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FLORA OF HONG KONG

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CLASSIFICATION SYSTEMS ADOPTED FOR THE *FLORA OF HONG KONG*

Gymnosperms

(Kubitzki 1990)

CONIFEROPHYTINA

Ginkgoatae

1. Ginkgoaceae

PINATAE

Pinales

2. Araucariaceae
3. Pinaceae
4. Sciadopityaceae
5. Taxodiaceae
6. Cupressaceae
7. Phyllocladaceae
8. Podocarpaceae

Taxales

9. Cephalotaxaceae
10. Taxaceae

CYCADOPHYTINA
Cycadatae

Cycadales

11. Boweniaceae
12. Cycadaceae
13. Stangeriaceae
14. Zamiaceae

GNETATAE

Gnetales

15. Ephedraceae
16. Welwitschiaceae
17. Gnetaceae

Angiosperms

(Cronquist 1988)

MAGNOLIOPSIDA (DICOTYLEDONS)

SUBCLASS MAGNOLIIDAE

Magnoliales

1. Winteraceae
2. Degeneriaceae
3. Himantandraceae
4. Eupomatiaceae
5. Austrobaileyaceae
6. Magnoliaceae
7. Lactoridaceae
8. Annonaceae
9. Myristicaceae
10. Canellaceae

Laurales

11. Amborellaceae
12. Trimeniaceae
13. Monimiaceae
14. Gomortegaceae
15. Calycanthaceae
16. Idiospermaceae
17. Lauraceae
18. Hernandiaceae

Piperales

19. Chloranthaceae
20. Saururaceae
21. Piperaceae

Aristolochiales

22. Aristolochiaceae

Illiciales

23. Illiciaceae
24. Schisandraceae

Nymphaeales

25. Nelumbonaceae
26. Nymphaeaceae
27. Barclayaceae
28. Cabombaceae
29. Ceratophyllaceae

Ranunculales

30. Ranunculaceae
31. Circaeasteraceae
32. Berberidaceae
33. Sargentodoxaceae
34. Lardizabalaceae
35. Menispermaceae
36. Coriariaceae
37. Sabiaceae

Papaverales

38. Papaveraceae
39. Fumariaceae

SUBCLASS HAMAMELIDAE

Trochodendrales

40. Tetracentraceae
41. Trochodendraceae

Hamamelidales

42. Cercidiphyllaceae
43. Eupteleaceae
44. Platanaceae
45. Hamamelidaceae
46. Myrothamnaceae

Daphniphyllales

47. Daphniphyllaceae

Didymelales

48. Didymelaceae

Eucommiales

49. Eucommiaceae

Urticales

50. Barbeyaceae
51. Ulmaceae
52. Cannabaceae
53. Moraceae
54. Cecropiaceae
55. Urticaceae
56. Physenaceae

Leitneriales

57. Leitneriaceae

Juglandales

58. Rhoipteleaceae
59. Juglandaceae

Myricales

60. Myricaceae

Fagales
61. Balanopaceae
62. Ticodendraceae
63. Fagaceae
64. Nothofagaceae
65. Betulaceae

Casuarinales
66. Casuarinaceae

SUBCLASS CARYOPHYLLIDAE

Caryophyllales
67. Phytolaccaceae
68. Achatocarpaceae
69. Nyctaginaceae
70. Aizoaceae
71. Didiereaceae
72. Cactaceae
73. Chenopodiaceae
74. Amaranthaceae
75. Portulacaceae
76. Basellaceae
77. Molluginaceae
78. Caryophyllaceae

Polygonales
79. Polygonaceae

Plumbaginales
80. Plumbaginaceae

SUBCLASS DILLENIIDAE

Dilleniales
81. Dilleniaceae
82. Paeoniaceae

Theales
83. Ochnaceae
84. Sphaerosepalaceae
85. Sarcolaenaceae
86. Dipterocarpaceae
87. Caryocaraceae
88. Theaceae
89. Actinidiaceae
90. Scytopetalaceae
91. Pentaphylacaceae
92. Tetrameristaceae
93. Pellicieraceae
94. Oncothecaceae
95. Marcgraviaceae
96. Quiinaceae
97. Elatinaceae
98. Paracryphiaceae
99. Medusagynaceae
100. Clusiaceae (Guttiferae) (incl. Hypericaceae)

Malvales
101. Elaeocarpaceae
102. Tiliaceae
103. Sterculiaceae
104. Bombacaceae
105. Malvaceae

Lecythidales
106. Lecythidaceae

Nepenthales
107. Sarraceniaceae
108. Nepenthaceae
109. Droseraceae

Violales
110. Flacourtiaceae
111. Peridiscaceae
112. Bixaceae
113. Cistaceae
114. Huaceae
115. Lacistemataceae
116. Scyphostegiaceae
117. Stachyuraceae
118. Violaceae
119. Tamaricaceae
120. Frankeniaceae
121. Dioncophyllaceae
122. Ancistrocladaceae
123. Turneraceae
124. Malesherbiaceae
125. Passifloraceae
126. Achariaceae
127. Caricaceae
128. Fouquieriaceae
129. Hoplestigmataceae
130. Cucurbitaceae
131. Datiscaceae
132. Begoniaceae
133. Loasaceae

Salicales
134. Salicaceae

Capparales
135. Tovariaceae
136. Capparaceae
137. Brassicaceae (Cruciferae)
138. Moringaceae
139. Resedaceae

Batales
140. Gyrostemonaceae
141. Bataceae

Ericales
142. Cyrillaceae
143. Clethraceae
144. Grubbiaceae
145. Empetraceae
146. Epacridaceae
147. Ericaceae
148. Pyrolaceae
149. Monotropaceae

Diapensiales
150. Diapensiaceae

Ebenales
151. Sapotaceae
152. Ebenaceae
153. Styracaceae
154. Lissocarpaceae
155. Symplocaceae

Primulales
156. Theophrastaceae
157. Myrsinaceae
158. Primulaceae

SUBCLASS ROSIDAE

Rosales
159. Brunelliaceae
160. Connaraceae
161. Eucryphiaceae
162. Cunoniaceae
163. Davidsoniaceae
164. Dialypetalanthaceae
165. Pittosporaceae
166. Byblidaceae
167. Hydrangeaceae (incl. Philadelphaceae)
168. Columelliaceae
169. Grossulariaceae
170. Greyiaceae
171. Bruniaceae
172. Anisophylleaceae
173. Alseuosmiaceae
174. Crassulaceae
175. Cephalotaceae
176. Saxifragaceae
177. Rosaceae
178. Neuradaceae
179. Crossosomataceae
180. Chrysobalanaceae
181. Surianaceae
182. Rhabdodendraceae

Fabales
183. Mimosaceae
184. Caesalpiniaceae
185. Fabaceae (Papilionaceae)

Proteales
186. Elaeagnaceae
187. Proteaceae

Podestemales
188. Podostemaceae

Haloragales
189. Haloragaceae
190. Gunneraceae

Myrtales
191. Sonneratiaceae
192. Lythraceae
193. Rhynchocalycaceae
194. Alzateaceae
195. Penaeaceae
196. Crypteroniaceae
197. Thymelaeaceae
198. Trapaceae
199. Myrtaceae
200. Punicaceae
201. Onagraceae
202. Oliniaceae
203. Melastomataceae
204. Combretaceae

Rhizophorales
205. Rhizophoraceae

Cornales
206. Alangiaceae
207. Cornaceae
(incl. Nyssaceae)
208. Garryaceae

Santalales
209. Medusandraceae
210. Dipentodontaceae
211. Olacaceae
212. Opiliaceae
213. Santalaceae
214. Misodendraceae
215. Loranthaceae
216. Viscaceae
217. Eremolepidaceae
218. Balanophoraceae

Rafflesiales
219. Hydnoraceae
220. Mitrastemonaceae
221. Rafflesiaceae

Celastrales
222. Geissolomataceae
223. Celastraceae
224. Hippocrateaceae
225. Stackhousiaceae
226. Salvadoraceae
227. Tepuianthaceae
228. Aquifoliaceae
229. Icacinaceae
230. Aextoxicaceae
231. Cardiopteridaceae
232. Corynocarpaceae
233. Dichapetalaceae

Euphorbiales
234. Buxaceae
235. Simmondsiaceae
236. Pandaceae
237. Euphorbiaceae

Rhamnales
238. Rhamnaceae
239. Leeaceae
240. Vitaceae

Linales
241. Erythroxylaceae
242. Humiriaceae
243. Ixonanthaceae
244. Hugoniaceae
245. Linaceae

Polygalales
246. Malpighiaceae
247. Vochysiaceae
248. Trigoniaceae
249. Tremandraceae
250. Polygalaceae
251. Xanthophyllaceae
252. Krameriaceae

Sapindales
253. Staphyleaceae
254. Melianthaceae
255. Bretschneideraceae
256. Akaniaceae
257. Sapindaceae
258. Hippocastanaceae
259. Aceraceae
260. Burseraceae
261. Anacardiaceae
262. Julianiaceae
263. Simaroubaceae
264. Cneoraceae
265. Meliaceae
266. Rutaceae
267. Zygophyllaceae

Geraniales
268. Oxalidaceae
269. Geraniaceae
270. Limnanthaceae
271. Tropaeolaceae
272. Balsaminaceae

Apiales
273. Araliaceae
274. Apiaceae (Umbelliferae)

SUBCLASS ASTERIDAE

Gentianales
275. Loganiaceae
[incl. Strychnaceae (Spigeliaceae)]
276. Gentianaceae
277. Saccifoliaceae
278. Apocynaceae
279. Asclepiadaceae

Solanales
280. Duckeodendraceae
281. Nolanaceae
282. Solanaceae
283. Convolvulaceae
284. Cuscutaceae
285. Retziaceae
286. Menyanthaceae
287. Polemoniaceae
288. Hydrophyllaceae

Lamiales
289. Lennoaceae
290. Boraginaceae
291. Verbenaceae
292. Lamiaceae (Labiatae)

Callitrichales
293. Hippuridaceae
294. Callitrichaceae
295. Hydrostachyaceae

Plantaginales
296. Plantaginaceae

Scrophulariales
297. Buddlejaceae
298. Oleaceae
299. Scrophulariaceae
300. Globulariaceae
301. Myoporaceae
302. Orobanchaceae
303. Gesneriaceae
304. Acanthaceae
305. Pedaliaceae
306. Bignoniaceae
307. Mendonciaceae
308. Lentibulariaceae

Campanulales
309. Pentaphragmataceae
310. Sphenocleaceae
311. Campanulaceae
312. Stylidiaceae
313. Donatiaceae
314. Brunoniaceae
315. Goodeniaceae

Rubiales
316. Rubiaceae
317. Theligonaceae

Dipsacales
318. Caprifoliaceae
319. Adoxaceae
320. Valerianaceae
321. Dipsacaceae

Calycerales
322. Calyceraceae

Asterales
323. Asteraceae (Compositae)

LILIOPSIDA (MONOCOTYLEDONS)

SUBCLASS ALISMATIDAE

Alismatales
324. Butomaceae
325. Limnocharitaceae
326. Alismataceae

Hydrocharitales
327. Hydrocharitaceae

Najadales
328. Aponogetonaceae
329. Scheuchzeriaceae
330. Juncaginaceae
331. Potamogetonaceae
332. Ruppiaceae
333. Najadaceae
334. Zannichelliaceae
335. Posidoniaceae
336. Cymodoceaceae
337. Zosteraceae

Triuridales
338. Petrosaviaceae
339. Triuridaceae

SUBCLASS ARECIDAE

Arecales
340. Arecaceae (Palmae)

Cyclanthales
341. Cyclanthaceae

Pandanales
342. Pandanaceae

Arales
343. Acoraceae
344. Araceae
345. Lemnaceae

SUBCLASS COMMELINIDAE

Commelinidales
346. Rapateaceae
347. Xyridaceae
348. Mayacaceae
349. Commelinaceae

Eriocaulales
350. Eriocaulaceae

Restionales
351. Flagellariaceae
352. Joinvilleaceae
353. Restionaceae
354. Centrolepidaceae

Juncales
355. Juncaceae
356. Thurniaceae

Cyperales
357. Cyperaceae
358. Poaceae (Gramineae)

Hydatellales
359. Hydatellaceae

Typhales
360. Sparganiaceae
361. Typhaceae

SUBCLASS ZINGIBERIDAE

Bromeliales
362. Bromeliaceae

Zingiberales
363. Strelitziaceae
364. Heliconiaceae
365. Musaceae
366. Lowiaceae
367. Zingiberaceae
368. Costaceae
369. Cannaceae
370. Marantaceae

SUBCLASS LILIIDAE

Liliales
371. Philydraceae
372. Pontederiaceae
373. Haemodoraceae
374. Cyanastraceae
375. Liliaceae
(incl. Amaryllidaceae)
376. Iridaceae
377. Velloziaceae
378. Aloeaceae
379. Agavaceae
380. Xanthorrhoeaceae
381. Hanguanaceae
382. Taccaceae
383. Stemonaceae
384. Smilacaceae
385. Dioscoreaceae

Orchidales
386. Geosiridaceae
387. Burmanniaceae
388. Corsiaceae
389. Orchidaceae

References

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ANGIOSPERMS
被子植物

HU Qi-ming 胡啟明

Herbs, shrubs or trees, usually with roots, stems and leaves. Secondary xylem almost all with vessels, rarely with tracheids. Flowers usually consisting of sepals, petals, androecium and gynoecium. Perianth undifferentiated or differentiated into calyx and corolla. Ovules enclosed by one or more carpels. Fruit dehiscent or indehiscent, containing one or more seeds.

B. Liliopsida
百合綱

Leaves mostly parallel-veined. Stem generally with scattered vascular bundles, without central pith and cambium. Flowers 3-merous, seldom 2-, rarely 5-merous. Cotyledon 1 (or the embryo sometimes undifferentiated).

Key to the families

(Based on P. H. Davis, J. Davis & J. Cullen: The identification of flowering plant families (1979), with modifications.)

1a. Plants thaloid, free-floating, not differentiated into stems and leaves; flowers minute ..... 345. **Lemnaceae**
1b. Plants differentiated into stems and leaves; terrestrial (or epiphytic) or more or less aquatic; flowers larger.
2a. Carpels free or only basally connate, or sometimes monocarpous.
3a. Trees or shrubs ..... 340. **Arecaceae** (part)
3b. Herbs.
4a. Plants saprophytic, slender, achlorophyllous ..... 339. **Triuridaceae**
4b. Plants aquatic or semiaquatic, green.
5a. Perianth obvious, 1–2 cycles, at least one of it petal-like, coloured.
6a. Perianth 2 cycles, 3-merous; carpels 10-merous.
7a. Ovules solitary, seldom 2–several, generally ventral-basal; fruit indehiscent, or seldom dehiscent at the base ..... 326. **Alismataceae**
7b. Ovules several or many, scattered over the inner surface of the carpel; fruit dehiscent ..... 325. **Limnocharitaceae**
6b. Perianth 1 cycle; carpels 3–4.
8a. Perianth lobes 2, carpels 3 ..... 328. **Aponogetonaceae**
8b. Perianth lobes 4, carpels 4 ..... 331. **Potamogetonaceae**
5b. Perianth absent.
9a. Flowers bisexual; stamens 2 ..... 332. **Ruppiaceae**
9b. Flowers unisexual; stamen 1.
10a. Plants of fresh water; leaves 1-veined ..... 333. **Najadaceae**
10b. Plants of marine; leaves parallel-veined ..... 337. **Zosteraceae**
2b. Carpels wholly connate.
11a. Flowers enclosed in scale-like bracts.
12a. Perianth present; fruit a capsule.
13a. Flowers bisexual; stamens 3; ovary 1-locular or sometimes imperfectly 3-locular ..... 347. **Xyridaceae**
13b. Flowers unisexual; stamens 4–6; ovary 2–3-locular ..... 350. **Eriocaulaceae**
12b. Perianth absent or scale-like, or bristle-like; fruit an achene or caryopsis.
14a. Culms usually triangular (less often terete) and solid; leaf sheath usually closed; flowers spirally or less often distichously arranged on axis of spike or spikelet; fruit an achene, seed-coat generally free from pericarp ..... 357. **Cyperaceae**
14b. Culms terete and usually hollow; leaf sheath usually open; flowers distichously arranged on axis of spikelet; fruit a caryopsis, seed-coat usually adnate to pericarp ..... 358. **Poaceae**
11b. Flowers not enclosed in scale-like bracts.
15a. Trees, shrubs or lianas.

16a. Leaves large, pinnate or palmate-divided ..... 340. **Arecaceae** (part)
16b. Leaves entire.
17a. Perianth absent; leaves spirally arranged at stem tip, margin and midrib spiny ..... 342. **Pandanaceae** (part)
17b. Perianth present; leaves scattered on stem or basally rosetted, without spines.
18a. Plants scandent; tip of petioles often with tendrils..... 384. **Smilacaceae**
18b. Plants erect; tip of petioles without tendrils..... 379. **Agavaceae** (*Dracaena, Cordyline*)
15b. Herbs.
19a. Perianth lobes scale-like, aristiform, minute, obscure or absent.
20a. Inflorescence a spadix with spathe (female flower solitary, male flowers whorled on top of inflorescence in *Pistia* only).
21a. Leaves ensiform, unifacial; plants with ethereal oil cells; fruit dry..... 343. **Acoraceae**
21b. Leaves with a more or less expanded, bifacial blade; plants without ethereal oil cells ..... 344. **Araceae**
20b. Inflorescence not a spadix with spathe.
22b. Leaves stiff, leathery, spirally arranged at stem tip, margin and midrib spiny; fruit a syncarp, often woody..... 342. **Pandanaceae** (part)
22a. Leaves reduced to a sheath or basal and cauline, not spiny; fruit capsular or a 1-seeded nutlet.
23a. Flowers bisexual, in cymes or head-like clusters; perianth segments 6, scarious; ovules 3–many per ovary ..... 355. **Juncaceae**
23b. Flowers unisexual, in cylindrincal spikes; perianth reduced to hairs and scales; ovules 1 per ovary..... 361. **Typhaceae**
19b. Perianth lobes obvious, not scale-like.
24a. Ovary superior.
25a. Perianth differentiated into calyx and corolla..... 349. **Commelinaceae**
25b. Perianth not differentiated into calyx and corolla, or wholly petal-like.
26a. Plants aquatic; leaves basally sheathing..... 372. **Pontederiaceae**
26b. Plants terrestrial.
27a. Flowers 2-merous.
28a. Plants scandent; leaves ovate or ovate-oblong; inflorescence not white lanuginose ..... 383. **Stemonaceae**
28b. Plants erect; leaves ensiform; inflorescence white lanuginose ..... 371. **Philydraceae**
27b. Flowers 3-merous.
29a. Plants not xerophytic; leaves not fleshy and rosetted ..... 375. **Liliaceae**
29b. Plants xerophytic; leaves fleshy and rosetted.
30a. Inflorescence a panicles; leaves richly fibrous..... 379. **Agavaceae** (part)
30b. Inflorescence a raceme; leaves not richly fibrous ..... 378. **Aloeaceae**
24b. Ovary inferior or semi-inferior.
31a. Plants aquatic; flowers unisexual, rarely bisexual..... 327. **Hydrocharitaceae**
31b. Plants terrestrial.
32a. Flowers actinomorphic.
33a. Perianth differentiated into calyx and corolla..... 362. **Bromeliaceae**
33b. Perianth not differentiated into calyx ad corolla, wholly petaloid.
34a. Leaves distichous, with sheathing base and narrow blade..... 376. **Iridaceae**
34b. Leaves spiral, without sheathing base, blade broader.
35a. Plants scandent; flowers unisexual, dioecious; fruits 3-winged..... 385. **Dioscoreaceae**
35b. Plants erect; flowers bisexual; fruits winged or not.
36a. Umbels with 4 involucrate bracts; ovary 1-locular .. 382. **Taccaceae**
36b. Flower solitary or in racemes or panicles; ovary 3-locular.
37a. Plants small; leaves scale-like, colourless or green; fruits winged..... 387. **Burmanniaceae**
37b. Plants larger; leaves ensiform or lanceolate, green; fruits not winged..... 379. **Agavaceae** (*Agave*)
32b. Flowers zygomorphic.
38a. Fertile stamens 5(–6)
39a. Leaves and bracts spirally arranged; flowers unisexual; fruit a banana..... 365. **Musaceae**
39b. Leaves and bracts distichous; flowers bisexual; fruit not a banana ..... 363. **Strelitziaceae**

38b. Fertile stamens 1, rarely 3.

40a. Flowers without petaloid staminodes; filament united with style forming gynostemium (column); pollen-grains ususlly cohering in pollinia ..... 389. **Orchidaceae**

40b. Flowers with petaloid staminodes; stamens free from style; pollen grains not cohering in pollinia.

41a. Sepals free; anthers 2-celled.

42a. Leaves distichous; sheaths open; plants aromatic ..... 367. **Zingiberaceae**

42b. Leaves spirally arranged; sheaths initially closed; plants not aromatic ..... 368. **Costaceae**

41b. Sepals partly connate; anthers 1-celled.

43a. Leaves more or less distichous, without pulvini ..... 369. **Cannaceae**

43b. Leaves spirally arranged, with pulvini ..... 370. **Marantaceae**

325. LIMNOCHARITACEAE 黃花蘭科(黃花絨葉草科)

YIP Kwok-leung 葉國樑

Herbs, aquatic, perennial, rhizomatous or stoloniferous, caulescent, glabrous, free floating or rooted; sap milky. Leaves basal (or alternate), submersed and floating (rarely emersed), sessile or petiolate, sheathing proximally; blade entire, linear, lanceolate, oblong or obovate, parallel-veined or pinnately veined. Inflorescences scapose umbels, floating (rarely erect), bracteate. Flowers bisexual, hypogynous, pedicellate; sepals 3, persistent; petals 3, deciduous; stamens 3 or 6 or 7–many, distinct; anthers 4-celled, dehiscing longitudinally; pistils (3–)10–20, distinct or coherent proximally, 1-locular; placentation laminar; ovules 12–100. Fruits follicles. Seeds: embryo U-shaped; endosperm absent.

Three genera and eight species in tropical and subtropical regions of the world; one genus and one species in China and Hong Kong.

1. Limnocharis Bonpl. 黃花蘭屬 (黃花絨葉草屬)

Herbs, aquatic, with aerial leaves. Leaves petiolate, ovate to orbicular. Scapes erect; umbels terminal; bracts forming an involucre; pedicels thick. Sepals persistent, green. Petals yellowish, thin. Stamens many, with sterile staminodes in outermost whorl; filaments flattened. Carpels many, free, crowded into a head, laterally compressed; stigmas sessile. Seeds many, strongly curved; embryo U-shaped.

Two species in tropical to subtropical regions of N & S America and naturalized in tropical Asia; one species in China and Hong Kong.

This genus is included in the Alismataceae by some authorities.

1. Limnocharis flava (L.) Buchenau

黃花蘭(黃花絨葉草) **(Fig. 1; Photo 1)**

Abh. Naturwiss. Vereine Bremen 2: 2. 1868; Fl. Males., Ser. I, 5(1): 120. 1954; FYN 4: 747, fig. 207. 1986; FRPS 8: 149, pl. 57. 1992; FOC 23: 89. 2010.

Alisma flavum L., Sp. Pl. 1: 343. 1753.

Limnocharis emarginata Bonpland, Pl. Aequinoct. 1: 116, t. 34. 1808["1807"].

Aquatic herb. Petiole trigonous, 20–65 cm, stout; leaf blade 6–28 cm × 4.5–20 cm, veins 9–13, transverse veins many, parallel, base obtuse or subcordate, apex obtuse or retuse. Scapes upper trigonous, 20–90 cm; umbels 2–15-flowered; bracts green, orbicular to broadly elliptic, 1.5–2 × 1–1.5 cm. Pedicels thick, triquetrous, 2–7 cm. Petals yellowish but blackish toward base, broadly ovate to orbicular, 2–3 × 1–2 cm, apex rounded. Stamens shorter than petals; filaments green. Carpels yellowish green. Fruit cluster 1.5–2 cm in diam.; follicles suborbicular. Seeds brown.

Locality: Sha Tin, also cultivated in Hong Kong Wetland Park. *Y. S. Lau 2603*.

Distribution: Guangdong, S Yunnan; naturalized throughout S and SE Asia; native to tropical America.

Ecology: Marshes, shallow-water fields. Flowering: Jul.

Uses: Ornamental, forage.

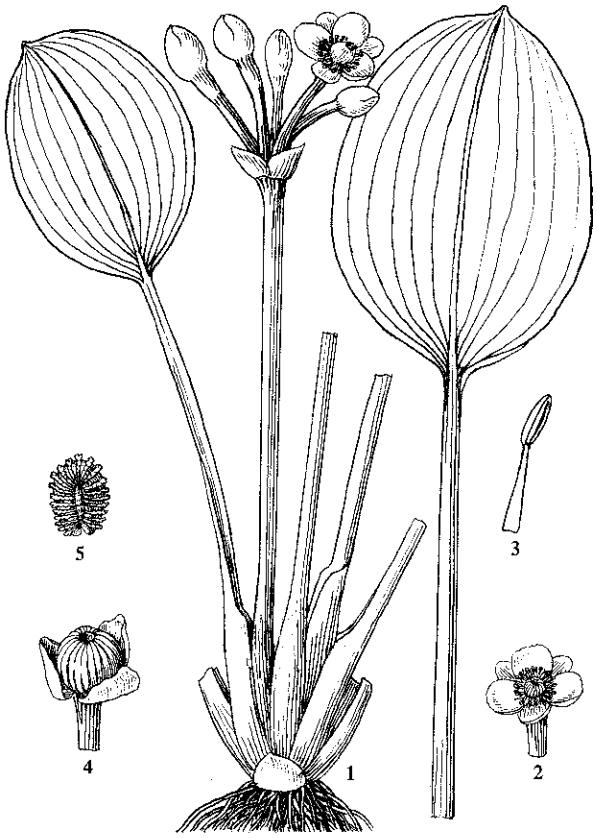

Figure 1. *Limnocharis flava* (L.) Buchenau
1. flowering plant; *2*. flower; *3*. stamen; *4*. fruit; *5*. seed. (drawn by H. P. Yu)

326. ALISMATACEAE 澤瀉科

WU De-lin 吳德鄰

Herbs aquatic or marshy, sometimes laticiferous. Stems corm-like, rhizomatous, or stoloniferous. Leaves basal, emersed or floating, sessile or petiolate; petiole with sheathing base, sheath without auricles; blade linear, lanceolate, ovate or sagittate, margins entire or undulate, with parallel primary veins from base of blade to apex and reticulate secondary veins. Inflorescences scapose, mostly erect, racemose or paniculate; bracts whorled, linear. Flowers actinomorphous, hypogynous, bisexual, unisexual or polygamous. Sepals 3, green, persistent. Petals 3, caducous. Stamens 6-many, free; anthers 2-celled, basifixed or versatile. Gynoecium of 2–many free carpels, carpels in 1 whorl or irregularly spaced, each with 1(–2) anatropous ovules; placentation basal, rarely marginal; styles terminal or lateral, persistent, stigma linear. Fruit a cluster or whorls of laterally compressed achenes, or rarely follicles. Seeds 1–few, oblong or hippocrepiform; endosperm absent.

About 11 genera and 75 species, cosmopolitan in distribution, but mainly in N hemisphere; four genera and 20 species in China; two genera and three species in Hong Kong.

1a. Flowers bisexual; stamens 6 ..... 1. *Alisma*
1b. Flowers unisexual; stamens many ..... 2. *Sagittaria*

1. Alisma L. 澤瀉屬

Herbs aquatic or marshy, tuberous, rarely rhizomatous, laticiferous or elaticiferous. Leaves basal, emersed or submersed, leaf blades lanceolate, cordate, or sagittate, with white squamules, 3–7-veined. Inflorescence scapose, emergent, verticillate, paniculate. Flowers bisexual. Sepals 3, herbaceous, persistent. Petals 3, white or pink, membranous, deciduous. Stamens 6, filaments filiform. Carpels many, free, whorled at apex of receptacle; styles terminal or lateral; ovule solitary. Achenes few or many, compressed, forming an echinate head. Seeds dark brown, black-purple or purple-red, hippocrepiform.

About 11 species, mainly distributed in N hemisphere; six species in China; one species in Hong Kong.

Figure 2. *Alisma plantago-aquatica* L.
1. plant; *2.* inner tepal; *3.* stamen and ovary; *4.* fruit. (drawn by H. P. Yu)

1. Alisma plantago-aquatica L. 澤瀉 **(Fig. 2)**
Sp. Pl. 342. 1753; Dandy in Tutin et al., Fl. Europ. 5: 2. 1980; FRPS 8: 141. 1992; R. Haynes, Fl. Thailand 7(3): 352. 2001; FGD 9: 159. 2009; FOC 23: 87. 2010.

Perennial herb, growing in tufts at the bottom of the water. Tuber fleshy, 1–3.5 cm in diam., or more. Submersed leaves linear or lanceolate; emersed leaves petiolate; petioles of 1.5–30 cm, base sheathed, upper part terete, spongy; leaf blades broad-lanceolate, elliptic to ovate, 2–11 × 1.3–7 cm, base broad-cunneate to shallowly cordate, apex acuminate, rarely acute; veins 5. Scapes 78–100 cm tall or more. Inflorescences paniculate, with 4–9 whorls, each whorl with 3–5 flowers or branches. Flowers bisexual. Sepals 2.5–3.5 × 2–3 mm, 7-veined. Petals white, pink or purplish, suborbiculate, 3.5–6.5 × 3.6 mm. Stamens in 1 series, filaments filiform. Carpels 17–23 in a single whorl; styles ventral. Achenes elliptic or suboblong, 2.5 × 1.5 mm, compressed, dorsally with 1–2 shallow sulci. Seeds purple-brown.

Locality: Sha Tin. *Y. S. Lau 2575.*
Distribution: NE to NW China, Yunnan; widespread throughout most regions of Europe and Asia.
Ecology: Ponds, paddy fields. Flowering & fruiting: May–Oct.
Uses: Ornamental, medicinal (folklore).

2. Sagittaria L. 慈姑屬

Perennial or rarely annual herbs, aquatic. Stems often with rhizomes. Emersed leaves sagittate, floating leaves mostly cordate, submersed phyllodes linear. Flowers in whorls of 2 or 3, forming a raceme or a narrow panicle, with female flowers proximally, male ones distally. Sepals 3, herbaceous. Petals 3, delicate, white or rarely pink. Stamens 6–many; filaments filiform. Carpels many, crowded on a large globose or oblong receptacle, laterally flattened; styles ventral or apical. Achenes laterally compressed, beaked, winged. Seeds hippocrepiform.

About 25 species mainly in temperate and tropical America; nine species in China; two species in Hong Kong.

1a. Floating herbs; floating leaves ovate or broadly ovate, submersed leaves linear or lanceolate, or petiole-like; racemes simple; achene with 1–3 lateral wings, margins irregulary and deeply lobed ..... 1. *S. guayanensis* subsp. *lappula*
1b. Emersed herbs; leaves sagittate; racemes usually 1–3-branched at base; achene without lateral wings, margins entire ..... 2. *S. trifolia* subsp. *leucopetala*

1. Sagittaria guayanensis Kunth subsp. **lappula** (D. Don) Bogin 冠果草 **(Photos 2–3)**
Mem. New York Bot. Gard. 2: 192. 1955; FHN 4: 61. 1977; FRPS 8: 129. 1992; FGD 9: 156. 2009; FOC 23: 85. 2010.
Sagittaria lappula D. Don, Prodr. Fl. Nepal. 22. 1825.
Lophotocarpus guayanensis (H. B. & K.) J. G. Sm., Rep. Miss. Bot. Gard. 4: 35. 1895; FKH 290. 1912.
Lophotocarpus formosanus Hayata, Ic. Pl. Form. 5: 249. 1915; FTW 5: 10. 1978.
Sagittaria cordifolia Roxb., Fl. Ind. 2: 647. 1824; FHK 346. 1861.

Perennial floating herb, stolons lacking. Submersed leaves linear or lanceolate, or petiole-like; floating leaves ovate or broadly ovate, 2–6 × 1–4 cm, base deeply cordate, apex obtuse; veins 4–8 forward, 3–6 backward; petioles 10–20 cm or more. Scapes erect, 8–25 cm, extending out from water surface. Inflorescences racemose, 2–15 cm, 2–5-whorled, each whorl 2–3-flowered; flowers bisexual or unisexual, usually bisexual flowers in 1–3 whorls at lower part of inflorescences; male flowers on upper part. Sepals 3, ovate, 5–9 × 3–6 mm, persistent. Petals 3, white, base yellowish, nearly of same size as sepals, fugacious. Stamens 6–many. Carpels many. Achenes obliquely oblong, 2–3 × 1.5–2.5 mm, tuberculate, with 1–3 lateral wings, margins irregularly and deeply lobed.

Locality: Sha Tin, Fanling, Lantau Island. *Y. S. Lau 752, 1277; Y. W. Lam 2229.*

Distribution: SW to SE China; S & SE Asia, tropical Africa.

Ecology: Ponds, paddy fields and marshes. Flowering & fruiting: May–Nov.

2. Sagittaria trifolia L. subsp. **leucopetala** (Miq.) Q. F. Wang 慈姑 **(Fig. 3; Photos 4–5)**

FOC 23: 85. 2010.

Sagittaria trifolia L., Sp. Pl. 993. 1753.

Sagittaria sinensis Sims., Bot. Mag. (Tokyo) 39: 163. 1814.

Sagittaria sagittifolia L. f. *sinensis* (Sims.) Makino, Bot. Mag. (Tokyo) 15(174): 105. 1901.

Sagittaria sagittifolia L. subsp. *leucopetala* (Miq.) Hartog, Fl. Males. ser. 1, 5: 332. 1957; FHN 4: 62. 1977; R. Haynes, Fl. Thailand 7(3): 358. 2001.

Sagittaria trifolia L. var. *sinense* (Sims.) Makino, Ill. Fl. Nippon 886, pl. 2657. 1940; FRPS 8: 133. 1992; FGD 9: 157. 2009.

Sagittaria sagittifolia auct. non. L.: FKH 290. 1912.

Perennial herb, emersed, stoloniferous; tuber ovoid-globular or globular, 5–7 cm. Leaves long-petiolate; blades sagittate, central lobe ovate to broadly ovate, 9–16 cm, 5–7-veined, apex central lobe, lateral lobes usually longer than central lobe. Scapes 40–70 cm. Racemes sometimes 1–3-branched at base; female flowers, on lower 1–8 whorls, pedicels 1–2 cm; male flowers with longer pedicels, on the upper part. Sepals ovate, 6–8 mm, reflexed. Petals white, twice as large as sepals. Stamens many, anthers yellow. Achenes obliquely obovate, 4 × 3 mm, winged, shortly beaked. Seeds brown.

Locality: Cultivated. *W. J. Tutcher 11240; Y. S. Lau 750, 2619.*

Distribution: Widely cultivated in China; Asia.

Ecology: Ponds, paddy fields and marshes. Flowering & fruiting: May–Oct.

Uses: Food (tuber).

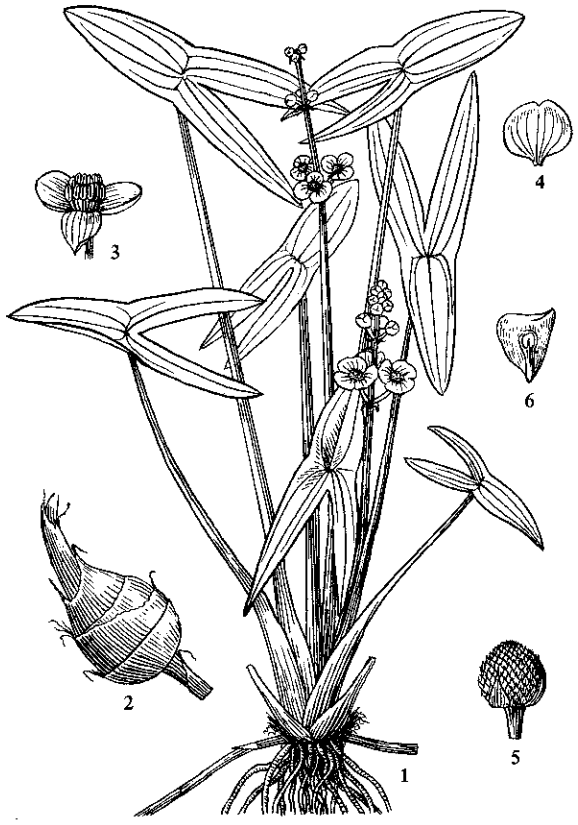

Figure 3. *Sagittaria trifolia* subsp. *leucopetala* (Miq.) Q. F. Wang
1. flowering plant; *2.* tuber; *3.* flower; *4.* petal; *5.* conocarpium; *6.* achene. (drawn by H. P. Yu)

327. HYDROCHARITACEAE 水鼈科

YIP Kwok-leung 葉國樑

Herbs, annual or perennial, submerged or floating, aquatic in fresh or brackish water or marine. Stems short or elongate, sometimes stoloniferous. Leaves radical or cauline, alternate, opposite, subopposite, whorled, or pseudowhorled, sessile or petiolate, usually sheathing at base. Flowers unisexual or bisexual, actinomorphic, enclosed in a bifid spathe or within 2 opposite spathal bracts, or rarely not spatulate; spathes sessile or pedunculate. Stamens 1–many, occasionally some staminodal; anthers 1–4-celled. Ovary inferior, 1-locular; carpels 2–15, fused; ovules few to many, on parietal, sometimes intruding placentas; styles 2–5; stigmas usually bifid. Fruit a fleshy and berry-like capsule dehiscent or opening by decay of pericarp. Seeds many, usually small, without endosperm; embryo straight.

About 17 genera with about 80 species: widely distributed in tropical and subtropical regions of the world; nine genera and about 29 species in China; six genera and nine species in Hong Kong.

Some authorities included in this family the genus *Najas* (Family 333. Najadaceae), which is distinguished by its fruit being an elliptic-oblong achene; the 2-lipped perianth; plant being an annual, submerged in fresh or brackish water; and its sessile leaves.

1a. Marine herbs; pollen grains thread-like ..... 1. *Halophila*
1b. Freshwater herbs; pollen grains not thread-like.
2a. Leaves cauline; stems elongate.
3a. Leaves alternate, opposite, or spirally arranged ..... 2. *Blyxa* (part)
3b. Leaves whorled.

4a. Leaves minutely serrate, magnification needed ..... 3. *Egeria*
4b. Leaves distinctly serrate to unaided eye ..... 4. *Hydrilla*
2b. Leaves all basal; stems short.
5a. Leaves lanceolate to orbicular, differentiated into petiole and blade; fruit oblong or ellipsoidal ..... 5. *Ottelia*
5b. Leaves linear, ribbon-like, sessile; fruit narrowly cylindrical.
6a. Stolon absent; leaves flattened; stamens 3–9; ovary attenuate into a long, filiform beak; peduncle of female flower shorter ..... 2. *Blyxa* (part)
6b. Stolon present; leaves slightly convex; stamens 1–3; ovary not as above; peduncle of female flower very long ..... 6. *Vallisneria*

1. Halophila Thouars 喜鹽草屬

YIP Kwok-leung 葉國樑 · Patrick LAI Chuen-chi 黎存志

Marine herbs. Rhizomes present; leaf-bearing branches arising from rhizome at each node; stolons absent. Erect stems, if present, rooted in substrate, unbranched, short; scales 2, midway or higher on stem. Leaves 2–8, terminal pairs or pseudowhorls (rarely distichous), submersed, sessile or petiolate; blade linear to ovate, base tapering to stem, apex obtuse, midvein without lacunae along side(s), blade uniform in colour throughout, abaxially without prickles, intravaginal squamules entire. Inflorescences 1-flowered or cymose, sessile; spathes not winged. Flowers unisexual, male and female on same plants or on different plants, submersed, sessile, nearly sessile (female), or pedicellate (male); petals absent. Male flowers: filaments distinct; anthers linear to fusiform; pollen in moniliform chains. Female flowers: ovary 1-locular; styles 3–5, not 2-fid. Fruits ovoid to spherical, smooth or ridged, not echinate, dehiscing by decay of pericarp. Seeds spherical or nearly so, echinate to reticulate.

About 13 species in tropical and warm temperate seas; four species in China; three species in Hong Kong.

Yip and Lai (Acta Phytotaxonomica Sinica 44(4): 457–463. 2006) recently provided a treatment of this genus based on field and herbarium specimens from Hong Kong.

1a. Leaves oblong-ovate to lanceolate; lateral shoots longer, 1–1.5 cm, with 6–10 leaf blades at the top; cross-veins lacking, mid-rib and intramarginal veins present ..... 1. *H. beccarii*
1b. Leaves ovate; lateral shoots short, 1 cm or less, often inconspicuous, with only one pair of leaves; cross-veins present, linking the mid-rib and intramarginal veins.
2a. Leaf blades 6–13 mm, with 7–12 pairs of cross-veins at an angle of 70°–90° ..... 2. *H. minor*
2b. Leaf blades 10–40 mm, with 12–25 pairs of cross-veins at an angle of 45°–60° ..... 3. *H. ovalis*

1. Halophila beccarii Asch. 貝克喜鹽草 **(Photo 6)**

Nuov. Giorn. Bot. Ital. 3: 302. 1871; Fl. Males., Ser. I, 5(4): 411. 1957; FRPS 8: 188, pl. 74. 1992; FTW ed. 2, 5: 15. 2000; Kuo & den Hartog in Short & Coles, Global Seagrass Research Methods 50. 2001; FGD 6: 300, fig. 169. 2005; Yip & Lai, Acta Phytotax. Sin. 44(4): 460. 2006; FOC 23: 102. 2010.

Marine herb. Thin rhizomes with 2 scales covering the base of the erect stem bearing a group of 4–10 leaves at the top. Blades lanceolate, up to 13 mm long, 1–2 mm wide, with pointed apex but lacking cross-veins. Female flowers with 2 styles, 10–15 mm long. Fruits ellipsoidal to ovoid, 4–5 mm by 1.2 mm. Seeds globose, 1.2 × 1 mm.

Locality: Tai Tam Bay, Sheung Pak Nai, Ha Pak Nai. *HK sheet 33274, 33275, 39064.*

Distribution: Hainan, Guangdong, Taiwan; Indo-Pacific region.

Ecology: Coastal mudflats. Flowering: May.

Notes: The lack of cross-veins clearly distinguishes this species from other *Halophila* species. The species is usually associated with mangrove communities and often exposed at low tide (Kuo & den Hartog, 2001), and has high fecundity and rapid rhizome extension rates so that it can colonize some areas in very short time and disappear quickly when unfavourable conditions come (Fong, Asian Marine Biology 16: 109–121. 1999).

2. Halophila minor (Zoll.) Hartog 小喜鹽草 **(Photos 7–8)**

Flora Males., Ser. I, 5(4): 410. 1957; FRPS 8: 188, pl. 73: 8. 1992; Kuo & den Hartog in Short & Coles, Global Seagrass Research Methods, 50. 2001; FGD 6: 301. 2005; Yip & Lai, Acta Phytotax. Sin. 44(4): 459. 2006; FOC 23: 102. 2010.

Lemnopsis minor Zoll., Syst. Verz. 1: 75. 1854.

Halophila lemnopsis Miq., Fl. Ind. Bat. 3: 230, fig. 176. 1856.

Halophila ovata auct. non Gaudich.: Hodgkiss & Morton, Mem. HK Nat. Hist. Soc. 13: 28–32. 1978; Check List HK Plants 73. 1978; 77. 1993 [quoad specim. May 1978, *Morton s.n.* (HK sheet 33276); 23 Jun 1971, *Thrower s.n.* (HK sheet 30426)].

Marine herb. Leaf blades ovate, 6–12 mm long, 3.5–6 mm wide with (4–)7–12 occasionally branched cross-veins, space between intramarginal veins and blade margin narrow. Dioecious. Male flowers with tepals 1.5 mm long, anthers 2.5–3.5 mm long. Female flowers with 3 styles, 8–20 mm long. Fruits 2–3.5 mm in diam.

Locality: Tai Tam, Ho Chung, To Kwa Peng, Hoi Ha, Tsam Chuk Wan, Sunny Bay. *HK sheet 38542, 39894, 39895.*

Distribution: Hainan, Nansha Islands; Indo-Pacific regions.

Ecology: Coastal mudflats. Flowering: Aug.

Notes: This species has recently been recorded on mudflats adjacent to mangroves (Kwok, Lam & Yip, *HK Biodiversity* No. 10: 16. 2005). This also represents the first locality of the species in continental China (Yip & Lai, 2006). A re-examination of herbarium specimens found that this species was also previously recorded as *Halophila ovata* (Check List HK Plants 73. 1978; 77. 1993). There is recent molecular evidence indicating potential divergence between *H. minor* and *H. ovalis* (Xu et al., Am. J. Bot.: e56–e57. 2010).

3. Halophila ovalis (R. Br.) Hook. f. 喜鹽草 **(Fig. 4; Photo 9)**

Fl. Tasm. 2: 25. 1858; Fl. Males., Ser. I, 5(4): 408. 1957; FRPS 8: 186, pl. 73: 1–7. 1992; K. F. Zhao & F. T. Li, Halophytes of China 320. 1999; FTW ed. 2, 5: 15. 2000; Kuo & den Hartog in Short & Coles, Global Seagrass Research Methods 50. 2001; FGD 6: 301. 2005; Yip & Lai, Acta Phytotax. Sin. 44(4): 459. 2006; FOC 23: 101. 2010.

Caulinia ovalis R. Br., Prod. Fl. Nov. Holl. 1: 339. 1810.

Halophila minor auct. non (Zoll.) den Hartog: Xing et al., Mem. HK Nat. Hist. Soc. 23: 122. 2000.

Halophila ovata auct. non Gaudich.: FKH 257. 1912; Fong, Asian Marine Biology 16: 111. 1999.

Marine herb. Rhizome internodes and petiole up to 10 cm long. Leaf blade varies in shape from oblong-elliptic, spatulate, obovate, to ovate, rarely linear, 10–40 mm long, 5–20 mm wide, with 12–28 often branched cross-veins on either side of the midrib. Dioecious. Male flowers with tepals 3–5(–6) mm, anthers 1.5–2.5 mm long. Female flowers with 3 styles, 10–40 mm long. Fruits 3–6 mm in diam. Seeds subglobose.

Figure 4. *Halophila ovalis* (R. Br.) Hook. f.
1. plant; *2.* male flower; *3.* female spathe and stigma; *4.* female flower. (drawn by H. P. Yu)

Locality: Tai Tam Bay, Ho Chung, Lai Chi Wo, Wu Shek Kok, San Tau. *Y. W. Lam 821; HK sheet 39897, 39898.*

Distribution: Hainan, Guangdong, Taiwan, Nansha Islands; N Pacific, S Africa, Indo-Pacific, S Australia.

Ecology: Coastal mudflats on shallow beaches. Flowering: Aug.

Notes: The species is the most common seagrass in the tropical and subtropical regions of the Indo-West Pacific and inhabits various environments, resulting in considerable morphological variation (Kuo & den Hartog, 2001). Listed in *Rare and Precious Plants of Hong Kong*.

2. Blyxa Noronha 水篩屬

Herbs, submerged freshwater. Stems short or elongate, erect or stoloniferous. Leaves basal or spirally arranged along stem, sessile, lanceolate or linear, with prominent midvein and several lateral veins, sheathed at base, minutely serrulate along margin. Spathe tubular, sessile or pedunculate, bifid at apex, with longitudinal veins, 1-flowered or sometimes several-flowered. Flowers bisexual or unisexual. Sepals 3, persistent, green, linear or lanceolate. Petals 3, white, longer than sepals. Stamens 3–9; filaments slender; anthers 4-celled. Pistils 3; ovary linear, attenuate into a long, filiform beak; styles 3; ovules many. Fruit linear to terete, long, narrow. Seeds many, oblong-fusiform, smooth or with spines, sometimes with a filiform projection from each end.

About 11 species in tropical and subtropical regions; five species in China; two species in Hong Kong.

1a. Stems shortened; leaves basal; seeds spiny or tuberculate ..... 1. *B. aubertii*
1b. Stems elongate; leaves cauline; seeds smooth ..... 2. *B. japonica*

1. Blyxa aubertii Rich. 無尾水篩 **(Photo 10)**

Mem. Cl. Sci. Math. Phys. Inst. France 12(2): 19. 1812; Fl. Males. 5(4): 390. 1957; FHN 4: 61. 1977 ["*auberti*"]; FRPS 8: 174, pl. 68: 1–2. 1992; FFJ 6: 28. 1995; FTW ed. 2, 5: 11. 2000; FGD 6: 298. 2005; FOC 23: 99. 2010.

Blyxa ecaudata Hayata, Icon. Pl. Formosan 5: 208, pl. 77c–f. 1915.

Blyxa roxburghii auct. non Rich.: FHK 347. 1861; FKH 257. 1912.

Submerged herb. Stems shortened. Leaves all in basal rosette, linear, 5–17(–60) cm × 3(–12) mm, veins 5–9, apex acuminate. Spathes green, 3–5 cm × ca. 2 mm, with peduncle 2.7–8 cm. Flowers bisexual. Sepals greenish purple, linear-lanceolate, 5–7 × ca. 1 mm. Petals 9–17 × ca. 0.5 mm. Stamens 3; filaments 3–6 mm; anthers 1–1.8 mm. Ovary narrowly cylindrical, 2.5–4 cm; styles ca. 7 mm. Fruit (2–)4–6(–8) cm. Seeds 30–70, oblong-ovoid, 1.2–1.8 × ca. 0.6 mm, ca. 6–12-ribbed; ribs obscurely tuberculate or ridged; rounded at both ends, without tails.

Locality: Happy Valley, Chai Wan, Sai Keng, Tai O. *HK sheet 7051, 27111, 27112.*

Distribution: Hainan, Guangdong, Guangxi, Sichuan, Hunan, Jiangxi, Zhejiang, Fujian, Taiwan; E & S Asia, Africa, Australia, also introduced into N America.

Ecology: Paddy fields and ditches. Flowering & fruiting: May–Sep.

Notes: The species was reported as *Blyxa octandra* (Roxb.) Planch ex Thwaites previously (Check List HK Plants 77. 1993).

2. Blyxa japonica (Miq.) Maxim. ex Asch. & Gürke 水篩 **(Fig. 5; Photos 11–12)**

Engler & Prantl, Pflanzenfam. 2(1): 253. 1889; FGZ 649, fig. 343. 1956; FRPS 8: 171, pl. 67: 1–2. 1992; FFJ 6: 29. 1995; FTW ed. 2, 5: 13, pl. 6. 2000; FGD 6: 297, fig. 166. 2005; FOC 23: 98. 2010.

Hydrilla japonica Miq., Ann. Mus. Bot. Lugduno-Batavi 2: 271. 1866.

Blyxa laevissima Hayata, Icon. Pl. Formosan. 5: 208–209, fig. 77a–b. 1915.

Ottelia japonica Miq., Ann. Mus. Bot. Lugduno-Batavum 2: 271. 1866.

Lagarosiphon roxburghii auct. non Benth.: FKH 257. 1912.

Submerged herb. Stems elongate, 10–20 cm tall, branched. Leaves cauline, lanceolate, 3–6 cm × 1–3 mm, veins 3, apex acuminate. Spathes sessile, green, 1–3 cm × 1–3 mm. Flowers bisexual. Sepals green with purple midvein, linear-lanceolate, 2–4 × 0.5–1 mm. Petals 6–10 × 0.5–1 mm. Stamens 3; filaments 1–3 mm, smooth; anthers 1.8–2.5 mm. Ovary conical; styles 3–4 mm. Fruit 1–2.5 cm. Seeds 30–60, narrowly elliptic, smooth, obtuse at both ends.

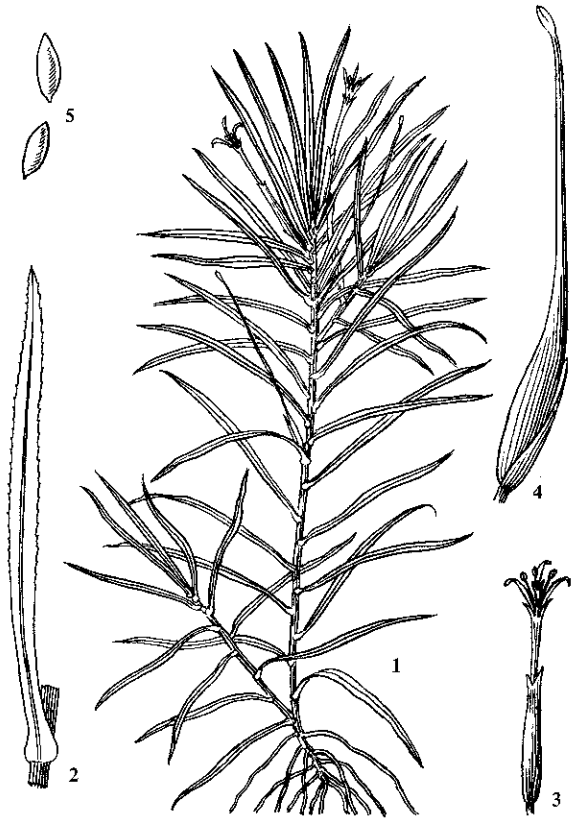

Figure 5. *Blyxa japonica* (Miq.) Maxim. ex Asch. & Gürke
1. plant; *2.* leaf; *3.* floret; *4.* fruit; *5.* seed. (drawn by H. P. Yu)

Locality: Pat Heung. *HK sheet 27094.*

Distribution: NE, E, C & S China to Sichuan; Japan, Korea, Indochina to S Asia, Europe.

Ecology: Paddy fields, marshy pools and ditches. Flowering & fruiting: May–Oct.

3. Egeria Planch. 水蘊草屬

Herbs, perennial, freshwater. Rhizomes and stolons absent. Stems erect, rooted in substrate, branched or unbranched, elongate. Leaves cauline, in whorls of 5 or more, submersed, sessile; blade linear, base sloping to stem, apex obtuse; midvein without rows of lacunae along sides, blade uniform in colour throughout; abaxial surface without prickles or aerenchyma; intravaginal squamules entire. Inflorescences 1-flowered, sessile; spathes not winged. Flowers unisexual, male and female on different plants, projected to surface by slender, elongate floral tube base, pedicellate; petals white. Male flowers: axillary, filaments distinct, anthers linear; pollen in monads. Female flowers: ovary 1-locular; styles 3, not 2-fid. Fruit ovoid, smooth, dehiscing irregularly. Seeds fusiform, mucilaginous.

Three species originated from S America, introduced into N America, Eurasia, Africa, and Australia; one species introduced into China and Hong Kong.

1. Egeria densa Planch. 水蘊草 **(Photo 13)**

Ann. Sci. Nat., Bot., sér. 3, 11: 80. 1849; FOC 23: 102. 2010.

Submerged herb. Stems 1–3 mm in diam. Leaves whorled, recurved, 10–40 × 1.5–4.5 mm, margin minutely serrate. Male spathes 2–4-flowered, 7.5–12 mm; pedicel to 8 cm. Sepals 3; petals 3, ovate, white; stamens 9, anthers yellow.

Locality: Cultivated. *HK sheet 42833.*

Distribution: Guangdong, Taiwan; native to tropical America.

Ecology: Ditches in cultivation areas. Flowering: Apr.–Oct.

Notes: This species is known to spread and become invasive in mild climate.

4. Hydrilla Rich. 黑藻屬

Herbs, submerged. Stems elongate, branched. Leaves verticillate or lowermost opposite, sessile, linear to narrowly elliptic, margin serrate with 2 small, fringed nodal scales. Plants dioecious or monoecious; flowers unisexual, axillary. Male spathe subsessile, membranous, subglobose, with apical knob and corona of setae, 1-flowered; male flowers shortly pedicellate, free from spathe on water surface at anthesis; sepals 3, ovate or obovate, convex; petals 3, narrower than sepals; stamens 3. Female spathe tubular, sessile, bifid at

apex, 1-flowered; sepals and petals similar to male ones; ovary cylindrical, attenuate into a filiform beak; styles (2–)3; ovules few. Fruit cylindrical or linear.

One species and one variety distributed in temperate to tropical; one species and one variety in China; one species in Hong Kong.

1. Hydrilla verticillata (L. f.) Royle 黑藻 **(Fig. 6)**

Ill. Bot. Himal. Mts. 1: t. 376. 1839; FKH 257. 1912; FGZ 647. 1956; FHN 4: 59. 1977; FRPS 8: 183, pl. 72: 1–6. 1992; FFJ 6: 24, fig. 17. 1995; FTW ed. 2, 5: 15. 2000; FGD 6: 295, fig. 164. 2005; FOC 23: 101. 2010.

Serpicula verticillata L. f., Suppl. Pl. 416. 1781[1782].

Submerged herb. Leaves in whorls of 3–8, linear or narrowly strap-shaped, 0.7–1.7 cm × 1–4 mm, midvein distinct, margin conspicuously denticulate, apex acute. Male spathe green; sepals white, ca. 2.3 × 0.7 mm; petals reflexed, white, or reddish, ca. 2 × 0.5 mm. Female spathe green; flowers similar to male ones. Fruit with 2–9 spine-like projections or smooth and without projection. Seeds (1–)2–6.

Locality: Cultivated. *S. Y. Hu 13709.*

Distribution: Widely distributed in China except NW; Asia, Australia and Europe, introduced into N America.

Ecology: Running freshwater in ponds and ditches. Flowering & fruiting: May–Oct.

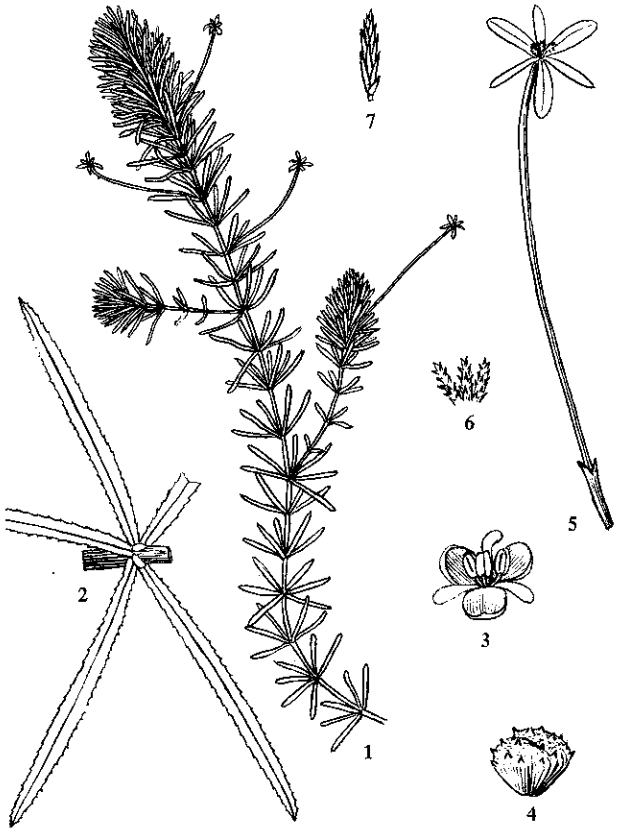

Figure 6. *Hydrilla verticillata* (L. f.) Royle
1. plant; *2.* branch node showing leaf arrangement and scales; *3.* male flower; *4.* male bud in spathe; *5.* female flower; *6.* stigma; *7.* dormant bud. (drawn by H. P. Yu)

5. Ottelia Pers. 海菜花屬

Herbs, of freshwater. Stems usually corm-like. Leaves all basal, petiolate, usually sheathing at base; blades submerged or sometimes floating, linear to broadly ovate, 3–11-veined. Spathes elliptic or ovate, usually 2–6-winged, apex bifid or trifid, with 1–many flowers. Flowers bisexual or unisexual and plants dioecious. Male flowers with longer pedicel. Bisexual and female flowers shortly pedicellate or without pedicel. Sepals 3, greenish, linear, oblong, or ovate. Petals 3, coloured, orbicular to broadly obovate, much longer and wider than sepals. Stamens 3–15; filaments linear, flattened; anthers laterally dehiscent; staminodes (absent or 1–)3, often present in female flowers. Ovary of 3, 6 or 9 (or more) carpels; ovules many; stigmas 2 per style, linear. Fruit cylindrical, fusiform, or conical. Seeds many, small, often hairy.

About 21 species distributed in tropical to temperate areas; about five species in China (two endemic); one species in Hong Kong.

1. Ottelia alismoides (L.) Pers.
龍舌草(水車前) **(Fig. 7; Photo 14)**

Syn. Pl. 1: 400. 1805; FKH 257. 1912; FGZ 649. 1956; FRPS 8: 153, pl. 58. 1992; FFJ 6: 26, fig. 19. 1995; FTW ed. 2, 5: 18, pl. 7. 2000; FGD 6: 291. 2005; FOC 23: 95. 2010.

Stratiotes alismoides L., Sp. Pl. 1: 535. 1753.

Damasonium indicum Willd., Sp. Pl. Editio quarta 2(1): 276. 1799, *nom. illeg. superfl.*

Ottelia alismoides (L) Pers. f. *oryzetorum* Kom., Izv. Imp. Bot. Sada Petra Velikago 10: 122. 1910.

Ottelia condorensis Gagnep., Bull. Soc. Bot. France 54(7): 543. 1907.

Ottelia dioecia S. Z. Yan, J. Sci. Med. Jinan Univ. 2: 162, fig. 187. 1982.

Ottelia indica Planch., Bombay Fl. 278. 1861.

Ottelia japonica Miq., Ann. Mus. Bot. Lugduno-Batavum 2: 271. 1866.

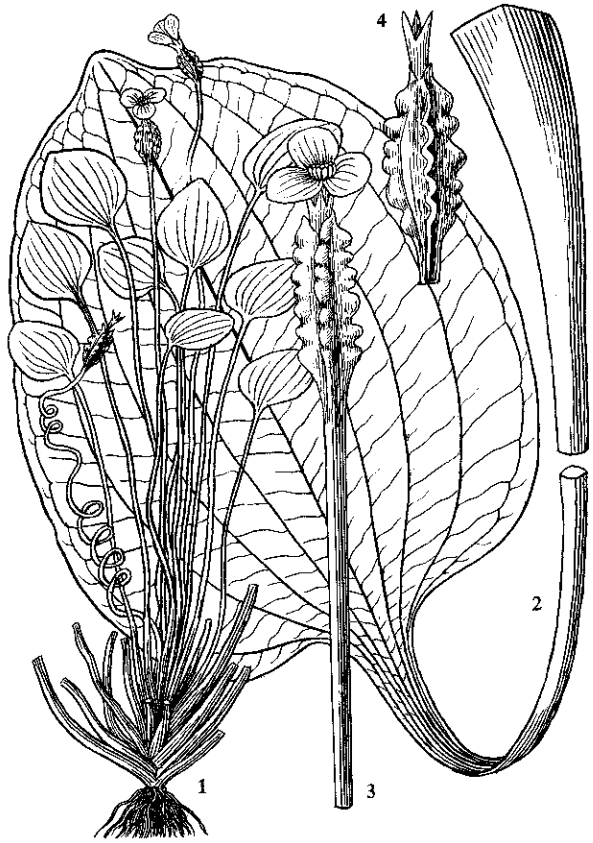

Figure 7. *Ottelia alismoides* (L.) Pers.
1. plant; *2.* leaf; *3.* flower; *4.* fruit. (drawn by H. P. Yu)

Submerged herb. Petiole varying greatly in length according to depth of water, 2–40 cm; leaf blade wholly submerged, varying greatly in shape and size, usually broadly ovate, ovate-elliptic, nearly orbicular, cordate, or sometimes lanceolate, ca. 20 × 18 cm or more, membranous, margins entire or serrate. Flowers bisexual or plants occasionally dioecious-polygamous. Spathe 2.5–4 × 1.5–2.5 cm, 2–3-lobed at apex, with 3–6 longitudinal wings. Flowers solitary, sessile. Petals white, slightly purple, or bluish, obovate, 2–3 cm. Stamens 3–9(–12); filaments glandular hairy; anthers narrowly oblong, yellow, 3–4 mm. Ovary nearly globose, with 3–9(–10) carpels; styles 6–12, deeply 2-lobed. Fruit 2–5 × 0.8–1.8 cm. Seeds fusiform, 1–2 mm, densely hairy, whitish.

Locality: Tai Po, San Wai, Fanling, Lantau Island, also cultivated in Hong Kong Wetland Park. *W. J. Tutcher 9958; HK sheet 27121, 27129.*

Distribution: Widely distributed in China especially in E & SW; Africa, E & S Asia, Australia; introduced into N America.

Ecology: Paddy fields, ponds and ditches. Flowering: Apr.–Oct.

Uses: Forage.

6. Vallisneria L. 苦草屬

Herbs, submerged, stoloniferous, without erect stems. Leaves basal, sessile, linear or strap-shaped, veins 3–9, parallel, slightly sheathed at base, margin minutely serrulate or entire. Plants dioecious; flowers unisexual. Male flowers many, minute, shortly pedicellate, clustered together on a central column enclosed by a common spathe, each flower finally breaking free and floating on water surface; spathe ovate or broadly lanceolate, shortly pedunculate; sepals 3, convex, 2 larger than the third; petals 3 or 2, minute; stamens 1–3; female spathe tubular, bifid at apex, pedunculate; peduncles long, coiled after anthesis. Female flowers solitary in spathe; sepals 3; petals 3, minute. Ovary narrowly cylindrical or narrowly triangular-cylindrical; ovules many; styles 3, bifid. Fruit cylindrical or triangular-cylindrical. Seeds many, oblong or fusiform.

About eight species distributed in tropical and subtropical; three species in China (one endemic); one species in Hong Kong.

Recent studies of the genus have resolved taxonomic problems of certain species in the tropics, based on living materials (e.g. Lowden, Aquatic Botany 13: 269–298. 1982; Jacobs & Frank, Telopea 7: 111–118. 1997).

1. Vallisneria natans (Lour.) H. Hara 苦草 **(Fig. 8; Photo 15)**

J. Jap. Bot. 49: 136. 1974; FYN 4: 750, fig. 208. 1986; FRPS 8: 177, pl. 69. 1992; FFJ 6: 26, fig. 20. 1995; FGD 6: 294, fig. 163. 2005; FOC 23: 99. 2010.

Physkium natans Lour., Fl. Cochinch. 663. 1790.

Vallisneria gigantea Graebn., Bot. Jahrb. Syst. 49: 68. 1912; Fl. Males. 5(4): 388, fig. 4. 1957; FTW ed. 2, 5: 18. 2000.

Vallisneria asiatica Miki, Bot. Mag. (Tokyo) 48: 329. 1934.

Vallisneria spiralis auct. non L.: FKH 257. 1912; FGZ 648. 1956; Check List HK Plants 77. 1993.

Submerged herb. Rhizome tuberous; stolons white, ca. 2 mm in diam., usually smooth. Leaves 0.2–2 m × 0.5–2 cm, veins 5–9, margin entire or inconspicuously serrulate, apex obtuse. Male spathe ovate-conical, 1.5–2 cm × 5–10 mm, with more than 200 male flowers; sepals strongly convex; stamens 1, filaments sometimes 2-lobed at apex, with hairs at base. Female spathe 1.5–2 cm; peduncle 30–50 cm or longer, slender. Sepals greenish purple, 2–4 × ca. 3 mm, apex obtuse; petals white, minute; staminodes 3. Fruit cylindrical, 5–30 cm × ca. 5 mm. Seeds narrowly obovoid, glandular hairy.

Locality: Ho Chung, also cultivated. *Y. S. Lau 3215.*

Distribution: Widely distributed in China except NW; tropical and subtropical Asia; Japan, Australia.

Ecology: Paddy fields, ditches and ponds. Flowering: Nov.

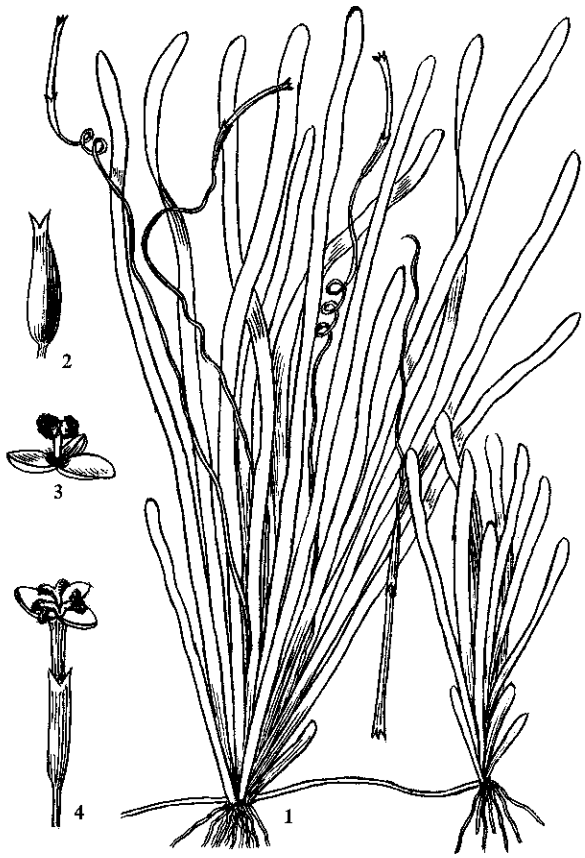

Figure 8. *Vallisneria natans* (Lour.) H. Hara

1. plant; *2.* spathe of male flower; *3.* male flower; *4.* female flower and spathe. (drawn by H. P. Yu)

328. APONOGETONACEAE 水蕹科

WU De-lin 吴德邻

Perennial freshwater herbs with a tuberous-thickened rhizome. Leaves all basal, usually with a long petiole sheathing at base, and a floating blade with a few main parallel veins and many transverse secondary veins, or sometimes leaves wholly submersed and with a scarcely expanded blade. Inflorescences a simple or basally 2–10-forked spike on a long scape projected above water surface, in bud enveloped by a caducous or rarely persistent spathe. Flowers small, hypogynous, perfect or rarely unisexual (the plants then dioecious). Tepals (1–)2(–6), distinct, commonly persistent, often petaloid, or sometimes wanting. Stamens free and distinct, mostly 6 in 2 cycles, or sometimes more (up to 25) in 3–4 cycles; anthers 2-celled, 4-sporangiate and opening by longitudinal slits. Gynoecium of (2–)3–6(–9 or more) carpels, these basally and adaxially coherent for about half or two-thirds of their length, separating at maturity, each carpel narrowed to a short style with a ventral stigmatic groove; ovules 2–12 per ovary, basal or marginal. Fruit a distinct follicle with a mostly, lateral or terminal, often curved beak. Seeds without endosperm.

One genus and ca. 45 species, confined to the Old World, predominantly the S hemisphere; one genus and one species in China and Hong Kong.

1. Aponogeton L. f. 水蕹屬

Morphological characters and geographical distribution are the same as the family.

1. Aponogeton lakhonensis A. Camus 水蕹 **(Fig. 9)**

Notul. Syst.(Paris) 1: 273. 1910; FRPS 8: 34. 1992; FGD 6: 303. 2005; FOC 23: 104. 2010.

Aponogeton natans auct. non (L.) Engl. & Krause: FHN 4: 64. 1977.

Aponogeton monostachyon auct. non L. f.: FKH 291. 1912.

Aquatic herb; rhizomes ovoid-globular or oblong, toward 2 cm. Leaves basal, submersed or floating, narrow ovate to lanceolate, 4–6 × 0.7–2 cm, base cordate or rounded, apex obtuse or acute, margin entire, midvein 1, parallel veins 3–4 on each sides of midvein; petioles of submersed leaves 9–15 cm, of floating leaves 40–60 cm. Scapes ca. 20 cm, exserted from the water when flowering; spikes cylindrical, ca. 5 cm; spathes caducous. Flowers bisexual, tepals 2, yellow, free, spathulate-obovate, 2 × 0.7 mm, midrib obvious. Stamens 6, slightly longer than tepals, free, 2-cycled. Carpels 3–6, free or connate at base, ovary 4–6-ovuled. Follicle ovoid, apex attenuate into a short and obtuse beak.

Locality: Tsuen Wan. *W. J. Tutcher 11576; HK sheet 29894.*

Distribution: Hainan, Guangdong, Guangxi, Jiangxi, Fujian, Zhejiang; India, Thailand, Indochina, Malaysia.

Ecology: Ponds, ditches or paddy fields. Flowering & fruiting: Apr.–Oct.

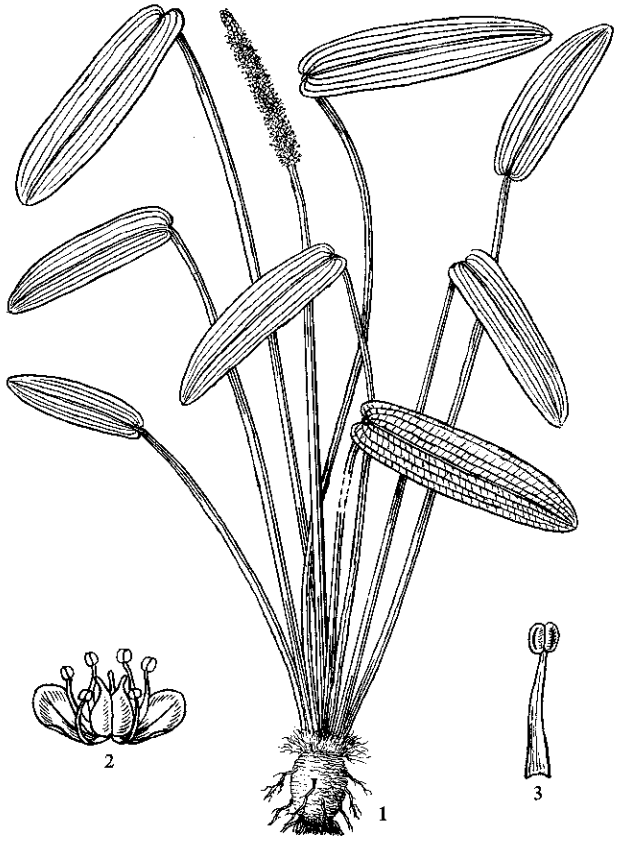

Figure 9. *Aponogeton lakhonensis* A. Camus
1. plant; *2.* flower; *3.* stamen. (drawn by H. P. Yu)

331. POTAMOGETONACEAE 眼子菜科

WU De-lin 吴德邻

Perennial or annual herbs growing in freshwater, rooted in substrate, with creeping sympodial rhizomes and erect, leafy branches. Leaves alternate or opposite, those immersed thin, those above water often leathery, sheathing at base; sheath free or partially adnate to petiole. Inflorescences a somewhat fleshy spikes, with peduncle surrounded by a sheath at base, elevated a little above water. Flowers small, anemophilous, bisexual, hypogynous, actinomorphic; bracts absent; tepals (2–)4, in one series, distinct, greenish, reddish, or brownish, rounded, flat to convex, shortly clawed. Stamens 4, opposite tepals and basally adnate to the claw, anthers extrorse, 2-celled, dehiscing by longitudinal slits. Gynoecium of 4 distinct carpels; ovules solitary, attached to ventral margin of carpel; styles short; stigmas capitate. Fruiting carpels drupaceous with hard endocarp and soft exocarp or achenial with thin pericarp. Seeds solitary, without endosperm, with coiled embryo.

Two genera and about 90 species cosmopolitan; one genus and nine species in China; one genus and one species in Hong Kong.

1. Potamogeton L. 眼子菜屬

The genus differs from the other genus (*Groenlandia*) of the family by the alternate leaves and drupaceous fruit with hard endocarp and soft exocarp.

About 90 species cosmopolitan; nine species in China; one species in Hong Kong.

1. Potamogeton pusillus L. 小眼子菜 **(Fig. 10)**

Sp. Pl. 127. 1753; FRPS 8: 44, pl. 12. 1992; FGD 6: 306. 2005; FOC 23: 111. 2010.

Submersed herb, without rhizomes. Stems cylindrical or subcylindrical, 0.5 mm in diam., branched, internodes 1.5–6 cm. Stipules membranous, connate into tubiform, 0.5–1.2 cm. Leaves sessile, linear, 2–6 cm × 1 mm, apex acuminate, entire; veins 1–3, midvein clear, lateral veins inconspicuous; dormant buds thin, fusiform, 1–2.5 cm. Spikes pedunculate, terminal, 8–10 mm, with flowers 2–3 whorls, interruptedly arranged. Flowers small. Tepals 4, green. Drupelets oblique-obovate, 1.5–2 mm, apex with a curved beak.

Locality: Mai Po. *S. T. Dunn 6815; Y. W. Lam 34.*

Distribution: Widely distributed in China and temperate regions of N hemisphere.

Ecology: Ponds and marshes. Flowering & fruiting : May–Oct.

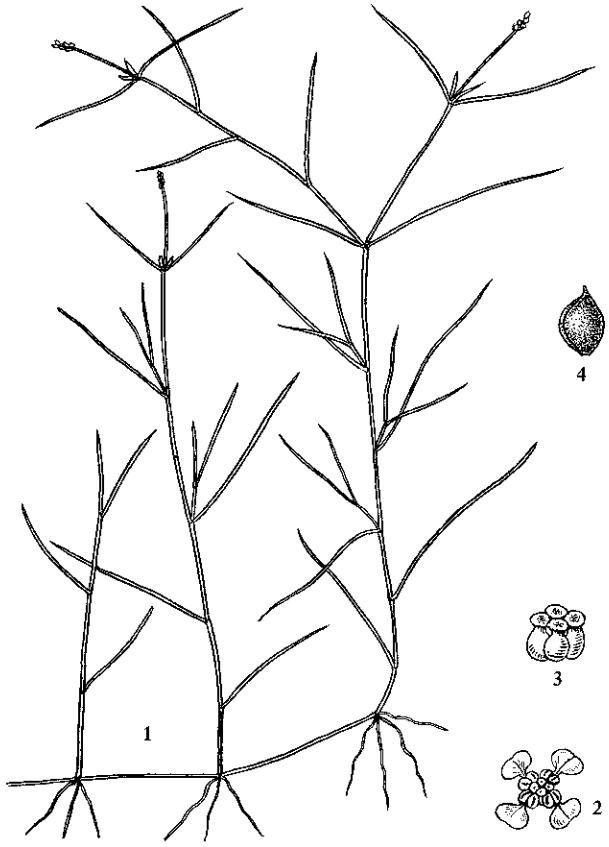

Figure 10. *Potamogeton pusillus* L.
1. plant; *2.* flower; *3.* pistil; *4.* fruit. (drawn by H. P. Yu)

332. RUPPIACEAE 川蔓藻科

WU De-lin 吳德鄰

Annual or perennial submersed glabrous herbs, growing in alkaline or brackish water, but sometimes in sea-water. Stems slender. Leaves alternate or opposite, linear or setaceous, 1-veined, sheathing at base. Inflorescence a 2–several-flowered terminal spike, initially enclosed by the sheathing base of leaves; bract absent. Peduncle elongating at anthesis, elevating inflorescence to or near water surface, or remaining short, occasionally becoming twisted in fruit, then pulling developing fruit below water surface. Flowers bisexual, hypogynous. Perianth absent. Stamens 2, anthers subsessile, extrorse, with two bisporangiate thecae dehiscing by longitudinal slits; connective broad. Gynoecium of 4 or more carpels, stigmas peltate or umbonate; ovule solitary, pendulous from apex of each carpel, campylotropous. Drupelets long-stipitate. Seeds without endosperm.

One genus and seven species sub-cosmopolitan; one genus and one species in China and Hong Kong.

1. Ruppia L. 川蔓藻屬

Morphological characters and geographical distribution are the same as the family.

1. Ruppia maritima L. 川蔓藻 **(Fig. 11; Photo 16)**

Sp. Pl. 127. 1753; FKH 291. 1912; FRPS 8: 83. 1992; FGD 6: 307. 2005; FOC 23: 118. 2010.

Ruppia rostellata W.D.J. Koch ex Rchb., Iconogr. Bot., Ic. Pl. Crit. 2: 66, t. 174, fig. 306. 1824; FHN 4: 65. 1977.

Submersed herb. Stems slender, milk-yellow, angulate, much-branched, 60–100 cm, internodes 1–6 cm. Leaves linear 2–10 cm × 0.3–0.5 mm, basally with membranous winged-sheath; sheath

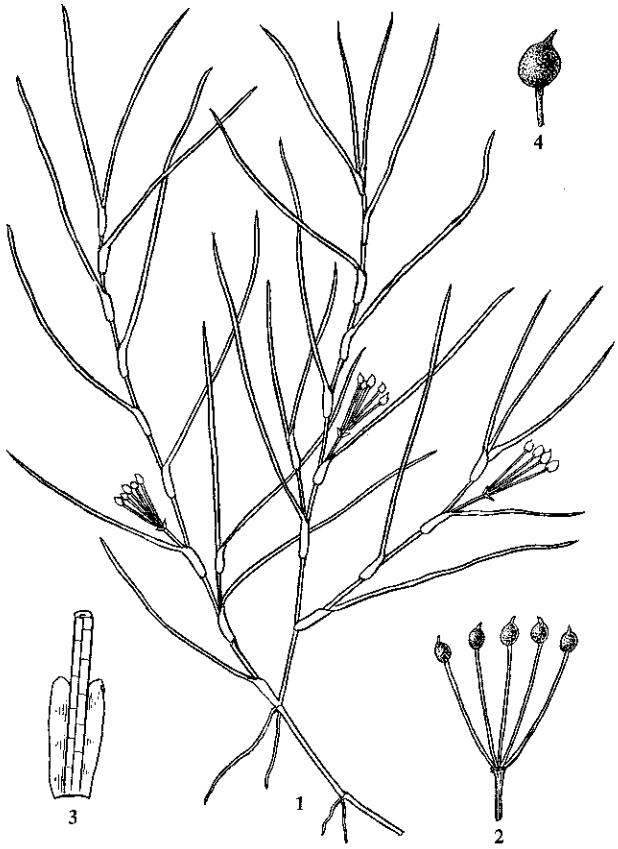

Figure 11. *Ruppia maritima* L.
1. plant; *2.* fruiting branch; *3.* base of leaf and leaf sheath; *4.* fruit. (drawn by H. P. Yu)

2–10 × 0.4 mm, auricle rotund-obtuse, apex acuminate or acute, 1-veined. Spikes 2–4 cm, 2-flowered, exserted out sheath after flowering; peduncle 10–18 mm, not spirally twisted in fruiting. Stamens 2. Carpels 4–6; ovary long-neck bottle-like, asymmetric; stigma umbonate. Drupelets 4–6, ovate-rotund, 2 × 1.5 mm, with straight or slightly curved short beak, stalk 5–17 mm.

Locality: Shek O, Sai Kung, Mai Po. *HK sheet 7778, 39602, 42835.*

Distribution: Hainan, Guangdong, Guangxi, Fujian, Zhejiang, Jiangsu, Shandong, Liaoning, Gansu, Qinghai, Xinjiang, Taiwan; temperate and subtropical sea area and salt lakes.

Ecology: Coastal lagoons, marshes. Flowering & fruiting: Apr.–Jun.

333. NAJADACEAE 茨藻科

YIP Kwok-leung 葉國樑

Small submersed annual herbs, monoecious or rarely dioecious, growing in fresh or brackish water. Stem slender, much branched. Leaves sessile, sub-opposite or apparently whorled, linear or subulate, 1-veined, toothed or entire, somewhat expanded and sheathing at base, and commonly subtending 2 small axillary scales, not ligulate. Flowers unisexual, very small and inconspicuous, hydrophilous, solitary(to few) in axils; male flower mostly subsessile and included in a spathe; perianth 2-lipped at apex; stamen 1, anther sessile, 1–4-celled, opening by longitudinal slits; in female flower perianth absent or this very thin and adhering to carpel; ovary of 1 carpel, 1-locular, stigmas 2–4; ovule solitary, erect from base, anatropous. Fruits usually embraced by leaf-sheath, indehiscent; seeds with a thin testa, straight embryo with large hypocotyl and radicle and no endosperm.

One genus and about 40 species widely distributed in the temperate and warm regions of the world; 11 species (one endemic) in China; three species in Hong Kong.

1. Najas L. 茨藻屬

Morphological characters and geographical distribution are the same as the family.

1a. Leaves with septa ..... 1. *N. pseudograminea*
1b. Leaves non-septate.
2a. Leaf teeth unicellular (of the spine-cell); anthers 4-celled ..... 2. *N. graminea*
2b. Leaf teeth multicellular (spine-cell on small to broad excrescences); anthers 1-celled ..... 3. *N. pseudogracillima*

1. Najas pseudograminea W. Koch 擬草茨藻

Ber. Schweiz. Bot. Ges. 44: 339. 1935; Triest, Mém. Acad. Roy. Sci. Outre-Mer, Cl. Sci. Nat. Méd., Collect. 8vo. 22: 121. 1988; FOC 23: 93. 2010.

Najas tenuifolia R. Br. subsp. *pseudograminea* (W. Koch) W. J. de Wilde, Fl. Malesiana 1(6): 168. 1962.

Stems ca. 10 cm tall, ca. 1 mm in diam. Leaves often in pseudowhorls of 3, 16–20 × 0.6–1.0 mm; midrib without spines; septa clearly visible up to halfway the margin; fibers present near each margin but absent on and near both sides of the midrib; sheath truncate to auriculate, 1–2 mm; auricles linear, short, minutely serrulate with 3–8 teeth, upper margin on each side minutely serrulate with 30–50 teeth. Plants monoecious; flowers 1–3 per axil, male flowers in upper axils and female ones below. Male flowers elliptic, 1.5–2.3 mm, enclosed in spathe with short neck; anther 4-celled. Female flowers inconspicuous, ca. 0.7–1 mm; style ca. 0.7 mm; stigmas 2- or 3-lobed. Fruit 1–1.3 × ca. 0.4 mm. Seeds not enclosed in spathe, elliptic-oblong, 1–1.3 × 0.24–0.43 mm, with more than 20 rows of pits; areoles regularly arranged per 25–30 in each longitudinal row, squarish to hexagonal or rectangular; cell walls not raised.

Locality: Sha Tin (Chung Chi College Campus). *J. P. W. Woo 2* (P).

Distribution: Thailand, Philippines, Indonesia, East Timor, Solomon Islands, N Australia.

Ecology: Ponds. Flowering & fruiting: Jul.

Notes: Triest (1988) noted that, in the specimen *Woo 2* (deposited at P), this species was found mixed with *N. pseudogracillima.*

2. Najas graminea Delile 草茨藻 **(Fig. 12; Photo 17)**

Descr. Égypte, Hist. Nat. 2: 282. 1813; FKH 291. 1912; Triest , Mém. Acad. Roy. Sci. Outre-Mer, Cl. Sci. Nat. Méd., Collect. 8vo. 22: 135. 1988; FRPS 8: 123. 1992; FGD 6: 312. 2005; FOC 23: 93. 2010.

Najas minor auct. non Allioni: FHK 345. 1861.

Stems unarmed, 10–20(–60) cm tall, 0.5–1(–1.5) mm in diam. Leaves narrowly linear to linear, 10–25(–33) × 0.4–1 mm; septa absent; fibres mostly present on and near both sides of the midrib and near margins; sheath 1.5–3(–4) × 1–2 mm, deeply auriculate; auricles narrowly triangular or lanceolate, 1–2 × 0.2–0.3 mm, serrulate with several teeth on each side, apex acute; leaf margin minutely and densely serrulate with 30–50 inconspicuous teeth on each side, consisting of brownish spine cells only. Plants monoecious; flowers solitary, or sometimes 2–4 together. Male flowers naked, usually more toward upper axils, ca. 1 mm, elliptic; spathe absent; anther 4-celled. Female flowers naked, 1.5–2(–3.7) mm; style ca. 1 mm; stigmas 2(–4)-lobed. Fruit oblong, 1.5–2 × ca. 0.8 mm. Seeds ellipsoidal-oblong, 1.5–2.4 × 0.5–0.7, with 25–35 rows of pits; areoles hexangular and irregularly polygonal toward ends, or rectangular, 0.06–0.08 mm.

Locality: Hong Kong Island, Sai Kung. *C. Wright 511* (BM, K); *HK sheet 42834.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Hebei, Henan, Liaoning, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; widely distributed in Asia, Australia and Europe; introduced in N America.

Ecology: Ponds, paddy fields, usually in still or slow-moving water. Flowering & fruiting: Jun.–Sep.

Notes: The species was recorded as *Najas minor* Allioni previously (Check List HK Plants 293. 2002; 103. 2004), based on an un-confirmed sighting record in the 1990s. The earliest record is the specimen collected by Charles Wright during the *U. S. North Pacific Exploring Expedition* (1853–1856), then identified as "*N. minor*" (FHK, 1861). However, *N. minor* as currently recognised is distinguished by its stems armed with spines and leaves with septa. Recently, a population of *N. graminea* has been found in a sheltered pool in Sai Kung.

Figure 12. *Najas graminea* Delile
1. part of plant; *2.* portion of stem; *3.* ovary; *4.* seed. (drawn by Y. X. Liu)

3. Najas pseudogracillima Triest 擬纖細茨藻

Mém. Acad. Roy. Sci. Outre-Mer, Cl. Sci. Nat. Méd., Collect. 8vo. 22: 98. 1988; FOC 23: 93. 2010.

Stems ca. 10 cm tall, ca. 0.5 mm in diam. Leaves often in pseudowhorls of 5, 9–11 × ca. 0.3 mm; midrib lacking spines; septa absent; fibres absent; sheath truncate, 1–2 mm; auricles orbicular to slightly obcordate, short, minutely serrulate with 3–5 teeth, upper margin on each side minutely serrulate with 6–10 teeth. Plants monoecious; flowers 1–3 per axil, male flowers in upper axils and female ones below. Male flowers elliptic, 0.6–0.8 mm; spathe absent; anther 1-celled; unisporangiate. Female flowers inconspicuous, ca. 1 mm; style ca. 1 mm; stigmas 2–3-lobed. Fruit 1.8–2 × ca. 0.5 mm. Seeds elliptic-oblong, 1.85–2.0 × 0.5 mm, with more than 25 rows of pits, not enclosed in spathe; areoles oblong, longitudinally elongate, rather irregularly arranged per 12–15 in each longitudinal row, irregularly shaped and longer than broad; cell walls not raised.

Locality: Sha Tin (Chung Chi College Campus). *J. P. W. Woo 2* (P); *S. Y. Hu 11263* (K).

Distribution: Endemic to Hong Kong.

Ecology: Ponds. Flowering & fruiting: Jul.–Nov.

Notes: The holotype specimen (*S. Y. Hu 11263*, K) was collected from the campus of Chung Chi College on 22 Nov. 1971. Triest (1988) noted that, in the specimen *Woo 2* (deposited at P), this species was found mixed with *N. pseudograminea*. *Najas pseudogracillima* is vegetatively similar to *N. gracillima* but differs by having male flowers without a spathe, whereas *N. gracillima* has male flowers with a spathe.

337. ZOSTERACEAE 大葉藻科

WU De-lin 吳德鄰

Submersed marine perennials, with creeping or tuberous rhizomes. Stems flattened, simple or branched, slender. Leaves in 2 rows, linear or filiform, with open or closed sheath often with stipuloid flanges. Flowers monoecious or dioecious, arranged on one side of spadix, initially enclosed in leaf-sheath; bracts absent. Perianth absent or represented by a row of bract-like lobes on each side of axis; male flower reduced to one 1-celled dorsifixed sessile anther opening by a longitudinal slit; pollen thread-like; female flowers consisting of 1 ovary with 2 stigmas, and 1 pendulous orthotropous ovule. Fruits a small drupe or irregularly dehiscing; seeds pendulous, without endosperm.

Three genera and 18 species distributed in warm to cool coasts; two genera and seven species in China; one genus and one species in Hong Kong.

1. Zostera L. 矮大葉藻屬

Submersed perennial herbs. Stems compressed, usually branched. Leaves distichous, linear, flat, ribbon-like, sheathing at base. Flowers monoecious, male and female flowers alternate in 2 rows forming a unilateral spike; perianth absent; male flowers consisting of a single, sessile, 1-celled anther; female flowers with 2 fused carpels; styles slender; stigma 2, filiform. Fruits ovoid, rounded at base, irregularly dehiscent, beaked. Seed solitary, longitudinally ribbed.

About 12 species widely distributed in temperate and warm regions; five species in China; one species in Hong Kong.

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1. Zostera japonica Asch. & Graebn.
矮大葉藻 **(Fig. 13; Photo 18)**

Pflanzenr. 31(IV 11): 32. 1907; FRPS 8: 90. 1992; FOC 23: 107. 2010.

Zostera nana auct. non Roth: Check List HK Plants 78. 1993.

Submersed marine herb; rhizomes creeping. Stems slender. Leaves 5–35 cm × 1–2 mm, apex obtuse or emarginate, entire, with a conspicuous midvein and lateral veins, and with 3 or 4 secondary veins between the midvein and lateral veins; sheaths 2–10 cm, margin membranous, with rounded auricles; spathe sheath 5–8 cm, apex blade 8–15 cm; spadix enclosed in spathe sheath. Anther 4.5–6 mm. Ovary 2 mm, stigma 2. Fruits oblong, ca. 4 mm, beaked. Seeds brownish, smooth and nitid.

Locality: Sheung Sze Wan, Lai Chi Wo, Tung Chung Pier. *Y. W. Lam 101, 111, 699.*

Distribution: Shandong, Hebei, Liaoning; Eurasia and Africa.

Ecology: Sea water.

Notes: Listed in *Rare and Precious Plants of Hong Kong*.

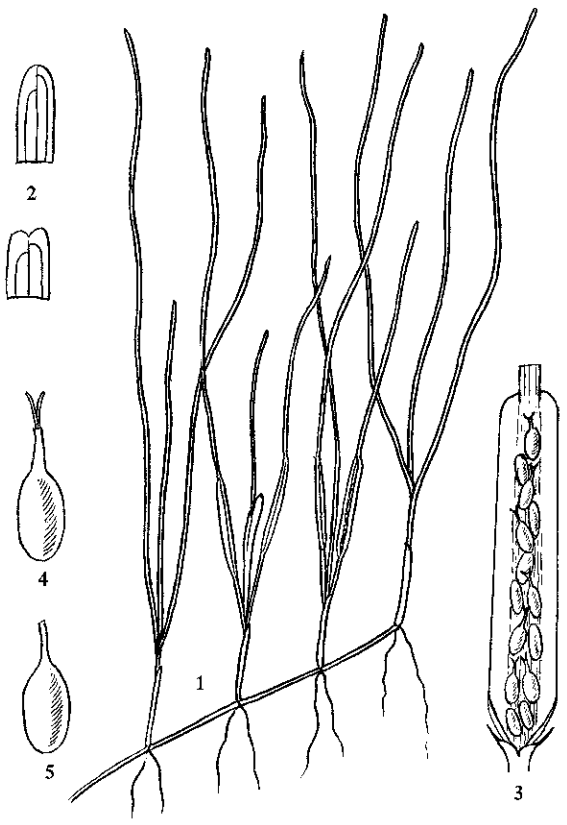

Figure 13. *Zostera japonica* Asch. & Graebn.
1. plant; *2*. apex of leaf; *3*. spadix (vertical section); *4*. pistil; *5*. nut. (drawn by H. P. Yu)

339. TRIURIDACEAE 霉草科

WU De-lin 吳德鄰

Saprophytic small herbs with simple stem, white, yellow or purplish, not green. Leaves reduced to scales. Inflorescence a terminal bracteate raceme. Flowers very small, actinomorphic, monoecious, or dioecious, rarely polygamous. Perianth segments 3–6(–10), 1-seriate, valvate, sometimes basally connate and with apical appendages, reflexed after flowering. Male flowers with (2–)3 or 6 stamens, sometimes 3 fertile and 3 staminodes, filaments very short or absent, anther sometimes sunk in receptacle, 2- or 4-celled, cells subglobose, at length confluent and opening by a transverse slit; connective sometimes produced into long subulate appendages. Female flowers rarely with staminodes; carpels 10–many, free, 1-locular; style terminal to almost basal; ovule solitary. Fruiting carpels crowded in a mass, obovoid, opening by a longitudinal slit. Seeds with copious endosperm and small, undifferentiated embryo.

Nine genera and 45 species widespread in tropical and subtropical regions, but seldom seen or collected; one genus and four species in China; one genus and two species in Hong Kong.

1. Sciaphila Blume 喜蔭草屬

Small, delicate, achlorophyllous, mycotrophic herbs, rhizomatous. Stem erect, simple or rarely branched, with scale-like leaves, whitish, pinkish, or reddish. Inflorescence a terminal raceme, sometimes branched from base. Flowers unisexual or hermaphrodite. Perianth segments 4–10, usually 6, equal or unequal, inner side papillate, apex sometimes with tufts of hairs, or ending in a globose knob or short point. Male flowers with 2, 3 or 6 stamens, opposed perianth segments; anthers 1–4-celled, sessile or on short filaments, often connate at base forming a small and flat circular androphore in centre of flower. Female flowers with 10–80 free carpels; style laterally or basally, apex papillate to penicillate or glabrous. Bisexual flowers with 3–6 persistent stamens; anthers 1-celled. Carpels 10–80 as in female flower, style club-shaped. Follicle with 1 seed, dehiscent.

About 30 species, pantropical but mainly in Indo-Malesia; five species in China; two species in Hong Kong.

1a. Male flowers 6–7 mm in diam.; style club-shaped; fruits 4 mm in diam. ..... 1. *S. secundiflora*
1b. Male flowers 2 mm in diam.; style awl-shaped; fruits 2 mm in diam. ..... 2. *S. ramosa*

1. Sciaphila secundiflora Thwaites ex Benth. 大柱霉草 **(Fig. 14; Photo 19)**

Hooker's J. Bot. Kew Gard. Misc 7: 10. 1855; Meerendonk, Fl. Males. ser. I. 10: 116. 1984; Hsieh et al., Taiwania 48(4): 245. 2003; FOC 23: 125. 2010.

Sciaphila megastyla Fukuy. & T. Suzuki, J. Jap. Bot. 12: 412. 1936; FRPS 8: 191. 1992; T. L. Wu et al., J. Trop & Subtrop. Bot. 8(2): 157. 2000; Check List HK Plants 293. 2002; 104. 2004.

Saprophytic herb, 4–12 cm tall, glabrous, pink or reddish. Stems slender, usually unbranched, 0.7–1 mm in diam. Leaves scale-like, ovate or ovate-lanceolate, 2–4 mm, apex acuminate to acute. Inflorescence terminal, racemose, erect, ca. 1–5 cm, 3–9-flowered; bracts lanceolate, 1–3 mm, acute; pedicels 1–2 mm, straight. Male flowers towards apex, 6–7 mm in diam., perianth segments usually 6, subulate, ca. 2.5–3.5 mm, patent, equal; stamens 2–3, subsessile; anthers 4-celled. Female flowers towards base, globose, perianth

segments 6, ± equal, oblong to lanceolate, ca. 2–2.5 mm, acuminate. Carpels 10–80, free, obovate, 0.5–1 mm, upper papillate; style club-shaped, 0.6–0.7 mm, inserted laterally at base or about halfway. Mature carpels obovoid, 1 mm, with persistent style.

Locality: Tai Mo Shan, Ma On Shan. *Y. W. Lam 1599; HK sheet 33860.*

Distribution: Guangdong, Taiwan; Sri Lanka, Malesia, Japan, Pacific islands.

Ecology: Litter layer in forests. Flowering & fruiting: Aug.

Notes: Listed in *Rare and Precious Plants of Hong Kong.*

2. Sciaphila ramosa Fukuy. & T. Suzuki 多枝霉草 **(Photo 20)**
J. Jap. Bot. 12: 414. 1936; FRPS 8: 193. 1992; T. L. Wu et al., J. Trop & Subtrop. Bot. 8(2): 158. 2000; Hsieh et al, Taiwania 48(4): 244. 2003; FOC 23: 126. 2010.

Erect herb, 8–12 cm tall, purplish, glabrous. Stems usually branched, 0.5–0.7 mm in diam. Leaves scale-like, lanceolate, ca. 0.8–1.3 mm, apex acuminate to acute. Inflorescence terminal, racemose, erect, ca. 1 cm, 3–9-flowered; bracts lanceolate, 1.5–2 mm, apex acute; pedicels 3–4 mm, straight. Male flower on upper part, 2 mm in diam.; perianth segments 6, lobes subequal, ovate or ovate-lanceolate, ca. 0.75 mm, apex mucronate or acute; stamens 2 or 3, subssesile, anther 4-celled. Female flowers perianth segments 4–6, ± equal, oblong to triangular, ca. 0.7 mm, apex acute, without appendage. Carpels ca. 20–30, style subapical, awl-shaped, 0.5–0.6 mm, apex papillate, exceeding ovary. Mature carpels obovate, slightly curved, 0.7 mm.

Locality: Tai Mo Shan. *Y. W. Lam 1600.*

Distribution: Taiwan.

Ecology: Litter layer in forests. Flowering & fruiting: Aug.

Notes: Listed in *Rare and Precious Plants of Hong Kong.*

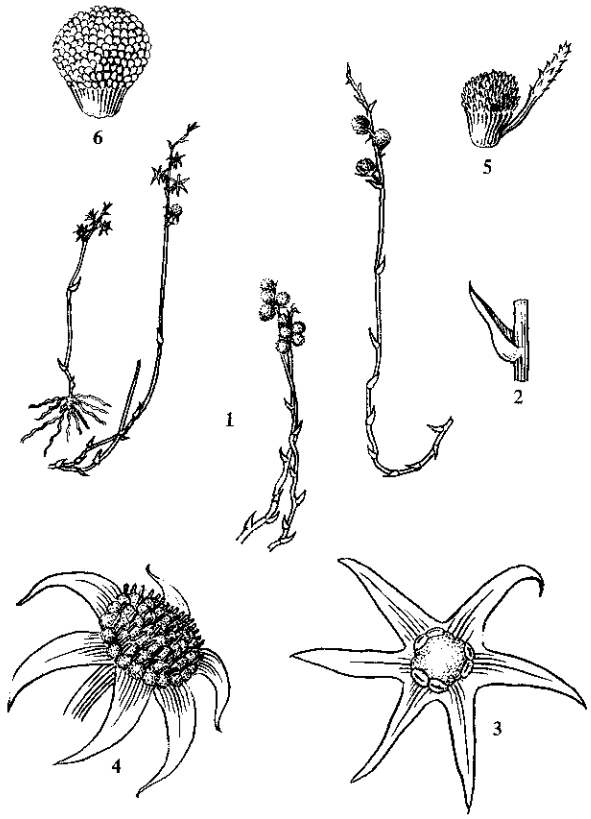

Figure 14. *Sciaphila secundiflora* Thwaites ex Benth.
1. plant; *2.* portion of stem with leaf; *3.* male flower; *4.* female flower; *5.* style and ovary; *6.* mature carpels. (drawn by H. P. Yu)

340. ARECACEAE (PALMAE) 棕櫚科

GUO Li-xiu 郭麗秀

Evergreen, trees, shrubs or climbers, hermaphroditic, polygamous, monoecious or dioecious, usually with large leaves and inflorescences, armed with spines or unarmed. Stems solitary or clustered, rarely acaulescent, unbranched aerially. Leaves pinnate, palmate or costapalmate, reduplicate or induplicate; pinnae (in pinnate leaves) arranged regularly or in groups, sometimes not on same plane; segments (in palmate leaves) single or multiple-folded, splitting in various degree; rachis sometimes extending into spiny, whip-like climbing organ (cirrus) in climbing species; sheaths open, or closed and sometimes forming crownshafts, with knees and sometimes with flagella in climbing species; petioles short to elongate, with hastula at apex in palmate leaves. Inflorescences borne among or below leaves; peduncle bearing a prophyll and usually 1 or more peduncular bracts; rachis bearing conspicuous or much-reduced rachis bracts; usually multiple-branched; flowers small, bisexual or unisexual, usually 3-merous. Fruits yellow, orange, red, white, purple or black; epicarp smooth, hairy, spiny, or covered in imbricate scales, mesocarp fleshy, fibrous or dry. Seed usually 1, rarely 2–3–10, endosperm homogeneous or ruminate.

About 183 genera and 2400 species distributed in tropical and subtropical Asia, America, Africa and the Pacific islands; 18 genera and 70 species in China; 12 genera and 17 species in Hong Kong (including eight cultivated species).

Glossary

Cirrus (pl. **cirri**) – a climbing organ, the apex of leaf rachis elongate to a long, whip-like structure with recurved spines, present in climbing palms, the rattans.

Costapalmate – *palmate* but with a short midrib or costa.

Crownshaft – a cylindrical structure formed by the closed, tubular leaf sheaths, wrapping the top of stem.

Flagellum (pl. **flagella**) – a climbing organ, a modified inflorescence, borne from sheath, elongate, whip-like, armed with recurved spines, present in climbing palms.

Hastula – in *palmate* leaves, a flap of tissue borne at the apex of the petiole, where it joins the blade, usually on the upper surface, rarely on lower or both surface.

Induplicate – of a *pinna* or segment, a fold V-shaped in cross-section.

Knee – in climbing palms, a swollen part on leaf sheath, outboard at the base of the petiole.
Peduncular bract – the second (and subsequent) bract(s) on an inflorescence main axis after the *prophyll*, empty.
Prophyll – the first bract on an inflorescence main axis.
Rachilla (pl. **rachillae**) – the last branch of an inflorescence, bearing the flowers.
Reduplicate – of a *pinna* or segment, a fold L-shaped in cross-section.

1a. Leaves palmate or costapalmate.
  2a. Petiole margins not spiny ..... 1. *Rhapis*
  2b. Petiole margins spiny.
    3a. Leaves lobed to the base, segments wedge-shaped, with eroded apices ..... 2. *Licuala*
    3b. Leaves lobed to middle or beyond middle, segments linear lanceolate, with pointed or split apices ..... 3. *Livistona*
1b. Leaves pinnate (or pinnately-veined if undivided) or bipinnate.
  4a. Pinnae at leaf base modified into green, straight spines ..... 4. *Phoenix*
  4b. Pinnae at leaf base not modified into spines.
    5a. Fruits covered in imbricate scales; stems, leaves and inflorescences usually spiny.
      6a. Prophyll tubular; cirri present or absent; inflorescences flagellate or non-flagellate ..... 5. *Calamus*
      6b. Prophyll boat-like; cirri always present; inflorescences not flagellate ..... 6. *Daemonorops*
    5b. Fruits without imbricate scales; stems, leaves and inflorescences not spiny.
      7a. Leaves induplicate, margin of pinnae lobed or jagged.
        8a. Leaves bipinnate; pinnae green abaxially ..... 7. *Caryota*
        8b. Leaves pinnate; pinnae whitish grey abaxially ..... 8. *Arenga*
      7b. Leaves reduplicate, margin of pinnae not lobed nor jagged.
        9a. Leaf sheaths open, fibrous ..... 9. *Syagrus*
        9b. Leaf sheaths closed and forming crownshafts.
          10a. Stems clustered ..... 11. *Dypsis*
          10b. Stems solitary.
            11a. Petals of female flowers connate basally ..... 10. *Roystonea*
            11b. Petals of female flowers free ..... 12. *Archontophoenix*

1. **Rhapis** L. f. ex Aiton 棕竹屬

Small to moderate shrubs, dioecious or polygamous. Stems clustered, slender, green, with distinct rings of leaf scar, covered with fibrous interwoven leaf sheaths on upper part. Leaves palmate, induplicate, split to 3/4 or more depth into several-ribbed segments, segment 2–many, minutely teethed on margins; sheaths with black or greyish black, interwoven fibres; petioles long and slender, elliptic in cross-section, unarmed; hastula small, triangular. Inflorescences axillary, branched 2–3 orders; peduncles short; prophyll closely or loosely tubular, splitting along the abaxial midline; flowers solitary or spirally arranged; male flowers: calyx cup-shaped, 3-lobed, corolla 3-lobed, stamens 6, in 2 whorls; female flower: sepals and petals similar to male flower, carpels 3, free, staminodes 6. Fruits usually developed from 1 carpel, globose or ovoid, sometimes borne on short stalks; epicarp smooth, mesocarp fleshy, slightly fibrous, endocarp thin, crustaceous, fragile. Seed 1, globose or subglobose, endosperm homogeneous.

About 11 species in China, Laos, Sumatra, Thailand and Vietnam; five species in China; one species in Hong Kong.

1. Rhapis excelsa (Thunb.) Henry ex Rehder
棕竹 **(Fig. 15; Photos 21–22)**

Rehder, J. Arnold Arbor. 11:.153. 1930; FHN 4: 161, fig. 1062. 1977; FGD 2: 448, fig. 313. 1991; FRPS 13(1): 20, pl. 4: 1–3. 1991; FOC 23: 146. 2010.

Rhapis flabelliformis L' Hér. ex Aiton, Hort. Kew. 3: 473. 1789; FHK 340. 1861; FKH 286. 1912.

Chamaerops excelsa Thunb., J. A. Murray, Syst. Veg., ed. 14, 984. 1784.

Moderate shrub, dioecious, rhizomatous, 1.2–3 m tall. Stems clustered, slender, 1.5–3 cm in diam., covered with fibrous interwoven leaf sheaths. Leaves palmate, split deeply into 5–12 uneven segments, segments 2–5-ribbed, 20–32 × 1.5–4 cm, apices erose; sheaths with black interwoven fibres; petioles elliptic in cross-section, unarmed; hastula small, semi-circled or triangular.

Figure 15. *Rhapis excelsa* (Thunb.) Henry ex Rehder
1. plant (reduced); *2.* leaf; *3.* portion of infructescence. (drawn by H. P. Yu)

Inflorescences axillary, branched 2–3 orders, ca. 30 cm; prophyll and peduncle bract brown hairy; rachilla glabrous; flowers spirally arranged; male flowers ovoid to oblong, 5–6 mm, calyx cup-shaped, 3-lobed, corolla 3-lobed, stamens 6; female flowers 4 mm, sepals and petals similar to male flower, carpels 3, free, staminodes 6. Fruits usually developed from 1 carpel, subglobose, 8–10 mm in diam., yellow. Seed 1, globose.

Locality: Hong Kong Island, Tai Mo Shan, Ng Tung Chai, Lamma Island. *H. C. Tang 1776; Y. S. Lau 856, 1873.*

Distribution: Hainan, Guangdong, Fujian, Yunnan; Vietnam.

Ecology: Forests or dry forests on slopes. Flowering: Jun.–Sep.

Uses: Ornamental.

2. Licuala Wurmb 軸櫚屬

Evergreen small to moderate shrubs, hermaphroditic, occasionally dioecious. Stems solitary or clustered, with node rings. Leaves palmate, rounded, subrounded or fan-shaped in outline, deeply divided almost to hastula into 1-fold or multiple-fold, wedge-shaped segments or undivided, segments regularly dentate at apex; sheath open, with fibrous margin, ocrea conspicuous; petioles usually spiny bilaterally, spines sometimes small, few, or absent; hastula present. Inflorescences axillary, branched 1–2 orders or unbranched; prophyll tubular, persistent; bracts small, inconspicuous; flower bisexual or unisexual, calyx 3-lobed, petals 3, stamens 6; carpels 3 free or nearly so in bisexual flower. Fruits globose, ovoid or ellipsoidal, small, epicarp thin and smooth, mesocarp flesh, slightly fibrous, endocarp thin, crustaceous. Seed 1, globose, endosperm homogeneous.

About 147 species distributed from Bhutan and NE India via S and SE Asia to Pacific islands (Vanuatu); three species in China; one species in Hong Kong.

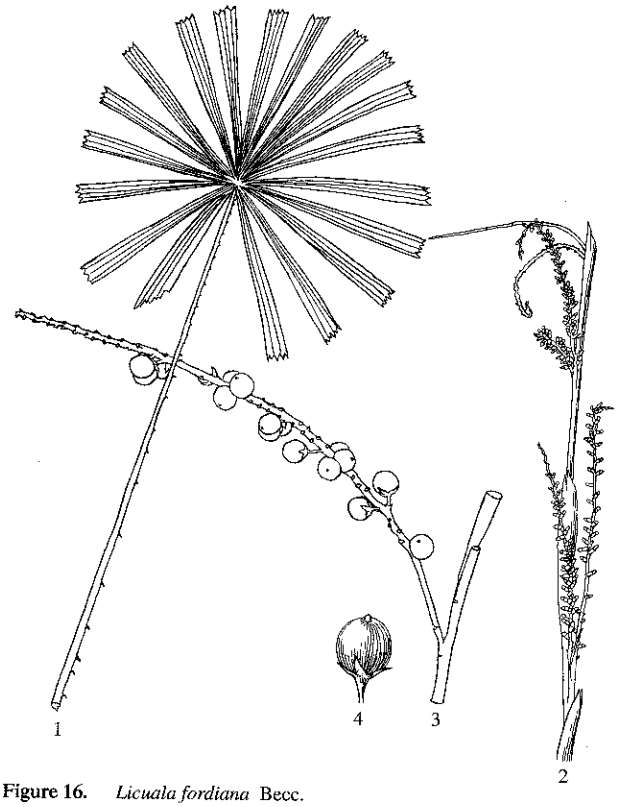

Figure 16. *Licuala fordiana* Becc.
1. leaf; *2.* inflorescences; *3.* portion of infructescence; *4.* fruit. (drawn by Y. X. Liu)

1. Licuala fordiana Becc. 穗花軸櫚 **(Fig. 16)**

Malesia 3: 198. 1889; FKH 285. 1912; FHN 4: 159. 1977; FGD 2: 444. 1991; FRPS 13(1): 30. 1991; FOC 23: 149. 2010.

Moderate shrub, 1.5–2 m tall. Stems clustered, short. Leaves palmate, subrounded or fan-shaped in outline, deeply divided into 15–20 segments; middle segment wider than others, 25–45 × 2–5 cm, apex dentate; petioles 0.8–1 m, the lower half sparsely armed with recurved spines on margins, or sometimes without spines. Inflorescence axillary, 0.5–1.2 m, unbranched or only branched at base, rachillae 1–3, 15–20 cm, hairy; flowers hermaphroditic 6–8 × 2.5 mm. Fruits globose, 7–8 mm in diam., red when mature.

Locality: Aberdeen, Mount Parker. *HK sheet 7673, 7675, 33472.*

Distribution: Hainan, Guangdong.

Ecology: Forests, altitude below 500 m. Flowering: Feb.–Mar.; fruiting: Mar.–Jun.

Uses: Ornamental.

3. Livistona R. Br. 蒲葵屬

Evergreen large trees, generally hermaphroditic. Stems solitary, bare or covered with petiole bases, rings of leaf scars obvious or not. Leaves palmate, rarely costapalmate, induplicate, dead leaves usually marcescent or deciduous below crown; blades divided to about 1/2 or more depth into single fold, rarely multifold, linear-lanceolate segments; segments 2-lobed, or the lobes split once again and sometimes pendulous; sheath open, with brown fibres; petioles well developed, unarmed or armed with strong or weak spines on bilateral margins; hastula present. Inflorescences axillary, branched to 5 orders; prophyll and peduncular bracts tubular. Flower small, bisexual, rarely dioecious; calyx and corolla 3-lobed; stamens 6; carpels 3, free, but share the same style. Fruits globose, ovoid or ellipsoidal, blue-black, purple-black, black or dark brown, developing from 1 carpel, with 2 sterile carpel-remains at base. Seed 1, globose, ovoid or ellipsoidal, endosperm homogeneous.

About 33 species in tropical and subtropical regions of Asia and Australia; three species in China; one species cultivated in Hong Kong.

1. Livistona chinensis (Jacq.) R. Br. ex Mart.
蒲葵 **(Fig. 17; Photos 23–24)**

Hist. Nat. Palm. 3: 240. 1838; FKH 286. 1912; FGD 2: 445, fig. 311. 1991; FRPS 13(1): 26. 1991; FOC 23: 148. 2010.

Latania chinensis Jacq., Fragm. Bot. 1: 16. 1800.

Livistona subglobosa Mart., Hist. Nat. Palm. 3: 319. 1838.

Livistona chinensis (Jacq.) R. Br. var. *subglobosa* (Mart.) Becc., Webbia 5: 16. 1912; FTW ed. 2, 5: 660. 2000.

Large tree, to 20 m tall. Stems 20–30 cm in diam., rough ringed with leaf scars; petiole bases persistent when young. Leaves palmate, blades rounded or subrounded, 1–1.8 m in diam., divided to 1/2 depth into single fold, linear-lanceolate segments; segment split to 20–30 cm depth and pendulous; petioles 1–2 m, proximally with green or black-brown, recurved spines on margins; hastula 1–3 cm. Inflorescences 1–1.5 m, branched to 3 orders, partial inflorescences 6–7, about 35–45 cm; rachillae 10–20 cm; flowers bisexual, 2–2.5 mm, 4–7 clustered, whitish yellow; calyx deeply 3-lobed, triangular; petals 3-lobed; stamens 6; carpels 3. Fruits ellipsoidal, about 1.8 × 1.2 cm, blue-black or black when matured. Seed 1, ellipsoidal, about 1.5 × 0.9 cm, endosperm homogeneous.

Locality: Cultivated. *R. Helms 2953; Y. S. Lau 1691; HK sheet 29535.*

Distribution: Hainan, Guangdong, Taiwan; Vietnam, S Japan.

Ecology: Coastal forests, often on sandy soils at low elevations. Flowering: Mar.–Apr.; fruiting: May–Jul.

Uses: Ornamental, material (weaving).

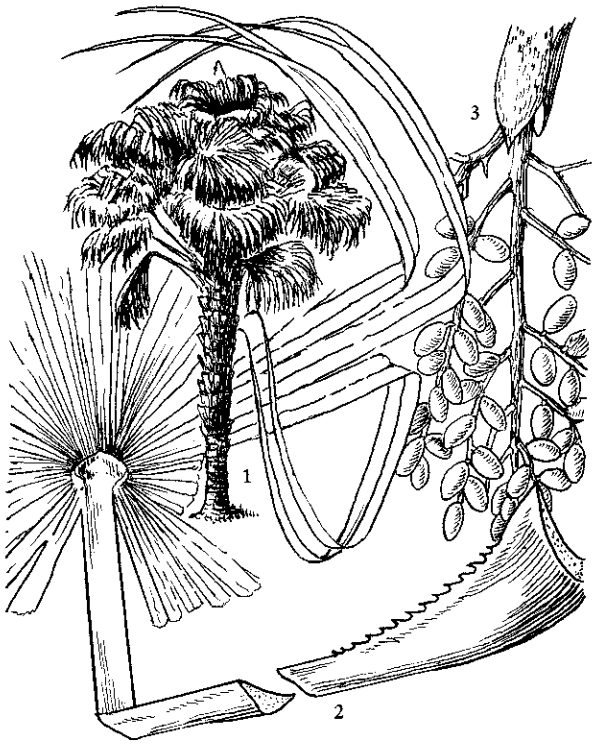

Figure 17. *Livistona chinensis* (Jacq.) R. Br. ex Mart.
1. flowering plant; *2.* leaf; *3.* portion of infructescence. (drawn by H. P. Yu)

4. Phoenix L. 刺葵屬

Evergreen large to dwarf shrubs, dioecious. Stems solitary or clustered, often with spirally arranged petiole bases or rough leaf scars. Leaves pinnate, induplicate; pinnae regularly arranged or grouped, linear to linear-lanceolate; the lower ones sometimes modified as stout spines (acanthophylls); sheaths open, fibrous. Inflorescences axillary, branched, erect or pendulous when fruiting; peduncle bearing a prophyll, other bracts inconspicuous; rachillae clustered or spirally arranged along rachis. Flowers small, unisexual; male flower with calyx 3-lobed, petals 3, stamens 6, rarely 3 or 9, pistillode absent; female flower subglobose, with sepals 3-lobed, petals 3, staminodes 6; carpels 3, free. Fruits obovoid, oblong, usually developed from 1 carpel, variously coloured, epicarp smooth, mesocarp fleshy, endocarp thin and membranous. Seed 1, elongate, deeply grooved, endosperm homogeneous, rarely ruminate.

About 14 species in tropical and subtropical regions of Asia and Africa; three species in China (one introduced); two species cultivated in Hong Kong.

1a. Pinnae irregularly arranged and spreading in different planes ..... 1. *P. loureiroi*

1b. Pinnae regularly arranged and spreading in same plane ..... 2. *P. roebelenii*

1. Phoenix loureiroi Kunth 刺葵 **(Fig. 18; Photos 25–26)**

Enum. Pl. 3: 257. 1841; FOC 23: 144. 2010.

Phoenix hanceana Naudin, J. Bot. 17: 174. 1879; FKH 285. 1912; FHN 4: 165, fig. 1066. 1977; FGD 2: 455. 1991; FRPS 13(1): 10. 1991; FTW ed. 2, 5: 660. 2000; Check List HK Plants 295. 2002; 104. 2004.

Phoenix hanceana Naudin var. *formosana* Becc., Philipp. J. Sci., C 3: 339. 1908.

Phoenix acaulis auct. non Roxb.: FHK 340. 1861.

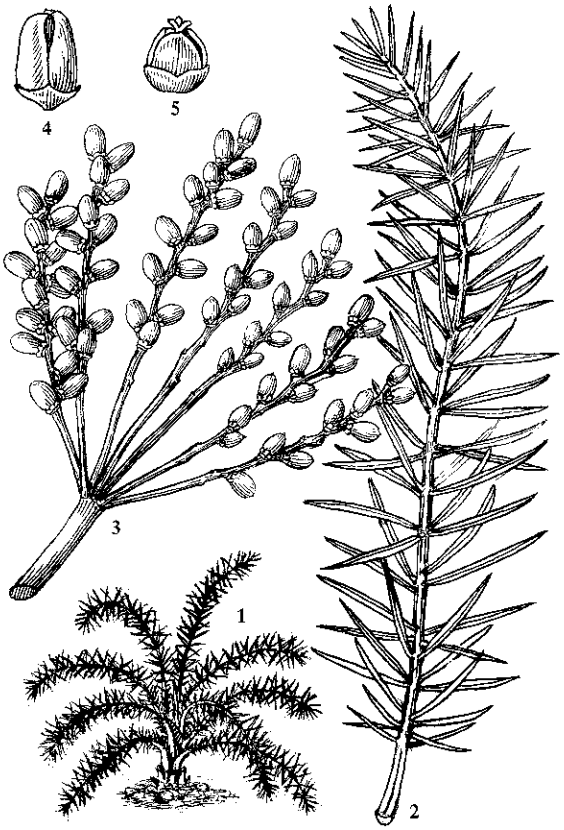

Figure 18. *Phoenix loureiroi* Kunth
1. plant; *2.* leaf; *3.* portion of infructescence; *4.* male flower; *5.* female flower. (drawn by H. P. Yu)

Small to moderate tree, 1–5 m tall. Stems solitary or clustered, 25–40 cm in diam., sometimes short and subterranean, rough, with petiole base remains. Leaves pinnate, to 2 m; pinnae 35–120, acanthophylls (pinnae on lower rachis) about 15 per side of rachis, linear, solitary, or 2–3 grouped, not in the same plane; middle pinnae 20–45 × 1–3 cm; sheaths and petioles to 40 cm. Inflorescences branched 1 order, with 30–40 rachillae; prophyll 15–20 cm, dark brown; peduncles to 50 cm. Flowers yellowish white; male flowers: calyx 1–1.5 mm, 3-lobed; petals 3, 4–5 × 1.5–2 mm; stamens 6; female flowers: calyx-lobe ca. 1 mm, petals 2 mm in diam., carpels 3, free, ovoid, 1.5 × 0.8 cm. Fruits oblong, 1.5–2 cm, black or purplish black. Seed 1, endosperm homogeneous.

Locality: Common in Hong Kong. *Y. S. Lau 663; S. P. Lau 154; K. L. Yip 4414.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan; Indian Subcontinent, SE Asia.

Ecology: Open forests. Flowering: Apr.–May; fruiting: Jun.–Oct.

Uses: Ornamental, material (weaving).

2. **Phoenix roebelenii** O' Brien 江邊刺葵(軟葉刺葵、日本葵) **(Photos 27–28)**

Gard. Chron., ser. 3, 6: 475. 1889; FGD 2: 455, fig. 319. 1991; FRPS 13(1): 10. 1991; FOC 23: 144. 2010.

Small trees, 1–3 m tall. Stems solitary, slender, to 10 cm in diam., with spirally arranged remains of triangular petiole bases. Leaves pinnate, 1–1.5(–2) m; pinnae 25–50 per side of rachis, regularly arranged and in the same plane, linear, soft, 20–30 cm × 5–10 mm, with persistent grey scales on abaxial midribs; acanthophylls (pinnae on lower rachis) about 12 per side. Inflorescences branched 1 order, prophyll 30–50 cm. Male inflorescences 30–55 cm, rachillae ca. 20, 7–20 cm; male flowers: sepals ca. 1 mm; petals 3, ca. 9 mm, stamens 6. Female inflorescences to 35 cm; rachillae 35–45; female flowers subovoid, ca. 6 mm; carpels 3, free. Fruits oblong-obovoid, 14–18 × 6–8 mm, purplish brown. Seed 1, endosperm homogeneous.

Locality: Cultivated. *Y. S. Lau 636; HK sheet 29497.*

Distribution: Yunnan; Vietnam, Laos, Myanmar, Thailand.

Ecology: Flowering: Apr.–May; fruiting: Jun.–Sep.

Uses: Ornamental.

5. Calamus L. 省藤屬

Climbers, rarely erect shrubs, dioecious; sheaths, petioles, rachis, cirri and flagella usually armed with various kinds of spines, bristles or hairs. Stems usually clustered, wrapped in sheaths, sometimes bare when old. Leaves pinnate, reduplicate, rarely bifid; pinnae arranged regularly, irregularly or in groups, linear, lanceolate or rhomboid; sheaths variously spiny, often with ocrea, usually with knees in the climbing species; flagellum usually whip-like, borne from sheath, with single or grouped, hook-like or claw-like spines; rachis sometimes terminating in a cirrus armed with single or groups of recurved spines, and mostly present in the species without flagellum. Inflorescences mostly elongate from some flagella, branched to 3 orders, male inflorescences more branched than female ones; prophyll and bracts (overlapped on branches and rachillae) tubular, spiny in climbers. Flower ovoid, small; calyx usually cup-shaped, 3-fid; petals 3, longer than sepals; male flowers borne along two opposite side of rachilla; stamens 6; female flower borne together with a sterile flower; ovary 3-locular, with 1 ovule in each locule. Fruits ovoid, subglobose, ellipsoidal or oblong, various coloured, covered with imbricate scales; sepals and petals persistent, flat or stalk-like. Seed usually 1, endosperm homogeneous or ruminate.

About 380 species mostly in tropical and subtropical Asia and Australia; 27 species (15 endemic) in China; four species in Hong Kong.

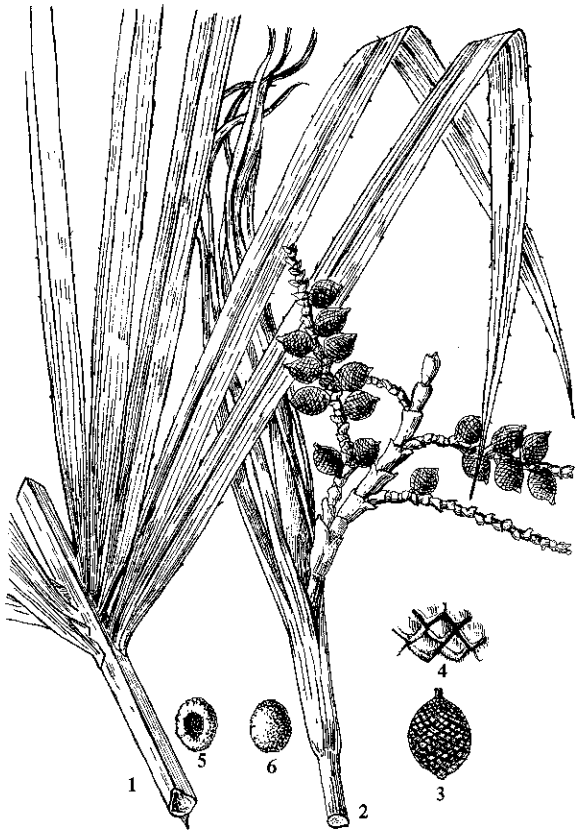

Figure 19. *Calamus thysanolepis* Hance

1. portion of rachis and leaf lobes; *2.* portion of infructescence showing spathe; *3.* fruit; *4.* portion of scales showing ciliate margin; *5.* adaxial view of seed; *6.* abaxial view of seed. (drawn by S. L. Chen)

1a. Erect, without cirri or flagellum; pinnae linear-lanceolate, not in the same plane ..... 1. *C. thysanolepis*

1b. Climber, with flagellum; pinnae lanceolate, or linear-lanceolate and in the same plane.

2a. Inflorescences flagellate; leaf rachis without cirri.

3a. Pinnae regularly arranged, linear ..... 2. *C. walkeri*

3b. Pinnae 2–4-clustered, lanceolate ..... 3. *C. tetradactylus*

2b. Inflorescences not flagellate, leaf rachis elongate to a whip-like cirri ..... 4. *C. ?egregius*

1. Calamus thysanolepis Hance 毛鳞省藤 **(Fig. 19; Photo 29)**

J. Bot. 12: 265. 1874; FKH 286. 1912; FGD 2: 474. 1991; FRPS 13(1): 68. 1991; FOC 23: 137. 2010.

Calamus hoplites Dunn, J. Linn. Soc., Bot. 38: 369. 1908; FRPS 13(1): 69. 1991.

Calamus thysanolepis Hance var. *polylepis* Wei, Guihaia 6: 24. 1986; FRPS 13(1): 69. 1991.

Erect shrubs. Stems clustered, to 5 m tall. Leaves pinnate, to 1.6 m, pinnae 2–6 in groups, point at different directions, not in the same plane, linear or elongate lanceolate, middle pinnae 30–38 × 1.5–2 cm, adaxial veins and margins bristly, abaxial rachis with short, single, hook-like spine; sheath open, without knee and flagellum, greenish brown; spines black and dense, to 2 cm; ocreas to 30 cm; petioles sparsely armed with straight, black-tipped spines. Inflorescences to 1 m, erect; male inflorescence branched 2–3 orders, female one branched 2 order; prophyll split to fibre-like, sometimes longer than the branch; male rachilla 3–4 cm, bearing 12–15 flowers each side; female rachilla 7.5 cm. Fruits ovoid, 15 × 10 mm, scales in 18–21 vertical rows, reddish brown, without groove in the middle, with cilia on the margins; persistent sepals and petals stalk-like. Seed 1, ellipsoidal, endosperm homogeneous.

Locality: Aberdeen, Tai Mo Shan. *L. T. Lo 408, 451; K. L. Yip 4213.*

Distribution: Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang, Fujian; Vietnam.

Ecology: Forests. Flowering: Jun.–Jul.; fruiting: Sep.–Oct.

Uses: Materials.

Notes: The type specimen (*Hance Herb. No. 18373*, BM) was collected by G. Dods from Tai Tam Tuk in Nov. 1873.

2. Calamus walkeri Hance 多果省藤 **(Photos 30–31)**

J. Bot. 12: 266. 1874; FKH 286. 1912; FGD 2: 470. 1991; FRPS 13(1): 75. 1991; FOC 23: 141. 2010.

Calamus faberi Becc., Ann. Roy. Bot. Gard. Calc. 11(1): 274, t. 99. 1908; FHN 4: 175. 1977; FGD 2: 470. 1991; FRPS 13(1): 75. 1991 ["*faberii*"]; Check List HK Plants 294. 2002; 104. 2004.

Calamus faberi Becc. var. *brevispicatus* (Wei) S. J. Pei & S. Y. Chen, Act. Phytotax. Sin. 27: 133. 1989; FRPS 13(1): 76. 1991.

Calamus tonkinensis Becc., Ann. Roy. Bot. Gard. Calc. 11(1): 275. 1908.

Calamus tonkinensis Becc. var. *brevispicatus* Wei, Guihaia 9: 31. 1986.

Climbing rattan. Stems clustered, to 30 m or longer, about 3 cm in diam. Leaves pinnate, 1–3 m; pinnae arranged regularly on the same plane, linear-lanceolate, 30–45 × 1.5–2.5 cm, bristly on midveins and margins; rachis with single, black-tipped, claw-like spines; cirri absent; sheath green hairy and spiny; spines flattened to 2.5 cm; ocreas dense bristly; flagellum whip-like, to 5 m, with strong, claw-like spines. Inflorescences borne from flagella; female inflorescences branched 2 orders, branches 12–20 cm, with 10–20 rachillae on each side; prophyll tubular, flattened, with short sparse spines; lower rachillae 5–7 cm, with 12–16 flowers on each side; flowers small, ca. 3 mm. Fruits oblong-ovoid, 1–1.2 × 1 cm, yellowish brown when mature, scales in 15–18 vertical rows, with brown narrow margin; endosperm homogeneous.

Locality: Happy Valley, Mount Parker. *Y. W. Lam 578; HK sheet 7709, 29556.*

Distribution: Hainan, Guangdong; Vietnam.

Ecology: Lowland forests. Flowering: Jun.–Dec.; fruiting: Sep.–Mar. of the following year.

Uses: Materials (furniture, handcrafts).

Notes: The type specimen (*Hance Herb. No. 18225*, BM) was collected by A. L. Walker from Hong Kong Island in Aug. 1873.

3. Calamus tetradactylus Hance 白藤 **(Photos 32–33)**

J. Bot. 13: 289. 1875; FKH 286. 1912; FHN 4: 174, fig. 1075. 1977; FGD 2: 471. 1991; FRPS 13(1): 87. 1991; FOC 23: 140. 2010.

Calamus bonianus Becc., Webbia 3: 231. 1910; FRPS 13(1): 87. 1991.

Calamus tetradactylus Hance var. *bonianus* (Becc.) Conrard, Fl. Gén. Indo-Chine 6: 1047. 1937.

Climbing rattan. Stems clustered, to 6 m or longer, slender, 6–15 cm in diam. Leaves pinnate, 45–55 cm; pinnae 2–4-clustered, 4–5 at apex, lanceolate, 10–26 × 2–5.5 cm; rachis with few single hook-like spines; cirrus absent; sheath green, glabrous, with few triangular spines or not; knees present; flagellum slender, to 1 m, with hook-like single spines; petioles short. Inflorescences borne from flagella, prophyll tubular, male inflorescences branched 2–3 orders, ca. 50 cm, the lower branches ca. 8 cm; rachillae 10–13 mm, with 4–6 flowers per side; male flowers small, ca. 3 mm; female inflorescences branched 2 orders, branches 3–4, 8–15 cm, the lower rachillae 2.5–5 cm, with 5–6 flowers per side; female flowers small, 3–4 mm. Fruits globose, 8–9 mm in diam., whitish yellow, scales in 21–23 vertical rows, with a groove in the middle, persistent sepals and petals stalk-like. Seeds 1, 6 mm in diam., endosperm homogeneous or slightly ruminate.

Locality: Common in Hong Kong. *Y. S. Lau 1748, 2654; HK sheet 39265.*

Distribution: Hainan, Guangdong, Guangxi, Fujian; Vietnam, Cambodia, Laos, Thailand.

Ecology: Forests and thickets. Flowering: May–Jun.; fruiting: Jun.–Jul.

Uses: Materials (furniture, handcrafts).

Notes: The type specimen (*Hance Herb. No. 18979*, BM) was collected by G. Dods from Wong Nai Chung around 1870s.

4. Calamus ?egregius Burret 短葉省藤

Notizbl. Bot. Gart. Berlin-Dahlem 13: 599. 1937; FHN 4: 173. 1977; FGD 2: 469. 1991; FRPS 13(1): 105. 1991; FOC 23: 139. 2010.

Calamus latifolius auct. non Roxb.: FKH 286. 1912.

Climbing rattan. Stems clustered, to 30 m or longer. Leaves pinnate, pinnae 2–3-clustered in alternate groups, lanceolate, 10–23 × 2–3 cm, margins bristly; rachis 0.85–1.5 m long, with single recurved spines abaxially, apex of leaf rachis elongate to a whip-like cirri with clawed spines; sheath whitish green with flattened, 1–2 cm long spines and brown hairs, ocreas 1.5–5 cm, split, knees present, flagella absent. Inflorescences branched to 2 orders, 0.25–1 m long, not flagellate; prophylls tubular, 2-ridged laterally, with scattered, short spines, rachillae 2–4 cm long.

Locality: Happy Valley, S of Wan Chai Gap. *W. J. Tutcher 4678, 8473; HK sheet 7683.*

Distribution: Hainan.

Ecology: Forests or thickets.

Usage: Materials (handcrafts).

Notes: According to Dunn and Tutcher (1912), *Calamus latifolius* is present in Hong Kong, but the voucher specimens (*W. J. Tutcher 4678, 8473*), rather poor and without fruits, are here temporarily determined as *Calamus egregius*, and further material is necessary before its status can be settled. The species was reported as *Calamus palustris* Griff. previously (Check List HK Plants 294. 2002; 104. 2004).

6. Daemonorops Blume 黃藤屬

Climbing rattans, sometimes erect, dioecious; leaf sheaths, pinnae, petioles, rachis, cirri and flagellum usually armed with various kinds of spines, bristles or hairs. Stems slender, clustered, rarely solitary. Leaves pinnate; pinnae many, spiny; rachis apex extended to a cirrus in climbers; sheath closed in climbing species, open in erect ones, sparsely to densely covered with various spines, bristles or hairs, ocreas present, obscure; knees present in climbers. Inflorescences branched to 3 orders, male inflorescences more branched than female ones; prophyll boat-like, covering other bracts, persistent, or falling but the basal bract persistent in the species with elongating inflorescences; male flower distichously arranged along rachilla; calyx small, usually 3-fid, cup-like; petals 3; stamens 6; female flowers borne with a sterile flower, ovoid, sepals cup-like, staminodes 6, connate at base forming a ring; ovary 3-locular, with 1 ovule in each locule; stigmas 3. Fruits globose, ovoid or ellipsoidal, covered with imbricate scales. Seed usually 1, globose or subglobose, endosperm ruminate.

About 100 species distributed from NE India through Indochina, Philippines, Malaysia, to Indonesia, and New Guinea; one species in China and Hong Kong.

1. Daemonorops jenkinsiana (Griff.) Mart.
黃藤 **(Fig. 20; Photos 34–35)**

Hist. Nat. Palm. 3: 327. 1853; FOC 23: 142. 2010.

Calamus jenkinsianus Griff., Calcutta J. Nat. Hist. 5: 81. 1845.

Calamus margaritae Hance, J. Bot. 12: 266. 1874; FKH 286. 1912.

Daemonorops margaritae (Hance) Becc., Rec. Bot. Surv. India 2: 220. 1902; FHN 4: 172, fig. 1074. 1977; FGD 2: 476, fig. 335. 1991; FRPS 13(1): 59. 1991; Check List HK Plants 295. 2002; 104. 2004.

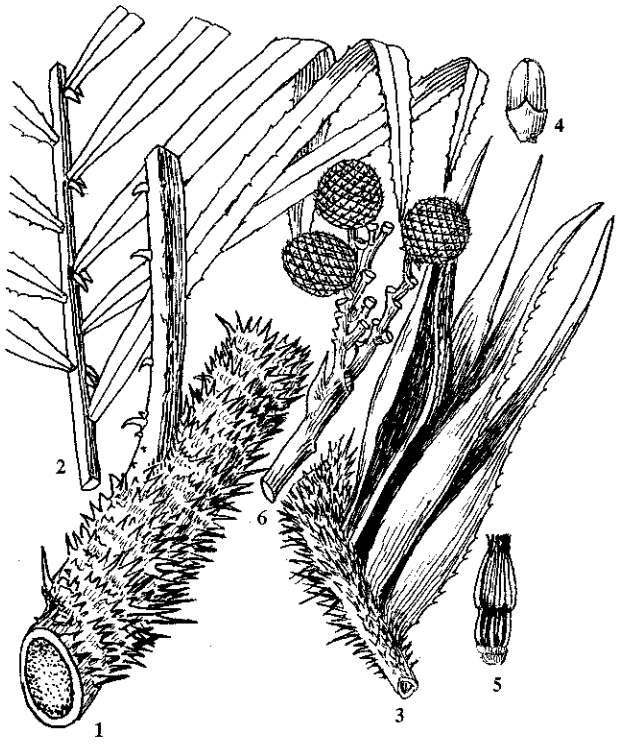

Figure 20. *Daemonorops jenkinsiana* (Griff.) Mart.
1. portion of stem showing spines on petiole and leaf sheath; *2.* portion of rachis and pinnae; *3.* male inflorescence and spathes; *4.* male flower; *5.* male flower with perianth removed; *6.* portion of infructescence. (drawn by H. P. Yu)

Climbing rattan, or sometimes shrubby. Stems clustered, to 20 m or longer, 4–6 cm in diam., covered by spiny leaf sheaths. Leaves pinnate, 1.5–3 m; pinnae many, regularly arranged, linear or linear-lanceolate, middle one 30–45 × 1.5–2 cm, adaxially bristly on veins; rachis apex elongate into a cirrus to 2 m, whioharmed with strong claw-like spines; sheath densely covered with brown to black hairs, spiny; spines sparsely distributed or in rows, black, flattened or needle-like; ocreas obscure; knees conspicuous. Inflorescences erect, spindly before blooming, 25–30 cm; prophyll boat-like, with flat and straight spines outside, branched 2–3 orders; bracts with few spines or not; male rachillla ca. 3 cm; male flowers oblong-ovoid, ca. 5 mm; calyx cup-like, slightly 3-fid; petals 3; female rachilla 2–4 cm, 4–7 flowers per side. Fruits globose, 1.7–2 cm in diam., brownish yellow, scales in 18–20 vertical rows, distinctly grooved in the middle, margins slightly dark; persistent sepals and petals flattened. Seed 1, subglobose, endosperm ruminate.

Locality: Victoria Peak, Wong Nai Chung, Tai Po, Lantau Island. *H. C. Tang 1135; K. L. Yip 4190; HK sheet 7687.*

Distribution: Hainan, Guangdong, Guangxi; Vietnam, Cambodia, Laos, Myanmar, Thailand, Nepal, Bhutan, India, Bangladesh.

Ecology: Forests. Flowering: Mar.–May; fruiting: Apr.–Oct.

Uses: Materials (furniture, thatching).

Notes: The type specimen of *Calamus margaritae* (*Hance Herb. No. 18407*, BM) was collected by M. Dods from Wong Nai Chung Valley in Apr. 1874.

7. Caryota L. 魚尾葵屬

Evergreen trees or shrubs, monoecious. Stems solitary or clustered, with a single flowering period, dying after flowering and fruiting. Leaves large, induplicately bipinnate; pinnae triangular, like a fish tail in shape, with irregularly toothed outer margins; sheaths closed, not forming a crownshaft; petioles swollen at base. Inflorescences usually branched 1 order, rarely unbranched; prophyll 1, peduncular bracts several, both tubular and persistent; rachillae usually many, long, pendulous; flowers unisexual, in triads of 1 female with 2 lateral male flower; male flowers: sepals 3, imbricate, petals 3, stamens 6–150, linear, filament short; female flowers: sepals 3, petals 3, staminode 0–6; ovary 3-locular, stigma 3-lobed. Fruits subglobose, orange, red or purple. Seed 1–2, endosperm ruminate except one species homogeneous.

About 13 species distributed in India throughout SE Asia and W Pacific islands; four species in China; two species cultivated in Hong Kong.

1a. Stems clustered, 5–8 m tall; fruits purplish black when mature ..... 1. *C. mitis*
1b. Stems solitary, to 25 m tall; fruits reddish or orange when mature ..... 2. *C. maxima*

1. Caryota mitis Lour. 短穗魚尾葵(小魚尾葵) **(Photos 36–37)**

Fl. Cochinch. 2: 569. 1790; FHN 4: 164. 1977; FGD 2: 453. 1991; FRPS 13(1): 115. 1991; FOC 23: 150. 2010.

Large shrub. Stems clustered, 5–8 m tall, 8–15 cm in diam., light green, with well spaced leaf nodes. Leaves bipinnate, to 3 m or longer; pinnae 10–20 on each side of secondary rachis, basal pinnae smaller than the upper ones, triangular, the outer margin straight, upper 1/2 of inner margin erose; sheaths margin with black fibres. Inflorescences 30–60 cm, branched 1 order, rachillae 20–60, 25–55 cm; male flowers elongate ovoid, 8–10 × 2.5–3 mm, stamens 12–25; female flowers 4–5 mm in diam., staminodes 3. Fruits globose, 1.5–2 cm in diam., purplish black when mature.

Locality: Cultivated.

Distribution: Hainan, Guangdong, Guangxi; Indochina, Malay Peninsula, Indonesia, Indian Subcontinent.

Ecology: Forests. Flowering: Apr.–Jun.; fruiting: Aug.–Nov.

Uses: Ornamental.

2. Caryota maxima Blume 魚尾葵 **(Fig. 21; Photo 38)**

Mart., Hist. Nat. Palm. 3: 195. 1838; FOC 23: 150. 2010.

Caryota ochlandra Hance, J. Bot. 17: 174. 1879; FKH 285. 1912; FHN 4: 163, fig. 1064. 1977; FGD 2: 454, fig. 318. 1991; FRPS 13(1): 115. 1991; Check List HK Plants 294. 2002; 104. 2004.

Large tree. Stems solitary, to 25 m tall, to 50 cm in diam., nodes well spaced. Leaves bipinnate, to 4 m, borne along upper half of stems; pinnae 12–28 per side of secondary rachis, drooping, the top pinna being the biggest, triangular, other pinnae smaller downwards, rhombic, the outer margin straight, upper 1/4 to 1/2 of inner margin irregularly toothed; sheaths with black fibres on the margin. Inflorescences to 3.5 m, branched 1 order, rachillae many, 1.5–2.5 m; male flowers ovoid, 15–20 mm, yellowish, stamens 50–110, anthers linear; female flowers 5–6 mm in diam., staminodes 3. Fruits globose, 2–2.5 cm in diam., reddish or orange when mature.

Locality: Cultivated. *W. J. Tutcher 10561.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan; Indochina, Malay Peninsula, Indonesia, Indian Subcontinent.

Ecology: Forests. Flowering: May–Jul.; fruiting: Aug.–Nov.

Uses: Ornamental, food (starch).

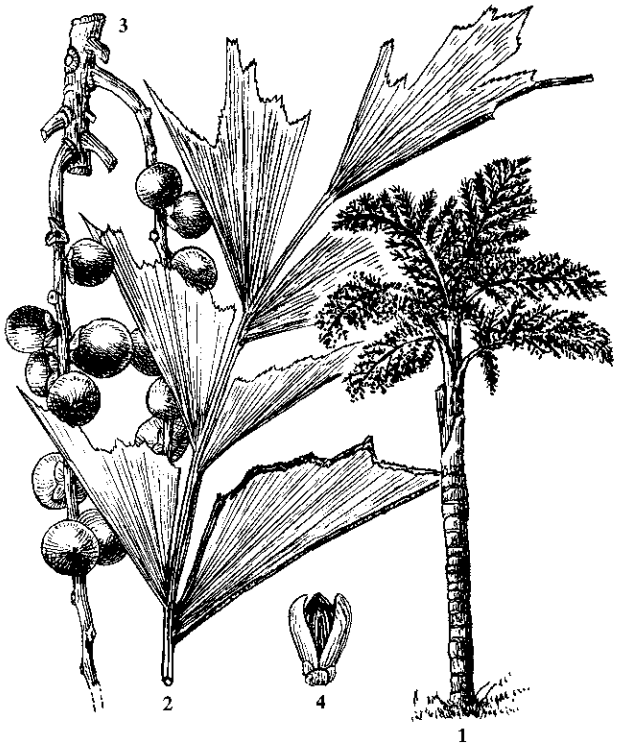

Figure 21. *Caryota maxima* Blume
1. plant; *2.* portion of pinnae; *3.* portion of infructescence; *4.* male flower. (drawn by H. P. Yu)

8. Arenga Labill., *nom. cons.* 桄榔屬

Evergreen trees or shrubs, monoecious or dioiecious. Stems usually clustered, seldom solitary, pleonanthic or hapaxanthic. Leaves pinnate, induplicate; sheaths covered by various indumentum, with black fibrous auricles; pinnae regular or irregular arranged; linear, elliptic or rhomboid, with ear-like bases, undulate margins and erose apices; green adaxially and whitish grey abaxially. Inflorescences interfoliar or seldom infrafoliar, branched 1–2 orders or seldom unbranched, pendulous or erect; peduncles subtended by several persistent bracts; flowers solitary or in triads; male flowers ovoid, usually sepals 3, petals 3, stamens more than 15, carpel absent; female flowers subglobose, smaller than males, sepals 3, petals 3, staminodes 3 or absent, carpels 2–3. Fruits globose to ellipsoidal, commonly

trigonous with the stigma remain, red, yellowish or purplish; epicarp smooth, mesocarp with irritant crystals. Seed 1–3, endosperm homogeneous.

About 20 species distributed from S Asia to N Australia; one species cultivated in Hong Kong.

1. Arenga pinnata (Wurmb.) Merr. 砂糖椰子(桄榔) **(Photos 39–40)**
Interpr. Herb. Amboin.: 119. 1917; FOC 23: 151. 2010.

Evergreen tree; stems solitary, up to 20 m tall and 30–60 in diam., with long internodes. Leaves pinnate, up to 7 × 1.6 m; pinnae about 110 pairs pointed to different directions, 40–120 × 5 cm, linear, with ear-like bases, undulate margins and erose apices, green adaxially and whitish abaxially; petioles to 1.5 m; sheaths persistent, with black needle-like fibres. Inflorescences interfoliar or seldom infrafoliar, up to 3.5 m, branched 1 order, pendulous; flowers solitary, large; male flowers purplish, ovoid, about 2 cm, sepals 3, petals 3, stamens 60–120; female flowers subglobse, 5–6 cm in diam., sepals 3, petals 3, carpels 3. Fruits subglobose, 7 cm in diam., trigonous, with stigma remains, yellowish or orangish. Seed 1–3, ovoid, black, endosperm homogeneous.

Locality: Cultivated.

Distribution: Malaysia, Indonesia, Philippines, New Guinea.

Ecology: Forests. Flowering: Jun.; fruiting: Lasting 1–2 years after flowering.

Uses: Ornamental, additive (flavouring), food (sugar, starch).

Notes: *Arenga westerhoutii* Griff., a plant native to Hainan, Guangxi and Yunnan, was previously misidentified as *A. pinnata* (cf. FHN 4: 167, fig. 1068. 1977; FGD 2: 452. 1991; FRPS 13(1): 110. 1991) but differs in pinnae arrangement, with pinnae of *A. westerhoutii* being regularly arranged and spaced in same plane except for basal few pinnae.

9. Syagrus Mart. 金山葵屬

Small to large trees, monoecious, unarmed or armed. Stems solitary or clustered, tall or short, sometimes subterranean, with rough rings of leaf scars. Leaves pinnate, reduplicate, recurved; pinnae few to many, regularly or irregularly arranged, in 1 or several planes, linear, single-fold; sheaths open, fibrous. Inflorescences interfoliar, branched 1 order, rarely spicate, much shorter than leaves; prophyll tubular, 2-keeled; peduncular bracts much longer than prophyll, enclosing the inflorescences until flowering, often spindle-shaped before split; peduncles usually longer than rachis, glabrous or hairy, rachillae few or many, usually zigzagged. Flowers unisexual, in triads of 2 male with 1 central female, paired or solitary male flowers distally; male flowers: sepals 3, petals 3, stamens 6, anthers elongate, pistillodes minute; female flowers: sepals 3, petals 3, staminodes membranous, ringed, 6-teethed, ovary 3-locular, with 1 ovule in each locule. Fruits globose, ovoid or ellipsoidal; green, brown, yellow or reddish; epicarp smooth, longitudinally striate, mesocarp fleshy or dry, fibrous, endocarp thick, woody, with 3 germinating pores near base. Seed 1(–2), endosperm homogeneous or ruminate.

About 31 species in S America, from Venezuela southwards to Argentina; one species cultivated for ornamental in S China and Hong Kong.

1. Syagrus romanzoffiana (Cham.) Glassm. 皇后葵(金山葵) **(Photos 41–42)**
Fieldiana, Bot. 31: 382. 1968; FRPS 13(1): 146, pl. 35. 1991.

Cocos romanzoffiana Cham., Choris Voy. Pittor. (Chili): 5, t. 6. 1822.

Tree, 10–16 m tall. Stems solitary, 25–40 in diam., dark grey, leaf scars roughly ringed. Leaves pinnate, 2–5 m, recurved; pinnae many, linear-lanceolate, 40–70(–90) × 3–4(–5) cm, apex bifid, spreading in different planes, 2–6 in groups, with a small gap between groups; sheaths open. Inflorescences interfoliar, 1–2 × 0.6 m, branched 1 order, rachillae up to 80, 30–50 cm, usually zigzagged; male flowers borne on upper rachis, 7–16 mm, sepals 3, petals 3, stamens 6; female flowers borne on lower rachis, 4.5–6 × 4–6 mm, sepals 3, petals 3, staminodes 6-teethed, ovary 3-locular. Fruits globose or obovoid; 3 × 2.8 cm, orange; mesocarp fleshy, fibrous, endocarp thick, woody, with 3 germinating pores near base. Seed 1, endosperm homogeneous.

Locality: Cultivated. *Y. S. Lau 3252; HK sheet 29595, 29600.*

Distribution: Brazil, S America.

Ecology: Flowering: Feb.; fruiting: Nov.–Mar. of the following year.

Uses: Ornamental.

10. Roystonea O. F. Cook 王棕屬

Large trees, monoecious. Stems solitary, robust, generally grey-white or grey-brown, rings of leaf scars conspicuous when young. Leaves pinnate, reduplicate; pinnae many, elongate lanceolate; sheaths closed, forming a prominent crownshaft; petioles short, channeled adaxially, rounded abaxially. Inflorescences borne under crwonshafts, branched 3–4 orders; peduncles short; prophylls tubular, 2-keeled laterally, leathery; peduncular bracts long, splitting longitudinally; rachillae straight or zigzagged; rachilla bracts small. Flowers usually in triads of 1 central female and 2 lateral males, paired or solitary male flowers distally; male flowers: sepals 3, triangular, short, petals 3, much longer than sepals, stamens 6–12, pistillodes small, subglobose; female flowers: ovoid, sepals 3, petals 3, connate at lower part, staminodes 6, connate in 6-lobed cupule, adnate to petal-base; ovary subglobose, 1-locular; stigmas 3, recurved. Fruits obovoid, oblong-ellipsoidal or subglobose, epicarp smooth, mesocarp fleshy and slightly fibrous, endocarp thin, fragile. Seed 1, ellipsoidal, endosperm homogeneous.

Ten species in Caribbean region; one species commonly cultivated in S China and Hong Kong.

1. Roystonea regia (Kunth) O. F. Cook 大王椰子(王棕) **(Photo 43)**

Science, II, 12: 479. 1900; FGD 2: 463, fig. 326. 1991; FRPS 13(1): 129. 1991.

Large tree, to 30 m tall, dioecious. Stems solitary, to 50 cm in diam., grey-white, smooth, rings of leaf scars conspicuous when young. Leaves pinnate, about 15 in number, to 5 m long, recurved; pinnae to 250 per side, arranged on different planes, elongate lanceolate, 2-lobed at apices, to 90 × 4 cm; sheaths closed and forming a green, leathery crownshaft. Inflorescences to 1.5 m, branched 3–4 orders. Flowers small, white, male flowers 6–7 mm, stamens 6; female flowers 3–3.5 mm. Fruits subglobose, about 1.3 × 1 cm, dark-red. Seed 1, endosperm homogeneous.

Locality: Cultivated.

Distribution: SE USA, C Mexico, Caribbean, Mesoamerica, cultivated elsewhere.

Ecology: Flowering: Mar.–Apr.; fruiting: Oct.

Uses: Ornamental.

11. Dypsis Noronha ex Mart. 散尾葵屬

Evergreen shrubs, monoecious. Stems clustered or solitary, with distinct rings of leaf scars, occasionally branched at base. Leaves pinnate (rarely bifid), reduplicate; pinnae many, regularly or irregularly arranged, linear to lanceolate; sheaths closed and forming a crownshaft, rarely almost open, sometimes fibrous; petioles short to long, or absent. Inflorescences usually interfoliar, rarely borne below the leaf sheaths, branched 1–4 orders; prophyll small; peduncles bracts conspicuous, tubular, caducous; rachillae bracts usually inconspicuous. Flowers sessile, in triads of 1 female with 2 lateral male flowers; male flowers: sepals 3, imbricate, petals 3, ± connate, stamens 3 or 6, pistillode present; female flowers: sepals 3, imbricate, petals 3, imbricate, staminodes 6, very small, stigmas 3. Fruits globose, ellipsoidal or fusiform, with persistent sepals and petals; epicarp smooth, mesocarp fleshy, endocarp thin, fibrous. Seed ovoid, endosperm homogeneous, embryo subbasal.

About 140 species native to Africa (Madagascar and adjacent islands); one species cultivated in Hong Kong.

1. Dypsis lutescens (H. Wendl.) Beentje & J. Dransf. 散尾葵 **(Photos 44–45)**

Palms Madagascar. 212. 1995.

Chrysalidocarpus lutescens H. Wendl., Bot. Zeitung (Berlin) 36(8): 117–118. 1878; FGD 462, fig. 325. 1991; FRPS 13(1): 125. 1991; Check List HK Plants 294. 2002; 104. 2004.

Shrub, 2–6 m tall, unarmed, monoecious. Stems clustered, yellowish green, crownshaft greenish grey, node rings conspicuous. Leaves pinnate, recurved, 1.5–2.5 m; pinnae 40–60 pairs, regularly arranged, linear or linear-lanceolate, 30–40 × 1–2 cm, shorter upwards, shallowly bifid at apex; sheaths closed and forming a crownshaft. Inflorescences borne below the sheaths, 50–70 cm, branched 2–3 orders; branches 20–30 cm; rachillae 8–10, 12–18 cm. Flower small, ovoid, golden yellow; male flowers: sepals 3, petals 3, stamens 6; female flower: sepals 3, petals 3, style short. Fruits obovoid or ovoid, 1.5–2 × 0.8–1 cm, yellow to purple. Seed slightly obovoid, endosperm homogeneous.

Locality: Cultivated. *Y. S. Lau 1846.*

Distribution: Madagascar; widely cultivated elsewhere.

Ecology: Flowering: May; fruiting: Aug.

Uses: Ornamental.

12. Archontophoenix H. Wendl. & Drude 假檳榔屬

Evergreen trees, monoecious. Stems solitary, unbranched, leaf scars conspicuous or obscure. Leaves pinnate, reduplicate; sheaths forming a crownshaft on the top of stem, thick and leathery. Inflorescences under the crownshafts, branched 3–4 orders, pendulous; prophylls tubular, deciduous. Flowers in triad of a pair of male flowers with a female one in the middle; male flowers: sepals 3, petals 3, stamens 9–24; female flowers: sepals 3, petals 3, staminodes 3–4, ovary triangular ovoid, 1-locular, stigmas 3. Fruits globose to ellipsoidal, red or pink when mature; epicarp smooth, mesocarp thin, fleshy with fibres, endocarp smooth, thin and fragile. Seed usually 1, endosperm ruminate.

Six species native to E Australia, popular as ornamentals in tropical and subtropical regions worldwide; one species cultivated in Hong Kong.

1. Archontophoenix alexandrae (F. Muell.) H. Wendl. & Drude 假檳榔 **(Photos 46–47)**

Linnaea 39: 212. 1875; FHN 4: 170, fig. 1072. 1977; FGD 2: 460, fig. 323. 1991; FRPS 13(1): 130. 1991.

Evergreen tree, to 20 m tall, monoecious. Stems solitary, with leaf scar rings. Leaves pinnate, up to 2.5 m; pinnae arranged regularly, about 80 on each side of rachis, long lanceolate, up to 80 × 5 cm, green adaxially, whitish abaxially; petioles 20–40 cm; sheaths closed and forming a crownshaft on top of stem, green, thick and leathery. Inflorescences under the crownshafts, up to 70 cm, branched 3–4 orders, pendulous; prophylls tubular, deciduous. Flowers white, in triad of a pair of male flowers with a female one in the middle; male flowers: 5–6 mm, sepals usually 3, petals 3, stamens 9–16; female flowers: sepals 3, petals 3, staminodes 3–4. Fruits globose, 0.8–1 cm in diam., red when mature; epicarp smooth, mesocarp thin, fleshy, with fibres, endocarp smooth, thin and fragile. Seed usually 1, endosperm ruminate.

female inflorescence a subglobose head. Male flowers odorous, with 8–12 stamens inserted pseudo-umbellately on slender column of 10–15 mm. Syncarps solitary, pendulous, long-pedunculate, yellow when ripen, subglobose, 15–20 cm in diam., comprising of 100–200 fibrous drupes, each drupe 2.5–3.5 cm, with lower part prism-shaped and upper part convex-pyramidal, 2–8-celled, persistent stigma sessile, reniform.

Locality: Cultivated. *Y. S. Lau 743.*

Distribution: Widely cultivated in tropical regions, no wild populations are known.

Ecology: Flowering: Jul.

Uses: Ornamental, food (fruit), leaves also used for making baskets and domestic articles.

3. Pandanus tectorius Parkinson

露兜樹 **(Fig. 22; Photos 52–53)**

J. Voy. South Seas 46. 1773; Li, Woody Fl. Taiwan 903, fig. 364. 1963; FHN 4: 176. 1977; FRPS 8: 18. 1992; FGD 6: 401. 2005; FOC 23: 129. 2010.

Pandanus fascicularis Lam., Encycl. 1: 372. 1783; FKH 287. 1912.

Pandanus odoratissimus L. f., Suppl. 424. 1781, excl. syn.; FKH 287. 1912; Stone, Rev. Fl. Ceylon 3: 311, fig. 6–7. 1981; Fl. Cambodge Laos et Viet-nam 20: 23. 1983.

Pandanus odoratissimus L. f. var. *sinensis* (Warb.) Kanehira, Form. Trees rev. ed. 63, fig. 24. 1936; Li, FTW 5: 825. 1978.

Pandanus remotus St. John, Pacif. Sci. 16: 70. 1962.

Pandanus sinensis (Warb.) Martel. in Kanehira, Fl. Micrones 69. 1933.

Pandanus tectorius Parkinson var. *sinensis* Warb., Pflanzenr. 3(9): 48. 1900; FRPS 8: 20. 1992; FGD 6: 402. 2005.

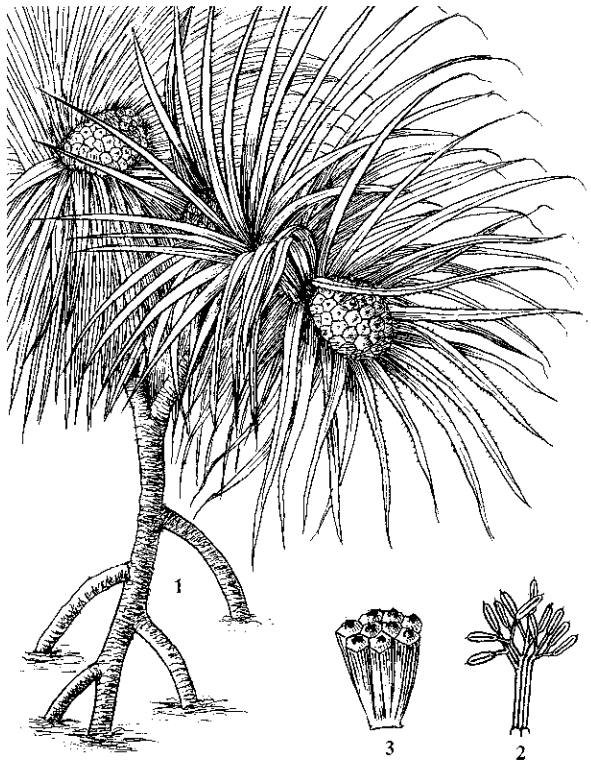

Figure 22. *Pandanus tectorius* Parkinson

1. plant; *2.* male flower; *3.* portion of fruit. (drawn by H. P. Yu)

Shrub or small tree, 1–4 m tall; stem branched, with aerial roots. Leaves aggregated on top of stem, leathery, loriform, usually over 1 m × 2–5 cm, margin and midrib abaxially with strong and upward spines, apex long caudate. Male inflorescence consisting of several 4–8 cm spikes; Spathes whitish, long-lanceolate, 20–40 × 1–5 cm, decrescent toward upper; stamens 10–15(–25) on a column of 1 cm, free part of filament ca. 1 mm; anther linear, 3 mm, conective prolonged into a small point. Female inflorescence terminal, globular; spathes several, milk white, 14–35 × 1–3 cm, margin serrate; carpels 2–12, connate, but free at apex. Syncarps pendent, red, yellow to orange, consisting of 40–80 drupes; drupe obconical, ca. 4 cm, truncate, angular, persistent stigma subsessile, slightly protruded, auriculate, nipple-shaped or hippocrepiform.

Locality: Common in Hong Kong. *Y. S. Lau 2880; HK sheet 7724.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Fujian, Taiwan; tropical Asia to Australia.

Ecology: Sandy beaches or cultivated in gardens. Flowering: May–Aug.; fruiting: Jan.–Oct.

Uses: Ornamental, material (fiber), medicinal (folklore).

Notes: A mutant cultivar 'Sanderii' is cultivated in Hong Kong for ornamental use. It is characterized by the leaves with several lengthwise golden-yellow bands from midrib to margin, and with minute spines on the margins.

4. Pandanus kaida Kurz 簕古子(露兜簕)

J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 38(2): 148. 1869; Warb., Pflanzenr. 3(9): 52. 1900; B. C. Stone, Fl. Cambodge Loas et Vietnam 20: 43. 1983; FOC 23: 129. 2010.

Pandanus forceps Mart., Webbia 1: 363. 1905; FKH 287. 1912; FHN 4: 177. 1977; FRPS 8: 15. 1992; FGD 6: 401. 2005; Check List HK Plants 296. 2002; 105. 2004.

Shrub or small tree, 1–3 m tall. Stems branched, without aerial roots. Leaves loriform, 1(–4) m × 3–5 cm, margin and midrib spiniferous, apex acuminate, long flagelliform-caudate. Male inflorescences consisting of several spikes, each spikes ca. 10 cm, spathes in lower part 45 × 4.5 cm; male flowers white, fragrant; stamens 10–20, nearly on top of filament bundle, free parts of filaments ca. 1 mm; anther long-elliptic, ca. 3 mm, apex cuspidate; female inflorescences capitate, 4 × 1.7 cm; spathes several, 14–20 × 2–3 cm; carpels 2–3 connate into a drup, stigma short, forked. Syncarps composed of ca. 150 drupes; drupe obconic, 3 × 1.7 cm, top 5-angled, persistent stigmas 2, opposite, forked, dentiform.

Locality: Tai Tam, Tai Mo Shan. *W. J. Tutcher 7222, 5137.*

Distribution: Hainan, Guangdong; Vietnam.

Ecology: Near seashore in forests or cultivated. Flowering: May–Jul.

Uses: Cultivated as hedges, food (young shoot edible).

5. Pandanus urophyllus Hance 分叉露兜

J. Bot. 13: 68. 1875; FKH 287. 1912; B. C. Stone, Fl. Cambodge, Laos et Vietnam 20: 34. 1983; FOC 23: 130. 2010.

Pandanus furcatus auct. non Roxb.: FRPS 8: 15. 1992; FGD 6: 400. 2005; Check List HK Plants 296. 2002; 105. 2004.

Tree, 7–12 m tall; stem with thick aerial roots, dichotomous branched. Leaves aggregated on top of stem, leathery, loriform, 1–4 m × 3–10 cm, margin densely denticulate-spiniferous, spines incurved, abaxially midrib with upward curved acute spines, apex 3-angulate-flagelliform-caudate. Male inflorescence consisting of several spikes; spikes golden yellow, cylindrical, 10–15 cm, spathes towards 1 m × 10 cm; male flowers many, stamens usually 3–5-clustered on top of filament bundle; anther linear, 5 mm, connective with long and curved awn-like point; female inflorescences a head, to 80 cm, with many spathes; female flowers with 1 carpels, rarely 2 connate; stigma forked, spineform, incurved. Syncarps red-brown, oblongoid to ellipsoidal, 23 × 12 cm, drupes bony, top pyramidal, 1–2-locular, exocarp fleshy, sweet and fragrant, persistent stigma dichotomous, spine-form.

Locality: Hong Kong Island, Tai Mo Shan, Lantau Island. *W. J. Tutcher 7107, 7222; L. T. Lo 455.*

Distribution: Xizang, Yunnan, Guangdong, Guangxi; Sikkim to Indochina.

Ecology: Forests. Flowering: Aug.

Uses: Cultivated as hedges.

Notes: The type specimen (*Hance Herb. No. 18394*, BM) was collected by J. Lamont and C. Harland from Hong Kong Island before 1875.

343. ACORACEAE 菖蒲科

HU Qi-ming 胡啟明

Perennial herbs, with creeping, branched rhizomes and specialized aromatic oil cells. Leaves distichous, ensiform, unifacial, bases overlapping, not differentiated into petiole and blade, with parallel veins. Inflorescence a terminal spadix, bone on leaf-like scape (peduncle), sessile, conoid, cylindrical and finger-like or slender and tail-like, flowering from base to top. Flowers bisexual, 3-merous, densely arranged; tepals 6, free, in 2 whorls; stamens 6, free, in 2 whorls, anthers introrse, thecae globose-ellipsoidal, dehiscing by longitudinal slit; ovary conical, 2–3-locular; ovules many, pendulous from apex of each locule, orthotropous; stigma minute or ± punctate, subsessile. Fruit a several-seeded berry. Seeds oblong to ellipsoidal with fleshy endosperm.

One genus and two species distributed in subtropical and temperate Asia, and N America.

1. Acorus L. 菖蒲屬

Morphological characters and geographical distribution are the same as those of the family.

Two species in China, one species in Hong Kong.

1. Acorus gramineus Soland. ex Aiton

金錢蒲 **(Fig. 23; Photo 54)**

Hort. Kew. 1: 474. 1789; FKH 289. 1912; FRPS 13(2): 8. 1979; FFJ 6: 411. 1995; FTW ed. 2, 5: 665. 2000; FGD 9: 176. 2009.

Acorus calamus auct. non L: FHK 345. 1861.

Acorus tatarinowii Schott, Oster. Bot. Zeitschr. 9: 101. 1859.

Perennial aromatic herb, 15–55 cm tall, with short, creeping rhizomes and many fleshy roots. Leaves distichous, ensiform, (15–)20–45(–55) × 0.3–1.4 cm, apex acuminate, dark green, venation parallel, midrib lacking. Peduncle 9–25 cm, compressed triangular. Spathe green, leaf-like, ± equaling the peduncle. Spadix narrowly cylindrical to subcylindrical, nearly erect, 3–14 cm, 3–14 cm, densely flowered, yellow; tepals 6, in 2 whorls, ± oblong, 1.5–2 × 0.7–1 mm, membranous, apex rounded or acute; anthers yellow, 0.4–0.5 mm in diam. Infructescence yellowish at maturity. Berry obovoid-globose, several-seeded. Seed ellipsoidal, 2–3 × 0.8–1.2 mm, hairy at base.

Locality: Tai Mo Shan, Tai Po Kau, Ha Hang, Lantau Island. *Y. S. Lau 1728; Y. W. Lam 642; HK sheet 35813.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Xinjiang, Qinghai, Ningxia, Gansu, Shanxi, Sichuan, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; Russia (Far East), Korea, Japan, Philippines, SE Asia.

Ecology: Wet places and rocks near water. Flowering: Feb.–Jul.; fruiting: Jul.–Aug.

Uses. Medicinal (folklore), ornamental.

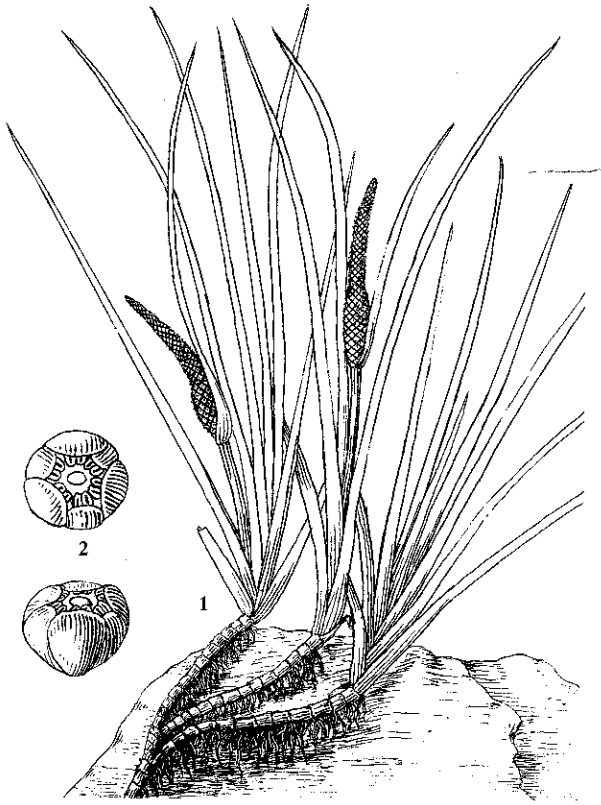

Figure 23. *Acorus gramineus* Soland. ex Aiton

1. plant; *2*. frontal and lateral views of flower. (drawn by H. P. Yu)

344. ARACEAE 天南星科

YU Hui 于慧

Perennial herbs or shrubs, sometimes epiphytic or aquatic, rhizomatous or tuberous. Leaves rarely solitary, alternate or clustered, usually petiolate with sheathing bases, blades various (e.g. linear), simple (base often cordate to sagittate), sometimes peltate or variously compound (e.g. pinnate, radiate, pedate); later veins parallel or pinnate or palmate-netted. Inflorescence a spadix, subtended by a spathe; spathe rarely absent, persistent (sometimes only proximally) or deciduous, variously coloured, commonly with tube-like base (margins fused or not) and deciduous limb (blade); spadix cylindrical or ovoid, various parts occasionally naked or with sterile flowers. Flowers bisexual or unisexual, male and female usually on the same plant or functionally on different plants, spadix female below and male above when unisexual; perianth absent or present; stamens 2–12, distinct or connate in synandria; ovary 1, 1–3(– many)-locular, sessile or embedded in spadix; styles 1; stigmas hemispheric, capitate, or discoid (sometimes strongly lobed). Fruits berries, distinct or connate at maturity. Seeds 1–many per berry.

About 104 genera and ca. 3300 species distributed worldwide, but chiefly in tropical regions; 35 genera and 200 species in China; 12 genera and 18 indigenous species in Hong Kong. In recent years many Aroids have been introduced to Hong Kong for ornamental use, such as *Caladium, Dieffenbachia, Monstera, Philodendron, Zantedeschia,* but they are not treated in this flora.

1a. Flowers bisexual.
  2a. Flowers with perianth.
    3a. Plants prickly, not climbing ..... 1. *Lasia*
    3b. Plants not prickly, climbing ..... 2. *Pothos*
  2b. Flowers without perianth.
    4a. Berries free ..... 3. *Epipremnum*
    4b. Berries connate ..... 4. *Rhaphidophora*
1b. Flowers unisexual, male and female flowers on same plant or not.
  5a. Spadix without appendage.
    6a. Plants terrestrial; leaves not rosulate ..... 5. *Aglaonema*
    6b. Plants aquatic; leaves rosulate ..... 6. *Pistia*
  5b. Spadix with terminal appendage.
    7a. Leaf usually solitary; flowering scape developing before the leaves ..... 7. *Amorphophallus*
    7b. Leaves usually appearing with flowers.
      8a. Stamens free.
        9a. Throat of spathe-tube open ..... 8. *Typhonium*
        9b. Throat of spathe-tube closed ..... 9. *Pinellia*
      8b. Stamens connate into synandria.
        10a. Ovules many per locule; placentae parietal ..... 10. *Colocasia*
        10b. Ovules few per locule; placenta basal.
          11a. Leaf blade peltate, usually cordate ..... 11. *Alocasia*
          11b. Leaf blade trifoliolate, palmate, pedate or radiate ..... 12. *Arisaema*

1. Lasia Lour. 刺芋屬

Perennial, evergreen, marsh or aquatic herbs. Stem erect or ascending, robust. Leaves several crowded at stem-apex; petiole long, prickly, sheathed at base; blade of juvenile leaves sagittate-hastate, that of adult leaves bipinnatifid-pedate, abaxially prickly on midrib and lateral veins. Peduncle long, prickly; spathe widened at base, apex elongate and twisted, opened by a slit when mature; spadix sessile, cylindrical, densely flowered. Flowers bisexual; tepals 4(or 6), free; stamens 4–6; ovary 1-locular, 1-ovuled; style very short; stigma suborbicular. Fruit a berry. Seed large, compressed, subcuneate.

Two species distributed in tropical Asia; one species in China; one species in Hong Kong.

1. Lasia spinosa (L.) Thwaites 刺芋 **(Photos 55–56)**

Enum. Pl. Zeyl., 336. 1864; FGZ 687. 1956; FHN 4: 129, fig. 1033. 1977; FRPS 13(2): 14. 1979; FYN 2: 740. 1979; FFJ 6: 413, fig. 374. 1995; FGD 9: 179, fig. 95. 2009; FOC 23: 16. 2010.

Dracontium spinosum L., Sp. Pl. 2: 967. 1753.

Lasia heterophylla (Roxb.) Schott, Melet. Bot. 1: 21. 1832; FKH 289. 1912.

Pothos heterophylla Roxb., Fl. Ind. ed. 1820, 1: 457. 1820.

Perennial herb, 1–2 m tall; stem ascending or creeping, prickly. Leaves of juvenile plants sagittate-hastate on 6–10 × 9–10 cm, that of adult plants deeply pedate-lobed, 15–45 × 15–20 cm, abaxial surface sparsely covered with curved prickles on veins, basal lobes oblong-lanceolate, central lobe larger, ovate-lanceolate; petiole 20–60 cm, longer than blade, prickly, sheathed at base. Peduncle, 20–35 cm, prickly; spathe 15–30 cm, dark-red abaxially, upper portion twisted; spadix yellow-green, cylindrical, 3–5 cm; tepals oblong, 1.5–3 mm, apex triangular-hooded, keeled; ovary ovoid. Fruits obovoid, apex truncate, densely warty-aculeate; seed ovoid-cordate, 5–7 mm.

Locality: Cultivated. *HK sheet 29773, 33099.*

Distribution: Guangdong, Guangxi, Yunnan, Fujian, Taiwan; Sikkim, Bangaladesh, India, Myanmar, Thailand, Indochina, Malaysia.

Ecology: Forests, near water. Flowering: Sep.; fruiting: Feb.

Uses: Food (vegetable), medicinal (folklore).

2. Pothos L. 石柑屬

Epiphytic shrubs or subshrubs; stems usually creeping or climbing, adhering to rocks or trees by means of aerial roots. Leaves alternate, usually articulate on the ± dilated petioles; petioles winged or foliaceous; leaf blade linear-lanceolate, lanceolate, elliptic or ovate-oblong, leathery, entire. Inflorescence terminal or axillary; peduncles axillary, often bracteate below the spathe; spathe ovate, reflexed; spadix sessile or stipitate, globular or cylindrical. Flowers many, bisexual; tepal of 6 small concave scales or segments; stamens 6, opposite to the perianth-scales; filaments flat; anthers 2-celled; ovary 3-locular, with 1 ovule in each locule; stigma sessile. Berries 1–2-seeded.

About 80 species in tropical Asia, Australia, Madagascar, Polynesia; eight species in China; one species in Hong Kong.

1. Pothos chinensis (Raf.) Merr. 石柑 **(Fig. 24; Photos 57–58)**

J. Arnold Arb. 19: 210. 1948; FHN 4: 130. 1977; FRPS 13(2): 19, pl. 3: 10. 1979; FYN 2: 742, fig. 202: 8. 1979; FTW, ed. 2, 5: 685, photo 74. 2000; FGD 9: 179, fig. 96. 2009; FOC 23: 7. 2010.

Tapanava chinensis Raf., Fl. Tellur. 4: 14. 1838.

Pothos seemannii Schott, Bonplandia 5: 44. 1857; Aroid. 22, t. 43. 1858; Prodr. Aroid. 564. 1860; FKH 289. 1912.

Pothos scandens auct. non L.: FHK 344. 1861.

Epiphytic liana; stems adhering to rocks or trees by means of aerial roots. Leaves alternate, subleathery; petiole dilated, obovate-oblong or cuneate, 1–4 cm; leaf blade ovate-elliptic to oblong-lanceolate, 6–13 × 1.5–5.6 cm, base obtuse, apex acuminate or long acuminate. Peduncle 8–20 mm, with 3–4 concave ovate bracts; spathe green, ovate, 8 × 10–15 mm, apex acute; spadix globular or slightly ovoid, yellow green, yellowish, 7–11 mm in diam. Berries ovoid to ellipsoidal, red when mature.

Locality: Common in Hong Kong. *N. H. Li 12; K. Y. Tam 150; HK sheet 40008.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Taiwan; Vietnam, Laos, Thailand.

Ecology: Trees and rocks in forests. Flowering & fruiting: All year round.

Uses: Medicinal (folklore), ornamental.

Notes: The type specimen of *P. seemannii* was collected by Seemann from Hong Kong Island in 1850s.

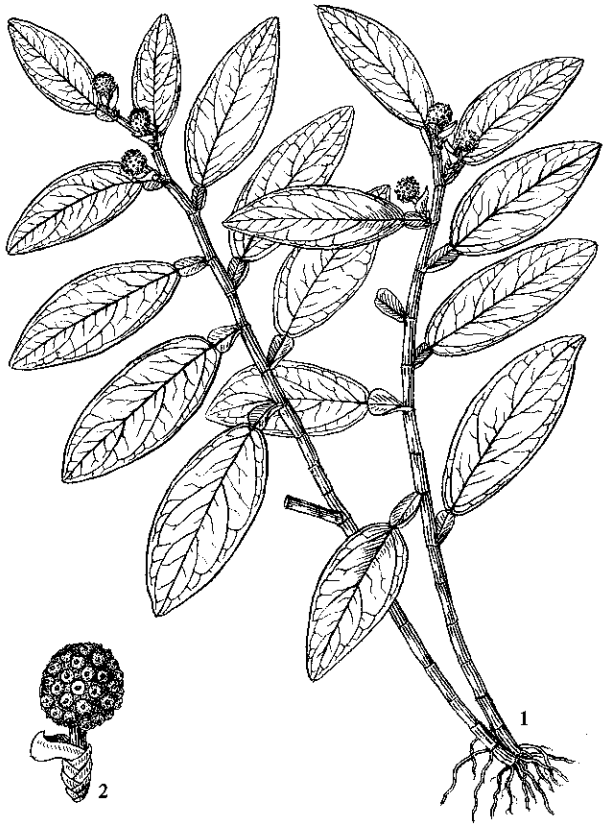

Figure 24. *Pothos chinensis* (Raf.) Merr.
1. plant; *2.* inflorescence. (drawn by H. P. Yu)

3. Epipremnum Schott 麒麟葉屬

Lianas; stems robust, suffrutescent or woody, adhering to trees or rocks by means of aerial roots. Leaves alternate; petiole long, sheathing at base, articulate at apex; leaf blade large, entire, pinnatifid or pinnatisect, with perforations along the midrib or not. Inflorescence axillary, solitary. Peduncle robust. Spathe ovate-cymbiform, apex acute or acuminate, deciduous; spadix sessile, elongate, cylindrical. Flowers bisexual, rarely unisexual, without perianth. Stamens 4(–6); filaments linear, flat; anthers much shorter than filaments; ovary polygonal-cylindrical, apex truncate; 1-locular, with 2–4 ovules. Berries small, not confluent.

About 20 species in tropical Asia; two species in China; one species in Hong Kong.

1. Epipremnum pinnatum (L.) Engl. 麒麟葉 **(Photo 59)**

Pflanzenr. 37(4, 23B): 60. 1908; FGZ 694. 1956; FRPS 13(2): 28, pl. 4: 1–7. 1979; FYN 2: 749, fig. 203: 1–7. 1979; FFJ 6: 414, fig. 375. 1995; FTW ed. 2, 5: 681, pl. 293, photo 72. 2000; FGD 9: 183, fig. 100. 2009; FOC 23: 15. 2010.

Pothos pinnata L., Sp. Pl. ed. 2: 1374. 1763.

Epipremnum mirabile Schott, Gen. Aroid. t. 79. 1858; FKH 289. 1912.

Rhaphidophora pinnata Schott, Bonplandia 5: 45. 1857; FHN 4: 133, fig. 1037. 1977.

Robust liana; stem terete, 2.5–4 cm thick at base, adhering to trees or rocks by means of aerial roots. Leaves large; petiole 25–40 cm, articulate at apex. Leaf blade of juvenile plants lanceolate to lanceolate-oblong, base shallowly cordate, that of adult plants oblong to broadly oblong, 40–60 × 30–40 cm, base broadly subcordate, apex acute, regularly pinnatifid and often small perforations along both

sides of midrib; lateral lobes 12–13 on each side, narrowly lanceolate to somewhat falcate. Peduncle terete, 10–14 cm; spathe 10–12 cm, apex acuminate; spadix cylindrical, ca. 10 cm, sessile; ovary hexagonal, apex truncate. Berries ellipsoidal, several-seeded.

Locality: New Territories. *W. J. Tutcher 9122.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan; India, Malay Peninsula, Philippines, Pacific islands.

Ecology: Forests, climbing on trees and rocks. Flowering: Apr.–May.

Uses: Ornamental.

4. Rhaphidophora Hassk. 崖角藤屬

Large lianas, stems thick, procumbent or climbing. Leaves distichous; petioles articulate, ± sheathed; leaf blades entire, pinnatifid or pinnatisect; lateral veins sub-parallel. Inflorescence terminal, solitary or sometimes 2–3 cymosely arranged. Spathe sessile, deciduous, convolute or concave; spadix cylindrical, shorter than spathe. Flowers bisexual or sometimes with a few male at the base of spadix, without scales or perianth; stamens 4, filaments flat; anther terminal, 2-celled; ovary 1-locular or incompletely 2-locular, 2–many-ovuled; stigma sessile on the truncate top of ovary. Berries red when mature, 2–many-seeded.

About 100 species distributed in tropical Africa, Asia and Australia; nine species in China; one species in Hong Kong.

1. Rhaphidophora hongkongensis Schott
獅子尾(崖角藤) **(Fig. 25; Photo 60)**

Bonplandia. 5: 45. 1857; FHN 4: 133, fig. 1038. 1977; FRPS 13(2): 36, pl. 6: 3–4. 1979; FYN 2: 754, fig. 204: 3–4. 1979; FFJ 6: 415, fig. 376. 1995; FTW ed 2, 5: 687, pl. 296. 2000; FGD 9: 185, fig. 101. 2009; FOC 23: 12. 2010.

Rhaphidophora peepla auct. non Schott: FHK 344. 1861.

Rhaphidophora angustifolia auct. non Schott: FKH 284. 1912.

Epiphytic liana. Stems rooting and attaching themselves to trees or rocks. Leaves papery to subleathery, distichous; petioles 5–10 cm, sulcate adaxially. Leaf blade falcate-elliptic to oblong-lanceolate or oblanceolate, (10–)20–35 × 5–6(–14) cm, lateral veins many, diverging at an angle about 45° from the midrib. Peduncle inserted in long sheathing bracts, cylindrical, 4–5 cm; spathe green to pale yellow, ovate, 6–9 cm, apex acuminate, deciducous; spadix cylindrical, 5–8 cm; ovary hexagonal-cylindrical, apex truncate. Berries yellowish green.

Locality: Hong Kong Island, Tai Mo Shan, Ng Tung Chai, Ma On Shan, Bride's Pool, Castle Peak, Lantau Island. *HK sheet 27434, 31061.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Fujian; Myanmar, Laos, Vietnam, Thailand, Kalimantan.

Ecology: Climbing on trees and rocks in forests. Flowering: Apr.–Aug.; fruiting: the following year.

Uses: Medicinal (folklore).

Notes: The type specimen (*J. G. Champion 525*, K) was collected from Hong Kong Island between 1847 and 1850.

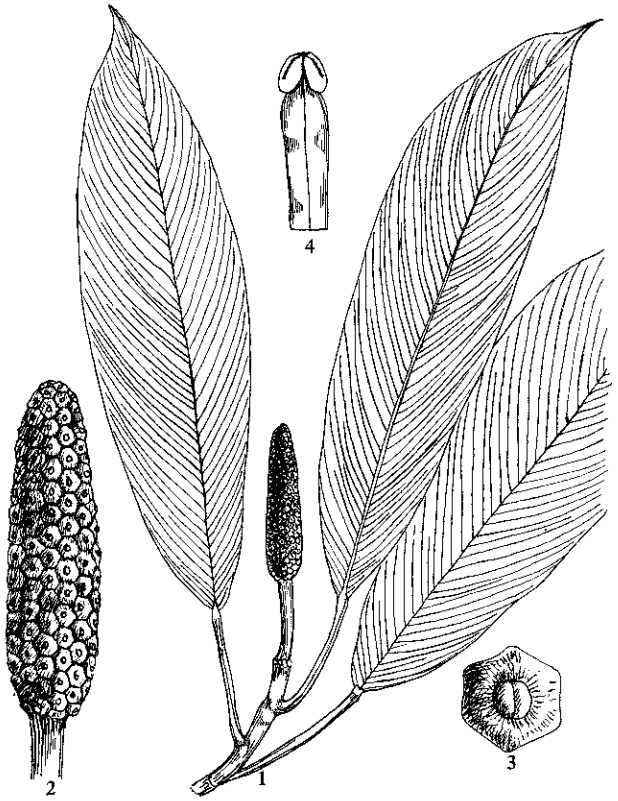

Figure 25. *Rhaphidophora hongkongensis* Schott
1. flowering branch; *2.* spadix; *3.* fruit (frontal view); *4.* stamen. (drawn by H. P. Yu)

5. Aglaonema Schott 廣東萬年青屬

Perennial herbs. Stems erect or ascending, rarely branched. Leaves spirally arranged; petiole sheathed, clasping the stem; leaf blade usually oblong-ovate to oblong-lanceolate; midrib strong. Inflorescences subterminal, usually several together; peduncle shorter than petiole; spathe erect, ovate-lanceolate or ovate, yellowish green or white inside; spadix cylindrical: female portion at the base few-flowered, about 1/3–1/4 the length of male portion; male portion above the female, densely flowered. Male flower: stamens 2, free; anthers sessile, apically dehiscent by a slit or a pore; staminodes between male and female portions of spadix, few, anther-like. Female flower: ovary 1(–2)-locular with 1 ovule in each locule; stigma discoid or funnelform, sessile or nearly so. Berries ovoid or oblong-ovoid, deep yellow or red, 1-seeded; seed oblong, large.

About 21 species distributed in tropical and subtropical Asia; two species in China; one species cultivated in Hong Kong.

1. Aglaonema modestum Schott ex Engl. 廣東萬年青 **(Fig. 26; Photo 61)**

Monogr. Phan. 2: 442. 1897; FHN 4: 134, fig. 1039. 1977; FRPS 13(2): 43. 1979; FYN 2: 760. 1979; FFJ 6: 418, fig. 378. 1995; FGD 9: 187, fig. 103. 2009; FOC 23: 23. 2010.

Perennial evergreen herb. Stems erect, green and smooth, 40–70 cm tall; internodes 1–2 cm. Leaves mostly crowded towards stem-apex; petiole 5–20 cm, green, the lower half sheathed and clasping stem at base; leaf blade ovate to ovate-lanceolate, 15–25 × 6–13 cm,

base broadly cuneate, apex caudate-acuminate, margin entire, dark green above, paler beneath; lateral veins 4–5 pairs. Peduncle slender, 5–10 cm. Spathe yellow-green, oblong-lanceolate, 5.5–7 × 1.5 cm, apex long-acuminate. Spadix cylindrical, about 2/3 the length of spathe; female portion 5–7.5 mm; male portion elongate, 2–3 cm. Flowers unisexual, without scales or perianth. Berries oblong-ovoid, ca. 2 cm, orange-red when mature, oblong.

Locality: Commonly cultivated in Hong Kong. *HK sheet 28245, 29749.*

Distribution: Guangdong, Guangxi, Yunnan; Vietnam, Philippines.

Ecology: Flowering: May; fruiting: Oct.–Nov.

Uses: Ornamental.

6. Pistia L. 大漂屬

Floating aquatic herbs, acaulescent or the stem strongly abbreviated. Leaves spirally arranged, rosulate; petiole very short, almost absent, with very small ligulate sheath; leaf blade obovate, obovate-cuneate or obcordate, densely hairy; primary veins parallel, rib-like, secondary veins reticulate. Inflorescences small, on a very short peduncle hidden in leaf-bases. Spathe very small, white, leaf-like, glabrous internally, hairy externally, lower margins connate to middle and with ovary wall forming a tube, limb ovate, expanded, apex acute-acuminate. Spadix shorter than spathe, dorsal 2/3 adnate to spathe; female portion with single gynoecium at base; male portion subtended by a thin, annular flap, composed of a basally naked spadix axis supporting a single whorl of a few flowers. Flowers unisexual, without scales or perianth. Male flower a synandrium composed of 2 connate stamens; thecae dehiscing by single apical slit. Female flower of a single pistil obliquely adnate to spadix axis; ovary ovoid, 1-locular with many ovules. Fruit a small ellipsoidal berry.

A monotypic genus widely distributed in tropical and subtropical regions of both hemispheres.

1. Pistia stratiotes L. 大漂 **(Fig. 27; Photo 62)**

Sp. Pl. 2: 963. 1753; FKH 288. 1912; FGZ 687, fig. 362. 1956; FHN 4: 141, fig. 1047. 1977; FRPS 13(2): 83, pl. 12: 6–9. 1979; FYN 2: 784, fig. 209: 6–9. 1979; FFJ 6: 421, fig. 382. 1995; FTW ed 2, 5: 682, pl. 295, photo 73. 2000; FGD 9: 193, fig. 111. 2009; FOC 23: 79. 2010.

Aquatic herb, with many feathery roots, floating on stagnant water. Leaves in rosulate clusters on a very short stem; petioles almost absent; leaf blade broadly cuneate to obovate-cuneate, 1.3–10 × 1.5–6 cm, truncate or emarginate at apex, entire or undulate, pubescent on both surfaces, especially near the base. Characters of inflorescence and flowers as the description of the genus.

Locality: Sha Tin, Sai Kung. *HK sheet 7726, 30264.*

Distribution: Hainan, Fujian, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Hubei, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; widely distributed in tropical and subtropical regions.

Ecology: Ponds and ditches. Flowering: May–Nov.

Uses: Animal food.

7. Amorphophallus Blume ex Decne. 魔芋屬

Perennial herbs with fleshy tuberous rhizome. Leaf compound, usually solitary; petiole long, usually smooth, marked with blotches; leaf blade divided into 2 segments, which again once or twice pinnately divided. Peduncle solitary, radical, without bracts

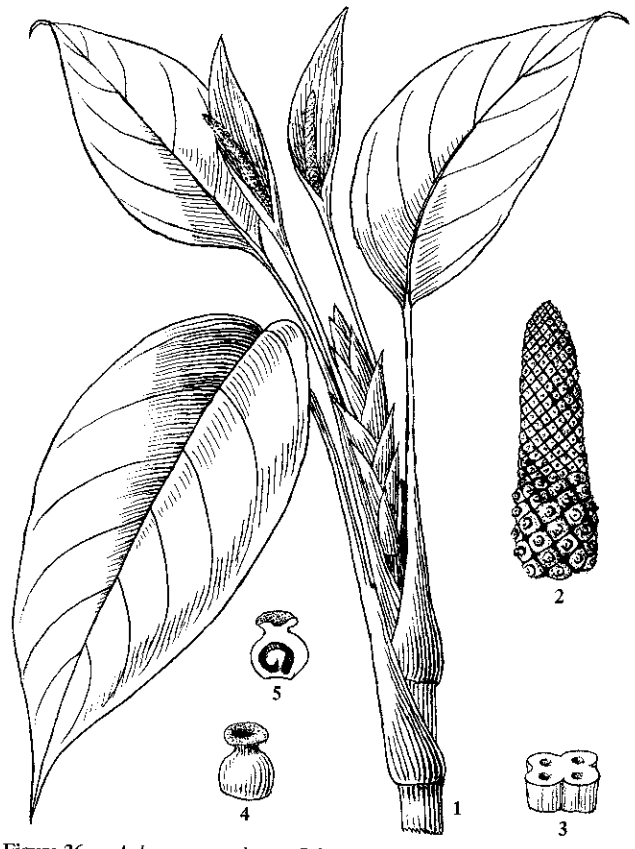

Figure 26. *Aglaonema modestum* Schott ex Engl.

1. plant; *2.* spadix; *3.* stamens; *4.* pistil; *5.* vertical section of pistil. (drawn by H. P. Yu)

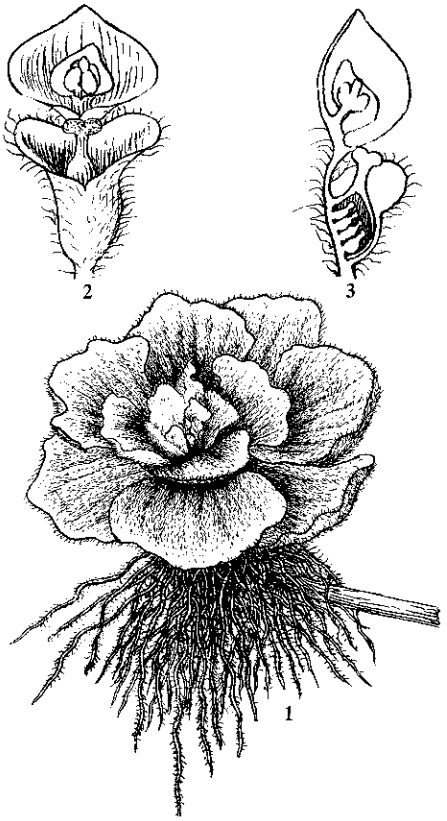

Figure 27. *Pistia stratiotes* L.

1. plant; *2.* spathe and inflorescence; *3.* vertical section of spadix, spathe and inflorescence. (drawn by H. P. Yu)

under the spathe; spathe funnelform or campanulate at the base, convolute, limb ± spreading; spadix sessile or shortly stipitate, erect; female portion at lower part, continuous with male portion or separated by a sterile portion, the rachis ending in an elongate appendage. Flowers unisexual, without scales or perianth; stamens 1–6; ovary 1–4 locular, ovule solitary in each locule. Fruit a berry, subglobose or obovid; seeds 1–4, without endosperm.

About 150 species in the paleotropics, from W Africa, to Australia and Polynesia; 21 species in China; two species in Hong Kong.

1a. Spadix distinctly longer than or equaling spathe ..... 1. *A. kiusianus*
1b. Spadix shorter than spathe ..... 2. *A. dunnii*

1. Amorphophallus kiusianus (Makino) Makino 東亞魔芋 **(Photo 63)**

Bot. Mag. (Tokyo) 27: 244. 1913; Hett. & Peng, Bot. Acad. Sin. 36. 105, f. 4. 1995; FTW ed. 2, 5: 671. 2000; FGD 9: 195. 2009; FOC 23: 29. 2010.

Amorphophallus konjac K. Koch ex Matsum. & Hayata var. *kiusiana* Makino, Bot. Mag. (Tokyo) 25: 16. 1911.

Amorphophallus variabilis auct. non Blume: FHK. 343. 1861; FKH 288. 1912; FRPS 13(2): 95. 1979; Check List HK Plants 298. 2002; 105. 2004.

Perennial herb; tuber depressed-globose. Leaves trisected, lobes lanceolate or oblong-elliptic, 6–20 × 3–4.5 cm; petiole glabrous, 80 cm, with grey or pale green spots. Peduncle 120 cm; spathe triangular, 9–25 × 4–13 cm, base and blade constricted, blade margins inrolled or wavy, pink-green or purple-brown externally, with small white spots; spadix sessile or subsessile, 9–22 cm, female portion conical, 1–4 cm, male portion cylindrical or slightly obconical, 2.5–4.5 cm, appendage fusiform-conical or long cylindrical, 4–16 cm, abruptly acute or obtuse. Ovary obovoid. Berries rounded or ovoid.

Locality: Victoria Peak, Shing Mun, Tai Mo Shan, Lantau Island. *HK sheet 29717, 29718.*

Distribution: Guangdong, Jiangxi, Fujian; Japan.

Ecology: Thin forests. Flowering: Jul.

2. Amorphophallus dunnii Tutcher
南蛇棒(鄧氏蒟蒻) **(Fig. 28; Photos 64–65)**

Journ. Bot. 49: 273. 1911; FKH 288. 1912; FHN 4: 138, fig. 1044. 1977; FRPS 13(2): 92, pl. 16: 5–9. 1979; FYN 2: 790. 1979; W. Hett. & Vander Ham, Blumea 46: 281. 2001; FGD 9: 196. 2009; FOC 23: 26. 2010.

Amorphophallus odoratus W. Hett. & H. Li, Blumea 39: 265. 1994.

Perennial herb; tuber subglobose or depressed-globose. Leaf solitary; petiole 30–90 cm, 1 cm in diam., with many, elongate, confluent, pale green or brownish green spots; leaf blade green, dissected; leaflets lanceolate or oblanceolate, 7–14 × 8 cm, base cuneate, apex abruptly acuminate. Inflorescence solitary. Inflorescence solitary; peduncle 20–60 cm; spathe broadly ovate to elliptic, 12–26 × 14 cm, strongly concave, top acute, overarching the spadix, base shortly convolute, externally bright pale green, basally with rounded white spots; spadix slightly shorter than spathe, stipitate or subsessile, 8–20 cm; female portion cylindrical, yellowish, 1.5–3 cm, base narrow; male portion 1.5–4.5 cm, appendage conical, ovate, greenish white, 4.5–14 cm, narrowing above middle, apex obtuse. Ovary obovate, 1–2.5 mm. Berries blue, cylindrical; seed solitary, black.

Locality: Mount Parker, Ng Tung Chai, Lantau Island. *HK sheet 7729, 29714.*

Distribution: Hainan, Guangdong, Guangxi, Hunan, Yunnan.

Ecology: Forests. Flowering: Mar.–Apr.; fruiting: Jul.–Aug.

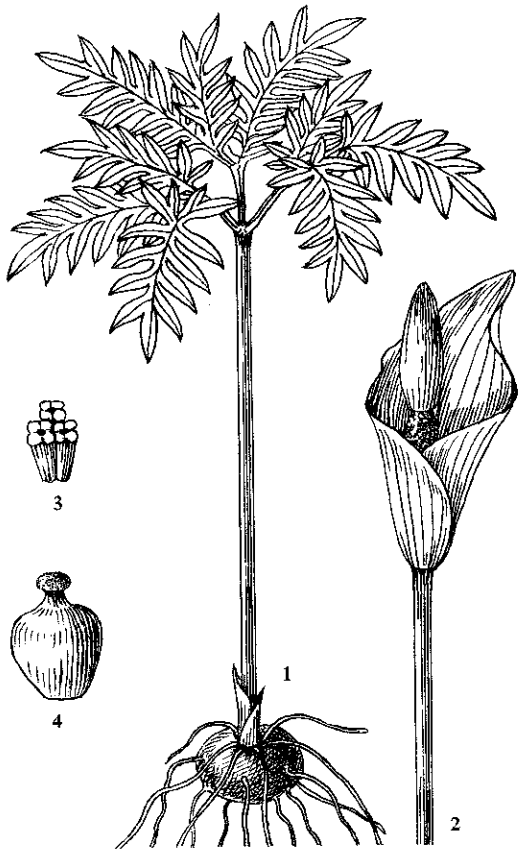

Figure 28. *Amorphophallus dunnii* Tutcher
1. plant; *2.* inflorescence; *3.* stamens; *4.* pistil. (drawn by H. P. Yu)

Notes: The type specimens were collected by S. T. Dunn and W. J. Tutcher from Lantau Island and Mount Parker in between 1909 and 1911 respectively. The type specimen of *A. odoratus* was collected by Simmons from Tai Mo Shan in 1994.

8. Typhonium Schott 犁頭尖屬

Perennial herbs, with tuberous rhizome. Leaves 2–5, radical; leaf blade sagittate-hastate, 3–5-lobed, or pedatisect, venation reticulate, often with 2–3-submarginal veins. Peduncle radical, without bracts under the spathe. Spathe convolute or tubular at the base, persistent, throat ± constricted, limb ovate-lanceolate or lanceolate, usually reddish purple, rarely white, apex acuminate; spadix androgynous: female flowers at the base, male flowers higher up, with neutral flowers either between the female and male flowers, or both; the rachis ending in a club-shaped or pointed appendage. Female flowers 1-locular, with 1 or more ovules. Male flowers with 1–3 stamens; anthers 2-celled, sessile or on short filament, opening by slits or pores, the connective sometimes prolonged. Berries ovoid, red or purple,

1(–2)-seeded.

About 40 species in India to Malaysia, Australia; 13 species in China; one species in Hong Kong.

1. Typhonium blumei Nicolson & Sivad.
犁頭尖(山半夏) **(Fig. 29; Photo 66)**

Blumea 27: 494, fig. 4. 1981; A. Hay, Blumea 37: 373, fig. 17. 1993; FGD 9: 198, fig. 113. 2009; FOC 23: 34. 2010.

Typhonium divaricatum auct. non (L.) Decne: Nouv. Ann. Mus. Paris 31: 367. 1834; FKH 288. 1912; FRPS 13(2): 111. 1979.

Arum divaricatum auct. non L.: FHK 342. 1861.

Perennial herb; tuber subglobose, 1–2 cm in diam. Leaves 4–8; petiole green, 20–40 cm, basal; leaf blade cordate-hastate, ovate or deltoid in outline, 5–10 × 3–9 cm, apex acuminate, the 2 basal lobes ovate-lanceolate or oblong, divaricate; lateral veins 3–5 pairs. Peduncle emerging from petiole sheath, pale green. Spathe tubular and green at the base for 14–20 mm, upper part expanded into a deep purple ovate limb, ca. 5 cm broad, and tapering into a long and slender apex. Spadix subequaling spathe, deep purple; female portion at the base, 0.4–0.6 cm, with several rows of female flowers, then followed with several rows of subulate neutral flowers; male portion 0.6–0.8 cm, orange; appendage purple, 10–13 cm, emerging very bad excrement smell, long cylindrical. Berries obovoid, few-seeded.

Locality: Magazine Gap, Pok Fu Lam. *HK sheet 30636, 31436.*

Distribution: Hainan, Guangdong, Guangxi, Sichuan, Yunnan, Hunan, Jiangxi, Zhejiang, Fujian, Taiwan; Japan, Philippines.

Ecology: Grassy slopes, roadsides. Flowering: May–Jul.

Uses: Medicinal (folklore).

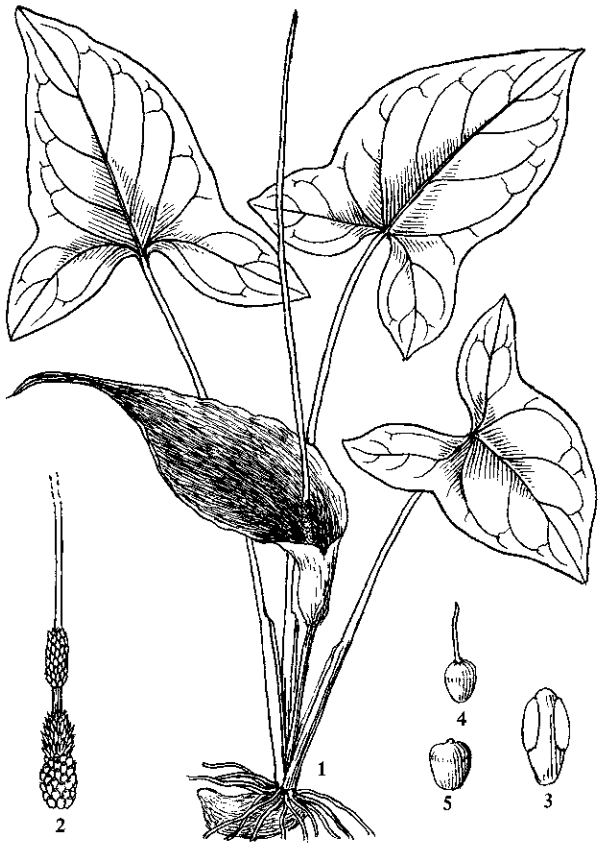

Figure 29. *Typhonium blumei* Nicolson & Sivad.
1. plant; *2.* spadix; *3.* stamens; *4.* pistil; *5.* asexual flower. (drawn by H. P. Yu)

9. Pinellia Ten. 半夏屬

Perennial herbs with tuberous rhizome. Leaves 1–5, usually with bulbils on the petiole; leaf blade entire, tripartite, trilobate or pedate. Peduncle solitary, equaling or exceeding petiole. Spathe persistent, tube convolute, constricted at apex, limb oblong-cymbiform, 2 times as long as tube; spadix monoecious: female portion adnate to spathe-tube from base to the constricted apex by one side, bearing ovaries at other side; male portion free from spathe-blade, exserted from the tube; appendages often elongate filiform. Flowers without scales or perianth: male flower consisting of 2 stamens fused into synandria, filament short; female flower of a 1-locular ovary, with 1 basal ovule. Berries oblong-ovoid, 1-seeded.

About six species in E Asia; five species in China; two species in Hong Kong.

1a. Leaves of adult plants trifoliate; bulbils present at petiole below middle, or both at proximal part of petiole and at base of leaf blade ..... 1. *P. ternata*

1b. Leaves only deeply 3-partite, anterior lobe broadly ovate or ovate-oblong, sessile; bulbils absent ..... 2. *P. tripartita*

1. Pinellia ternata (Thunb.) Breitenb. 半夏 **(Fig. 30; Photo 67)**

Bot. Zeitg. (Berlin) 37: 687. 1879; FRPS 13(2): 204, pl. 40: 1–7. 1979; FYN 2: 837. 1979; FFJ 6: 430, fig. 391. 1995; FTW ed 2, 5: 682, pl. 294. 2000; FGD 9: 200, fig. 115. 2009; FOC 23: 42. 2010.

Arum ternatum Thunb., Fl. Jap. 233. 1784.

Pinellia ternata (Thunb.) Makino f. *angustata* (Schott) Makino, Check List HK Plants 300. 2002; 106. 2004.

Pinellia tuberifera Tenore, Atti Accad. Sci. Fis. Mat. Napoli 4: 57. 1839; FKH 288. 1912.

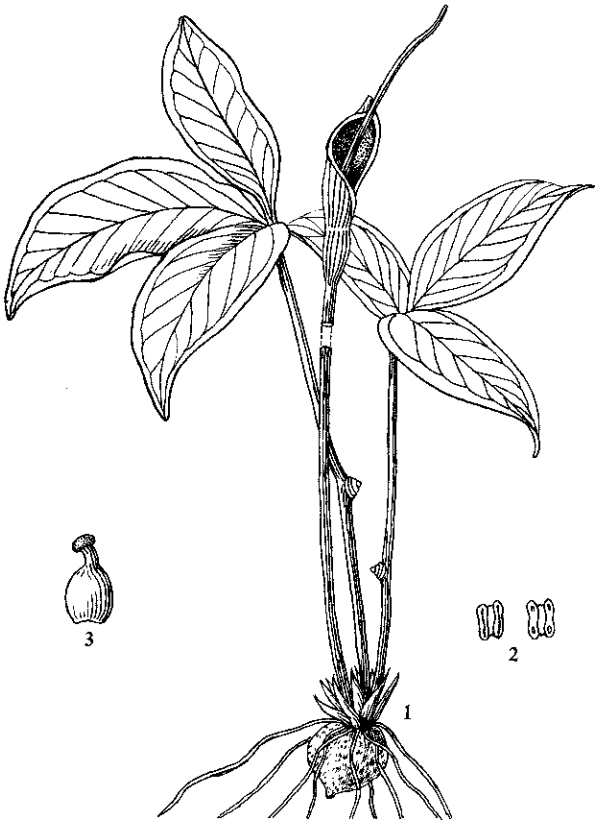

Figure 30. *Pinellia ternata* (Thunb.) Breitenb.
1. plant; *2.* stamens; *3.* pistil. (drawn by H. P. Yu)

Perennial herb, tuber globose, 1–2 cm in diam. Leaves (1–)2–3(–5); petiole 15–20 cm, base sheathing; leaf blade of seedlings usually simple, ovate-cordate to hastate, that of adult plants trifoliolate; leaflets oblong-elliptic or lanceolate, base cuneate, apex acuminate, terminal one 3–10(–20) × 1–3(–5) cm; lateral ones smaller; lateral veins 8–10 pairs. Peduncle longer than petiole, 25–35 cm; spathe greenish or whitish green, tube narrowly cylindrical, 1.3–2 cm; limb oblong, green or usually purplish at margin, 4–5 cm, apex obtuse or acute; spadix: female portion 1.3–2 cm, sterile portion 3 mm, male portion 5–7 mm, appendage linear, green to purplish, 6–12 cm, erect or sigmoid. Berries ovoid, yellowish green.

Locality: Mount Violet. *HK sheet 34816.*

Distribution: Widely distributed in China except Nei Mongol, Xinjiang, Xizang, Qinghai; Korea, Japan.

Ecology: Grasslands, farmlands and thin forests. Flowering: May–Jul.; fruiting: Aug.

Uses: Medicinal (folklore).

Notes: The species was reported as *Pinellia ternata* (Thunb.) Makino previously (Check List HK Plants 300. 2002; 106. 2004).

2. Pinellia tripartita (Blume) Schott 三裂葉半夏

Syn. Aroid. 5. 1856; FOC 23: 41. 2010.

Atherurus tripartitus Blume, Rumphia 1: 137. 1835.

Perennial herb, tuber subglobose, ca. 2.5 cm in diam. Leaves 2–5; petiole green, 30–35 cm; leaf blade green, 3-partite; leaflets broadly ovate to ovate-oblong; anterior leaflet ca. 15 × 4–7 cm, apex ca. 1.5 cm; lateral leaflets smaller; primary lateral veins 8–12 per side on each leaflet, forming a distinct marginal collective vein, also with 2 thinner collective veins along margin. Inflorescence solitary; peduncle to 25 cm, shorter than petioles, slender. Spathe whitish to light green, slightly constricted, 7–9(–10) cm; tube oblong to subcylindrical, ca. 3.5 × 1–1.25 cm; limb boat-shaped, oblong, ca. 4 × 2.5 cm. Spadix 20–25 cm; female portion ca. 3 cm, adnate to spathe; female flowers densely arranged; pistil 1–1.2 mm; ovary ovoid, 0.9–1 mm; style distinct, 0.2–0.3 mm, attenuate; stigma subhemispheric; sterile portion between female and male portion 0.6–0.7 cm; male portion 1.8–2 cm; thecae elongate, opening by a slit; appendage long exserted from spathe, sigmoid, 15–20 cm, base ca. 3 mm in diam., smooth. Berries 1-seeded, pale green to whitish, ovoid.

Locality: Hong Kong Island. *C. Wright 508* (P).

Distribution: Japan.

Ecology: Forests. Flowering: May–Jul.

Notes: The species can be easily distinguished from *P. ternata* by petioles lacking bulbils.

10. Colocasia Schott 芋屬

Perennial herbs, with underground rhizome or short caudex, sometimes stoloniferous. Leaves basal, simple; petiole long, sheathing at base; blade asymmetrically peltate, base usually cordate; lateral veins many. Inflorescences at or near apex of leafy plant, several together: peduncle erect, shorter than leaves; spathe tube green, ovoid or ellipsoidal, 1/2–1/5 the length of the limb, convolute, persistent; limb orange, oblong or narrowly lanceolate, falling off after anthesis; spadix slender, shorter than spathe, female portion at the base, male portin at apex, with a sterile portion between the female and male portion. Appendage cylindrical, subulate, or none. Flowers unisexual, without perianth; female flower of a single 1-locular ovary, with many ovules; male flower of 2–6 sessile stamens; anthers opening by longitudinal slits. Fruits a berry, green to white or red, many-seeded.

About 13 species in tropical and subtropical Asia; eight species in China; one species in Hong Kong.

1. Colocasia esculenta (L.) Schott 芋 **(Fig. 31; Photo 68)**

Melet. Bot. 18. 1832; FYN 2: 778. 1979; FFJ 6: 432, fig. 393. 1995; FTW ed. 2, 5: 678. 2000; FGD 9: 201, fig. 116. 2009; FOC 23: 74. 2010.

Arum esculentum L., Sp. Pl. 2: 965. 1753.

Colocasia antiquorum Schott, Melet. Bot. 18. 1832; FKH 288. 1912.

Perennial herb; tuber ovoid to ellipsoidal. Leaves 2–3 or more, peltate; petiole 20–90 cm, green or purplish, sheathing at base; leaf blade ovate to oblong-ovate in outline, 20–50 × 10–35 cm, base deeply cordate, apex acute or shortly acuminate; lateral veins 4 pairs. Peduncle usually solitary, shorter than petiole. Spathe

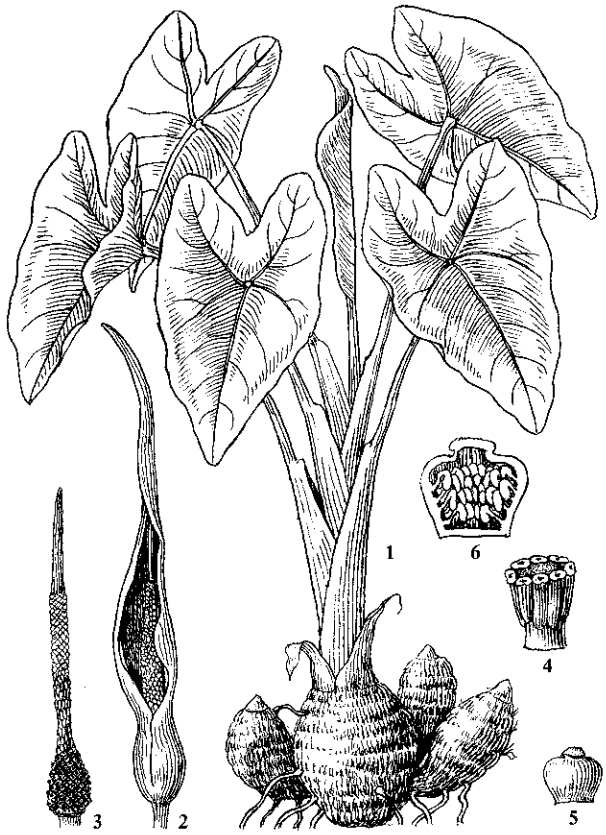

Figure 31. *Colocasia esculenta* (L.) Schott

1. plant (shorting young plant); *2.* spadix; *3.* spadix without spathe; *4.* stamens; *5.* pistil; *6.* vertical section of pistil. (drawn by H. P. Yu)

various in length, usually 20 cm, tube green, ovoid, ca. 4 cm; limb pale yellow to greenish, lanceolate or elliptic, acuminate, ca. 17 cm, margins inrolled; spadix ca. 10 cm, female portion conical, 3–3.5 cm, at the base; sterile portion slender, cylindrical, 3–3.3 cm; male portion cylindrical, 4–4.5 cm; appendage subulate ca. 1 cm.

Locality: Cultivated or wild. *HK sheet 32847, 36157.*

Distribution: Areas S of Changjiang River; widely cultivated in the tropics.

Ecology: Flowering: Aug.–Sep.

Uses: Food.

11. Alocasia (Schott) G. Don 海芋屬

Perennial evergreen herbs with underground tubers or caulescent stock. Leaves usually large, and sometimes peltate; petiole long, sheathing below; leaf blade usually ovate, cordate at base. Inflorescences solitary or several together; spathe convolute or tubular at base, apex constricted, persistent; limb usually cymbiform, falling off from the tube after anthesis; spadix sessile, shorter than sapthe, cylindrical, erect; female portion short, conical-cylindrical at the base; fertile male portion higher up, cylindrical, sterile male portion in the interval; appendage club-shaped. Flowers unisexual; female flowers: ovary 1-locular, with several ovules; stigma discoid-globose, or stellate; male flowers: stamens 3–8, sessile, anthers united into pyramidal synandria. Fruit a berry, usually red when mature.

About 70 species in tropical Asia and Malaysia; four species in China; two species in Hong Kong.

1a. Leaf blade 10–16(–40) cm; caulescent stock branched, stoloniferous ..... 1. *A. cucullata*

1b. Leaf blade 50–100 cm; caulescent stock simple, not stoloniferous ..... 2. *A. macrorrhizos*

1. Alocasia cucullata (Lour.) Schott 尖尾芋 (Photo 69)

Melet. Bot. 18. 1832; FKH 289. 1912; FRPS 13(2): 75, pl. 14: 1. 1979; FTW ed. 2, 5: 667. 2000; FGD 9: 202. 2009.

Arum cucullatum Lour., Fl. Cochinch. 2: 536. 1790.

Alocasia cucullata (Lour.) G. Don, Hort. Brit. ed. 3, 631. 1839; FFJ 6: 434. 1995; FOC 23: 78. 2010; Check List HK Plants 105. 2004.

Herb evergreen, caulescent stock erect, 3–6 cm thick, branched, stoloniferous. Leaves peltate; petiole green, 25–80 cm, sheathed below medium; blade broadly ovate to ovate-cordate, 10–16(–40) × 7–18(–28) cm, base shallowly cordate, apex acute, margin entire; lateral veins 4–8 on each side, the lowest one basal. Inflorescences usually solitary, axillary. Peduncle terete, 20–30 cm. Spathe green, tube oblong-ovoid, 4–8 cm; limb cymbiform, 5–15 cm, margin convolute. Spadix shorter than spathe, ca. 10 cm; female portion cylindrical, 1.5–2.5 cm; sterile male portion 2–3 cm; fertile male portion subfusiform, 3.5 cm; appendage pale green, yellowish green, narrowly conical, ca. 3.5 cm. Berry subglobose, 6–8 mm in diam., 1-seeded.

Locality: Happy Valley, Victoria Peak, Sha Tin, Tai Mong Tsai, Sai Keng, Nam Chung, Luk Keng. *HK sheet 33004, 33063.*

Distribution: Hainan, Guangdong, Guangxi, Sichuan, Guizhou, Yunnan, Zhejiang, Fujian, Taiwan; Japan, India, Sri Lanka, Myanmar, Thailand.

Ecology: Forests, streamsides, wet places. Flowering: May.

Uses: Medicinal (folklore).

2. Alocasia macrorrhizos (L.) G. Don 海芋 (Fig. 32; Photos 70–71)

Hort. Brit. ed. 3, 631. 1839; FFJ 6: 435, fig. 394. 1995.

Arum macrorrhizum L., Sp. Pl. ed. 1: 965. 1753.

Arum indicum Lour., Fl. Cochich. 2: 536. 1790.

Caladium odorum Lindl., Bot. Reg. 8: t. 641. 1822.

Colocasia odora (Lindl.) Bornyn., Nouv. Ann. Mus. Hist. Nat. 3: 145, t. 7. 1834; FHK 343. 1861.

Alocasia odora (Roxb.) K. Koch, Index Seminum Hort. Berol. 1854(App.): 5. 1854; FOC 23: 77. 2010; Check List HK Plants 105. 2004.

Colocasia indica (Lour.) Kunth., Enum. Pl. 3: 39. 1841; FHK 343. 1861.

Alocasia macrorrhiza (L.) Schott, Osterr. Bot. Wochenbl. 4: 409. 1854; FKH 289. 1912; FRPS 13(2): 76. 1979; FGD 9: 203, fig. 117. 2009; Check List HK Plants 298. 2002, *nom. illeg. prior.*

Large evergreen perennial herb, to 2(–3) m tall; caulescent stock stout, to 15 cm thick, unbranched. Leaves spirally arranged, crowded toward apex of the stock, ± peltate; petiole green, 0.5–2(–3) m, sheathing at base; leaf blade broadly ovate, 50–100 × 40–100 cm, base sagittate, apex acute, margin entire; lateral

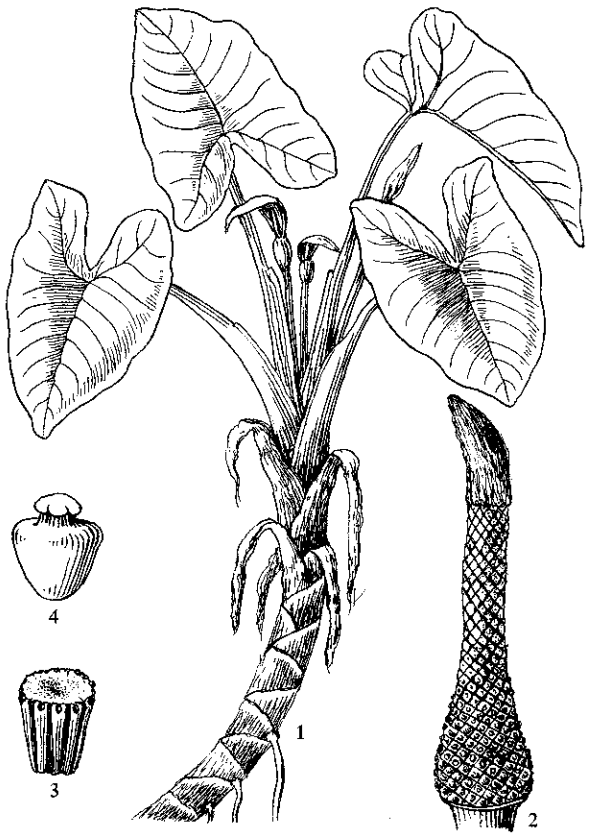

Figure 32. *Alocasia macrorrhizos* (L.) G. Don

1. plant; *2.* spadix with spathe removed; *3.* stamens; *4.* pistil. (drawn by H. P. Yu)

veins 9–12 pairs. Peduncle 2–3 together, terete, green, 12–60 cm. Spathe tube inrolled, green, narrowly ellipsoidal, 5–9 cm, convolute and constricted at apex; limb yellowish green or pale green, lanceolate and concave, 10–20 × 4–5 cm. Spadix rather short: female portion green, 2–4 cm; sterile male portion white or pale green, 2.5–6 cm; fertile male portion 3–7 cm; appendage yellowish, conical, 3–5.5 cm. Berries ovoid, 8–10 mm, red when mature, 1–2-seeded.

Locality: Common in Hong Kong. *HK sheet 7732, 29735.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Jiangxi, Fujian; Bangaladesh, India, Malay Peninsula, Indochina, Philippines, Indonesia.

Ecology: Forests and shaded places. Flowering: All year round in tropics.

Uses: Medicinal (folklore), ornamental.

Notes: Some authors consider *Alocasia odora* a distinct species which differs from *A. macrorrhizos* in having shortly peltate leaves, whereas leaves of *A. macrorrhizos* are deeply cordate at the base with the lateral costae partially naked in the sinus.

12. Arisaema Mart. 天南星屬

Perennial herbs, with tuberous or rhizome. Leaves usually appearing with flowers, 1–3; petiole long, ± sheathing and encircling the peduncle; leaf blade trifoliolate, palmately or pedately compound. Peduncle erect, as are the petioles usually marked with spots or blotches. Spathe tube cylindrical, convolute, gradually enlarged toward apex; limb helmet-shaped, apex long acuminate. Flowers unisexual, without perianth, borne at base of spadix. Spadix sessile, included or exserted, terminated by a sterile, usually long and filiform appendage. Male flowers of 2–5, almost sessile 2–4-celled anthers; female flowers with an ovoid 1-locular ovary, containing 1–many ovules, stigma peltate or capitate. Fruit a berry, 1–many-seeded.

About 150 species, mostly in Asia, few in tropical Africa, Middle America and N America; 82 species in China; four species in Hong Kong.

1a. Leaves 3-partite ..... 1. *A. penicellatum*

1b. Leaves pedately, palmately or radiately compound.

2a. Leaves radiately compound, leaflets 7–20 or more ..... 2. *A. erubescens*

2b. Leaves pedately or palmately compound.

3a. Leaflets 11–19; spathe-tube auriculate at mouth ..... 3. *A. heterophyllum*

3b. Leaflets 5–7; spathe-tube not auriculate at mouth ..... 4. *A. cordatum*

1. Arisaema penicillatum N. E. Br. 畫筆南星 **(Photo 72)**

J. Linn. Soc., Bot. 18: 248, t. 5. 1880; FKH 288. 1912; FHN 4: 140. 1977; FRPS 13(2): 123, pl. 23: 11–13. 1979; FYN 2: 804, fig. 216: 11–13. 1979; FGD 9: 204. 2009; FOC 23: 48. 2010.

Arisaema laminatum auct. non Blume: FHK 342. 1861.

Perennial herb; tuberous rhizome subglobose. Leaves 2; petioles 25–30 cm, basal 1/2 sheathing; leaf blade 3-partite; lobes ovate-lanceolate to oblong-lanceolate, 8–14 cm, oblique at the base, apex acuminate and aristate, the central one petiolulate, lateral ones almost sessile. Peduncle usually shorter than petiole; spathe tube pale green, 4 cm, convolute; limb pale green to white, broadly ovate and ending in a fine and long (12–25 mm) point. Spadix unisexual or bisexual: female portion pyramidal, green, ca. 1 cm; male portion long conical, sparsely bearing male flowers; appendage filiform, 3–5 cm, covered with filiform or subulate neuter flowers at apex. Synandria of 3 stamens; anthers ovate, opening by longitudinal apical slits. Ovaries ovoid, apex constructed into a short style, stigma capitate.

Locality: Victoria Peak, Ma On Shan, Castle Peak. *HK sheet 7727, 34081.*

Distribution: Guangdong, Guangxi, Yunnan.

Ecology: Forests. Flowering & fruiting: Apr.–Jun.

Notes: The syntype specimens were collected by Harland, Hance, Urquhart, Lamont and C. Ford between 1840s and 1880. Listed in *Rare and Precious Plants of Hong Kong.*

2. Arisaema erubescens (Wall.) Schott 一把傘南星 **(Photo 73)**

Melet. Bot. 17. 1832; FRPS 13(2): 189, pl. 37: 1–8. 1979; FYN 2: 830, fig. 220: 1–8. 1979; FFJ 6: 425, fig. 386. 1995; FGD 9: 207. 2009; FOC 23: 67. 2010.

Arum erubescens Wall., Pl. Asia. Rar. 2: 30, t. 135. 1831.

Arisaema consanguineum Schott, Bonplandia (Hanover) 7: 27. 1859; FKH 288. 1912; FTW ed. 2, 5: 673. 2000.

Perennial herb; tuberous rhizome depressed globose. Leaf 1–2, radiately 9–15(–20)-foliolate; petiole, 40–80(–120) cm, basal 1/3–1/2 sheathing; leaflets lanceolate, oblong-lanceolate to elliptic, usually 1 upward, the others radiately spreading. Peduncle shorter than petiole, erect. Spathe green to dark purple, with stripes or not, slightly recurved at mouth; tube cylindrical, 4–8 cm, auriculate at mouth limb oblong-ovate, acuminate with a filiform tail to 12–14 cm. Plants dioecious: male spadix 2–2.5cm, flowers dense; female spadix ca. 2 cm; appendage clavate, erect, 2–4.5 cm. Berries red when mature, 1–2-seeded.

Locality: Sunset Peak, Lantau Peak. *HK sheet 29667, 33667.*

Distribution: Widely distributed in China (except Nei Mongol, Heilongjiang, Jilin, Liaoning, Xinjiang); India, Nepal, Sikkim, Myanmar, Thailand.

Ecology: Forests and thickets. Flowering: May–Jul.

Uses: Medicinal (folklore).

3. Arisaema heterophyllum Blume
異葉天南星 **(Fig. 33; Photo 74)**

Rumphia 1: 110. 1835; FRPS 13(2): 157, pl. 30: 1–3. 1979; FYN 2: 822, fig. 218: 1–3. 1979; FFJ 6: 428, fig. 389. 1995; FTW ed. 2, 5: 675. 2000; FGD 9: 205, fig. 118. 2009; FOC 23: 60. 2010.

Arisaema kwangtungensis Merr., Philipp. J. Sci. 15(3): 228–229. 1919[1920].

Perennial herb; tuberous rhizome depressed globose, 2–4 cm in diam. Leaf usually 1–2, pedately compound; petiole glaucous, 30–60 cm, basal 3/4 sheathing; leaflets 11–19(–21), oblanceolate, oblong or linear-oblong, cuneate at base, apex acuminate; terminal one shorter than the others. Peduncle usually longer than petiole. Spathe tube cylindrical, 3–8 cm, glaucous externally, whitish green internally, throat slightly recurved; limb ovate to ovate-lanceolate, 5–11 × 3–5 cm, apex acuminate, dark green to pale green. Bisexual spadix: female portion 1–2.2 cm, at the base; male portion 1.5–3.2 cm, higher up, ending in appendage. Unisexual spadix: male portion 3–5 cm; appendage elongate, filiform. Ovaries globose, style distinct, stigma punctate, ovules 3–4. Synandria stalked, anthers 2–3, dehiscing by apical slits. Berries yellowish red or red, cylindrical, usually with a single clavate seed.

Locality: Sunset Peak. *HK sheet 32931, 34879.*

Distribution: Widely distributed in China except NW region and Xizang; Japan, Korea.

Ecology: Forests and thickets. Flowering: Apr.–May; fruiting: Jul.–Sep.

Uses: Medicinal (folklore).

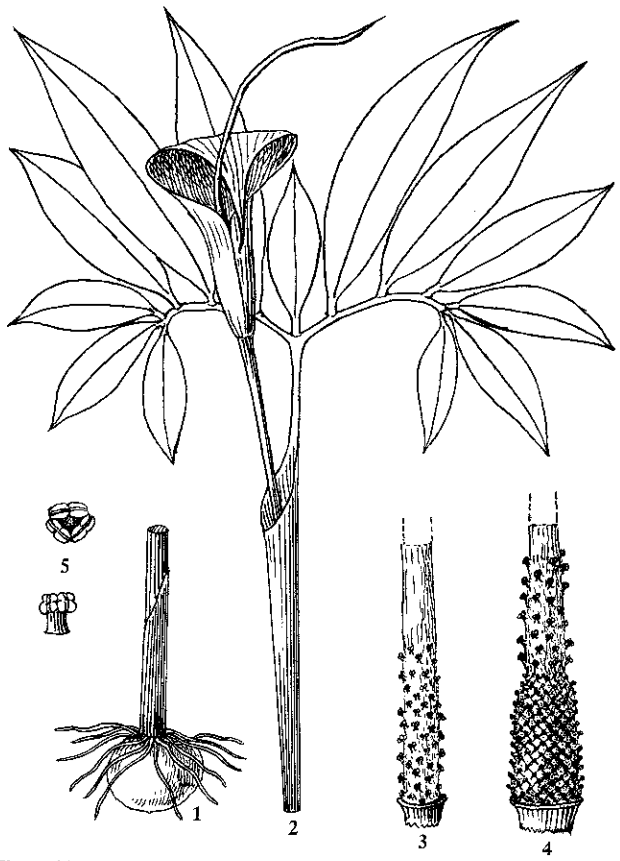

Figure 33. *Arisaema heterophyllum* Blume
1. lower portion of plant; *2.* upper portion of plant; *3.* male spadix; *4.* biseual spadix; *5.* stamens. (drawn by H. P. Yu)

4. Arisaema cordatum N. E. Br. 心檐南星 **(Photos 75–76)**

J. Linn. Soc., Bot. 36: 177. 1903; FKH 288. 1912; FRPS 13(2): 163, pl. 31: 4–5. 1979; FGD 9: 206. 2009; FOC 23: 61. 2010.

Arisaema brevistipitatum Merr., Lingnan Sci. J. 13(1): 19. 1934.

Perennial slender herb; tuberous rhizome globose, 1–1.5 cm in diam. Leaves solitary, bipinnatifid-pedate; petiole slender, 10–30 cm; leaflets (5–)7, sessile, oblong, 7–10 × 1.5–3 cm, broadly cuneate at base, apex acute to abruptly acuminate. Peduncle slender, 2–4.5 cm. Spathe violet when dried, tube funnelform, 3–3.5 cm, throat margins broadly auriculate; limb triangular-ovate, apex acuminate. Spadix unisexual: male portion shortly stipitate, synandria composed of 2 anthers, anthers globose, dehiscing by apical pores; appendage 15–27 cm, lower portion fusiform, exceeding from throat then narrowed into filiform and hanging.

Locality: Tai Mo Shan, Sunset Peak. *HK sheet 33108, 35025.*

Distribution: Guangdong, Guangxi.

Ecology: Forest and thickets. Flowering: Apr.

Notes: The holotype specimen (*A. B. Westland 92*, K) was collected by A. B. Westland from Tai Mo Shan in 1887.

345. LEMNACEAE 浮萍科

HU Qi-ming 胡啟明

Small or minute aquatic herbs, floating or submersed, sometimes forming a green carpet over stagnant, freshwater. Plants not differentiated into stem and leaves; the vegetative structure reduced to small green bodies called fronds, with or without roots. Fronds fleshy or membranous, flat and subrounded to linear, or thickened and nearly globular, with 2 marginal reproductive pouches (or one marginal and the other on adaxial surface). Reproduction almost wholly vegetative; daughter fronds formed from the pouches detaching or remaining attached for many weeks. Flowers unisexual, monoecious, apetalous, emerging from the pouches or from a cavity near median line on adaxial surface, in groups (interpreted as inflorescences by some authors) of 1 pistil (female flower) and 1 or 2 stamens (male flower); anthers 2- or 4-celled; ovary flask-shaped, 1-locular, with 1–7 basal ovules. Fruit a small utricle. Seeds 1–4, smooth or ribbed.

Five genera and 38 species distributed worldwide in aquatic ecosystems; four genera and eight species in China; three genera and three species in Hong Kong.

1a. Frond rootless, without veins ..... 1. *Wolffia*
1b. Frond with roots, 1–many-veined.
2a. Frond 1–5(–7)-veined, with a single root ..... 2. *Lemna*
2b. Frond 7–16(–21)-veined, with 5–21 roots ..... 3. *Spirodela*

1. **Wolffia** Horkel ex Schleid. 無根萍屬

Minute aquatic herbs; plants rootless, free floating on or below the water surface. Fronds 1 or 2 cohering in groups, symmetrical, globular, ovoid or boat-shaped, green adaxially, green to transparent abaxially, never reddish, with 1 basal pouch reproducing daughter fronds and flower; veins absent. Daughter fronds connected to mother frond by a very short stipe (not visible). Flowers minute, petalless, male and female separate but within same reproductive pouch but without spathe. Stamen 1, sessile, anther 2-celled. Ovary 1-locular, with 1 ovule. Seed 1, nearly smooth.

About 11 species distributed nearly worldwide; one species in China and Hong Kong.

1. Wolffia globosa (Roxb.) Hartog & Plas 無根萍 **(Fig. 34)**

Blumea 18(2): 367. 1970; FOC 23: 86. 2010.

Lemna globosa Roxb., Fl. Ind. 3: 565. 1832.

Wolffia arrhiza auct. non (L.) Horkel ex Wimm., Fl. Schles. 140. 1857; Hodgkiss, H. K. Freshwater Plants 82. 1978; FRPS 13(2): 211, pl. 42: 4. 1979; FGD 4: 411, fig. 249: 7–8. 2000; FTW ed. 2, 5: 696. 2000; Check List HK Plants 302. 2002; 106. 2004.

Minute thalloid herb, rootless, free floating on or just below water surface. Fronds ovoid to hemispherical, 0.5–1.5 mm, in diam., rounded or slightly pointed at apex, adaxial surface green, with stomata in parallel rows, abaxial surface transparent green, conspicuously convex, epidermal cells pentagonal or hexagonal. Plants rarely flowering.

Figure 34. *Wolffia globosa* (Roxb.) Hartog & Plas
1. a group of plants; *2.* fronds. (drawn by Y. X. Liu)

Locality: New Territories (fide Hodgkiss 1978).

Distribution: Widely distributed in China; tropical to temperate regions.

Ecology: Ponds and ditches.

Uses: Forage.

2. **Lemna** L. 浮萍屬

Small aquatic herbs, free floating or submersed. Fronds flat, 1–many cohering together, each with a single long root on abaxial surface, green, or sometimes reddish abaxially, margin entire, with (1–)2 lateral pouches at base, reproducing daughter fronds and flower (rarely in most species); veins 1–5(–7), leaving from node towards apex. Daughter fronds connected to mother frond by a thin white stipe or a green stalk. Flowers minute, petalless, male and female separate but surrounded by same small membranous spathe: stamens 2, anthers 4-celled; pistil 1, 1–7-ovuled. Seeds longitudinally ribbed.

About 13 species distributed nearly worldwide; five species in China; one species in Hong Kong.

1. Lemna minor L. 浮萍 **(Fig. 35; Photo 77)**

Sp. Pl. 2: 970. 1753; FKH 290. 1912; FRPS 13(2): 210, pl. 42: 3. 1979; FGD 4: 410, fig. 249: 4–6. 2000; FOC 23: 82. 2010.

Small aquatic herb, free floating on water surface. Frond flat, suborbicular, obovate to obovate-elliptic, 2–6 × 2–3 mm, 1–many cohering in small groups, green and shining, sometimes reddish adaxially, scarcely reddish abaxially, margins entire, with a pouch on one side; veins 3(–5), reaching nearly apex. Root usually 2–4 cm, mostly with a rounded tip. Flowers minute, petalless; stamens 2; ovary 1-locular, with 1 ovule. Fruit winged laterally towards top; seed with 10–16 distinct ribs.

Locality: New Territories. *HK sheet 29837.*

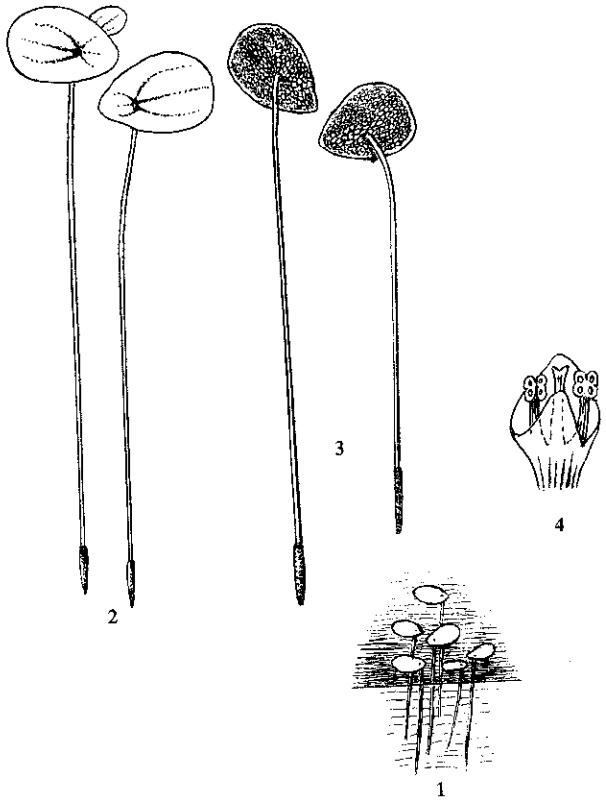

Figure 35. *Lemna minor* L.
1. habit; *2.* adaxial view of fronds; *3.* abaxial view of fronds; *4.* spathe and flower. (drawn by H. P. Yu)

Distribution: Widely distributed in China; tropical to temperate regions.
Ecology: Ponds, paddy fields and ditches.
Uses: Animal food.

3. Spirodela Schleid. 紫萍屬

Small aquatic herbs, free floating. Fronds flat or sometimes convex (gibbous) on abaxial surface, 1–10 cohering together, each with 5–21 roots, green and shining adaxially, often red abaxially, margin entire, with 2 lateral pouches at base, reproducing daughter fronds and flower; veins (5–)7–21, leaving from node towards apex, sometimes visible on upper surface. Daughter fronds connected to mother frond by thin white stipe. Flowers minute, male and female separate but within same small membranous spathe: stamens 2, anthers 4-celled; ovary 1-locular, 2-ovuled. Fruit globular, winged.

Two to four species distributed nearly worldwide; one species in China and Hong Kong

1. Spirodela polyrhiza (L.) Schleid. 紫萍 **(Fig. 36; Photo 78)**
Linnaea 13: 392. 1839; FRPS 13(2): 207, pl. 42: 1. 1979; FGD 4: 409, fig. 249: 1–3. 2000; FOC 23: 80. 2010.

Lemna polyrhiza L., Sp. Pl. 970. 1753; FKH 290. 1912.

Small free floating herb, often forming a complete green carpet on water. Fronds flat or rarely gibbous, obovate to circular, 3–8(–10) × 4–6 mm, each with 5–21 roots, adaxial surface green, sometimes with indistinct papillae along veins, abaxial surface usually purplish, or sometimes green, palmately 5–11-veined. Daughter fronds connected to mother frond by thin white stipe. Flowers minute, male and female separate but within same spathe. Fruit laterally winged towards top.

Locality: New Territories. *Y. W. Lam 1339, 1751.*

Distribution: Widely distributed in China; tropical and temperate regions.

Ecology: Ponds, paddy fields and ditches.

Uses: Animal food, medicinal (folklore).

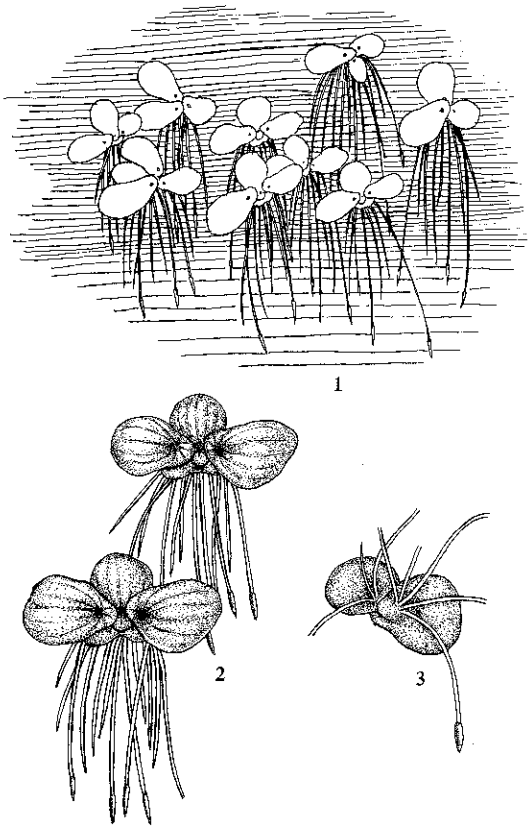

Figure 36. *Spirodela polyrhiza* (L.) Schleid.
1. habit; *2.* adaxial view of fronds; *3.* abaxial view of fronds. (drawn by Y. X. Liu)

347. XYRIDACEAE 黃眼草科

HU Qi-ming 胡啟明

Herbs perennial or sometimes annual. Leaves normally arising in tufts from the top of the rootstock, distichous and equitant, narrow and erect, sheathing at base. Flowers bisexual, in terminal heads or dense spikes; bracts conspicuous, spirally imbricate or decussate, persistent or sometimes caducous. Sepals 3, ± zygomorphic (sometimes the median one much larger, or reduced or absent). Corolla actinomorphic or rarely zygomorphic, usually ephemeral; petals 3, yellow, less often white or blue, free, base clawed or sometimes connate, or forming a long tube. Stamens 3, either all bearing anthers or 2 barren and petal-like; filaments short, adnate and opposite to petals, rarely free; anthers 2-celled, dehiscing longitudinally. Ovary superior; style filiform, apex 3-branched or simple. Capsule oblong, 3-valved, loculicidal.

About five genera and 300 species widely distributed in tropical and subtropical regions; one genus and six species in China; one genus and three species in Hong Kong.

1. Xyris L. 黃眼草屬

Rush-like herbs, perennial or rarely annual. Leaves equitant, radical or nearly so, sheathing at base; leaf blade linear to ensiform, smooth, papillose, rugose, or scaberulose. Flowers yellow, in terminal heads; peduncle scape-like, terete to compressed, sometimes winged or ribbed; bracts leathery, imbricate, basal ones usually smaller and sterile, median ones larger and each enveloping a flower, apex emarginate, rounded, or acute, margin scarious, entire, ciliate, fimbriate, or lacerate. Sepals 3, lateral 2-keeled and compressed, entire, dentate, or ciliate, wings membranous; the median one broader and more petal-like, enveloping corolla or sometimes ± reduced or obsolete. Petals 3, free, limb obovate, narrowly clawed. Stamens usually 3, fertile; filaments flattened; anthers basifixed, extrorse, dehiscing by vertical slits. Staminodia 3 or rarely absent, alternate with petals, often clawed, 2-cleft or 2-brachiate and branches with

penicillate hairs. Ovary usually sessile, 1 or 3-locular or imperfectly 3-locular. Style filiform, apex 3-branched; stigmas usually U-shaped. Seeds obovoid to ellipsoidal, longitudinally striate, apex usually apiculate.

About 280 species mainly in tropical and subtropical America, some species in Africa, Asia, and Australia; six species in China; three species in Hong Kong.

1a. Leaf blade usually 3–6 mm wide, peduncle conspicuously furrowed; head 1–1.5 cm in diam. ..... 1. *X. indica*
1b. Leaf blade 1.5–3.5 mm wide; peduncle not conspicuously furrowed; head 3–10 mm in diam.
2a. Median bracts rounded and ± erose at apex ..... 2. *X. bancana*
2b. Bracts entire, apex mucronate ..... 3. *X. pauciflora*

1. Xyris indica L. 黃眼草 **(Fig. 37)**

Sp. Pl. 1: 42. 1753; FKH 282. 1912; van Royen, Fl. Males., ser. 1, 4: 373. 1953; Hansen, Fl. Camb., Laos, Vietnam 20: 157. 1983; FRPS 13(3): 13, pl. 4: 1–5. 1997; FOC 24: 4. 2000; FGD 6: 332, fig. 189. 2005.

Perennial, robust herb, 25–70 cm tall. Leaves linear-ensiform, 20–50(–70) cm × (2.5–)3–6(–8) mm, apex acute to obtuse, glabrous, veins indistinct when dry, with many short, prominent, transverse ribs connecting longitudinal veins; sheath 7–20(–30) cm. Peduncle (15–)30–80 cm, with prominent furrows. Head ovoid to subglobose, 1–1.5 × 0.8–1.5 cm. Median bracts suborbicular, obovate, or conchiform, 5–8 × 5–7 mm, minutely papillate in the upper third, margin gold-coloured, membranous, apex entire or emarginate. Lateral sepals linear-spatulate, 5–7 × 0.8–1.4 mm, crest denticulate, apex obtuse; median sepal cap-shaped, 4–6 × 2–2.5 mm. Petals yellowish to yellow; limb obovate to suborbicular, 3–4.5 × 3–4 mm, margin serrulate; claw 3.5–5 × ca. 0.5 mm. Stamens ca. 4 mm. Staminodia 2–3 mm. Ovary obovoid, 1-locular. Capsule globose to obovoid, 3–4 mm.

Locality: Fanling. *W. J. Tutcher 8392.*

Distribution: Hainan, Guangdong, Fujian; Indochina, Malaysia, Thailand, India, Sri Lanka, Philippines, Australia.

Ecology: Inundated paddy fields, wet places. Flowering: Sep.–Nov.; fruiting: Oct.–Dec.

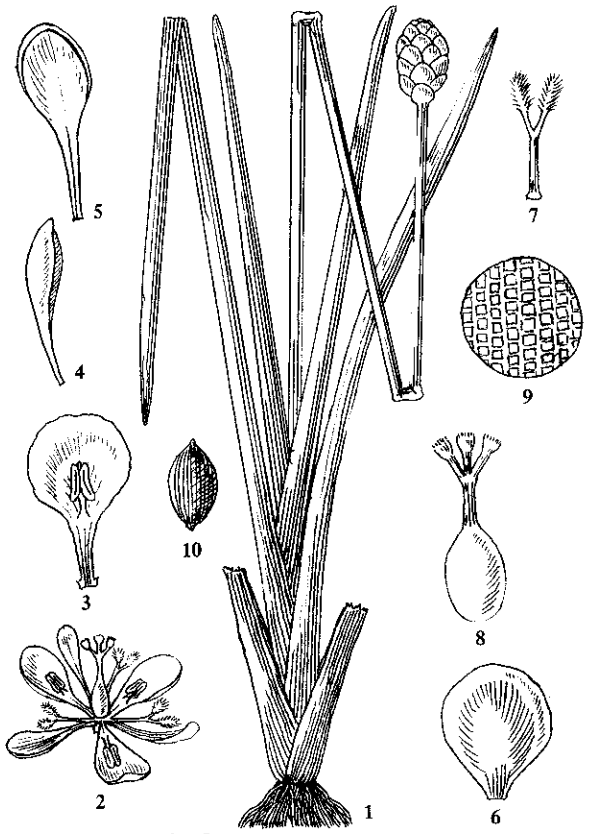

Figure 37. *Xyris indica* L.
1. plant; *2.* flower; *3.* petal and stamen; *4.* lateral sepal; *5.* median sepal; *6.* bract; *7.* staminode; *8.* pistil; *9.* leaf blade (enlarged) (showing transverse ribs); *10.* seed. (drawn by H. P. Yu)

2. Xyris bancana Miq. 中國黃眼草

Fl. Ned. Ind., Eerste Bijv. 608. 1861; FKH 282. 1912, *excl. syn. X. schoenoides*; van Royen, Fl. Males., ser. 1, 4: 369. 1953; Hansen, Fl. Camb., Laos, Vietnam 20: 156. 1983; FOC 24: 5. 2000; FGD 6: 333. 2005.

Xyris chinensis Malme, Svensk Bot. Tidskr. 21: 386. 1927; FRPS 13(3): 17. 1997.

Xyris schoenoides auct. non Mart.: FHK 379. 1861.

Tufted herb, 30–50 cm tall. Leaf blade narrowly ensiform-linear, 8–12(–20) cm × 1.5–2 mm, apex acute, smooth or minutely and transversely rugulose; sheath 2–4 cm. Peduncle 15–40(–50) cm, slender, subterete, smooth, basally subtended by a sheath. Head ellipsoidal, 5–12 × 5–8 mm. Basal bracts oblong-ovate, ca. 4 mm, indistinctly keeled, apex rounded and usually emarginate; median bracts obovate, ca. 5 × 3.5 mm, conchiform, not keeled, apex rounded and ± erose, with a papillate triangle in the upper half. Lateral sepals free, subequilateral, linear to narrowly obovate, curved, 4.5–5 mm, less than 1 mm wide, margin ± erose, keel narrow and entire at base and apex but central portion slightly wider and denticulate.

Locality: Kowloon Peak, Shing Mun, Tai Lam Chung. *L. Gibbs 7768; Y. S. Lau 3088; HK sheet 7651.*

Distribution: Guangdong; Indochina, Thailand, Malaysia, Indonesia, New Guinea.

Ecology: Swamps and other wet places. Flowering: Aug.–Sep.

Notes: The species was reported as *Xyris capensis* Thunb. var. *schoenoides* (Mart.) Nilsson previously (Check List HK Plants 302. 2002; 106. 2004).

3. Xyris pauciflora Willd. 蕙草 **(Photo 79)**

Phytographia. 1: 2. 1794; FHK 379. 1861; FKH 282. 1912; van Royen, Fl. Males., ser. 1, 4: 371. 1953; Hansen, Fl. Camb., Laos, Vietnam 20: 160. 1983; FRPS 13(3): 18, pl. 4: 6–9. 1997; FOC 24: 5. 2000; FGD 6: 334, fig. 190. 2005.

Tufted herb, 14–50 cm tall. Leaves linear-lanceolate, striate when dry, 8–22 cm × 1–3 mm, apex acute to acuminate, sparsely papillose on the margin and between the longitudinal veins on both surfaces; sheath 1–5 cm. Peduncle 5–35 cm, subterete. Head globose

to ovoid, usually less than 1 cm in diam. Basal bracts elliptic, papillose along apical 1/2 of midvein, apex emarginate to obtuse; median bracts suborbicular to broadly obovate, 3–5 × 3–4 mm, with a papillate triangular patch in the upper third, margin membranous, mucronate at the top. Lateral sepals boat-shaped, 3.5–4.5 × ca. 1.5 mm, membranous, keel narrow, coarsely serrulate, apex subacute; median sepal cap-shaped, ca. 3.5 mm. Petals yellow; limb obovate, 2.5–3.5 mm; claw 3–4 mm. Stamens 0.9–1.3 mm. Staminodes 2-brachiate, shorter than stamens. Ovary obovoid. Style 1.2–2 mm; stigma capitate. Capsule ovoid to ellipsoidal, 4–5 mm.

Locality: Lan Nai Wan, Tai Po, Fanling, Sheung Shui, Sai Kung, Lantau Island. *Y. S. Lau 1438; Y. W. Lam 1263, 1782.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Jiangxi, Fujian, Taiwan; Indochina, Thailand, Bhutan, Nepal, India, Sri Lanka, Malaysia, Philippines, New Guinea, Australia.

Ecology: Ravines damp sandy soils, swamps. Flowering: Sep.–Nov.; fruiting: Oct.–Dec.

349. COMMELINACEAE 鴨跖草科

HU Qi-ming 胡啟明

Annual or perennial herbs, often creeping at the base. Leaves alternate, distichous or spirally arranged, parallel-veined, with sheathing petioles. Inflorescence usually of cincinni in panicles or solitary, sometimes shortened into heads, terminal or issuing from the leaf sheath. Flowers bisexual, rarely unisexual, usually slightly irregular. Sepals 3, free or connate only at base, often boat-shaped or carinate, sometimes galeate at apex. Petals (2–)3, usually blue purple, or white, free, sometimes connate and tubular at middle and free at 2 ends (*Cyanotis*). Stamens 6, free, all or only 2–3 fertile; filaments glabrous or torulose villous; anthers parallel or slightly divergent, longitudinally dehiscent, rarely dehiscent by apical pores. Ovary 3-locular, or reduced to 2-locular, with 1, 2, or more ovules in each locule; style simple, with an entire or 3-lobed stigma. Fruit a capsule, rarely baccate and indehiscent. Seeds peltate or angular, the testa usually wrinkled.

About 40 genera and 650 species distributed in tropical, subtropical and temperate regions; 15 genera (two introduced) and 59 species (12 endemic, three introduced) in China; seven genera and 21 species in Hong Kong.

1a. Inflorescence capitate, borne at each node of middle part of stem, penetrating leaf sheath ..... 1. *Amischotolype*
1b. Inflorescence not as above.
2a. Inflorescence terminal; fruit baccate, indehiscent ..... 2. *Pollia*
2b. Inflorescence terminal or not, fruit capsular.
3a. Fertile stamens 6.
4a. Flowers in terminal, broom-like panicle; ovary and capsule 2-celled ..... 3. *Floscopa*
4b. Flowers in helicoid cymes (cincinni), subtended by spathe-like involucral bracts; ovary and capsule 3-celled.
5a. Petals connate in middle, free at both ends; bracts imbricate, in 2 rows ..... 4. *Cyanotis*
5b. Petals wholly free; bracts not in 2 rows ..... 5. *Tradescantia*
3b. Fertile stamens 3.
6a. Flowers few, subtended by spathe-like involucral bracts; capsule usually 2-valved ..... 6. *Commelina*
6b. Flowers in panicles; bracts small, not spathe-like; capsule 3-valved ..... 7. *Murdannia*

1. Amischotolype Hassk. 穿鞘花屬

Perennial herbs, rhizomatous; stems erect or creeping at the base. Leaves alternate, petiolate. Flowers in sessile heads, each consisting of several cymes, borne at each node of middle part of stem, penetrating leaf sheaths. Sepals free, carinate, herbaceous. Petals free, purplish, oblong or obovate-orbicular. Stamens 6, all fertile, subequal; filaments torulose villous; anther-cells parallel, ovoid, longitudinally dehiscent. Ovary 3-locular; ovules 2 per locule, sometimes 1 in posterior locule. Capsule 3-valved, globose or ovoid, trigonous. Seeds (1–)2 per valve, cylindrical, trigonous, rugose, reticulate.

About 20 species in tropical Africa and Asia; two species in China; one species in Hong Kong.

1. Amischotolype hispida (Less. & A. Rich.) D. Y. Hong 穿鞘花 **(Fig. 38; Photo 80)**

Acta Phytotax. Sin. 12: 461. 1974; FHN 4: 80, fig. 997. 1977; FRPS 13(3): 71, pl. 19: 1–3. 1997; FOC 24: 23. 2000; FGD 6: 314, fig. 178. 2005.

Forrestia hispida Less. & A. Rich., Voy. Astrolabe 2: t. 1. 1834.

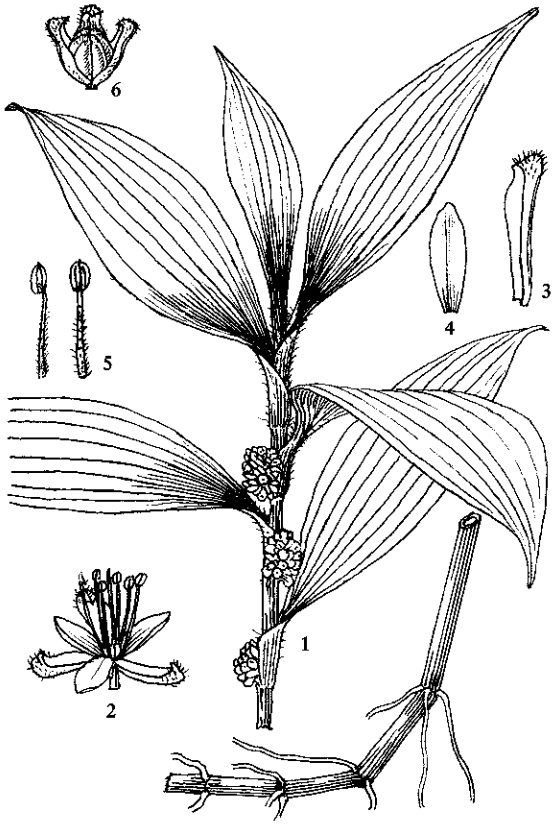

Figure 38. *Amischotolype hispida* (Less. & A. Rich.) D. Y. Hong
1. plant; *2.* flower; *3.* sepal; *4.* petal; *5.* stamens; *6.* capsule. (drawn by H. P. Yu)

Forrestia chinensis N. E. Br., J. Linn. Soc. Bot. 36: 158. 1903; FKH 284. 1912.

Perennial herb, up to 1 m tall; stems erect, creeping at the base, glabrous. Leaves borne on the upper part of stem; leaf sheaths to 4 cm, densely brownish yellow hirsute; leaf blade elliptic, 15–50 × 5–10.5 cm, base long-attenuate into a winged petiole, apex acuminate, brownish yellow hirsute near margin on both surfaces and below middle of abaxial major veins. Heads 2–3 cm in diam., with 20 or more flowers. Sepals green, obovate, 5–13 mm, abaxially densely brown hirsute along midvein, rarely subglabrous, elsewhere glabrous or very sparsely hairy. Petals white, lanceolate, 4–10 mm, apex obtuse, glabrous. Stamens 6, ca. 12 mm; filaments bearded. Capsule ovoid-globose, trigonous, ca. 7 mm, much shorter than persistent sepals, sparsely hirsutulous near obtuse apex. Seeds ca. 3 × 2 mm, rugose.

Locality: Ng Tung Chai, Kap Lung, Mau Ping. *Y. S. Lau 3023; Y. W. Lam 979.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Fujian, Taiwan; Japan, Indochina, Thailand, Malaysia, Philippines, Indonesia, New Guinea.

Ecology: Streamsides, forests. Flowering: Jul.–Aug.; fruiting: Sep.–Dec.

2. Pollia Thunb. 杜若屬

Perennial herbs, with horizontal rhizomes; stems erect or creeping at the base. Leaves large, alternate. Flowers actinomorphic, in terminal panicles; involucral bracts nearly leaf-like, borne on peduncles; bracts small. Sepals free, shallowly boat-shaped, often enlarging and persistent in fruits. Petals free, white, blue, purple, or greenish yellow, sometimes spotted, ovate-elliptic, ovate-orbicular, or obovate, sometimes clawed. Stamens 6, all fertile, equal or 3 smaller, or only anterior 3 fertile; filaments glabrous; anther-cells oblong, longitudinally dehiscent; antherodes deltoid-lanceolate or sagittate. Ovary 3-locular; ovules (1–)5–10 per locule. Fruits baccate, globose, 3-valved, indehiscent. Seeds (1–)5–8 per valve, purplish grey, polygonal, slightly flattened.

About 17 species in tropical, subtropical, and warm-temperate regions of the E hemisphere; eight species (one endemic) in China; two species in Hong Kong.

1a. Leaves sessile, densely puberulent abaxially ..... 1. *P. secundiflora*
1b. Leaves glabrous or nearly so abaxially; petioles 2–4 cm ..... 2. *P. siamensis*

1. Pollia secundiflora (Blume) Bakh. f. 長花枝杜若(杜若)
Bekn. Fl. Java. 10 (Fam. 211): 10. 1949; FRPS 13(3): 89, pl. 24: 2–3. 1997; FOC 24: 34. 2000; FGD 6: 316. 2005.

Commelina secundiflora Blume, Enum. Pl. Javae 1: 3. 1827.

Aclisia sorzogonensis E. Mey., Reliq. Haenk. 1: 138, pl. 25. 1827.

Pollia sorzogonensis (E. Mey. ex Presl) Endl., Gen. Pl. 1029. 1836; FHK 377. 1861; FKH 284. 1912.

Perennial herb, 1–2 m tall, with slender and long horizontal rhizomes. Stems erect, sparsely white pubescent. Leaves sessile; leaf sheath ca. 2.5 cm, densely pubescent; leaf blade broadly ovate-lanceolate or oblong, 10–15 × 3–8 cm, base attenuate, apex acuminate, verrucose adaxially, densely puberulent abaxially. Panicle with 3–4 branches, with peduncle to more than 20 cm, densely brown-yellow hooked hirsute; involucral bracts leaf-like, nearly as large as leaves, distal ones much smaller, to 5 mm, densely brown-yellow hirsute; bracts membranous. Sepals nearly orbicular, boat-shaped, ca. 3 mm, glabrous, persistent. Petals white, obovate, shallowly boat-shaped, ca. 5 mm. Stamens 6; fertile stamens 3, anterior; staminodes 3, with shorter filaments. Fruit globose, ca. 6 mm in diam.

Locality: Victoria Peak, Cape D'Aguilar, Causeway Bay. *C. Wright 545* (K), *H. F. Hance 1035* (BM).

Distribution: Hainan, Guangdong, Guangxi, Hunan, Guizhou, Yunnan; Indochina, Thailand, Myanmar, India, Malaysia, Indonesia.

Ecology: Forests. Flowering: Apr.

Figure 39. *Pollia siamensis* (Craib) Faden ex D. Y. Hong
1. fruiting branch; *2*. flower. (drawn by H. P. Yu)

2. Pollia siamensis (Craib) Faden ex D. Y. Hong 長柄杜若 **(Fig. 39; Photos 81–82)**
FRPS 13(3): 89, pl. 24: 4. 1997; FOC 24: 34. 2000; FGD 6: 316, fig. 180. 2005.

Perennial herb, 30–100 cm tall, with slender and long horizontal rhizomes; stems erect or ascending, glabrous or nearly so. Leaves alternate; leaf sheath 2–4 cm, glabrous or sparsely puberulent; leaf blade elliptic to narrowly ovate, 10–25 × 2.5–8 cm, base narrowed

into a petiole of 2–4 cm, apex acuminate, glabrous or subglabrous adaxially on both surfaces. Panicle 5–10 cm including the peduncle, densely glandular pubescent; involucral bracts leaf-like, but much smaller than leaves, densely glandular pubescent; bracts membranous, often persistent. Sepals ovate-orbicular, boat-shaped, ca. 3 mm, glabrous. Petals white, ovate-elliptic, shallowly boat-shaped, ca. 4 mm. Stamens 6; fertile stamens 3, anterior; staminodes 3, with shorter filaments. Fruit globose, ca. 5 mm in diam.

Locality: Hong Kong Island, Ng Tung Chai. *Y. S. Lau 2432; HK sheet 38314.*

Distribution: Hainan, Guangxi, S Yunnan; Indochina, Thailand, Philippines, Indonesia, New Guinea.

Ecology: Forests. Flowering: Apr.–Aug.

3. Floscopa Lour. 聚花草屬

Perennial herbs, with long rhizomes; stems erect or ascending, usually creeping at the base. Leaves alternate. Flowers nearly regular, in terminal panicles; bracts often small. Sepals free, shallowly to strongly boat-shaped, leathery, persistent. Petals free, blue or purple, sometimes white, obovate, clawed. Stamens 6, equal, all fertile; filaments glabrous; anther-cells connate, slightly divergent proximally, ellipsoidal, longitudinally dehiscent. Ovary constricted at the base or stalked, 2-locular, with 1 ovule in each locule. Capsule flattened, didymous, 2-valved. Seeds 1 per valve, hemispheric, reticulate or striate.

About 20 species distributed in tropical and subtropical regions of the world; two species (one endemic) in China; one species in Hong Kong.

1. Floscopa scandens Lour. 聚花草 **(Fig. 40; Photo 83)**

Fl. Cochinch. 1: 193. 1790; FKH 284. 1912; FHN 4: 69, fig. 991. 1977; FRPS 13(3): 81. 1997; FOC 24: 25. 2000; FGD 6: 317, fig. 181. 2005.

Floscopa paniculata Hassk., Pl. Jungh. 151. 1852; FHK 377. 1861.

Perennial herb, 20–70 cm tall; stems simple, usually glabrous, creeping at the base. Leaves sessile or with short, winged petiole; leaf sheath hairy or only with hairs on 1 side, margin fringed with long hairs, at least at the top; leaf blade elliptic to ovate-lanceolate, 4–12 × 1–3 cm, scabrous adaxially; covered with multicellular hairs near the base abaxially. Panicle terminal, to 8 × 4 cm, densely glandular with long hairs; peduncle nearly absent; pedicels very short. Sepals shallowly boat-shaped. Petals blue or purple. Fertile stamens 6; filaments glabrous. Capsule ovoid, compressed, ca. 2 × 2 mm. Seeds grey-blue, semi-ellipsoidal, ca. 1.5 mm, shallowly radiate striate.

Locality: Hong Kong Island, Tai Mo Shan, Lam Tsuen, Fanling, Sai Kung, Tai Mong Tsai, Yung Shue O, Lantau Island. *Y. S. Lau 2642; Y. W. Lam 454, 1378.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Xizang, Sichuan, Hunan, Jiangxi, Fujian; Vietnam, Laos, Thailand, Myanmar, Sikkim, Bhutan, India, Oceania.

Ecology: Forests, wet places in ravines. Flowering & fruiting: Jul.–Nov.

Uses: Medicinal (folklore).

Figure 40. *Floscopa scandens* Lour.
1. plant; *2.* flower; *3.* capsule; *4.* seeds. (drawn by H. P. Yu)

4. Cyanotis D. Don 藍耳草屬

Annual or perennial herbs, creeping or ascending, without rhizomes. Leaves alternate. Flowers regular, in short dense spike-like cincinnus or clusters, either sessile, within the leaf sheath, or pedunculate and surrounded by imbricate falcate bracts. Sepals free or connate only at base. Petals connate and tubular in middle, free at both ends, purple, blue, or white, linear-lanceolate. Stamens 6, all fertile, equal; filaments lanate, rarely glabrous; anther-cells longitudinally dehiscent. Ovary 3-locular, 2 ovules in each locule. Capsule 3-valved. Seeds 1–2 per valve, cylindrical or quadrangular, reticulate or pitted.

About 50 species distributed in tropical and subtropical Africa and Asia to N Australia; five species in China; three species in Hong Kong.

1a. Inflorescence 3–6-flowered, within the leaf sheath ..... 1. *C. axillaris*
1b. Inflorescence with more flowers, surrounded by spathe-like bracts.
2a. Plants with globose bulbs; leaves all cauline ..... 2. *C. vaga*
2b. Plants not bulbiferous, with fibrous roots and rosulate basal leaves ..... 3. *C. arachnoidea*

1. Cyanotis axillaris (L.) D. Don ex Sweet 鞘苞花 **(Fig. 41)**
Hort. Brit. 430. 1826; FHK 378. 1861; FKH 284. 1912; FOC 24: 23. 2000.

Commelina axillaris L., Sp. Pl. 1: 42. 1753.

Amischophacelus axillaris (L.) R. S. Rao & Kammathy, J. Linn. Soc. Bot. 59: 379. 1966; FRPS 13(3): 120, pl. 30: 6–9. 1997; FGD 6: 323. 2005; Check List HK Plants 302. 2002; 107. 2004.

Annual herb, 30–40 cm tall, with roots fibrous; stems with long creeping branches. Leaves all cauline, linear or linear-lanceolate, (2–)5–10 cm × 5–8 mm, abaxially glabrous or sparsely pubescent. Flowers 2–3 together, nearly sessile within the short loose leaf sheath. Sepals linear-spatulate, 6–9 mm, divided nearly to the base, hirsute on abaxial surface. Petals ovate, deep blue, ca. 12 mm. Filaments thickened above a dense tuft of articulate hairs. Capsule oblong, trigonous, 4–5 mm, hispid at apex, with 6 horned projections. Seeds grey-black or grey-brown, pitted.

Locality: Tai Au Mun. *Y. S. Lau 2597.*

Distribution: Hainan, Guangxi; Indochina, Myanmar, Thailand, India, Sri Lanka, Malaysia, Indonesia, Philippines.

Ecology: Moist sandy lowlands. Flowering: Spring and autumn.

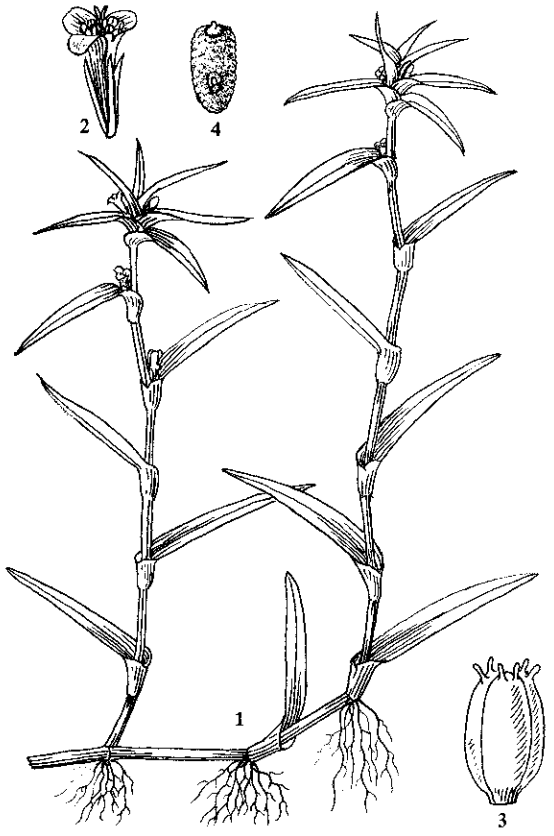

Figure 41. *Cyanotis axillaris* (L.) D. Don ex Sweet
1. portion of plant; *2.* flower; *3.* capsule; *4.* seed. (drawn by H. P. Yu)

2. Cyanotis vaga (Lour.) Schultes & J. H. Schultes
藍耳草 **(Fig. 42; Photo 84)**
Syst. Veg. 7: 1153. 1830; FRPS 13(3): 122, pl. 30: 1–2. 1997; FOC 24: 22. 2000; FGD 6: 319. 2005.

Tradescantia vaga Lour., Fl. Cochinch. 1: 193. 1790.

Cyanotis barbata D. Don, Prodr. Fl. Nepal. 45. 1825; FKH 284. 1912.

Cyanotis fasciculata auct. non Roem. & Schult.: FHK 378. 1861.

Cyanotis kewensis auct. non C. B. Clarke: FKH 284. 1912.

Perennial herb, with globose bulbs, ± white woolly or glabrescent; stems ascending, 10–60 cm tall. Leaves all cauline, linear to lanceolate, 5–15 cm × 3–15 mm. Flowers in small clusters, 2–3 together, unequally pedunculate or nearly sessile, terminal or in the upper axils, and each cluster surrounded by 8–10 lanceolate much calcite imbricate bracts; proximal bracts 8–12 mm. Sepals connate at base, oblong-lanceolate, ca. 5 mm, abaxially white hirsute. Petals purple or blue-purple, 6–8 mm. Filaments woolly below the anthers. Capsule obovoid, trigonous, ca. 2.5 mm, hirsutulous at apex. Seeds grey-brown, striate and finely reticulate.

Locality: Hong Kong Island, Lantau Island. *H. C. Tang 1987; Y. W. Lam 924.*

Distribution: Hainan, Guangdong, Guizhou, Yunnan, Xizang, Sichuan, Taiwan; Vietnam, Laos, Myanmar, Thailand, Bhutan, Nepal, India.

Ecology: Thin forests, grassy slopes. Flowering: Jul.–Sep.; fruiting: Oct.

Figure 42. *Cyanotis vaga* (Lour.) Schultes & J. H. Schultes
1. plant; *2.* corolla and stamens. (drawn by H. P. Yu)

3. Cyanotis arachnoidea C. B. Clarke 蛛絲毛藍耳草 **(Photo 85)**
Monogr. Phan. 3: 250. 1881; FRSP 13(3): 122, pl. 30: 10. 1997; FOC 24: 22. 2000; FGD 6: 318. 2005.

Perennial herb, with fibrous roots; main stem strongly abbreviated and amply branched; branches diffuse, 20–80 cm. Leaves on the main stem rosulate, linear, 8–20(–30) × 0.5–1.5 cm; leaves on fertile branches much shorter, 5–7 cm, abaxially rather densely arachnoid. Flowers in terminal and axillary heads, sessile or on peduncle to

4 cm; bracts 7–8 mm. Sepals connate at base, linear-lanceolate, ca. 5 mm, abaxially arachnoid. Petals blue-purple, blue, or white, ca. 6 mm. Filaments blue arachnoid. Capsule broadly oblong, trigonous, ca. 2.5 mm, densely hirsutulous at apex. Seeds grey-brown, pitted.

Locality: Hong Kong Island, Ma On Shan, Lantau Island. *P. S. Choi 254; Y. W. Lam 924.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Jiangxi, Fujian, Taiwan; Vietnam, Laos, Myanmar, Thailand, India, Sri Lanka.

Ecology: Ravines, humid rocks. Flowering: Jun.–Sep.; fruiting: Oct.

Uses: Medicinal (folklore).

5. Tradescantia L. 紫萬年青屬

Perennial herbs, without rhizomes; stems usually ascending from the decumbent base, rarely erect. Leaves alternate or spirally arranged, sheathing at nodes. Flowers regular, in pseudoterminal or lateral clusters, rarely solitary; flower-clusters sessile, or forming a panicle; involucral bracts mostly spathe-like; bracts filiform. Sepals 3, free or connate at base, boat-shaped. Petals 3, free or with claws fused at base. Stamens 6, all fertile, subequal or antepetalous 3 shorter; filaments glabrous or bearded; anther-cells ellipsoidal or oblong, longitudinally dehiscent. Ovary 3-locular; with 2 ovules in each locule. Fruit an ovoid capsule, 3-valved. Seeds (1–)2 per valve.

About 70 species mainly distributed in tropical America; three species commonly cultivated in Hong Kong.

Another species *Tradescantia fluminensis* Vell. was cultivated previously.

1a. Stems erect; leaves spirally arranged and congested towards apex of stem ..... 1. *T. spathacea*

1b. Stems decumbent or ascending; leaves alternate and evenly distributed on stems.

2a. Leaves ovate-elliptic, with silver-green stripes adaxially ..... 2. *T. zebrina*

2b. Leaves oblong, without stripes ..... 3. *T. pallida*

1. Tradescantia spathacea Sw. 紫背萬年青 (Photo 86)

Prodr. 57. 1788; FFJ 6: 458, fig. 412. 1995; FOC 24: 38. 2000.

Rhoeo discolor (L'Hér.) Hance, Ann. Bot. Syst. 3: 660. 1853; FGZ 653, fig. 346. 1956.

Herb perennial, glabrous, 20–45 cm tall. Stems simple, erect, to 2 cm in diam. Leaves alternate, spirally arranged, sessile, crowded toward apex of stem; leaf blade lanceolate, 15–35 × 2.5–5(–6) cm, somewhat fleshy, base narrowed and into the sheath, apex acuminate, dark green adaxially, purple abaxially. Flowers clusters many-flowered, shortly pedunculate, in axils of leaves and subtended by 2 bracts; bracts ovate, conduplicate, 3–4 cm. Sepals white, 3–6 mm. Petals white, ovate, 5–8 mm, apex abruptly acute. Stamens 6, all fertile; filaments white hairy. Capsule 3-valved.

Locality: Cultivated. *HK sheet 29373.*

Distribution: Native to Caribbean region and C America, widely cultivated in tropical and subtropical regions.

Ecology: Flowering: Autumn to winter.

Uses: Medicinal (folklore).

2. Tradescantia zebrina Heynh. 吊竹梅(水竹草) (Photo 87)

Alph. Aufz. Gew. 735. 1847.

Tradescantia zebrina Bosse, Vollst. Handb. Bl.-gärtn. 4: 655. 1849, *nom. illeg.*; FFJ 6: 457, fig. 411. 1995; FOC 24: 38. 2000.

Zebrina pendula Schnizl., Bot. Zeitung (Berlin) 7: 870. 1849; FGZ 654. 1956.

Perennial herb, ± succulent; stems prostrate or decumbent, branched, rooting at nodes. Leaves alternate, sessile; leaf sheath 8–12 mm, green, with purple longitudinal lines, sparsely villous or glabrescent, mouth fringed with long hairs; leaf blade elliptic-ovate, 3–7 × 1.5–3 cm, base rounded, ± oblique, apex acute or acuminate, adaxially green or purplish, with 2 longitudinal, silver stripes, abaxially purple, glabrous or sparsely pilose at base near the sheath. Flowers in clusters subtended by bracts; bracts 2, leaf-like, 1 larger, ciliate. Sepals lanceolate to oblong-lanceolate, ca. 5 × 1.5 mm. Corolla tube white, ca. 1.2 cm; lobes rose pink, ovate, ca. 6 mm, apex obtuse. Stamens 6, all fertile; filaments covered with purplish blue multicellular hairs. Capsule 3-valved. Seeds rugulose.

Locality: Cultivated. *Y. S. Lau 1724, 1769.*

Distribution: Native to tropical America, cultivated elsewhere.

Ecology: Flowering: Jun.–Aug.

Uses: Ornamental.

3. Tradescantia pallida (Rose) D. R. Hunt 紫鴨跖草 (Photo 88)

Kew Bull. 30: 452. 1975; FFJ 6: 457. 1995.

Setcreasea pallida Rose, Contrib. U. S. Natl. Herb. 13(9): 294. 1911.

Perennial herb, whole plant purple in colour; stems ascending or decumbent, much branched. Leaves alternate, sessile; leaf sheath 1–1.2 cm, not closely clasping the stem; leaf blade lanceolate to oblong-lanceolate, 5–10 × 1.5–3 cm, base narrowed to the sheath, apex acute or acuminate, glabrous, long-ciliate on the narrowed portion of the base. Flower clusters subsessile, terminal on apex of branches, subtended by bracts; bracts 2, leaf-like, conduplicate, one larger up to 6 × 2 cm, glabrous. Sepals 3, free, oblong. Petals 3, purple. Stamens 6, all fertile; filaments covered with moniliform hairs.

Locality: Cultivated.
Distribution: Native to tropical Mexico to Mesoamerica; widely cultivated.
Ecology: Flowering: May–Oct.
Uses: Ornamental.
Notes: The species was reported as *Setcreasea purpurea* B. K. Boom previously (Check List HK Plants 304. 2002; 107. 2004).

6. Commelina L. 鴨跖草屬

Annual or perennial herbs, without rhizomes; stems decumbent or erect. Leaves alternate, sheathing at base. Flowers few, irregular, borne on 2 peduncles and enclosed in a folded involucral bracts; involucral bracts spathe-like, usually pedunculate from a split leaf sheath opposite to the blade. Sepals 3, membranous, inner 2 often connate at base. Petals free, blue, spatulate or orbicular, inner (anterior) 2 larger and clawed, the third differently shaped or more sessile than the 2 others. Fertile stamens 3, on 1 side, 1 larger than the others; filaments glabrous; staminodes 3, with deformed anthers. Ovary 2–3-locular, posterior locule with 1 developed or abortive ovule or empty, anterior 2 locules each with 1–2 ovules. Capsule oblong, globose, or ellipsoidal, 3-valved or most frequently 2-valved. Seeds cylindrical or ellipsoidal, reticulate or sub-smooth.

About 170 species mainly in tropical and subtropical regions; eight species in China; five species in Hong Kong.

1a. Involucral bract cordate, folded, not connate at the base.
  2a. Involucral bract lanceolate; capsule 3-locular, 5-seeded ..... 1. *C. diffusa*
  2b. Involucral bract subcordate; capsule 2-locular, 4-seeded ..... 2. *C. communis*
1b. Involucral bract turbinate, connate at base, open at the top only.
  3a. Leaves ovate to elliptic-ovate, apex obtuse or acute; capsule 3-valved, 5-seeded ..... 3. *C. benghalensis*
  3b. Leaves lanceolate or ovate-lanceolate, apex long-acuminate; capsule 2–3-valved, 3-seeded.
    4a. Involucral bract small, ca. 1 cm, pedunculate, solitary or 2–3 congested; leaves 2–4(–6) cm ..... 4. *C. auriculata*
    4b. Involucral bract larger, 2–2.5 cm, subsessile, 3–8 congested, forming a head; leaves usually over 6 cm ..... 5. *C. paludosa*

1. **Commelina diffusa** Burm. f.

節節草 **(Fig. 43; Photos 89–90)**

Fl. Indica 18, pl. 7, fig. 2. 1768; FFJ 6: 453. 1995; FRPS 13(3): 126. 1997; FOC 24: 36. 2000; FGD 6: 320. 2005.

Commelina salicifolia auct. non Roxb.: FHK 376. 1861.

Commelina nudiflora auct. non L.: FKH 284. 1912.

Annual herb; stems creeping at the base, branching and ascending to 40 cm or more. Leaves subsessile; leaf sheath 0.6–3 cm, with red spots when dry, hispidulous throughout or in a line, ciliate on the edge; leaf blade lanceolate or proximal ones oblong, 3–12 × 0.8–3 cm, base obtuse, apex acuminate or acute, margin scabrous. Involucral bracts ovate-lanceolate, folded, 1–4 cm, glabrous or hispidulous abaxially, base cordate or rounded, apex acuminate or shortly so. Peduncle 2 branched; 1 branch 1.5–2 cm, with 1–4 long-exserted male flowers; the other much shorter, with 3–5 included bisexual flowers; pedicels thick and curved, ca. 3 mm, lengthening to 5 mm in fruit. Sepals 3, unequal, the anterior one lanceolate, ca. 3 × 2 mm, the posterior 2 obovate, ca. 5 × 3 mm, ± connate at the base. Petals blue, 2 longer ones broadly ovate, ca. 4.5 × 6 mm, clawed; the third smaller, ovate, ca. 4 × 4 mm, scarcely clawed. Fertile stamens 3; filaments 5–7 mm. Capsule oblong, trigonous, ca. 5 mm, 3-valved. Seeds black, ovoid-globose, ca. 2 mm, reticulate.

Locality: Common in Hong Kong. *Y. S. Lau 2313; L. T. Lo 525; HK sheet 41520.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Fujian, Taiwan; worldwide in Tropics and Subtropics.

Ecology: Margins of forests, streamsides and other moist places. Flowering & fruiting: May–Nov.

Uses: Medicinal (folklore).

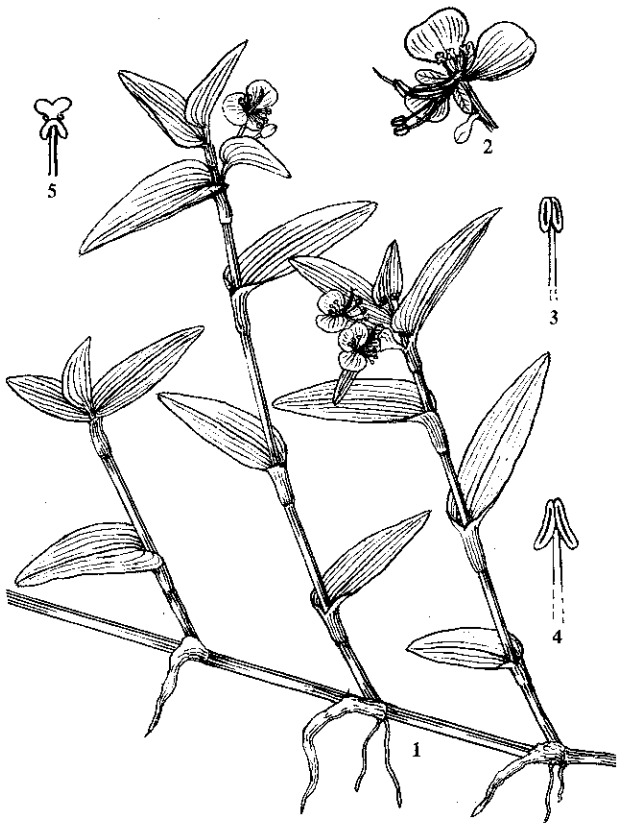

Figure 43. *Commelina diffusa* Burm. f.
1. plant; *2.* flower; *3–4.* stamen; *5.* reduced stamen. (drawn by H. P. Yu)

2. Commelina communis L. 鴨跖草 **(Photo 91)**

Sp. Pl. 1: 40. 1753; FHK 376. 1861; FKH 284. 1912; FFJ 6: 454, fig. 408. 1995; FRPS 13(3): 127, pl. 29: 6–7. 1997; FOC 24: 36. 2000; FGD 6: 321. 2005.

Annual herb; stems much branched, creeping or ascending to 50 cm or more, rooting at nodes, glabrous or puberulent on the upper portion. Leaves sessile or nearly so; leaf sheaths 0.7–1 cm, glabrous, scarcely ciliate; leaf blade lanceolate to ovate-lanceolate, 2.5–7(–9) × 1–2 cm, base obtuse, apex acuminate, glabrous. Involucral bracts cordate, folded, 1.2–2.5 cm, apex acute, base with 1.5–4 cm long stalk, often hirsute-ciliate. Peduncle 2-branched; one branch ca. 8 mm, with 1–2 male flowers, the other branch shorter, with 3–4 bisexual flowers, nearly included in the bract; pedicels ca. 3 mm at anthesis, curved and less than 6 mm in fruit. Sepals 3, green, membranous, the posterior 2 ovate, ca. 4 × 3 mm. Petals 3, the anterior 2 dark blue, ovate, ca. 9 × 8 mm, the posterior one white, ca. 5 mm. Capsule ellipsoidal, 5–7 mm, 2-valved. Seeds 2 per valve, brown-yellow, irregularly pitted, truncate at one end.

Locality: Common in Hong Kong. *Y. S. Lau 2763; Y. W. Lam 414; HK sheet 41587.*

Distribution: Widely distributed in China except for Qinghai, Xinjiang, and Xizang; Russia (Far East), Korea, Japan, Indochina, Thailand.

Ecology: Shaded and humid places. Flowering: Summer to autumn.

Uses: Medicinal (folklore).

3. Commelina benghalensis L.

飯包草 **(Fig. 44; Photos 92–93)**

Sp. Pl. 1: 41. 1753; FHK 376. 1861; FKH 284. 1912; FFJ 6: 455, fig. 409. 1995; FRPS 13(3): 128, pl. 31: 3–4. 1997; FOC 24: 37. 2000; FGD 6: 321. 2005.

Perennial herb; stems much branched, creeping at the base, ascending distally to 70 cm or more, sparsely pubescent. Leaves petiolate; leaf sheaths 0.5–1.5 cm, sparsely hirsute-ciliate; leaf blade ovate to elliptic-ovate, 3–7 × 1.5–4 cm, base rounded and narrowed into a broad petiole, apex obtuse or acute, subglabrous, ciliate on leaf sheath and petiole. Involucral bracts opposite to the upper leaves, solitary, or 2–3 aggregated at apex of branches, sessile or very shortly stalked, funnelform and ± compressed, 1–1.4 cm, sparsely hairy, margins connate, open at the apex only. Peduncle 2-branched; the proximal branch longer than the bract, with 1 male flowers, the distal branch shorter, with 2–3 included, fertile flowers. Sepals 3, green unequal, lanceolate or obovate, ca. 2 mm, glabrous. Petals 3, blue, ovate, 3–5 mm, posterior 2 ± connate, stalked. Capsule ellipsoidal, 4–6 mm, 3-valved. Seeds black, cylindrical or semi-cylindrical, ca. 2 mm, rugose, irregularly reticulate, truncate at one end.

Locality: Tai Wai, Ting Kau, Yuen Long, Nam Sang Wai. *Y. W. Lam 747, 766; HK sheet 39783.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Shaanxi, Hebei, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; tropical and subtropical Africa and Asia.

Ecology: Lowland wet places. Flowering: Summer to autumn.

Uses: Medicinal (folklore).

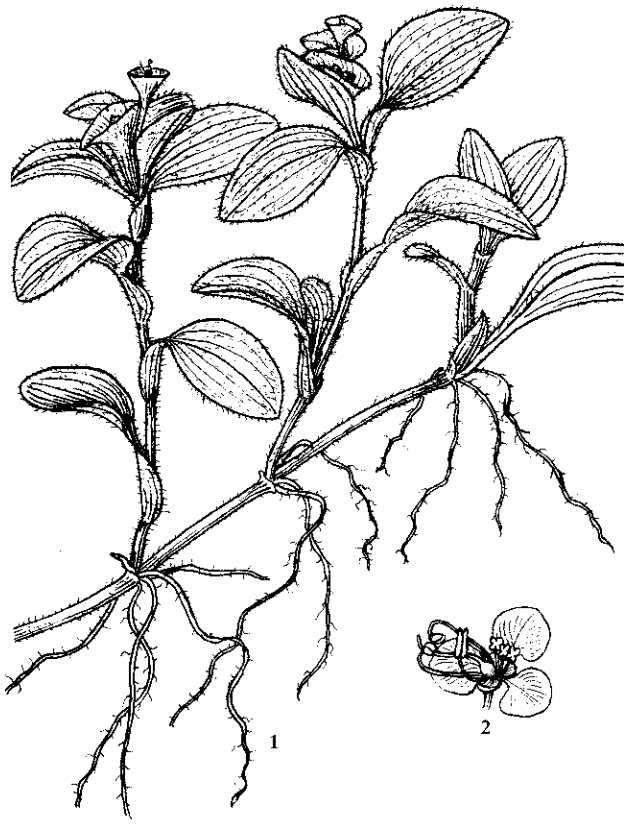

Figure 44. *Commelina benghalensis* L.
1. plant; *2.* flower. (drawn by H. P. Yu)

4. Commelina auriculata Blume 耳苞鴨跖草

Enum. Pl. Javae 1: 2. 1827; FKH 283. 1912; FFJ 6: 455. 1995; FRPS 13(3): 132. 1997; FOC 24: 38. 2000; FGD 6: 321, fig. 183. 2005.

Perennial herb, stems ascending to 1.4 m, glabrous except sparsely hairy in a line distally. Leaf sheaths 0.6–1.8 cm, hairy, fringed with long hairs at mouth; leaf blade elliptic-lanceolate to lanceolate, 2–4(–8) × 1–2 cm, base ± oblique and narrowed into a short (ca. 3 mm) petiole, apex acuminate, adaxially sparsely scabrid, abaxially sometimes pubescent, or glabrous on both surfaces. Involucral bracts opposite to upper leaves, solitary or 2–3 aggregated at apex of branches, with ca. 5 mm long stalk, funnelform, ca. 1 cm, glabrous or slightly white hispid, proximal margins connate, apex acute. Peduncle simple (one branch reduced), with 2–5 small, bisexual flowers. Sepals 3, pale green, lanceolate or obovate, 3–4 mm, apex obtuse, posterior 2 ± connate. Petals 3, blue or with a white one, 2 longer ones ca. 7 mm, the other shorter, ca. 3 mm. Capsule globose, trigonous, ca. 4 mm, 2–3-valved with posterior valve indehiscent. Seeds 1 per valve, grey-brown, ellipsoidal, ca. 3.5 mm, smooth, flat on one surface.

Locality: Yuen Long. *Y. W. Lam 748.*

Distribution: Guangdong, Fujian, Taiwan; Indonesia, W Oceania.

Ecology: Ravines, shaded and humid places. Flowering: Jun.

5. Commelina paludosa Blume 大苞鴨跖草 **(Photos 94–95)**

Enum. Pl. Javae 1: 2. 1827; FFJ 6: 456, fig. 410. 1995; FRPS 13(3): 129, pl. 31: 1–2. 1997; FOC 24: 37. 2000; FGD 6: 322. 2005.

Commelina obliqua Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 45. 1825; FKH 284. 1912.

Perennial herb; stems often erect from the geniculate base to 1 m, simple or sometimes branched distally, glabrous or sparsely hispidulous. Leaves sessile; leaf sheath 2–3.5 cm, hispid in a line on one side, fringed with long hairs at mouth, sometimes either glabrous with only a few hairs at mouth or hirsute throughout; leaf blade lanceolate to ovate-lanceolate, 6–18 × 2–4.5(–7) cm, base attenuate, apex long acuminate, glabrous on both surfaces or adaxially granular hairy and abaxially hirsute. Involucral bracts often 4–10 aggregated at apex of branches, sessile, funnelform, ca. 2 × 1.5–2 cm, proximal margins connate, apex acute or shortly so, glabrescent. Peduncle unbranched, ca. 1.2 cm, with (1–)3–7 flowers nearly included in involucral bracts; pedicels ca. 7 mm, twisted. Sepals 3, pale green, lanceolate, 3–6 mm. Petals 3, blue or sometimes the posterior one white, obovate to spathulate, 5–8 mm. Fertile stamens 3, unequal; filaments glabrous. Capsule ovoid-globose, trigonous, ca. 4 mm, 3-valved. Seeds 1 per valve, dark brown, ellipsoidal, slightly flattened, finely reticulate.

Locality: Fanling, Tai Po, Tai Mo Shan, Shing Mun, Lantau Island. *L. T. Lo 250; K. L. Yip 4089; HK sheet 29280.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, SE Xizang, Sichuan, Hunan, Jiangxi, Fujian, Taiwan; Indochina, Myanmar, Thailand, Bhutan, Nepal, India, Malaysia.

Ecology: Forests, streamsides in ravines. Flowering & fruiting: Jun.–Dec.

Uses: Medicinal (folklore).

7. Murdannia Royle, *nom. cons.* 水竹葉屬

Herbs perennial, rarely annual. Roots fibrous or fusiform thickened. Stems creeping or ascending, sometimes main stem abortive. Leaves alternate and cauline or in a basal rosette. Cincinni solitary or several, forming panicles, shortened into heads, or sometimes reduced to solitary flowers. Flowers regular. Sepals free, shallowly to strongly boat-shaped. Petals free, purple, blue, pink, yellow, or nearly white, orbicular or obovate. Fertile stamens 3 or 2, opposite to sepals; filaments glabrous or hairy; anther cells opening by longitudinal slits; staminodes 3(–4), or absent, opposite to petals; antherodes sagittate or 3-sect. Ovary 3-locular, with 1–7 ovules in each locule. Capsule 3-valved, ovoid, ellipsoidal or globose. Seeds 1–2 per valve, uniseriate, quadrangular, reticulate, pitted, rugose, or verrucose.

About 50 species distributed in tropical and subtropical regions, mainly in Asia; 20 species in China; six species in Hong Kong.

1a. Apex of antherodes sagittate; flowers 1–3-fasciculate in leaf axils ..... 1. *M. triquetra*
1b. Apex of antherodes 3-parted; flowers in terminal panicles.
  2a. Involucral bracts sheath-like ..... 2. *M. vaginata*
  2b. Involucral bracts not sheath-like.
    3a. Main stem well developed; leaves nearly all cauline; seeds deeply pitted ..... 3. *M. nudiflora*
    3b. Main stem abortive, with rosulate basal leaves; seeds radiate-striate or verrucose.
      4a. Roots 2–3 mm thick; cincinni several forming panicles ca. 5 cm ..... 4. *M. simplex*
      4b. Roots fibrous, less than 1 mm thick; cincinni capitate.
        5a. Basal leaves 1.2–1.8 cm wide; cincinni densely capitate; bracts 5–7 mm ..... 5. *M. bracteata*
        5b. Basal leaves 6–9 mm wide; cincinni sub capitate; bracts ca. 4 mm ..... 6. *M. loriformis*

1. Murdannia triquetra (Wall. ex C. B. Clarke) G. Brückn. 水竹葉 **(Fig. 45; Photo 96)**

Nat. Pfl.-Syst. (ed. 2), 15a: 173. 1930; FFJ 6: 460, fig. 414. 1995; FRPS 13(3): 95, pl. 25: 1–3. 1997; FOC 24: 27. 2000; FGD 6: 327, fig. 188. 2005.

Aneilema triquetrum Wall. ex C. B. Clarke, Monogr. Phan. 3: 208. 1881.

Perennial herb, with elongate, horizontal rhizomes and fibrous roots. Stems ascending from the creeping base, to 40 cm, with a line of harsh, white hairs on one side. Leaves sessile; leaf sheath fringed with white hairs; leaf blade linear-lanceolate or linear-elliptic, 1.5–4(–6) cm × 4–6(–8) mm, apex acuminate or obtuse, ciliate only in proximal part. Cincinni terminal and axillary, usually 1-flowered; peduncle 1–4 cm, with linear bract at middle, sometimes with a flower in axil of bract; pedicels 1–2 cm. Sepals narrowly oblong, 4–6 mm. Petals pink, purple-red, or blue-purple, obovate. Fertile stamens 3; filaments bearded; staminodes 3; antherodes sagittate. Capsule ovoid-globose, trigonous, 5–7 × 3–4 mm, obtuse or acute at both ends. Seeds (1–)3 per valve, uniseriate, reddish grey, not flattened.

Locality: Tai Mong Tsai, Lai Chi Wo. *Y. S. Lau 307; HK sheet 39267.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Shaanxi, Henan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian; Vietnam, Laos, Myanmar, Thailand, India.

Ecology: Wet places, watersides. Flowering & fruiting: Aug.–Oct.

Uses: Animal food, medicinal (folklore).

2. Murdannia vaginata (L.) G. Brückn. 細柄水竹葉 **(Photo 97)**

Nat. Pfl.-Syst. (ed. 2), 15a: 173. 1930; FRPS 13(3): 99. 1997; FOC 24: 28. 2000; FGD 6: 329. 2005.

Commelina vaginata L., Mant. Pl. 2: 177. 1771.

Aneilema vaginatum (L.) R. Br., Prodr. 271. 1810; FKH 283. 1912.

Dictyospermum vaginatum (L.) D. Y. Hong, Acta Phytotax. Sin. 12(4): 477. 1974.

Perennial herb, with elongate rhizomes and fibrous roots; stems slender and creeping or slightly robust and ascending, 15–50 cm, branched at base, glabrous or with a line of hairs on one side. Leaves sessile; leaf sheath open, ciliate; leaf blade linear, 4–10(–20) cm × 4–7 mm, glabrous, margin ciliate. Flowers 1–5, fasciculate in sheath-like involucral bracts; peduncle slender, 5–10(–20) cm; involucral bracts 1–3 on each stem, distant, striate; pedicels 1–1.5 cm, with 2 bracteoles at middle, hirsute distally. Sepals lanceolate, ca. 3 mm, initially hairy, glabrescent, persistent. Petals blue, obovate-orbicular. Fertile stamens 2; filaments pubescent; staminodes 3 or 4; antherodes 3-parted. Capsule globose, ca. 3 mm in diam. Seeds 1 per valve, grey-black, reticulate.

Locality: Sha Tin, Sai Kung, Wu Kau Tang, Fanling, Lo Wu, Lantau Island. *Y. S. Lau 2777; Y. W. Lam 893; HK sheet 41814.*

Distribution: Hainan, Guangdong, Guangxi, Jiangsu; Philippines, Vietnam, Thailand, India, Sri Lanka.

Ecology: Sandy beaches. Flowering & fruiting: Jul.–Oct.

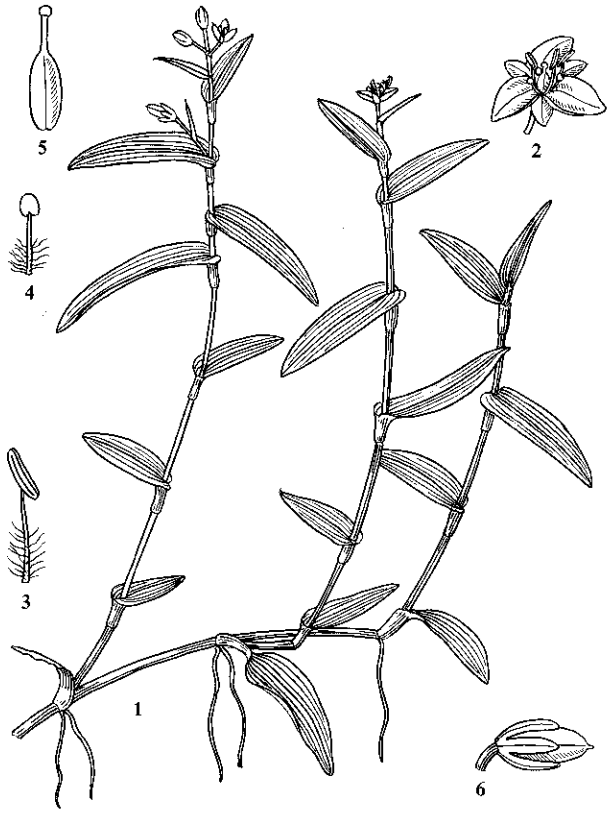

Figure 45. *Murdannia triquetra* (Wall. ex C. B. Clarke) G. Brückn. *1.* plant; *2.* flower; *3.* stamen; *4.* staminode; *5.* pistil; *6.* capsule. (drawn by H. P. Yu)

3. Murdannia nudiflora (L.) Brenan 裸花水竹葉 **(Photo 98)**

Kew Bull. 7: 189. 1952; FFJ 6: 460, fig. 415. 1995; FRPS 13(3): 106, pl. 27: 1–2. 1997; FOC 24: 30. 2000; FGD 6: 330. 2005.

Commelina nudiflora L., Sp. Pl. 1: 41. 1753.

Aneilema nudiflorum (L.) R. Br., Prodr. 271. 1810; FHK 376. 1861; FKH 283. 1912.

Annual herb, without rhizomes; roots fibrous less than 0.3 mm thick; stems in tufts, diffuse or ascending from the creeping base, 10–50 cm, glabrous. Leaves nearly all cauline, sometimes 1–2 basal; leaf sheath mostly less than 10 mm, hirsute throughout, sometimes glabrous except for a hirsute line along mouth slit; leaf blade linear or lanceolate, 2–7(–10) × 0.5–1 cm, glabrous or sparsely hispid on both surfaces, apex obtuse or acuminate. Cincinni several, in terminal panicles, or solitary, with several densely arranged flowers; peduncle slender, to 4 cm; proximal involucral bracts leaf-like but smaller than leaves, distal ones less than 10 mm; bracts caducous; pedicels slender, straight, 3–5 mm. Sepals ovate-elliptic, ca. 3 mm. Petals purple, obovate-orbicular. Fertile stamens 2; filaments bearded proximally; staminodes 2–4; antherodes 3-parted. Capsule ovoid-globose, trigonous, 3–4 mm. Seeds 2 per valve, yellow-brown, deeply pitted, or shallowly pitted and radiate white verrucose.

Locality: Hong Kong Island, Shing Mun, Sai Kung, Lai Chi Chong, Luk Keng, Po Toi Islands. *Y. S. Lau 2357; Y. W. Lam 1065; HK sheet 41521.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Henan, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Fujian; Japan, Philippines, Cambodia, Laos, Myanmar, Bhutan, India, Sri Lanka, Malaysia, Indonesia, New Guinea, Indian Ocean and Pacific islands

Ecology: Shaded and wet places, watersides. Flowering & fruiting: Jun.–Oct.

4. Murdannia simplex (Vahl) Brenan 細竹篙草

Kew Bull. 7: 186. 1952; FRPS 13(3): 110, pl. 27: 5–6. 1997; FOC 24: 31. 2000; FGD 6: 331. 2005.

Commelina simplex Vahl, Enum. Pl. 2: 177. 1806.

Aneilema sinicum Ker Gawl., Bot. Reg. t. 659. 1822; FKH 283. 1912.

Perennial herb, without rhizomes; roots robust, 2–3 mm thick, densely tomentose. Main stem strongly abbreviated, with 2–4 fertile stems arising from the base of main stems, usually erect, sometimes ascending, to 50 cm. Basal leaves rosulate, with sheath hirsute only on one side; leaf blade linear, 15–35 × 0.6–1.5 cm, glabrous. Cauline leaves often 2–3, rarely more, proximal one longer, to 12 cm, distal ones shorter, sometimes only ca. 1 cm, glabrous. Cincinni several, to 2 cm, forming narrow panicles ca. 5 cm; peduncle ca. 1 cm; involucral bracts ovate or ovate-lanceolate, less than 1 cm, membranous, caducous; bracts subequaling sepals, caducous; flowers pendulous in bud, ascending after anthesis; pedicels straight, ca. 5 mm in fruit. Sepals elliptic, 4–5 mm. Petals purple, obovate-orbicular. Fertile stamens 2; filaments bearded; staminodes 3; antherodes 3-parted. Capsule ovoid-globose, trigonous, 4–5 mm. Seeds 2 per valve, brown-black, white radiate verrucose.

Locality: Cape D'Aguilar, Sai Kung, Fanling, Castle Peak, Lantau Island. *S. P. Lau 52; Y. W. Lam 283, 1778.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan; Africa, India to Indonesia.

Ecology: Marshes, wet places. Flowering & fruiting: Apr.–Oct.

5. Murdannia bracteata (C. B. Clarke) Kuntze ex J. K. Morton 大苞水竹葉 **(Photo 99)**

J. Linn. Soc. Bot. 59(380): 472. 1966.

Murdannia bracteata (C. B. Clarke) J. K. Morton ex D. Y. Hong, Acta Phytotax. Sin. 12: 473. 1974; FRPS 13(3): 109. 1997; FOC 24: 30. 2000; FGD 6: 330. 2005.

Aneilema nudiflorum (L.) R. Br. var. *bracteatum* C. B. Clarke, Monogr. Phan. 3: 211. 1881.

Perennial herb, with horizontal rhizomes; roots fibrous, 0.5–1 mm thick, densely tomentose. Main stem strongly abbreviated, with basal rosulate leaves and usually 2 fertile stems arising from the base of main stem, creeping or ascending apically, 20–60 cm; internodes ca. 10 cm, pubescent throughout or only on one side. Basal leaves linear, 20–30 × 1.2–1.8 cm, glabrous on both surfaces or abaxially puberulent, margin ciliate proximally. Cauline leaves ovate-lanceolate or lanceolate, 3–12 × 1–1.5 cm, glabrous or scabrous abaxially; leaf sheath pubescent throughout or only hispid-ciliate at mouth. Cincinni (1–)3–5, densely flowered, capitate; peduncle 2–3 cm; involucral bracts leaf-like but smaller; bracts orbicular, 5–7 mm, caducous; pedicels very short, strongly curved, lengthening to 2–3 mm in fruit. Sepals ovate-elliptic, ca. 4 mm. Petals blue, obovate-orbicular. Fertile stamens 2; filaments pubescent; staminodes 3; antherodes 3-parted. Capsule broadly ellipsoidal, trigonous, ca. 4 mm, Seeds 2 per valve, yellow-brown, radiate striate, white reticulate, not pitted.

Locality: New Territories.

Distribution: Hainan, Guangdong, Guangxi, Yunnan; Vietnam, Laos, Thailand.

Ecology: Ravines, sandy soil by water. Flowering & fruiting: May–Nov.

6. Murdannia loriformis (Hassk.) R. S. Rao & Kammathy 牛軛草 **(Photo 100)**

Bull. Bot. Surv. India 3: 393. 1961; FRPS 13(3): 108, pl. 27: 3–4. 1997; FOC 24: 30. 2000; FGD 6: 330. 2005.

Aneilema loriforme Hassk., Pl. Jungh. 2: 143. 1852.

Aneilema nudiflorum R. Br. var. *rigidior* Benth., FHK 377. 1861.

Aneilema angustifolium N. E. Br., J. Linn. Soc., Bot. 36(251): 151. 1903; FKH 283. 1912.

Perennial herb, without rhizomes; roots fibrous, 0.5–1 mm thick, glabrous or tomentose. Main stem undeveloped, with several fertile stems arising from leaf rosette, diffuse or ascending, 15–50(–100) cm, glabrous or puberulent on one side, very rarely densely hirsute. Basal leaves in rosulate tufts, blade linear, 5–15(–30) cm × 6–9 mm, apex acute, margin ciliate only proximally; cauline leaves smaller, 2.5–8 cm × 4–7 mm, ciliate only on one side of sheath mouth, glabrous elsewhere, very rarely densely hirsutulous. Cincinni terminal, with several densely arranged flowers, solitary or 2–3 forming a subcapitate panicle; proximal involucral bracts leaf-like but smaller, distal ones very small, less than 10 mm; peduncle ca. 2.5 cm; bracts suborbicular, ca. 4 mm, caducous; pedicels slightly curved, 2.5–4 mm in fruit. Sepals ovate-elliptic, 3–4 mm. Petals blue or purple-red, obovate-orbicular. Fertile stamens 2; filaments pubescent; staminodes 3; antherodes 3-parted. Capsule ovoid-globose, trigonous, 3–4 mm. Seeds 2 per valve, yellow-brown, radiate striate, finely white reticulate, neither pitted nor verrucose.

Locality: New Territories. *HK sheet 39300, 39301.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Hunan, Jiangxi, Anhui, Zhejiang, Fujian, Taiwan; Japan, Philippines, Vietnam, Thailand, Sri Lanka, New Guinea.

Ecology: Wet grassy fields, streamsides. Flowering & fruiting: Apr.–Sep.

350. ERIOCAULACEAE 穀精草科

HU Qi-ming 胡啟明

Perennial or annual herbs, growing in wet places or in shallow water. Stem undeveloped, rarely elongate. Leaves alternate, all closely crowded at the base as if in a rosette, narrow and grass-like, parallel-veined, often ± transparent and with transverse minor veins, base sheathing. Inflorescence a dense androgynous head terminating the scape and subtended by an involucre of bracts; scapes thin, twisted and ribbed, base surrounded by a bladeless, tubular sheath. Flowers 2–3-merous, bracteate. Male flowers: sepals 2–3, connate or free; petals 2–3, often inconspicuous; stamens 6. Female flowers: sepals 2–3, free or connate; petals absent to 4, free; ovary (1–)3-locular, with a solitary ovule in each locule; style 1, 1–3-branched. Fruit a capsule, thin, loculicidally dehiscent. Seeds small, contain copious floury endosperm and a small embryo; testa usually reticulate and prickly.

Ten genera and ca. 1150 species distributed mainly in tropical and subtropical regions; one genus and 35 species (13 endemic) in China; one genus and seven species in Hong Kong.

1. Eriocaulon L. 穀精草屬

Aquatic or marsh herbs, perennial or annual. Leaves linear, all radical or crowded on a short stem. Scapes 3–8-ribbed, with 1 sheathing scale or short leaf at the base and a terminal head. Flowers sessile, in unisexual, in androgynous heads, with imbricate bract 1 under each flower, and a few outer ones empty. Male flowers: sepals 2–3, usually connate into an abaxially split tube, rarely free; petals basally connate and funnelform, apex ± 2–3-lobed, usually with a black gland, margin usually ciliate; stamens 4–6, in 2 whorls; anthers 2-celled. Female flowers: sepals 2–3, free or rarely connate at base; petals 3 or absent, margin ciliate, with or without a black gland at apex; ovary 1–3-locular, style single, with 2 or 3 stigmas. Capsule 2–3-valved, dehiscent loculicidally.

About 400 species distributed mainly in tropical and subtropical regions; 35 species in China; seven species in Hong Kong.

1a. Plants with elongate stem or rhizomes.
2a. Plants submerged, with elongate stem; leaves filiform, 0.1–0.2 mm wide ..... 1. *E. setaceum*
2b. Plants not submerged, with elongate rhizomes; leaves 0.6–0.8 mm wide ..... 2. *E. tonkinense*
1b. Plants without elongate stem or rhizomes.
3a. Heads mealy-white; bracts leathery, rigid.
4a. Leaves and scapes villous at lower part; heads very mealy ..... 3. *E. australe*
4b. Leaves and scapes glabrous; head slightly mealy ..... 4. *E. sexangulare*
3b. Head not mealy-white; bracts membranous, soft.
5a. Head blackish when dry ..... 5. *E. nantoense*
5b. Head straw-coloured.
6a. Involucral bracts almost as long as the head; female flowers with petals ..... 6. *E. truncatum*
6b. Involucral bracts at most half as long as the head; female flower without petals ..... 7. *E. cinereum*

1. Eriocaulon setaceum L. 絲葉穀精草

Sp. Pl. 1: 87. 1753; FHK 383. 1861; FKH 292. 1912; FHN 4: 84. 1977; FRPS 13(3): 37, pl. 10: 16–26. 1997; Z. X. Zhang, Diss. Bot. 68. 1999; FOC 24: 11. 2000; FGD 9: 164. 2009.

Annual herb. Stem 1–5(–25) cm; roots many fibrous, tufted. Leaves radical, filiform, 3–5 cm × 0.1–0.2 mm, slightly enlarged at the base, glabrous, transparent, pale yellowish green, with transverse minor veins between parallel-veins under lens. Scapes very slender, 5–11 cm, 6-ribbed, glabrous. Flower-heads dusky, ovoid-globose, ca. 3 mm in diam.; receptacle subglabrous or villous; involucral bracts reflexed, straw-coloured, ovate, ca. 1 mm, membranous, glabrous; floral bracts orbicular to oblanceolate, abaxially white clavate hairy toward apex or glabrous. Male flowers: sepals spathe-like, apex 3-lobed, shortly hairy abaxially; petals 3, elliptic to subulate, small, anterior one slightly larger than others, white clavate hairy adaxially and toward apex abaxially, gland black, sometimes absent; anthers black. Female flowers: sepals 3, free, boat-like to obovate, abaxially white clavate hairy toward margin; petals 3, free, oblanceolate-linear, unequal, membranous, gland black, sometimes absent; ovary 3-locular; style deeply 3-cleft.

Locality: Fanling. *W. J. Tutcher 7210, 11577.*

Distribution: Hainan, Guangdong, Guangxi, Sichuan, Yunnan; Japan, Indochina, Myanmar, Thailand, Sri Lanka, India, Bangladesh, Indonesia, N Australia.

Ecology: Paddy fields, ponds, marsnes. Flowering & fruiting: Aug.–Oct.

2. Eriocaulon tonkinense Ruhland 越南穀精草

Pflanzenr. IV 30 (Heft 13): 72. 1903; Z. X. Zhang, Diss. Bot. 194. 1999; FOC 24: 12. 2000; FGD 9: 164. 2009.

Eriocaulon cristatum Mart. var. *brevicalyx* C. H. Wright, J. Linn. Soc. Bot. 36(251): 199. 1903.

Eriocaulon yaoshanense Ruhland var. *brevicalyx* (C. H. Wright) W. L. Ma, Acta Phytotax. Sin. 29(4): 301. 1991; FRPS 13(3): 42. 1997; Check List HK Plants 305. 2002; 108. 2004.

Eriocaulon cristatum auct. non Mart.: Benth., FHK 382. 1861; FKH 292. 1912.

Herb caulescent. Rhizomes elongate, 2–3 cm. Leaves all radical, narrow-linear to almost subulate, 7–25 cm × 0.6–0.8 mm. Scapes 15–25(–30) cm, stiff, 5–7-ribbed. Flower-heads subglobose, 3–8 mm in diam., brown or black at base and grey at apex; receptacle glabrous; involucral bracts broadly obovate, straw-coloured, blackish at apex; floral bracts obovate to cuneate, dark at the top and fringed with short white hairs. Male flowers: sepals connate into a spathe, apex 3-lobed, lobes nearly equal, posterior one flat, lateral ones boat-like, all fringed with short white hairs at top; petals 3, obovate to elliptic, with one larger than others, adaxially white clavate hairy toward apex, gland black; stamens 6, anthers milky white to brownish. Female flowers: sepals 3, similar that in males; petals 3, free, oblanceolate-linear, white clavate hairy adaxially and at apex, gland black; ovary 3-locular; style 3-cleft.

Locality: Wong Nai Chung, Lan Nai Wan, Shek O. *W. J. Tutcher 7245; Y. S. Lau 1488; HK sheet 35728.*

Distribution: Guangdong, Guangxi; Vietnam, India.

Ecology: Marshlands. Flowering & fruiting: Oct.–Jan. of the following year.

3. Eriocaulon australe R. Br. 毛穀精草 **(Fig. 46)**

Prodr. 254. 1810; FHK 382. 1861; FKH 292. 1912; FHN 4: 83. 1977; FRPS 13(3): 31, pl. 8: 1–11. 1997; Z. X. Zhang, Diss. Bot. 154. 1999; FOC 24: 10. 2000; FGD 9: 162. 2009.

Annual herb. Roots many, fibrous, tufted. Leaves linear, usually 10–30 cm × 1.5–3(–5) mm, sometimes up to 50 cm long and 5–8 mm broad, sparsely villous, veins 10–15. Scapes 15–60 cm, 5–7-ribbed. Flower-heads subglobose, 6–8 mm in diam., glaucous, base truncate; receptacle villous; involucral bracts broadly obovate, ca. 2.5 mm in diam., in 2–3 series, much shorter than flower-head, leathery, apex obtuse or acute, abaxially sparsely villous; floral bracts obovate, abaxially densely white clavate hairy toward acute apex. Male flowers: sepals 3, slightly connate at base, 2 larger, boat-like, dorsally winged, abaxially hairy toward apex, another one smaller, oblanceolate-oblong glabrous; petals 3, linear, connate at base into a tube, white clavate hairy at apex, gland black, ovate; anthers black. Female flowers: sepals 3, similar to that in males, 2–2.3 mm; petals 3, linear, white clavate hairy at apex, with black glands at centre; ovary 3-locular; style 3-cleft.

Locality: Shek O, Quarry Bay, Sha Tin, Lantau Island. *Y. S. Lau 171, 2545; Y. W. Lam 1260.*

Distribution: Hainan, Guangdong, Yunnan, Jiangxi, Fujian; Indochina, Thailand, Malaysia, Australia, Pacific islands.

Ecology: Marshlands and boggy grounds. Flowering & fruiting: Summer to autumn.

4. Eriocaulon sexangulare L. 華南穀精草 **(Fig. 47; Photo 101)**
Sp. Pl. 1: 87. 1753; FRPS 13(3): 35, pl. 8: 12–22. 1997; Z. X. Zhang, Diss. Bot. 189. 1999; FOC 24: 11. 2000; FGD 9: 163, fig. 87. 2009.

Eriocaulon wallichianum Mart., Pl. Asiat. Rar. 3: 26–27, pl. 249. 1832; FHK 381. 1861; FKH 292. 1912; FHN 4: 84. 1977.

Eriocaulon cantoniensis Hook. & Arn., Bot. Beech. Voy. 219. 1837.

Eriocaulon sinicum Miq., J. Bot. Néerl. 1: 87. 1861; FKH 292. 1912.

Annual herb. Roots many, fibrous, tufted. Leaves linear-lanceolate, 5–25 cm × 3–15 mm, apex very pointed, glabrous. Scapes 10–25(–35) cm, scarcely angular. Flower-heads subglobose, 5–7 mm in diam., glaucous, base truncate; receptacle glabrous; involucral bracts straw-coloured, subrounded, in 1 series, about 1/3 the length of the head, leathery, abaxially white clavate hairy; floral bracts obovate, 2–2.5 mm, leathery, very closely imbricate, apex obtuse or with a very short inflected point, and slightly mealy at the tip, abaxially hairy toward apex. Male flowers: sepals 3, ± connate at the base, of which 2 boat-shaped, with a winged keel, another one oblong-lanceolate, much smaller, flat, irregularly and minutely toothed at apex; petals (2–)3, linear, base united into a tube, apex pubescent, gland indistinct or absent; anthers (4–)6, black. Female flowers: sepals (2–)3, ovate, of which 2 larger, similar to that in males, another one smaller, lanceolate, sometimes reduced or absent; petals (2–)3, linear, unequal, membranous, occasionally villous at centre, apex white clavate hairy; ovary (2–)3-locular; style (2–)3-cleft.

Locality: Common in Hong Kong. *H. C. Tang 1941; Y. S. Lau 346, 2336.*

Distribution: Hainan, Guangdong, Guangxi, Fujian, Taiwan; Japan, Philippines, Indochina, Myanmar, Thailand, India, Sri Lanka, Malaysia, Africa.

Ecology: Paddy fields and other moist situations. Flowering & fruiting: Aug.–Mar. of the following year.

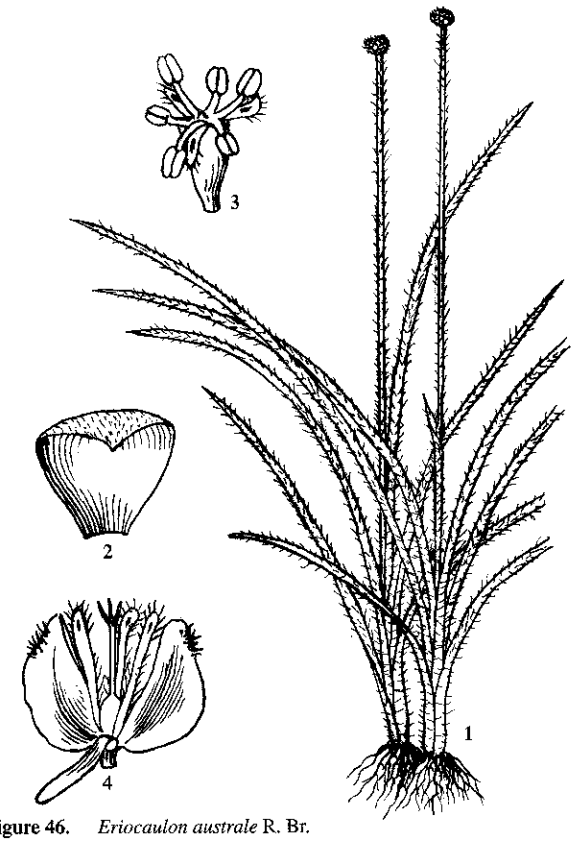

Figure 46. *Eriocaulon australe* R. Br.
1. plant; *2.* floral bract; *3.* male flower with sepals removed; *4.* female flower. (drawn by H. P. Yu)

5. Eriocaulon nantoense Hayata 南投穀精草 **(Photo 102)**
Icon. Pl. Formosan. 10: 51. 1921; FRPS 13(3): 26, pl. 6: 1–11. 1997; Z. X. Zhang, Diss. Bot. 99. 1999; FOC 24: 9. 2000; FGD 9: 162. 2009.

Eriocaulon luzulifolium auct. non Mart.: FKH 292. 1912.

Annual herb. Roots many, fibrous, tufted. Leaves all radical, linear to linear-lanceolate, 2–5 cm × 1.5–3 mm, apex pointed. Scapes slender, 5–20(–26) cm, 4–5-ribbed. Flower-heads blackish when dry, subglobose, 3.5–5(–6) mm in diam.; receptacle sparsely pubescent, or densely white villous; involucral bracts straw-coloured, obovate-cuneate, slightly shorter than the head, apex rounded or nearly so, rigid, glabrescent; floral bracts obovate to oblanceolate, apex shortly acuminate, abaxially white clavate hairy toward apex. Male flowers: sepals 3, connate into a spathe, split on abaxial side, or only united at base and with 3 free lobes, blackish, with white short hairs at the top; petals united into a tube, upper part 3-lobed, lobes equal or the anterior one slightly larger than others, white clavate hairy toward apex, gland brownish, grey, black, inconspicuous, or absent; anthers black. Female flowers: sepals 3, dusky, free, boat-like, dorsally keeled, with white clavate hairy toward apex; petals 3, oblanceolate-linear, membranous, hairy, gland present or absent;

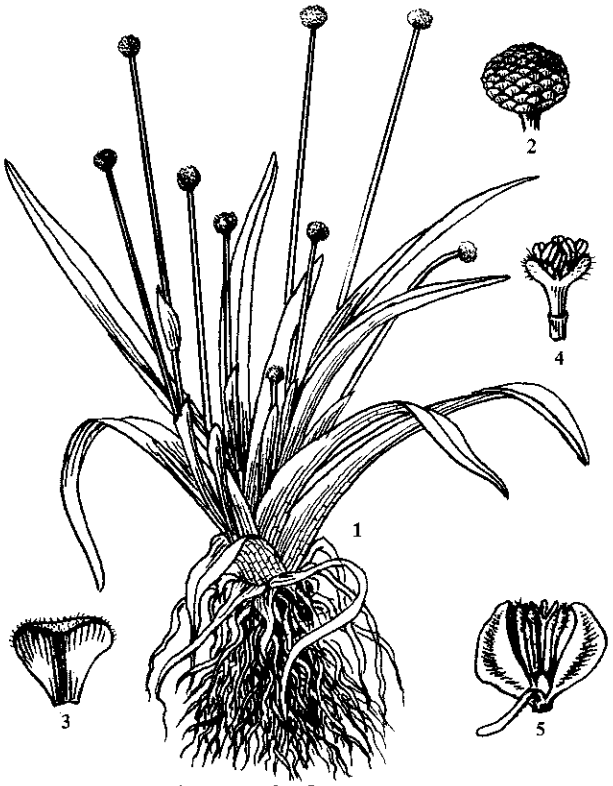

Figure 47. *Eriocaulon sexangulare* L.
1. plant; *2.* inflorescence; *3.* floral bract; *4.* male flower with outer perianth removed; *5.* female flower. (drawn by H. P. Yu)

ovary 3-locular; style 3-cleft.

Locality: Tai Mo Shan. *Y. W. Lam 1175; HK sheet 29957.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Zhejiang, Fujian, Taiwan.

Ecology: Marshlands and paddy fields. Flowering & fruiting: Aug.–Dec.

6. Eriocaulon truncatum Buch.-Ham. ex Mart. 菲律賓穀精草 **(Photo 103)**

Pl. Asiat. Rar. 3: 29. 1832; FHK 382. 1861; FKH 292. 1912; FHN 4: 85. 1977; FRPS 13(3): 62. 1997; Z. X. Zhang, Diss. Bot. 179. 1999; FOC 24: 13. 2000; FGD 9: 165. 2009.

Eriocaulon merrillii Ruhland ex Perkins, Fragm. Fl. Philipp. 1: 136. 1904; FRPS 13(3): 47. 1997; Check List HK Plants 305. 2002; 108. 2004.

Annual herb. Roots many, fibrous, tufted. Leaves all radical, linear-lanceolate, 2–6 cm × 2–5(–6) mm. Scapes 2–13 cm. Flower-heads straw-coloured, at first hemispherical, nearly globular when full grown, 4–5 mm in diam.; receptacle glabrous or subglabrous to villous; involucral bracts straw-coloured, various in shape, ovate-elliptic, oblong to obovate-oblong, almost as long as the head, membranous, apex obtuse, glabrous; floral bracts obovate to oblanceolate, hyaline, glabrous or sparsely hairy. Male flowers: sepals 2, connate into a spathe, 1–1.8 mm, blackish, glabrous or sparsely hairy at margin, apex 2–3-lobed; petals united into a tube at base, apex 3-lobed, lobes puberulous, each with a black gland or gland absent; anthers (5–)6, black. Female flowers: sepals 2, linear, blackish, free, usually glabrous; petals 3(–4), villous adaxially and at margin, apex white clavate hairy; ovary 3-locular; style 3-cleft.

Locality: Hong Kong Island, Sham Tseng, Ho Pui, Lantau Island. *Y. W. Lam 934, 1780, 2172.*

Distribution: Hainan, Guangdong, Taiwan; Japan, Philippines, Thailand, Indonesia.

Ecology: Paddy fields and other wet places. Flowering & fruiting: May–Dec.

7. Eriocaulon cinereum R. Br. 白藥穀精草

Prodr. 254. 1810; FKH 292. 1912; FRPS 13(3): 49, pl. 14: 1–11. 1997; Z. X. Zhang, Diss. Bot. 189. 1999; FOC 24: 13. 2000; FGD 9: 166. 2009.

Eriocaulon heteranthum Benth., FHK 382. 1861; FHN 4: 85, fig. 1000. 1977.

Eriocaulon sieboldianum Siebold & Zucc. ex Steud., Syn. Pl. Glumac. 2: 272. 1855.

Annual herb. Roots many, fibrous, tufted. Leaves all radical, narrowly linear, 1–5(–7) cm × 0.8–1.5 mm, ending in fine points, glabrous. Scapes many and slender, 3–12(–18) cm, 4–6-ribbed. Flower-heads light yellow to dark green, at first hemispherical, broadly ovoid when full grown, 2–4 mm in diam.; receptacle villous, occasionally glabrous; involucral bracts pale green-yellow to blackish, oblong to obovate-oblong, ca. 1.5 mm, about half the length of the head, membranous, glabrous; floral bracts oblong to oblanceolate, glabrous or occasionally abaxially villous. Male flowers: sepals united at base into a tube, upper part flat, spathe-like, apex irregularly 3-toothed, glabrous or abaxially hairy toward apex; petals united into a tube at base, limb 3-lobed, lobes ovate to oblong, anterior one slightly larger than others, shortly hairy at apex, gland black or brown; anthers white to dusky. Female flowers: sepals 2(–3), blackish, free, linear, glabrous or sparsely villous abaxially and at margin; petals absent; ovary 3-locular; style 3-cleft.

Locality: Deep Water Bay, Tai Mo Shan, Lantau Island. *W. J. Tutcher 5299; HK sheet 7794, 7797.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Gansu, Shaanxi, Henan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; Korea, Japan, Philippines, Indochina, Indian Subcontinent, Indonesia, Australia, Africa.

Ecology: Paddy fields and other moist situations. Flowering & fruiting: Jun.–Oct.

355. JUNCACEAE 燈心草科

WU De-lin 吳德鄰

Perennial or annual herbs, tufted or with erect or creeping rhizome. Stems erect, terete or laterally flattened. Leaves occasionally reduced to a bladeless or nearly bladeless sheath at base of stem; leaf sheath often shortly prolonged on both sides into a pair of auricles at leaf blade junction; leaf blade ususlly linear or filiform, grass-like and flat, or terete, glabrous except for pilose margin on some grass-like blade. Inflorescence a panicle, corymb, or 1-flowered. Flowers bisexual or unisxual (then plants dioecious), regular, usually small, 1–2-bracteolate at base, mostly wind pollinated. Perianth segments (3 or)6, in (1–)2 whorls, free, usually greenish to brownish or blackish, rarely white or yellowish, glume-like. Stamens 3 or 6, if 6, then 3 opposite to outer perianth segments; filaments thin; anthers basifixed, 2-celled, dehiscing by longitudinal slits; pollen grains in tetrads. Ovary superior, 1-locular, or divided by 3 septa and 3-locular, or incompletely septate; ovules 3 and inserted at base of ovary, or many and biseriate on 3 parietal placentas; stigmas 3, papillose. Capsules 1–3-valved, loculicidal. Seeds globose, ovoid, or fusiform, small, sometimes with caudate appendages; embryo straight, minute, enclosed by fleshy endosperm.

About eight genera and 300 species widely distributed in temperate and cold regions of both hemispheres, in tropical regions restricted to high elevations; two genera and 92 species in China; one genus, two species and one subspecies in Hong Kong.

1. Juncus L. 燈心草屬

Perennial or annual herbs. Rhizome shortly or long creeping. Stems often tufted. Leaves either all basal or also cauline; leaf sheath open on 1 side, apex often auriculate; leaf blade grass-like, terete, or scale-like. Inflorescence terminal, or pseudolateral when basal involucral bract seemingly a continuation of stem, usually many-flowered; ultimate divisions into dense heads, lax cymes, or 1-flowered. Bracteoles present or absent. Perianth segments 6, in 2 whorls, papery to hyaline. Stamens 6 or 3, attached to base of perianth segments; filaments filiform, anthers oblong or linear. Ovary 1–2-locular; placentae 3, parietal, sometimes inconspicuously prominent but more frequently protruding and sometimes connate at middle; ovules many per locule; style 1; stigmas twisted. Capsule 3-valved; valves usually bearing placentae at middle. Seeds ovoid or oblong, minute, sometimes appendaged.

About 240 species widely distributed in both hemispheres, most abundant in temperate and cold regions, rarely tropical; 76 species in China; two species and one subspecies in Hong Kong.

1a. Inflorescence pseudolateral; involucral bract erect, seemingly a continuation of stem, leaves reduced to a sheath and closely embracing stem ..... 1. *J. effusus*

1b. Inflorescence terminal; involucral bract leaf-like; leaves not as above.

2a Leaf blade compressed, incompletely septate ..... 2. *J. prismatocarpus*

2b. Leaf blade terete, sometimes slightly compressed when dry, distinctly and perfectly septate ..... *2a. J. prismatocarpus* subsp. *teretifolius*

1. Juncus effusus L. 燈心草 **(Fig. 48; Photos 104–105)**

Sp. Pl. 1: 326. 1753; FRPS 13(3): 160. 1997; FOC 24: 48. 2000; FGD 6: 403. 2005.

Perennial herb, densely tufted. Rhizome shortly creeping, thick. Stems terete, 25–90 cm or taller, 1–3(–4) mm in diam., striate; pith continuous. Cataphylls closely embracing stem, reddish brown to chestnut brown, sheath-like, 2–22 cm. Inflorescences pseudolateral, densely to laxly many-flowered; involucral bract erect, seemingly a continuation of stem, terete, 5–28 cm. Perianth segments usually pale brown, linear-lanceolate, 2–2.7 × ca. 0.8 mm, unequal, with outer ones slightly longer than inner ones, apex acute. Stamens 3(or 6), about 2/3 the length of perianth; anthers 0.5–0.7 mm, slightly shorter than filaments. Ovary 3-locular; style very short. Capsules ovoid to oblong, slightly depressed or not, subequaling or slightly longer than perianth, 3-septate, apex obtuse. Seeds ovoid-oblong, 0.5–0.6 mm, reticulate.

Locality: Tai Mo Shan. *HK sheet 29955, 42769.*

Distribution: Widely distributed worldwide.

Ecology: Wet places. Flowering: Apr.–Jul.; fruiting: May–Sep.

Uses: Material (weaving), medicinal (folklore).

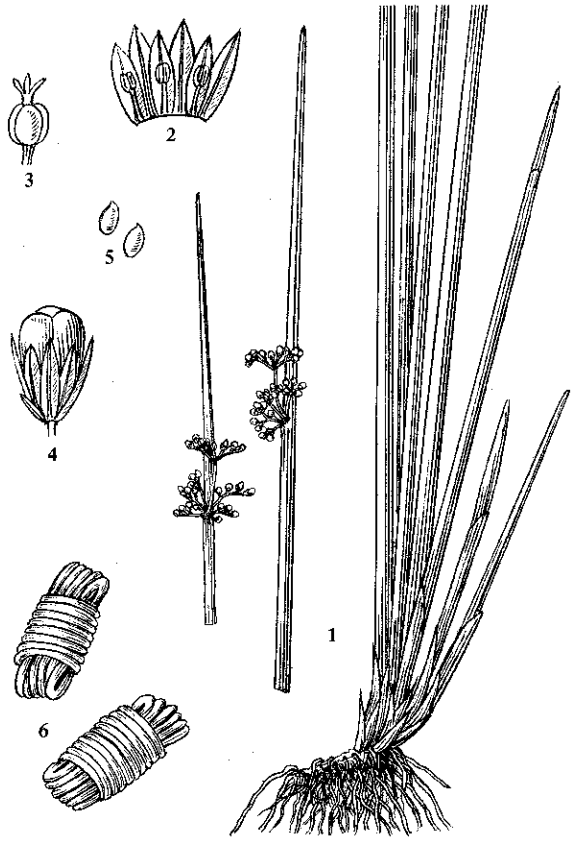

Figure 48. *Juncus effusus* L.
1. plant; *2.* tepals and stamens; *3.* pistil; *4.* capsule; *5.* seed; *6.* rush pith. (drawn by H. P. Yu)

2. Juncus prismatocarpus R. Br. 笄石菖 **(Photos 106–107)**

Prodr. 259. 1810; FKH 285. 1912; FHN 4: 265. 1977; FOC 24: 54. 2000; FGD 6: 405. 2005.

Juncus leschenaultii J. Gay ex Laharpe, Mem. Soc. Hist. Nat. Paris 3: 137. 1827; FHK 330. 1861.

Juncus prismatocarpus R. Br. var. *leschenaultii* (J. Gay ex Laharpe) Buchenau, Pflanzenr. 25(36): 180. 1906.

Juncus alatus auct non Franch. & Sav.: FKH 285. 1912.

Perennial herb, tufted, (8–)10–65 cm tall. Stems erect or ascending, terete or compressed, 0.7–3 mm in diam. Basal leaves few, cauline leaves 2–4; leaf sheath auricles obtuse, short; leaf blade linear, terete to compressed, 10–25 cm × (1–)2–4 mm, distinctly and perfectly to incompletely septate, apex obtuse, acute, or acuminate. Inflorescences terminal, sparingly or much branched; involucral bract leaf-like, shorter than inflorescence; heads 5–10(–30), globose to hemispheric, 7–10 mm in diam., (3–)8–15(–20)-flowered. Bracts 2–2.5 mm, broadly ovate to ovate-lanceolate, thinly membranous. Perianth segments narrowly lanceolate to linear-lanceolate, 3.5–4 mm, subequal, veins longitudinal, apex acute. Stamens 3, inserted opposite to outer perianth segments; filaments 1.2–1.4 mm; anthers 0.9–1 mm. Stigmas very long, often recurved or sinuous. Capsules narrowly prismatic, 3.8–4.5 mm; angles prominent, acute; placentas not or only slightly intruded, hence fruit 1-locular. Seeds wax-yellow, oblong, 0.6–0.8 mm, regularly longitudinally ribbed; transverse veins faint, remote.

Locality: Hong Kong Island, Sai Kung. *Y. W. Lam 1761; HK sheet 7667, 39861.*

Distribution: Hainan, Guangdong, Zhejiang, Taiwan; widely distributed worldwide temperate and subtropical sea area and salt lakes.

Ecology: Wet places. Flowering: May–Aug.
Uses: Medicinal (folklore).

2a. Juncus prismatocarpus R. Br. subsp. **teretifolius** K. F. Wu 圓柱葉燈心草
Acta Phytotax. Sin. 32: 455. 1994; FRPS 13(3): 193. 1997; FOC 24: 55. 2000; FGD 6: 406. 2005.

Differs in these characters: Plants large, robust. Leaf blade terete, sometimes slightly compressed when dry, distinctly and perfectly septate.
Locality: Tsing Fai Tong, Sha Lo Tung. *Y. Yip s.n.* (*HK sheet 42848, 42849*)
Distribution: Xizang, Yunnan, Guangdong, Zhejiang, Jiangsu.
Ecology: Paddy fields, marshes. Fruiting: Jun.–Jul.
Notes: According to FOC (24: 54. 2000), this subspecies is morphologically very close to *Juncus wallichianus*, and their relationship awaits further research to clarify. *Juncus wallichianus* differs in the apex of its capsules being cuspidate (cf. FOC Ill. 24: fig. 44: 7–9. 2002; Fl. Nei Mongol., ed. 2, 5: 453, fig. 187: 1–5. 1994).

357. CYPERACEAE 莎草科

DENG Yun-fei 鄧雲飛 • *Carex* by NG Sai-chit 吳世捷

Annual or perennial, rhizomatous to stoloniferous herbs. Culms (stems) simple, solid or hollow, at times septate, usually trigonous, rarely terete or 2-sided, usually nodeless. Leaves usually 3-ranked, rarely distichous or polystichous, usually radical, sometimes cauline, usually sheathing at base; blade usually linear, grass-like, sometimes broader and constricted into a pseudopetiole below; sheath open or closed; ligule often present, sometimes on opposite side to blade. Involucral bracts 1–several, leaf-like or glume-like. Inflorescence unbranched to compoundly or decompoundly branched and umbel-like, or paniculate, comprising 1–many ultimate inflorescence units (spikelets or spicoids). Spikelets comprising 1–many glumes, the glumes membranous to leathery, spirally arranged or 2-ranked, each subtending a single bisexual or unisexual flower or sterile, the spikelet sometimes reduced to a single flower and aggregated into spikes; spicoids (tribe Hypolytreae only) comprising a terminal female flower, 2–12 membranous scale-like floral bracts on a much reduced axis, the lowest 2 bracts opposite and keeled, some of the bracts subtending a male flower, the spicoid subtended and usually hidden by a glume-like spicoid bract, these spirally arranged and aggregated into spikelet-like spikes. Perianth absent or reduced to segments or scale-like segments. Stamens 1–3; anthers basifixed. Stigmas 2–3, rarely styles undivided, the base sometimes persistent and variously shaped in achene. Ovary 2–3-carpellate, unilocular, with a single ovule. Achenes usually hard, 2–3-sided, rarely with a succulent or corky exocarp, surface smooth or variously minutely patterned, sometimes partially or completely enclosed by an enlarged basal prophyll (utricle).

About 4000–5000 species in 100–125 genera, worldwide; 36 genera and about 870 species in China; 27 genera, 143 species, one subspecies and one variety in Hong Kong.

1a. All flowers unisexual; female flowers and achenes enclosed by a sac-like structure (utricle)..... 1. *Carex*
1b. Flowers unisexual or bisexual; female flowers and achenes not enclosed by a sac-like structure (utricle).
2a. Inflorescence comprising small units (spicoids) with 2 opposite, keeled scales (floral bracts) at the base often enclosing a further 2–10 scales, each unit subtended and usually hidden by a glume-like bract.
3a. Leaves reduced to bladeless sheaths; culms septate; inflorescence a solitary spike..... 2. *Lepironia*
3b. Leaves with blades fully developed; culms not septate; inflorescence of several spikes or an open panicle.
4a. Spicoids with 6 floral bracts; stamens 3 per spicoid..... 3. *Mapania*
4b. Spicoids with 2 floral bracts; stamens 2 per spicoid..... 4. *Hypolytrum*
2b. Inflorescence various but not as above.
5a. Achenes usually bony, often with a 3-lobed cup-like or stipe-like structure at base.
6a. Achenes tightly enclosed by two glumes and falling with them..... 5. *Diplacrum*
6b. Achenes not tightly enclosed by two glumes..... 6. *Scleria*
5b. Achenes not bony, without cup-like or stipe-like structure at base.
7a. Plants with very long rhizome and capitate inflorescence; seashore only..... 7. *Remirea*
7b. Plants not as above; inland.
8a. Spikelet few-flowered (usually 1–2-flowered); several lower glumes usually empty.
9a. Style articulated with the ovary; style base persistent on achene; stigmas 2 or sometimes undivided..... 8. *Rhynchospora*
9b. Style continuous with the ovary; style persistent or deciduous on achene; stigmas 3.
10a. Plants large and robust with a long, narrow inflorescence and dark, long-acuminate glumes; achene black, without disk..... 9. *Gahnia*
10b. Plants not as above.
11a. Inflorescence a single capitate cluster of spikelets; spikelet 1-flowered; rachilla internodes short..... 10. *Actinoschoenus*
11b. Inflorescence a single terminal spikelet or paniculate; spikelets usually 2- or more-flowered; rachilla internodes elongated.
12a. Glumes 2-ranked..... 11. *Schoenus*
12b. Glumes spirally arranged.

13a. Flowers without perianth of hypogynous scales ..... 12. *Cladium*
13b. Flowers with perianth of hypogynous scales.
14a. Style base enlarged, persistent on achene ..... 13. *Machaerina*
14b. Style base not enlarged, deciduous ..... 14. *Lepidosperma*

8b. Spikelet many-flowered; only 1 or 2 lower glumes empty.
15a. Style jointed with the ovary and clearly demarcated from it.
16a. Leaf blades absent; inflorescence reduced to a single terminal spike; bristle-like perianth segments present ..... 15. *Eleocharis*
16b. Leaf blades usually present if absent then style-base not persistent on achene; inflorescence paniculate or single; bristle-like perianth segments absent.
17a. Achene with a button-like thickening formed by the present style-base ..... 16. *Bulbostylis*
17b. Achene without a button-like thickening of style-base.
18a. Inflorescence often with many (rarely single) spikelets; glumes usually ± leathery; achene usually < 1.5 mm, base not stipitate ..... 17. *Fimbristylis*
18b. Inflorescence always with single spikelet; glumes often more delicate; achene usually > 2 mm, base conspicuously clavate-stipitate for 0.5–1 mm ..... 18. *Abildgaardia*
15b. Style continuous with the ovary and not demarcated from it.
19a. Flowers with a perianth of hypogynous scales or segments or of both.
20a. Perianth consists of segments only.
21a. Leaves well-developed ..... 19. *Scirpus*
21b. Leaves reduced to bladeless sheaths ..... 20. *Schoenoplectus*
20b. Perianth consists of scales, or in *Fuirena* often segments also found.
22a. Stems noded; leaves cauline, ligulate; inflorescence paniculate; achene not enclosed by hypogonous scales ..... 21. *Fuirena*
22b. Stems not noded; leaves basal, eligulate; inflorescence capitate; achene enclosed by hypogonous scales ..... 22. *Lipocarpha*
19b. Flowers without a perianth of hypogynous scales or segments.
23a. Rachilla articulate, falling off with achene.
24a. Stigma 2 ..... 23. *Kyllinga*
24b. Stigma 3 ..... 24. *Mariscus*
23b. Rachilla not articulate, persistent.
25a. Stigma 3, achene trigonous, triquetrous ..... 25. *Cyperus*
25b. Stigma 2, achene lateral flattened.
26a. One face of the achene opposite the rachilla ..... 26. *Juncellus*
26b. One angle of the achene facing the rachilla ..... 27. *Pycreus*

1. Carex L. 薹草屬

NG Sai-chit 吳世捷

Perennial herbs with creeping or stoloniferous rhizome, monoecious, rarely dioecious (not in Hong Kong). Culms densely or loosely tufted, trigonous. Leaves basal or cauline, linear, rarely lanceolate, sheathed at base. Bracts leaf-like to setaceous, rarely scale-like, with or without sheath. Inflorescence racemose, spicate, fasciculate or paniculate with one or more spikes; branches of the inflorescences with or without a sheath-shaped or utriculiform bracteole (cladoprophyll) at base. Spikes with or without peduncle, composed of many unisexual spikelets. Spikelets reduced to a single unisexual naked flower, without perianth, in axil of its single bract (glume). Male flower with (2–)3 stamens, filaments distinct. Female flower with one pistil contained in a connate prophyll (utricle); style slender, sometimes thickened at base, persistent or deciduous, stigmas 3 or 2; reduced spikelet-axis sometimes present in the utricle. Fruit an achene rather tightly or loosely enveloped in the persistent utricle, trigonous, plano-convex or biconvex.

More than 2000 species widely spread over both hemispheres; 502 species (245 endemic) in China; 28 species in Hong Kong.

Carex graciliflora Dunn reported previously (Check List HK Plants 307. 2002; 108. 2004) belongs to another taxon and shall be discussed in a future report.

Majority of the Hong Kong species are forest species, with a few specialized in open habitat. Similar to most genera in Cyperaceae, the Hong Kong *Carex* species generally do not show any adaptation to animal pollination or seed dispersals, although bees have been seen visiting the male spikes of *C. pumila* (Shaw, J. C., PhD. Thesis, The University of Hong Kong, 2000) and *C. tenebrosa* (personal observation), respectively. Utricles of some species may be adapted to animal and water dispersal.

1a. Spikes all look similar, bisexual and androgynous.
2a. Utricles and achenes trigonous, stigma 3.
3a. Branches of inflorescence branch further, forming ± compound panicle; branches of inflorescence arise from a cladoprophyll which is utriculiform.
4a. Spikelets 3–6 cm, utricle rounded and swollen, > 1.7 mm wide ..... 1. *C. baccans*
4b. Spikelets short, < 2 cm, utricle smaller, < 1.5 mm wide.
5a. Culm central and tufted, leaves linear.

6a. Female glume with scabrous awn, inflorescence branches broad 4–5 cm, rarely less than 4 cm..... .....2. *C. cruciata*

6b. Female glume without awn, or only with short mucronate point, inflorescence branches broad less than 4 cm.....3. *C. filicina*

5b. Culms lateral, leaves linear or broad lanceolate.

7a. Leaves all free, each with an obvious petiole, leave blade broad lanceolate, > 2.5 cm wide.....4. *C. scaposa*

7b. Several basal radical leaf sheathes rolled into a high shoot, 5–10 cm tall, enclosing other leaves; leaves without petiole, leave blade linear, < 2 cm wide.....5. *C. tsiangii*

3b. Branches of inflorescence do not branch further, each of the branches is a single spike; base of inflorescence branches with or without a cladoprophyll; cladoprophylls, if present, sheath-like, never utriculiform.

8a. Spikelet narrow, < 4 mm wide; utricle small, 1.0–1.3 mm wide; achene either trigonous with excavation at the middle of the achene ridge or trigonous but secondarily flattened dorsiventrally, and without excavation at the middle of the achene ridge.....6. *C. cryptostachys*

8b. Spikelet broad, 4–6 mm wide; utricle large, 1.8–2.1 mm wide; achene trigonous without excavation at the middle of the achene ridge, nor become flattened dorsiventrally secondarily..... 7. *C. funhuangshanica*

2b. Utricles and achenes biconvex, stigma 2.

9a. Spikes rather dense on inflorescences, middle and upper bracts have 2–3 spikes each; peduncle of middle and upper spikes shorter, same length as bract sheath or up to 4 mm longer than sheath; female glumes mucronate to aristate, occasionally muticous, ovate; utricle completely hispidulous, elliptic; achene narrow elliptic, 1.1–1.3 mm wide; stigma of ripen achene longer than utricle..... 8. *C. teinogyna*

9b. Spikes rather loose and few on inflorescences, middle and upper bracts usually with only 1 spikes each, rarely 2 or more; peduncle of middle and upper spikes usually 3–20 mm longer than sheath; female glume muticous, occasionally mucronate, rarely with short awn; utricle with hispid margins, glabrous or with sparse hairs towards the margins; achene ovate to broad-elliptic, 1.3–1.6 mm wide; stigma of ripen achene as long as or shorter than utricle..... 9. *C. bodinieri*

1b. Spikes usually dimorphic. Terminal spikes have male spikelets only, very rarely with a few female spikelets. Lateral spikes either completely female or bisexual (androgynous), very rarely completely male for the uppermost lateral spike.

10a. Utricle papillose.

11a. Achene trigonous..... 10. *C. maculata*

11b. Achene biconvex.

12a. Lateral spikes less than 4 cm, and broader, 5–6 mm wide; female glumes apex acuminate, with a mucronate tip .....11. *C. pruinosa*

12b. Lateral spikes less than 6.5 cm, and narrower, 3–4.5 mm wide; female glumes apex truncate to emarginate, end in a scabrous awn ca. 1 mm..... 12. *C. phacota*

10b. Utricle not papillose.

13a. Mature achenes with smooth achene ridge, without any excavation nor constriction.

14a. Apex of achenes with a discoid annular crown, or forming into a truncate cylindrical crown.

15a. Apex of achenes with a truncate cylindrical crown.

16a. Female spikelets less than 2 mm wide..... 13. *C. tenuispicula*

16b. Female spikelets at least 2.2 mm wide.

17a. Lateral spikes more than 3 cm; male glumes 3–3.5 mm; female glumes apex truncate or rounded to minutely murconate ..... 14. *C. truncatigluma*

17b. Lateral spikes less than 3 cm; male glumes 2.4–3 mm; female glumes apex acute to obtuse.15. *C. ligata*

15b. Apex of achenes with a discoid annular crown.

18a. Terminal spikes linear cylindrical; male glumes obtuse, margin free but very close or connate to at most one-third of the length..... 16. *C. tristachya*

18b. Terminal spikes oblong to elliptical; male glumes acute to acuminate with mucronate point, margin free .....17. *C. breviculmis*

14b. Apex of achenes not truncate, nor with any discoid-annular ring.

19a. Mature pistillate spikes more than 5 cm long and less than 4 mm thick; female glumes are narrow lanceolate, less than 0.5 mm wide.....18. *C. nemostachys*

19b. Mature female spikes less than 4.5 cm long and more than 5 mm thick; female glumes are more than 0.5 mm wide.

20a. Rhizomes stoloniferous; mature utricle leathery to corky ..... 19. *C. pumila*

20b. Rhizomes not stoloniferous; mature utricle membranous to herbaceous.

21a. Spikes with many spikelets, lateral spike with more than 20 spikelets; terminal spike borne on a stalk at least 1 cm long, far away from the highest lateral spike; male glumes with awn ....20. *C. chinensis*

21b. Spikes with very few spikelets, lateral spike with less than 5 spikelets; terminal spike sessile or with a very short stalk, very close to the highest lateral spike; male glumes without awn..... .....21. *C. arisanensis*

13b. Mature achenes with excavation or constriction at the middle of the achene ridge.
22a. Utricles small, < 3 mm, beak short; achene small, < 2.5 mm; apex of achene with a discoid-annular ring or a short cylindrical crown; achene ridge excavated at the middle ..... 22. *C. nexa*
22b. Utricles large, > 6 mm, beak long; achene large, > 4 mm; apex of achene with a short or long cylindrical beak, which may be erect or curved; achene ridge constricted or excavated at the middle.
23a. Leaves broad-linear > 2 cm wide ..... 23. *C. harlandii*
23b. Leaves narrow < 1.5 cm wide.
24a. Female part of the lateral spikes with 8 or less spikelets; leaves less than 4 mm wide ..... 24. *C. canina*
24b. Female part of the lateral spikes with more than 10 spikelets; leaves more than 5 mm wide.
25a. Culms and both sides of leaves pubescent ..... 25. *C. pseudolaticeps*
25b. Culms not pubescent.
26a. Culms much shorter than leaves, less than or about 10 cm; spikes often at ground level or only slightly higher ..... 26. *C. zunyiensis*
26b. Culms longer than 15 cm, longer than or ± equal to leaves; spikes well above ground.
27a. Terminal male spike > 5.5 cm; female spikelets more than 60, very dense on female part of lateral spikes; apex of female glumes rounded to slightly emarginate, with long scabrous awn up to 2 mm; beak of utricles with scabrous margins; achenes with long straight beak at least 1.5 mm; dried specimen dark olive green ..... 27. *C. tenebrosa*
27b. Terminal male spike < 4 cm; female spikelets less than 30, rather loosely distributed on female part of lateral spikes; apex of female glumes acute, extended into a short mucronate tip or awn; beak of utricles smooth; achenes with short or curved long beak; dried specimen pale green, yellowish green, or brownish ..... 28. *C. manca*

1. Carex baccans Nees 浆果薹草

Wight, Contr. Bot. India 122. 1834; S. T. Dunn, J. Bot. 47: 325. 1910; FKH 305. 1912; FHN 4: 337. 1977; FTW 5: 310, pl. 1347. 1978; Flora Malesiana Ser. I 9(1): 137, fig. 119: 15, 127, 131i. 1979; FFJ 6: 350. 1995; FTW ed. 2, 5: 200. 2000; FRPS 12: 62, pl. 13: 1–4. 2000; FYN 15: 702, fig. 163: 1–4. 2003; FGD 8: 367. 2007; FOC 23: 288. 2010.

Rhizome woody. Culms central to borne in leave axils, erect and robust, 80–150 cm tall, 0.5–0.6 cm thick, trigonous, glabrous, leafy below middle-part. Leaves both cauline and basal, flat, 8–12 mm wide, glabrous abaxially, scabrid adaxially, papery, basal persistent leaf sheaths red-brown, reticulate. Bracts leafy, longer than inflorescence, long-sheathed; panicle compound, ovate, 10–35 cm; inflorescence branches 3–8, single, oblong to ovate, 5–6 × 3–4 cm, lower 1–3 branches more widely-spaced, axis bluntly triquetrous, nearly glabrous; bractlets glumaceous, lanceolate, 3.5–4 mm, leathery, only the basal one with short sheath, others sheathless, awned; peduncles of inflorescence branches rigid, the basal one 12–14 cm, upper ones gradually shorter, usually enclosed in bractlet-sheath; spikes producing from utriculiform cladoprophylls, numerous, cylindrical, 3–6 cm, bisexual and androgynous; male part of spike tenuous, with only few spikelets, 1/2 or 1/3 length of female part; female part with dense and numerous spikelets; male glumes broadly ovate, 3–4.5 × 2–2.5 mm, awned, membranous, chestnut-brown; female glumes broadly ovate, 2–2.5 × 2–2.5 mm, awned, papery, purplish brown or chestnut-brown, with 1 green midvein, margins hyaline; utricles obovate-globose or nearly globose, inflated, 3.5–4.5 mm, nearly leathery, red to purplish red when mature, shining, with many vertical veins, upper margins hairy, shortly stipulate at base, shortly beaked at apex, beak mouth minutely bidentate. Achene elliptic, trigonous, 3–3.5 mm, brown when mature, shortly stipulate at base, apex apiculate; style base not thickened, stigmas 3.

Locality: Tai Mo Shan, Ng Tung Chai. *Y. W. Lam 1310, 1740; HK sheet 13913.*

Distribution: Hainan, Guangdong, Guangxi, Sichuan, Guizhou, Yunnan, Fujian, Taiwan; Laos, Cambodia, Thailand, Vietnam, Malaysia, Nepal, India.

Ecology: Montane hillside grasslands, alt. 700–900 m. Fruiting: Aug.–Dec.

Notes: The utricle is berry-like and brightly coloured when ripe. It may be adapted for seed dispersals by birds and mammals.

2. Carex cruciata Wahlenb. 十字薹草 **(Fig. 49; Photo 108)**

Kongl. Vetensk. Acad. Nya Handl. 24: 149. 1803; C. B. Clarke, J. Linn. Soc. Bot. 36: 281. 1903-04; FKH 305. 1912; FHN 4: 338. 1977; FTW 5: 310, pl. 1347. 1978; Fl. Malesiana Ser. I 9(1): 118, fig. 118: 3a; 124a–d. 1979; FFJ 6: 350–51, fig. 313. 1995; FTW ed. 2, 5: 209, pl. 80. 2000; FRPS 12: 72, pl. 14: 9–11. 2000; FYN 15: 707, fig. 165: 6–8. 2003; FGD 8: 368. 2007; FOC 23: 291. 2010.

Carex benghalensis Roxb., Fl. Ind. 3: 572. 1832; FHK 401. 1861.

Rhizome thick, woody, with stolons. Culms central to borne in leave axils, erect, 40–90 cm tall, shorter than or ± equal to leaves, 2–4 mm thick, trigonous, smooth. Leaves mainly basal, a few cauline, flat, 4–8 mm wide, scabrid abaxially and adaxially along midrib, veins and margins, papery, persistent sheaths dark brown, fibriform. Bracts leafy, longer than inflorescence branches, long-sheathed towards base; panicle compound; inflorescence branches ovate-triangular, 4–10 × 3–6 cm wide, usually single; peduncles of inflorescence branches rigid, smooth, trigonous to flattened, lowest one 10–18 cm, upper ones gradually shorter; inflorescence axis trigonous to slightly flattened, covered in dense short hairs; bractlets glumaceous and awned, 0.7–3.0 mm, hairy abaxially; cladoprophylls utriculiform, without flower, several-veined and hairy abaxially; spikes many, all producing from cladoprophylls, patent horizontally, 4–17 mm, bisexual, androgynous; male part of spike about one-third to as long as female part; male glumes lanceolate, 2.5–3.0 mm, acuminate, mucronate, membranous, pale brownish white, with dense brown spots and short lines; female glumes ovate, ca. 2 mm, membranous,

apex obtuse to acute, shortly awned ca. 0.4 mm, 3-veined. Utricles longer than glumes, elliptic, inflated trigonous, 3–3.2 mm, pale brownish white, with brown spots and short lines, smooth or upper part loosely hairy, with several raised veins, nearly sessile, apex attenuate into medium beak about 1/3 length of utricle, hairy or glabrous laterally, beak opening obliquely truncate. Achenes ovate-elliptic, trigonous, 1.5–1.8 mm, dark brown when mature; base of style slightly thickened, stigma 3.

Locality: Common in Hong Kong. *H. C. Tang 2127; S. C. Ng 2229; L. T. Lo 161.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Hubei, Jiangxi, Zhejiang, Fujian, Taiwan; Bhutan, Nepal, India, Indonesia, Thailand, Vietnam, Japan, Madagascar.

Ecology: Hillside grasslands, roadsides, alt. 50–900 m. Fruiting: Aug.–Dec.

Notes: The ripe utricle is fleshy and white. It may be adapted for dispersals by birds.

Figure 49. *Carex cruciata* Wahlenb.
1. lower part of plant; *2.* upper part of plant; *3.* utricle and female glume; *4.* prophyll; *5.* glume; *6.* achene. (drawn by H. P. Yu)

3. Carex filicina Nees 蕨状薹草

Wight, Contrib. Bot. India, 123. 1834; FHN 4: 339. 1977; Fl. Malesiana Ser. I 9(1): 122, fig. 118: 4. 1979; FFJ 6: 351, fig. 314. 1995; FRPS 12: 75, pl. 15: 6–9. 2000; FTW ed. 2, 5: 212. 2000; FYN 15: 704, fig. 164: 6–9. 2003; FGD 8: 369. 2007; FOC 23: 292. 2010.

Rhizome thick, woody. Culms borne in leave axils, loosely tufted, oblique to erect, 40–90 cm tall, shorter than leaves or rarely longer, 2–2.5 mm thick, trigonous, glabrous. Leaves flat, 4–10 mm wide, glabrous on both sides, papery; sheaths persistent, purplish red or purplish brown, split into fibers towards base. Bracts leafy, longer than inflorescence branches, long-sheathed; panicle compound, 20–50 cm; inflorescence branches 4–8, triangular-ovate, 4–8 cm wide, 3–5 cm, single, rarely binate; peduncles of inflorescence branches tenuous, trigonous, lowest one 10–20 cm, upper ones gradually shorter, sparsely hairy on ridges; rachis sharply trigonous to slightly flattened, short hairy; bractlets glumaceous, 1–1.5 mm, apex with or without awn; cladoprophylls utriculiform, without flower; spikes all producing from cladoprophylls, numerous, patent or slightly patent, oblong or oblong-cylindrical, 5–15 mm, bisexual, androgynous, male part of spike shorter than female part, with 3–7 spikelets; female part with 2–16 spikelets. Male glumes lanceolate, 2–3 mm, acuminate, membranous, brown or reddish brown; female glumes ovate or lanceolate, 1.5–2 mm, membranous, acuminate or acute, brown, reddish brown or pale brown with reddish brown spots and short lines, glabrous, with 1 midvein. Utricles membranous, brown or reddish brown, or wholly pale brown with reddish brown spots and short lines, elliptic or narrowly elliptic, trigonous, 3–3.4 mm, glabrous, with 2 lateral veins and several fine veins abaxially, nearly sessile, apex contracted into long excurved beak about 1/2 or more the length of utricle, beak opening obliquely truncate. Achenes narrow elliptic to rounded-rhomboid, trigonous, ca. 1.6 mm, yellowish brown to dark brown when mature; base of style not thickened, stigma 3.

Locality: Victoria Peak, Tai Mo Shan, Nei Lak Shan, Shek Pik. *Y. W. Lam 1395; S. C. Ng 1593; J. C. Shaw 105.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Hubei, Hunan, Jiangxi, Zhejiang, Fujian, Taiwan; India, Nepal, Sri Lanka, Myanmar, Thailand, Vietnam, Malaysia, Indonesia, Philippines.

Ecology: Margins of hillside forests and grasslands, alt. 500–900 m. Fruiting: Sep.–Nov.

4. Carex scaposa C. B. Clarke 花葶薹草 **(Fig. 50; Photo 109)**

Bot. Mag. 113, pl. 6940. 1887; FKH 305. 1912; FHN 4: 337. 1977; FFJ 6: 352, fig. 315. 1995; FRPS 12: 82, pl. 16: 1–4. 2000; FYN 15: 710, fig. 166: 1–4. 2003; FGD 8: 369. 2007; FOC 23: 294. 2010.

Rhizome woody. Culms central, oblique to erect, 35–70 cm tall, 1–3 mm thick, blunty trigonous, sparsely pubescent, with or without leafless glabrous papery pale brown spathe-like sheath at the base or on the culm towards the base. Leaves basal, tufted, longer or shorter than culms; petiole 20–30 cm, glabrous, papery, sometimes leaf base extending downwards forming narrow wings; leaf blade elliptic, elliptic-linear, to elliptic-oblanceolate, 20–35 × 2.5–4.5 cm wide, with 3 longitudinal veins, base attenuate to acuminate, glabrous on both surfaces or scabrid abaxially. Bracts spathe-like, shorter than inflorescence branches; inflorescence compound, 3–several-branched; inflorescence branches paniculate, triangular-ovate, 2–3.5 × 2–3 cm wide, single or binate; peduncles rigid, trigonous, 4–8 cm, densely pubescent; axis of inflorescence branches sharply trigonous to flattened, densely pubescent; bractlets glumaceous, broad lanceolate, 2–5 mm, brown to pale brown; cladoprophylls utriculiform, without flower. Spikes about 20, all producing from cladoprophylls, patent, bisexual, androgynous, oblong-cylindrical, 7–15 mm. Male part of spike linear-lanceolate, shorter than female part, and fewer spikelets; male glumes ovate-lanceolate, 2.5–3 mm, membranous, pale brown. Female part with 5–7 spikelets; female glumes ovate, 2.5–2.7 mm, membranous, acuminate, brown with spots and 3 longitudinal veins, margins ciliate when young.

Utricles elliptic, trigonous, 3–3.5 mm, papery, pale brown with dense brown spots, with 2 lateral veins abaxially, glabrous, nearly sessile, apex contracted gradually into medium beak up to 1/2 of the utricle length, beak opening emarginate. Achenes broad elliptic, trigonous, 2–2.5 mm, brown when mature; base of style not thickened, stigma 3.

Locality: Tai Mo Shan, Ma On Shan, Lantau Peak, Sunset Peak. *Y. W. Lam 435; HK sheet 39599, 41605.*

Distribution: Guangdong, Guangxi, Guizhou, Sichuan, Yunnan, Hunan, Jiangxi, Zhejiang, Fujian; Vietnam.

Ecology: Montane hillside forests, alt. 600–900 m. Fruiting: Aug.–Nov.

Notes: A distinctive species characterised by broad lanceolate leaves with rather long petiole. The local specimens are rather consistent in leaf shape and petiole length, but FRPS (12: 82–84) has reported considerable variation among specimens within China.

Figure 50. *Carex scaposa* C. B. Clarke
1. plant; *2.* female glume; *3.* utricle; *4.* achene. (drawn by H. P. Yu)

5. Carex tsiangii F. T. Wang & Tang 三念薹草

Contrib. Inst. Bot. Nat. Acad. Peiping 6(2): 59. 1949; FRPS 12: 92. 2000; FGD 8: 371. 2007; FOC 23: 298. 2010.

Rhizome woody, with stolons. Culms lateral, erect to oblique, 45–55 cm tall, 1–1.5 mm thick, trigonous to flattened, glabrous, with leafless brown sheaths at culm base and towards lower part of the culm. Leaves longer than culms, basal, several leaves and basal leafless brown sheaths forming a high shoot, leaf blades linear, flat, 5–7 mm wide, glabrous to slightly scabrous on both sides, margins entire or scabrid, soft papery. Bracts spathe-like and leafless, shorter than inflorescence branches; panicle compound, 10–30 cm, 3–10-branched; inflorescence branches broadly ovate, ca. 2 × 2 cm, single or binate, each with 3–10 spikes, peduncles tenuous, 2–7 cm, pubescent; inflorescence axis sharply trigonous, densely hirsutus when young; bractlets glumaceous, lanceolate, 3–9 mm, pale brown with brown dots, loosely pubescent; spikes horizontally patent, bisexual, androgynous, 8–12 mm, cylindrical, male part equal to female part, female part with 3–15 spikelets; male glumes lanceolate, 3–3.5 mm, acute, brown with brown spots and short lines, with 1 midvein; female glumes ovate to ovate-lanceolate, 2.5–3 mm, acute, membranous, pale brown with brown spots and short lines, with 1 midvein, loosely pubescent, margins ciliate. Utricles broad-elliptic, obtusely trigonous, 3–4.2 mm wide, papery, brown, glabrous, with several fine veins, apex contracted into long beak about 50% of the whole length of utricle, orifice minutely 2-toothed. Achenes elliptic or broad-elliptic, trigonous, ca. 2 mm; style base thickened, stigma 3.

Locality: Sunset Peak, Lantau Peak. *S. C. Ng 1531, 2651.*

Distribution: Guangdong.

Ecology: Margins of montane hillside open forests and hillside forests with grasslands, alt. 700–900 m. Fruiting: Sep.–Oct.

6. Carex cryptostachys Brongn. 隱穗薹草 **(Photo 110)**

Duperrey, Voy. Monde, Phanerog. 152. 1832; FHK 403. 1861; C. B. Clarke, J. Linn. Soc. Bot. 36: 281. 1903–04; FKH 306. 1912; FHN 4: 340. 1977; Fl. Malesiana. Ser. I 9(1): 148, fig. 120: 26. 1979; FFJ 6: 358, fig. 322. 1995; FTW ed. 2, 5: 209, pl. 81. 2000; FRPS 12: 141, pl. 29: 1–5. 2000; FYN 15: 723, fig. 169: 1–5. 2003; FGD 8: 372. 2007; FOC 23: 317. 2010.

Rhizome oblique, woody, covered with dark brown fibrous remains of basal sheaths. Culms tufted and borne in leave axils, slightly pendent to oblique, slender, 10–25 cm tall, slender and weak, flattened trigonous. Leaves longer than or as long as the culms, blades 3–16 mm wide, flat, smooth on both surfaces, slightly scabrid along margins, stiff papery. Bracts bristle-like, sheath 4–8 mm and spathe-like. Spikes 6–10, all androgynous, oblong to cylindrical, 8–25 mm, spikelets rather loose; male part short, 2–4 mm; peduncle 4–8 mm, only slightly longer than sheath, slender. Female glumes ovate-oblong to ovate, 2–2.3 mm, pale-brown to yellow-green, the midrib green, apex acute, mucronate to acuminate. Utricles distinctly longer than the glume, 3-ribbed longitudinally, elliptic to oblong-fusiform, obscurely trigonous or slightly flattened, 3–3.8 mm, membranous, yellow-green to pale yellow, puberulent above, many-veined, base cuneate with short stipe 0.5–1 mm, attenuate above into a short beak, orifice minutely 2-toothed. Achene 2.2–2.5 mm; shape is either trigonous rhombic or trigonous but flattened dorsiventually into elliptic-fusiform shape; faces excavated both at upper and lower parts, and angles excavated at middle; yellowish to dark brown; style-base curved and persistent; stigmas 3.

Locality: Common in Hong Kong. *H. C. Tang 1206; Y. S. Lau, 3037; S. C. Ng 1268, 2917; Y. W. Lam 1367; HK sheet 13995.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan; Vietnam, Thailand, Malay Peninsula, Indonesia, Philippines, Australia (Queensland).

Ecology: Common in almost all forest habitats in Hong Kong, occasionally also found in rock crevices along streamsides of steep ravine, alt. 50–800 m. Fruiting: Mar.–Aug.

Notes: Two extreme forms with some intermediates were observed among Hong Kong specimen. The trigonous form characterised by trigonous rhombic urtricle and achene, with excavation at the middle of achene angles and on all faces is close to the description of FRPS and FTW (e.g. *HK sheet 13995; H. C. Tang 1206*). It is usually found in forest habitat with relatively thick soil. The flattened form is characterized by dorsiventrally flattened utricle and secondarily flattened trigonous achene, excavation is shallow or even absent (e.g. *Y. S. Lau 3037; S. C. Ng 1268, 2917*). It generally has narrower and shorter leaves, and usually found in rock crevices along streamsides of steep ravine. Intermediates with less obvious dorsiventrally flattened utricle and achene and intermediate constriction at the achene angle had been observed in both Hong Kong (*Y. W. Lam 1367*) and Hainan (*S.K. Lau 606* (PE) and *Y. Zhong 4198* (PE)) specimens.

7. Carex funhuangshanica F. T. Wang & Tang ex P. C. Li 鳳凰山薹草

Acta Phytotax. Sin. 37(2): 168, fig. 7. 1999; FRPS 12: 179, pl. 35; 9–11. 2000 [*"fenghuangshanica"*]; FOC 23: 332. 2010.

Rhizome short. Culms borne in leave axils, oblique, slender and rather flaccid, 15–25 cm tall, 0.8 mm thick, trigonous, smooth. Leaves longer than the culm, flat, 1.5–4 mm wide, stiff papery, margins smooth to slightly scabrid, persistent sheaths brown and spilt into fibers. Bracts leafy and longer than the inflorescence, up to 12 cm, lowest bract not different with sterile leaves; sheath 2–7 mm. Spikes (1–)2, lowest spike may be borne near the base of culm, androgynous, oblong, 1–2 cm × 4–5 mm, peduncle slender, ca. 1 cm; male part 1/4–1/2 the length spike, male spikelets 8–13, rather densely distributed on the male part. Male glumes ovate, 2.2–2.6 mm, apex obtuse, papery, yellowish green to yellowish brown, abaxial side with 1 green midrib and several weak veins. Female glumes ovate or broad-ovate, 2.5–3 mm, apex obtuse, leathery, abaxial side with 1 green midrib and several weak vein, yellowish green on both sides, margins white hyaline. Utricles ovate to broad-elliptic, trigonous, 4.3–4.9 mm, greenish to yellowish brown, leathery, glabrous, each side with several robust veins, margins narrowly winged and ciliate, upper part attenuate into a short beak, orifice minutely 2-toothed, base cuneate and nearly sessile. Achene ovate to broad-elliptic, trigonous, 3–3.5 mm, brownish, base attenuate into a short stipe, apex without beak; style-base thickened conically, stigmas 3.

Locality: Pok Fu Lam, Castle Peak, Mui Wo, Yi O, San Tau. *S. C. Ng 1333; Y. W. Lam 1495; HK sheet 14008.*

Distribution: Guangxi.

Ecology: Lowland sparse forests, alt. 10–200 m. Fruiting: May–Jun.

Notes: The species was reported as *Carex speciosa* Kunth previously (Check List HK Plants 308. 2002; 109. 2004).

8. Carex teinogyna Boott 長柱頭薹草(細梗薹草)

Ill. Gen. Carex 1: 60, pl. 158. 1858; Fl. Malesiana. Ser. I 9(1): 175, fig. 123: 59. 1979; FFJ 6: 347, fig. 308. 1995; FRPS 12: 436, pl. 89. 2000; FYN 15: 788, fig. 185: 1–4. 2003; FGD 8: 392. 2007; FOC 23: 433. 2010.

Rhizome short and woody. Culms densely tufted, 25–60(–90) cm tall, rather slender, trigonous to flattened, scabrid. Leaves shorter than or equalling the culms, 2.5–3 mm wide, lower part conduplicate, midrib canaliculate, becoming flat towards upper part, veins and margins scabrous, basal sheaths usually splitting into fibers. Bracts shorter than or equal to branches of inflorescence, the lower bracts leaf-like, < 12 cm, upper bracts reducing to bristle-like; sheaths 5–25 mm. Inflorescence compound, spikes rather dense on inflorescences, lower bracts with (2–)3 branches of inflorescence, among them at least one branched further into 2 or more spikes; middle and upper bracts bear (1–)2–3 spikes. Spikes linear, 1–5 cm, androgynous, male part only ca. 1/4 of the spikes, remaining part of spikes male, male spikelets 7–25 and rather loosely distributed, peduncle slender but short, ca. 4–5 mm, usually only slightly longer than subtending bract-sheath. Male glumes similar to male glumes. Female glumes oblong-ovate, 3.5–4 mm, apex acute with a short scabrid mucronate point or awn, hyaline, brown to reddish brown, midrib green 3-veined. Utricles equal to or shorter than glume, oblong or narrow-elliptic, plano-convex, 3.2–4.7 × 1.1–1.3 mm, membranous, dark-brown to brown, hispidulous but a little bit less so at the middle, several-veined, base abruptly contracted to a short stipe, abruptly narrowed above to a rather long beak 1–1.4 mm, orifice minutely 2-toothed. Achenes tightly enveloped, elliptic, 1.8–2.3 × 1.1–1.3 mm, yellowish to dark-brown or black, sessile; style base slightly thickened, stigmas 2, slender and longer than utricle (including beak), persistent.

Locality: Aberdeen, Happy Valley, Bride's Pool, Tai Mo Shan, Sha Tin, Sunset Peak. *Y. S. Lau 2807; L. T. Lo 420; Y. W. Lam 1443.*

Distribution: Guangdong, Guangxi, Yunnan, Hunan, Jiangxi, Anhui, Zhejiang; India, Myanmar, Vietnam, Korea, Japan.

Ecology: Common in hillside forests and streamsides, alt. 100–700 m. Fruiting: Nov.–Jan. of the following year.

Notes: Its long persistent styles may help dispersal by attaching to passing-by mammals and birds or by assisting floatation on water surface.

9. Carex bodinieri Franch. 濱海薹草 **(Fig. 51)**

Bull. Soc. Philom. Paris, ser. 8, 7: 85. 1895 et in Nouv. Arch. Mus. Paris 3, ser. 8: 243, 1896; C. B. Clarke, J. Linn. Soc. Bot, 36: 295. 1903, *pro syn. sub C. longipes* D. Don; FFJ 6: 349, fig. 311. 1995; FRPS 12: 445, pl. 91: 5–7. 2000; FGD 8: 392. 2007; FOC 23: 436. 2010.

Carex brunnea auct. non Thunb.: Dunn, J. Bot. 47: 325. 1910; FKH 306. 1912.

Carex longipes auct. non D. Don: FKH 306. 1912.

Rhizome short and woody. Culms tufted or loosely tufted, rather slender, 35–60 cm tall, trigonous, smooth. Leaves basal, shorter than culm, 1.7–2.8 mm wide, flat, rather stiff, scabrous on both surfaces and margins; sheaths short, usually splitting to base into fibers. Bracts sheathed, sheaths 1.0–3.0 cm, the lower bracts leafy, upper blades reduced to bristle-like. Inflorescence a diffuse and loose compound raceme, lower bracts bear 2(–3) branches, among them usually 1 is compound, with several 2 or more spikes; middle and upper bracts each with 1(–2) spikes, very rarely more; bracts and branches loosely distributed, the lower branches can be up to 10 cm apart, the upper branches closer to each other. Spikes many, androgynous, cylindrical to narrow-lanceolate, 1–2.5 cm, male part range from less than 1/4 of the length for lower spike to nearly 1/2 for the upper spikes, female spikelets 9–12, rather loosely distributed on

spikes, peduncle slender and extend out of the sheath by up to 4 cm. Male glume narrowly ovate, 3–6 mm, apex acute, yellow-brown, hyaline, with brown short lines, midrib green 1-veined. Female glumes broad-ovate, 2.8–3 mm, apex acute, muticous or rarely with short awn, membranous, yellow-brown to brown, middle with brown short lines, midrib green 3-veined. Utricle suberect, slightly longer than glume, broad-elliptic, compressed plano-convex, 3.9–4.5 mm, membranous, pale brown to reddish-brown, dorsal side with up to 9 thin veins, glabrous or with sparse hairs towards the margins, upper margins loosely hispid, upper part abruptly contracted into a medium length beak ca. 1.3 mm, base gradually contracted to a short stipe; orifice 2-toothed. Achenes tightly enveloped, ovate to broad-elliptic, compressed plano-convex, 2–2.3 × 1.3–1.6 mm, yellowish to dark brown; style base slightly thickened; stigmas 2, usually shorter than to occasionally equal to utricle.

Locality: High West, Nam Fung Rd., Magazine Gap, Wan Chai Gap, Pik Uk. *S. T. Dunn Ex Herb. Hongk. 7187 (K), S. C. Ng 1552, 2810; HK sheet 42115, 42117.*

Distribution: Guangdong, Hunan, Fujian, Zhejiang, Jiangsu, Anhui; Japan.

Ecology: Montane hillside open forests; alt. 500–900 m. Fruiting: Sep.–Nov.

Notes: The type specimen (*Bodinier 1334* (P)) was collected from Happy Valley, Hong Kong Island in 1895.

Specimens of this species were reported as *Carex brunnea* Thunb. previously (S. T. Dunn *l.c.*; Check List HK Plants 306. 2002; 108. 2004; Corlett *et al.*, Mem. Hong Kong. Nat. Hist. Soc. 23: 113).

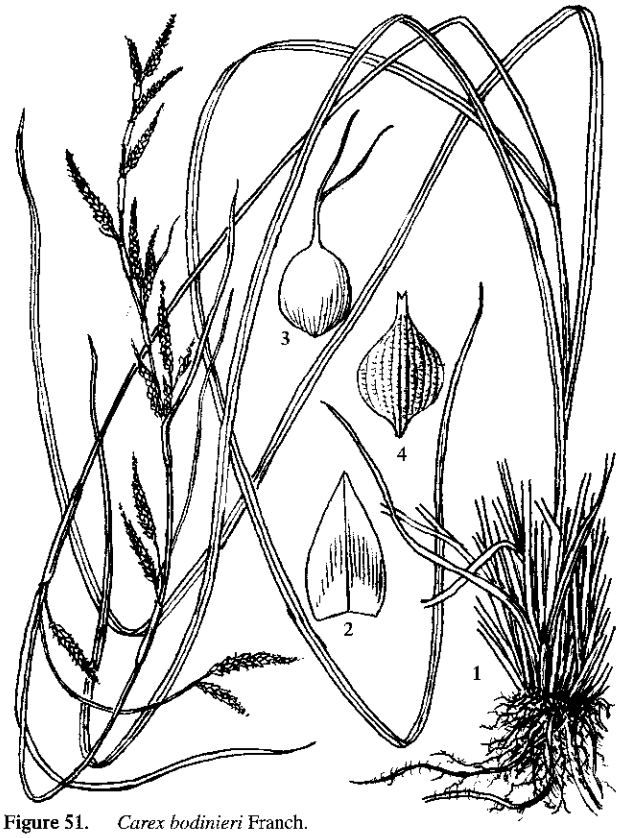

Figure 51. *Carex bodinieri* Franch.
1. plant; *2.* glume; *3.* utricle; *4.* achene. (drawn by H. P. Yu)

Clarke (1903) identified *Bodinier 334* from Happy Valley of Hong Kong as *C. longipes,* which he considered as conspecific with *C. bodinieri.* Without citing any specimen, FGD 8: 393 also mentioned *C. longipes* distributed in Hong Kong and "recorded from coastal region of Guangdong", but this is not mentioned by FRPS and FOC. In this study, I follow the FRPS treatment of considering *C. longipes* and *C. bodinieri* different species. I have not noted any specimen of *C. longipes* in Hong Kong. *Bodinier 334* was not examined by me, but it is unlikely to be *C. longipes*, as the inclusion of Hong Kong into its distribution range results in disjunct distribution for this species. It happens that the specimen cited by Clarke (1903) is very similar to the type specimen of *C. bodinieri* (*Bodinier 1334*) in collection number and locality. A possibility is that *Bodinier 334* may be a typo mistake of *Bodinier 1334.*

10. Carex maculata Boott 斑點果薹草 **(Photos 111–112)**

Trans. Linn. Soc. 20: 128. 1846; Hayata, Icon. Plant Formos. 10: 60. 1921; FTW 5: 359, pl. 1360. 1978; Fl. Malesiana. Ser. I 9(1): 157, fig. 121: 39. 1979; FFJ 6: 354, fig. 317. 1995; FTW ed. 2, 5: 220, pl. 84. 2000; FRPS 12: 140, pl. 28: 1–4. 2000; FGD 8: 372. 2007; FOC 23: 317. 2010.

Rhizome slender and woody. Culms borne in leave axils, oblique to erect, 40–50 cm tall, trigonous, smooth, with a few brown leafless sheath at the base. Leaves equal to or shorter than culm, sheathed, blades 3–6 mm wide, flat, smooth but slightly scabrid along leaf margins and toward apex, herbaceous. Bracts sheathed and leafy, longer than inflorescences, sheath up to 4 cm for the lowest spikes, getting shorter towards the terminal of the inflorescence. Spikes 3–4, the lowest spike remote, the others congregated towards top of culm; terminal spike staminate, linear-cylindrical, 1.2–2.5 cm, peduncle short (3 mm) to almost obsolete; lateral spikes pistillate, oblong-cylindrical to cylindrical, 1.5–2.5 cm, spikelets dense, the lower spikes has rather long peduncle up to 5 cm, peduncle becoming shorter (to 3 mm) for higher spikes. Male glumes oblong-lanceolate, 3.5–4 mm, obtuse, sometimes mucronate, membranous, with 3 longitudinal green veins. Female glumes oblong-ovate to ovate, 1.5–1.7 mm, acute to obtuse, membranous, yellowish brown with brown short lines. Utricles borne obliquely, longer than glume, broad-obovate to broad-elliptic, trigonous but slightly flattened dorsiventrally, 2.1–2.5 mm, membranous, brown, reddish brown to dark-purple, densely papillate, 3–5-veined on each side, base attenuate to cuneate, apex abruptly contracted into a short beak, orifice subtruncate to slightly emarginate. Achene tightly enveloped in utricle, broad-obovate to broad-elliptical, trigonous, 1.5–1.7 mm, yellowish brown to pale yellow or pale brown, base abruptly contracted to a short stipe, apex with a short curved style base, style base not thickened, stigma 3.

Locality: Pat Sin Leng, Shing Mun Arboretum, Tai Mo Shan. *S. Y. Hu 13584* (K); *S. C. Ng 1309; HK sheet 42078.*

Distribution: Guangdong, Hunan, Sichuan, Jiangxi, Jiangsu, Zhejiang, Fujian, Taiwan; India, Sri Lanka, Indonesia.

Ecology: Streamsides, open hillside forests, alt. 300–900 m. Fruiting: Mar.–May

Notes: A distinctive species characterised by reddish brown female spikelets. The leaves, although erect, are rather soft in texture and resemble that of wetland grasses.

11. Carex pruinosa Boott 粉被薹草

Proc. Linn. Soc. 1: 255. 1858 et Ill. Gen. Carex 1: 65, t. 174. 1858; C. B. Clarke, J. Linn. Soc. Bot. 36: 306. 1903–04; FKH 306. 1912; FFJ 6: 346, fig. 306. 1995; FRPS 12: 428. 2000; FYN 15: 782. 2003; FGD 8: 390, fig. 211. 2007; FOC 23: 430. 2010.

Rhizome short. Culms tufted, 30–80 cm tall, rather stiff, smooth, with red-brown sheaths at base. Leaves equal to or shorter than the culm, 3–5 mm wide, flat, margins revolute. Bracts leafy, longer than spikes. Spikes 3–5, well-spaced at the upper part of culm, peduncle slender 1.5–4 cm; male spike terminal, occasionally with several male spikelets at apex, narrow-cylindrical, 2–3 mm; lateral spikes male, pendent, sometimes with male flowers at apex, cylindrical, 15–35 × 4–7 mm, male spikelets 50–80 and very densely distributed. Female glumes ovate to oblong, ca. 3.3 × 1.4 mm, apex acuminate with short mucronate tip < 0.5 mm, midrib 3-veined green, hyaline on the two sides, with dense ferruginous dots and short lines. Utricles equal to or slightly longer than the glume, oblong-ovate, 2.5–3 × 2–2.3 mm, densely papillose and red-brown glandular, base broad-cuneate, abruptly contracted above into a short beak, orifice emarginate. Achenes rather loosely enveloped, broad-ovate, biconvex, ca. 2 × 1.5 mm, yellow-brown; stigmas 2.

Locality: Mount Kellet.

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuen, Henan, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian; India, Bhutan, N Thailand, Indonesia.

Ecology: Ravines, streamsides, grasslands, alt. 50–2500 m. Fruiting: Mar.–Jun.

Notes: Record of this species in Hong Kong was mentioned in C. B. Clarke (1903) and FKH (1912), but no specimen of this species had been deposited in the Hong Kong Herbarium. Although Clarke (1903) had cited a specimen from Mount Kellet (*Bodinier 1431*), but it was not seen in K. The above description and information are based on FRPS and a Guangdong specimen deposited in HK (*HK sheet 14101*).

12. Carex phacota Spreng. 鏡子薹草 **(Photos 113–114)**

Syst. Veg. 3: 826. 1826; FKH 306. 1912; FHN 4: 341. 1977; FTW 5: 365. 1978; Fl. Malesiana. Ser. I 9(1): 170, fig. 122: 52, 132: c. 1979; FFJ 6: 346, fig. 307. 1995; FTW ed. 2, 5: 225. 2000; FRPS 12: 431. 2000; FYN 15: 782. 2003; FGD 8: 391, fig. 212. 2007; FOC 23: 431. 2010.

Rhizome short and woody. Culms central, with basal leaves, 50–70 cm tall, acute-trigonous, base with yellow green to yellowish-brown sheaths, which splitting into reticulate fibers. Leaves longer or shorter than the culm, 2–5 mm wide, flat, margins slightly revolute, base plicate. Lower bracts leaf-like, longer than spikes, sheath absent to very short, ca. 2 mm, upper bracts bristle-like. Spikes 3–5, close to each other, pendent to somewhat extent; male spike terminal, linear-cylindrical, 3–6 cm × 2–2.5 mm wide, peduncle 2–2.5 cm; lateral spikes pistillate, often pendent, long-cylindrical, 2.5–6.5 cm × 3–4.5 mm, spikelets 100–120 and very densely distributed. Male glumes oblong to lanceolate, ca. 2.5 (awn excluded) × 0.5 mm, apex emarginate to obtuse, with an awn ca. 0.5 mm. Female glumes oblong, 2–2.9 mm, (awn excluded), apex truncate or emarginate, pale and hyaline with rusty dots and short lines, midrib green 3-veined, extend into a scabrous awn 0.9–1.2 mm. Utricles longer than the glume, broad-ovate or elliptic, 2–2.5 × 1.7–1.8 mm, biconvex, densely papillose, greenish brown to dark brown, upper part abruptly contracted above to a short beak ca. 0.2 mm, the orifice entire to slightly emarginate. Achenes rather loosely enveloped, rounded or broadly ovate, ca. 1.8 mm, biconvex, brown, densely papillose; style long, base not thickened; stigmas 2.

Locality: Beacon Hill, Kwun Yam Shan Tsuen, Sha Lo Tung, Sunset Peak. *S.Y. Hu 9829* (K); *HK sheet 41813, 42081.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; Nepal, India, Sri Lanka, Myanmar, N Thailand, Vietnam, Malaysia, Indonesia.

Ecology: Streamsides, open wetlands and abandoned farmlands, alt. 200–800 m. Fruiting: Feb.–Mar.

13. Carex tenuispicula Tang ex S. Y. Liang 纖穗薹草

Acta Phytotax. Sin. 34: 92, fig. 1. 1996; FRPS 12: 149, pl. 30: 9–12. 2000; FGD 8: 375. 2007; FOC 23: 320. 2010.

Carex tenuispicula Y. C. Tang, FFJ 6: 359. 1995. ined.

Rhizome short. Culms borne in the leave axil, trigonous, 10–30 cm tall, oblique, very slender and rather flaccid, pale brownish to pale greenish. Basal sheaths split into dark brown fibers. Leaves shorter than or longer than culms, 7–40 cm × 2–4 mm, flat, scabrid along margins, papery. Bracts leafy and longer than spikes for lower bracts, 5–12 cm, becoming shorter and bristle-like towards top of culms; sheath ca. 2 mm for lower and middle bracts, or absent for upper bracts. Spikes 4–6, pale brownish to pale yellowish, remote especially for lower spikes, lowerest spikes are often from near base of culms; male spike terminal, linear, 3–4 cm × 0.5–0.7 mm, peduncle 3–4 mm. Lateral spikes androgynous, mainly pistillate, narrowly cylindrical, 1–4 cm × 1.5–1.7 mm, female spikelets 9–28, rather loosely distributed, peduncle long and slender, 4–10 cm, lower spikes often pendent with longer peduncle. Male glumes broad ovate, apex rounded, 1.5–1.6 cm, margin ciliate, very pale brownish. Pistillate glumes broad ovate, apex obtuse to rounded, 1.3–1.5 mm, membranous, pale-brown, margin hyaline and ciliate. Utricles longer than the glume, fusiform, trigonous, 2.2–3 × ca. 1 mm, membranous, very pale brownish, many-veined, upper part gradually attenuate forming a short beak, orifice slightly 2-toothed. Achene tightly enveloped, pale brownish to brown, rhombic or fusiform, trigonous, 1.9–2.1 × ca. 0.9 mm, faces slightly depressed at upper and lower part, upper part of the achene form into a short cylindrical neck ca. 0.2 × 0.2 mm, pale yellowish to pale brownish, apex flat; base attenuate into a stipe; style-base slightly thickened; stigmas 3.

Locality: Tai Po Kau, Ma On Shan, Nei Lak Shan, Keung Shan, Sunset Peak. *HK sheet 41935, 41936, 41939.*

Distribution: Guangdong, Fujian.

Ecology: Montane hillside open forests, alt. 300–500 m. Fruiting: Jan.–Mar.

14. Carex truncatigluma C. B. Clarke 截鱗薹草 **(Photo 115)**

J. Linn. Soc., Bot. 36: 315. 1904; FFJ 6: 359, fig. 323. 1995; FRPS 12: 144, pl. 30: 1–4. 2000; FYN 15: 725, fig. 169: 6–9. 2003; FGD 8: 373. 2007; FOC 23: 318. 2010.

Carex gracilispica Hayata, Icon. Pl. Form 10: 62, fig. 39. 1921; FTW 5: 331, pl. 1355. 1978; Fl. Malesiana. Ser. I 9(1): 149. 1979; FTW ed. 2, 5: 213, pl. 82. 2000.

Rhizome woody, obliquely ascending, covered with greyish brown fibrous remains of leaf sheath. Culms tufted and borne in leave axils to lateral, oblique to erect, slender, 15–35 cm tall, trigonous. Leaves longer than or equal to the culms, 5–8 mm wide, flat, slightly scabrid to smooth on both surfaces, stiff papery. Bracts bristle-like to short-leafy, with sheath 6–8 mm. Spikes 3–6, male spike terminal, linear cylindrical, 3.5–5 × 0.1 cm, peduncle almost obsolete or very short, ca. 0.5 cm. Lateral spikes female, cylindrical, 3.5–5 × 0.2–0.3 cm thick, spikelets rather loose; the highest pistillate spike surpass or equal the staminate spike in length, with peduncle equal to or slightly longer than the enclosing bract sheath; the lower pistillate spikes remote and with longer peduncles up to 2–4 cm, extending beyond the sheath. Male glumes oblong, apex rounded, 3–3.5 mm, pale yellowish brown. Female glumes broad-obovate, apex truncate or rounded to minutely murconate, yellowish, margins broadly hyaline, midrib green. Utricles longer than the glume, rhombic-fusiform, trigonous, 3.4–4.2 × 1–1.1 mm, pale greenish brown, membranous, puberulent, many-veined, base cuneate with short stipe, upper part cuspidate into a short beak, orifice minutely 2-toothed. Achene tightly enveloped, rhombic-fusiform, trigonous, 2.5–3 × 1–1.1 mm, pale brown to dark brown; upper part of the achene form into a ivory-coloured stout, cylindrical crown, ca. 0.5 mm, apex truncate to shallowly concave; faces of achene excavated at the lower part, but only slightly so at the upper part; base attenuate into a stipe ca. 0.5 mm; style base slightly thickened and persistent; stigmas 3.

Locality: Pok Fu Lam, Mount Nicholson, Tai Mo Shan, Wu Kau Tang, Nam Chung, Sha Lo Tung, Lantau Peak, Cheung Chau. *J. C. Shaw 410; S. C. Ng 1208; HK sheet 36834.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Jiangxi, Anhui, Zhejiang, Fujian, Taiwan; Vietnam, Malay Peninsula, Philippines.

Ecology: Fairly common in hillside forests, alt. 50–900 m. Fruiting: Feb.–Apr.

15. Carex ligata Boott ex Benth. 香港薹草(顯柱薹草) **(Photo 116)**

FHK 402. 1861; Boott, Ill. Gen. Carex 4: 211. 1867; C. B. Clarke, J. Linn. Soc. Bot. 36: 294. 1903–04; Kük., Pflanzenr. 38(IV, 20): 473, fig. 75G–K. 1909; FKH 306. 1912; FRPS 12: 146. 2000 *pro parte*, excluding *C. nexa* Boott ex Benth.; FGD 8: 374. 2007; FOC 23: 319. 2010 *pro parte*, excluding *C. nexa* Boott ex Benth.

Carex hongkongensis Franch., Nouv. Arch. Mus. Paris III 10: 93. 1898.

Rhizome short and woody. Culms borne in leave axils, erect, 25–40 cm tall, slender, obtusely trigonous, smooth, basal sheaths dark brown and split into fibers. Leaves longer than the culm, 3–5 mm wide, flat, abaxial surface slightly scabrid, margins scabrid, papery. Bracts leafy, 2–3 cm, shorter than the subtended spikes; sheath brownish to greenish, 0.5–1 cm. Spikes 3–4, remote and ± regularly spaced on the stem; male spike terminal, narrowly cylindrical, 3–4 cm, ca. 1–1.3 mm thick, peduncle 3–4 cm; pistillate spikes lateral, cylindrical, 1–2 cm × 3.5–4 mm, spikelets 10–40, rather densely distributed on spikes, peduncle 1.5–2.5 cm, slender. Male glumes oblong, apex rounded, 2.4–2.9 × 1–1.3 mm, lower margins clasping the spike rachis to almost amplexicaul, pale greenish with broad hyaline margin and green midrib. Female glumes obovate-oblong, apex acute to obtuse, 2.2–2.8 mm, greenish with broad hyaline margin and 1–3 green midribs. Utricles longer than the glumes, rhombic, trigonous, 3–3.3 mm, membranous, puberulent above, many-veined, base cuneate with short stipe, upper part cuspidate into a beak 0.3–0.4 mm, orifice 2-toothed. Achene tightly enveloped, rhombic, trigonous, 2.1–2.4 mm; upper part of the achene form into a ivory-coloured stout, cylindrical crown 0.3–0.4 mm, shallowly concave at top; faces slightly depressed to excavated at both the upper and lower part, middle of achene raised into angle longitudinally, base attenuate into a stipe ca. 0.2 mm; style base thickened; stigmas 3.

Locality: Pok Fu Lam, Ma On Shan, Tai Mo Shan, Sunset Peak. *S. C. Ng 1233, 2916; HK sheet 42104.*

Distribution: Guangdong, Fujian.

Ecology: Hillside and ravine forests, alt. 300–700 m. Fruiting: Mar.–May.

Notes: The syntype specimens (*Harland 790 ex parte; C. Wright 8, 78, 79, & 602; Wilford 263*, all deposited at K) were collected from Hong Kong. FRPS also mentioned this species distributed in Anhui province. The author had examined the Anhui specimen at PE (*S. W. Su 87033*), and found it very different from the above type specimens with respect to its achene and male spikelet.

16. Carex tristachya Thunb. 三穗薹草

Syst. Veg., ed. 14, 845. 1784; FKH 306. 1912; FHN 4: 342. 1977; FFJ 6: 361, fig. 326. 1995; FRPS 12: 158, pl. 32: 1–4. 2000; FGD 8: 375. 2007; FOC 23: 324. 2010.

Rhizome short. Culms tufted and borne in leave axils, erect to oblique, 12–40 cm tall, slender, obtusely trigonous, smooth. Basal sheath dark brown and split into fibers. Leaves shorter or equal to the culm, 2–3 mm wide, flat, papery, margins scabrid. Bracts leafy for the lowest spikes, longer than the subtended spikes, 2–4 cm, upper bracts reduce to sheath similar to glumes in colour, texture and size; lower sheath up to 2 cm. Spikes 4–6, upper ones closer to contiguous, more remotely spaced for lower spikes; terminal spike staminate, narrowly linear-cylindrical, 18–23 × ca. 1.5 mm, peduncle very short to obsolete; lateral spikes pistillate, cylindrical, 1–1.5 cm × 2–2.5 mm, spikelets 12–17, rather densely distributed on spikes; peduncles of lowest spikes extend far beyond sheath, up to 10 cm, those of upper spikes getting shorter, the peduncle of the uppermost spike is short and only slightly extend out of sheath. Male glumes broad ovate, ca. 2.4 × 1.3 mm, base of margin free or slightly connate to below the middle; filament of stamen thread-like or flat. Female glumes elliptic to oblong, 1.8–1.9 × 1.0–1.1 mm, apex mucronate, obtuse to truncate, pale yellow, midrib green. Utricles longer than the glumes, erect, ovate-fusiform, trigonous, 2.8–3.0 mm × ca. 1 mm, membranous, green, many-veined, puberulent, upper part attenuate

into a short beak, orifice minutely 2-toothed, base attenuate into a short stipe. Achene tightly enveloped, ovate, ca. 2.1 mm, brown to dark brown, apex discoid-annulate; style base thickened conically; stigmas 3.

Locality: San Tau, Tung Lung Chau. *S. C. Ng 2153; HK sheet 41933, 41934.*

Distribution: Hainan, Guangdong, Hunan, Anhui, Jiangsu, Zhejiang, Fujian; Korea, Japan.

Ecology: Hillside open forests and shrublands, alt. 10–100 m. Fruiting: Mar.–Apr.

17. Carex breviculmis R. Br. 青綠薹草

Prodr. Fl. Nov. Holland. 242. 1810; FTW 5: 335. 1978; Fl. Malesiana. Ser. I 9(1): 150. 1979; FTW ed. 2, 5: 205. 2000; FRPS 12: 161, pl. 33: 1–4. 2000; FYN 15: 727. 2003; FGD 8: 376. 2007; FOC 23: 326. 2010.

Carex leucochlora Bunge, Enum. Pl. Chin. Bor. 68. 1833, FFJ 6: 360, fig. 325. 1995.

Rhizome short. Culms tufted and borne in leave axils, erect to oblique, ca. 20 cm tall, trigonous, slender. Basal sheaths pale-brown and split into fibers. Leaves longer or shorter than the culm, blades 2–3 mm wide, flat, margins scabrid, papery. Lowest bract leafy, longer than the subtended spikes, sheath ca. 9.2 mm; upper bracts bristle-like, nearly sheathless. Spikes 2–5, upper spikes contiguous, lower spikes more remotely spaced. Terminal spike staminate, oblong, 1–1.2 cm × 2–3 mm, nearly sessile, close to the next lateral spike. Lateral spikes androgynous, but the uppermost lateral spikes is occasionally a short mainly male spike, other lateral spikes are mainly pistillate, oblong-ovate, 8–15 × 3–4 mm wide, spikelets 30–50, densely distributed on spikes; peduncles up to 3.5 cm for the lowest spike, to almost absent for the upper spikes. Male glumes obovate-oblong, apex acuminate and shortly mucronate, membranous, pale-yellow. Female glumes oblong, 1.7–2 mm (excluding awn) × ca. 0.8 mm, apex truncate or rounded, midrib 3-veined, excurrent into an awn 0.7–1 mm, membranous, pale greenish to pale yellowish. Utricles nearly equal the glume, obovate, obtusely trigonous, 2.3–2.4 mm, membranous, pale yellowish green, many-veined, upper part densely puberulent, suddenly contracted to a conical beak, orifice emarginate, base attenuate into a short stipe. Achene tightly enveloped, ovate, 1.8 mm, dark brown, apex discoid-annulate; style-base conically thickened; stigmas 3.

Locality: Cheung Sheung. *S. C. Ng 1081.*

Distribution: Widespread from NE through C to S and SW China; India, Myanmar, Russia (Far East), Korea, Japan.

Ecology: Hillside grasslands, alt. 400 m. Fruiting: Apr.–Jun.

18. Carex nemostachys Steud. 條穗薹草(線穗薹草) **(Photos 117–118)**

Flora 29: 23. 1846 et Synops. Cyper. 218. 1855; FHN 4: 341. 1977; FTW 5: 351. 1978; FFJ 6: 367, fig. 334. 1995; FTW ed. 2, 5: 223. 2000; FRPS 12: 285, pl. 58: 1–3. 2000; FGD 8: 380, fig. 210. 2007; FOC 23: 374. 2010.

Rhizomes thick, sometimes stoloniferous. Culms 40–90 cm tall, erect, robust and stiff, trigonous, upper part scabrid, basal sheaths disintegrating into yellow-brown fibers. Leaves slightly longer than the culms, 4–7 mm wide, stiff, thick papery to leathery, lower part plicate, becoming flat towards upper part, veins and margins scabrid. Bracts sheathless, lower bracts leafy and longer than subtended spikes, 10–17 cm, upper bracts reduced to bristle shorter than spikes. Spikes 5–8, contiguous towards the top of culm, becoming more spaced towards middle of culm; male spike terminal, cylindrical-linear, 6–8 cm, peduncle short to almost obsolete; female spikes lateral, cylindrical, 5–8 cm × 2.5–3 mm, female spikelets very abundant, more than 100, and rather densely distributed on the long spikes, peduncle short for the lower spikes, almost absent for upper spikes. Male glumes ca. 5 mm, linear to narrow-lanceolate, margins scabrid and with rough hairs, 1–3-veined yellowish. Female glumes 3.5–4.5 × ca. 0.4 mm, narrow-lanceolate, apex with awn, margins of awn scabrid, membranous, pale-greyish, 1–3-veined. Utricles patent, curved outward away from rachis, slightly shorter than glume (including awn), ovate or broad-ovate, obtusely trigonous, 3–3.6 mm, membranous, brown, few-veined, hispidulous, base cuneate, upper part abruptly contracted to a slender, recurved beak, orifice obliquely truncate to minutely 2-toothed. Achene loosely enveloped, broad-obovate to broad-elliptical, trigonous, 1.8–2.0 mm, brownish yellow to brown; style base not thickened, stigmas 3.

Locality: Sha Lo Tung, Fo Tan. *H. C. Tang 2297; Y. S. Lau 3080; HK sheet 36026.*

Distribution: Guangdong, Fujian, Zhejiang, Jiangsu, Anhui, Jiangxi, Hunan, Hubei, Guizhou, Yunnan; India, Bengladesh, Myanmar, Thailand, Vietnam, Cambodia, Japan.

Ecology: Streamsides, wet places under forests, open grassy abandoned farmlands, alt. ca. 200 m. Fruiting: Nov.–Jan. of the following year.

19. Carex pumila Thunb. 矮生薹草

Murray, Syst. Veg., ed. 14, 846. 1784; FHK 402. 1861; C. B. Clarke, J. Linn. Soc. Bot. 36: 307. 1903–04; FKH 305. 1912; FTW 5: 357, pl. 1359. 1978; FFJ 6: 356, fig. 320. 1995; FTW ed. 2, 5: 227, pl. 88. 2000; FRPS 12: 373, pl. 78: 1–4. 2000; Y. L. Zheng & Y. F. Deng, Guihaia 23(6): 542. 2003; FGD 8: 388. 2007; FOC 23: 408. 2010.

Rhizome slender, stoloniferous. Culms central, 10–20 cm tall, trigonous, middle and basal part completely enclosed by sheath of basal leaves, lowest sheaths bladeless and reddish brown. Leaves longer than or equalling culm, blades 2–3.5 mm wide, flat, leathery, upper part of the leaves scabrous along veins and margins, with long sheath. Lower bracts leafy, longer than or shorter than culms, 5–10 cm, sheath short ca. 6 mm; upper bracts become smaller, reducing to bristle or glume for the terminal spike. Spikes 3–6, the top 1–2 staminate, clavate or narrowly cylindrical, 1.5–2.5 cm, peduncle short, < 0.7 mm; the other spikes pistillate, oblong or oblong-cylindrical, 1.5–2 cm, ca. 8 mm wide, spikelets quite many, 13–19, rather loosely distributed, peduncle short, < 8 mm. Male glumes oblong, ca. 5.8 × 2 mm, apex acute and with or without short mucronate tip, yellowish brown and with magenta dots and short lines towards the base and middle of glume, midrib leathery, margins hyaline. Female glumes broad-ovate, 4.5–5.5 mm, apex acute and mucronate, membranous, brownish with rusty or magenta short lines, midrib 3-veined green, margin white and hyaline. Utricles longer

than glumes, obliquely patent, ovate, inflated-trigonous, 6.2–6.6 × ca. 2.1 mm, corky, yellowish or yellowish brown, glabrous, distinctly several-veined, abruptly contracted to a broadly cuneate base and a thick stipe < 1 mm, upper part gradually narrowed to a rather broad and short beak ca. 2 mm, orifice 2-toothed. Achenes rather tightly enveloped, broad-obovate to elliptic, trigonous, 3.5 × 1.7 mm, base with short-stipe, style-base not thickened, stigmas 3.

Locality: Sai Kung (Tai Long Wan), Pak Shek Kok. *J. C. Shaw 393; S. C. Ng 1392; Y. W. Lam 1767.*

Distribution: Guangdong, Guangxi, Liaoning, Hebei, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; Russia (Far East), Korea, Japan.

Ecology: Coastal sandy beaches. Grow in mobile sand at the seaward margin of sand dune vegetation, alt. 0–2 m. Fruiting: Apr.–Oct.

20. Carex chinensis Retz. 中華薹草 **(Photos 119–120)**

Retz. Observ. Bot. 3: 42. 1783; FHK 402. 1861; C. B. Clarke, J. Linn. Soc. Bot. 36: 280. 1903–04; FKH 305. 1912; FFJ 6: 371, fig. 338. 1995; FRPS 12: 314. 2000; FGD 8: 383. 2007; FOC 23: 386. 2010.

Rhizome short and woody, obliquely ascending, covered with brown fibers formed from old disintegrating leaf sheaths. Culms tufted and borne in leave axils, oblique to erect, slender, 20–55 cm tall, obtusely trigonous, basal sheaths brown and tinging reddish. Leaves longer than the culm, 3.5–5.5 mm wide, margins scabrid, papery. Bracts with short leaf blade, 8–12 cm, sheath long, 1–3 cm. Spikes 4–5, distant; male spike terminal, narrow-lanceolate to linear, 2.5–3 × 2.5–5.2 mm; peduncle 2–3 cm; lateral, spikes almost completely pistillate 2–3.5 cm × 6–6.5 mm, female spikelets 26–75, rather densely distributed on spikes; peduncles erect, slender, 2.5 – 4.5 cm. Male glumes 4.5–6.5 mm, oblanceolate to oblong, apex with awn, light brown. Female glumes oblong, apex truncate or sometimes emarginate or acuminate, 4.5–5.7 × 0.6–0.9 mm, pale, the midrib extend into a scabrid long awn, 1–2 mm. Utricles slightly shorter than the glume, obliquely patent, rhomboid-elliptic, trigonous, 3–3.5 mm, membranous, yellow-green, sparsely puberulent, many-veined, upper part abruptly contract into a medium beak, orifice 2-toothed, base attenuate into a stipe. Achenes tightly enveloped, rhomboid, trigonous, 1.7–2.2 × ca. 1 mm wide, upper part broadly acute, beak short, apex annulate or rarely not so; style thickened at base; stigmas 3.

Locality: Hong Kong Island, Tai Po, Lamma Island, Lantau Island. *H. C. Tang 1232, 2351; Y. S. Lau 2703; S. P. Lau 86.*

Distribution: Guangdong, Yunnan, Guizhou, Shaanxi, Sichuan, Hunan, Jiangxi, Zhejiang, Fujian.

Ecology: Fairly common in montane hillside open forests, alt. 100–800 m. Fruiting: Mar.–Apr.

21. Carex arisanensis Hayata 阿里山薹草

J. Coll. Sci. Univ. Tokyo 30: 378. 1911 et Icon. Pl. Form. 6: 130, pl. 18. 1916; FTW 5: 349. 1978; FTW ed. 2, 5: 200. 2000; FRPS 12: 348–349. 2000; FGD 8: 388. 2007; FOC 23: 400. 2010.

Rhizome short. Culms lateral and borne in axils of leaves, 10–40 cm tall, slender and flaccid, trigonous, smooth, base of culms with short leafy-sheaths. Leaves shorter or longer than the culm, linear, 4–8 mm wide, flat, soft herbaceous. Upper bracts spathe-like, upper part glumaceous to rarely with short lanceolate leaf blade 5–10 mm, sheath less than 2 mm to not exist; lower bracts have longer leaf blade, 1–4 cm, and longer sheaths 2–4 mm. Spikes (2–)3–4, terminal spike staminate, lanceolate-oblong, 5–8 mm, peduncle short, < 2 mm to sessile, very close to the adjacent pistillate spike; lateral spikes all pistillate, oblong to elliptic, 8–10 cm, spikelets very few, 2–3(–4), densely clustered; peduncles of upper spikes short to almost absent, lower spikes with slender and rather flaccid peduncles up to 3 cm long-exserted beyond the bract sheath. Male glumes oblong to elliptic, 3–4 × ca. 1.5 mm, apex broad-acute or obtuse, midrib green, margin broad hyaline. Female glumes ovate-oblong, 3.5–5 × 1.2 mm, apex acute, pale, margin broad hyaline, midrib green. Utricles longer than glumes, ovate-fusiform, trigonous, 6.5–7 mm, glabrous, brown-green, membranous, many-veined, base cuneate, upper part attenuate to a long beak; orifice hyaline, emarginate, 2-toothed. Achenes tightly enveloped, obovate-elliptic, trigonous, ca. 3 mm, pale brown; style base not thickened; stigmas 3.

Locality: Sunset Peak, Tai Mo Shan. *Y. W. Lam 1392, 2269; H. G. Ye. et al. 1163, 1168.*

Distribution: Guangdong, Guangxi, Hunan, Taiwan.

Ecology: Montane hillside forests, usually in wet seepages or streamsides, alt. 600–900 m. Fruiting: Feb.–Apr.

22. Carex nexa Boott ex Benth. 聯結薹草

FHK 402. 1861; Boott, Ill. Gen. Carex 4: 194. 1867; C. B. Clarke, J. Linn. Soc. Bot. 36: 300. 1903–04; FKH 306. 1912; FRPS 12: 211. 2000 *pro syn. sub C. ligata* Boott ex Benth.; FGD 8: 374. 2007; FOC 23: 319. 2010 *pro syn. sub C. ligata* Boott ex Benth.

Carex ligata Boott ex Benth. var. *nexa* (Boott ex Benth.) Kük., Pflanzenr. 38(IV, 20): 474. 1909.

Rhizome short and woody. Culms borne in leave axils, 30–50 cm tall, oblique to erect, slender, obtusely trigonous to flattened trigonous, smooth, basal sheaths dark brown and split into fibers. Leaves longer than or equal to the culm, 3–4.5 mm wide, flat, smooth dorsally and slightly scabrid along margins, papery. Bracts leafy, ca. 5 cm and longer than subtended spikes for lower bracts, becoming shorter and bristle-like towards top of culms; sheath greenish, 5–25 mm, getting shorter towards top of culms. Spikes 3–5, rather remote, regularly spaced; terminal spike staminate, linear, 5–6 cm × 1.8–2.2 mm, peduncle 2–3 cm; lateral spikes pistillate or androgynous, cylindrical, 2–3.5 cm × 3.5–3.9 mm, spikelets 18–35, and fairly densely distributed on spikes, peduncle slender 6–40 cm, getting shorter towards top of culm. Male glumes oblanceolate to oblong-obovate, apex acute, 6.7–7.5 × 1.3–1.4 mm, yellowish to brownish, hyaline, 1–3-veined at the middle, midrib brown. Female glumes oblong, 3.1–3.6 × 0.9–1.1 mm, apex acute, acuminate to shortly awned, pale yellowish green to brownish, midrib brown. Utricles longer than the glume, slightly curved outward from the rachis, elliptic-fusiform, trigonous, 3.2–3.7 × 0.9–1 mm, membranous, many-veined, base cuneate with short stipe, gradually attenuate above to a beak ca. 0.5 mm, orifice minutely 2-toothed. Achene tightly enveloped, elliptic-fusiform, trigonous, 2.1–2.3 mm; upper part of the achene form into an ivory-coloured, cylindrical crown 0.1–0.2 mm, shallowly concave to flat at top; faces slightly depressed at both

the upper and lower part, middle of achene ridges excavated, base attenuate into a stipe ca. 0.2 mm; style base thickened; stigmas 3.

Locality: Victoria Peak, D'Aguilar Peak, Ma On Shan, Castle Peak, Tung Lung Chau, Shek Pik, Ngong Ping (Lantau Island). *S. C. Ng 1169; HK sheet 8219, 14015, 42197.*

Distribution: Guangdong, Fujian.

Ecology: Hillside open forests, alt. 500–900 m. Fruiting: Mar.–May.

Notes: The type specimens (*C. Harland 790 ex parte* (K); *C. Wright 100, 607* (K)) were collected from Hong Kong Island in 1850s. This species was treated as a variety of *C. ligata* by Kükenthal (1909) FRPS and FOC have considered it a synonym of *C. ligata*. I have examined the type specimens of these two species at K, and found their differences are significant enough to be considered as different species. The achene of *C. ligata* is rhombic and without excavation at the middle of the achene. The male spikelet of *C. ligata* is narrow-cylindrical, and the male glumes are greenish in colour and much shorter than that of *C. nexa*.

23. Carex harlandii Boott 長囊薹草 **(Photo 121)**

Ill. Gen. Carex 2: 87, pl. 255. 1860; FHK 403. 1861; C. B. Clarke, J. Linn. Soc. Bot. 36: 289. 1903–04; FKH 306. 1912; FFJ 6: 371, fig. 339. 1995; FRPS 12: 323, pl. 65: 1–4. 2000; FGD 8: 384. 2007; FOC 23: 393. 2010.

Carex anomocarya Nelmes, Kew Bull. 1950: 202. 1951; FHN 4: 344. 1977; Fl. Malesiana Ser. I 9(1): 144, fig. 120: 22, fig. 128. 1979.

Rhizome thick and woody, covered with fibers of disintegrating leaf sheath. Culms lateral or borne in axils of leaves, oblique to erect, 30–90 cm tall, trigonous, smooth, basal leaves 2–5, ranging from short and sheath-like to long leaf-like equal to culms. Leaves of sterile ramets longer than the culm, broad-linear, 10–25 cm wide, flat, base plicate, upper margins slightly scabrous, papery, apex acuminate. Bracts leafy, with sheath, lower bracts longer than the subtended spikelets, becoming shorter for upper bracts. Spikes (2–)3–4 at the upper part of culm, upper spikes close, more distally spaced down the culm. Male spike terminal, linear-cylindrical, 4.5–7 cm, peduncle short to almost absent. Lateral spikes androgynous, pistillate on the lower four-fifths or more, cylindrical, 5–8 cm × 8–10 mm wide, spikelets 28–70, rather densely distributed on spikes, peduncles 5 cm or less. Female glumes ovate-oblong or oblong, ca. 6 mm (including awn), pale-green, 3-veined, midrib excurrent into a scabrous awn ca. 1.8 mm. Utricles longer than the glumes, 8–9 mm (including beak), obliquely patent, elliptic-rhomboid, papery, brown, yellow-green or green, glabrous, many-veined, lower part attenuate toward base, upper part attenuate into a long beak 3.3–3.8 mm, orifice 2-toothed. Achenes tightly enveloped, rhomboid-elliptic, trigonous, 5–5.7 mm, yellow-brown to dark brown, middle of the achene constricted on angles, base attenuate into a curve stipe, upper part attenuate to a robust and erect cylindrical beak, apex of beak annulate; style base thickened conical, stigmas 3.

Locality: Mount Nicholson, Shek O, Kowloon Peak, Tai Mo Shan, Soko Islands. *Y. W. Lam 1393, 2085; J. C. Shaw 365.*

Distribution: Guangdong, Guangxi, Hainan, Fujian, Anhui, Zhejiang, Jiangxi, Hubei; Myanmar, Thailand, N Vietnam, Indonesia.

Ecology: Common in hillside and lowland forests, alt. 10–700 m. Fruiting: Feb.–Jun.

Notes: The type specimen was collected by C. Harland from Hong Kong Island in 1850s.

24. Carex canina Dunn 長柄薹草(果柄薹草) **(Photo 122)**

J. Bot. 47: 325. 1910; FKH 305. 1912; FGD 8: 385. 2007.

Carex hastata Kük., Fedde Repert. Spec. Nov. Regni Veg. 27: 110. 1929, syn. nov.; FRPS 12: 325, pl. 70: 9–11. 2000; FOC 23: 394. 2010.

Carex lianchengensis S. Y. Liang et Y. Z. Huang, FFJ 6: 690. 1995, syn. nov.; FRPS 12: 334. 2000 [*"lienchengensis"*]; FOC 23: 396. 2010.

Rhizome short, woody, covered with fibers of dark brown disintegrating leaf sheath. Culms lateral to tufted and borne in axils of leaves, 25–40 cm tall, slender, trigonous, upper part scabrid, basal sheaths bladeless or having short leaf blade less than 8 cm. Leaves longer than or equal to the culms, linear, 4–6 mm wide, flat, stiff papery, margins scabrid. Bracts short leafy; sheath short, 3–4 mm. Spikes 2–3, cluster towards the top of culms, uppermost lateral spikes almost at the same height as the terminal spike; terminal spike staminate, linear, ca. 1 cm, peduncle short, 3–9 mm; pistillate spikes lateral, oblong-ovate to ovate, 10–15 × 7–10 mm, spikelets very few, only 2–7, but densely distributed on spikes, peduncle short 7–13 mm. Male glumes lanceolate, ca. 3.8 × 1.5 mm, apex obtuse, pale green, midrib green. Female glumes ovate, 5–7 × 2–2.5 mm, apex acute, pale green, 3-veined, green. Utricles longer than the glume, obliquely patent, rhomboid, 7.5–9.2 mm, membranous, yellow-green, glabrous, finely many-veined, base cuneate, upper part abruptly contracted above to a beak 1.5 × 2 mm, orifice 2-toothed. Achenes tightly enveloped, elliptic, trigonous, up to 4.3–5 mm, yellow-brown to black, middle of achene constricted to excavated, base attenuate into a short erect stipe 0.5–1 mm, upper part attenuate into an erect and robust cylindrical beak ca. 1 mm, apex of beak annulate; style-base thickened, stigmas 3.

Locality: Sunset Peak. *S. C. Ng 2930, 3054, 3056; Y. W. Lam 1372.*

Distribution: Guangdong, Hunan, Fujian, Zhejiang.

Ecology: Montane hillside open forests, alt. 500–900 m. Fruiting: Feb.–Apr.

Notes: The type specimen (*S. T. Dunn 7154*, HK) was collected from Lantau Island in 1909.

The author has examined the types of *C. canina* and *C. hastata* (*Y. L. Keng 2353*, PE), and found them similar in their inflorescence, glumes, utricles and achenes, as well as their leaves and growth form. *Carex lianchengensis* (*H. B. Chen, s.n. [Chinese National Herbarium 28928]*, PE, isotype), is also similar to *C. canina* in all aspects apart from the culm and leaf length, which are not enough to separate two species, as size varies greatly among specimens of *C. canina* from Hong Kong. The author has noted small size plants of *C. canina* in the field comparable to the size of the isotype of *C. lianchengensis*.

FRPS mentioned that *C. lianchengensis* differs from *C. canina* in culm position. However, culm position is not a reliable character for separation of species in the section Rhomboidales Kükenthal to which all these species belong. Species in this section vary

within species with respect to the lateral culms position, which may be borne in axils of middle or lateral leaves, as demonstrated in *C. manca* and *C. harlandii*.

25. Carex pseudolaticeps Tang & F. T. Wang ex S. Y. Liang 彌勒山薹草
Acta Phytotax. Sin. 36: 536, fig. 3: 1–5. 1998; FRPS 12: 326, pl. 67: 1–5. 2000 ["*pseudo-laticeps*"]; FGD 8: 385. 2007; FOC 23: 394. 2010.

Rhizome short and woody with brown fibers of disintegrated leaf sheath. Plant pubescent throughout. Culms lateral or borne in axils of outer leaves, lateral culms with or without basal leaves, 7–35 cm tall, trigonous, base of culm with leafless sheath. Leaves longer than the culms, 6–12 mm wide, flat, base plicate, soft papery. Bracts short leafy to bristle-like, sheath up to 2.5 cm. Spikes 3–4, fairly close towards the top of culms; male spike terminal, narrowly cylindrical, ca. 3.5 cm, peduncle less than 3 cm; lateral spikes 3, androgynous, male part short at the top one-fifth to one-eighth, cylindrical, 1–4 cm, spikelets 13–48, rather densely distributed on spikes, peduncles 0.5–3 cm. Male glumes ovate, ca. 3.5 × 1.4 mm, apex rounded to broad-acute, hyaline, midrib green and keeled. Female glumes lanceolate, ca. 4.5 mm, pale greenish; midrib green, 3-veined and excurrent into a mucronate tip ca. 1.5 mm. Utricles longer than the glume, obliquely patent, ovate-elliptic, 7–7.5 mm, papery, green-brown, densely pubescent, many-veined, base attenuate, upper part attenuate to a long beak 2.8–3.2 mm, orifice 2-toothed. Achenes tightly enveloped, rhomboid-ovate to broad-elliptic, 4.2–4.5 mm, trigonous, middle of achenes constricted on the angles, black, base with a short curved stipe, upper part attenuate into an erect cylindrical beak 1.4–1.8 mm, apex of beak annulate; style base thickened at base; stigmas 3.

Locality: Ng Tung Chai, Nei Lak Shan. *S. C. Ng 2920, 3048.*

Distribution: Guangdong, Guangxi.

Ecology: Montane hillside forests, alt. 600–800 m. Fruiting: Mar.–Apr.

Notes: The type specimen (*C. L. Tso 20216*, PE, holotype) was collected from Nei Lak Shan, Lantau Island in 1929.

26. Carex zunyiensis Tang & F. T. Wang 遵義薹草
Acta Phytotax. Sin. 24: 241. 1986; FRPS 12: 336, pl. 70: 1–4. 2000; FYN 15: 772. 2003; Y. L. Zheng & Y. F. Deng, Guihaia 23(6): 542. 2003; X. F. Jing et al., J. Wuhan Bot. Res. 22(1): 51. 2004; FGD 8: 387. 2007; FOC 23: 397. 2010.

Rhizome short and woody. Culms lateral or in axils of outer leaves, 4–12 cm tall, much shorter than leaves, basal leaves sheath-like with leaf blade, 5–9 cm, or without leaf blade. Sterile leaves 25–60 × 0.8–1 cm, flat, base plicate, blade smooth on both sides, margins slightly revolute and scabrid, basal sheaths split into dark brown fibers. Bracts short leafy, longer than subtending spikelets but less than 8 cm for lower spikelets, pale yellowish to pale greenish. Spikes 2–3, close together towards top of culm; male spike terminal, linear-cylindrical, 3–3.5 cm × ca. 2 mm; female spikes lateral, oblong-cylindrical, 2.5–3 × ca. 1 cm, spikelets many and dense on the spikes, peduncle short 0.8–1 cm. Male glumes narrow-oblong to lanceolate, ca. 3.4 × 0.8 mm, apex acuminate, yellowish, midrib 3-veined. Female glumes lanceolate, 4.5–5.8 mm, apex acute, greenish yellow to pale yellow, margins scabrous, midrib raised. Utricles longer than the glume, obliquely patent, elliptic, 4–5 × 2.1–2.4 mm, thin papery, pale yellow to green, many-veined, base cuneate, upper part contracted into an erect cylindrical beak ca. 2.2 mm, orifice 2-toothed. Achenes 4.3–4.9 × 2.4–2.6 mm, tightly enveloped, pale yellow to yellowish brown, ovate-elliptic, trigonous, middle of achene excavated on the angles, base cuneate into a short and slightly curved stipe, upper part contract into a short curved beak ca. 1 mm, apex of beak annulate; stigmas 3.

Locality: Sunset Peak. *S. C. Ng 2161, 3055.*

Distribution: Guangdong, Guangxi, Guizhou, Anhui, Zhejiang.

Ecology: Montane hillside open forests, alt. 500–900 m. Fruiting: Jan.–Apr.

Notes: A distinctive species characterised by its short inflorescence borne near or half-buried in the ground.

27. Carex tenebrosa Boott 芒尖鱗薹草(薄葉薹草)
Ill. Gen. Carex 2: 88, t. 256. 1860; FHK 402. 1861; C. B. Clarke, J. Linn. Soc. Bot. 36: 313. 1903–04; FKH 306. 1912; FRPS 12: 331–332. 2000; FGD 8: 386. 2007; FOC 23: 395. 2010.

Rhizome stout and woody, with dark brown fibers of disintegrating leaf sheath. Dried specimen dark olive-green. Culms central or lateral with basal leaves, 80–100 cm tall, trigonous, smooth, leathery. Leaves longer than the culms, 5–8 mm wide, flat to moderately revolute, margins scabrid, leathery. Lower bracts leaf-like, ca. 8 cm, reducing to setaceous for upper bracts, scabrous, sheath less than 5 cm. Spikes 3–4; male spike terminal, broad-linear with tapering ends, 4–9 cm, peduncle long, < 10 cm; lateral spikes 2–3, androgynous, male part about two- to three-fifths of the spike, cylindrical, 6–9.5 cm, spikelets 80–100 and very densely distributed on spikes, peduncle long for lower spikes, become shorter for upper spikes, 3–20 cm. Male glume oblong, 5–6 × 1.4–2.5 mm, apex emarginate to truncate with a hispid awn ca. 1.5 mm, membranous, pale brown. Female glumes oblong, 6.5–7.5 × 2.2–2.8 mm, apex truncate to emarginate, brown-green, the midrib project extend into a scabrous awn 3–4 mm. Utricles longer than the glume, rhomboid, 7–8.5 mm, stiff papery, dark olive-green, many-veined, base cunneate, sparsely hispid on margins, upper part attenuate into a long beak 3–4 mm, margin of beak scabrous along margins, orifice deeply 2-toothed. Achenes tightly enveloped, 4.7–5 × ca. 2 mm, rhomboid, trigonous, middle of achenes constricted, upper part contracted to an erect or slightly oblique cylindrical beak 1.5–2 mm, apex of beak slightly inflated; style-base slightly thickened; stigmas 3, rather long.

Locality: Victoria Peak, Happy Valley, Ma On Shan, Pai Ngak Shan, Sunset Peak. *S. C. Ng 1226, 2152; HK sheet 42079.*

Distribution: Guangdong.

Ecology: Montane hillside open forests, alt. 500–900 m. Fruiting: Feb.–Apr.

Notes: The species was reported as *Carex thibetica* Franch. previously (Check List HK Plants 308. 2002; 109. 2004).

28. Carex manca Boott ex Benth. 彎柄薹草(紅苞薹草)

FHK 402. 1861; Boott, Ill. Gen. Carex 4: 131, t. 425. 1867; C. B. Clarke, J. Linn. Soc. Bot. 36: 297. 1903–04; FKH 306. 1912; FFJ 6: 372. 1995; FRPS 12: 319. 2000; X. F. Jing et al., J. Wuhan Bot. Res. 22(1): 50. 2004; FGD 8: 384. 2007; FOC 23: 391. 2010.

Rhizome thick and short, woody, covered with brown disintegrating leaf sheath. Culms lateral or borne in axils of leaves at the outside, oblique, slender, 30–70 cm tall, trigonous, smooth, base of culms with leafless sheathes. Basal leaves shorter than the culms (7–10 cm) or absent; leaves of sterile ramets longer than the culms, 6–8.5 mm wide, flat, leaf base plicate, papery, upper margins scabrid, adaxial side pale green. Bracts with short leaf blade, 1 cm or less, sheath loose, 1–2.5 cm. Spikes 2–3; male spike terminal, linear-cylindrical, 3.5–4.5 cm, borne on long peduncle 5.5–7.5 cm; lateral spikes androgynous, female for the lower half to two-thirds, oblong-cylindrical, 2–3 cm, female spikelets 12–18, rather loosely distributed on spikes, peduncles less than 7 cm. Male glumes oblanceolate-oblong, ca. 7 mm × 2–2.4 mm, apex acute, pale to yellow-brown, hyaline, midrib 3-veined green. Female glumes oblong-lanceolate or ovate-lanceolate, ca. 5.5 mm, apex acute to rounded, or rarely truncate or emarginate, pale to yellowish, 3-veined, green; midrib extend into a short mucronate point or rarely with an awn to 1.2 mm. Utricles longer than the glume, rhomboid-elliptic, trigonous, 6–6.5 mm, membranous, many-veined, yellow-green, upper part sparsely puberulent and abruptly contracted above to a smooth long beak ca. 2 mm, orifice 2-toothed, base cuneate into a short beak. Achenes tightly enveloped, yellow-brown to dark brown, ovate to broad-elliptic, 3–4 mm (including beak), trigonous, angles constricted at the middle, upper part abruptly contracted into a cylindrical beak which is often curved, base abruptly end in a curved stipe; stigmas 3.

Locality: Victoria Peak, Pok Fu Lam, Tai Mo Shan, Ma On Shan. *S. C. Ng 1344; HK sheet 42076, 42077.*

Distribution: Guangdong, Hubei.

Ecology: Montane hillside open forests, alt. 200–500 m. Fruiting: Mar.–Apr.

Notes: The type specimen (*C. Harland 790 ex parte* (K)) was collected from Hong Kong Island in 1850s.

2. Lepironia Rich. 石龍芻屬

Robust, rhizomatous perennial. Culms terete, transversely septate. Leaves reduced to bladeless sheaths. Inflorescence bract 1, erect, continuous with the culm. Inflorescence pseudolateral capitate or a single spike. Spikes comprising many spirally imbricate glume-like bracts (spicoid bracts), each subtending a partial inflorescence (spicoid) with a much reduced axis. Spicoids comprising a single naked female flower, and many scale-like floral bracts, the 3–4 immediately below the female flower empty, the remainder subtending a male flower comprising 1 stamen, the lowest 2 opposite and keeled. Preianth bristle absent. Stigmas 2. Achenes dorsiventrally flattened, ± smooth to longitudinally ribbed.

One species from Madagascar, India, Sri Lanka, SE & E Asia to Australia and Pacific islands; also in China and Hong Kong.

1. Lepironia articulata (Retz.) Domin.

石龍芻(蒲草、肇慶草) **(Fig. 52; Photo 123)**

Biblioth. Bot. 85: 486. 1915; FHN 4: 269. 1977; FTW ed. 2, 5: 286. 2000; FGD 8: 349. 2007; FOC 23: 171. 2010.

Restio articulatus Retz., Observ. Bot. 4: 14. 1786.

Lepironia mucronata Rich., Syn. Pl. 1: 70. 1805; FKH 301. 1912; FRPS 11: 202. 1961.

Perennial. Rhizome with greyish brown scales at least distally. Culms crowded in row along rhizome, stiff, 10–120 cm tall, 2–7 mm thick, terete, smooth. Leaf sheath open, the uppermost 12–26 cm long. Apex obliquely truncate. Involucral bract subulate, terete, 2.2–6 cm long. Inflorescence comprising 1 spike. Spike elliptic or oblong, terete, 10–35 × 3–7 mm, green to chestnut brown or purplish brown. Spicoid bracts oval, ovate-orbicular, 3.2–6.7 × 3–6.2 mm, apex rounded and often weakly recurved, easily detaching when mature. Spicoids ± equalling spicoid bracts. Floral bracts up to 15, lowest 2 linear-lanceolate, 4–6 mm long, keel ciliate. Achenes ovate or obovate to broadly obovate, biconvex, 3–4 × 2–2.8 mm (excluding 0.5 mm long beak), hard, brown, ± smooth to indistinctly longitudinally veined, often spinulose at apex.

Locality: Cultivated in gardens. *Y. W. Lam 1776; K. L. Yip 4204; HK sheet 20634.*

Distribution: Guangdong; Madagascar, India, Sri Lanka, Laos, Thailand, Vietnam, Cambodia, Malesia, Micronesia, Australia, New Caledonia and Fiji.

Ecology: Flowering & fruiting: Feb.–Jun.

Uses: Weaving.

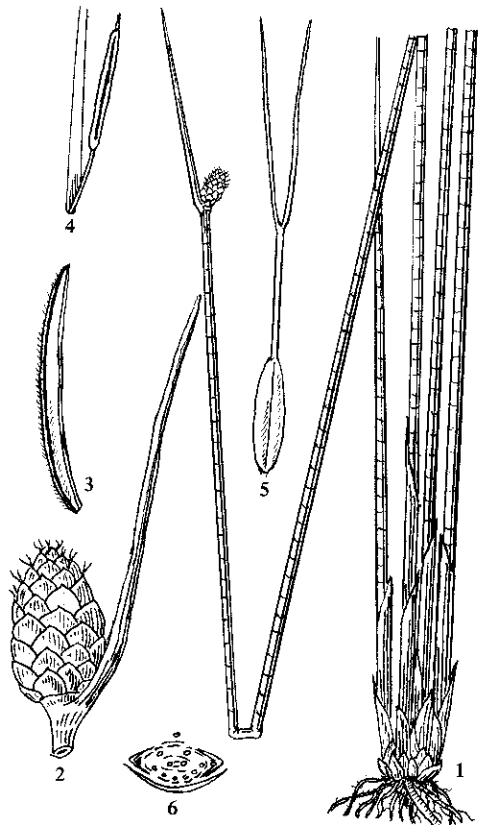

Figure 52. *Lepironia articulata* (Retz.) Domin.

1. plant; *2.* spike; *3.* spicoid bract; *4.* male flower; *5.* female flower; *6.* spicoid diagram. (drawn by H. P. Yu)

3. Mapania Aubl. 擂鼓薤屬

Robust, stonoliferous or rhizomatous perennials; rhizomes woody, roots coarse. Culms central or lateral (arising from lower leaf axils or below the leaves), the latter with cataphylls at base. Leaves 3-ranked, basal or cauline; blade linear to oblong, leathery; pseudopetiole present or absent; ligule absent. Involucral bracts leaf-like in capitate and centrally culmed species, otherwise glume-like. Inflorescence paniculate, capitate with few to many spikes or a single spike only. Spikes comprising few to many spirally imbricate glume-like bracts (spicoid bracts), each subtending a partial inflorescence with a much reduced axis (spicoid). Spicoid comprising a naked, terminal female flower and 6 scale-like floral bracts, the lowest 2 opposite, keeled, the lowest 3 subtending a male flower comprising 1 stamen, the remainder empty. Perianth segments absent. Stigmas 3 (or rarely 2). Achenes with a hard or succulent exocarp, smooth or sculptured, lateral costae or furrows 0 or 2–3.

About 80 species in the tropics; three species in China; one species in Hong Kong.

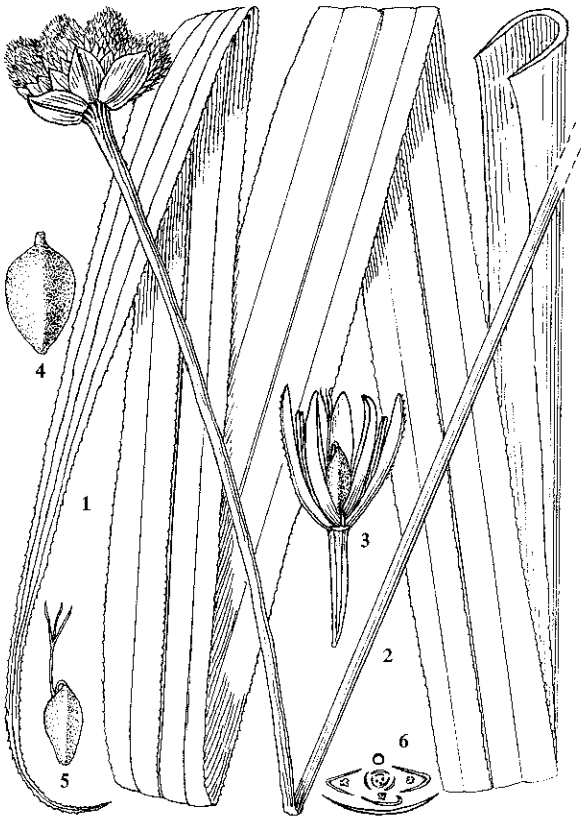

Figure 53. *Mapania silhetensis* C. B. Clarke
1. leaf; *2.* inflorescence; *3.* spicoid; *4.* achene; *5.* achene with stigma; *6.* spicoid diagram. (drawn by H. P. Yu)

1. Mapania silhetensis C. B. Clarke
華擂鼓薤(擂鼓薤) **(Fig. 53; Photos 124–125)**
Fl. Brit. India 6: 681. 1894; FOC 23: 170. 2010.

Mapania sinensis H. Uittien, Recueil Trav. Bot. Néerl. 33: 288. 1936; FRPS 11: 197. 1961.

Mapania wallichii auct. non C. B. Clarke: FGD 8: 350. 2007, *p.p.* quod syn. *M. sinensis* H. Uittien; Check List HK Plants 317. 2002.

Perennial. Rhizomes thick, woody. Culms lateral, 25–55 cm tall, ca. 3 mm thick, with several cataphylls toward base. Leaves basal, distichous; leaf sheath brownish, ca. 12 cm, margin thickly membranous; leaf blade ca. 130 × 2.5–3.5 cm or longer, subleathery, smooth, 3-veined, apical margin and abaxial midvein serrulate, apex caudate to acuminate. Involucral bracts brown, glume-like, ovate to ovate-deltate, 1.5–2.5 cm, shorter than inflorescence, leathery, apex acute. Inflorescences capitate, broadly ovoid, 2–4.5 × 1.5–2 cm, with 4 spikes fascicled at apex of culm, with many glume-like bracts and spicoids. Glume-like bracts straw-coloured, spirally and imbricately arranged, narrowly oblong, ca. 1 cm, papery, apex obtuse. Spicoids with 6 glumes, 3 male flowers, and 1 female flower; basal 2 glumes opposite, cymbiform, membranous, keeled, spinulose on apical part of keel, each subtending 1 male flower; remaining 4 bracts narrowly oblong, outermost one subtending a male flower. Filaments to 1.6 cm; anthers linear, 7–8 mm. Style ca. 6.5 mm; stigmas 3. Achene dark brown, obovoid, 4–4.5 mm, obtusely 3-sided, outer surface succulent, apex conically rostrate.

Locality: Sai Kung, Wong Chuk Yeung, Pat Sin Leng, Wang Shan Keuk. *F. W. Xing 6973, 7161.*

Distribution: Guangdong, Guangxi; Bangladesh, India, Vietnam.

Ecology: Forests. Flowering & fruiting: Sep.–Oct.

4. Hypolytrum Rich. 割雞芒屬

Moderately robust to robust, stoloniferous or rhizomatous perennials; roots coarse. Culms central or lateral, the latter with cataphylls at base. Leaves 3-ranked, basal or cauline; blade leathery, glabrous, pseudopetiole present or 0; ligule absent. Involucral bracts leaf-like, basal bract usually longest. Inflorescence usually an open compound panicle, more rarely capitate with 1–many spikes. Spikes comprising many spirally imbricate glume-like bracts (spicoid bracts) each subtending a partial inflorescence (spicoid) with a much reduced axis. Spicoids comprising a naked, terminal female flower and 2(–3) scale-like floral bracts, all subtending a male flower comprising 1 stamen, the lowest 2 floral bracts opposite, keeled. Stigmas 2–3. Achenes sculptured, often with spongy conical apex.

About 60 species distributed in pantropical regions; four species in China; two species in Hong Kong.

1a. Culms lateral; inflorescences capitate with 1–many spikes; basal involucral bracts much shorter than inflorescences ..... 1. *H. hainanense*

1b. Culms central; inflorescences paniculate with many spikes; basal involucral bracts much longer than inflorescences ..... 2. *H. nemorum*

1. Hypolytrum hainanense (Merr.) Tang & Wang 海南割雞芒 **(Photos 126–127)**

FRPS 11: 201. 1961; FGD 8: 352. 2007 ["*hainanensis*"]; FOC 23: 169. 2010.

Mapania hainanensis Merr., Lingn. Sci. J. 9: 35. 1903.

Perennial. Roots fibrous. Rhizomes stout, woody. Culms lateral, 30–40 cm tall, 3-angled, basally with several scales and bladeless sheaths. Basal scales broadly ovate. Bladeless sheaths dark greyish brown, densely spirally arranged. Leaves basal, tufted; leaf sheath reddish, to 14 cm, not closed, slightly folded, smooth, margin thickly membranous; leaf blade flat, ca. 1 m × 1–1.8 cm, gradually narrowed towards apex, papery, glabrous, margin and abaxial midvein serrulate. Involucral bracts 2–3, leaf-like, 1.5–5 cm, slightly longer than inflorescence; basalmost bract sheathing. Inflorescences a corymbose panicle congested into a head, 1.3–2 × 1.5–2.5 cm, with many spikes. Spikes narrowly ellipsoidal, becoming globose in fruit, 5–6 mm in diam., with many glume-like bracts and spicoids. Glume-like bracts yellowish brown, spirally and imbricately arranged, oblong-obovate, 2.5–3 mm, leathery, punctate, keeled, each subtending a spicoid. Spicoids ca. 2 mm, with 2 glumes, 2 male flowers, and 1 female flower; glumes dark greyish brown, lateral and opposite, narrowly elliptic and cymbiform, ca. 2.5 mm, keeled, membranous, connate on adaxial side, spinulose on keel, each with a male flower. Anther narrowly oblong; connective apex not prominent beyond anther. Stigmas 2. Achenes dark greyish brown, broadly obovoid to ovoid, ca. 3 mm, biconvex, irregularly longitudinally rugose, apex with a conical beak.

Locality: Tai Po Kau. *S. C. Ng 1413.*

Distribution: Hainan.

Ecology: Forests and thickets, wet places along streams. Flowering & fruiting: May–Aug.

2. Hypolytrum nemorum (Vahl) Spreng.

割雞芒(海蒔利) **(Fig. 54; Photo 128)**

Syst. Veg. 1: 233. 1825; FHN 4: 271. 1961; FTW ed. 2, 5: 283. 2000; FYN 15: 667. 2003; FGD 8: 352. 2007; FOC 23: 168. 2010.

Schoenus nemorum Vahl, Symb. Bot. 3: 8. 1794.

Hypaelyptum nemorum (Vahl) P. Beauv., Fl. Oware 2: 13. 1810.

Hypolytrum latifolium Rich. ex Pers., Syn. Pl. 1: 70. 1805; FHK 389. 1861; FKH 301. 1912; FRPS 11: 199. 1961.

Rhizomes short, slightly thick, woody, with dense reddish scales. Culms central, 35–90 cm tall, 1–3 mm thick, trigonous, smooth to scabrid. Leaves mostly basal or 1–2 cauline; blade linear, 6–130 × 1–2.3 cm, apex and base gradually narrowed, 3-veined; pseudopetiole absent; basal sheaths 2–15 cm, reddish brown to purple, cauline sheaths light purple or cinnamon brown. Involucral bracts 2–3, leaf-like, 10–40 cm, much longer than the inflorescence. Inflorescence an open panicle, hemispherical or broadly ovoid, 2–7 × 3–10 cm, comprising up to 10 primary peduncles each subtending up to 6 secondary peduncles terminating in 1–3 sessile or shortly stalked spikes. Spikes ± elliptic-globose, 3–7 × 2.5–6 mm, light to mid-brown. Spicoids bracts ovate-orbicular 1.3–2.5 × 1.2–2 mm, apex rounded. Spicoids ± equalling the spicoid bracts. Floral bracts 2, free or ± connate on abaxial side, 1.2–1.8 mm long, keel ciliate. Stigmas 3. Achenes broadly ovoid, 1.8–3 × 1.3–1.5 mm, apex conical, irregularly 2–5-ridged.

Locality: Common in Hong Kong. *Y. S. Lau 2247; Y. W. Lam 1308, 2052.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; tropical Asia, Africa.

Ecology: Forests and thickets. Flowering & fruiting: Apr.–Aug.

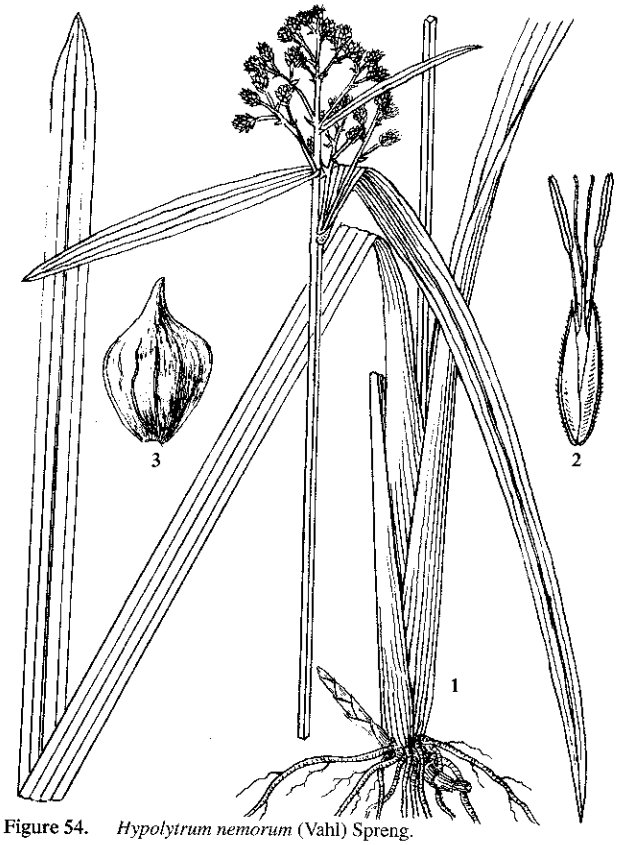

Figure 54. *Hypolytrum nemorum* (Vahl) Spreng.
1. plant; *2.* spicoid; *3.* achene. (drawn by H. P. Yu)

5. Diplacrum R. Br. 裂穎茅屬

Small or medium-sized annuals, occasionally perennial. Leaves basal and cauline, linear; ligule absent; contraligule absent. Inflorescence comprising of few to many head-like clusters of spikelets borne from the axils of leaf-like bracts, usually almost throughout the length of culm. Spikelets unisexual, the female spikelets with 3–4 glumes and terminated by a female flower; male spikelets large, otherwise minute. Perianth segments absent. Stamen 1. Stigmas 3. Achenes tightly enveloped in 2 subtending glumes and falling off with them, pericarp bony, irregularly rugose, reticulate or smooth. Disk obsolete, adnate to base of the achene.

Six species in the tropics of both hemispheres; one species in China and Hong Kong.

1. Diplacrum caricinum R. Br.
裂穎茅 **(Fig. 55; Photos 129–130)**

Prodr. 241. 1810; FKH 304. 1912; FGZ 766. 1956; FRPS 11: 217. 1961; FTW ed. 2, 5: 254. 2000; FGD 8: 362. 2007; FOC 23: 269. 2010.

Scleria caricina (R. Br.) Benth., Fl. Austr. 7: 426. 1878.

Small, diffuse, slender annual. Culms loosely tufted, 10–30 cm tall, ca. 1 mm thick, sharply triquetrous, smooth, glabrous. Leaves basal and cauline, linear, 1–4 × 0.2–0.5 cm, apex shortly acute, margin minutely scabrous toward apex; sheaths slightly dilated upwards, wingless. Inflorescence consisting of axillary clusters of spikelets almost throughout the length of the culm; spikelets unisexual, 1–2 mm long; peduncles short, scarcely exserted from the leaf sheath. Primary bracts leaf-like. Male spikelets ca. 1.5 mm long, few-flowered. Stamen 1; filament up to 1.5 mm long; anther oblong, ca. 0.4 mm long. Female spikelet ca. 2 mm long. Glumes paired, ca. 2 mm long, broadly oblong, apex 3-lobed, side thinly membranous, 5–8-veined, pale greenish. Stigmas 3. Achenes tightly enveloped by 2 subtending glumes and falling off with them, globose, 0.7–1 mm in diam., umbonulate at apex, with 3 prominent, longitudinal ribs, irregularly ribbed, slightly hispidulous at apex, whitish. Disk adnate to base of the achene, obtusely triangular in outline.

Locality: Pok Fu Lam, Victoria Peak, Kwun Tong, Sai Kung, Tung Chung. *H. C. Tang 1399; Y. S. Lau 3184; Y. W. Lam 1626.*

Distribution: Guangdong, Guangxi, Hainan, Jiangsu, Fujian, Taiwan, Zhejiang; India, Sri Lanka, Vietnam, Thailand, Malaysia, Philippines, Japan, Micronesia, Australia.

Ecology: Farmlands and wastelands. Flowering & fruiting: Aug.–Oct.

Figure 55. *Diplacrum caricinum* R. Br.
1. plant; *2.* portion of inflorescence; *3.* female spikelet; *4.* glume of male spikelet; *5.* glume of female spikelet; *6.* achene. (drawn by H. P. Yu)

6. Scleria P. J. Bergius 珍珠茅屬

Annual or perennials. Rhizome usually woody, knotted. Culms solitary or tufted, usually erect, sometimes climbing or scrambling. Leaves cauline or basal and cauline, the latter sometimes apparently in whole; blade mostly linear; sheath closed, often 3-winged or terete; ligule absent; contraligule usually present. Inflorescence usually paniculate, bearing a terminal and 1–several (rarely none) lateral partial inflorescences, occasionally reduced and spike-like or capitate. Spikelets unisexual or bisexual; bisexual spikelets with terminal female flower and 1–several lateral male ones; female spikelets with a single female flower and 1–several lateral glumes (reduced male flowers); male spikelets with several to many glumes. Glumes spirally arranged or 2-ranked. Flowers unisexual. Perianth segments absent. Stamens 1–3 per male flower. Stigmas 3; style continuous with the ovary, caducous. Achenes terete or subtrigonous, mostly globose, ovoid or subpyramidal, with bony pericarp and a stipe-like, 3-lobed or cup-like, rarely indistinct disk attached at the base.

About 200 species in tropical and subtropical regions of both hemispheres, with the highest number of species in tropical America; 24 species in China; nine species in Hong Kong.

1a. Achene-bearing spikelets bisexual; disk at base of achenes either indistinct or stipe-like.
  2a. Culms 90 cm or more long; leaves 6 mm or more wide; lateral branches of inflorescence cymose, often binate ..... 1. *S. corymbosa*
  2b. Culms less than 90 cm long; leaves less than 6 mm wide; lateral branches of inflorescence often spicate, single ..... 2. *S. lithosperma*
1b. Achene-bearing spikelets usually female; disk at base of achenes lobed or cup-like.
  3a. Small annuals; rhizomes absent or not well developed.
    4a. Involucral bracts linear-lanceolate; achene ca. 1.5 mm in diam.; disk lobes obtuse ..... 3. *S. rugosa*
    4b. Involucral bracts setaceous; achene ca. 2 mm in diam.; disk lobes acute or acuminate.
      5a. Leaf sheath glabrous; disk ca. 1/2 height of achene; achene trisulcate, apex with yellowish white tip, surface smooth ..... 4. *S. laxa*
      5b. Leaf sheath villous; disk ca. 1/4–1/3 height of achene; achene spherical to obovoid-spherical, surface pitted with regular longitudinally elongate patterns ..... 5. *S. parvula*
  3b. Perennials; rhizomes well developed and prominent.
    6a. Culms terete or sometimes slightly 3-angled; leaf sheath wingless ..... 6. *S. harlandii*
    6b. Culms 3-angled or triquetrous; leaf sheath winged at middle part of culm.

7a. Contraligule oblong to oblong-lanceolate, 4–12 mm, glabrous ..... 7. *S. ciliaris*
7b. Contraligule depressed-rounded, semicircular or nearly semicircular, at most 4 mm, ciliate or glabrescent.
8a. Disk slightly 3-lobed, lobes broadly triangular, apex rounded; achene with white reticulation .... 8. *S. terrestris*
8b. Disk deeply 3-lobed, lobes lanceolate-triangular, apex acute; achene rugose ..... 9. *S. levis*

1. Scleria corymbosa Roxb. 伞房珍珠茅

Fl. Ind., ed. 1820, 3: 574. 1832; FGD 8: 354. 2007; FOC 23: 263. 2010.

Scleria ridleyi C. B. Clarke, Fl. Brit. India 6: 686. 1894; FHK 400. 1861; FKH 303. 1912.

Perennial; rhizome woody, horizontal. Culms solitary, 60–200 cm tall, 0.5–3 cm thick, triquetrous, glabrous, scabrid along angles. Leaves cauline; blade broadly linear, 30–70 cm × 6–25 mm, abruptly acute to subobtuse, flat; sheath 6–15 cm, green to brown; contraligule depressed-deltoid, brown. Involucral bracts leaf-like, the longest up to 47 cm, the lowest one longer than inflorescence, glabrous. Inflorescence paniculate, 35–80 cm; nodes 3–5, each subtending 2–3 long-pedunculate, corymbiform partial inflorescence. Spikelets bisexual and male, intermingled, solitary or in groups of 2–5; bisexual spikelets ovoid, 4–5 mm, with a male spikelet in axils of the uppermost glume; male spikelets ovate-lanceolate, 4–4.5 cm long, 7–8-flowered. Glumes broadly ovate to ovate-lanceolate, 3.5–4 mm, acute, mucronate, sides dark chestnut brown, glabrous. Stamens 3, anthers linear, ca. 2 mm. Achenes ovoid, trigonous, 3–3.5 × 2–2.5 mm, apex ± acute, base with 3 shallow depressions, shiny white, smooth, glabrous; disk triangular, adnate to base of achene.

Locality: Sunset Peak. *S. C. Ng 1534.*

Distribution: Hainan, Guangdong; Sri Lanka, India, Myanmar, Thailand, Laos, Cambodia, Malaysia, Indonesia, Philippines, Papua New Guinea.

Ecology: Wet and swampy forest floors, less frequently in open wet grassy places. Flowering & fruiting: Jun.–Dec.

2. Scleria lithosperma (L.) Sw. 石果珍珠茅

Prodr. 18. 1788; FHK 399. 1861; FKH 303. 1912; FRPS 11: 206. 1961; FTW ed. 2, 5: 312. 2000; FGD 8: 354. 2007; FOC 23: 263. 2010.

Scirpus lithosperma L., Sp. Pl. 51. 1753.

Perennial; rhizomatous woody. Culms loosely tufted, base bulbous, 40–80 cm tall, 1–2 mm thick, triquetrous, glabrous. Leaves cauline; blade narrowly linear, 8–40 cm × 1.5–4 mm, gradually narrowed, subobtuse; sheath 6–9 cm, reddish brown, puberulent; contraligule depressed-rounded or depressed-deltoid, ciliate. Lowest involucral bracts leaf-like, up to 10 cm. Inflorescence paniculate, with 3–4 nodes each subtending a single, open, pedunculate narrow partial inflorescence, sometimes the whole inflorescence becoming ± spike-like; peduncles filiform. Spikelets bisexual, 1–3, ovate-turbinate, 3–5 mm long. Glumes ovate, 3–4 mm long, acuminate or acute, mucronate, sides membranous, glabrous, rusty brown, stamens 1(–2). Achenes obovoid-ellipsoidal, trigonous, 2–2.8 × 1.7–2 mm, apex rounded, base cuneate with 3 depressions, shiny white, smooth; disk small, annular.

Locality: Aberdeen, To Tei Wan, Middle Island. *Y. W. Lam 1514; J. C. Shaw 559; HK sheet 8209.*

Distribution: Guangdong, Hainan, Taiwan, Yunnan; tropics.

Ecology: Semi-dry open grassy places, floors and margins of forests, particularly near the coast. Flowering & fruiting: Jun.–Oct.

3. Scleria rugosa R. Br. 皱果珍珠茅 **(Photos 131–132)**

Prodr. Fl. Nov. Holland. 240. 1810; FTW ed. 2, 5: 312. 2000; FYN 15: 669. 2003; FGD 8: 360. 2007; FOC 23: 263. 2010.

Scleria onoei Franch. & Savat., Enum. Pl. Jap. 2: 122, 549. 1879; FRPS 11: 209. 1961.

Annual; rhizome absent. Culms densely tufted, 10–35 cm tall, 0.7–1.5 mm thick, triquetrous, pubescent. Leaves cauline; blade narrowly linear, 5–15 cm × 2–4 mm, ± obtuse, folded, pubescent; sheath 1.5–3.5 cm long, narrowly winged or wingless, pale to mid-brown; contraligule rounded-deltoid to suborbicular, ciliate. Lowest involucral bracts leaf-like, up to 14 cm. Inflorescence paniculate, 9–20 cm; nodes 2–3, distant, each subtending 1(–2) partial inflorescence; partial inflorescence sessile to shortly pedunculate, simple, 1–2 cm, with few spikelets. Spikelets unisexual, solitary or in pairs; female spikelets broadly obovate, 3–4 mm; male spikelets shortly pedunculate, lanceolate, 2–2.5 mm. Glumes ovate, 2.5–4 mm long, acute, sides membranous, pale green sometimes tingled with reddish brown, keel green. Stamens 1. Achenes globose or broadly obovoid-globose, terete, 1.2–1.8 × 1.2–1.8 mm, white, usually smooth or transversely wrinkled above, rarely trabeculate, glabrous; disk shallowly 3-lobed, lobes suborbicular, densely glandular.

Locality: Fung Mun Au. *HK sheet 34219.*

Distribution: Guangdong, Guangxi, Fujian, Jiangsu, Hainan, Taiwan, Yunnan; India, Sri Lanka, Vietnam, Laos, Thailand, Cambodia, Japan, Malaysia, Micronesia, Australia and New Caledonia.

Ecology: Open, wet grasslands and rice fields. Flowering & fruiting: Aug.–Sep.

4. Scleria laxa R. Br. 疏鬆珍珠茅

Prodr. Fl. Nov. Holland. 240. 1810; FGD 8: 360. 2007; FOC 23: 264. 2010.

Annual; rhizome absent. Stem very slender, smooth, 1–2-noded below the inflorescence, 20–45 cm tall, 1–1.5 mm thick. Leaves narrowly linear, 5–15 cm × 1–3 mm, apex rather abruptly narrowed to the ± obtuse tip, glabrous, smooth or scabrid on the margins and the main veins near the apex, 3–5-veined; sheaths narrow, wingless, upper ones glabrous, lower ones often leafless, pubescent, purplish; contraligule short, broadly rounded, ciliate. Inflorescence occupying by far the greater part of the stem, narrow, very loose, consisting of about 3 very remote fascicles of partial panicles, the terminal panicle not larger than the lateral ones, 1–2 cm; peduncles 3–4 together at the nodes, exserted from the sheaths, ± noding, filiform, slightly incrassate at the apex, 2–4 cm; primary bracts erect,

as long as or overtopping the inflorescence. Spikelets unisexual; male spikelets about as long as their peduncles, linear-lanceolate, 1.5–2.5 mm; stamen 1; anther oblong-linear, 0.7–1 mm; female spikelets 3.5–4 mm, without a trace of a male part; glumes ovate, acute or mucronate. Cupula very small, 0.7 mm wide, hardly lobed. Achenes globose, ca. 1.7 mm across, deeply longitudinally ribbed, with 3 of the ribs more prominent, ± trabeculate between the ribs, slightly tuberculate at the top, umbonulate, glabrous, shining, white, the ribs not all reaching the base of the achene, but leaving a smooth triangular area above each disk-lobe; disk small, shortly 3-lobed; lobes obtuse, semi-orbicular.

Locality: Shek O, Kwun Tong, Tung Chung. *Y. W. Lam 1258; HK sheet 13874, 39380.*

Distribution: Guangdong, Hainan, Fujian; Philippines, Queensland, New Guinea.

Ecology: Grasslands of hillslopes. Flowering & fruiting: Jun.

5. Scleria parvula Steud. 小型珍珠茅 **(Photos 133–134)**

Syn. Pl. Glumac. 2: 174. 1855; FYN 15: 670. 2003; FGD 8: 360. 2007; FOC 23: 264. 2010.

Scleria biflora auct. non Roxb.: FKH 303. 1912; FRPS 11: 208. 1961; Check List HK Plants 103. 1993.

Scleria tessellata auct. non Willd.: FHK 399. 1861.

Annual; rhizome absent. Culms tufted, (10–)30–90 cm tall, 1–3 mm thick, triquetrous, scabrid on angles. Leaves cauline; blade linear, 20–35 cm × 2–6 mm, acute, flattish, glabrous, scabrid on upper margin; sheath 3–10 cm, narrowly winged or wingless, greenish to reddish purple, pubescent along the wing; contraligule rounded-truncate, margin ciliate. Lowest involucral bracts leaf-like, up to 20 cm. Inflorescence paniculate, 10–20 cm; nodes 2–4, distant, each subtending 1–3 partial inflorescence; partial inflorescence sessile to long-pedunculate, ± simple, narrowly elliptic, 1–4 cm, bracteoles rather prominent. Spikelets unisexual; female spikelets somewhat turbinate, 4–5 mm; male spikelets lanceolate, 4–5 mm, peduncle 1–3 mm. Glumes ovate, 3.5 mm long, acute, mucronate, sides membranous, pale brown to reddish brown, keel green. Stamens 3; anther linear, 1–1.5 mm. Achenes globose to ± ellipsoidal, 2–2.3 × 1.7–2 mm, shiny white, cancellate with regular, longitudinally oblong lacunae, glabrous to ± rufous pubescent; disk deeply 3-lobed, lobes ovate to elliptic-ovate, without deep pit at sinus between lobes.

Locality: Quarry Bay. *Y. S. Lau 2546.*

Distribution: Guangdong, Hunan, Jiangxi, Fujian, Jiangsu, Shandong, Zhejiang, Guizhou, Sichuan, Yunnan, Xizang; Sri Lanka, India, Nepal, Thailand, Vietnam, Laos, Cambodia, Japan, Korea, Malaysia, Philippines, New Guinea, tropical Africa.

Ecology: Wet, open grasslands, swamps and occasionally floors of open forests. Flowering & fruiting: Oct.

6. Scleria harlandii Hance 圓桿珍珠茅(夏蘭珍珠茅) **(Photo 135)**

Ann. Sci. Nat. Bot., sér. 5, 5: 248. 1866; FKH 303. 1912; FRPS 11: 216. 1961; FYN 15: 672. 2003; FGD 8: 357. 2007; FOC 23: 268. 2010.

Scleria purpurascens auct. non Steud.: FHK 400. 1861.

Perennial; rhizome woody, covered with reddish brown scales. Culms to more than 1 m tall, ca. 6 mm thick, terete to sometimes slightly triquetrous, shiny, glabrous. Leaf sheath 4–6 cm, yellow with purple lines, tightly embracing culm, thinly leathery, wingless, sometimes pilose, apical ones often overlapped; contraligule semicircular or subtriangular, 2–3 mm, purple, margin ciliate, cilia ca. 1 mm; leaf blade linear, ca. 30 × 0.6–0.8 cm, thinly leathery, slightly scabrous, glabrous, apex attenuate. Involucral bracts leaf-like, basalmost to 35 cm, sheathing; bractlets setaceous, nearly equalling spikelets, hairy, base auricled. Inflorescences compound paniculate, to 40 cm, with 8–9 branches; branches ca. 5 cm, triangular, axes often pubescent. Spikelets 1–2, light rust-coloured to purple, 3–4 mm, mostly unisexual. Male spikelets oblong-ovoid to narrowly ovoid, apex truncate to acute; glumes 1.4–3 mm, membranous, with rusty lines. Female spikelets usually at base of branch, narrowly ovoid, apex acuminate; glumes broadly ovate to ovate-lanceolate, ± keeled, margin apically ciliate, apex cuspidate. Male flowers: stamens 3; anthers linear, ca. 1 mm; connective apex ca. 0.3 mm. Female flowers: stigmas 3. Achene white, subspherical or ovoid, ca. 2.5 mm in diam., bluntly 3-sided, smooth, shiny, only apical part sparsely hairy, apex tipped; disk yellow with light rust-coloured lines, ca. 2 mm in diam., 3-lobed; lobes triangular, margins reflexed, apex acute to acuminate or 2–3-lobed.

Locality: Pok Fu Lam, Shek O, Tai Po Kau. *J. C. Shaw 478; L. T. Lo 164; H. C. Tang 1942.*

Distribution: Fujian, Hainan, Guangdong, Guangxi, Yunnan; Vietnam, Cambodia.

Ecology: Forest. Flowering & fruiting: Mar.–Sep.

Notes: The type specimens were collected by C. Harland and J. Lamont from Hong Kong Island in 1850s.

7. Scleria ciliaris Nees 緣毛珍珠茅 **(Photos 136–137)**

Wight, Contr. 117. 1834; FGD 8: 356. 2007; FOC 23: 265. 2010.

Scleria chinensis Kunth, Enum. Pl. 2: 357. 1837, based on *S. ciliaris* Nees, *nom. superfl.*; FHK 400. 1861; FKH 303. 1912; FRPS 11: 211. 1961.

Perennial; rhizome woody, covered with purplish scales. Culms tufted, 0.4–1.5 m tall, 2.5–6 mm thick, triquetrous, smooth to scabrid. Leaves cauline; blades linear, 15–50 × 0.7–1.5 cm, apex subobtuse, flattish, glabrous or scabrid; sheaths 4–8 cm, narrowly to broadly winged; contraligule oblong-lanceolate, 1–1.5 cm long. Lowest involucral bract leaf-like, up to 20 cm. Inflorescence paniculate but often appearing spike-like, 7–60 × 3–13 cm; nodes 2–3, close or rarely distant, each subtending a single partial inflorescence; partial inflorescence shortly pedunculate, ovoid-lanceolate, compound, 5–15 cm; bracteoles prominent, stiff. Spikelets unisexual, in clusters of 2–3; female spikelets ovoid, 4–5 mm; male spikelets lanceolate, 3.5–4 mm. Glumes ovate to lanceolate, 3–5 mm, acuminate, sides membranous, pale brown to mid-reddish brown. Stamens 3; anther linear, ca. 2 mm. Achenes ovoid-globose to ± depressed-ovoid, obscurely trigonous, 2–2.3 × 2.3–2.5 mm, rounded, shiny white or slightly purplish grey, reticulate or undulate-rugose, usually glabrous;

disk 3-lobed, lobes semicircular, brown, acute, obtuse, reflexed.

Locality: Common in Hong Kong. *J. C. Shaw 695, H. C. Tang 1257; HK sheet 41683.*

Distribution: Hainan, Guangdong; Myanmar, Thailand, Vietnam, Cambodia, Malaysia, Philippines, Papua New Guinea, tropical Africa, Pacific islands.

Ecology: Forest floors and grasslands.

8. Scleria terrestris (L.) Fassett

高秆珍珠茅 **(Fig. 56; Photos 138–139)**

Rhodora 26: 159. 1924; FTW ed. 2, 5: 313 2000; FYN 15: 676. 2003; FGD 8: 358. 2007; FOC 23: 265. 2010.

Zizania terrestris L., Sp. Pl. 2: 991. 1753.

Scleria elata Thw., Enum. Pl. Zeyl. 353. 1864; FKH 303. 1912; FRPS 11: 211. 1961.

Scleria radula Hance, Ann. Sci. Nat. Bot., sér. 4, 18: 232. 1862; FKH 303. 1912; FRPS 11: 206. 1961.

Scleria vestita Boeck., Linnaea 38: 482. 1875. *nom. illeg.* (type same as *Scleria radula* Hance.)

Scleria laevis Retz. var. *scaberrima* Benth., FHK 400. 1861.

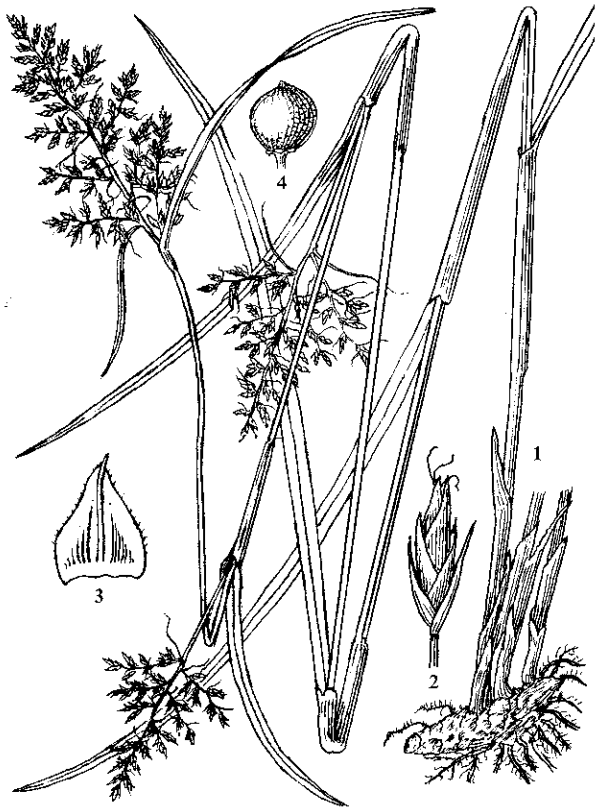

Figure 56. *Scleria terrestris* (L.) Fassett
1. plant; *2.* spikelet; *3.* glume; *4.* achene. (drawn by H. P. Yu)

Perennial; rhizome woody, covered with purple scales. Culms sometimes climbing, (0.6–)1–4 m tall, 3–6 mm thick, triquetrous, scabird, Leaves cauline; often closely spaced; blade linear, 15–40(–60) cm × (5–)7–20 mm, glabrous or scabrid, apex long caudate, flattish; sheath 6–15 cm, triquetrous, winged or not, reddish or purplish brown; contraligule crescent-shaped or depressed rounded, 2–4 mm, ciliate or glabrescent. Lowest involucral bracts leaf-like, up to 40 cm. Inflorescence paniculate, 25–50 × 5–10 cm; nodes 2–4, rather distant, each subtending a single partial inflorescence; partial inflorescence long-pedunculate, ovate-pyramidal to broadly ovoid, compound, 4–14 cm; bracteoles indistinct. Spikelets solitary or in groups of 2–3; female spikelets sessile, broadly ovoid, 3.7–5 mm; male spikelets lanceolate or oblong-lanceolate, 3–4 mm. Glumes broadly ovate, 3.5–4 mm, abruptly acute. Achene 2.5–3 × 2.5–2.8 mm, spherical, shiny white to dark purplish, smooth or indistinctly scrobiculate, puberulent to glabrous; disk shallowly 3-lobed, lobes broadly triangular, obtuse to rounded or ± emarginate.

Locality: Mount Kellet, Sha Lo Tung, Tai Mo Shan, Bride's Pool. *J. C. Shaw 624; Y. S. Lau 1942; K. L. Yip 4087.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Chongqing, Hunan, Jiangxi, Fujian, Taiwan, Zhejiang, Jiangsu; India, Nepal, Sri Lanka, Myanmar, Laos, Cambodia, Vietnam, Japan, Thailand, Malaysia, Indonesia, Australia.

Ecology: Floors of forests, thickets and wet grasslands.

Notes: The type specimens of *Scleria radula* (*Hance 1157*) and *Scleria laevis* var. *scaberrima* (*Harland s.n.*) were collected from Hong Kong Island in 1850s.

9. Scleria levis Retz. 毛果珍珠茅 **(Photo 140)**

Obs. 4: 13. 1786; FHK 400. 1861; FTW ed. 2, 5: 311. 2002; FYN 15: 673. 2003; FGD 8: 358. 2007; FOC 23: 266. 2010.

Scleria hebecarpa Nees in Wight, Contrib. Bot. Ind. 117. 1834; FKH 303. 1912; FRPS 11: 213. 1961.

Scleria pubescens Steud., Syn. Cyp. 168. 1855; FHK 400. 1861.

Scleria hebecarpa Nees var. *pubescens* (Steud.) C. B. Clarke, Fl. Brit. India 6: 689. 1894; FRPS 11: 214. 1961.

Perennial; rhizome woody, creeping, covered with brown scales. Culms 30–90 cm tall, 1–3 mm thick, triquetrous, glabrous to puberulent. Leaves cauline; blade linear, 18–35 cm × 2–8(–12) mm, glabrous, scabrid on the margin and along the midvein abaxially, gradually narrowed towards apex, flat; sheath 5–8 cm, winged, green to reddish or purplish brown; contraligule shallowly rounded, pubescent. Lowest involucral bracts leaf-like, up to 13 cm, upper bracts and bracteoles prominent, setaceous. Inflorescence paniculate, open to compact, sometimes appearing head-like, 5–13 × 1.5–2.5 cm; nodes 3–4, each subtending a single partial inflorescence; partial inflorescence sessile or shortly pedunculate, ovate-lanceolate, 2–8 cm. Spikelets female and male in groups of 2–4; female spikelets sessile, obovoid, 4–6 mm; male spikelets pedunculate, oblong-lanceolate, 3–4 mm. Glumes ovate, 2–4 mm, acuminate, sides membranous, mid-brown to chestnut brown. Stamens 3; anther linear, ca. 3 mm. Achenes globose, ± terete, 1.7–2.5 × 1.7–2.5 mm, rounded, white, smoothish, pubescent to glabrous; disk 3-lobed, the lobes lanceolate-triangular, acute, minutely toothed at apex.

Locality: Common in Hong Kong. *Y. W. Lam 753; Y. S. Lau 2544, 3138.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Zhejiang, Fujian, Taiwan; widely distributed from India to Myanmar, Vietnam, Japan, throughout Malesia to Queensland and New Caledonia.

Ecology: Grasslands, floors of open forests, margins of rice fields. Flowering & fruiting: Jun.–Oct.

7. Remirea Aubl. 海濱莎屬

Perennials. Rhizomes long-creeping, branching. Culms 1 or few, trigonous, smooth. Leaves many, crowded along and often obscuring lower part of culm, leathery; ligule absent. Involucral bract leaf-like. Inflorescence capitate. Spikes 3–8, often exceeded by upper leaves and involucral bracts. Spikelets falling off entire when mature, comprising 1 fertile glumes above and 1–2 sterile glumes below (excluding basal prophyll); rachilla corky-thickened. Flowers bisexual. Perianth segments absent. Stamens 3. Stigmas 3. Achenes oblong to ellipsoidal, trigonous.

One species in pantropical regions; also distributed in China and Hong Kong.

1. Remirea maritima Aubl. 海濱莎 **(Fig. 57)**

Hist. Pl. Guiane 1: 45, pl. 16. 1775; FKH 302. 1912; FRPS 11: 123. 1961; FTW ed. 2, 5: 295. 2000; FGD 8: 344. 2007; FOC 23: 242. 2010.

Miegia maritima (Aubl.) Willd., Sp. Pl. 1(1): 311–312. 1797.

Perennial; rhizomes slender, rigid, horizontally long-creeping, branching, internodes 1–10 cm, clothed with brown sheaths and their fibrous remnants. Culms solitary or a few together at nodes of rhizome, 3–15 cm tall, usually with a considerable length of lower part in sand, 1–2 mm thick, triquetrous, smooth. Leaves aggregated on lower part of upper ground portion of culms; blades linear, shorter than or occasionally equalling the culm, 3–8 × 0.4–0.5 cm, acute, leathery, glaucous-green, canaliculate; sheaths 1–1.5 cm, light to reddish brown. Inflorescence terminal, capitate, usually 3–8 congested in a head-like cluster at culm-apex, 1–2 × 1–3 cm. Leafy bracts 3–8, patent or reflexed, equalling or longer than inflorescence, longest one to 8 cm. Spikes ellipsoidal to ovoid, 1–3 × 0.7–1 cm, densely bearing many spikelets, glaucous or yellowish brown. Spikelets ovoid, terete to weakly laterally flattened, 4–5 × 1–2 mm, acute, bearing 4 glumes, 1-fruited; rachilla jointed above base. Glumes ovate to broadly ovate, lowest 3 empty, fourth bearing a bisexual flower, 3–4.5 × 1.5–1.7 mm, acute to mucronate, margin membranous to chartaceous, 3–5-veined, pale to mid-brown, keel obtuse, brown. Stamens 3; anthers 2 mm long. Achenes oblong, trigonous, ca. 2.5 × 0.7 mm, maturing greyish brown, smooth; style shorter than achene; stigmas 3.

Locality: Hong Kong. *HK sheet 8088.*

Distribution: Hainan, Guangdong, Taiwan; pantropics.

Ecology: Sandy beaches. Flowering & fruiting: Sep.–Dec.

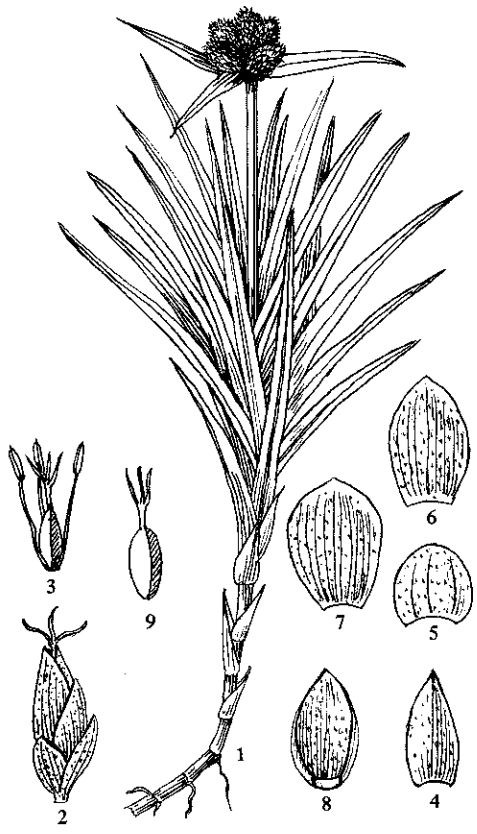

Figure 57. *Remirea maritima* Aubl.
1. plant; *2.* spikelet; *3.* flower; *4–7.* glumes; *8.* fleshy glume; *9.* achene. (drawn by H. P. Yu)

8. Rhynchospora Vahl 刺子莞屬

Annuals or perennials. Culms central. Leaves basal and/or cauline; blade linear to lanceolate; sheaths closed; ligule absent. Inflorescence of terminal and lateral umbel-like partial inflorescence, or paniculate or capitate. Spikelets lanceolate, ovate to elliptic, flattened to terete. Glumes 5–9 (rarely more), distichous or spirally imbricate, membranous to papery, 1-veined, the basal 2–3 glumes empty and small, the remainder glumes gradually larger with a single flower, the uppermost glume often empty. Flowers either all bisexual, the upper ones not maturing achene, or lower 1–few bisexual and upper ones staminate, or unisexual with the lowest pistillate and upper ones staminate. Perianth segments 0–6, rarely more, bristle-like, upwardly or retrorsely scabrous, rarely smooth. Stamens (1–)2–3. Stigmas 2 or style undivided. Achenes biconvex, smooth, cancellate, rugose or sometimes spinose; style base persistent, variously shaped.

About 350 species distributed worldwide; seven species in China; six species in Hong Kong.

1a. Perianth segments absent ..... 1. *R. gracillima*
1b. Perianth segments present.
  2a. Inflorescence with 1–several globose heads.
    3a. Inflorescence with 2–7 spicately disposed heads ..... 2. *R. malasica*
    3b. Inflorescence a single terminal head ..... 3. *R. rubra*
  2b. Inflorescence of terminal and lateral open panicles.
    4a. Leaves 7–15 mm wide; achenes 3–4 mm long, deeply channeled; style hardly divided ..... 4. *R. corymbosa*
    4b. Leaves 1.5–4 mm wide; achenes ca. 2 mm long, not channeled; style 2-cleft.

5a. Spikelets ovate-elliptic, 3–4.5 mm long ..... 5. *R. brownii*
5b. Spikelets lanceolate, 7–9 mm long ..... 6. *R. chinensis*

1. Rhynchospora gracillima Thwaites 柔弱刺子莞
Enum. Pl. Zeyl. 435. 1864; FKH 302. 1912; FGD 8: 315. 2007 ["*gracilima*"]; FOC 23: 255. 2010.

Annual or short-lived perennial; rhizome very short. Culms densely tufted, 20–60 cm tall, 0.2–0.5 mm thick, triquetrous, smooth. Leaves basal; blade setaceous, up to 30 × 0.5–1.3 mm, subacute, canaliculated; sheath 1–4 cm, light green to light brown. Involucral bracts leaf-like, the longest 2–4 cm. Inflorescence 8–20 cm, with 1–3 nodes each with 1 open partial inflorescence; terminal partial inflorescence up to 4 cm, with primary and secondary anthelas; primary anthelas 3–5, up to 4 cm. Spikelets up to 7 per partial inflorescence, solitary, lanceolate, 5–7 × 1.5–2 mm. Glumes 6–7(–8), ovate to broadly ovate, 2–4 cm, subacute to mucronulate, sides membranous, light rusty brown. Perianth segments absent. Stamens 2–3; anthers linear, 1.5–2 mm long. Stigmas 2. Achenes obovoid, compressed, 1.2–1.5 × 1.2–1.5 mm, light grey, undulate-rugose with 6–8 ridges; style base depressed-conical, much wider than long.

Locality: Ho Pui Reservoir. *Y. W. Lam 1488; S. C. Ng 2032.*

Distribution: Guangdong, Fujian; Sri Lanka, India, Thailand, Malaysia, Indonesia, tropical Africa, Madagascar, Australia.

Ecology: Wet places. Flowering & fruiting: Mar.–Dec.

2. Rhynchospora malasica C. B. Clarke 馬來刺子莞（日本刺子莞）
Fl. Brit. India 6: 670. 1893; FTW ed. 2, 5: 298. 2000; FGD 8: 316. 2007; FOC 23: 255. 2010.
Rhynchospora nipponica Makino, Bot. Mag. (Tokyo) 18: 145. 1904; FRPS 11: 114. 1961.

Perennial; rhizome long creeping. Sterile shoots elongate to 80 cm, bearing a dense leaf fascicle at distal end. Culms 60–100 cm tall, simple, erect, several-nodose, obtusely triquetrous below, regularly triquetrous with acute edges above, surrounded at base with dusky brown sub-aphyllous sheaths, sub-densely leaved on midway portion. Leaves broadly linear, overtopping culm, flattish, 40–60 cm × 5–9 mm, fresh green, gradually tapering above to acute apex, scabrid abaxially and margin; sheath elongate, tightly surrounding culm; ligule short, membranous, rusty brown. Inflorescence 5–20 cm, spicately bearing 2–7 heads, sub-contiguous above, interrupted toward base; bracts not sheathing at base, lower ones with elongate blade 7–20 cm. Inflorescence spicate or racemose, with 2–7 spicate heads; heads sessile, globose, 10–15 mm across, densely many-spiculose, greyish stramineous and tinged with red-brown. Spikelets lanceolate-ovate to lanceolate, 6–7 mm, weakly laterally compressed, contracted at base, gradually tapering above to acuminate apex, 1-flowered, 1-fruited; glumes 5–6, lower 3–4 ovate, much smaller than lanceolate-ovate upper 2, all 1-veined, acute, membranous, greyish brown. Stamens 3; anthers linear, ca. 2 mm. Stigmas 2, style filiform, 2 mm. Perianth segments 6, filiform, flexuose, smooth, 3.5–4.5 mm. Achenes broadly obovate, 2–2.5 mm, thickly biconvexed with obtuse edges, faintly transversely wrinkled, dark brown; style base narrowly conical-subulate, 4–4.5 mm, somewhat constricted at base, gradually attenuate from above base to slender style.

Locality: Tai Tam Reservoir. *S. T. Chan 590.*

Distribution: Guangdong, Taiwan; Japan, Korea, Thailand, Indonesia, Malesia.

Ecology: Marshes and swamps. Flowering & fruiting: May–Oct.

3. Rhynchospora rubra (Lour.) Makino
刺子莞 **(Fig. 58; Photos 141–142)**
Bot. Mag. (Tokyo) 17: 180. 1903; FRPS 11: 113. 1961; FGZ 8: 584. 1988; FTW ed. 2, 5: 298. 2002; FYN 15: 619. 2003; FGD 8: 315. 2007; FOC 23: 255. 2010.
Schoenus ruber Lour., Fl. Cochinch. 1: 41. 1790.
Rhychospora wallichiana Kunth, Enum. Pl. 2: 289. 1837; FHK 396. 1861; FKH 302. 1912.

Annual or short-lived perennial; rhizome very short or absent. Culms tufted, 20–70(–100) cm tall, 1–2 mm thick, triquetrous. Leaves basal; blade narrowly linear, shorter than culms, up to 42 cm × 2–4 mm, subacute, flattish to folded or canaliculate; sheath 1–7 cm, yellowish brown. Involucral bracts 4–8, leaf-like, eventually reflexed, the longest up to 8 cm, base dilated, margins ciliate. Inflorescence with one terminal head; head subglobose to globose, 1.0–1.7 cm in diam. Spikelets many, ovate-lanceolate, somewhat flattened, 6–8 × 1.5–2 mm, 2–3-flowered. Glumes 6–8, ovate to lanceolate, up to 6.5 mm, acute, sides thinly papery, pale to mid-brown, lower ones sterile. Stamens (2–)3; anthers linear, ca. 2 mm. Perianth segments 3–6, unequal, up to half the length of achene. Style filiform, stigmas 2 or sometimes undivided. Achenes obovate to broadly obovate, bilaterally compressed,

Figure 58. *Rhynchospora rubra* (Lour.) Makino
1. plant; *2.* spikelet; *3.* achene. (drawn by H. P. Yu)

1.3–1.8 × 1–1.5 mm, scabrid-hispid along margins, maturing somewhat shiny mid-brown, smooth to indistinctly minutely papillose; style base depressed-conical, ca. 0.5 mm.

Locality: Common in Hong Kong. *Y. S. Lau 2505; H. C. Tang 2256; Y. W. Lam 713.*

Distribution: Areas S of Changjiang; tropical regions of Asia and Australia.

Ecology: Roadsides, grasslands and open areas. Flowering & fruiting: May–Nov.

4. Rhynchospora corymbosa (L.) Britton 傘房刺子莞 **(Photos 143–145)**

Trans. New York Acad. Sci. 11: 84. 1892; FRPS 11: 110. 1961; FTW ed. 2, 5: 297. 2002; FYN 15: 618. 2003; FGD 8: 314. 2007; FOC 23: 253. 2010.

Scirpus corymbosus L., Cent. Pl. II 7. 1756.

Rhynchospora aurea Vahl, Enum. Pl. 2: 229. 1805; FHK 396. 1861; FKH 302. 1912.

Perennial; rhizome short. Culms 1–few, 80–120(–150) cm tall, 3–10 mm thick, triquetrous, smooth to scabrid above. Leaves basal and 2–3 cauline; blade narrowly linear, 20–70 cm × 0.8–1.6 mm, long-acuminate, flattish, glabrous; basal sheaths up to 20 cm, pale brown, cauline sheaths 5–8 mm, greenish. Involucral bracts leaf-like, the longest 10–30 cm. Inflorescence panicle-like, open, 20–40 cm, comprising 2–5 rather distant partial inflorescence, the terminal one corymb-like, 10–15 × 10–15 cm, simple to compound, with primary anthelas (8–)12–many, up to 12 cm. Spikelets in clusters of 2–10, lanceolate or elliptic, subterete, 6–9 mm. Glumes 5–7, sub-distichous, ovate to oblong-ovate, 2.5–6 mm, acute to mucronulate, sides membranous, reddish brown. Perianth segments in bisexual flower 6, ± equalling achene. Stamens 3; anthers 2–3 mm long. Styles ca. 2 mm, stigma 2 or sometimes undivided, very short. Achenes obdeltoid-obovate, compressed, 2.5–3.5 × 2 mm, apex without short neck, glabrous, dull yellowish brown to mid-brown, finely transversely winkled to rugose, style base elongate-conical, 4–5 mm.

Locality: Kau Sai Chau, Sha Lo Tung, Wu Kau Tang. *K. L. Yip 4041; J. C. Shaw & G. Reels 333; Y. W. Lam 1849.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; tropical and subtropical regions.

Ecology: Farmlands and river banks. Flowering & fruiting: Mar.–Dec.

5. Rhynchospora brownii Roem. & Schult. 皺果刺子莞 **(Photos 146–147)**

Syst. Veg. 2: 86. 1817; FRPS 11: 111. 1961; Flora Guizhouensis 8: 584. 1988; FYN 15: 617. 2003.

Rhynchospora rugosa (Vahl) Gale subsp. *brownii* (Roem. & Schultes) T. Koyama in Williams, Pl. Coll. Nepal 118. 1978; FTW ed. 2, 5: 298. 2000; FOC 23: 254. 2010.

Rhynchospora rugosa auct. non (Vahl) Gale: FGD 8: 314. 2007; Check List HK Plants 319. 2002; 112. 2004.

Perennial. Rhizome short. Culms loosely tufted, 30–70 cm tall, 1–1.7 mm thick, trigonous, smooth to scabrid above. Leaves basal and 2–3 cauline; blade narrowly linear, up to 55 cm × 1.5–3 mm, gradually acute, flattish to canaliculate; basal sheath up 8 cm, greyish brown, cauline sheaths up to 5 cm, greenish. Involucral bracts leaf-like, the longest up to 20 cm. Inflorescence narrow, panicle-like, 10–30 cm, with 2–3(–4) distant nodes each subtending 1–3 pedunculate spikelet clusters, the clusters rarely with primary and secondary anthelas. Spikelets 2–40 per cluster, ovate-lanceolate to ovate-elliptic, subterete, 3–4.5 mm. Glumes 5–7, ovate to broadly ovate, 1–3.5 mm long, acute, mucronate, sides thinly papery, dark brown. Perianth segments 6(–7), shorter or slightly longer than achene. Stamens (1–)2–3; anthers linear, 1–1.5 mm. Stigmas 2. Achenes broadly obovate, biconvex, 1.5–1.8 × 1–1.5 mm, maturing light brown, weakly transversely winkled and lineolate with longitudinally oblong epidermal cells; style-base conical, ± as broad as achenes abruptly widening below.

Locality: Tai Tam, Aberdeen, Shing Mun, Castle Peak, Tung Shue O, Tung Chung. *Y. W. Lam 2175; S. C. Ng 1359.*

Distribution: Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan, Yunnan, Sichuan; tropical and subtropical regions.

Ecology: Marshes and grasslands. Flowering & fruiting: May–Oct.

6. Rhynchospora chinensis Nees & Meyen
華刺子莞 **(Fig. 59; Photo 148)**

Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 19(Suppl. 1): 108. 1843; Linnaea 37: 586. 1873; FRPS 11: 111. 1961; FTW ed. 2, 5: 297. 2000; FOC 23: 254. 2010.

Rhynchospora glauca Vahl var. *chinensis* (Nees & Meyen) C. B. Clarke, Fl. Brit. India 6: 672. 1893.

Rhychospora glauca auct. non Vahl: FKH 302. 1912.

Rhychospora laxa auct. non R. Br.: FHK 397. 1861.

Figure 59. *Rhynchospora chinensis* Nees & Meyen
1. plant; *2.* spikelet; *3.* achene. (drawn by H. P. Yu)

Perennial; rhizome very short. Culms loosely to densely tufted (30 –)50–140 cm tall, 1–3 mm thick, trigonous to triquetrous above, smooth or scabrid above. Leaves basal and 2–4 cauline, blade linear, 10–60 cm × 3–5 mm, long-acuminate, flattish to plicate; basal sheaths yellowish brown to mid-brown, cauline sheaths greenish. Involucral bracts leaf-like, the longest up to 13 cm. Inflorescence narrow, panicle-like, 20–40 cm, with 3–5(– 6) nodes each subtending 1–3 pedunculate spikelet clusters. Spikelets up to 15 per cluster, ovate-lanceolate, 6–8 × 1.5–2.5 mm. Glumes 5–8, ovate to ovate-lanceolate, 1–5 cm, acute to mucronate, sides membranous, mid-brown to rusty brown. Perianth segments 6, longer than achene. Stamens 2(– 3); anthers 2–2.5 mm. Stigmas 2. Achenes broadly obovate, compressed, 1.9–2.5 × 1.5–1.8 mm, slightly shiny, yellowish to mid-brown, weakly transversely winkled and lineolate; style base conical, gradually widening below.

Locality: Aberdeen, Stanley Rd., Tai Tam Reservoir, Castle Peak, Sai Kung, Yung Shue O, Lantau Island. *S. C. Ng 1337; HK sheet 13768.*

Distribution: Hainan, Guangdong, Hainan, Hubei, Zhejiang, Shandong, Anhui, Fujian, Jiangsu, Jiangxi, Taiwan; Korea, Japan, India, Sri Lanka, Myanmar, Vietnam, Indonesia, Madagascar.

Ecology: Wet places. Flowering & fruiting: Jul.–Oct.

9. Gahnia J. R. & G. Forst. 黑莎草屬

Robust perennials. Rhizome short, woody. Culms central. Leaves basal and cauline; blade linear; ligule present. Involucral bracts leaf-like. Inflorescence paniculate, with several to many partial inflorescence, each bearing many spikelets. Spikelets solitary or clustered, 1–2-flowered. Glumes several, spirally imbricate, upper 2–3 smaller than lower ones, the upper 1–2 bearing flowers. Flowers 1–2, the upper bisexual, the lower (when present) staminate or sterile. Perianth segments usually absent. Stamens (2 –)3–6; filaments often elongate and persistent at base of achene. Stigmas (2 –)3; style continuous with ovary. Achenes trigonous, 4-angular or terete.

About 30 species, the highest number in E Australia and New Zealand, several species in Malesia and two species in E Asia; three species in China; one species in Hong Kong.

1. Gahnia tristis Nees ex Hook. & Arn.
黑莎草 **(Fig. 60; Photos 149–150)**

Bot. Beech. Voy 228, 1837 [Linnaea 9: 301. 1834, *nom. nud.*]; FHK 398. 1861; FKH 303. 1912; FRPS 11: 121. 1961; FHN 4: 303. 1977; Flora Guizhouensis 8: 588. 1988; FTW ed. 2, 5: 283. 2000; FGD 8: 319. 2007; FOC 23: 258. 2010.

Perennial. Culms densely tufted, 50–100 cm tall, 2–5 cm thick, subterete to trigonous, smooth. Leaves basal and cauline; blade rigid, 40–120 cm × 3–12 mm, caudate-acuminate, leathery, margins strongly inrolled, cauline sheaths 7–15 cm, yellowish brown, basal sheaths up to 30 cm, dark or chestnut brown. Involucral bracts several, leaf-like, the lowest up to 30 cm; sheath up to 3 cm. Inflorescence paniculate, resembling a spike, ± cylindrical to linear-oblong, 15–50 × 3–7 cm with 10–28 ± sessile partial inflorescence each 1–5 × 1.2–1.7 mm. Spikelets many, densely clustered, oblong, becoming turbinate in achene, 7–10 mm, 6–8-glumed, 1-flowered. Glumes ovate-lanceolate, 10–12 mm, long-acuminate, sides papery, dark brown, upper 2–3 glumes broadly ovate, much shorter, ciliolate, obtuse to rounded. Perianth segments absent. Stamens 3; filaments slender, enveloped by glumes; anthers linear, 3–4 mm. Stigmas 3. Achenes ellipsoidal, trigonous, 4.5 × 2 mm, conical, dark brown to shiny black, smooth.

Locality: Common in Hong Kong. *J. C. Shaw 344; H. C. Tang 1931; HK sheet 8198.*

Distribution: Hainan, Guangxi, Guangdong, Hunan, Fujian, Jiangsu, Jiangxi, Zhejiang, Taiwan; Thailand, Vietnam, Japan, Malaysia.

Ecology: Thickets on hillslopes. Flowering & fruiting: Mar.–Dec.

Uses: Material (oil).

Figure 60. *Gahnia tristis* Nees ex Hook. & Arn.
1. portion of plant; *2.* inflorescence; *3.* spikelet; *4–12.* glumes; *13.* flower (spikelet rachis included); *14.* achene. (drawn by H. P. Yu)

10. Actinoschoenus Benth. 星穗莎屬

Perennials. Rhizome creeping. Leaves basal; blades present of leaves reduced to basal sheath; ligule absent. Involucral bracts leaf-like or subulate. Inflorescence a single capitate cluster of spikelets. Spikelets flattened to subterete. Glumes 2-ranked, lower 2–3 empty and smaller. Flowers bisexual. Perianth segments absent. Stamens 3. Stigmas 3. Achenes broadly ovate, trigonous, smooth or verruculose, indistinctly reticulate.

Four to five species in Old World tropics; two species in China; one species in Hong Kong.

1. Actinoschoenus chinensis (Benth.) Benth.
中華星穗莎 **(Fig. 61; Photo 151)**

Hooker's Icon. Pl. 14: 33, 1881; Gen. Pl. 3: 1058. 1883.

Arthrostylis chinensis Benth., FHK 397. 1861.

Fimbristylis chinensis (Benth.) Tang & Wang, FRPS 11: 106. 1961; FHN 4: 296. 1977.

Fimbristylis actinoschoenus auct. non C. B. Clarke: FKH 298. 1912.

Fimbristylis thouarsii auct. non (Kunth) Merr.: FGD 8: 309. 2007; FOC 23: 253. 2010; Check List HK Plants 315. 2002; 111. 2004.

Perennial. Culms tufted, 15–40 cm tall, triquetrous, slender, with 2 sheaths at base. Leaves basal, reduced to bladeless sheath. Sheath brown, with prominent ribes, margin membranous and darker. Involucral bracts subulate, shorter than inflorescence, soon reflexed and hidden by inflorescence. Inflorescence capitate. Spikelets 1–2(–6), lanceolate, 6–8 × 0.5–2 mm, few-flowered. Glumes 5–7, lower ones distichous, lowest 3 without flowers, uppermost one with sterile flower, variable in shape and size, smaller upward, semiorbicular, broadly ovate or oblong-ovate, 0.25–2 mm, membranous, brown, glabrous, 3-veined, apex mucronate. Stamens 3; anthers linear. Style slender, base enlarged; stigmas 3. Achenes cream-coloured to light brownish, obovoid, 1–1.2 mm, trigonous, smooth to verruculose and indistinctly reticulate.

Locality: Mount Nicholson, Deep Water Bay Rd., Lower Shing Mun Reservoir. *Y. W. Lam 1641; HK sheet 41766, 41767.*

Distribution: Hainan, Guangdong.

Ecology: Sandy farmlands, forests, rocks.

Notes: The type specimen (*C. Wright s.n.*) Benth. was collected from Hong Kong in 1850s. The species was considered conspecific with *Actinoschoenus thouarsii* (Kunth) Benth. (= *Fimbristylis thouarsii* Kunth) by many authors, but *A. chinensis* is easily distinguished from the latter by its spikelets being 1–2(–6) and glumes much broader.

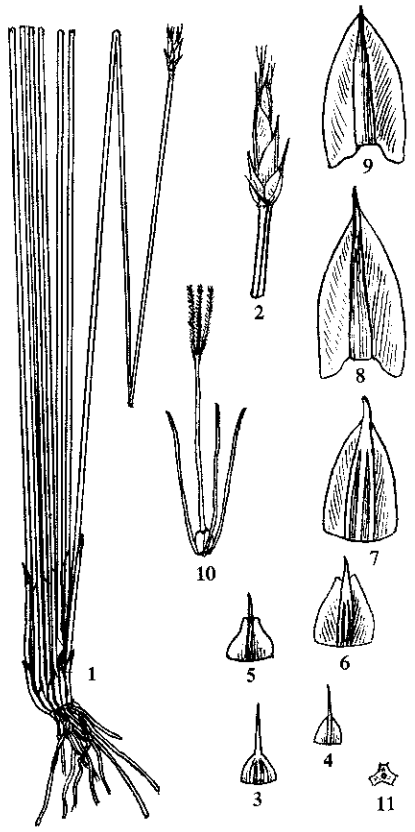

Figure 61. *Actinoschoenus chinensis* (Benth.) Benth.
1. plant; *2.* spikelet; *3–9.* glumes; *10.* portion of flower; *11.* cross section of culm. (drawn by H. P. Yu)

11. Schoenus L. 赤箭莎屬

Annuals or perennials. Rhizome sometimes creeping or woody. Culms erect or with ascending base rooting at nodes. Leaves basal and cauline, rarely reduced to bladeless sheaths; ligule absent. Involucral bracts leaf-like or glume-like. Inflorescence panicle-like, rarely capitate or reduced to a single spikelet. Spikelets usually lanceolate to oblong-lanceolate, flattened, several-glumed, few-flowered. Glumes distichous, caducous, 1-veined, keel acute, lower several glumes empty. Flowers usually bisexual, the uppermost one often not producing mature achenes or male. Perianth segments 0–6. Stamens (1–)3(–6). Stigmas 2(–3); style continuous ovary. Achenes trigonous.

About 120 species, mostly in Oceania and SE Asia, only with a few species in Europe and Americas; four species in China; one species in Hong Kong.

1. Schoenus falcatus R. Br. 赤箭莎 **(Fig. 62)**

Prodr. 232. 1810; FRPS 11: 116. 1961; FTW ed. 2, 5: 308. 2000; FOC 23: 256. 2010.

Schoenus sinensis Hand.-Mazz., Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 62: 150. 1925.

Perennial. Rhizome short, woody. Culms 60–100(–150) cm tall, 2–5 mm thick, obtusely angular, smooth, glabrous. Leaves mostly basal, 3–4-cauline; blade narrowly linear, rigid, 90 cm × 2–7 mm, long-acuminate channeled, glabrous; basal sheath 3–5 cm, dark purplish, cauline sheath 1.5–3 cm. Involucral bract several, lowest bract 3–16 cm. Inflorescence narrow, panicle-like, 20–40 cm, with 4–10 distant nodes each subtending 2–4 partial inflorescence. Spikelets many, shortly pedunculate, oblong-lanceolate, weakly flattened, 7–14 × 2.5 mm, 8–10-glumed, 3–8-flowered. Glumes ovate-lanceolate to oblong-lanceolate, 5–7 × 1 mm, acute, mucronate, sides

papery, brown, margins paler, keel acute, yellow green, the lower 2–5 glumes empty, shorter. Perianth segments 1–3, ± equalling achene. Stamens 3; filaments slender; anthers linear, ca. 3 mm. Style 3–4 mm; stigmas 3. Achenes broadly ellipsoidal or obovoid, trigonous, 1–1.3 × 0.8–1 mm, apex pubescent, rust brown, pitted-reticulate with large epidermal cells.

Locality: Penny's Bay. *S. C. Ng 1719, 1825.*

Distribution: Guangdong, Guangxi, Guizhou, Taiwan; Vietnam, Thailand, Malaysia, New Guinea, Japan, Australia, Pacific islands.

Ecology: Rocks near seashore, thin forests by rivers. Flowering & fruiting: May–Jul.

12. **Cladium** P. Browne 克拉莎屬

Large robust perennials with elongate, many-nodose culms, often bearing extra-vaginal shoot at lower nodes. Leaves cauline; blades broadly linear, flat, pseudo-dorsiventral, strongly serrulate-scabrous on margins, long sheathing at base. Inflorescence paniculate, consisting of several, terminal and lateral compound anthelas with many elongate anthelas. Spikelets clustered in small heads terminating ultimate anthelalets. Spikelets ovoid, bearing 6–8 glumes on markedly flexuose rhachilla; glumes irregularly spirally disposed, the lower 4–6 empty and smaller than upper 2, both bearing a hermaphrodite flower, only the upper flower producing achene. Perianth segments absent. Stamens 2. Style slender, base not enlarged; stigmas 3. Achene ovoid, subterete or trigonous, the wall thick and corky, stipitate or sessile, smooth.

Four species in tropical and warm-temperate parts of Eurasia, Pacific islands and N & S America; two species in China; one species in Hong Kong.

1. **Cladium chinense** Nees ex Hook. & Arn.
華克拉莎 **(Fig. 63; Photos 152–153)**

Bot. Beech. Voy. 227. 1838; FRPS 11: 118. 1961.

Cladium jamaicence Crantz subsp. *chinense* (Nees) T. Koyama in H. Hara, Stearn & L. H. J. Williams, Enum. Fl. Pl. Nepal 1: 105. 1978; FOC 23: 258. 2010.

Cladium mariscus (L.) Pohl subsp. *chinense* (Nees) Govaerts, World Checkl. Seed Pl. 3(1): 15. 1999.

Mariscus chinensis (Nees) Fernald, Rhodora 25: 51. 1923.

Cladium mariscus (L.) Pohl subsp. *jamaicense* auct. non (Crantz) Kük.: FGD 8: 318. 2007; Check List HK Plants 309. 2002; 109. 2004.

Cladium jamaicense auct. non Crantz: FKH 302. 1912; FTW ed. 2, 5: 237. 2000.

Cladium mariscus auct. non R. Br.: FHK 397. 1861.

Perennial; rhizome thick, horizontal. Culm solitary, 1–3 m tall, terete, many-nodose, often bearing extra-vaginal shoot at lower nodes. Leaves cauline; blades elongate, broadly linear, flat, 60–90 × 0.8–1.5 cm, thickly leathery, gradually tapering above to 3-sided caudate apex, strongly serrulate-scabrous on margins; sheaths shorter than the internode. Inflorescence 30–90 cm, with terminal and lateral 5–9 anthelas, those rather contiguous or the lower ones spaced; bracts leafy, sheathing at base, the lower bract-blades much surpassing their subtending anthelas; anthelas 4–8 cm long and as broad, the peduncle and anthelas flattened. Spikelets congested in globose heads of 4–12, 4–9 mm in diam., the spikelets ovate-elliptic to broadly so, 3 × 2 mm, rusty brown. Glumes 6–8, broadly ovate to ovate, 1–2.5 mm, abruptly contracted above to obtuse or

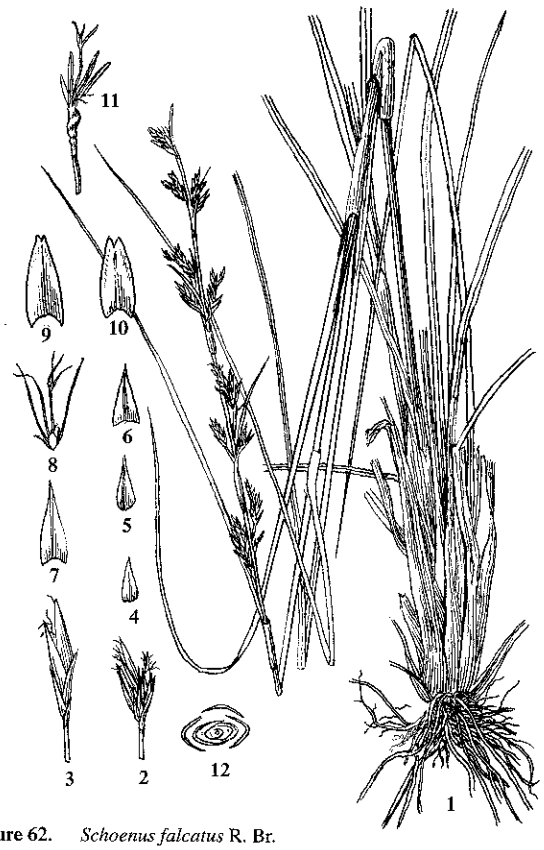

Figure 62. *Schoenus falcatus* R. Br.
1. flowering plant; *2.* portion of inflorescence; *3.* spikelet; *4–7.* glumes; *8.* achene; *9–10.* glumes; *11.* floret with rachilla; *12.* spikelet diagram (draw by H. P. Yu)

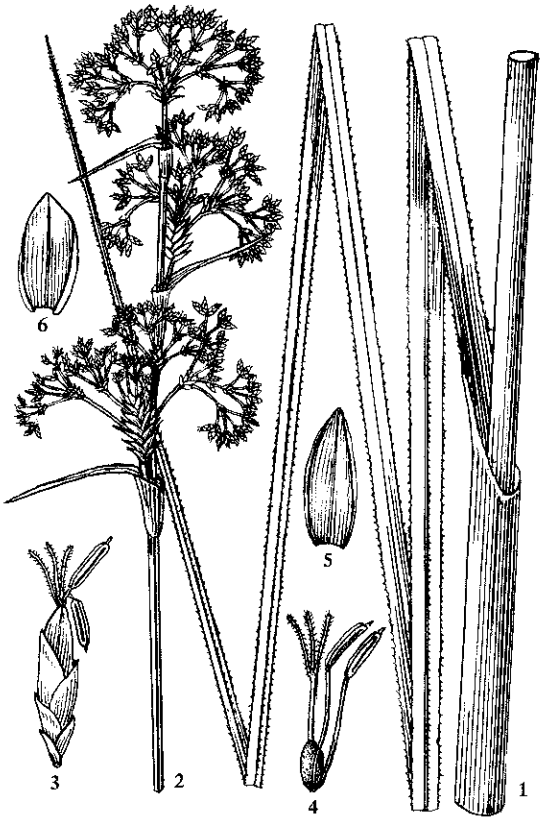

Figure 63. *Cladium chinense* Nees ex Hook. & Arn.
1. portion of plant; *2.* inflorescence; *3.* spiketlet; *4.* bisexual flower; *5–6.* glumes. (drawn by H. P. Yu)

subacute apex, the lower 4–6 empty, each of the apical 2 bearing a bisexual flower, the upper flower only producing achene. Stamens 2; anthers oblong, ca. 2 mm. Style slender; stigmas 3, pilose. Achene ovoid, ca. 2.5 mm, brown, rounded at base, apiculate.

Locality: Common in Hong Kong. *Y. W. Lam 2168; S. P. Lau 48; HK sheet 33347.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; Vietnam, Japan, Korea.

Ecology: Forests, streams and marshes. Flowering & fruiting: May–Jun.

13. **Machaerina** Vahl 劍葉莎屬

Perennials; rhizome short or horizontally decumbent, occasionally emitting stolons. Culms laxly tufted or solitary and disposed along the rhizome, ancipitous, biconvex or terete, at times transversely septate, usually 1–2-nodose. Leaves 2-ranked, basal few cataphylloid; blades ancipitous or terete, sometimes much reduced, rarely transversely septate, spongiose inside; sheaths elongate, ligule none. Inflorescences paniculate bearing 1–several partial panicles; branches often fasciculate; branchlets flexuous and zigzag; bracts sheathing, often spathaceous. Spikelets frequently clustered, ovoid to subturbinate with fruit, subtended by 1–2 bracteoles, bearing several glumes, on ± straight persistent rhachilla, 1–several-flowered, but only the lowest or lowest 2 flowers hermaphrodite and fruit-bearing, the upper flowers reduced. Glumes 2-ranked, keeled, the lower 1–4 empty and smaller than the fruit-bearing one(s), the fruit-bearing one(s) the largest, the remaining upper glumes gradually smaller, bearing male flowers or empty. Flowers hermaphrodite or staminate; perianth segments often none, rarely up to 6, filiform, scabrous. Stamens (1–)3. Stigmas 3. Achenes mostly ovoidal or ellipsoidal, triquetrous to subterete, sessile or stipitate, the surfaces smooth to wrinkled, the apex crowned with a pyramidal, often pubescent, persistent style base, which is adnate to the achene body.

About 45 species distributed in tropical and temperate regions but mostly in Australia and New Zealand; four species in China; two species in Hong Kong.

1a. Culms terete; leaves (2–)4–7 mm broad; achene densely pubescent at tip ..... 1. *M. rubiginosa*

1b. Culms flattened; leaves (0.7–)1–2.5 cm broad; achene glabrous ..... 2. *M. ensigera*

1. **Machaerina rubiginosa** (Spreng.) T. Koyama 圓葉劍葉莎

Bot. Mag. (Tokyo) 69: 65. 1956; FOC 23: 259. 2010.

Schoenus rubiginosus Sol. ex G. Forst., Fl. Ins. Austr. 89. 1786.

Fuirena rubiginosa Spreng., Mant. Prima Fl. Hal. 29. 1807.

Cladium glomeratum auct. non R. Br. ex C. B. Clarke: FKH 302. 1912.

Perennial; rhizome short, emitting long horizontal stolons covered with 2-ranked, pale, lanceolate scales. Culms tufted, slender, compressed-biconvex to subterete, usually with 1 node above the base, smooth, (30–)100–180 cm tall, (2–)3–6 mm thick. Basal leaves shorter than to about as long as stems, erect, biconvex with obtuse edges to subterete, smooth, pungent, spongiose inside, (2–)4–7 mm wide; cauline leaf long-sheathing, with short blade. Panicle erect, narrow, dense or interrupted, (10–)20–50 cm, consisting of 3–7 fascicles of branches, the lower branches distant, subtended by long-sheathing, shortly laminate bracts; upper branches approximate, their bracts gradually shorter. Lower branches often solitary, up to 25 cm, upper ones 2–4 together, erect, rigid, scabrous, much shorter. Spikelets in oblong to almost globose clusters, lanceolate or finally ovate, 2–3-flowered, maturing 1–2 achenes, 4–7 × 2–2.5 mm. Glumes 5, ovate to lanceolate, acuminate, long-ciliate, the longest 4.5–6.5 mm. Perianth segments absent. Stamens 3; anthers 1.5–2 mm, with distinctly produced connective. Stigmas 3. Achenes ellipsoidal to oblong-ellipsoidal, trigonous, sessile, smooth, shining, orange to reddish-brown, 3–5 × 1.5–2 mm, densely pubescent, persistent style base included.

Locality: Hong Kong. *HK sheet 8197.*

Distribution: Yunnan; Sri Lanka, Bangladesh, India, Indoneasia, Philippines, New Guinea, Japan, New Zealand, Australia.

Ecology: Flowering & fruiting: Apr.–Aug.

2. **Machaerina ensigera** (Hance) T. Koyama 劍葉莎 **(Fig. 64)**

Bot. Mag. (Tokyo) 69: 63. 1956; FOC 23: 259. 2010.

Cladium ensigerum Hance, J. Bot. 23: 80. 1885; FKH 302. 1912; FRPS 11: 119. 1961.

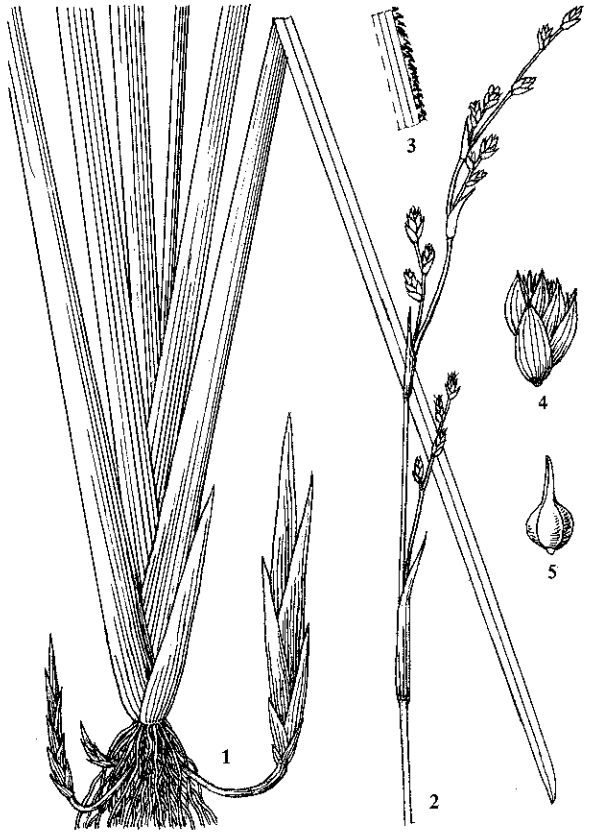

Figure 64. *Machaerina ensigera* (Hance) T. Koyama

1. plant; *2.* inflorescence; *3.* portion of leaf showing scabrous dentate margin ; *4.* spikelet; *5.* achene. (drawn by H. P. Yu)

Baumea ensigera (Hance) S. T. Blake, Contr. Queensland Herb. 8: 29. 1969.
Mariscus ensiger (Hance) Fernald, Rhodora 25: 53. 1923.

Rhizomes horizontal, 4.5–7 mm thick. Culms flattened. Leaves basal; blade ensiform, 3.8–50 × (0.7–)1–2.5 cm, rigid, many-veined, margin purple, finely scabrous, and denticulate. Inflorescences paniculate, narrow, usually 3-branched. Spikelets purple, ca. 11.3 × 3.5 mm, 2–3-flowered. Glumes ovate-lanceolate, apex acuminate. Achene subdrupaceous, ellipsoidal, 3-furrowed, glabrous; persistent style base thickened.

Locality: Pok Fu Lam, Sai Kung. *HK sheet 8180, 8181.*

Distribution: Endemic to Hong Kong.

Ecology: Forests, streamsides. Flowering & fruiting: Apr.–Aug.

Notes: The type specimen of *Cladium ensigerum* (*Hance Herb. No. 22181*) was collected by C. Ford from Pok Fu Lam in May 1883. The species is very close to *M. myriantha* (Chun & F. C. How) Y. C. Tang and differs in its leaf blades being shorter, to 50 cm, margin serrulate and spikes 1–1.2 cm long.

14. **Lepidosperma** Labill. 鱗子莎屬

Perennial herbs with short, woody rhizome, often stoloniferous. Stems tufted, usually nodeless, terete, compressed, or 3–4-angular. Leaves basal, equitant, similar to the stems. Inflorescence paniculate. Bracts shorter than the inflorescence, the lowest with a short pungent blade, the upper ones smaller and shorter. Spikelets oblong-lanceolate. Flowers usually 2–4, the upper one bisexual, the lower one(s) sterile, or male by reduction. Rachilla short, straight. Glumes 4–7, spirally arranged, imbricate, scaberulous at the top. Perianth segments 3 or 6 biseriate, white hypogynous scales, which are narrow, hyaline (therefore easily overlooked in young flowers), under the fruit broadened and incrassate, spongiose, ovate to lanceolate, shorter than the achene. Stamens 3, anthers linear, connective distinctly produced. Style continuous with the ovary, stigmas 3; style base persistent, at the first bulbous to dome-shaped, ultimately depressed-hemispherical. Achene oblong or oblong-elliptic, obtusely trigonous, crusty, often smooth and shining when ripe.

About 100 species in tropical Asia to Australia, New Zealand and New Caledonia; one species in China and Hong Kong.

1. **Lepidosperma chinense** Nees

鱗子莎 **(Fig. 65; Photo 154)**

Linnaea 9: 302. 1834; FHK 398. 1861; FKH 302. 1912; FRPS 11: 120. 1961; FGD 8: 321. 2007; FOC 23: 260. 2010.

Perennial; rhizome stout, short. Culms slender to rather stout, rigid, (25–)40–150(–250) cm tall, 1–3 mm thick, subterete or slightly angular, smooth, few-leaved at the base. Leaves shorter than the stems, almost terete, 2–4 mm thick, with a shallow, very inconspicuous groove, rigid, glaucous, pith chambered by many approximate transverse partitions; sheaths chestnut-coloured, lower ones bladeless. Panicle narrowly oblong, dense, often somewhat interrupted at the base, 3–10 cm, consisting of several oblong-lanceolate, suberect spikes. Involucral bracts spathe-like, shortly sheathing, blackish brown, rounded at the apex, the lowest ending in a short pungent blade. Spikelets crowded, oblong-lanceolate, 5–6 mm, 2-flowered. Glumes 5–7, firm, oblong to lanceolate, 3–5 mm, black with rusty margins, apex obtuse to acute, the empty ones mucronulate, the upper ones subacute. Hypogynous scales small, connate at the base, whitish, 0.5–0.7 mm. Stamens 3, anthers ca. 2 mm, yellow. Styles slender, stigmas 3. Achene ellipsoidal, 2.5–4 × 1.5–3 mm, apiculate, shining rusty, purplish dotted.

Locality: Common in Hong Kong. *J. C. Shaw 493; Y. W. Lam 1330; Y. S. Lau 2479.*

Distribution: Guangdong, Guangxi, Hainan, Hunan, Fujian, Zhejiang; Vietnam, Malaysia, Indonesia, Papua New Guinea.

Ecology: Grasslands in valleys. Flowering & fruiting: May–Dec.

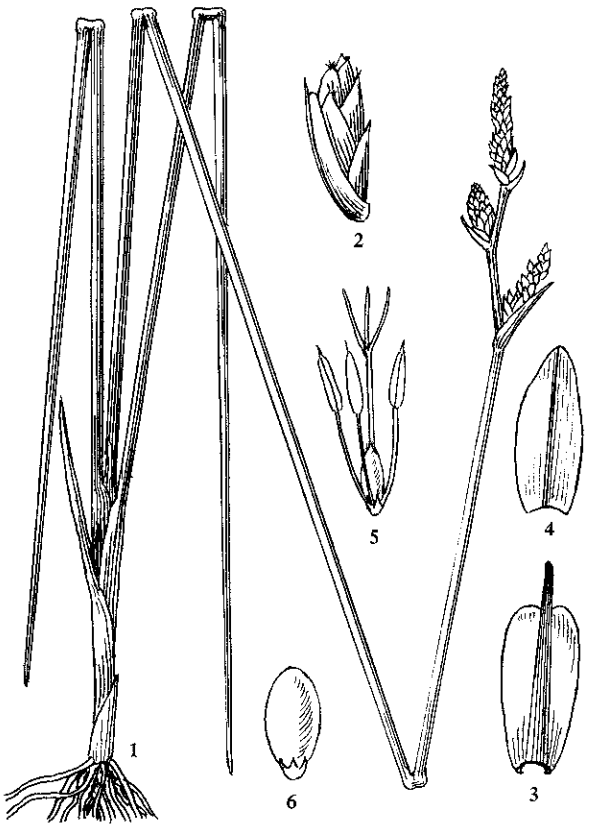

Figure 65. *Lepidosperma chinense* Nees
1. plant; *2.* spikelet; *3.* involucral bract; *4.* glume; *5.* bisexual flower; *6.* achene. (drawn by H. P. Yu)

15. **Eleocharis** R. Br. 荸薺屬

Annuals or perennials; rhizome short or absent; stolons usually present. Culms terete or angular, sometimes transversely septate. Leaves reduced to bladeless sheath; ligule absent. Involucral bracts 1–2, glume-like. Inflorescence a single, terminal spikelet. rarely 2-ranked. Flowers bisexual. Perianth segments up to 8, bristle-like, sometimes absent. Stamens 1–3. Stigmas 2–3, base of style persistent on achenes. Achenes trigonous or biconvex, mostly obovate, surface smooth, reticulate, pitted, longitudinally grooved or transversely ridged.

About 250 species in tropical and temperate regions of the world; 35 species in China; 11 species in Hong Kong.

1a. Spikelets cylindrical, usually 11 mm or longer, as broad as the coarse culms.
2a. Culms transversely septate.
3a. Spikelets 4–6 mm across ..... 1. *E. dulcis*
3b. Spikelets 2–3 mm across ..... 2. *E. equisetina*
2b. Culms not transversely septate.
4a. Culms terete or weakly angular ..... 3. *E. ochrostachys*
4b. Culms triquetrous or 4–5-angled at least on upper part.
5a. Sheath apex often with setaceous blade up to 4 mm long; glumes broadly obovate, closely imbricate ..... 4. *E. spiralis*
5b. Sheath apex without blade; glumes ovate to ovate-elliptic, loosely imbricate ..... 5. *E. acutangula*
1b. Spikelets ovoid or ellipsoidal, up to 11 mm long, distinctly broader than the slender culms.
6a. Lower glumes 2-ranked ..... 6. *E. retroflexa*
6b. Lower glumes spirally arranged.
7a. Stigmas 2; achenes biconvex, black at maturing.
8a. Achenes 1 mm long; orifice of sheaths firm ..... 7. *E. geniculata*
8b. Achenes 0.5 mm long; orifice of sheaths hyaline ..... 8. *E. atropurpurea*
7b. Stigmas 3; achenes trigonous, pale brown to olivaceous green or dark grey green, never black.
9a. Achenes tuberculate (with cross bars); spikelet never proliferous, sub-loosely flowered ..... 9. *E. acicularis*
9a. Achenes smoother or nearly so; spikelet frequently proliferous, densely flowered.
10a. Annuals or short-lived perennials; culms less than 15 cm tall, terete to weakly angular; spikelets less than 2 mm across, erect ..... 10. *E. pellucida* var. *japonica*
10b. Stoloniferous perennials; culms 40–70 cm tall, acutely 4(–5)-angled; spikelets more than 3 mm across, somewhat oblique ..... 11. *E. tetraquetra*

1. Eleocharis dulcis (Burm. f.) Trin. ex Hensch. 荸荠(馬蹄) **(Fig. 66; Photos 155–156)**

Vita Rumphii 186. 1833; FRPS 11: 49. 1961; FHN 4: 280. 1977; FTW ed. 2, 5: 257. 2000; FYN 15: 588. 2003; FGD 8: 288. 2007; FOC 23: 191. 2010.

Andropogon dulcis Burm. f., Fl. Indica 219. 1768.

Eleocharis tuberosa Schult., Mant. 2: 86. 1824; FKH 297. 1912.

Eleocharis plantaginea R. Br., Prodr. 1: 224. 1810; FKH 297. 1912.

Perennial. Stolons elongate, terminated by a small tuber. Tubers 5–7 mm across. Culms tufted, 40–90 cm tall, 3–7 mm thick, terete, transversely sepatate, spongiose, easily flattened when dry. Sheaths 3–20 cm, apex truncate, reddish brown. Spikelet cylindrical, 2–5 × 0.4–0.6 cm. Glumes many per spikelet, elliptic-oblong to oblong-obovate, 5–6.5 × 1.7–3.2 mm, apex obtuse to rounded-truncate, sides herbaceous or papery, whitish, margins narrow, hyaline, midrib greenish. Perianth segments 6–8, longer than achenes, flattened below, barbellate above. Stamens 3; anthers 2.5–3 mm long. Stigmas 2. Achenes brown, obovate, biconvex, 1.7–2.2 × 1.5–1.8 mm, apex indistinctly annulate, style base triangular-conical, surface shiny yellowish or greyish brown, indistinctly cancellate.

Locality: Cultivated. *P. S. Choi 536; Y. W. Lam 1775; HK sheet 39700.*

Distribution: Widely cultivated in China; Korea, Japan, Vietnam, Malaysia, Madagascar, W Africa, Australia.

Ecology: Ponds, marshes and paddy fields. Flowering & fruiting: May–Oct.

Uses: Food (tuber).

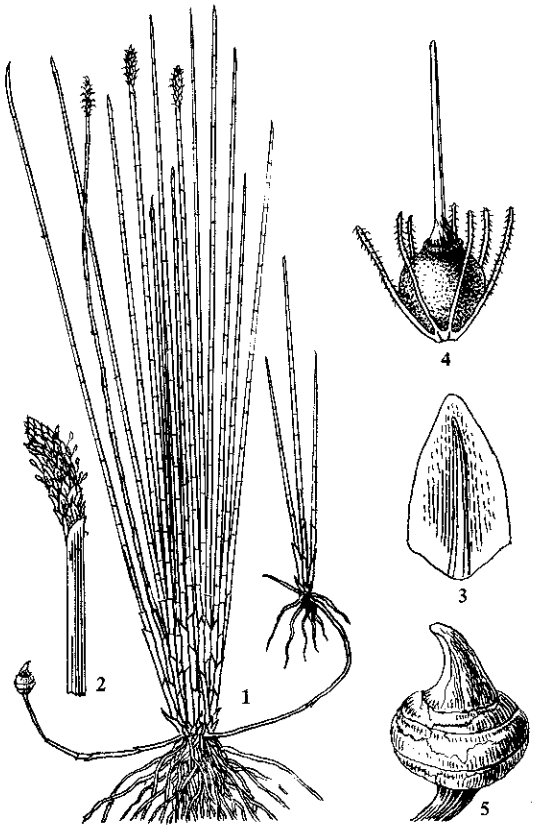

Figure 66. *Eleocharis dulcis* (Burm. f.) Trin. ex Hensch. *1.* plant; *2.* spikelet; *3.* glume; *4.* achene; *5.* tuber. (drawn by H. P. Yu)

2. Eleocharis equisetina J. Presl & C. Presl 木贼状荸荠 **(Photos 157–158)**

Reliq. Haenk. 1(3): 195. 1828; FRPS 11: 48. 1961; FHN 4: 280. 1977; FGD 8: 287. 2007.

Eleocharis kuroguwai Ohwi, J. Jap. Bot. 12(9): 654. 1936.

Eleocharis dulcis auct. non (Burm. f.) Trin. ex Hensch.: FOC 23: 191. 2010, *p.p.*

Perennial. Stolons elongate, terminated by a small tuber. Culms tufted, 30–50 cm tall, 2–3 mm thick, terete, transversely septate,

spongiose, easily flattened when dry. Sheaths 5–15 cm, apex truncate, reddish brown, glabrous. Spikelet cylindrical, 2–4 × 0.2–0.3 cm. Glumes oblong-obovate, 3–8 × 4 mm, apex obtuse, subleathery, greenish or brownish, margin hyaline. Perianth 7–8, ca. 1.5 times of achenes. Stamens 3, anthers linear. Stigmas 3. Achenes ca. 2 × 1.2 mm, obovoid or ellipsoidal, biconvex, yellow, apex indistinctly annulate, style base triangular-conical, surface shiny yellowish or greyish brown, indistinctly cancellate.

Locality: Yuen Long, Mai Po, Kuk Po, Lai Chi Wo, Tai Mo Shan, Ma Wan. *Y. W. Lam 1208, 1848; J. C. Shaw 114.*

Distribution: Hainan, Guangdong, Jiangsu, Taiwan; Japan, SE Asia, India.

Ecology: Marshes and wet places. Flowering & fruiting: Jun.–Sep.

3. Eleocharis ochrostachys Steud. 假馬蹄(假荸薺) **(Photos 159–160)**

Syn. Pl. Glumac. 2: 80. 1855; FRPS 11: 51. 1961; FHN 4: 282. 1977; FTW ed. 2, 5: 259. 2000; FGD 8: 289. 2007; FOC 23: 192. 2010.

Eleocharis variegata auct. non Kunth: FKH 297. 1912; Check List HK Plants 89. 1993.

Perennial. Stolons elongate, 1.5–2.5 mm thick. Culms tufted, 40–80 cm tall, 2–3 mm thick, terete to weakly angular, without transverse septa, longitudinally canaliculate on surface when dry. Sheaths 6–15 cm, apex mucronulate, pale brown to reddish brown. Spikelets cylindrical to ovoid, 1–2.5 cm × 3–4 m. Glumes several to many per spikelet, ovate to ovate-oblong, 4–5 × 2–2.2 mm, apex obtuse, sides herbaceous, pale green, finely striate, margins broadly membranous. Perianth segments 6–7, much exceeding achenes, barbellate. Stamens 3; anthers 0.7–0.8 mm. Stigmas 3. Achenes broadly obovate, compressed-trigonous, 1.5–2 × 1.3–1.6 mm, apex annulate, surface yellowish brown, shiny, with longitudinal rows of transversely linear-oblong epidermal cells.

Locality: Aberdeen, Kwun Tong, Lantau Island. *Y. W. Lam 916, 1302; HK sheet 13364.*

Distribution: Hainan, Guangdong, Fujian, Taiwan; Vietnam, Thailand, Myanmar, India, Malaysia, Indonesia, Japan, Micronesia.

Ecology: Marshes, paddy fields and lakes. Flowering & fruiting: Sep.–Nov.

4. Eleocharis spiralis (Rottb.) Roem. & Schult. 螺旋鱗荸薺 **(Photos 161–162)**

Syst. Veg. 2: 155. 1817; FRPS 11: 50, pl. 19: 1–3. 1961; FHN 4: 281. 1977; FGD 8: 289. 2007.

Scirpus spiralis Rottb., Descr. Icon. Rar. Pl. 45, t. 15, fig. 1. 1773.

Stoloniferous perennial. Stolons ca. 3 mm thick. Culms tufted, 30–60 cm tall, 2–4 mm thick, usually triquetrous, rarely subterete, smooth. Sheaths 3–17 cm, light green to purplish, apex often with setaceous blade 1–4 mm. Spikelets cylindrical, yellowish, 1.5–3 cm × 4–6 mm. Glumes many per spikelet, densely imbricate, broadly obovate, 3.2–4 × 2–2.5 mm, very broadly obtuse to truncate, sides subleathery, yellowish brown. Perianth segments 5–6, slender, shorter than or equalling achenes, rarely longer, pale brownish, sparsely patent-spinulose. Stamens 3; anthers linear, 2–2.3 mm long. Stigmas 3. Achenes black, obovoid to ovoid, biconvex, 1.5–1.7 × 1.2–1.4 mm, apex rounded or indistinctly annulate, style base conical, surface maturing dark brown, indistinctly cancellate.

Locality: Wu Kai Sha, Yuen Long, Yung Shue O, Mai Po, Plover Cove, Tai Ho. *J. C. Shaw 671; Y. W. Lam 746, 1142.*

Distribution: Guangdong, Hainan; Africa, Madagascar, Australia.

Ecology: Margins of ponds. Flowering & fruiting: Oct.–Jan. of the following year.

Uses: Weaving.

5. Eleocharis acutangula (Roxb.) Schult. 銳棱荸薺 **(Photos 163–164)**

Mant. 2: 91. 1824; FHN 4: 282. 1977; FTW ed. 2, 5: 255. 2000; FGD 8: 289. 2007; FOC 23. 192. 2010.

Scirpus acutangulus Roxb., Fl. Ind., ed. 1820, 1: 216. 1820.

Eleocharis fistulosa Link, Jahrb. Gewächsk. 3: 78. 1820; FRPS 11: 51. 1961.

Stoloniferous perennial; stolons often terminated by a small tuber. Culms tufted, 30–70 cm tall, 2.5–4 mm thick, sharply triquetrous, smooth. Sheaths up to 10 cm, triangular-acute, pale green to brownish. Spikelets cylindrical, 2–4 cm × 3–4 mm. Glumes ovate to ovate-elliptic, 4–5 mm, rounded, herbaceous, green, margins hyaline. Perianth segments 6, longer than achenes, usually barbellate. Stamens 2–3; anthers 1.5–1.7 mm long. Stigmas 3. Achenes broadly obovate, compressed-trigonous, 1.5–2 × 1.4 mm, apex constricted into a short neck, style base subulate-deltoid, surface yellowish brown, indistinctly shallowly pitted transversely oblong epidermal cell.

Locality: Aberdeen, Sai Kung. *Y. W. Lam 1722, 2169, 2225.*

Distribution: Hainan, Guangdong, Yunnan, Fujian, Taiwan; Vietnam, Myanmar, India, Sri Lanka, Malay Peninsula.

Ecology: Marshes and paddy fields. Flowering & fruiting: Jul.–Sep.

6. Eleocharis retroflexa (Poir.) Urb. 貝殼葉荸薺 **(Photo 165)**

Symb. Antill. 2: 165. 1900; FHN 4: 283. 1977; FGD 8: 290. 2007; FOC 23: 193. 2010.

Scirpus retroflexus Poir., Encycl. 6(2): 753. 1805.

Eleocharis chaetaria Roem. & Schult., Syst. Veg. 2: 154. 1817; FRPS 11: 54. 1961.

Annual; rhizome absent. Culms tufted, often recurved, 4–14 cm tall, 0.2–0.3 mm thick, angular. Sheaths 0.3–0.5 cm long, apex lanceolate, acute, pale brown to reddish brown below. Spikelets broadly ovate, 3–4 × 1.7–2.5 mm, laterally ± flattened. Glumes 3–8 per spikelet, ± 2-ranked, ovate to ovate-elliptic, 2.5–3 × 1.5–2 mm, pale brown to reddish, sides membranous, apex subacute, margins broad-hyaline, the glumes keeled, keel ± acute. Perianth segments 6, flattened, equalling to slightly longer than achenes, sparsely scabrid above. Stamens 3; anthers linear. Stigmas 3. Achenes broadly obovoid, trigonous, 0.7–1 × 0.6–0.7 mm, apex rounded, style base depressed-conical, decurrent with apex, surface trabeculate with 7–9 rows of deeply pitted epidermal cells, pale yellow.

Locality: Sai Kung, Lai Chi Wo, Ham Tin, Pui O. *Y. W. Lam 1718; S. C. Ng 1080; HK sheet 39295.*

Distribution: Hainan, Guangdong, Yunnan, Fujian; Japan, Vietnam, Thailand, Cambodia, India, Sri Lanka, Myanmar, Malaysia, Indonesia, Philippines, Papua New Guinea, Australia, tropical America.

Ecology: Margins of ponds, streamsides. Flowering & fruiting: Oct.–Nov.

7. Eleocharis geniculata (L.) Roem. & Schult. 黑籽荸荠 **(Photos 166–167)**

Syst. Veg. 2: 150. 1817; FHN 4: 284. 1977; FTW ed. 2, 5: 259. 2000; FGD 8: 290. 2007; FOC 23: 197. 2010.

Scirpus geniculatus L., Sp. Pl. 1: 48. 1753.

Eleocharis capitata R. Br., Prodr. 1: 225. 1810; FKH 297. 1912.

Scirpus capitatus Willd., Sp. Pl. 1: 294. 1798. non L. 1753; FHK 394. 1861.

Eleocharis caribaea (Rottb.) S. F. Blake, Rhodora 20: 24. 1918; FRPS 11: 61. 1961.

Annual; rhizome absent. Culms densely tufted, 7–40 cm tall, 0.2–0.4(–0.7) mm thick. Sheaths 0.5–3 cm, apex obliquely truncate, pale green, to reddish or purple brown below. Spikelets ovoid-globose to ovoid-ellipsoidal, 3–7 × 3–4 mm. Glumes many per spikelet, closely imbricate, broadly elliptic to ovate, 1.8–2 × 1.2 mm, apex obtuse, sides membranous, pale brown, midrib green. Perianth segments 6–8, slightly longer than achenes, sparsely barbellate. Stamens 2–3; anthers linear, ca. 0.5 mm long. Stigmas 2. Achenes black, broadly obovate, biconvex, 0.9–1 × 0.7–0.8 mm, rounded, maturing shinny black, ± smooth; style base depressed-conical.

Locality: Sai Wan, Shap Sze Heung, Yung Shue O, San Tau. *Y. W. Lam 1640, 2168; Y. S. Lau 669.*

Distribution: Hainan, Guangdong, Fujian, Taiwan; tropical and subtropical regions of the world.

Ecology: Marshes, wet places and paddy fields. Flowering & fruiting: Jan.–Jul.

8. Eleocharis atropurpurea (Retz.) J. Presl & C. Presl 紫果藺

Reliq. Haenk. 1(3): 196. 1828; FRPS 11: 62. 1961; FHN 4: 284. 1977; Flora Guizhouensis 8: 571. 1988; FTW ed. 2, 5: 255. 2000; FYN 15: 595. 2003; FGD 8: 290. 2007; FOC 23: 197. 2010.

Scirpus atropurpureus Retz., Observ. Bot. 5: 14. 1789.

Dwarf annual; rhizome absent. Stems tufted, erect or curved, capillary, angular-sulcate, smooth, 4–15 cm tall, 0.3–0.7 mm thick. Sheaths appressed, purplish or brownish at the base, apex of the uppermost oblique, often attenuate. Spikelets oblong-ovoid, ± obtuse, somewhat angular, densely many-flowered, 2–4 (finally lengthening to 8) mm, 1.5–2 mm across. Glumes elliptic, 0.9–1.3 × 0.5–0.7 mm, apex obtuse, membranous, keeled, 1-veined, with green keel and pale or ± purplish sides. Perianth segments 3–6, slender, minutely retrorsely scabrous to almost smooth, shorter than to about as long as the achene, whitish, translucent, not rarely vestigial or absent. Stamens 1–2; anthers linear or oblong-linear, minutely apiculate, 0.3–0.7 mm. Stigmas 2. Achene black, obovate, biconvex, 0.5–0.7 × 0.3–0.4 mm, smooth, shining; epidermal cells very inconspicuous. Style base minute, flattened, strongly depressed, disciform or depressed-conical, 1/4–1/3 as wide as the achene.

Locality: Castle Peak, Tung Lung Chau. *HK sheet 13341, 37014.*

Distribution: Anhui, Shandong, Taiwan, Hainan, Guangdong, Guangxi, Sichuan, Yunnan, Hunan, Jiangsu; widely spread over tropical regions of the world.

Ecology: Paddy fields and wet places. Flowering & fruiting: Jun.–Oct.

9. Eleocharis acicularis (L.) R. Br. 牛毛氈 **(Photos 168–169)**

Prodr. 1: 224. 1810; Roem. & Schult., Syst. Veg. 2: 154. 1817; FKH 297. 1912; FTW ed. 2, 5: 254. 2000; FGD 8: 291. 2007.

Scirpus acicularis L., Sp. Pl. 1: 48. 1753.

Eleocharis yokoscensis (Franch. & Sav.) Tang & F. T. Wang, FRPS 11: 54, pl. 20: 10–13. 1961; Flora Guizhouensis 8: 567. 1988; FYN 15: 590. 2003; FOC 23: 193. 2010.

Perennial, with capillary stolons, usually forming dense mats. Culms erect, capillary, angular-sulcate (usually 4-angled), smooth, 3–10(–30) cm tall, 0.1–0.3(–0.5) mm thick, often much elongate in deep or running water. Sheaths thinly membranous, loose, oblique at the mouth, often reddish at the base, the apex scarious and often somewhat inflated. Spikelet ovate to lanceolate, ± flattened, acute, (3–)5–8(–15)-flowered, 2–4(–7) × 1–1.5 mm. Glumes thinly membranous, suberect, oblong-ovate, 1.5–2 × 1–1.5 mm, apex ± obtuse, pale green with scarious margins and often reddish brown sides, the lower ones subdistichous, 1-veined. Perianth segments 1–4, very slender, equalling or exceeding the achenes, often reduced or absent. Stamens 2–3; anthers linear, 0.6–1 mm; connective shortly produced. Sigmas 3. Achenes whitish to light brown, obovate-oblong, 0.7–1 × 0.4–0.5 mm, almost terete or trigonous, on each face with 2–4 distinct longitudinal ribs connected by many transverse cross-ridges; epidermal cells transversely linear; style bases minute, depressed pyramidal, 1/3–1/2 as wide as the achene.

Locality: Sha Tin, Wu Kau Tang, Fanling. *Y. S. Lau 1501, 2173; S. T. Chan 199.*

Distribution: Widely distributed in China; N America, Europe, E Russia, Korea, Japan, India, Myanmar, Vietnam, Indonesia, Philippines, Sri Lanka.

Ecology: Wet places. Flowering & fruiting: Apr.–Nov.

10. Eleocharis pellucida var. **japonica** (Miq.) Tang & F. T. Wang 稻田荸荠 **(Photo 170)**

FRPS 11: 58. 1961; FHN 4: 283. 1977; FYN 15: 593. 2003; FOC 23: 195. 2010.

Eleocharis congesta auct. non D. Don: FGD 8: 292. 2007; Check List HK Plants 312. 2002; 110. 2004.

Eleocharis japonica Miq., Ann. Mus. Bot. Lugduno-Batavum 2: 142. 1865.

Eleocharis congesta D. Don subsp. *japonica* (Miq.) T. Koyama, FTW 5: 220. 1978, ed. 2, 5: 257. 2000.
Scirpus japonicus (Miq.) Franch. & Sav., Enum. Pl. Jap. 2: 109. 1877.
Eleocharis afflata Steud., Zoll. Verz. Ind. Archip. 84. 1851; FKH 297. 1912.
Scirpus afflatus (Steud.) Benth., FHK 394. 1861.

Stoloniferous perennial; stolons often terminated by a small tuber. Culms tufted, 30–70 cm tall, 2.5–4 mm thick, sharply triquetrous, smooth. Sheaths 4–10 cm, triangular-acute, pale green to brownish. Spikelets cylindrical, 2–4 cm × 3–4 mm. Glumes ovate to ovate-elliptic, ca. 2.2 × 1 mm, rounded, herbaceous, green, margins hyaline. Perianth segments 6, longer than achenes, usually barbellate. Stamens 2–3; anthers 1.5–1.7 mm long. Stigmas 3. Achenes yellowish brown, broadly obovate, 1.5–2 × 1.4 mm, compressed-trigonous, apex constricted into a short neck, style base subulate-deltoid, surface indistinctly shallowly pitted transversely oblong epidermal cell.

Locality: Sai Kung, Sha Tin. *Y. S. Lau 3089; Y. W. Lam 1703; HK sheet 39235.*

Distribution: S, SE & SW China; Russia, Korea, Japan, India, Myanmar, Indochina, Indonesia, Philippines, Europe, N America.

Ecology: Marshes, paddy fields and ditches. Flowering & fruiting: May–Aug.

11. Eleocharis tetraquetra Nees 龍師草 **(Photos 171–172)**

Contr. Bot. India 113. 1834; FRPS 11: 55. 1961; FHN 4: 283. 1977; FTW ed. 2, 5: 259. 2000; FGD 8: 291. 2007; FOC 23: 194. 2010.

Stoloniferous perennial; stolons slender. Culms tufted, 30–90 cm tall, 1–2.5 mm thick, acutely 4(–5)-angled. Sheaths 6–15 cm, apex obtuse, mucronulate, pale brown to reddish or purple brown. Spikelet somewhat oblique, oblong or lanceolate, 8–10 × 3–5 mm. Glumes many per spikelet, oblong to ovate, 3–4 × 1.5–2 mm, apex obtuse, sides papery, rusty brown above, margins narrowly hyaline, midrib greenish. Perianth segments 6(–8), slightly longer to twice as long as achenes body, retrorsely barbellate, spinules rather long. Stigmas 3. Achenes obovate, flattened trigonous, 1.5–2 × 1–1.2 mm, apex rounded, style base deltoid, surface smooth, maturing greenish brown, ± smooth.

Locality: Tai Mo Shan, Penny's Bay. *J. C. Shaw & R. Corlett 115; Y. W. Law 1593; HK sheet 38291.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Henan, Anhui, Jiangsu, Fujian, Jiangxi, Heilongjiang, Liaoning, Sichuan, Yunnan, Zhejiang, Taiwan; Japan, Russia, Afghanistan, Bhutan, Sri Lanka, India, Nepal, Pakistan, Thailand, Vietnam, Indonesia, Philippines, Papua New Guinea, Australia.

Ecology: Margins of ponds and other wet places. Flowering & fruiting: Sep.–Nov.

16. Bulbostylis Kunth 球柱草屬

Annuals or perennials. Culms ± filiform, terete. Leaves basal, or rarely reduced to bladeless sheaths; blades narrowly linear or filiform; sheath with long silky hairs at apex. Involucral bracts leaf-like to glume-like. Inflorescence simple to decompound corymbose or capitate or reduced to a single terminal spikelet. Spikelets ovoid to ellipsoidal, often angular. Glumes many, all fertile, spirally imbricate. Flowers bisexual. Perianth segments absent. Stamens 1–3. Stigmas 3; style base thickened, persistent on achene. Achenes obovoid to orbicular, trigonous to triquetrous, surface variously patterned.

About 100 species in the tropical and subtropical regions of the world; three species in China and Hong Kong.

1a. Spikelets in heads; achene smooth..... 1. *B. barbata*
1b. Spikelets umbellate, rarely reduced to a single spikelet; achene transversely wrinkled.
  2a. Inflorescence with loosely arranged spikelets on long anthelas; glumes glabrous, apex obtuse ..... 2. *B. densa*
  2b. Inflorescence with crowded spikelets on very short anthelas, often contracted to nearly head-like; glumes pubescent, mucronate at apex..... 3. *B. puberula*

1. Bulbostylis barbata (Rottb.) Kunth
球柱草 **(Fig. 67; Photo 173)**

Enum. Pl. 2: 208. 1837; FKH 300. 1912; FRPS 11: 71. 1961; FHN 4: 285. 1977; FTW ed. 2, 5: 193. 2000; FYN 15: 597. 2003; FGD 8: 293. 2007; FOC 23: 219. 2010.

Scirpus barbatus Rottb., Progr. 27. 1772.

Isolepis barbata (Rottb.) R. Br., Prodr., Fl. Nov. Holl. 222. 1810; FHK 393. 1861.

Annual. Rhizome absent. Culms densely tufted, 5–30 cm tall, 0.2–0.4 mm thick, ± terete, smooth, glabrous. Leaves basal; blade filiform, 4–10 cm × 0.2–0.5 mm, acute, glabrous to sparsely pilose

Figure 67. *Bulbostylis barbata* (Rottb.) Kunth
1. plant; *2.* spikelet; *3.* glume; *4.* achene. (drawn by H. P. Yu)

above; sheath 0.5–2 cm, brownish. Involucral bracts 1–3, setaceous, the longest 0.3–2.5 cm. Inflorescence capitate, 5–15 mm wide. Spikelets 2–20, lanceolate to ovoid-conical, angular, 3–8 × 1–1.8 mm. Glumes 7–15 per spikelet, ovate, 1.5–2.3 × 1–1.5 mm, apex acute, recurved-mucronate, sides membranous, yellowish green to rusty or chestnut brown, ciliolate to puberulent, margins hyaline, keel acute. Stamen 1(–2); anther oblong, 0.2–0.3 mm. Stigmas 3. Achenes whitish, obovoid-orbicular, trigonous, 0.6–0.8 × 0.4–0.6 mm, ± smooth to finely papillose.

Locality: Deep Water Bay, Tai Lung, Wu Shek Kok, Tung Chung, Yi O. *Y. W. Lam 799, 826; Y. S. Lau 2626.*

Distribution: Widely distributed in China except NW regions; pantropics.

Ecology: Open-dry sandy places, frequent on dunes and sandy ground near sea. Flowering & fruiting: Apr.–Oct.

2. Bulbostylis densa (Wall.) Hand.-Mazz. 絲葉球柱草

Vegetationsbilder 20(7): 16. 1930; FRPS 11: 70. 1961; FTW ed. 2, 5: 194. 2000; FYN 15: 597. 2003; FGD 8: 292. 2007; FOC 23: 218. 2010.

Scirpus densus Wall., Fl. Ind., ed. 1820, 1: 231. 1820.

Bulbostylis cappillarus auct. non (L.) Kunth: FKH 300. 1912.

Annual; rhizome absent. Culms tufted, filiform, 5–40 cm tall, 0.2–0.5 mm thick, smooth, glabrous. Leaves basal; blade filiform, 2–10 cm × 0.4–0.5 mm, apex acute, glabrous to sparsely pilose; sheath pale brown. Involucral bracts setaceous to ± glume-like, the longest up to 0.7 cm. Inflorescence simple to compound, sometimes condensed and appearing ± capitate; primary branches 1–5, 2–5 cm. Spikelets (1–)2–8, solitary or clustered, cylindrical-ovoid to ovoid, somewhat angular, 3–6 × 1.5 mm. Glumes 5–18 per spikelet, ovate to broadly ovate, 1.5–2 × 1 mm, light chestnut brown, glabrous, apex subacute, sides membranous, margins hyaline, keel acute, pale brown. Stamens 2; anthers oblong, 0.2–0.3 mm long. Style ca. 1 mm, stigmas 3. Achenes obovoid-orbicular, trigonous, 0.7–0.9 × 0.5–0.8 mm, maturing greyish, indistinctly transversely wrinkled, minutely papillose.

Locality: Sunset Peak. *Y. S. Lau 2740; HK sheet 42189.*

Distribution: Areas S of Huanghe; widespread in the Old World tropics.

Ecology: Open, wet, grassy places or on wet rock outcrops. Flowering & fruiting: Apr.–Dec.

3. Bulbostylis puberula (Poir.) Kunth 毛鱗球柱草

Enum. Pl. 2: 213. 1837; FRPS 11: 70. 1961; FHN 4: 285. 1977; FGD 8: 293. 2007; FOC 23: 218. 2010.

Scirpus puberulus Poir. in Lamk., Enc. 6: 767. 1804.

Annual; rhizome absent. Culms densely tufted, 7–40 cm tall, 0.3–0.8 mm thick, scabrid, glabrous to puberulent. Leaves basal; blade filiform, 2–9 cm × 0.3–0.6 mm, glabrous to puberulent; sheath 0.8–3 cm long, pubescent, pale brown. Involucral bracts 2–4, leaf-like, the longest up to 4 cm. Inflorescence simple, often condensed and appearing ± capitate, 1–1.5 × 1.5 cm. Spikelets (1–)5–20, solitary, ovoid to cylindrical-ovoid, angular, 4–8 × 1.4–1.6 mm. Glumes 5–14 per spikelet, broadly ovate, 1.7–2.2 × 1.5–2 mm, densely pubescent, apex acute, recurved-mucronate, side membranous, pale greenish to light brown, margins hyaline, keel acute. Stamen 1; anther 0.5–0.7 mm long. Style ca. 1 mm; stigmas 3. Achenes broadly obovoid, triquetrous, 0.8–1 × 0.5–0.8 mm, whitish to pale yellowish, transversely wrinkled, obscurely reticulate with longitudinally oblong epidermal cells.

Locality: Tai Mo Shan. *HK sheet 13499.*

Distribution: Hainan, Guangdong; widespread in tropical Africa and Asia.

Ecology: Sandy places near seashore. Flowering & fruiting: Feb.–Jun.

Uses: Medicinal (folklore).

17. Fimbristylis Vahl 飄拂草屬

Annuals or perennials; rhizome absent or present, stoloniferous. Culms usually tufted, angled, trigonous or flattened. Leaves basal, blade or reduced to bladeless sheaths; blades linear to filiform, often canaliculate, often cellular-reticulate on upper surface, ligule sometimes present, pubescent or membranous. Involucral bracts leaf-like, setaceous or glume-like. Inflorescence simple to decompound, umbel-like or capitate or a single spikelet. Spikelets mostly ovoid or ellipsoidal, terete, angular or ± laterally flattened. Glumes few to many per spikelet, spirally arranged or all 2-ranked. Flowers bisexual. Perianth segments absent. Stamens 1–3. Stigmas 2–3; style base not persistent on achenes. Achenes trigonous or biconvex, surface variously patterned.

Over 200 species mostly in the tropics and subtropics, with highest number in S Asia, Indochina and Malesia; 55 species in China; 27 species in Hong Kong.

1a. Spikelets ± compressed; glumes distichously arranged at least on basal part of spikelet.
  2a. Glumes glabrous, not gland-dotted ..... 1. *F. eragrostis*
  2b. Glumes hairy or gland-dotted ..... 2. *F. fusca*
1b. Spikelets terete; glumes spirally arranged.
  3a. Achenes linear-oblong or oblong ..... 3. *F. tetragona*
  3b. Achenes obovate to broadly obovate.
    4a. Spikelet solitary; involucral bracts glume-like; leaves with only bladeless sheath.
      5a. All leaves reduced to bladeless sheath; spikelet longer than 5 mm; glume brown with short rust-coloured line, apex mucronate; achenes with transverse wavy reticulation.
        6a. Spikelets slightly patent to ± horizontal, 3.5–5.5 mm wide; achene margin verruculose ..... 4. *F. nutans*
        6b. Spikelets erect, 2–3.5 mm wide; achene margin not verruculose ..... 5. *F. acuminata*

5b. At least some leaves with blades; spikelet ca. 4 mm; glume pale, apex not mucronate; achenes with sparse verrucae and nearly hexagonal reticulation.
7a. Spikelet up to 1 mm wide, with up to 9 glumes; glumes whitish to pale greenish brown..... 6. *F. pauciflora*
7b. Spikelet 1.5 mm wide, with more than 9 glumes; glumes pale brown to pale reddish brown ..... 7. *F. polytrichoides*

4b. Spikelet (1–)2–many; involucral bracts not glume-like; leaves with blade.
8a. Stigmas 2; styles compressed, usually ciliate; achenes compressed.
9a. Spikelets angular due to the keeled glumes, 7 mm or less.
10a. Style-base pilose with long pendent hairs..... 8. *F. velata*
10b. Style-base glabrous ..... 9. *F. aestivalis*
9b. Spikelets terete, at least some to 1 cm or more.
11a. Ligule a fringe of short hairs.
12a. Achene smooth, without longitudinal rows of epidermal cells.
13a. Glume somewhat hairy; veins on glume absent ..... 10. *F. sieboldii*
13b. Glumes glabrous; veins on glumes present.
14a. Glume yellowish white, ca. 4 mm; achenes yellowish white, with a short yellowish white stripe ..... 11. *F. schoenoides*
14b. Glume brown or yellowish brown, 5–7 mm; achenes yellowish brown, with a short brown stripe.
15a. Spikelets 3–6; bract 1, shorter than the inflorescence..... 12. *F. tristachya*
15b. Spikelets 1–2; bract 1 or absent, longer than the inflorescence ..... 13. *F. subbispicata*
12b. Achene with longitudinal rows of epidermal cells.
16a. Spikelets very narrowly ovoid to linear; ca. 2 mm broad..... 14. *F. hookeriana*
16b. Spikelets usually ovoid, oblong or ellipsoidal, broader than 2.5 mm.
17a. Achene without obvious vertical ribs ..... 15. *F. longispica*
17b. Achene with obvious vertical ribs.
18a. Achene with 15–24 vertical rows of transversely oblong-rectangular epidermal cells ..... 16. *F. tomentosa*
18b. Achene with 5–11 vertical rows of transversely oblong-rectangular epidermal cells ..... 17. *F. dichotoma*
11b. Ligule absent.
19a. Rhizomes long-creeping; leaves with appressed silky hairs on lower surface..... 18. *F. sericea*
19b. Rhizomes not long-creeping; leaves without appressed silky hairs.
20a. Spikelets ellipsoidal-cylindrical to ovoid-cylindrical, 1–2 mm wide..... 19. *F. cymosa*
20b. Spikelets broadly ovoid to ovoide-ellipsoidal, 3–4 mm wide ..... 20. *F. rigidula*

8b. Stigmas 3; styles triquetrous, usually glabrous; achenes trigonous.
21a. Glumes densely glandular dotted, margin fimbriate-ciliate, apex often emarginate ..... 21. *F. leptoclada*
21b. Glumes not glandular dotted, margin not fimbriate-ciliate, apex not emarginate.
22a. Ligule a fringe of short hairs.
23a. Culms trigonous or tetragonous; glumes 5–7-veined..... 22. *F. thomsonii*
23b. Culms compressed; glumes 1–3-veined.
24a. Culms 50–70 cm tall, robust; rhizome long to short; leaf blade 3–5 mm wide; inflorescences a decompound anthela..... 23. *F. complanata*
24b. Culms (30–)20–50 cm tall, slender; rhizome short to almost absent; leaf blade 1–2.5 mm wide; inflorescences a simple or compound anthela ..... 24. *F. exaltata*
22b. Ligule absent.
25a. Cauline leaves all with a leaf blade ..... 25. *F. insignis*
25b. Basal part of cauline leaves reduced to bladeless sheaths.
26a. Leaf blades bilaterally compressed, ensiform; sheaths compressed; spikelet spherical or nearly spherical; glumes ca. 1 mm..... 26. *F. littoralis*
26b. Leaf blades bilaterally dorsiventrally flattened, linear; sheaths tubular; spikelet obovoid to oblong-obovoid; glumes ca. 2 mm ..... 27. *F. diphylloides*

1. Fimbristylis eragrostis (Nees) Hance 知風飄拂草

J. Linn. Soc., Bot. 13: 132. 1873; FRPS 11: 103. 1961; FTW ed. 2, 5: 269. 2000; FGD 8: 311. 2007; FOC 23: 216. 2010.
Abildgaardia eragrostis Nees, Contr. Bot. India 95. 1834; FKH 299. 1912.

Perennial; rhizome short. Culms 1–few, 10–70 cm tall, 0.5–3 mm thick, 4–5-angled, smooth. Leaves basal; rosette-forming; blade linear, 5–20 cm × 1.5–5 mm, apex obtuse to ± truncate, mucronate, flattish, subleathery, margins often incurved; sheath 1–3 cm, brownish to yellowish brown; ligule absent. Involucral bracts 2–5, narrowly lanceolate to ± setaceous, 0.3–2 cm. Inflorescence simple

to compound, open to rather congested, 2–8 × 2–8 cm; primary branches 2–6, 1–6 cm. Spikelets 12–many per inflorescence, oblong to oblong-lanceolate, 6–13 × 2–4 mm, often twisted, somewhat flattened. Glumes 8–25 per spikelet, ± 2-ranked to spirally arranged above, ovate, 3–5 × 2–3 mm, apex subacute, mucronate, sides papery, slightly shiny yellowish brown tinged dark brown, margins pale-hyaline, keel acute, 1-veined. Stamens 3; anthers 1.5–2 mm long. Style brown, 3-sided, basally inflated; stigmas 3. Achenes broadly obovoid, trigonous, 0.7–1 × 0.5–0.7 mm, light brown, verruculose.

Locality: Hong Kong Island, Castle Peak. *H. C. Tang 1988; HK sheet 13476.*

Distribution: Hainan, Guangdong, Fujian, Taiwan, Yunnan; Cambodia, Sri Lanka, India, Malaysia, tropical Australia.

Ecology: Thin forests and grasslands. Flowering & fruiting: Jun.–Sep.

2. Fimbristylis fusca (Nees) Benth. 褐穗飄拂草 **(Photos 174–175)**

Gen. Pl. 3: 1048. 1883; FKH 299. 1912; FRPS 11: 105. 1961; FYN 15: 615. 2003; FGD 8: 313. 2007; FOC 23: 217. 2010.

Abildgaardia fusca Nees, Contr. Bot. India 95. 1834; FHK 390. 1861.

Perennial; rhizome woody, covered with fibrous leaf sheath remnants. Culms few to several, (15–)30–55 cm tall, 0.5–1 mm thick, angular, smooth to hispid-scabrid above. Leaves basal; blade linear, 4–15 cm × (1–)2–4 mm, often weakly falcate, obtuse to rounded shortly acuminate, flat; sheath ca. 0.5 cm, yellowish brown; ligule absent. Involucral bracts 3–5, setaceous, 0.7–3 cm, glabrous or pubescent. Inflorescence simple to compound, open, 2–15 × 1–12 cm; primary branches up to 10 cm. Spikelets 3–many per inflorescence, lanceolate, subterete to ± flattened, 5–10 × 1.7–2.5 mm. Glumes 3–10 per spikelet, 2-ranked, lanceolate, 4–6.5 × 2–2.5 mm, sides herbaceous to ± papery, shortly hispid, chestnut-brown, margins narrow, hyaline, keel subacute, 1-veined, brown. Stamens 3; anthers 1.5–2 mm. Style 4–5 mm, 3-sided, basally inflated; stigmas 3. Achenes obvoid, trigonous, 0.9–1 × 0.6–0.8 mm, light brownish, densely verrucose, obscurely reticulate.

Locality: Aberdeen, Cape D'Aguilar, Mount Kellet, Tai Mo Shan, Castle Peak. *J. C. Shaw 526; S. C. Ng 1439; HK sheet 7976.*

Distribution: Guangdong, Guangxi, Yunnan, Guizhou, Hunan, Zhejiang, Anhui, Fujian, Taiwan; Japan, Nepal, India, Myanmar, Thailand, Vietnam, Malaysia, Papua New Guinea, Australia.

Ecology: Wastelands. Flowering & fruiting: Jun.–Sep.

3. Fimbristylis tetragona R. Br. 四棱飄拂草

Prodr. 1: 226. 1810; FKH 299. 1912; FRPS 11: 100. 1961; FTW ed. 2, 5: 277. 2000; FGD 8: 308. 2007; FOC 23: 215. 2010.

Annual or perennial. Rhizome poorly developed. Culms densely tufted, 10–60 cm tall, 0.8–1.3 mm thick, sharply 4-angled, smooth. Leaves reduced to bladeless sheaths; sheaths 1–15 cm, pale greenish adaxially, yellowish brown abaxially, apex obliquely truncate, broadly hyaline; ligule absent. Inflorescence a single, terminal spikelet. Involucral bracts glume-like, inconspicuous. Spikelets broadly ellipsoidal to ovoid-ellipsoidal, terete, 5–12 × 4–6 mm. Glumes many per spikelet, spirally imbricate, oblong-elliptic, 3–4.5 × 1.2–1.5 mm, apex rounded, incurved, sides membranous, finely many-veined, yellowish brown and often tinged darker brown below keel, keel broad, 3-veined. Stamen 3; anthers 1–1.5 mm. Style long and compressed, sparsely ciliate, basally gradually broader and nearly as wide as nutlet; stigmas 2–3. Achenes linear-oblong to oblong, biconvex, 1.5–1.7 × 0.3–0.4 mm, cream, cancellate with 5–8 longitudinal rows of transversely oblong-hexagonal epidermal cells.

Locality: Aberdeen, Wong Chuk Hang, Wong Nai Chung. *HK sheet 8085, 39296, 41584.*

Distribution: Hainan, Guangdong, Fujian, Taiwan; Vietnam, Myanmar, Nepal, Sri Lanka, India, Thailand, Indochina, Malaysia, Philippines, Australia.

Ecology: Paddy fields and marshes. Flowering & fruiting: Sep.–Oct.

4. Fimbristylis nutans (Retz.) Vahl 垂穗飄拂草 **(Photos 176–177)**

Enum. Pl. 2: 285. 1806; FHK 391. 1861; FKH 299. 1912; FRPS 11: 102. 1961; FTW ed. 2, 5: 272. 2000; FGD 8: 309. 2007; FOC 23: 215. 2010.

Scirpus nutans Retz., Observ. Bot. 4: 12. 1786.

Perennial; rhizome short. Culms 20–75 cm tall, 0.5–1.5 mm thick, subterete to trigonous above, smooth. Leaves reduced to basal sheaths; sheaths cylindrical, 1–12 cm, light green to pale brownish, apex obliquely truncate; ligule absent. Involucral bracts 1, glume-like. Inflorescence a single terminal spikelet, erect at first, soon becoming patent to ± horizontal. Spikelets ovoid to ovoid-ellipsoidal, terete, 8–16 × 4–6 mm. Glumes many per spikelet, spirally imbricate, broadly ovate to ovate, 4–5 × 2.5–3 mm, apex rounded, mucronate, sides membranous to thinly papery, mid-brown, striate with dark brown below keel, margins broadly pale-hyaline, keel flattish to obtuse, indistinctly 4–5-veined, yellowish brown. Stamens 3; anthers 2 mm long. Style long and compressed, 3-sided, basally slightly inflated, apically sparsely ciliate; stigmas 3. Achenes broadly obovate, unequally biconvex, 1.25–1.5 × 0.8–1 mm, maturing cream to slightly brownish, coarsely transversely wrinkled.

Locality: Aberdeen, Lion Rock, Tung Chung. *Y. S. Lau 2798; Y. W. Lam 1262; HK sheet 13448.*

Distribution: Hainan, Guangdong, Guangxi, Hunan, Taiwan; Japan, Vietnam, Myanmar, Thailand, Sri Lanka, India, Malaysia, New Guinea, Australia.

Ecology: Marshes, paddy fields and other wet places. Flowering & fruiting: Jul.–Aug.

5. Fimbristylis acuminata Vahl 披針穗飄拂草 **(Photos 178–179)**

Enum. Pl. 2: 285. 1806; FHK 391. 1861; FKH 299. 1912; FRPS 11: 102. 1961; FHN 4: 295. 1977; FTW ed. 2, 5: 262. 2000; FGD 8: 309. 2007; FOC 23: 215. 2010.

Fimbristylis setacea Benth., Hooker's J. Bot. Kew Gard. Misc. 2: 239. 1843.

Annual or short-lived perennial. Rhizome absent. Culms densely tufted, 3–35 cm tall, 0.2–0.6 mm thick, triquetrous, smooth. Leaves reduced to basal sheaths; sheaths cylindrical, 1.5–5 cm, pale green to light brown. Ligule absent. Involucral bracts 1, glume-like. Inflorescence a single terminal spikelet. Spikelet ovoid to ovoid-conical, terete, (4–)6–13 × 2–3 mm. Glumes 5–15 per spikelet, broadly ovate to elliptic, 2.7–4 × 1.5–2 mm, apex subacute, sides thinly papery to membranous, pale greenish, yellow brown to reddish brown, margins pale-hyaline, keel obtuse. Stamens 2; anthers 0.8–1 mm. Style long and compressed, sparsely ciliate, basally inflated; stigmas 2. Achenes obovate to orbicular, biconvex, 1–1.3 × 1–1.3 mm, whitish to cream, coarsely transversely wrinkled, very finely striate.

Locality: Aberdeen, Mount Kellet, Yung Shue O, Chek Keng, Sai Kung, Ham Tin. *Y. W. Lam 1717, 1723, 1726.*

Distribution: Guangdong, Guangxi, Fujian, Taiwan; Sri Lanka, India, Malaysia, Laos, Thailand, Vietnam, Papua New Guinea, Japan, tropical Australia.

Ecology: Sandy farmlands, secondary forests and crevices of rocks. Flowering & fruiting: Jun.–Sep.

6. Fimbristylis pauciflora R. Br. 海南飄拂草

Prodr. 1: 225. 1810; FHN 4: 295. 1977; FGD 8: 308. 2007; FOC 23: 215. 2010.

Fimbristylis hainanensis Tang & F. T. Wang, FRPS 11: 101, 228. 1961.

Perennial. Rhizomes hardly developed. Culms densely tufted, 5–18 cm tall, slender, short, flatly cylindrical, smooth, glabrous, with few leaf sheaths at base. Leaves bladeless; sheath brown, cylindrical, apically attenuate, margins membranous, mouth obliquely truncate. Involucral bracts absent. Inflorescences reduced to a single terminal spikelet, narrowly oblong to clavate-oblong, 3.5–4.5 × 1–1.5 mm, few-flowered, with basalmost glume empty. Glumes pale with rust-coloured short lines, oblong to oblong-ovate, 3–4.5 × 1–1.5 mm, 7–9-veined, midvein abaxially green, apex obtuse and not mucronate. Stamens 3; anthers linear. Style long and compressed, sparsely ciliate, basally slightly broader; stigmas 3, with sparse papillae. Achenes white, obovoid, ca. 0.8 mm, trigonous, with sparse verrucae and nearly hexagonal reticulation.

Locality: Tai Mo Shan. *HK sheet 42200.*

Distribution: Guangdong, Hainan; India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Papua New Guinea, Thailand, Vietnam, Australia, Pacific islands.

Ecology: Wet places by ponds

7. Fimbristylis polytrichoides (Retz.) Vahl 細葉飄拂草

Enum. Pl. 2: 248. 1806; FRPS 11: 96. 1961; FTW ed. 2, 5: 274. 2000; FGD 8: 305. 2007; FOC 23: 213. 2010.

Scirpus polytrichoides Retz., Observ. Bot. 4: 11. 1786.

Annual or short-lived perennial. Rhizome very short or absent, with many remnant fibers from old leaves. Culms 5–30 cm tall, 0.3–0.5 mm thick, subterete to trigonous, smooth, glabrous. Leaves basal; blade filiform, up to 4 cm × 0.2–0.5 mm, obtuse, shallowly canaliculate, often reduced to bladeless sheath; sheath 1–4 cm, yellowish brown, apex obliquely truncate; ligule absent. Involucral bracts 1, glume-like or setaceous, 0.3–2.5 cm. Inflorescence a single, terminal spikelet. Spikelets ellipsoidal to oblong-ovoid 5–9 × 2.5–3.5 mm, obtuse. Glumes many per spikelet, spirally imbricate, elliptic to oblong-elliptic, 2.5–3.2 × 1–1.3 mm, obtuse, sides thinly membranous, pale brown on upper part, margins hyaline, keel obtuse, 1-veined. Stamens 1–2; anthers 0.7–1 mm. Style long, slightly compressed, basally inflated, apical half ciliate; stigmas 2. Achenes obovate, biconvex, 0.8–1 × ca. 0.5 mm, maturing brown to greyish purple, minutely cancellate with 15–20 longitudinal rows of transversely linear epidermal cells, often verruculose above.

Locality: Victoria Peak, Rocky Harbour, Yi O. *J. C. Shaw 701; Y. W. Lam 925; HK sheet 41737.*

Distribution: Hainan, Guangdong, Fujian, Taiwan; tropical Africa, Asia, Australia.

Ecology: Muddy seashores and crevices of rocks. Flowering & fruiting: Mar.–Sep.

8. Fimbristylis velata R. Br. 曲芒飄拂草

Prodr. 1: 227. 1810; FGD 8: 306. 2007.

Fimbristylis squarrosa Vahl, Enum. Pl. 2: 289. 1805; FHK 392. 1861; FKH 299. 1912; FRPS 11: 97. 1961; FYN 15: 612. 2003.

Fimbristylis aestivalis (Retz.) Vahl var. *esquarrosa* (Makino) T. Koyama, J. Fac. Sci. Univ. Tokyo 3. 8: 116. 1961; FTW ed. 2, 5: 265. 2000; FOC 23: 214. 2010.

Annual; rhizome absent. Culms densely tufted, 10–25 cm, compressed and obtusely trigonous, with fewer leaves at base. Leaves shorter than culms, extremely narrow, less than 1 mm wide, flat or sometimes folded, sparsely pubescent on both surfaces, sheaths pale brown, densely pubescent. Bracts 3–7, leafy, the lowest equalling or slightly shorter than inflorescence, base broader, pubescent; anthelae compound or decompound, spreading; anthelas many to fewer, up to 2.5 cm, slim; spikelets solitary, lanceolate or oblong, 3–7 × 1.2–2 mm, apex acute, many-flowered; glumes spiral, membranous, oblong, 1.5–2 mm, yellowish brown, obtuse, with 1 midvein abaxially, vein slightly upheaving extending into short awn ca. 1/5 length of glumes, slightly recurved; stamen 1, anther linear, ca. 0.5 mm; style long, slightly compressed, sparsely ciliate, base inflated with white long filiform pendent hairs covering the top of achene; stigmas 2, with papillae. Achenes obovate, flatly biconvex, yellow, ca. 0.5 mm, shortly stipitate, almost smooth or with very indistinct hexagonal reticulation.

Locality: Aberdeen. *J. C. Shaw 345; Y. W. Lam 1505.*

Distribution: Guangdong, Hainan, Yunnan, Shandong, Hebei, Heilongjiang, Taiwan; India, Myanmar, Japan, Korea, Russia, S Europe to S Africa.

Ecology: Margins of ponds and other wet places. Flowering & fruiting: Jul.–Oct.

9. Fimbristylis aestivalis (Retz.) Vahl
夏飄拂草 **(Fig. 68; Photos 180–181)**

Enum. Pl. 2: 288. 1806; FHK 392. 1861; FKH 299. 1912; FRPS 11: 99. 1961; FTW ed. 2, 5: 262. 2000; FYN 15: 614. 2003; FGD 8: 306. 2007; FOC 23: 214. 2010.

Scirpus aestivalis Retz., Observ. Bot. IV.: 12. 1791[1786].

Annual; rhizome absent. Culms densely tufted, 3–20 cm tall, 0.3–0.5 mm thick, trigonous, smooth. Leaves basal; blade linear, 1.5–4 cm × 0.3–0.6 mm, acuminate, flattish or with incurved margins, ± pilose; sheath 0.5–1.5 cm, pale green to yellowish brown; ligule absent. Involucral bracts 2–3(–6), leaf-like, the longest 1–5 cm. Inflorescence simple to compound, 2–7 × 2–7 cm; primary branches 3–7, 0.5–3.3 cm. Spikelets many per inflorescence, solitary, ovoid-conical, subterete, 2.5–7 × 1–1.5 mm. Glumes 10–40 per spikelet, spirally imbricate, ovate, 1–1.5 × 0.6–0.8 mm, acute, recurved-mucronate to shortly cuspidate, sides membranous, yellowish brown, keel subacute, finely 3-veined, green. Stamens 1, anthers 0.3 mm. Style long and compressed, basally inflated, apically ciliate; stigmas 2. Style-base glabrous or ciliolate. Achenes obovate, thickly biconvex, 0.5–0.6 × 0.3–0.4 mm, maturing yellowish, sometimes slightly shiny, smooth or faintly cancellate with a few rows of transversely oblong epidermal cells.

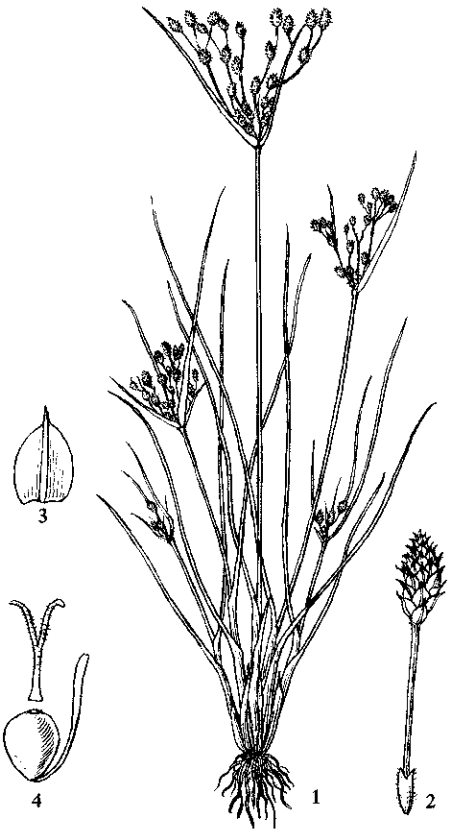

Figure 68. *Fimbristylis aestivalis* (Retz.) Vahl
1. plant; *2.* spikelet; *3.* glume; *4.* achene. (drawn by H. P. Yu)

Locality: Kau Wa Keng, Lam Tsuen, Tung Chung River. *Y. S. Lau 2681; J. C. Shaw & Macia 291; HK sheet 40872.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Chongqing, Hunan, Hubei, Heilongjiang, Shaanxi, Jiangxi, Zhejiang, Anhui, Fujian, Taiwan; Japan, Nepal, Sri Lanka, India, Thailand, Indonesia, Philippines, Australia.

Ecology: Marshes, paddy fields and other wet places. Flowering & fruiting: May–Aug.

10. Fimbristylis sieboldii Miq. ex Franch. & Sav. 鏽鱗飄拂草 **(Photos 182–183)**

Enum. Pl. Jap. 2: 118. 1877 ["*sieboldi*"]; FOC 23: 212. 2010.

Fimbristylis ferruginea (L.) Vahl var. *sieboldii* (Miq. ex Franch. & Sav.) Ohwi, J. Jap. Bot. 14: 576. 1938; FRPS 11: 93. 1961.

Fimbristylis ferruginea auct. non (L.) Vahl: FHK 391. 1861; FKH 299. 1912; FRPS 11: 93. 1961; FTW ed. 2, 5: 269. 2000; FGD 8: 303. 2007; Check List HK Plants 314. 2002; 110. 2004.

Perennial; rhizome woody, creeping. Culms tufted, often forming clumps or crowded along creeping rhizome, 15–5 cm tall, 0.5–1.5 mm thick, trigonous, smooth. Leaves arising from lower part of culm; blade narrowly linear, 1–15 cm × 0.6–2.5 mm, obtuse, canaliculate to inrolled-margined; sheath cylindrical 2–12 cm, pale glaucous to brown or orange brown, apex truncate; ligule a fringe of short hairs. Involucral bracts 1–3, leaf-like, the longest ± erect, shorter to longer than inflorescence, 1–3 cm. Inflorescence simple, rarely compound, rather compact, 1.2–5 × 1–3.5 cm; primary branches 3–7, 0.7–4 cm. Spikelets (1–)3–15 per inflorescence, usually solitary, ovoid-conical or ellipsoidal-conical, terete, 8–20 × 2.5–4 mm. Glumes many per spikelet, spirally imbricate, broadly ovate-elliptic or broadly ovate, 3.5–4.2 × 1.8–2.8 mm, apex obtuse, mucronate, sides thinly chartaceous, pale to dark brown, sparsely to densely shortly pubescent, margins ciliate, keel obtuse, 1-veined. Stamens 3; anthers 1.5–7 mm. Style long and flat, sparsely ciliate, basally broader; stigmas 2. Achenes broadly obovate, biconvex, 1–1.2 × 0.7–0.8 mm, maturing light orange brown or yellowish brown, ± smooth, with indistinct isodiametric epidermal cells.

Locality: Common in Hong Kong. *Y. W. Lam 2166; K. L. Yip 4193; Y. S. Lau 2490.*

Distribution: Hainan, Guangdong, Fujian, Zhejiang, Jiangsu, Anhui, Shandong, Taiwan; Japan, Korea.

Ecology: Margins of ponds and wet places. Flowering & fruiting: Jun.–Aug.

11. Fimbristylis schoenoides (Retz.) Vahl 少穗飄拂草 **(Photos 184–185)**

Enum. Pl. 2: 286. 1805; FHK 391. 1861; FKH 299. 1912; FRPS 11: 95. 1961; FTW ed. 2, 5: 274. 2000; FYN 15: 610. 2003; FGD 8: 305. 2007; FOC 23: 213. 2010.

Scirpus schoenoides Retz., Observ. Bot. 5: 14. 1789.

Perennial; rhizome very short. Culms tufted, 5–50 cm tall, 0.3–0.8 mm thick, smooth. Leaves basal; blade narrowly linear to ± filiform, 2–16 cm × 0.5–1 mm, flattish or with inrolled margins; sheath 2–6 cm, cinnamon-brown, apex obliquely truncate, ciliolate; ligule a fringe of dense short hairs. Involucral bracts 1–2, glume-like, rarely with short setaceous blade. Inflorescence usually a solitary spikelet sometimes simple; primary branches (when present) 1–2, 1–3 cm. Spikelets 1–2(–3) per inflorescence, ovoid to ellipsoidal,

5–10 × 3–4 mm. Glumes many per spikelet, ovate-orbicular, 2.5–3.2 × 2–3 mm, apex obtuse to rounded, shortly mucronate, sides thinly papery, 5–7-veined, pale to orange brown, slightly shiny, keel rounded. Stamens 2; anthers 0.5 mm. Style long, compressed, basally inflated, apical half ciliate; stigmas 3. Achenes obovate-orbicular, biconvex, 1.1–1.3 × 1–1.2 mm, ± rounded, maturing yellowish white, smooth with minute isodiametric epidermal cells.

Locality: Aberdeen, Pok Fu Lam, Chek Keng. *Y. W. Lam 1073; HK sheet 13457, 42171.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan; S & SE Asia, Australia.

Ecology: Wastelands. Flowering & fruiting: Aug.–Nov.

12. Fimbristylis tristachya R. Br. 三穗飄拂草

Prodr. 227. 1810; FGD 8: 306. 2007; FOC 23: 213. 2010.

Perennial; rhizome short. Culms tufted, 30–70(–100) cm tall, 1–1.5 mm thick, angular, smooth to scabrid above. Leaves basal; blade narrowly linear, 7–27 cm × 0.5–1.5 mm, apex obtuse to shortly acuminate, flattish to canaliculate; sheath up to 15 cm, yellowish to brown, apex truncate; ligule a fringe of short hairs. Involucral bracts 1–2, leaf-like, the longest suberect, 0.5–3 cm. Inflorescence a single spikelet or simple to compound open; primary branches (when present) 0.8–4 cm. Spikelets (1–)3–6 per inflorescence, solitary, ovoid to ovoid-cylindrical, terete, (6–)10–25 × 4–6 mm. Glumes many per spikelet, spirally arranged, broadly ovate, 4–6 × 3–4.5 mm, apex obtuse, mucronulate, sides papery, indistinctly 7–10-veined, mid- to chestnut-brown, margins scarious, keel obtuse. Stamens 3; anthers 1.8–2.5 mm. Style ca. 3 mm long, compressed, apically ciliate, basally inflated; stigmas 2. Achenes obovate, biconvex, (1–)1.2–1.5 × 0.8–1 mm, rounded, yellowish brown, smooth, somewhat shiny, with minute isodiametric epidermal cells.

Locality: Cape D'Aguilar, Shek O, Sha Tin. *Y. S. Lau 2504, 2520; Y. W. Lam 790.*

Distribution: Guangdong, Hainan; Asia, tropical Australia, Africa.

Ecology: Thickets and thin forests. Flowering & fruiting: Jul.–Oct.

13. Fimbristylis subbispicata Nees & Meyen 雙穗飄拂草 **(Photos 186–187)**

Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 29(Suppl. 1): 75. 1843; FHK 391. 1861; FKH 299. 1912; FRPS 11: 95. 1961; FTW ed. 2, 5: 277. 2000; FGD 8: 305. 2007; FOC 23: 213. 2010.

Annual. Rhizome absent. Culms tufted, slim, 7–60 cm tall, flatly trigonous, greyish green, smooth, striate, with few leaves at base. Leaves shorter than culms, ca. 1 mm wide, slightly stiff, flat, upper part ciliate, sometimes involute. Bracts absent or only 1, erect, linear, longer than inflorescence, 0.7–10 cm; spikelet usually single and terminal, rarely 2, ovate, oblong-ovate or oblong-lanceolate, cylindrical, 8–30 × 4–8 mm, many-flowered; glumes spiral, membranous, ovate, broadly ovate or nearly elliptic, 5–7 × 3–4 mm, apex obtuse, mucronate, brown with short rusty-brown lines, not keeled, with many veins abaxially. Stamens 3, anthers linear, 2–2.5 mm. Style slender, compressed, ciliate, base slightly inflated, stigmas 2. Achenes globose to obovoid, flatly biconvex, brown, 1.5–1.7 mm, stipitate, with hexagonal reticulation, slightly shining.

Locality: Aberdeen, Happy Valley, Wu Kai Sha, Tung Chung. *J. C. Shaw 667; Y. W. Lam 810, 1621.*

Distribution: Hainan, Guangdong, Fujian, Zhejiang, Jiangsu, Shandong, Hunan, Henan, Hebei, Shanxi, Shaanxi, Liaoning, Jilin, Heilongjiang, Taiwan; Japan, Korea, Vietnam.

Ecology: Hillslopes, ravines along streams, marshes. Flowering & fruiting: Aug.–Oct.

14. Fimbristylis hookeriana Böcklr. 金色飄拂草(羅浮飄拂草) **(Photos 188–189)**

Linnaea 37: 22. 1871; FRPS 11: 94. 1961; FGD 8: 302. 2007; FOC 23: 212. 2010.

Fimbristylis fordii C. B. Clarke, J. Linn. Soc., Bot. 36: 236. 1903; FKH 299. 1912; FRPS 11: 94. 1961; Check List HK Plants 314. 2002; 111. 2004.

Annual or short-lived perennial. Rhizome absent. Culms tufted, 6–40 cm tall, without rhizome. Leaves nearly equalling culms, ciliate, 1–2.5 mm wide, apex acute, midvein prominent abaxially. Bracts 2–5, leafy, longer than inflorescence, sometimes up to 8 cm, apex acuminate or acute; anthelae simple, rarely compound, with few slender anthelas; spikelets solitary, narrowly lanceolate or linear, 7–17 × ca. 2 mm, lowest 1–2 glumes empty; flowering glumes oblong-ovate, 2.5–3.5 × 1.5–2 mm, greyish green or brown-hued, apex mucronate or awned, sometimes hairy, margins hyaline, with 3 or more veins abaxially. Stamens 3; anthers oblong, ca. 0.8 mm. Style slender, compressed, apically ciliate, basally slightly inflated, stigmas 2. Achenes obovate, biconvex, white, ca. 1 mm, shortly stipitate, verruculose.

Locality: Cape D'Aguilar. *S. C. Ng 2005, 4047; HK sheet 42172.*

Distribution: Guangdong, Hunan, Jiangxi, Zhejiang, Jiangsu; India, Vietnam, Laos, Thailand, Philippines.

Ecology: Grassy fields, rocks along streams. Flowering & fruiting: Aug.–Sep.

15. Fimbristylis longispica Steud. 長穗飄拂草

Syn. Pl. Glumac. 2: 118. 1855; FKH 299. 1912; FRPS 11: 91. 1961; FYN 15: 608. 2003; FGD 8: 304. 2007; FOC 23: 211. 2010.

Perennial. Rhizomes short. Culms tufted, 25–60 cm. tall, with some leafless sheaths at base. Leaves shorter than culms, nearly glabrous, 1.5–2.5 mm wide, subglabrous, apex obtuse, margins often involute. Sheath brownish, glabrous. Bracts 2–3, leafy, the lowest one usually longer than inflorescence, apex obtuse; anthelae compound, decompound or simple, with 3–6 anthelas; spikelets solitary, narrowly oblong, oblong or oblong-ovate or ovate, 6–20 × 3–4 mm, apex acute or obtuse; glumes spirally arranged, broadly ovate, boat-shaped, ca. 3 × 2.5 mm, with 3–5 brown or pale brown veins, glabrous, apex mucronate. Stamens 3; anthers linear, ca. 3 mm. Style slightly longer than achene, apically ciliate, basally slightly inflated, stigmas 2. Achenes globose-obovate, biconvex, 1.2–1.5 mm, pale

brown to brown, sessile, with hexagonal reticulation, without vertical ribs and verrucae.

Locality: No precise locality. *Faber 221* (K).

Distribution: Guangdong, Guangxi, Yunnan, Fujian, Zhejiang, Jiangsu, Shandong, Liaoning, Jilin, Heilongjiang; Japan, Myanmar, Vietnam, Malaysia.

Ecology: Coastal area and wet places.

16. Fimbristylis tomentosa Vahl 絨毛飄拂草

Enum. Pl. 2: 290. 1805; FYN 15: 610. 2003; FGD 8: 304. 2007.

Fimbristylis diphylla (Retz.) Vahl var. *tomentosa* (Vahl) Benth., FHK 392. 1861.

Fimbristylis podocarpa Nees, Contr. Bot. India 98. 1834; FHK 391. 1861; C. B. Clarke, J. Linn. Soc. Bot. 36: 233. 1903.FKH 299. 1912.

Fimbristylis dichotoma (L.) Vahl subsp. *podocarpa* (Nees) T. Koyama, Micronesica 1: 87. 1964; FOC 23: 211. 2010.

Caespitose annual; rhizome absent, with fibrous roots. Stems tufted, angular, compressed just below the inflorescence, smooth, 40–60 cm tall, 0.5–1 mm thick. Leaves nearly distichous, ascending, 1/2–3/4 the length of the culms, 2–3 mm wide, flat, abruptly acuminate, softly hairy, rarely glabrous, scabrid on the margins in the upper part; sheaths margin ciliate-scabrid, abaxial surface pilose-hirsute. Inflorescence simple or compound, loose, with 5–25 spikelets, very rarely reduced to a single spikelet, up to 8 cm. Involucral bracts up to 5, the longest overtopping the inflorescence, up to 10 cm. Primary anthelas obliquely erect, compressed, glabrous and smooth, the longest 2–4 cm. Spikelets solitary, ovoid or oblong-ovoid, rarely oblong, terete, 5–10(–15) × (1.5–)3–4 mm, apex acute, densely many-flowered, brown; rachilla narrowly winged. Glumes spiral, papery, appressed, broadly ovate or orbicular, 3–3.5 × 3.2–3.5 mm, apex mucronulate, scarcely keeled, with strong midvein. Stamens (1–)2; anthers oblong-linear, 0.7–1 mm. Style 1.2–1.5 mm, compressed, short and broad, hyaline-margined, gradually but slightly dilated towards the base, ciliate in the upper 2/3–3/4; stigmas 2, shorter than the style. Achene biconvex, broadly elliptic to orbicular, 1.1–1.5 × 0.9–1.4 mm, prominently stipitate (the gynophores obpyramidal, often somewhat saucer-shaped, 0.3–0.5 mm long and wide), umbonulate, sometimes tuberculate, especially towards the obtuse, thickened edges, at first white, finally stramineous, reticulate by the impressed epidermal cells superposed in 16–24 vertical rows on either face, verrucose.

Locality: Hong Kong. *H. C. Tang 1256; S. Y. Hu 6266* (CUHK).

Distribution: Hainan, Guangdong, Guangxi, Jiangxi, Taiwan, Yunnan; tropical Africa and Asia, Australia.

Ecology: Open places or light shaded moist grasslands.

17. Fimbristylis dichotoma (L.) Vahl 兩歧飄拂草 **(Photos 190–191)**

Enum. Pl. 2: 287. 1805; FKH 299. 1912; FRPS 11: 89. 1961; Flora Guizhouensis 8: 580. 1988; FTW ed. 2, 5: 266. 2000; FYN 15: 609. 2003; FGD 8: 303. 2007; FOC 23: 210. 2010.

Scirpus dichotomus L., Sp. Pl. 1: 50. 1753.

Fimbristylis diphylla (Retz.) Vahl, Enum. Pl. 2: 289–290. 1805; FHK 392. 1861; C. B. Clarke, J. Linn. Soc. Bot. 36: 233. 1903; FKH 299. 1912.

Annual or short-lived perennial. Rhizomes short. Culms loosely tufted, 10–70 cm tall, 0.5–2.5 mm thick, triquetrous, glabrous to sparsely pubescent smooth. Leaves basal; blade narrowly linear, (3–)10–30 cm × 1.5–5 mm, obtuse, flattish, margins ± incurved; sheath 2–12 cm, pale green to mid-brown, apex truncate; ligule a fringe of dense hairs. Involucral bracts 2–7, the longest 1–2 leaf-like, 2–8 cm. Inflorescence simple to compound, open to congested, 2–17 × 1–15 cm; primary branches 2–12, 1–8 cm. Spikelets 2–many per inflorescence, solitary or in clusters of 2–3, ovoid to ovoid-ellipsoidal, 3–10 × 2.5–3.5 mm. Glumes many per spikelet, spirally arranged, broadly ovate to suborbicular, 1.5–3(–4) × 1.5–2.2 mm, subacute, mucronate, sides thinly chartaceous, 2–4-veined or veins 0, mid-brown to dark reddish brown, margins pale-hyaline, keel obtuse, greenish to pale brown. Stamens (1–)2–3, anthers 0.5–1.7 mm long. Style compressed, apically ciliate, basally inflated; stigmas 2. Achenes obovate to broadly obovate, biconvex, 0.7–1.3 × 0.8–1 mm, maturing cream to pale brown, deeply cancellate with 5–13 rows of transversely oblong epidermal cells, occasionally verrucose on shoulder.

Locality: Common in Hong Kong. *J. C. Shaw 529; Y. W. Tam 1217; K. L. Yip 4040.*

Distribution: Spread over most provinces of China; widely distributed in subtropical and temperate regions.

Ecology: Open grassy fields. Flowering & fruiting: Jul.–Oct.

Uses: Forage.

Notes: The type specimens of *Fimbristylis diphylla* Vahl var. *leptophylla* Benth. (FHK 392. 1861) were collected by H. F. Hance, C. Harland and C. Wright from Hong Kong in 1850s, but is not treated because no material is available. Clarke (J. Linn. Soc. Bot. 36: 233–235. 1903) discussed the range of variation of this widespread species, including the two varieties from Hong Kong Island described by Bentham (FHK 392. 1861).

18. Fimbristylis sericea (Poir.) R. Br. 絹毛飄拂草 **(Photo 192)**

Prodr. 228. 1810; FKH 299. 1912; FRPS 11: 83. 1961; FTW ed. 2, 5: 276. 2000; FGD 8: 299. 2007; FOC 23: 208. 2010.

Scirpus sericeus Poir., Encycl., Suppl. 5: 99. 1804.

Perennial; rhizomes long-creeping, covered with often blackish brown fibers from old leaf sheaths. Culms erect, (10–)30–60 cm tall, 1.2–2.5 mm thick, trigonous, smooth. Leaves basal, many; blade linear, 4–10 cm × 1.7–4 mm, obtuse, margins inrolled, glaucous, with appressed silky hairs on the lower surface; sheath 2–3 cm, pale green to dark rusty brown, apex obliquely truncate; ligule absent. Involucral bracts 2–3, leaf-like, the longest up to 2 cm. Inflorescence simple to compound, 3–10 cm × 3–4 cm; primary branches 2–6, 1–8 cm. Spikelets few to many per inflorescence, in cluster of 3–10, ovoid to oblong-ovoid, terete, 6–12 × 2.5–4 mm. Glumes many

per spikelet, spirally arranged, ovate to broadly ovate, 2.5–4 × 2–3 mm, subacute to subobtuse, mucronate, sides herbaceous, brownish grey, shortly pubescent, margins whitish-hyaline, keel obtuse, brown. Stamens 2–3; anthers 1.5 mm. Style slightly compressed, basally slightly inflated and hairy, apically slightly pubescent; stigmas 2–3. Achenes obovate, biconvex, 1–1.5 × 0.8–1 mm, purplish or dark brown, ± smooth to minutely dotted.

Locality: Long Ke, Tai Wan (Sai Kung). *Y. W. Lam 1736; HK sheet 39433, 41561.*

Distribution: Hainan, Guangdong, Zhejiang, Fujian, Taiwan; India, Vietnam, Thailand, Japan, Korea, Malaysia, Australia.

Ecology: Sandy beaches and wet sand dunes. Flowering & fruiting: Aug.–Oct.

19. Fimbristylis cymosa (Lam.) R. Br. 黑果飄拂草 **(Photos 193–194)**

Prodr. 228. 1810; FRPS 11: 82. 1961; FTW ed. 2, 5: 266. 2000; FGD 8: 299. 2007; FOC 23: 206. 2010.

Scirpus cymosus Lam. Tabl. 1: 141. 1791.

Fimbristylis spathacea Roth, Nov. Pl. Sp. 24. 1821; FKH 299. 1912.

Fimbristylis cymosa R. Br. var. *spathacea* (Roth) T. Koyama, J. Jap. Bot. 46(3): 66. 1971; FOC 23: 207. 2010.

Fimbristylis wightiana Nees, Contrib. 99. 1834; FHK 392. 1861.

Perennial; rhizomes not or hardly elongate. Culms tufted, 5–60 cm tall, 1–2 mm thick, trigonous, smooth. Leaves basal, rosette-forming; blade narrowly linear, 5–30 cm × 1–4 mm, subobtuse, subleathery, flattish to weakly inrolled; sheath up to 3 cm, whitish or cinnamon-brown; ligule absent. Involucral bracts 1–3, leaf-like, the longest shorter than inflorescence, 0.5–1.8 cm. Inflorescence simple to compound, open to congested; primary branches 2–6, 1–3 cm. Spikelets few to many per inflorescence, ellipsoidal-cylindrical to ovoid-cylindrical, 2–6 × 1–2 mm. Glumes many per spikelet, spirally arranged, ovate to broadly ovate, 1–2.2 × 0.5–1.5 mm, apex obtuse, sides membranous, mid-brown, margins broadly white-hyaline, keel obtuse, obscurely 3–5-veined, paler brown. Stamens 1–3; anthers 0.8–1 mm, connective smooth. Style slender, not ciliate, basally slightly thickened; stigmas 2(–3). Achenes obovate, biconvex to rarely compressed-trigonous, 0.7–0.9 × 0.5–0.7 mm, maturing dark brown to black, smooth to indistinctly cancellate.

Locality: Cape D'Aguilar, Stonecutters Island, Castle Peak, Ping Chau. *J. C. Shaw 583; Y. W. Lam 986; Y. S. Lau 2476.*

Distribution: Hainan, Guangdong, Guangxi, Fujian, Taiwan, Zhejiang; tropics.

Ecology: Sandy beaches and mangroves. Flowering & fruiting: Jul.–Oct.

20. Fimbristylis rigidula Nees 結壯飄拂草

Contr. Bot. India 99. 1834; FKH 299. 1912; FRPS 11: 91. 1961; Flora Guizhouensis 8: 581. 1988; FYN 15: 609. 2003; FGD 8: 303. 2007; FOC 23: 211. 2010.

Perennial; rhizomes short, woody, covered with fibrous leaf sheath remnant. Culms usually solitary, 15–50 cm tall, 0.5–1.2 mm thick, trigonous, smooth, often sparsely hairy above. Leaves basal; blade linear, 4–20 cm × 2–3.5 mm, acute, shortly apiculate, flat margins weakly incurved, glaucous; sheath 3–7 cm, pale to mid-brown; ligule absent. Involucral bracts 3–5, the longest leaf-like, 1.5–4 cm. Inflorescence simple to compound, rarely decompound, 2–5 × 2–3 cm; primary branches 3–6, up to 4 cm. Spikelets 5–20 per inflorescence, solitary or in pairs, broadly ovoid to ovoid-ellipsoidal, 5–8(–12) × 3–4 mm. Glumes many per spikelet, spirally arranged, ovate to broadly ovate, 3–3.2 × 2 mm, apex obtuse, often mucronate, sides chartceous, 3–4-veined, reddish brown, margins broadly white-hyaline, keel obtuse, 3-veined, greenish. Stamens 3; anthers 1.7–2 mm. Style slender, compressed, apically ciliate, basally inflated; stigmas 2. Achenes obovate-orbicular, biconvex, 1–1.5 × 0.8–1.2 mm, greyish brown, verruculose, with 25–30 fine longitudinal rows of epidermal cells.

Locality: Lantau Island. *H. C. Tang 1256; HK sheet 8057.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Guizhou, Hunan, Hubei, Zhejiang, Jiangsu, Jiangxi, Fujian, Taiwan; Japan, Nepal, Bangladesh, Myanmar, Nepal, Pakistan, India, Thailand, Philippines.

Ecology: Grasslands of hillslopes. Flowering & fruiting: Apr.–Jun.

21. Fimbristylis leptoclada Benth. 纖細飄拂草 **(Photo 195)**

FHK 393. 1861; FKH 300. 1912; FGD 8: 297. 2007; FOC 23: 208. 2010.

Perennial. Rhizome short. Culms tufted, 15–60 cm tall, 0.2–1.5 mm thick, trigonous, smooth to scabird. Leaves basal, few; blade filiform, 10–30 cm × 0.3–0.5 mm, obtuse margins ± incurved; sheath 1.5–4 cm, pale-hyaline to mid-brown, apex oblique; ligule absent. Involucral bracts 1–3, glume-like or setaceous, the longest 5–20 mm. Inflorescence simple or capitate, 5–20 × 5–8 mm; primary branches (when present) up to 2 cm. Spikelets 3–12 per inflorescence, in clusters of 2–8, ellipsoidal, 2.2–3.5 × 1.5–2 mm. Glumes 10–15 per spikelet, spirally imbricate, broadly ovate, 1–1.5 × 0.7–1.3 mm, rounded-truncate or shallowly emarginate, mucronulate, sides membranous, brown, densely gland-dotted, margins pale-hyaline, fimbriate-ciliate above, keel obtuse, 3-veined, pale brown. Stamens 1–2; anthers 0.5 mm. Style 3-sided, glabrous, basally inflated; stigmas 3. Achenes obovoid, trigonous, 0.7–0.9 × 0.5–0.7 mm, cream, verruculose.

Locality: High West. *HK sheet 7977.*

Distribution: Guangdong, Fujian; Japan, Sri Lanka, Vietnam, Thailand, Malaysia, Papua New Guinea.

Ecology: Dry sandy grasslands. Flowering & fruiting: Jul.–Aug.

Notes: The type specimen (*C. Wright 579*, K, holotype; US, isotype) was collected by C. Wright from Hong Kong in 1850s.

22. Fimbristylis thomsonii Boeck. 西南飘拂草 **(Photos 196–197)**

Linnaea 37: 37–38. 1871; FHK 393. 1861; FKH 300. 1912; FRPS 11: 80. 1961; FTW ed. 2, 5: 279. 2000; FYN 15: 602. 2003; FGD 8: 297. 2007; FOC 23: 205. 2010.

Perennial. Rhizomes short, stout. Culms 1–several, 20–80 cm tall, 0.7–2 mm thick, flattened-trigonous, smooth. Leaves basal, 2-ranked; blade linear, up to 40 cm × 2–5 mm, abruptly acuminate, flattish; sheath up to 5 cm, truncate, pale green to rusty brown; ligule a dense fringe of short hairs. Involucral bracts 2–4, the longest suberect, 1–8 cm. Inflorescence compound, rather open, 5–12 × 4–8 cm; primary branches 2–5, 0.7–9 cm. Spikelets oblong-ovoid to ovoid-lanceolate, angular, 5–8 × 2–3 mm. Glumes 6–17 per spikelet, spirally arranged, ovate, 3–4 × 2–2.5 mm, acute to mucronate, sides papery, indistinctly 5–7-veined, chestnut-brown, margins membranous, keel acute, green. Stamens 3; anthers 2 mm. Style 3-sided, glabrous, basally inflated; stigmas 3. Achenes obovoid, trigonous, 1.2–1.5 × 0.7–1 mm, whitish yellow, cancellate with several rows of hexagonal to transversely oblong epidermal cells and scattered papillae towards apex.

Locality: Common in Hong Kong. *J. C. Shaw 390; H. C. Tang 1932; Y. S. Lau 1802.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; India, Myanmar, Thailand, Malaysia, Vietnam, Laos, Japan.

Ecology: Thickets and wet grasslands. Flowering & fruiting: May–Jul.

23. Fimbristylis complanata (Retz.) Link 扁鞘飘拂草 **(Photos 198–199)**

Hort. Berol. 1: 292. 1827; FHK 393. 1861; FKH 300. 1912; FRPS 11: 81. 1961; Flora Guizhouensis 8: 575. 1988; FTW ed. 2, 5: 265. 2000; FYN 15: 603. 2003; FGD 8: 298. 2007; FOC 23: 205. 2010.

Scirpus complanatus Retz., Observ. Bot. 5: 14. 1791.

Perennial. Rhizomes short. Culms crowded in series along rhizome to ± tufted, 30–70 cm tall, 0.9–5 mm thick, flattened, smooth to scabrid, narrowly winged above. Leaves basal; blade linear, up to 26 cm × 2–5 mm, obtuse to rounded, flat, margins incurved; sheath 1–8 cm, obliquely truncate, pale to rusty brown; ligule a fringe of short hairs. Involucral bracts 2–4, the longest suberect, 1–8 cm. Inflorescence compound, 4–10 cm; primary branches 4–7, 1–5 cm. Spikelets ellipsoidal to ovoid-lanceolate, terete, 4–9 × 1–2 mm. Glumes 5–20 per spikelet spirally arranged, ovate to ovate-lanceolate, 1.8–2.5(–3) mm long, mucronate, sides chartaceous, yellowish brown to brown, margins paler, keel acute, green. Stamens 2–3; anthers 1 mm long. Style 3-sided, glabrous, basally inflated to conic; stigmas 3. Achenes broadly obovoid, trigonous, 0.5–0.7 × 0.3–0.4 mm whitish, finely cancellate with several rows of transversely oblong epidermal cells.

Locality: Tai Mo Shan, Sai Kung, Tung Chung. *Y. W. Lam 812, 954, 1623.*

Distribution: Hainan, Guangdong, Guizhou, Yunnan, Sichuan, Hubei, Jiangsu, Fujian, Taiwan; tropics.

Ecology: Muddy seashores, wet places by streams or paddy fields. Flowering & fruiting: May–Aug.

24. Fimbristylis exaltata (T. Koyama) Y. F. Deng, **st. nov.** 血色飘拂草

Fimbristylis complanata (Retz.) Link f. *exaltata* T. Koyama, Bull. Arts Sci. Div. Ryukyu Univ. 3: 70. 1959.

Fimbristylis complanata (Retz.) Link var. *exaltata* (T. Koyama) Y. C. Tang ex S. R. Zhang & T. Koyama, FOC 23: 205. 2010.

Fimbristylis consanguinea auct. non Kunth: FGD 8: 297. 2007; Check List HK Plants 314. 2002; 110. 2004.

Fimbristylis complanata (Retz.) Link var. *kraussiana* auct. non (Hook. ex Steud.) C. B. Clarke: FRPS 11: 81. 1961.

Perennial; rhizome short, covered with pale brownish scales. Culms densely tufted, often forming a large clump, slender, 15–50 cm tall, 1–1.5 mm thick, trigonous, smooth, glabrous, glaucous-green leaved at base. Leaf blades herbaceous, glabrous, mostly 1/2–2/3 as long as the culm, linear, 1–2.5 mm wide, margin apically finely serrulate, apex acute; ligule a fringe of short whitish pubescence; sheaths cylindrical with obtuse pale green back, 1–6 cm, the hyaline ventral side tinged with light brown, the orifice obliquely truncate, ciliolate, generally ± auriculate. Corymbs simple or in part subcompound, subdensely bearing 3–20 spikelets, 1–2.5 cm long and as wide; bracts 2–4, elongate, the lowest leaf-like, 5–25 mm, slightly shorter than to surpassing the corymb; anthelas 1–3.5 mm. Spikelets few, solitary, oblong to ovate-lanceolate, 4–6 × 1.5–2 mm, brown to dark brown, several–10-flowered. Glumes spirally imbricated, ovate or ovate-oblong, 2.5–3 × ca. 2 mm, shallowly boat-shaped with convex keel, apex mucronate, thinly membranous, brown, finely 1–3-veined. Stamens 3; anther oblong, ca. 1.5 mm. Style 3-sided, ca. 2 mm, glabrous, basally inflated to conical; stigmas 3. Achenes obovoid, trigonous, 1–1.2 × 0.8–0.9 mm, apex rounded to mucronulate, base cuneate, pale yellowish, substantially smooth, with transverse oblong reticulation.

Locality: Happy Valley. *HK sheet 8087.*

Distribution: Guangdong, Guangxi, Guizhou, Hunan, Hubei, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; Korea, Japan.

Ecology: Marshes and other wet places. Flowering & fruiting: May–Aug.

25. Fimbristylis insignis Thwaites 硬穗飘拂草 **(Photo 200)**

Enum. Pl. Zeyl. 349. 1864; FKH 300. 1912; FGD 8: 300. 2007; FOC 23: 207. 2010.

Perennial; rhizomes short. Culms densely tufted, 20–60 cm tall, 0.5–2 mm thick, ± trigonous, smooth. Leaves basal, many; blade linear, often somewhat falcate, 5–18 cm × 1–4 mm, rounded, leathery, margins serrulate, incurved; sheath 1–2 cm, pale greenish; ligule absent. Involucral bracts 2–3, subulate, erect, the longest shorter than inflorescence, 0.5–1.5 cm. Inflorescence simple, rarely compound, 3–10 × 3–5 cm; primary branches 2–6, 1–8 cm. Spikelets (2–)4–18 per inflorescence, oblong-conical to cylindrical, terete, 12–20 × 2–4 mm. Glumes many per spikelet, spirally imbricate, ovate, 4–7 × 2.5–4 mm, apex obtuse, shortly cuspidate, sides chartaceous,

orange brown, slightly shiny, margins narrowly pale-hyaline, keel obtuse, 1-veined, yellowish. Stamens 3; anthers 1.5–2 mm. Styles 0.5–1 mm, 3-sided, glabrous; stigmas 3. Achenes broadly obovoid to obovoid-pyriform, trigonous, 1–1.3 × 0.8–1 mm, apex ± truncate, deeply furrowed on each side, indistinctly cancellate, sometimes verruculose.

Locality: Pok Fu Lam. *S. Y. Hu 8497, 10876* (CUHK).

Distribution: Hainan, Guangdong; Vietnam, Laos, Thailand, Sri Lanka, India, Malaysia, Indonesia, Philippines, Australia.

Ecology: Burnt-over grasslands, rock outcrops, rarely wet forest floors.

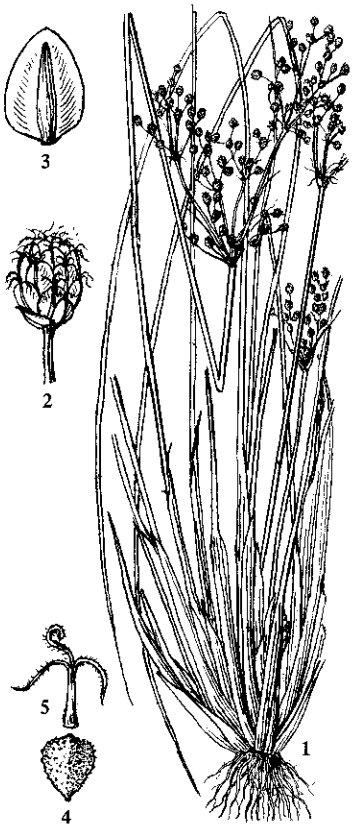

Figure 69. *Fimbristylis littiralis* Gaudich.
1. plant; *2.* spikelet; *3.* glume; *4.* achene; *5.* style and stigma. (drawn by H. P. Yu)

26. Fimbristylis littoralis Gaudich.

水虱草(日照飄拂草) **(Fig. 69; Photos 201–202)**

Voy. Uranie 10: 413. 1829; FTW ed. 2, 5: 271. 2000; FOC 23: 208. 2010.

Fimbristylis miliacea (L.) Vahl, Enum. Pl. 2: 287. 1805, nom. rej.; FHK 393. 1861; FKH 300. 1912; FRPS 11: 85. 1961; Flora Guizhouensis 8: 577. 1988; FTW ed. 2, 5: 271. 2000; FYN 15: 604. 2003; FGD 8: 300. 2007; Check List HK Plants 314. 2002; 111. 2004.

Scirpus miliaceus L., Syst. Nat. (ed. 10) 868. 1759, nom. rej.

Annual or short-lived perennial. Rhizome short. Clumstufted, 10–60(–90) cm tall, 1–3 mm thick, 4-sided, smooth, bearing 1–3 bladeless sheath at base. Leaves basal, or cauline reduced to bladeless sheaths; blade linear, 10–50 cm × 1–4 mm, apex subacute, bilaterally flattened; basal sheaths 1–18 cm, open, cauline sheaths tubular, 2–10 cm; ligule absent. Involucral bracts 2–4, setaceous, the longest 1–3 cm. Inflorescence compound to decompound, open, 3–10 × 3–10 cm; primary branches 3–7, 1–7 cm. Spikelets many per inflorescence, ovoid-globose to globose, 1.5–3(–5) × 1–2.1 mm, 6–10-flowered. Glumes many per spikelet, spirally arranged, broadly ovate, 1–1.2 × 0.6–0.8 mm, apex obtuse, sides membranous, reddish brown, margins broadly hyaline, keel obtuse, yellowish, obscurely 3-veined. Stamens 1(–2); anthers oblong, ca. 0.6 mm long. Style 3-sided, apically compressed, sparsely pilose, basally inflated; stigmas 3. Achenes obovoid, trigonous, 0.6–0.8 × 0.3–0.5 mm, creamy yellow, sparsely verruculose especially on angles, cancellate with 5–7 longitudinal rows of transversely linear-oblong cells.

Locality: Common in Hong Kong. *Y. S. Lau 1556; Y. W. Lam 1555; HK sheet 42185.*

Distribution: Widely spread over S, SW and E China; tropical and subtropical regions of the world.

Ecology: Paddy fields and other wet places. Flowering & fruiting: Aug.–Oct.

27. Fimbristylis diphylloides Makino 擬二葉飄拂草

J. Jap. Bot. 11(4): 252, fig. 3. 1935; FRPS 11: 87. 1961; Flora Guizhouensis 8: 578. 1988; FGD 8: 301. 2007; FOC 23: 209. 2010.

Annual. Rhizome absent or very short. Culms tufted, thin, flatly 4-angled, striate, 15–50 cm tall, bearing 1–2 bladeless sheaths at base, sheaths cylindrical, 2.5–6.5 cm, mouth obliquely truncate, acute, covered with fibriform old sheaths; leaves shorter than or nearly equalling culms, flat, acute at apex, finely toothed at margins, 1.2–2.2 mm wide; sheaths membranous and rusty-brown adaxially, mouth obliquely split, without ligule. Bracts 4–6, much shorter than inflorescence, setaceous, dilated at base, finely serrulate on margins; anthelae simple or nearly compound, 1.5–6 × 2–6 cm; anthelae 4–8, scabrid, 0.6–4 cm; spikelets solitary, obovate or oblong-obovate, obtuse or nearly acute, 2.5–7.5 × 1.5–2.5(–3) mm, densely many-flowered; glumes broadly ovate or oblong-ovate, ca. 1.5 × 1 mm, membranous, extremely obtuse at apex, margins hyaline, 3-veined abaxially, veins green and slightly keeled. Stamens 2, anthers oblong, ca. 0.8 mm, about 1/2 length of filaments. Style not ciliate, base slightly inflated, stigmas 2–3, slightly longer than or nearly equalling style. Achenes broadly obovoid, trigonous or biconvex, ca. 1 mm, brown, with sparse verrucae and transversely oblong reticulation.

Locality: Lung Kwu Tan. *HK sheet 37113.*

Distribution: Guangdong, Guangxi, Guizhou, Sichuan, Hubei, Hunan, Hubei, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian; Japan, Korea.

Ecology: Paddy fields and other wet places. Flowering & fruiting: Jun.–Sep.

18. Abildgaardia Vahl 柄果莎屬

Annuals, or tufted to rhizomatous perennials. Culms scapose. Leaves eligulate, sometimes reduced to a sheath. Inflorescence depauperate anthelate or capitate with few spikelets, or reduced to single spikelet. Primary bracts short, not sheathing. Spikelets with many densely (spiro-)distichous, deciduous glumes, each subtending a flower. Flowers bisexual. Segments absent. Stamens 2–3. Style deeply 3-fid, style base distinct, thickened, deciduous. Achene mostly obovate, stipitate, rounded trigonous, rarely winged, surfaces often tuberulate, rarely smooth.

About ten species distributed in tropics or subtropics; one species in China and Hong Kong.

1. Abildgaardia ovata (Burm. f.) Kral
獨穗柄果莎 **(Fig. 70; Photo 203)**

Sida 4(2): 72. 1971.

Carex ovata Burm. f., Fl. Indica 194. 1768.

Fimbristylis ovata (Burm. f.) Kern, Blumea 15(1): 126. 1967; FHN 4: 298. 1977; FTW ed. 2, 5: 274. 2000; FYN 15: 615. 2003; FGD 8: 310. 2007; FOC 23: 217. 2010; Check List HK Plants 314. 2002; 111. 2004.

Cyperus monostachyus L., Mant. Pl. 2: 180. 1771.

Abildgaardia monostachya (L.) Vahl, Enum. Pl. 2: 296. 1805; FHK 389. 1861.

Fimbristylis monostachya (L.) Hassk., Pl. Jav. Rar. 61. 1848; FKH 298. 1912; FRPS 11: 229. 1961.

Perennial; rhizomes short. Culms tufted, 6–40 cm tall, 0.3–0.8 mm thick, trigonous, smooth below, spinulose-scabrous above. Leaves basal; blade narrowly linear, up to 30 cm × 0.5–1.2 mm, flattish with weakly incurved margins or weakly inrolled; sheath 1–6 cm, dorsally pale green to pale brown, ventrally whitish-hyaline; ligule absent. Involucral bracts 2–3, glume-like or with setaceous blade 0.5–1 cm. Inflorescence reduced to 1 terminal spikelet, with a 1–2 cm long peduncle. Spikelets ovate, ovate-lanceolate, somewhat flattened, 8–15 × 3–7 mm, 10–20-flowered. Glumes 8–20 per spikelet, 2-ranked below, ± spirally arranged above, ovate to broadly ovate, 3–6 × 2–4 mm, apex acute, slightly incurved, 3-veined, greenish. Stamens 3; anthers linear, ca. 2 mm. Style 3-sided, glabrous, basally inflated; stigmas 3. Achenes broadly obvoid, trigonous, 2–2.5 × 1.3–1.5 mm, stiple ca. 0.5 mm, white or cream, ± densely verruculose.

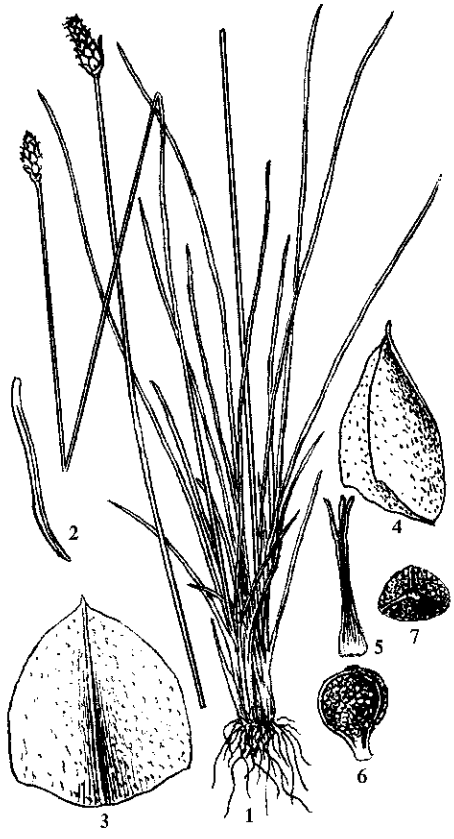

Figure 70. *Abildgaardia ovata* (Burm. f.) Kral
1. plant; *2.* bract; *3–4.* glumes; *5.* style and stigma; *6–7.* achene. (drawn by H. P. Yu)

Locality: Common in Hong Kong. *J. C. Shaw 604; Y. W. Lam 258, 953.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Guizhou, Sichuan, Hunan, Fujian, Zhejiang, Taiwan; tropical and subtropical regions of the world.

Ecology: Grasslands. Flowering & fruiting: Jun.–Sep.

19. Scirpus L. 藨草屬

Tufted or rhizomatous perennials. Culms few- or many-noded, terete to triquetrous. Leaves basal and cauline, ligulate; blades linear; basal sheaths open, cauline sheaths tubular. Involucral bracts leaf-like, spreading. Inflorescence terminal, paniculate, simple to decompound. Spikelets generally small, ovoid or ellipsoidal, terete. Glumes spirally arranged, mostly membranous, deciduous, each subtending a flower. Flowers bisexual. Perianth segments (0–)3–6, filiform, as long as to much longer than the fruit (and then often extremely contorted), ± scabrid, deciduous with the fruit. Stamens 1–3. Style base not distinct, not thickened, persistent; stigmas 2–3. Achene obovate to elliptic, (compressed) trigonous or biconvex, beaked, smooth.

About 35 species mostly in the temperate regions of N hemisphere; 12 species in China; two species in Hong Kong.

1a. Perianth segments 6, stigmas 1 ..... 1. *S. hainanensis*
1b. Perianth segments 0–3(–6), stigmas 2–3 ..... 2. *S. ternatanus*

1. Scirpus hainanensis S. M. Huang 海南藨草
FHN 4: 538, fig. 1143. 1977; FGD 8: 279. 2007; FOC 23: 174. 2010.

Perennial. Rhizome short or absent. Culms terete, several-noded, glabrous, 60–90 cm tall, 3–5 mm thick. Leaves basal or 3–5 cauline, blades linear, flat, shorter than culms, 3–5 mm wide, apex gradually acuminate, margin scaberulous; sheath brown, 1.5–3 cm. Involucral bracts leafy, usually shorter than inflorescence, gradually shorter upward, with sheath. Inflorescence decompound, primary branches 4–6, unequal. Spikelets in finger-like clusters of 3–12, 5–7 × 2–3 mm, 10–15-flowered. Glumes ovate or oblong-ovate, 2–2.5 × ca. 1.5 mm, apex acute or shortly mucronate, membranous, 1-veined, abaxially yellowish-green in the middle, yellowish or brownish laterally, with brown stripes. Perianth segments 6, ca. 1.5 mm, scaberulous above. Stamen 1, anther oblong, less than 1 mm. Style ca. 1.5 mm, slightly inflated at base, stigmas 3. Achenes obovoid or broadly obovoid, trigonous, ca. 1.5 mm, pale brown, smooth.

Locality: Sunset Peak (fide Corlett et al., 2000).

Distribution: Hainan, Fujian, Jiangsu.

Ecology: Forests along streams. Flowering & fruiting: Jul.–Sep.

2. Scirpus ternatanus Reinw. ex Miq. 百穗藨草 **(Fig. 71)**
Fl. Ned. Ind. 3: 307. 1856; FRPS 11: 13. 1961; FTW ed. 2, 5: 309. 2000; FOC 23: 173. 2010.

Scirpus ternatensis C. B. Clarke, J. L. Soc., Bot. 36: 254. 1903; FKH 301. 1912.

Scirpus chinensis Munro, Bot. Voy. Herald 428. 1857, non Osbeck, 1757; FHK 395. 1861.

Perennial. Culms erect, rather stout to stout, 50–200 cm tall, 4–8 mm thick, trigonous to triquetrous above, several-noded. Leaves basal and up to 7 cauline; blades up to 70 × 0.7–2.5 cm, acuminate, flattish; basal sheaths pale to chestnut brown, cauline sheaths greenish brown. Involucral bracts 3–5, leafy, up to 50 cm. Inflorescence decompound, 10–25 × 10–25 cm; primary branches up to 8, unequal, up to 10 cm; secondary and tertiary branches up to 5 cm. Spikelets in finger-like to ± globose clusters of 3–10, ovoid to oblong-ovoid, 2.5–6 × 2–3 mm, obtuse, rarely subacute, dark brown. Gulmes ovate to ± orbicular, 1.2–2.5 × 1–1.5 mm, obtuse, ± mucronulate, membranous. Perianth segments 0–3(–6), delicate, sparsely antrorsely scaberulous in the upper half. Stamens 2–3, anthers oblong-linear, 0.7–1 mm. Style glabrous, stigmas 2(–3). Achenes obovate, 0.7–1 × 0.5–0.8 mm, plano-convex or biconvex, strongly dorsiventrally compressed, minutely apiculate, pale brown, smooth.

Locality: Tai Tam Reservior. *J. C. Shaw 929; H. G. Ye et al 1162; HK sheet 8104.*

Distribution: Hainan, Guangdong, Guangxi, Xizang, Yunnan, Sichuan, Hunan, Hubei, Jiangxi, Fujian, Jiangsu, Shandong, Taiwan; Malaysia, Indonesia, Philippines, Bhutan, India, Myanmar, Vietnam, Thailand, Japan.

Ecology: Wet places. Flowering & fruiting: Jul.–Aug.

Notes: The type specimen of *Scirpus chinensis* Munro was collected by Hance from Hong Kong.

Figure 71. *Scirpus ternatanus* Reinw. ex Miq.
1. portion of plant; *2.* inflorescence; *3.* anthela; *4.* glume; *5.* achene; *6.* cross section of achene. (drawn by H. P. Yu)

20. Schoenoplectus (Rchb.) Palla, *nom. cons.* 水蔥屬

Annuals or perennials, sometimes with decumbent creeping rhizomes. Culms trigonous or terete, not nodose above base, naked, clothed at base with a few to several bladeless leaf sheaths. Leaves mostly reduced to bladeless sheaths, rarely leaf blade present; ligule absent. Involucral bracts culm-like, lowest bract erect, remainder usually indistinct. Inflorescences varying from open anthela to contracted head, frequently becoming pseudolateral with its lowest bract erect and continuous with culm, small, secondary inflorescence sometimes present within lowermost leaf sheath at culm base. Spikelets mostly ovoid or ellipsoidal, rarely flattened, with many glumes on a continuous axis. Glumes spirally imbricate, rarely 2-ranked, usually membranous, all bearing a bisexual flower in axil. Flowers with 3–6 perianth segments, needle-like, spinulose-scabrous, rarely broader and fimbriate, or sometimes reduced to none. Stamens 3. Stigmas 3 or less commonly digynous; style continuous with ovary. Achenes biconvex or trigonous, smooth to transversely wrinkled, maturing brown or black.

About 100 species distributed worldwide with highest species diversity in E and S Asia and temperate N America; 22 species in China; four species in Hong Kong.

1a. Perianth segments absent ..... 1. *S. lateriflorus*
1b. Perianth segments present.
  2a. Inflorescence paniculate ..... 2. *S. subulatus*
  2b. Inflorescence capitate.
    3a. Culms terete ..... 3. *S. juncoides*
    3b. Culms trigonous ..... 4. *S. triangulatus*

1. Schoenoplectus lateriflorus (J. F. Gmel.) Lye 側花水蔥

Bot. Not. 124: 290. 1971.

Scirpus lateriflorus J. F. Gmel., Syst. Nat. 1: 127. 1791; FRPS 11: 27. 1961; FGD 8: 282. 2007.

Schoenoplectus supinus (L.) Palla subsp. *lateriflorus* (J. F. Gmel.) Soják, Cas. Nar. Muz. (Prague) 141: 62. 1972; FTW ed. 2, 5: 303. 2000; FYN 15: 576. 2003; FOC 23: 188. 2010.

Scirpus supinus L. var. *lateriflorus* (J. F. Gmel.) T. Koyama, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 7(6): 302. 1958; FHN 4: 277. 1977.

Scirpus supinus auct. non L.: FKH 300. 1912.

Isolepis supinus auct. non (L.) R. Br.: FHK 394. 1861.

Annual. Rhizome absent. Culms tufted, 5–30 cm tall, 1–2 mm thick, trigonous, striate. Leaf sheath 5–15 cm, brown, apex obliquely truncate, mucronate, the uppermost sheath sometimes with a compressed-triangular blade to 10 cm. Involucral bracts 1, the lower bract erect, 3–12 cm, ventrally sulcate. Inflorescence pseudolateral, capitate or short, paniculate, simple, branches 4, unequal, with 3–10 spikelets; small secondary inflorescence often present at culm base. Spikelets ovate-lanceolate to oblong, 4–8 × 2–3 mm. Glumes elliptic or elliptic-ovate, boat-shaped, 1.8–2.5 × ca. 2 mm, apex acute, mucronate, green to pale yellowish brown. Perianth segments absent, rarely rudimentary. Stamens 3; anthers oblong, connective pilose. Style slender, ca. 0.5 mm, stigmas 3. Achenes broadly obovoid, trigonous, 1–1.3 mm, black, sides transversely wrinkled.

Locality: Hong Kong. *C. Wilford 271; C. Wright 590* (K).

Distribution: Guangdong, Guangxi, Jiangsu, Yunnan, Taiwan; Afghanistan, Pakistan, Nepal, India, Sri Lanka, Myanmar, Thailand, Vietnam, Malaysia, Indonesia, Australia, Philippines, Madagascar, Africa.

Ecology: Wet places. Flowering & fruiting: Aug.–Sep.

Notes: The species was reported as *Scirpus supinus* L. var. *lateriflorus* Gmel. previously (Check List HK Plants 320. 2002; 112. 2004).

2. Schoenoplectus subulatus (Vahl) Lye 鑽苞水蔥 **(Photos 204–205)**

Skr. Utg. Svensk Linné-Sällsk. 124: 290. 1971; FOC 23: 183. 2010.

Scirpus subulatus Vahl, Enum. Pl. 2: 268. 1806; FRPS 11: 17. 1961; FHN 4: 276. 1977.

Schoenoplectus litoralis (Schrad.) Palla subsp. *subulatus* (Vahl) T. Koyama, Fl. Ceylon 5: 157. 1985.

Scirpus littoralis auct. non Schard.: FGD 8: 282. 2007; Check List HK Plants 320. 2002; 112. 2004.

Perennial. Rhizome short; stolons terminated by a tuber. Culms erect, 60–150 cm tall, 0.5–0.8 mm thick, terete to trigonous below inflorescence, smooth, closed with leafless sheath at base. Leaf sheath cylindrical, 4–20 cm, membranous, septate-nodulose, becoming fibrous with age, apex with a recurved setaceous blade for 5–10 mm. Involucral bracts 1, subcompressed, ± equalling inflorescence, obtuse. Inflorescence paniculate, simple; branches 3–7, unequal, up to 5 cm, scabrous, terminated by 1–3 spikelets. Spikelets oblong-ovate or elliptic-ovate, 7–15 × 3–4 mm, many-flowered. Glumes oblong-ovate or elliptic, 3.5–4 × 1.8–2 mm, ± obtuse, shortly mucronate, rust brown, the margins tinged red. Perianth segments 3–4, broadly linear to ± spathulate, slightly exceeding achene, fimbriate. Stamens 3; anthers linear, ca. 2 mm. Stigmas 2. Achenes broadly obovate, biconvex, 2 × 1.5–1.7 mm, somewhat shiny, chestnut-brown, very minutely papillose.

Locality: Plover Cove, Mai Po. *K. L. Yip 4203; Y. W. Lam 1777; J. C. Shaw 268.*

Distribution: Hainan, Guangdong, Sichuan, Shanxi, Gansu; India, Sri Lanka, Malesia, Australia, Japan and Micronesia.

Ecology: Wet places. Flowering & fruiting: Jul.–Oct.

Notes: The species was merged with *Scirpus littoralis* Schard. or treated as a subspecies of the latter by some authors, but it is easily distinguished from the latter by its terete to trigonous culm and narrower, more laxly fimbriate perianth segments.

3. Schoenoplectus juncoides (Roxb.) Palla
螢藺 **(Fig. 72; Photos 206–207)**

Bot. Jahrb. Syst. 10: 229. 1889; Flora Guizhouensis 8: 561. 1988; FTW ed. 2, 5: 300. 2000; FYN 15: 577. 2003; FOC 23: 186. 2010.

Scirpus juncoides Roxb., Fl. Ind., ed. 1820, 1: 228. 1820; FHK 395. 1861; FRPS 11: 23. 1961; FHN 4: 277. 1977; FGD 8: 284. 2007; Check List HK Plants 319. 2002; 112. 2004.

Schoenoplectiella juncoides (Roxb.) Lye, Lidia 6(1): 25. 2003.

Scirpus erectus auct. non Poir.: FKH 301. 1912; Check List HK Plants 89. 1993.

Perennial. Rhizome short, roots many, fibrous. Culms tufted, 15–70 cm tall, 1–3 mm thick, subterete or obtusely several-angled, smooth. Leaf sheaths 3–4, lower scale-like, brownish, upper 5–15 cm, obliquely truncate, mucronate. Involucral bracts 1, 1.5–15 cm, abruptly subacute, base dilated, 1-furrowed on ventral side. Inflorescence pseudolateral, capitate, with (1–)2–12 spikelets. Spikelets oblong to ovoid-oblong, 6–18 × 3–6 mm, pale yellowish brown. Glumes ovate to broadly ovate, 3–4 × 1.8–2.7 mm, apex rounded to shallowly emarginate, mucronate, thickly membranous, pale brown, keel green, 1–3-veined. Perianth segments 4–6, ± retrorsely scabrous, of which 4 equalling or slightly longer than achene, remainder ± as long as achenes or less. Stamens 3; anthers oblong, ca. 2 mm. Style ca. 2 mm, stigmas 2, one of them rudimentary. Achenes broadly obovate, unequally biconvex, 1.8–2 × 1.5 mm, shiny dark brown, transversely wrinkled.

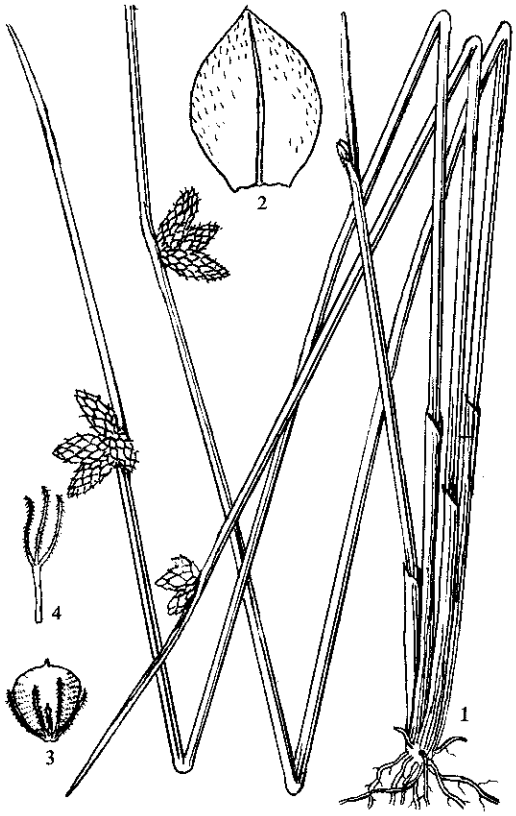

Figure 72. *Schoenoplectus juncoides* (Roxb.) Palla
1. plant; *2.* glume; *3.* achene; *4.* style and stigma. (drawn by H. P. Yu)

Locality: Wu Kai Sha, Sai Kung, Pui O. *Y. S. Lau 244; Y. W. Lam 2224; J. C. Shaw 200.*

Distribution: Widely distributed in China except Nei Mongol, Xizang and Gansu; Madagascar, tropical and subtropical Asia, Australia, Fiji, Hawaii.

Ecology: Marshes, paddy fields and other wet places. Flowering & fruiting: Aug.–Nov.

4. Schoenoplectus triangulatus (Roxb.) Soják 水毛花 **(Photos 208–209)**

Čas. Nár. Mus., Odd. Přír. 141(1–2): 62. 1972.

Scirpus triangulatus Roxb., Fl. Ind. ed. 1820, 1: 219. 1820; FRPS 11: 21. 1961.

Schoenoplectus mucronatus (L.) Palla subsp. *robustus* (Miq.) T. Koyama, FTW 5: 214. 1978; FOC 23: 184. 2010.

Scirpus mucronatus auct. non L.: FGD 8: 282. 2007; Check List HK Plants 112. 2004.

Perennial. Rhizomes short. Culms deep green, slightly densely tufted, 45–130 cm tall, 5–11 mm thick, sharply 3-angled with shallowly concave sides, clothed at base with 2–4 leaf sheaths. Leaf sheaths brown, 7–25 cm, membranous to herbaceous, obliquely truncate at orifice. Involucral bract 1, culm-like, upright or obliquely bent, 2–10 cm. Inflorescences a pseudo-lateral hemispherical head, with (3–)5–20 spikelets. Spikelets ovoid, oblong-ovoid, to narrowly ovoid, 10–20 × 4–6 mm, terete, densely many-flowered, apex subacute. Glumes broadly obovate, ovate, broadly ovate, 3.8–5 × 2.5–3 mm, pale green and brownish tinged usually with reddish brown, very concave, papery, margin apically minutely ciliolate, apex with a green 1–3-veined costa excurrent in a mucro. Perianth segments 6, 1.5–2 mm, retrorsely scabrous. Stamens 3; anthers linear, ca. 2.5 mm; connective apex slightly prominent beyond anthers. Style ca. 4 mm; stigmas 3. Achene blackish brown at maturity, obovoid to broadly obovoid, 2–2.5 × 1.5–2 mm, compressed 3-sided, conspicuously or inconspicuously transversely wrinkled, ± shiny, base contracted to cuneate, apex rounded to mucronate.

Locality: San Tin, Kam Tin. *Y. W. Lam 1774; HK sheet 40625.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, SE Xizang, Sichuan, Shanxi, Shaanxi, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; India, Indonesia, Japan, Korea, Malaysia, Sri Lanka; Africa, Europe, Madagascar.

Ecology: Pond and lake margins, swamps, grasslands in streamsides, paddy fields. Flowering & fruiting: May–Nov.

21. Fuirena Rottb. 芙蓉草屬

Annuals or perennials often pubescent. Culms (3–)4–5-angular, nodose. Leaves mostly cauline; blade pubescent or glabrous, 3–5-veined; sheaths closed; ligule absent. Involucral bracts leaf-like, sheathing at base, equalling or longer than inflorescence. Inflorescence paniculate, with few to many clusters of sessile spikelets at few to several nodes. Spikelets with many glumes. Glumes spirally imbricate, pubescent outside, usually shortly awned, 1–3-veined, the lowest 1–3 empty, Flowers bisexual. Perianth segments

3–6 in 1–2 whorls, each of 3 segments, outer whorl of simple bristles, sometimes absent, inner whorl of bristles, blades or claws. Stamens 2–3. Stigmas 3; style continuous with ovary. Achenes trigonous to triquetrous, apex beaked, base cuneate to stipitate, smooth to trabeculate.

About 30 species in the tropics with the high specific concentration in tropical Africa; three species in China; two species in Hong Kong.

1a. Leaf blades usually glabrous; perianth segments 3, all alike, obovate, subsessile, gradually narrowed at base ..... 1. *F. umbellata*

1b. Leaf blades pubescent and ciliate-margined; perianth segments 6, of two types, outer ones needle-like and scaberulose or smooth, inner ones with a subquadrate blades ..... 2. *F. ciliaris*

1. Fuirena umbellata Rottb.
芙蓉草 **(Fig. 73; Photos 210–211)**

Descr. Icon. Rar. Nov. Pl. 70, tb. 19, fig. 3. 1773; FHK 395. 1861; FKH 301. 1912; FRPS 11: 44. 1961; FHN 4: 278. 1977; FTW ed. 2, 5: 282. 2000; FYN 15: 587. 2003; FGD 8: 285. 2007; FOC 23: 179. 2010.

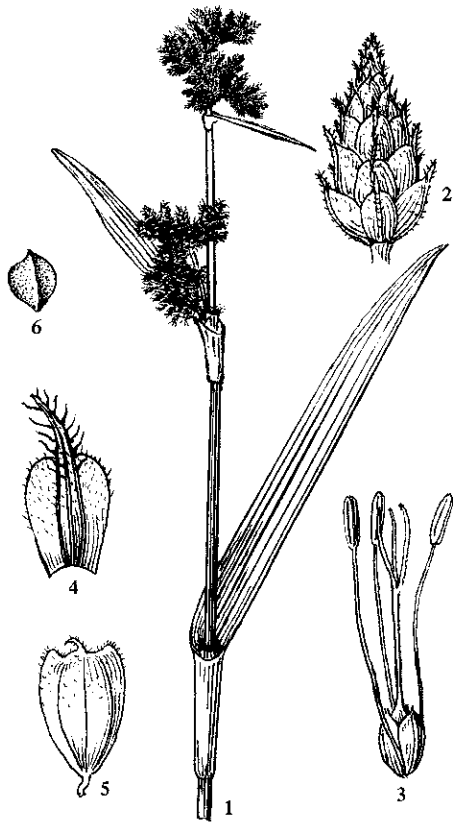

Figure 73. *Fuirena umbellata* Rottb.
1. portion of plant; *2.* spikelet; *3.* bisexual flower; *4.* glume; *5.* petaloid perianth; *6.* achene. (drawn by H. P. Yu)

Perennial. Rhizomes horizontally creeping. Culms solitary, erect, 30–100 cm tall, 6–9 mm thick, 5-angled, pubescent below inflorescence. Cauline leaves 5–7; blade lanceolate to linear-lanceolate, 10–20 cm × 5–25 mm, apex acute, ciliate at base; sheath 2–5 cm, usually glabrous. Inflorescence with 3–12 clusters of spikelets; peduncles whitish villous. Spikelets ovoid or ovoid-ellipsoidal, ± squarrose, 4–10 × 2.5–3 mm, apex acute, brownish green or dark brownish green. Glumes obovate to ovate elliptic, 2–2.5 × 1.2–1.5 mm, apex rounded, shortly pubescent, awn 0.8–1 mm, often pilose. Perianth segments 3, in 1 whorl only, obovate, all alike, obovate, membranous, truncate, subsessile, gradually narrowed at base. Stamens 3; anthers oblong, 0.5–0.7 mm. Styles linear, stigmas 3, equalling the style. Achenes obovoid to ellipsoidal, 0.8–1.2 × 0.6–0.7 mm, shiny, smooth to obscurely wrinkled.

Locality: Common in Hong Kong. *P. S. Choi 266, 289; Y. W. Lam 2107.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Xizang, Fujian, Taiwan; pantropics.

Ecology: Moist grasslands, near rivers or in paddy fields.

2. Fuirena ciliaris (L.) Roxb. 毛芙蓉草 **(Photo 212)**

Hort. Beng. 81. 1814, *nom. nud.*; Fl. Ind. ed. 1820, 1: 184. 1820; FRPS 11: 43. 1961; FHN 4: 279. 1977; FTW ed. 2, 5: 281. 2000; FYN 15: 585. 2003; FGD 8: 286. 2007; FOC 23: 179. 2010.

Scirpus ciliaris L., Mant. Pl. 2: 182. 1771.

Fuirena glomerata Lam., Tabl. Encycl. 1: 150. 1791; FHK 396. 1861.

Annual. Rhizomes short. Culms tufted, 5–50 cm tall, 1–2 mm thick, ciliate-pubescent above. Cauline leaves 5–7; blade linear, 5–15 cm × 3–8 mm, abruptly acute, margins pubescent or ciliate; sheath 1–3 cm, pubescent. Inflorescence with 1–3 clusters of spikelets; peduncles short, ciliate-pubescent. Spikelets ovoid or oblong-ellipsoidal, 4–7 × 3 mm, subacute, squarrose, greyish green. Glumes obovate to obovate-oblong elliptic, 1.5–1.7 × 1.25 mm, apex acute or obtuse, thinly membranous, shortly pubescent outside with pilose centre, awn ca. 1 mm, ciliate. Perianth segments 6; 3 outer ones needle-like, occasionally much reduced, scaberulose or smooth; 3 inner ones with a subquadrate blades, apex mucronate, base abruptly narrowed to a distinct stipe for ca. 0.3 mm long. Stamens 3; Anthers oblong, ca. 0.25 mm. Styles linear, stigmas 3. Achenes obovoid to ellipsoidal, 0.8–1 × 0.5–0.6 mm, brown, smooth to obscurely wrinkled.

Locality: Castle Peak, Sha Tin, Sai Kung. *Y. S. Lau 1467; Y. W. Lam 1218; HK sheet 39282.*

Distribution: Hainan, Guangdong, Guangxi, Hubei, Fujian, Jiangsu, Shandong, Taiwan, Yunnan; tropical Africa, Indian Subcontinent, SE Asia, Japan, Malesia and Australia.

Ecology: Margins of ponds and other wet places.

22. Lipocarpha R. Br. 湖瓜草屬

Annuals or perennials. Clums erect, ± cylindrical, smooth. Leaves basal, linear, flat to ± canaliculate; ligule absent. Involucral bracts leaf-like. Inflorescence capitate, terminal or pseudolateral. Spikes 1–8, ovoid, comprising many, densely imbricate spikelets each subtended by a spikelet bract. Spikelet bracts glume-like, conspicuous, hiding spikelet, apex short to elongate and sometimes strongly recurved. Spikelets comprising 2 glumes, both similar, the lower one empty, the upper one subtending a flower, sometimes 1 or both reduced or 0. Flowers bisexual. Perianth segments absent. Stamens 1–3. Stigmas 2–3; style continuous with ovary. Achenes obovate, ellipsoidal to narrowly cylindrical.

About 35 species distributed in temperate and subtropical regions; four species in China; two species in Hong Kong.

1a. Spikes 4–5 mm wide, not squarrose, usually 4–7 to a head ..... 1. *L. chinensis*

1b. Spikes 2–3 mm wide, squarrose, usually 1–3 to a head..... ..... 2. *L. microcephala*

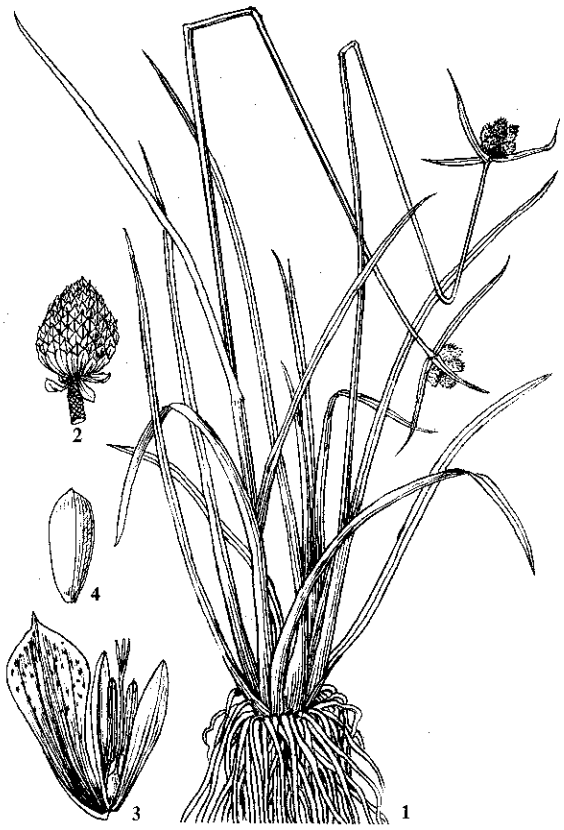

Figure 74. *Lipocarpha chinensis* (Osbeck) Kern
1. plant; *2.* spike; *3.* spikelet; *4.* achene. (drawn by H. P. Yu)

1. Lipocarpha chinensis (Osbeck) Kern

華湖瓜草 **(Fig. 74; Photos 213–214)**

Blumea, Suppl. 4: 167. 1958; FRPS 11: 192. 1961; FHN 4: 373. 1977; Flora Guizhouensis 8: 613. 1988; FTW ed. 2, 5: 287. 2000; FYN 15: 662. 2003; FGD 8: 348. 2007; FOC 23: 250. 2010.

Scirpus chinensis Osbeck, Dagb. Ostind. Resa 220. 1757.

Scirpus senegalensis Lam., Tabl. Encycl. 1: 140. 1791.

Lipocarpha senegalensis (Lam.) T. Durand & H. Durand, Syll. Fl. Congol. 619. 1909; Flora Guizhouensis 8: 613. 1988.

Lipocarpha argentea R. Br., Narr. Exped. Zaire 459. 1818, *nom. illeg.*; FHK 388. 1861; FKH 301. 1912.

Annual or perennial. Rhizome absent. Clums tufted, 15–70 cm tall, 1–2 mm thick, flat or compressed triquetrous, longitudinally sulcate, sparsely puberulent. Leaves basal; blade up to 40 cm × 2–4 mm, ± flat, apex acuminate; sheath 1–15 cm, reddish brown or reddish purple, glabrous. Involucral bract 2–3(–5), the longest up to 20 cm, basal ones bladeless, apical ones leaved. Inflorescence terminal clustered spikes. Spikes (1–)3–10, oblong or ovoid-ellipsoidal, 5–8 × 4–5 mm. Spikelet bracts spathulate to obovate or oblong, 1.5–2.7 × 0.4–1.3 mm, triangular-acute, apical part 1–2 mm long, membranous, white to pale yellowish or greenish brown, midvein green. Spikelets with two glumes and 1 bisexual flower; glumes elliptic or ovate-lanceolate, 1.5–2 mm, apex obtuse or acute. Stamens 2; anthers narrowly oblong, ca. 1 mm long. Style slender; stigmas 3, puberulent. Achenes oblong or oblong-ovoid, trigonous, 1–1.2 × 0.3–0.5 mm, pale yellowish brown.

Locality: Aberdeen, Happy Valley, Yung Shue O, Wu Kau Tang, Lantau Island. *Y. W. Lam 2155; J. C. Shaw & G. Reels 258; HK sheet 42192.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Hunan, Jiangxi, Shandong, Zhejiang, Fujian, Taiwan; tropical Asia, Africa, Australia.

Ecology: Marshes, paddy fields and other wet places. Flowering & fruiting: Jun.–Oct.

2. Lipocarpha microcephala (R. Br.) Kunth 湖瓜草

Enum. Pl. 2: 268. 1837; FHK 388. 1861; FKH 301. 1912; FHN 4: 273. 1977; FTW ed. 2, 5: 287. 2000; FYN 15: 664. 2003; FGD 8: 348. 2007; FOC 23: 250. 2010.

Hypaelyptum microcephalum R. Br., Prodr. 220. 1810.

Annual. Rhizome absent. Clums densely tufted, 5–40 cm tall, 0.5–1 mm thick. Leaves basal; blade up to 10 cm × 1–2 mm, flattish or weakly inrolled; sheath up to 3 cm, pale to purplish brown. Involucral bracts 2–3, the longest 5–10 cm. Inflorescence terminal. Spikes (1–)2–4(–5), ellipsoidal to ovoid-ellipsoidal, 3–8 × 2–3 mm. Spikelet bracts obovate-oblong, 1–1.5 × 0.2–0.4 mm, acuminate, the apical part recurved, 0.5–0.8 mm, scaberulous at tip, yellowish to brown, midvein green. Spikelets with 2 glumes and 1 bisexual flower. Glumes linear-oblong to oblong-lanceolate, 1–1.3 × 0.2 mm, white, 5-veined, apex obtuse or acute. Stamens 2; anthers linear-oblong, 2–3 mm. Style slender, exserted from subtending glumes; stigmas 3, puberulent. Achenes linear-oblong, often slightly curved, trigonous, 0.9–1 × 0.2–0.3 mm, yellowish brown, densely puncticulate, shiny, apex acuminate.

Locality: Fanling, Yung Shue O. *S. P. Lau 23; HK sheet 13660, 42164.*

Distribution: Widely spread over NE, E, S & SW China; Japan, Korea, Vietnam, Cambodia, Laos, Myanmar, Thailand, India, Malaysia, Indonesia, Philippines, Papua New Guinea, Australia.

Ecology: Wet places. Flowering & fruiting: May–Oct.

23. Kyllinga Rottb., *nom. cons.* 水蜈蚣屬

Perennials. Rhizome short or horizontally creeping, sometimes knotty. Leaves basal, 3-ranked, the blades elongate or reduced; ligule absent. Involucral bracts leaf-like. Inflorescence capitate. Spikes 1–few, sessile, cylindrical, ellipsoidal or globose; axis short. Spikelets many, falling entire, crowded, bilaterally flattened. Glumes several, 2-ranked, strongly laterally flattened, sides membranous to hyaline, veins 0–several, keel strongly acute, sometimes winged, smooth, spinulose or serrulate. Flowers 1–5 per spikelet, bisexual or male in upper glumes. Perianth segments absent. Stamens 2–3. Stigmas 2. Achenes 1–2 per spikelet, laterally biconvex with one margins facing the axis.

About 75 species in temperate, subtropical and tropical regions of both hemispheres; seven species in China; three species in Hong Kong.

1a. Glumes winged on keel, white and becoming straw-coloured ..... 1. *K. nemoralis*
1b. Glumes not winged on keel, greenish.
2a. Involucral bracts (5–)7–8; spikes 4–5 ..... 2. *K. polyphylla*
2b. Involucral bracts 3–4; spikes 1(–3) ..... 3. *K. brevifolia*

1. Kyllinga nemoralis (J. R. Forst. & G. Forst.) Dandy ex Hutch. & Dalz. 單穗水蜈蚣 **(Photos 215–216)**

Fl. W. Trop. Afr. 2: 486. 1936; FTW ed. 2, 5: 286. 2002; FYN 15: 659. 2003; FGD 8: 346. 2007; FOC 23: 249. 2010.

Thryocephalon nemorale J. R. Forst. & G. Forst., Char. Gen. Pl. (ed. 2) 129–130, pl. 65. 1776.

Kyllinga monocephala Rottb., Descr. Icon. Rar. Nov. Pl. 13, t. 4, fig. 4. 1773, *nom. illeg.*; FHK 388. 1861; FKH 296. 1912; FRPS 11: 190. 1961; Check List HK Plants 317. 2002; 111. 2004.

Kyllinga triceps auct. non Rottb.: FKH 297. 1912; Check List HK Plants 88. 1993.

Perennial. Rhizome long creeping. Culms tufted, close together or spaced along rhizome, erect, 10–45 cm tall, triquetrous, not thickened at base. Leaves many, usually shorter than culm; blades narrowly linear, 2–5 mm wide, rather soft, flattish; sheaths brown to purplish brownish. Inflorescence a single head, bearing a globose central spike and 2–3 small lateral spikes; central spike 5–10 × 5–7 mm, densely bearing many spikelets, whitish; leafy bracts 3–4, spreading to reflexed, lowest to 30 cm. Spikelets ovate-elliptic to lanceolate-ovate, 2.7–3.5 × 1.5 mm, 1-flowered. Glumes usually 5, lowest two smaller or narrow, 1–1.5 mm, remaining glumes 2.5–3.5 mm, boat-shaped, thinly membranous, whitish and eventually becoming straw-coloured, variegate with rusty brown, 3–4-veined on each side, broadly winged on acute green keel, wing serrulate, keel ending in a short usually recurved cusp. Stamens 3. Style slender, stigmas 2. Achenes oblong-obovate or suborbicular, biconvex, 1.25–1.5 mm, maturing brownish.

Locality: Common in Hong Kong. *S. P. Lau 5; J. C. Shaw 569; K. L. Yip 4018.*

Distribution: Hainan, Guangdong, Guangxi, Hunan, Yunnan, Taiwan; Bhutan, Nepal, Pakistan, India, Sri Lanka, Myanmar, Thailand, Laos, Cambodia, Vietnam, Malaysia, Indonesia, Philippines, Puapua New Guinea, Japan, Australia, Madagascar, tropical Africa, Indian Ocean islands, Pacific islands.

Ecology: Wastelands. Flowering & fruiting: May–Aug.

2. Kyllinga polyphylla Willd. ex Kunth 水蜈蚣(香根水蜈蚣) **(Photos 217–218)**

Enum. Pl. 2: 134. 1837; FOC 23: 248. 2010.

Kyllinga aromatica Ridl., Trans. Linn. Soc. London, Bot. 2: 146. 1884.

Perennial; rhizome horizontally creeping. Culms crowded in series along rhizome, up to 75 cm tall, triquetrous, smooth. Leave on uppermost 1–2 sheaths only, linear-lanceolate, 2–6.5 × 0.4–0.5 cm, apex acute, flat; sheaths up to 15 cm, greenish to purplish. Involucral bracts 4–7, linear, the longest up to 14 cm. Inflorescence capitate. Spikes 4–5; terminal spike ± spherical, 0.7 × 0.7 cm, lateral spikes smaller, in axils of involucral bracts. Spikelets elliptic, 3–3.7 × 0.8–0.9 mm, 1–2-flowered. Glumes ovate-elliptic, 2.5–3 × 2 mm, apex obtuse, shortly mucronate, sides membranous, indistinctly 3–5-veined, whitish to pale greenish, keel greenish, smooth to sparsely toothed. Stamens 1; anther 1–1.2 mm. Stamens 3; anther linear. Style slender; stigmas 2. Achenes oblong-obovate, 1 × 0.6 mm, greyish brown.

Locality: Victoria Park, Tsiu Hang, Tai Po Kau. *Y. S. Lau 2254, 3090; Y. W. Lam 327.*

Distribution: Taiwan; native to W Africa, widely cultivated.

Ecology: Wastelands. Flowering & fruiting: May–Aug.

Uses: Spice.

Notes: The species was reported as *Kyllinga aromatica* (Ridl.) Mattf. & Kunth previously (Check List HK Plants 316. 2002; 111. 2004).

3. Kyllinga brevifolia Rottb. 短葉水蜈蚣 **(Fig. 75; Photos 219–220)**

Descr. Icon. Rar. Pl. 13, pl. 4, fig. 3. 1773; FKH 297. 1912; FRPS 11: 187. 1961; Flora Guizhouensis 8: 610. 1988; FTW ed. 2, 5: 284. 2000; FYN 15: 658. 2003; FGD 8: 347. 2007; FOC 23: 248. 2010.

Cyperus brevifolia (Rottb.) Hassk., Cat. Hort. Bot. Bogor. 24. 1844.

Perennial; rhizome slender, long-creeping. Culms arranged in a row along the rhizome, 7–30 cm tall, 1–1.5 mm thick, triquetrous, smooth. Leaves radical and subradical; blade narrowly linear, 2–17 × 1–3 mm, acute, flattish-plicate; sheath 1–20 cm, brownish to

purplish brown. Involucral bracts 2–4, the longest 3–20 cm × 1.7–2.4 mm, sometimes erect. Inflorescence capitate, globose. Spikes 1(–3), globose, 0.5–1 × 0.5–1 cm. Spikelets oblong-lanceolate to elliptic-lanceolate, 3–3.5 × 1 mm, 1(–2)-flowered. Glumes ovate-elliptic, 1–3.5 mm, shortly cuspidate, sides membranous, 5–7-veined, pale green to pale brown, keel sparsely spinulose, green. Stamens 1–3; anthers 1 mm long. Style slender; stigmas 2. Achenes 1–2 per spike, obovate or elliptic, 1–1.5 × 0.5–0.7 mm, brownish, minutely punctate.

Locality: Common in Hong Kong. *Y. W. Lam 329; S. P. Lau 5; K. L. Yip 4079.*

Distribution: Widely spread over Areas S of Changjiang; tropics.

Ecology: Thickets on hillslopes, wet places. Flowering & fruiting: May–Sep.

24. Mariscus Vahl, *nom. cons.* 砖子苗屬

Perennials or annuals. Spikelets with few to many glumes distichously disposed on a continuous simple axis (rachilla), subterete, subtetragonous, or laterally flattened; rachilla jointed at base, usually above prophyll or above lowest glume, hence spikelets falling entire. Glumes all nearly alike, often only 1–several of these flower-bearing, rarely all flower-bearing. Flower bisexual with 1–3 stamens and trigonous pistil. Achenes trigonous, linear-oblong or elliptic, one of sides facing rachilla; style not jointed at base, 3-lobed at apex forming 3 stigmas.

About 200 species distributed in temperate, subtropical and tropical regions of the world; ten species in China; four species in Hong Kong.

Figure 75. *Kyllinga brevifolia* Rottb.
1. plant; *2.* spikelet; *3.* glume; *4.* achene. (drawn by H. P. Yu)

1a. Spikelets radially disposed at apices of anthelas, forming a head without rhachis ..... 1. *M. radians*
1b. Spikelets spicately disposed on elongated rachis of spikes; spikes cylindrical to ellipsoidal.
2a. Spikelets lanceolate to lanceolate-oblong, weakly flattened, 1.5–2 mm wide ..... 2. *M. javanicus*
2b. Spikelets linear to linear-oblong, subterete, 0.7–1 mm wide.
3a. Spikes with side narrowed to base; spikelets 1 mm or more wide, at least the lowest ones somewhat erect ..... 3. *M. cyperinus*
3b. Spikes truly cylindrical; spikelets less than 1 mm wide, spreading to ± reflexed ..... 4. *M. cyperoides*

1. Mariscus radians (Nees & Meyen) Tang & F. T. Wang 輻射砖子苗

FRPS 11: 177. 1961; FTW ed. 2, 5: 290. 2000; FGD 8: 341. 2007.

Cyperus radians Nees & Meyen ex Kunth, Enum. Pl. 2: 95. 1837 ["*radiates*"]; FHK 386. 1861; FKH 295. 1912; FOC 23: 225. 2010.

Perennial. Rhizome short, clothed with brownish fibers. Culms ± tufted, very low, 2–6 cm tall; obtusely trigonous smooth, usually hidden in leaf tuft, which much surpass culm. Leaves several, surpassing corymb; blades linear, plicate, 2–4 mm wide, stiffish; sheaths purplish brown. Corymbs simple with 2–7 elongate anthelas; anthelas somewhat unequal, patent, lower ones 9–12 cm, each terminated by a head-like cluster of spikelets; leafy bracts 3–7, equalling or shorter than corymb anthelas. Heads globose, 8–25 mm across, bearing 5–20 spikelets. Spikelets ovate to lanceolate-ovate, 6–12 × 2–4 mm, slightly turgid, bearing 4–15 flowers, pale green and tinged with brown. Glumes broadly ovate, 3.5–4 mm, papery, pale-green with purplish brown striate, sometimes tinged with purple brown, 11–13-veined, greenish keel convex, ending in a short recurved cusp at acute apex of glume. Stamens 3; anther broadly linear. Style slender; stigmas 3. Achene oval, trigonous with shallowly concave sides, 1.5–2 mm, dark brown, style elongate.

Locality: Sai Kung. *S. C. Ng 2212.*

Distribution: Guangdong, Fujian, Zhejiang, Shandong, Taiwan; Sri Lanka, Vietnam, Thailand, Malaysia, Indonesia.

Ecology: Sandy beach. Flowering & fruiting: Aug.–Sep.

2. Mariscus javanicus (Houtt.) Merr. & F. T. Metc. 羽穗砖子苗 **(Photos 221–222)**

Lingnan Sci. J. 21: 4. 1945; FRPS 11: 177. 1961; FTW ed. 2, 5: 290. 2000; FGD 8: 340. 2007.

Cyperus javanicus Houtt., Nat. Hist. 2: 13, pl. 88, fig. 1. 1782; FOC 23: 237. 2010.

Coarse perennial. Rhizome short, woody, thick. Culms tufted, robust, 40–110 cm tall, 3–5 mm thick, obtusely trigonous, minutely granulate, glaucous green. Leaves many, mostly surpassing culms; blades linear, 8–12 mm wide, leathery, plicate below middle, flattish

to incurvd-marginate above middle, glaucous-green and often whitish powdery, separate-nodulose, prominently scabrous on margins; sheaths dark brown or purplish brown, cylindrical, septate-nodulose. Corymbs compound to decompound, ample, 10–15 cm; primary anthelas 6–10(–12) cm, patent, subrigid; secondary corymbs with 3–6 anthelalets; spikes cylindrical to oblong, 1.5–3 × 8–12 mm, bearing many spikelets; leafy bracts 5–6, lower ones much surpassing corymb. Spikelets divergent to slightly reflexed, lanceolate to oblong-lanceolate, 4.5–6 × 1.8–2 mm, turgid, 4–6-flowered; rhachilla rather broadly winged, jointed above prophyll. Glumes broadly ovate, ca. 3 mm, subleathery, brownish with rusty lineaolate, apex acuminate, margins whitish hyaline, many-veined; keel hardly ridged, forming an obtuse back. Stamens 3; anther linear. Style slender, 1–1.5 mm; stigmas 3. Achenes oval to obovate, trigonous, ca. 1/2 as long as glume, black-brown at maturity, minutely puncticulate; style elongate.

Locality: Pok Fu Lam, Shek O, Sha Tin. *Y. W. Lam 755; Y. S. Lau 2305; HK sheet 7848.*

Distribution: Guangdong, Hainan, Taiwan; Sri Lanka, India, Cambodia, Vietnam, Myanmar, Thailand, Malaysia, Philippines, Japan, Madagascar, tropical Africa, Australia, Hawaii.

Ecology: Sandy beaches, marshes. Flowering & fruiting: Jun.–Jul.

3. Mariscus cyperinus (Retz.) Vahl 莎草磚子苗

Enum. Pl. 2: 377. 1805; FKH 296. 1912; FRPS 11: 182. 1961; FTW ed. 2, 5: 290. 2000; FYN 15: 655. 2003; FGD 8: 343. 2007.

Kyllinga cyperina Retz., Observ. Bot. 6: 21. 1791

Cyperus cyperinus (Retz.) J. V. Suringar, Cyperus, 154. 1898; FOC 23: 238. 2010.

Mariscus sieberianus Nees ex C. B. Clarke, Fl. Brit. India 6: 622. 1893; FKH 296. 1912.

Cyperus umbellatus auct. non (Vahl) Benth.: FHK 386. 1861.

Perennial. Rhizome short, woody, clothed with brown fibers. Culms solitary or few together, erect, 20–70 cm tall, triquetrous, smooth, leaved at ± thickened base. Leaves several, shorter than culm; blades narrowly linear, 5–7 mm wide, herbaceous, flattish plicate; sheaths pale green and stained with purplish pink. Corymbs simple, open, with short anthelas, sometimes nearly head-like; anthelas 6–10, 0–5 cm, each terminated by a cylindrical or oblong, spike narrowed to base, 1.5–3 × 8–12 mm, greenish, densely bearing many spikelets; leafy bracts 4–10, lower few surpassing corymb. Spikelets patent to erect-patent, linear-lanceolate, subterete, 4–6.5 mm × 1 mm, bearing 4–7 glumes and 2–3 achenes; rachilla with lanceolate wings, jointed above prophyll. Glumes tightly erect, elliptic to oblong-elliptic, 3–3.5 mm, inrolled, membranous to thinly chartaceous, obtuse or suddenly acute at apex, glaucous green and eventually tinged with straw-brown, 3–4-veined on both sides, green keel convex. Stamens 3; anthers linear. Style slightly longer than achene; stigmas 3. Achenes linear-oblong, trigonous, 1.5–1.8 × 0.6–0.9 mm, brown, minutely granulate.

Locality: Cape D'Aguilar, Shing Mun, Hong Kong Wetland Park, Hau Hok Wan. *J. C. Shaw 411, 456; HK sheet 42176.*

Distribution: Hainan, Guangdong, Guangxi, Sichuan, Hunan, Fujian, Jiangxi, Taiwan, Zhejiang, Sichuan; Sri Lanka, Bangladesh, Nepal, Bhutan, India, Myanmar, Thailand, Vietnam, Malaysia, Indonesia, Philippines, Papua New Guinea, Japan, Australia, SW Asia, Pacific islands, Indian Ocean islands.

Ecology: Moist grasslands of valleys and hillslopes. Flowering & fruiting: Jul.–Sep.

4. Mariscus cyperoides (L.) Urb.

磚子苗 **(Fig. 76; Photos 223–224)**

Symb. Antill. 2(1): 164. 1900; FGD 8: 342. 2007.

Scirpus cyperoides L., Mant. Pl. 2: 181. 1771.

Mariscus umbellatus (Rottb.) Vahl, Enum. Pl. 2: 376. 1805; FRPS 11: 179. 1961; Flora Guizhouensis 8: 608. 1988.

Kyllinga umbellata Rottb., Descr. Icon. Rar. Pl. 1773; Check List HK Plants 357. 2004.

Cyperus umbellatus Benth., FHK 386. 1861.

Mariscus sumatrensis (Retz.) J. Anthelanal, Adansonia n. s. 15: 110. 1975; FTW ed. 2, 5: 291. 2000; FYN 15: 654. 2003.

Kyllinga sumatrensis Retz., Observ. Bot. 4: 13. 1786.

Mariscus albescens Gaudich., Voy. Bonite, Bot. 415. 1826; FKH 296. 1912.

Perennial with short woody rhizome clothed with brown fibers. Culms solitary or few together, erect, triquetrous, 10–50 cm tall, smooth, ± thickened base leafy. Leaves rather many, shorter than to equalling culm; blades linear, 3–6 mm wide, flattish plicate, herbaceous; sheaths pale, eventually becoming brownish or reddish brownish. Corymbs simple, open, 3–8 cm wide; anthelas 3–12, patent, longer ones to 8 cm, terminated by a spike; spikes cylindrical, 1–2.5 cm × 6–10 mm, densely bearing many spikelets, greenish; leafy bracts 3–8, lower ones surpassing corymb. Spikelets spreading or lower ones ± reflexed, linear-lanceolate, 3–5 × 0.7 mm, bearing 4–5 glumes, 1–2-fruited; rachilla jointed

Figure 76. *Mariscus cyperoides* (L.) Urb.
1. plant; *2.* spikelet; *3.* achene. (drawn by H. P. Yu)

above base, with white-hyaline lanceolate wings. Glumes lanceolate-oblong, ca. 3 mm long, membranous, pale green, apex obtuse or mucronate, margined inrolled, several-veined, keel 3-veined, forming an obtuse back. Stamens 3; anthers linear. Style ca. 1 mm; stigmas 3. Achenes linear-oblong, ca. 2 mm long, straw-coloured, minutely puncticulate.

Locality: Common in Hong Kong. *J. C. Shaw 483; K. L. Yip 4080; Y. W. Lam 754.*

Distribution: S, E, C & SW China; SE Asia, Himalaya, Africa, Australia, America.

Ecology: Grasslands of hillslopes. Flowering & fruiting: Apr.–Oct.

25. Cyperus L. 莎草屬

Annuals or perennials, rhizomatous or stoloniferous. Glumes terete to trigonous. Leaves basal, 3-ranked, rarely without blade; ligule absent. Involucral bracts leaf-like. Inflorescence terminal, usually simple to decompound, umbel-like with ultimate branches (branches) terminating in 1 or more spikes on finger-like cluster of spikelets, more rarely spikes or spikelet clusters sessile or inflorescence capitate. Spikelets linear to oblong or elliptic, laterally flattened to subterete; axis straight or zigzag, deciduous or persistent. Glumes 2-ranked, deciduous or persistent, sides membranous to papery or leathery, veins none to several, keel acute to rounded. Flowers bisexual. Perianth segments absent. Stamens 1–3. Stigmas (1–)3; style continuous with ovary. Achenes usually trigonous, sometimes triquetrous or dorsiventrally compressed.

About 500 species, cosmopolitan; 36 species in China; 23 species, one variety and one subspecies in Hong Kong.

1a. Primary branches of inflorescence more than 20 ..... 1. *C. papyrus*
1b. Primary branches of inflorescence up to 10 or inflorescence capitate.
2a. Spikelets in elongate spikes.
3a. Spike axis hairy.
4a. Spike axis ciliate-scabrid, spikelets 2.5 mm or more wide ..... 2. *C. procerus*
4b. Spike axis densely hispid, spikelets less than 2.5 mm wide ..... 3. *C. pilosus*
3b. Spike axis glabrous.
5a. Spikelet axis internodes not or hardly winged.
6a. Glumes apex without awn ..... 4. *C. malaccensis*
6b. Glumes apex with a short or minute stiff awn.
7a. Rachis of spike short; spikelets densely arranged, nearly capitate; glumes densely imbricate; achenes ca. 1/2 as long as the subtending glume ..... 5. *C. compressus*
7b. Rachis of spike long; spikelets laxly arranged; glumes laxly imbricate; achene nearly as long as the subtending glume.
8a. Inflorescence a compound anthela; spikelets erect or obliquely spreading ..... 6. *C. iria*
8b. Inflorescence a simple anthela; spikelets nearly spreading ..... 7. *C. orthostachyus*
5b. Spikelet axis distinctly winged along axis internodes (best seen when glumes removed).
9a. Spikes cylindrical; spikelets densely crowded.
10a. Spikes with 50 or more, suberect spikelets; spike axis usually obscured by spikelets ..... 8. *C. imbricatus*
10a. Spikes with less than 50, patent to spreading spikelets; spike axis usually distinct ..... 9. *C. exaltatus*
9b. Spikes oblong to ovoid, rarely loosely cylindrical; spikelets not densely crowded.
11a. Rhizome short or plants annual; spikelet axis visible between glumes (particularly in mature inflorescences).
12a. Glumes 1.5 mm or more wide; achenes 0.8 mm or more wide ..... 10. *C. tenuiculmis*
12b. Glumes less than 1.5 mm wide; achenes less than 0.8 mm wide.
13a. Spikelets mostly spreading, up to 1 mm wide; glume margins narrowly hyaline toward apex ..... 11. *C. distans*
13b. Spikelets suberect or patent, 1–2 mm wide; glume margins broadly hyaline along length of glume.
14a. Spikes 6 cm or more radially spreading; spikelets 1–1.5 mm wide ..... 12. *C. nutans*
14b. Spikes less than 6 cm, suberect; spikelets ca. 2 mm wide ..... 13. *C. eleusinoides*
11b. Plants with horizontally creeping rhizome or stoloniferous; spikelet axis not visible unless glumes removed.
15a. Spikelets suberect; glumes broadly ovate, up to 2.7 × 2–2.3 mm ..... 14. *C. stoloniferus*
15b. Spikelets flattened; glumes narrowly to elliptic ovate, ca. 2 mm wide ..... 15. *C. rotundus*
2b. Spikelets in finger-like or globose clusters or inflorescence capitate.
16a. Leaves always reduced to bladeless sheaths; involucral bracts 15 or more, ± equal ..... 16. *C. involucratus*
16b. Leaves with fully developed blade; involucral bracts less than 15, unequal.
17a. Inflorescence capitate ..... 17. *C. pygmaeus*
17b. Inflorescences umbel-like with elongate branches.
18a. Annual; glumes with a distinct, strongly recurved apex ..... 18. *C. cuspidatus*
18b. Annual or perennial; glumes without a strongly recurved apex.
19a. Glumes up to 1.5 mm long and less than 1 mm wide.

20a. Spikelets in congested globose clusters; glume apex rounded to emarginate.....19. *C. difformis*
20b. Spikelets in finger-like clusters; glume apex obtuse.
21a. Glumes usually more than 1 mm long; achenes 0.4 mm or more wide ..... 20. *C. haspan*
21b. Glumes usually up to 1 mm long; achenes less than 0.4 mm wide.....21. *C. tenuispica*
19b. Glumes usually to 1.5 mm long and 1 mm or more wide.
22a. Achenes with prominent pale brown thickening on angles.....22. *C. platystylis*
22b. Achenes without prominent thickening on angles .....23. *C. diffusus*

1. Cyperus papyrus L. 紙莎草 **(Photos 225–226)**

Sp. Pl. 47. 1753.

Perennial. Rhizome short, woody. Culms 1–5 m tall, 2–4 cm thick, trigonous, smooth. Leaves reduced to bladeless sheaths. Involucral bracts up to 12, the longest 5–10 cm. Inflorescence simple to compound, 20–35 cm in diam.; primary branches many (up to 200 or more), ± equal, 10–30 cm; secondary branches up to 2 cm, spikes more usually in sessile clusters. Spikes cylindrical, 1–3 × 0.6–1 cm; axis 1.5–3 cm. Spikelets spreading, linear, 6–12 × 1 mm, subterete; axis straight, winged. Glumes 5–17 per spikelet, elliptic to ovate-elliptic, 2–2.5 mm, obtuse, sides membranous, 3-veined below keel, light brownish, keel green. Stamens 3. Stigmas 3. Achenes ovoid, trigonous, 0.9–1.1 × 0.4–0.5 mm, greyish, smooth.

Locality: Cultivated. *HK sheet 42173.*

Distribution: Native to tropical Africa.

Ecology: Cultivated in ponds or wet places. Flowering & fruiting: Jun.–Aug.

Uses: Ornamental, paper making.

2. Cyperus procerus Rottb. 闊穗莎草

Descr. Icon. Rar. Pl. 29, t. 5, fig. 3. 1773; FKH 296. 1912; FTW ed. 2, 5: 248. 2000; FGD 8: 326. 2007; FOC 23: 235. 2010.

Perennial. Rhizome with long stolons. Culms 1–few, 50–100(–150) cm tall, 4–7(–10) mm thick, smooth, triquetrous. Leaves surpassing culm; blade linear, up to 60–150 cm × 7–10(–15) mm, long-acute, often subtriquetrous toward apex, canaliculate; sheath 8–28 cm, pale greenish to purplish brown. Involucral bracts 3–4, the longest 20–70 cm. Inflorescence simple to compound, rather open, 10–15 cm × 8–12 cm; primary branches 3–7, 6–15(–20) cm; secondary branches up to 2 cm or spikes sometimes solitary. Spikes broadly ovoid, 2–4 cm; axis 2–3 cm, scabrid. Spikelets 4–8 per spike, rather distant, patent to spreading, oblong to linear-lanceolate, 5–18 × 2.5–3.5 mm, flattened; axis straight. Glumes 9 or more on the longest spikelets, oval or ovate, 2.5–3 × 2–2.2 mm, sides membranous, 5–7-veined, pale brown to reddish brown, margins broadly white-hyaline near apex, keel obtuse, reddish brown, smooth. Stamens 3; anthers 1.2–1.8 mm. Stigmas 3. Achenes ellipsoidal, trigonous, 1.3–1.5 × 0.6–0.8 mm, maturing dark brown, ± smooth.

Locality: Yung Shue Au. *S. C. Ng 4488.*

Distribution: S & SW China; India, Vietnam, Malaysia, Australia, Africa.

Ecology: Wet places near water. Flowering & fruiting: Mar.–Oct.

3. Cyperus pilosus Vahl 毛軸莎草 **(Photos 227–228)**

Enum. Pl. 2: 354. 1805; FHK 387. 1861; FKH 295. 1912; FRPS 11: 141. 1961; FTW ed. 2, 5: 248. 2000; FYN 15: 633. 2003; FGD 8: 326. 2007; FOC 23: 234. 2010.

Perennial. Rhizome with long stolons. Culms 1–few, 25–28(–120) cm tall, 5–8 mm thick, sharply triquetrous, smooth or scabrid on angles below inflorescence. Leaves few to several per culm; blade broadly linear, 13–47 cm × 6–13 mm, acute, flattish to plicate; sheath 3–10 cm, pale greenish to purplish brown. Involucral bracts 3–5, the longest up to 50 cm. Inflorescence simple to compound, open to rather congested; primary branches 4–7(–10), 12–14(–20) cm; secondary branches 0.5–2 cm or spikes in ± sessile clusters. Spikes ± oblong, 2–3 × 1–2 cm; axis 1.5–3 cm, densely shortly hispid. Spikelets 5–25 per spike, rather distant, spreading, linear-lanceolate to elliptic-oblong, 4–15 × 1–2 mm, flattened to subterete; axis straight. Glumes 5–9 or more on the longest spikelets, ovate to broadly deltoid-ovate, 1.8–2.5 × 1.2–1.5 mm, acute, often mucronulate, sides thinly papery to membranous, 5–7-veined, pale brown tinged with reddish brown, margins whitish-hyaline, keel obtuse, green, smooth. Stamens 3; anthers 0.5–0.8 mm. Stigmas 3. Achenes broadly ellipsoidal to obovoid, trigonous, 1–1.5 × 0.5–0.8 mm, maturing dark brown, ± smooth.

Locality: Tai Mo Shan, Castle Peak, Sheung Miu Tin, Tung Chung, Shui Hau. *Y. W. Lam 2231; J. C. Shaw & G. Reels 163; HK sheet 39642.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Chongqing, Hunan, Hubei, Shaanxi, Xizang, Jiangxi, Jiangsu, Anhui, Zhejiang, Fujian, Taiwan; Japan, C Asia, tropical Asia, Australia.

Ecology: Marshes, paddy fields and other wet places. Flowering & fruiting: Aug.–Nov.

4. Cyperus malaccensis Lam. 苾芏 **(Photos 229–230)**

Tabl. Encycl. 1: 146. 1791; FKH 295. 1912; FRPS 11: 141. 1961; FTW ed. 2, 5: 245. 2000; FGD 8: 327. 2007; FOC 23: 234. 2010.

Perennial; rhizome long-creeping. Culms 1–few, 60–180 cm tall, 7–12(–15) mm thick, smooth, sharply triquetrous. Leaves reduced to bladeless sheaths except for upper 1–3 leaves; blade linear, linear-lanceolate, 5–25 cm × 3–16 mm, acute or shortly acuminate, ± flattened; sheath 8–20 cm, greenish to reddish brown. Involucral bracts 3–4, the longest up to 30 cm × 8–15 mm. Inflorescence

simple to compound, somewhat congested, subglobose, 2–10 × 4–15 cm; primary branches 3–8, unequal, 3–10 cm; secondary branches 0.3–1.6 cm. Spikes ovoid, 1–2.5 cm; axis 0.2–1 cm, smooth, glabrous. Spikelets 2–15 per spike, linear, 10–13 × 1.2–1.8 mm, subterete; axis straight. Glumes 9 or more on the longest spikelets, elliptic to ovate, 2–2.2 × 1–1.5 mm, obtuse, sides papery, indistinctly 5–7-veined around keel, glaucous and tinged or flecked with brown or dark reddish, the margins widely pale-membranous, keel rounded, brownish. Stamens 3; anthers 0.8–1 mm. Stigmas 3. Achenes cylindrical, trigonous, 1.7–2 × 0.5 mm, blackish brown, minutely punctate.

Locality: Yuen Long, Castle Peak, Sha Po Tsuen, Lung Kwu Tan, Silver Mine Bay. *Y. W. Lam 1590; HK sheet 39092, 39650.*

Distribution: Guangdong, Hainan, Taiwan; Sri Lanka, India, Nepal, Myanmar, Thailand, Vietnam, Malaysia, Indonesia, Philippines, Papua New Guinea, Japan, Australia.

Ecology: Ditches or muddy places near estuary. Flowering & fruiting: Jun.–Nov.

Uses: Weaving.

4a. Cyperus malaccensis Lam. var. **brevifolius** Boeck. 短葉莞芏(鹹水草) **(Photos 231–232)**

Linnaea 35: 604. 1867; FRPS 11: 141. 1961.

Cyperus malaccensis Lam. subsp. *monophyllus* (Vahl) T. Koyama, FTW ed. 2, 5: 246. 2000; FOC 23: 234. 2010.

Cyperus monophyllus Vahl, Enum. Pl. 2: 352. 1806.

Cyperus tegetiformis auct. non Roxb.: FKH 296. 1912.

Leaves blade short to very short, sometimes basalmost sheath bladeless. Involucral bracts shorter than inflorescence. Glumes not incurved.

Locality: Cape D'Aguilar, Sha Tin, Castle Peak, Mai Po, Sai Kung, Nai Chung, Sam A Tsuen, Yung Shue O, Silver Mine Bay. *J. C. Shaw 672; Y. S. Lau 1995; Y. W. Lam 682.*

Distribution: Guangdong, Guangxi, Sichuan, Jiangxi, Jiangsu, Zhejiang, Fujian, Taiwan; Japan, Vietnam, Indonesia.

Ecology: Wet places near streams. Flowering & fruiting: Jun.–Nov.

Uses: Ties, strings (clums).

5. Cyperus compressus L. 扁穗莎草 **(Fig. 77; Photo 233)**

Sp. Pl. 1: 46. 1753; FKH 295. 1912; FRPS 11: 147. 1961; FTW ed. 2, 5: 239. 2000; FGD 8: 330. 2007; FOC 23: 237. 2010.

Annual. Rhizome absent, roots fibrous. Culms tufted, 8–35(–50) cm tall, 1–2 mm thick, trigonous, smooth. Leaves basal; blade linear, 3–20 cm × 1–4 mm, acute, flat to channelled; sheath 1–7 cm, pale brown to reddish brown. Involucral bracts 2–5 cm, the longest up to 30 cm. Inflorescence simple to ± capitate, open to congested, 1.5–10 × 2–10 cm; primary branches (when present) 2–5, 0.8–15 cm; spikes solitary. Spikes ovate, 1.2–1.3 × 1.5–4 cm; axis 0.1–0.5 cm. Spikelets 3–10 per spike, patent to spreading, often appearing finger-like, linear to oblong-lanceolate, 10–25 × 2.5–4 mm, flattened; axis zigzag. Glumes ovate, 3–4 × 2–2.7 mm, apex acute, mucronate, sides herbaceous or papery, 3-veined, pale green to pale golden brown, keel sharply acute, green. Stamens 3; anthers 0.7–1 mm. Stigmas 3. Achenes broadly obovoid, trigonous, 1–1.5 × 0.7–1 mm, dark brown, shiny, minutely punctate.

Locality: Common in Hong Kong. *J. C. Shaw & G Reels 75; Y. W. Lam 763; HK sheet 37111.*

Distribution: Hainan, Guangdong, Guizhou, Sichuan, Chongqing, Yunnan, Xizang, Gansu, Hebei, Henan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Shandong, Shanxi, Liaoning, Zhejiang, Fujian, Taiwan; tropics.

Ecology: Wastelands. Flowering & fruiting: Jul.–Dec.

Figure 77. *Cyperus compressus* L.
1. plant; *2.* spiketlet; *3.* glume; *4.* achene; *5.* transverse section of achene; *6.* stamen. (drawn by H. P. Yu)

6. Cyperus iria L. 碎米莎草 **(Fig. 78; Photos 234–235)**

Sp. Pl. 1: 45. 1753; FHK 386. 1861; FKH 295. 1912; FRPS 11: 143. 1961; FTW ed. 2, 5: 245. 2000; FYN 15: 635. 2003; FGD 8: 329. 2007; FOC 23: 235. 2010.

Annual. Rhizome absent, roots fibrous. Culms 1–several, 8–60 cm tall, 2–3(–5) mm thick, triquetrous, smooth. Leaves 2–3 per culm; blade linear, 4–18 cm × 2–6 mm, flattish to weakly channelled; sheath 2–10 mm, reddish to purplish brown. Involucral bracts 3–5, the longest up to 40 cm. Inflorescence simple to compound, open, 5–20 × 3–15 cm; primary branches 3–7, 2–12(–15) cm; secondary branches very short or 0, the spikes in clusters of 3–5. Spikes broadly ovoid to oblong-ovate or linear-oblong, 1–5 ×

0.2–0.7 cm; axis 1–2.5 cm. Spikelets spicately arranged, erect-patent, oblong-elliptic to linear-oblong, 9–13 × 1.6–2 mm, flattened; axis straight. Glumes obovate-orbicular, 0.7–1.3 × 1–1.5 mm, rounded to shallowly emarginate, mucronulate, sides thinly herbaceous, 3–5-veined, greenish to yellowish or mid-brown, margins whitish-hyaline above, keel acute, green. Stamens 2–3; anthers 0.2–0.3 mm. Stigmas 3. Achenes ellipsoidal to obovoid, trigonous, 1–1.5 × 0.5–0.8 mm, dark brown, minutely punctate.

Locality: Common in Hong Kong. *Y. S. Lau 1965; J. C. Shaw 507; K. L. Yip 4196.*

Distribution: Widely distributed in China; Russia, Korea, Japan, Vietnam, India, Iran, N Australia, Africa.

Ecology: Wet places and paddy fields. Flowering & fruiting: Jun.–Oct.

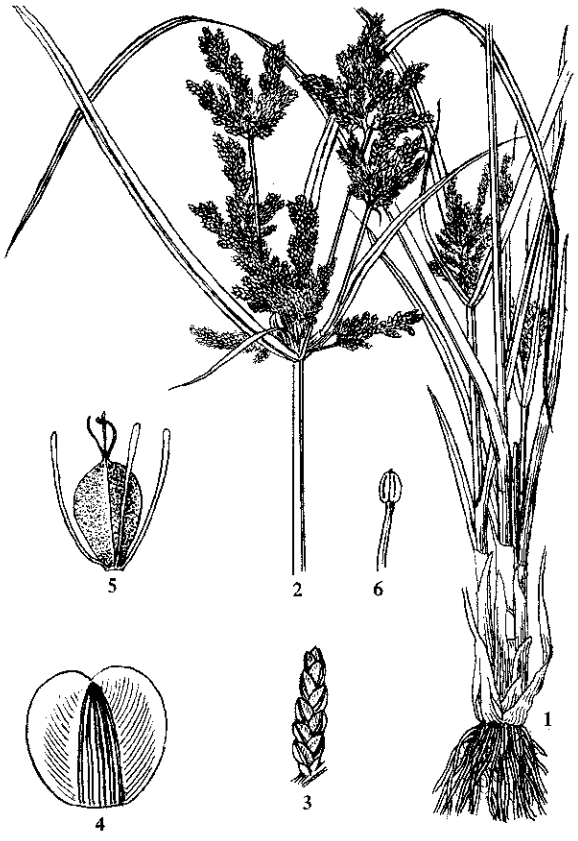

Figure 78. *Cyperus iria* L.
1. portion of plant; *2.* inflorescence; *3.* spikelet; *4.* glume; *5.* achene; *6.* stamen. (drawn by H. P. Yu)

7. Cyperus orthostachyus Franch. & Sav. 三輪草

Enum. Pl. Jap. 218. 1879; FRPS 11: 145. 1961; FOC 23: 236. 2010.

Cyperus truncatus Turcz. ex Ledeb. var. *orthostachyus* (Franch. & Sav.) C. B. Clarke, J. Linn. Soc., Bot. 36: 218. 1903.

Annual, rhizome absent, with only fibrous roots. Culms slender, 8–65 cm tall, compressed triquetrous, smooth, with few leaves at basal part. Leaves shorter than or equalling culm; sheath brownish; leaf blade 3–6 mm wide, flat, margin scabrous. Bracts 3–4, leaf-shaped, very much longer than inflorescence or basalmost 1–2 longer than inflorescence, margin scabrous. Anthela simple, rarely compound; anthelas 5–11, mostly to 15(–20) cm, unequal in length, each with 1(–5) spike. Spikes ovate-oblong, broadly ovate, or oblong cylindrical in outline, 1–3.5 × 1–3 cm, with 5–32 or many spikelets. Spikelets slightly laxly or densely arranged, lanceolate to linear, 0.3–2.5 cm × 1–2 mm, obliquely spreading or suberect, sometimes level spreading after anthesis, 6–46-flowered; rachilla wings white, narrow, hyaline; glumes greyish brown, broadly ovate to elliptic, ca. 1.5 mm, membranous, keel abaxially green, veins 5–7 and obscure, margin apically white hyaline, apex rounded to retuse and muticous. Stamens 3; anthers ellipsoidal, short; connective prominent above anther. Style short; stigmas 3, slightly short. Achene brown, obovoid, nearly as long as scale, trigonous, surface puncticulate, apex mucronate.

Locality: Yuen Long. *Y. W. Lam 1341.*

Distribution: Chongqing, Hunan, Hubei, Guizhou, Anhui, Fujian, Jiangxi, Jiangsu, Shaanxi, Shandong, Zhejiang, Liaoning, Jilin, Heilongjiang; Japan, Korea, Russia, Vietnam.

Ecology: Cultivated. Flowering & fruiting: Jun.–Aug.

Uses: Ornamental.

8. Cyperus imbricatus Retz. 疊穗莎草 **(Photo 236)**

Observ. Bot. 5: 12. 1788; FRPS 11: 131. 1961; FTW ed. 2, 5: 244. 2000; FGD 8: 325. 2007; FOC 23: 231. 2010.

Perennial. Rhizome short. Culms 37–130 cm tall, 2–8 mm thick, indistinctly to distinctly trigonous, smooth. Leaves basal; blade narrowly linear, up to 60 × 5–15 cm, acuminate, flattish; sheath dark brown or reddish brown. Involucral bracts 3–5, the longest up to 60 cm. Inflorescence simple, rarely compound, 8–22 × 10–25 cm; primary branches 5–8, up to 15 cm; secondary branches 1–2 cm, spikes more usually in ± sessile clusters. Spikes erect-patent to patent, narrowly cylindrical, 1.5–4 × 0.3–0.9 cm, pale yellowish brown, axis 1.5–5 cm, winged, usually obscured by spikelets. Spikelets 50–70 or more, densely imbricate, suberect, lanceolate to linear-oblong, 3–6 × 1–2 mm, flattened; axis straight. Glumes 9 or more, in longest spikelets, ovate to ovate-oval, 1.2–1.8 × 1 mm, obtuse, recurved mucronate, sides membranous, 3-veined, yellowish brown, keel greenish. Stamens 3; anthers 0.3 mm, connective minute. Stigmas 3. Achenes ellipsoidal to ± ovoid, trigonous, 0.6–0.8 × 0.4 mm, slightly obcompressed, yellowish.

Locality: Common in Hong Kong. *Y. S. Lau 2215; HK sheet 37122; 39386.*

Distribution: Guangdong, Guangxi, Hainan, Taiwan; Japan, Vietnam, India, Nepal, Afghanistan, Bangladesh, Myanmar, Laos, Thailand, Vietnam, Malaysia, Papua New Guinea, Philippines, Madagascar, Africa, America, SW Asia, Indian Ocean islands.

Ecology: Wet places and paddy fields. Flowering & fruiting: Sep.–Oct.

9. Cyperus exaltatus Retz.
高桿莎草 **(Fig. 79; Photos 237–238)**

Observ. Bot. 5: 11. 1789; FKH 296. 1912; FRPS 11: 130. 1961; FTW ed. 2, 5: 242. 2000; FGD 8: 324. 2007; FOC 23: 230. 2010.

Rhizomatous perennial. Culms tufted, 60–180 cm tall, 6–10 mm thick, trigonous, smooth. Leaves basal; blade linear, up to 170 cm × 6–15 mm, acuminate, flattish-plicate; sheath purple-brown. Involucral bracts 4–6, the longest up to 70 cm. Inflorescence simple to compound, 15–27 × 17–30 cm; primary branches 5–9, 3–18 cm; secondary branches 0.5–5 cm, or spikes ± sessile clusters. Spikes erect-patent to patent, narrowly to broadly cylindrical, 2–5 × 0.7–1.5 cm; axis 1.5–4.8 cm. Spikelets 20–40, crowded, erect-patent to patent ± 2-ranked, oblong-lanceolate to linear, 4–10 × 1–2 mm, flattened; axis straight, winged. Glumes 9 or more on the longest spikelets, ovate to broadly ovate, 1.5–2 × 1.2–1.5 mm, acute, mucronate, sides membranous, 3–5-veined, greenish to yellowish brown, keel pale to mid-brown. Stamens 3; anthers 0.5–0.7 mm, connective minute. Stigmas 3. Achenes ellipsoidal to ellipsoidal-obovoid, trigonous, 0.7–0.8 × 0.3–0.5 mm, yellowish brown, minutely punctate.

Locality: Castle Peak, Hong Kong Wetland Park. *Y. S. Lau 2275; S. C. Ng 986; HK sheet 40461.*

Distribution: Hainan, Guangdong, Fujian, Taiwan; Vietnam, India, Indonesia, Malaysia, Philippines, Australia, Africa.

Ecology: Wet places and marshes. Flowering & fruiting: Jun.–Aug.

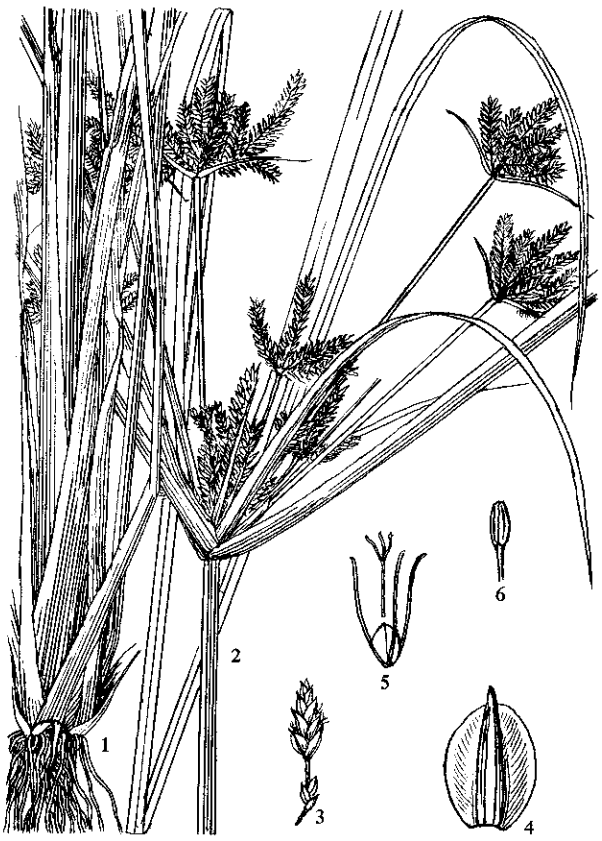

Figure 79. *Cyperus exaltatus* Retz.
1. portion of plant; *2.* inflorescence; *3.* spikelet; *4.* glume; *5.* achene; *6.* stamen. (drawn by H. P. Yu)

10. Cyperus tenuiculmis Böeck. 四棱穗莎草(棱穗莎草)

Linnaea 30: 286. 1870; FTW ed. 2, 5: 251. 2000; FYN 15: 629. 2003; FGD 8: 328. 2007; FOC 23: 233. 2010.

Cyperus zollingeri auct. non Steud.: FKH 296. 1912; FRPS 11: 137. 1961; Check List HK Plants 311. 2002; 110. 2004.

Perennial; rhizome short. Culms 1–few, 35–70(–90) cm tall, 1–2 mm thick, triquetrous, smooth. Leaf blades narrowly linear, 9–28 × 0.2–0.6 cm, sharply acute, folded; sheath 2–16 cm, light brown. Involucral 2–7, the longest up to 20 cm. Inflorescence simple, lax, occasionally congested, up to 15 cm; primary branches 2–8, 1–16 cm; spikes solitary. Spikes ovoid, up to 5 cm; axis 0.5–1.3 cm. Spikelets 7–14 per spike, suberect to patent, often appearing ± finger-like, linear to linear-lanceolate, 10–30 × 1.5–2 mm, slightly flattened; axis zigzag, winged. Glumes 9 or more on the longest spikelets, ovate-elliptic to elliptic, 3.5–4 × 2–2.5 mm, apex obtuse to ± acute, sides papery, 7–9-veined, yellow brown to mid-brown, keel similar. Stamens 3; anthers 1–1.5 mm long. Stigmas 3. Achenes elliptic or obovate, triquetrous with concave sides, 1.7–2 × 0.8–1 mm, maturing blackish, minutely punctate.

Locality: Hong Kong.

Distribution: Hainan, Guangdong, Guangxi, Sichuan, Yunnan, Fujian, Zhejiang, Taiwan; Nepal, Sikkim, Bhutan, Sri Lanka, India, Myanmar, Cambodia, Thailand, Indonesia, Malaysia, Philippines, Papua New Guinea, Vietnam, Africa, Australia, America.

Ecology: Hillslopes, wastelands. Flowering & fruiting: May–Nov.

Notes: *C. zollingeri* Steud. is closely related and occurs in Peninsula Malaysia.

11. Cyperus distans L. f. 疏穗莎草 **(Photo 239)**

Suppl. Pl. 103. 1781; FHK 387. 1861; FKH 295. 1912; FRPS 11: 138. 1961; FTW ed. 2, 5: 242. 2000; FYN 15: 631. 2003; FGD 8: 329. 2007; FOC 23: 233. 2010.

Perennial. Rhizome short, woody. Culms 1–few, 20–100 cm tall, 2–5 mm thick, triquetrous, smooth, thicked at base. Leaves basal, shorter than culm; blade linear, up to 100 cm × 4–10 mm, acuminate, weakly folded; sheath 5–20 cm, light brown to purple brown. Involucral bracts 4–6, the longest 20–60 cm. Inflorescence simple, rarely compound, open, 9–28 × 9–27 cm; primary branches 5–12, 3–17 cm; secondary branches 0.5–3 cm. Spikes broadly ovoid-pyramidal, 4–6 × 3–5 cm; axis 0.2–0.3 cm. Spikelets 8–20 per spike, mostly spreading, rather distant, linear, 8–40 × 0.8–1 mm, subterete; axis zigzag, winged, visible between glumes. Glumes 9 or more on the longest spikelets, rather distant, elliptic or oblong-ovate, 1.8–2 × 1–1.2 mm, apex obtuse to rounded-obtuse, sides membranous, 3–5-veined below keel, light to dark reddish brown, margins narrowly hyaline around apex, keel greenish. Stamens 3; anthers 0.5–0.7 mm. Stigmas 3. Achenes cylindrical to cylindrical-ellipsoidal, trigonous, 1.5–1.8 × 0.3–0.5 mm, dark brown, minutely punctate.

Locality: Common in Hong Kong. *Y. S. Lau 2256; Y. W. Lam 328, 761.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; Nepal, Sikkim, Bhutan, Sri Lanka, India, Myanmar, Cambodia, Laos, Thailand, Indonesia, Malaysia, Philippines, Papua New Guinea, Vietnam, Africa, Australia, America.

Ecology: Paddy fields and other wet places. Flowering & fruiting: Jul.–Aug.

12. Cyperus nutans Vahl 垂穗莎草 **(Photo 240)**

Enum. Pl. 2: 363. 1805; FRPS 11: 138. 1961; FYN 15: 631. 2003; FGD 8: 325. 2007; FOC 23: 233. 2010.

Perennial; rhizome short. Culms 1–few, 70–120(–150) cm tall, 4–10 mm thick, trigonous to triquetrous above, smooth. Leaves basal; blade linear, 20–40 cm × 6–15 mm, acute, flattish-plicate, whitish below; sheath 10–30 cm, greenish to reddish brown. Involucral bracts 4–6, the longest 50–75 cm. Inflorescence simple, rarely compound, lax, 15–30 × 8–20 cm; primary branches 6–12, erect-patent, up to 30 cm; secondary branches 0.3–3.5 cm. Spikes subsessile, 6 × 1 cm, radically spreading. Spikelets 1.5–2 mm wide. Glumes up to 2.2 mm, more conspicuously mucronate, tinged with glaucous green. Stamens 3; anthers linear-oblong. Style very short; stigmas 3. Achenes obovate to broadly elliptic, 1–1.2 × 0.5–0.7 mm, rather abruptly narrowed to apiculate apex.

Locality: Tai Shui Hang. *HK sheet 13120, 13122.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Hunan, Yunnan, Sichuan, Taiwan; Vietnam, Laos, Thailand, Sri Lanka, India, Nepal, Bhutan, Philippines, Indonesia, Malaysia, Papua New Guinea, Australia, Africa.

Ecology: Ravines. Flowering & fruiting: May–Oct.

Notes: The species was reported as *Cyperus nutans* Vahl var. *eleusinoides* (Kunth) Haines previously (Check List HK Plants 88. 1993).

13. Cyperus eleusinoides Kunth 穆穗莎草

Enum. Pl. 2: 39. 1837; FKH 296. 1912; FRPS 11: 139. 1961; FYN 15: 631. 2003; FGD 8: 325. 2007; FOC 23: 233. 2010.

Cyperus nutans Vahl subsp. *eleusinoides* (Kunth) T. Koyama, Gard. Bull. Singapore 30: 136. 1977.

Cyperus nutans Vahl var. *eleusinoides* (Kunth) R.W. Haines, Bot. Bihar Orissa 5: 898. 1924.

Perennial; rhizome short, surculose. Culms stout, to 1 m tall, trigonous, smooth, base swollen, tuber-shaped, with leaves at basal part. Leaves shorter than culm; leaf blade 6–12 mm wide, flat, margin scabrous; sheath long, brown. Bracts 5–6, basal 2–3 longer than inflorescence. Anthelas compound or decompound, 6–12, to 18 cm, each with 3–6 anthelalets; anthelalets mostly to 4 cm, unequal in length. Spikes oblong to cylindrical, 1–3 cm × 4–10 mm, with very many spikelets, suberect. Spikelets polystichous, densely arranged, linear-oblong, 4–8 × ca. 2 mm, 6–12-flowered; rachilla winged, wings white hyaline, early deciduous. Glumes lax, ovate-elliptic, ca. 2 mm, pale and brown striate or brown, apex mucronate, membranous, apical margin white hyaline, veins 5–7, keel green. Stamens 3; anthers linear; connective prominent above anther. Style short; stigmas 3. Achene obovoid, trigonous, ca. 2/3 as long as scale, dark brown, surface densely and slightly prominently punctate.

Locality: Stonecutters Island, Port Shelter, New Territories. *S. L. Thrower 1289* (CUHK).

Distribution: Guangdong, Guangxi, Fujian, Yunnan, Taiwan; tropical Asia and Africa, Australia.

Ecology: Ravines. Flowering & fruiting: May–Oct.

14. Cyperus stoloniferus Retz. 粗根茎莎草 **(Photos 241–242)**

Observ. Bot. 4: 10. 1786; FKH 296. 1912; FRPS 11: 134. 1961; FTW ed. 2, 5: 251. 2000; FGD 8: 328. 2007; FOC 23: 231. 2010.

Perennial. Rhizome long, thick, woody, base of shoot with ellipsoidal to ovoid tubers. Culms 1–2, 8–40 cm tall, 0.7–3 mm thick, trigonous, smooth, base swollen. Leaves usually shorter than culm; blade linear, up to 50 cm × 2–4 mm, acuminate, flattish to canaliculate; sheath pale brown, becoming fibrous. Involucral bracts 2–3, the longest 10–30 cm. Inflorescence simple, often congested, up to 6 × 6 cm; primary branches 2–5, 0.5–6 cm, spikes solitary. Spikes obovoid, 1.5–2.5 cm; axis 0.3–0.5 cm. Spikelets 3–8 per spike, suberect to patent, linear oblong to oblong-lanceolate, 6–15 × 1.5–2 mm, often weakly curved; axis slightly zigzag, winged. Glumes 9 or more on the longest spikelets, broadly ovate, 2.2–2.7 × 2–2.3 mm, obtuse, mucronate, sides thickly membranous, 5–7-veined, pale brown to dark reddish brown, keel pale green. Stamens 3; anthers 1.5–2 mm. Stigmas 3. Achenes ovoid, trigonous, 1–1.5 × 1 mm, dark brown, minutely punctate.

Locality: Sai Kung, Castle Peak, Lamma Island, Lautau Island. *J. C. Shaw 537; HK sheet 39434, 40719.*

Distribution: Guangdong, Hainan, Fujian, Taiwan; Japan, Vietnam, Laos, Cambodia, Thailand, Myanmar, India, Pakistan, Malaysia, Indonesia, Philippines, Papua New Guinea, Australia, Madagascar, Indian Ocean islands, Pacific islands.

Ecology: Sandy beaches and mudflats. Flowering & fruiting: Jul.–Aug.

15. Cyperus rotundus L. 香附子 **(Fig. 80; Photos 243–244)**

Sp. Pl. 1: 45. 1753; FHK 387. 1861; FKH 296. 1912; FRPS 11: 134. 1961; FTW ed. 2, 5: 250. 2000; FYN 15: 627. 2003; FGD 8: 328. 2007; FOC 23: 232. 2010.

Perennial. Rhizome with stolons, terminated by a globose-ovoid tuber. Culms tuberous at base, 10–60 cm tall, 1–2 mm thick, triquetrous, smooth. Leaves few, shorter than culm; blade linear, up to 60 cm × 2–5 mm, acuminate, flattish; sheath pale brown. Involucral bracts 2–3(–5), the longest usually equalling or shorter than inflorescence, 2–35 cm. Inflorescence simple, rarely compound, 3–8(–15) × 2–5(–10) cm; primary branches 2–10, 1–8(–12) cm; secondary branches (when present), 0.7–2 cm, spikes usually solitary. Spikes obovoid, 1.5–5 cm; axis 0.2–0.8 cm. Spikelets 3–10 per spike, suberect to patent, narrowly oblong to linear, 10–30 × 1.5–3 mm, flattened; axis ± straight, winged. Glumes 9 or more on the longest spikelets, ovate or ovate-elliptic, 3–3.5 × 2 mm, obtuse, mucronate, ± recurved, sides membranous, 5–7-veined, reddish or slightly purplish brown with pale narrow hyaline margins, keel greenish. Stamens 3; anthers 1 mm. Stigmas 3. Achenes cylindrical to obovoid-cylindrical, trigonous, 1.3–1.5 × 0.5–0.7 mm, brown, minutely punctate.

Locality: Common in Hong Kong. *Y. S. Lau 2229; J. C. Shaw 432; HK sheet 37085.*

Distribution: Guangdong, Guizhou, Yunnan, Sichuan, Gansu, Shaanxi, Shanxi, Hebei, Henan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; widely distributed in temperate regions.

Ecology: Wastelands. Flowering & fruiting: May–Nov.

Uses: Medicinal (folklore).

16. Cyperus involucratus Rottb. 風車草 **(Photos 245–246)**

Descr. Pl. Rar. 22. 1772; FGD 8: 330. 2007.

Cyperus alternifolius L. subsp. *flabelliformis* (Rottb.) Kük., Pflnanzenr. 4 (20, heft 101): 193. 1936; FRPS 11: 148. 1961; FTW ed. 2, 5: 239. 2000; FYN 15: 637. 2003.

Perennial. Rhizome white, short, thick. Culms tufted, 0.5–1.8 cm tall, 3–10 mm thick, trigonous to ± terete at base, scabrous below inflorescence. Leaves bladeless, reduced to sheaths; sheaths 10–20 cm, pale greenish to yellow brown, apex obliquely truncate. Involucral bracts 15 or more, ± equal, 20–50 × 0.5–1.5 cm. Inflorescence simple to compound, 9–12 × 15–30 cm; primary branches many, ± equal, 7–10 cm, patent; secondary branches 1–1.5 cm. Spikelets in clusters of 3–10, oblong-lanceolate to elliptic, flattened, 3–8 × 1.5–3 mm, densely 8–36-flowered, light green to rusty brown, the midrib green, axis straight. Glumes ovate, 1.8–2 × 1.2–1.5 mm, acute, sides membranous, 3–5-veined, pale green sometimes tinged with rusty brown, keel acute, greenish to pale brown. Stamens 3, anther linear, yellow, ca. 1 mm. Ovary trigonous, 0.5 mm; style ca. 1 mm, stigmas 3, ca. 1 mm. Achenes trigonous, broadly elliptic, ca. 0.5 mm wide, brown, reticulate-tuberculate, cell margin wavy; wave raised.

Locality: Cultivated or naturalized. *H. C. Tang 2346; J. C. Shaw 895; HK sheet 32811.*

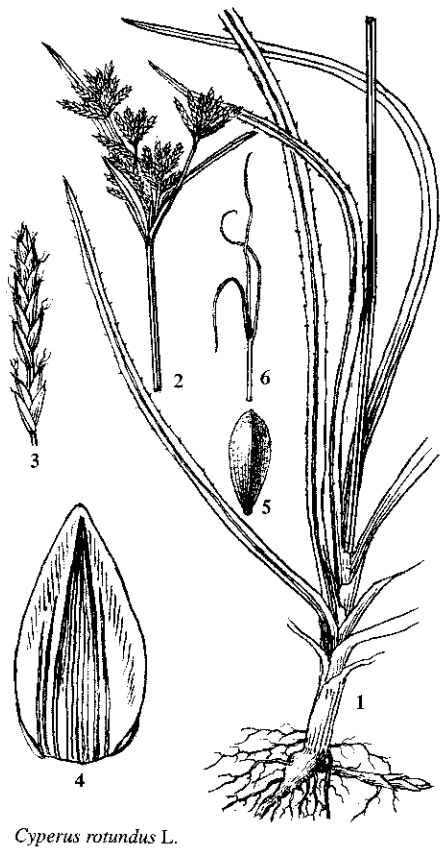

Figure 80. *Cyperus rotundus* L.
1. portion of plant; *2.* inflorescence; *3.* spikelet; *4.* glume; *5.* achene; *6.* style and stigma. (drawn by H. P. Yu)

Distribution: Cultivated in Guangdong, Hunan, Taiwan; native to Africa.

Ecology: Cultivated in gardens. Flowering & fruiting: Apr.–Aug.

Uses: Ornamental.

Notes: The species was reported as *Cyperus flabelliformis* Rottb. previously (Check List HK Plants 309. 2002; 109. 2004).

17. Cyperus pygmaeus Rottb. 矮莎草

Descr. Icon. Rar. Pl. 20, pl. 14, fig. 4–5. 1773; FRPS 11: 157. 1961; FGD 8: 334. 2007; FOC 23: 228. 2010.

Annual. Rhizome absent, with fibrous roots. Culms tufted, 12–18 cm tall, compressed triquetrous, slightly concave on 3 sides, few leaved basally. Leaves shorter than culm; sheath reddish brown, short; leaf blade 2–2.5 mm wide, flat, apical margin and abaxially midvein spinulose. Involucral bracts 4–7, leaf-like, longer than inflorescence, ± horizontal to sometimes downwards reflexed. Inflorescences capitate, with many spikelets. Spikelets densely aggregated, narrowly oblong-ovoid to suboblong, 4–5 × ca. 1.5 mm, 10–15-flowered. Glumes distichous, oblong-lanceolate, ca. 2 mm, yellowish white but medially rust brown and shortly striate, 3-veined, midvein green and apically forming a slight keel, apex acute and excurved mucronate. Stamen usually 1; anther short, linear; connective slightly prominent beyond anthers. Style short; stigmas 2(–3), longer than style. Achene oblong, 1–1.2 mm, 2/3–3/4 as long as subtending glume, lenticular with one flat and one convex side, minutely papillose.

Locality: Chek Keng. *HK sheet 42208.*

Distribution: Hainan, Guangdong, Guangxi, Hubei, Henan, Anhui, Zhejiang, Taiwan; Mediterranean and E Africa through W Asia and India to SE Asia, Malesia and Australia.

Ecology: Margins of ponds, wet places in sand.

18. Cyperus cuspidatus Kunth 長尖莎草

Nov. Gen. Sp. (quarto ed.) 1: 204–205. 1815[1816]; FRPS 11: 155. 1961; FTW ed. 2, 5: 240. 2000; FYN 15: 642. 2003; FGD 8: 331. 2007; FOC 23: 227. 2010.

Cyperus uncinatus auct. non Poir.: FKH 295. 1912.

Annual. Roots fibrous. Culms tufted, 3–15 cm tall, flaccid, trigonous, smooth, base with few leaves. Leaves shorter than culm; leaf blade 1–2 mm wide, usually folded. Involucral bracts 2–3, linear, longer than inflorescence. Inflorescences simple to capitate, 1.5–4 × 2.5–6 cm; primary branches 2–6, mostly to 2 cm. Spikelets 5–many, digitately arranged at a primary branches, linear, 5–15 × 2–3 mm, strongly flattened; axis straight, wingless. Glumes narrowly elliptic, 1–1.5 × 0.6–1 mm, emarginate, strongly recurved-mucronate, awn 0.5–1 mm, sides thinly papery, rusty brown to chestnut-brown, keel acute, 3-veined, greenish sometimes purplish-lineolate. Stamens 2–3; anthers 0.2–0.3 mm. Style 0.3–0.6 mm; stigmas 3. Achenes obovoid to cylindrical-obovoid, trigonous, 0.5–0.6 × 0.3–0.4 mm, dark brown, minutely punctate.

Locality: Beacon Hill, Tai Mo Shan. *S. P. Lau 24; HK sheet 7841, 13237.*

Distribution: Guangdong, Guangxi, Hainan, Yunnan, Xizang, Sichuan, Zhejiang, Jiangsu, Anhui, Jiangxi, Shandong, Fujian, Taiwan; pantropics.

Ecology: Open grasslands. Flowering & fruiting: Jun.–Sep.

19. Cyperus difformis L. 異型莎草 **(Photos 247–248)**

Cent. Pl. II 6. 1756; FHK 385. 1861; FKH 295. 1912; FRPS 11: 152. 1961; FTW ed. 2, 5: 240. 2000; FYN 15: 642. 2003; FGD 8: 332. 2007; FOC 23: 226. 2010.

Annual. Rhizome absent; roots fibrous. Culms tufted, (10–)25–60 cm tall, 2–5 mm thick, sharply triquetrous, sides concave. Leaves slightly shorter than culm; blade linear, 2–22 × 2–6 mm, acute, folded, sheath 2–10 mm, pale or yellowish brown to pinkish. Involucral bracts 2–3, unequal, the longest up to 25 cm. Inflorescence simple, open, occasionally congested; primary branches 3–9, 1–4 cm. Spikelets many, in congested globose clusters, 2–6 × 2–6 mm, linear to linear-oblong, 2–8 × 1–1.3 mm, flattened; axis straight. Glumes ± orbicular, 0.5–0.8 × 0.4–0.8 mm, apex rounded or shallowly emarginate, sides membranous, faintly 3-veined, deep green tinged with brownish purple, margins white hyaline, keel yellowish. Stamens 1–2; anthers 0.1 mm. Style short, stigmas 3. Achenes ellipsoidal-obovoid, trigonous, 0.5–0.7 × 0.3 mm, maturing yellowish.

Locality: Common in Hong Kong. *J. C. Shaw 155; Y. S. Lau 2489; Y. W. Lam 1585.*

Distribution: Widely distributed in China; tropical and subtropical regions of the Old World.

Ecology: Wet grasslands and along streams. Flowering & fruiting: Jun.–Dec.

20. Cyperus haspan L. 畦畔莎草 **(Photo 249)**

Sp. Pl. 1: 45. 1753; FHK 386. 1861; FKH 295. 1912; FRPS 11: 153. 1961; FTW ed. 2, 5: 244. 2000; FYN 15: 639. 2003; FGD 8: 332. 2007; FOC 23: 227. 2010.

Annual or short-lived perennial; rhizome short to slightly long. Culms tufted or solitary, 10–40 cm tall, 0.5–2.2 mm thick, rather weak, sharply triquetrous, smooth. Leaves shorter than culm; blade linear, 2–20 cm × 2–5 mm, acute, flattish-plicate; sheath up to 6 cm, reddish purple to purplish. Involucral bracts 2–3, unequal, the longest up to 10 cm. Inflorescence simple to decompound, open to somewhat congested, 3–15 × 3–15 cm; primary branches 10–22, 1.2–10(–20) cm × 0.2–0.7 mm; secondary and tertiary branches 1–2.5 cm or 0. Spikelets 1 or in finger-like clusters of 3–6(–10), linear-oblong or linear-lanceolate, 5–10 × 1–2 mm, flattened; axis straight. Glumes ± oblong to elliptic-lanceolate or ovate, (1–)1.1–1.5 × 0.5–0.7 mm, at apex obtuse or mucronulate, straight to slightly recurved, sides membranous, pale brownish and often tinged with rusty brown or purplish brown, keel greenish or pale brown, 3-veined. Stamens 1–3; anthers narrowly oblong, ca. 0.5 mm, connective hispidulous. Style short, stigmas 3. Achenes broadly obovoid, trigonous, sides ± flat, 0.4–0.5 × 0.4–0.5 mm, creamy yellow, verruculose.

Locality: Common in Hong Kong. *J. C. Shaw 159; HK sheet 38161, 42177.*

Distribution: Guangdong, Guangxi, Yunnan, Xizang, Sichuan, Henan, Hunan, Hubei, Anhui, Jiangxi, Jiangsu, Fujian, Zhejiang, Taiwan; tropical and subtropical regions.

Ecology: Wet places and paddy fields. Flowering & fruiting: Jun.–Oct.

20a. Cyperus haspan L. subsp. **juncoides** (Lam.) Kük. 軟垂莎草

Repert. Spec. Nov. Regni Veg. 23: 184. 1926; FGD 8: 333. 2007.

Cyperus juncoides Lam., Tabl. Encycl. 1: 147. 1791.

Cyperus haspan L. var. *flaccidissimus* Kük., Pflanzenr. IV, 20(101): 248. 1936.

Differs from type species by rhizome creeping, culms usually more robust, up to 0.8–1 m tall, at the base surrounded by long, bladeless, reddish sheaths, rarely leaf blades well-developed, spikelets often longer, 0.5 mm wide, internodes of the rachilla 0.3–0.5 mm, glumes less densely imbricate, not completely hiding the rachilla, narrower, mucronulate, 1.2–1.8 mm, stamens (2–)3; anthers linear-oblong, achenes slightly larger, 0.5–0.7 mm.

Locality: Stonecutters Island. *HK sheet 38153.*

Distribution: Guangdong, Guangxi, Yunnan, Sichuan, Fujian, Taiwan; pantropical regions.

Ecology: Flowering & fruiting: Jul.–Oct.

21. Cyperus tenuispica Steud. 窄穗莎草

Syn. Pl. Glumac. 2: 11. 1854; FRPS 11: 153. 1961; FTW ed. 2, 5: 253. 2000; FGD 8: 332. 2007; FOC 23: 227. 2010.

Cyperus flavidus C. B. Clarke, J. Linn. Soc., Bot. 20: 287. 1883.

Annual or rarely short-lived perennial. Culms tufted, (3–)5–35 cm tall, 1–2 mm thick, triquetrous, smooth. Leaves shorter than culm; blade linear, up to 20 cm × 2–4 mm, acute, flat, soft; sheath up to 5 cm long, reddish brown to purplish brown. Involucral bracts 1–3, unequal, the longest up to 20 cm. Inflorescence simple to compound, open to rather congested, 3–10 × 3–10 cm; primary branches 5–10, 3–10 cm × 0.4–0.7 mm; secondary branches 0 or 0.4–2 cm. Spikelets 1 or in finger-like clusters of 2–9, linear-oblong, 3–12 × 1–1.5 mm, flattened; axis slightly zigzag. Glumes ovate to oblong-ovate, 0.8–1 × 0.5–0.8 mm, apex truncate or obtuse, shortly recurved-mucronate, straight to slightly recurved, sides membranous, veins inconspicuous, reddish brown or purplish brown, keel yellow green. Stamens 1–2; anthers 0.2–0.4 mm. Stigmas 3. Achenes obovoid-orbicular or ovoid, broadly trigonous, sides rounded, 0.3–0.5 × 0.2–0.3 mm, maturing white or creamy yellow, usually minutely tuberculate.

Locality: Hong Kong Island, Shing Mun. *HK sheet 7831, 13127.*

Distribution: Guangdong, Guangxi, Guizhou, Xizang, Sichuan, Hunan, Anhui, Jiangxi, Jiangsu, Zhejiang, Taiwan; widely distributed in temperate and subtropical regions of Asia, Africa and Australia.

Ecology: Open grasslands. Flowering & fruiting: Aug.–Oct.

22. Cyperus platystylis R. Br. 盤柱莎草

Prodr. 214. 1810; FTW ed. 2, 5: 248. 2000; FOC 23: 224. 2010.

Perennial. Rhizome short. Culms 1–3, 30–90(–120) cm tall, 3–8 mm thick, triquetrous, scabrid on angles. Leaves ± equalling culm; blade linear, up to 90 cm × 5–12(–20) mm, long-acuminate, flattish-plicate, sheath light brown to purplish brown, Involucral bracts 4–12, unequal, the longest 30–80 cm. Inflorescence simple to compound, 7–20(–30) × 4–10 cm; primary branches 10–17, unequal, 2–10 cm; secondary branches up to 4 cm, arising along a short axis. Spikelets in finger-like clusters of 2–8, oblong-lanceolate to lanceolate, 5–20 × 2.5–3 mm, flattened; axis straight. Glumes ovate to broadly ovate, 2–2.5 × 1.5–2 mm, subobtuse, mucronate, sides thickly membranous to herbaceous, greenish to brown. Stamens 3; anthers 1 mm. Stigmas 3. Achenes cylindrical-ellipsoidal or cylindrical-ovoid, trigonous, laterally compressed, adaxial side concave, 1.7–2 × 0.8–1 mm, mid-brown with broad pale brown thickening on angles and apex, shiny, ± smooth.

Locality: Hong Kong. (fide H. G. Ye & S. L. Peng (eds.), Plant Div. Inventory of Guangdong 583. 2006)

Distribution: Taiwan; India, Sri Lanka, Malaysia, Australia.

Ecology: Marshes and paddy fields. Flowering & fruiting: Mar.–Oct.

23. Cyperus diffusus Vahl 多脈莎草(線穗莎草) **(Photo 250)**

Enum. Pl. 2: 321. 1805; FHK 295. 1912; FRPS 11: 148. 1961; FTW ed. 2, 5: 248. 2000.

Cyperus laxus Lam.: FGD 8: 331. 2007.

Perennial. Rhizomatous short. Culms ± tufted, 30–80 cm tall, 3–5 mm thick, trigonous to subtriquetrous, smooth. Leaf blades linear, 8–48 × 0.3–2 cm, abruptly acute, flattish, sheath 4–10 cm, pale green to rusty or purplish brown. Involucral bracts 4–12, unequal, the longest up to 50 cm. Inflorescence simple to decompound, open to rather dense, 6–20 × 7–30 cm; primary branches 10–20 or more, 2.5–20 cm; secondary and tertiary branches 0.5–4 cm. Spikelets in open finger-like clusters of (1–)2–9, oblong, subterete, 3–10 × 1.5–3 mm; axis straight. Glumes 6–20 per spikelet, ovate-orbicular, 1.5–2 × 1.5–2 mm, obtuse, recurved-mucronate, awn 0.2–0.5 mm, sides thinly herbaceous, indistinctly to prominently 7–11-veined, greenish tinged with pale or reddish brown, keel acute to subobtuse, greenish. Stamens 3; anthers 0.8–1 mm. Stigmas 3. Achenes elliptic, trigonous, 1.2–1.5 × 0.7–0.8 mm, blackish brown, indistinctly minutely punctate.

Locality: Ng Tung Chai, Tai Po. *Y. W. Lam 1309, 1311, 2086.*

Distribution: Guangdong, Guangxi, Hainan, Xizang, Yunnan, Taiwan; Nepal, Bhutan, Sri Lanka, India, Myanmar, Laos, Thailand, Cambodia, Vietnam, Malaysia, Indonesia, Philippines, Australia, Indian Ocean islands, Pacific islands.

Ecology: Forests of valleys and wet places. Flowering & fruiting: Jun.–Oct.

26. Juncellus (Griseb.) C. B. Clarke 水莎草屬

Herbs, annual or perennial, with or without a rhizome, stoloniferous or only with fibrous roots. Culms tufted or scattered, usually compressed triquetrous. Leaves usually basal; leaf blade slightly short, with slightly long to short sheaths. Bracts few, leaf-shaped. Anthela simple or compound, laxly spreading to congested into capitulum; anthelas elongate or abbreviated, rarely nearly absent. Spikelets few to many, arranged into spikes or fascicles; rachilla not articulate at base, persistent, narrowly winged or wingless; scales distichous, gradually deciduous from base to apex of rachilla at maturity, basalmost 1–2 usually without a flower but remaining ones each with a bisexual flower. Flowers without hypogynous segments or scale-like perianth parts. Stamens (1–)3; connective prominent above anther or not. Style base not swollen; stigmas 2(–3), deciduous at maturity. Achene biconvex, plano-convex, 1 side facing rachilla, surface prominently puncticulate, reticulately striate, or rarely smooth.

About ten species distributed in Africa, America, Asia, Australia and C Europe; three species in China; one species in Hong Kong.

1. Juncellus serotinus (Rottb.) C. B. Clarke 水莎草 **(Fig. 81)**

Fl. Brit. India 6: 594. 1893; FKH 294. 1912; FRPS 11: 159. 1961; FYN 15: 644. 2003; FGD 8: 335. 2007.

Cyperus serotinus Rottb., Descr. Icon. Rar. Pl. 31. 1773; FTW ed. 2, 5: 250. 2000; FOC 23: 239. 2010.

Perennial; rhizomes stoloniferous, slender stolons terminated by a small tuber. Culms solitary or a few together, erect, 40–100 cm tall, triquetrous with shallowly concave sides, rather soft. Leaves few, usually shorter than the culms, rarely slightly overtopping culm; blades linear, 3–10 mm wide, folded toward base, flattish above, soft; sheaths brownish. Corymbs compound, sublax, 7–15 cm long and as wide; anthelas 5–7, unequal, 2–16 cm, each bearing 1–3 spikes; spikes ovate-elliptic, 2–4 cm, subloosely bearing 5–17 spikelets; rachis hispidulous to nearly smooth; leafy bracts 3–4, lowest to 8 mm wide, to twice as long as corymb. Spikelets patent, linear to linear-lanceolate, 1–2 cm × 2–2.75 mm, 10–34-flowered. Glumes broadly ovate, 2–2.5 × 2 mm, reddish brown to dark brown, apex obtuse, 5–7-veined, keel greenish. Stamens 3; anthers linear. Style short; stigmas 2. Achenes orbicular-obovate, plano-convex, 1.5 mm, greyish brown.

Locality: New Territories. *W. J. Tutcher 8115; S. Y. Hu 8281* (CUHK).

Distribution: Widely distributed in China; Korea, Japan, NW Himalaya, C Europe, Mediterranean region.

Ecology: Flowering & fruiting: Jul.–Oct.

27. Pycreus P. Beauv. 扁莎屬

Annuals or perennials, rhizomatous or stoloniferous. Culms terete to trigonous. Leaves basal, 3-ranked, rarely without blade; ligule 0. Involucral bract several, leaf-like. Inflorescence terminal, usually umbel-like, with primary, secondary and sometimes tertiary branches terminating in 1 or more spikes or finger-like cluster of spikelets, more rarely capitate. Spikelets linear to oblong or elliptic, laterally flattened; axis persistent. Glumes few to many, 2-ranked, persistent, sides membranous to leathery, veins 0–several, keel acute obtuse. Flowers bisexual. Perianth biconvex, with one margin facing the spikelets axis.

About 70 species in temperate, subtropical and tropical regions of the world, with high concentration of species in Africa; 11 species in China; four species in Hong Kong.

1a. Culms few- to several-nodes below middle, base decumbent to obliquely ascending, rooting at nodes; glumes furrowed on both surfaces..... 1. *P. sanguinolentus*

1b. Culms no node above base, erect from very base; glumes not furrowed on sides.

2a. Glumes distinctly mucronate, pale or light stramineous on subtranslucent sides.....2. *P. pumilus*

2b. Glumes muticous or only minutely mucronate at apex, straw-coloured or sanguineous-brown, not pale and subtranslucent.

3a. Lowest bract 3–5 times as long as anthela; spikelets mostly dark purplish brown, rarely ± faded stramineous; glumes obtuse..3. *P. flavidus*

3b. Lowest bract as long as to almost 2.5 times as long as corymb; spikelets rusty-brown to yellow-brown .....4. *P. polystachyos*

1. Pycreus sanguinolentus (Vahl) Nees

紅鱗扁莎 **(Fig. 82; Photos 251–252)**

Linnaea 9: 283. 1835; FKH 294. 1912; FRPS 11: 170. 1961; FTW ed. 2, 5: 293. 2000; FYN 15: 649. 2003; FGD 8: 338. 2007; FOC 23: 245. 2010.

Cyperus sanguinolentus Vahl, Enum. Pl. 2: 351. 1805.

Cyperus eragrostis Vahl, Enum. Pl. 2: 322. 1805, non Lam. 1791; FHK 385. 1861.

Annual or short-lived perennial. Culms tufted, 10–60 cm tall, 0.7–2 mm thick, trigonous, smooth, lower part with several nodes. Leaves shorter than culm; blade linear, 4–11 cm × 2–4 mm, acuminate, flattish-plicate; sheath 1–3 cm, pale green to reddish brown. Involucral bracts 3–5, the longest 10–15 cm. Inflorescence ± capitate or simple; primary branches 2–5, 1–4 cm. Spikes ovoid, 0.9–2 × 1–2 cm; axis 1–4 mm. Spikelets 3–17, narrowly ovate or oblong-lanceolate, 7–20 × 2–3.5 mm, axis straight. Glumes ovate or broadly ovate, 2–2.5 × 1.5–2 mm, obtuse, sides membranous, pale brown to reddish or purple brown, keel rather broad, often distinctly furrowed on both sides of keel, 3–5-veined, green. Stamens 3; anthers 0.7–1 mm. Style slender; stigmas 2. Achenes broadly obovate, 1–1.3 × 0.8–1 mm, black, minutely punctate.

Locality: Castle Peak, Sai Kung, Pui O. *Y. W. Lam 1624, 2219, 2232.*

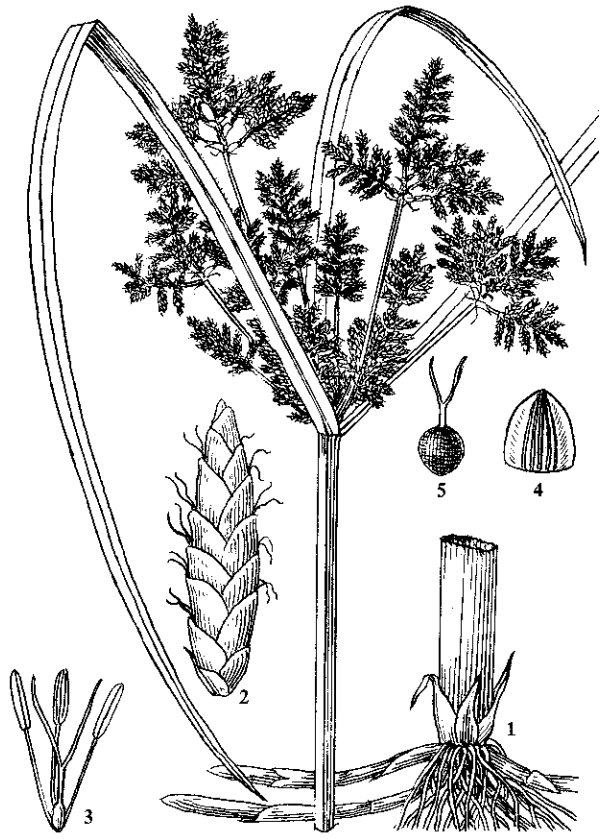

Figure 81. *Juncellus serotinus* (Rottb.) C. B. Clarke

1. portion of plant; *2.* spikelet; *3.* flower; *4.* glume; *5.* achene. (drawn by H. P. Yu)

Figure 82. *Pycreus sanguinolentus* (Vahl) Nees

1. plant; *2.* spikelet; *3.* glume; *4.* achene. (drawn by H. P. Yu)

Distribution: Widely distributed in China; C to E Asia, Mediterranean region, Africa and Australia.
Ecology: Paddy fields and grasslands. Flowering & fruiting: Jul.–Dec.

2. Pycreus pumilus (L.) Domin 矮扁莎 **(Photos 253–254)**

Bibliogr. Bot. Cracow 85: 417. 1915; FRPS 11: 170. 1961; FTW ed. 2, 5: 293. 2000; FGD 8: 336. 2007; FOC 23: 245. 2010.

Cyperus pumilus L., Cent. Pl. II 6. 1756.

Pycreus pulvinatus Nees, Contrib. 74. 1834; FKH 294. 1912.

Annual. Culms tufted, 1–20 cm tall, 0.5–1 mm thick, triquetrous, smooth. Leaves few, shorter than to surpassing culm; blade narrowly linear, 1–19 cm × 1–2 mm, gradually narrowed, long-acuminate, flat; sheath 0.5–4 cm, pale brown to light reddish brown. Involucral bracts 3–5, the lowest 3–20 cm. Inflorescence capitate or simple, primary branches 0–6, up to 3 cm. Spikes ovoid to subglobose, 0.6–1.5 × 1–1.2 cm; axis up to 0.3 cm, often distinct. Spikelets 3–many, spreading, oblong to oblong-lanceolate, 3–10 × 1.5–2.5 mm, flattened; axis ± straight. Glumes ovate to ovate-elliptic, 1–1.8 × 1–1.3 mm, apex rounded-truncate to emarginate, mucronate, sides translucent, pale greenish to brownish, keel acute, 3–5-veined, green to reddish brown. Stamens 2; anthers 0.3 mm. Style ca. 0.5 mm; stigmas 2, ca. 0.3 mm. Achenes elliptic to elliptic-lanceolate, 0.5–0.8 × 0.3–0.5 mm, brownish, minutely punctate.

Locality: Aberdeen, Sheung Shui, Tai Mo Shan, Tai Wan (Sai Kung), Po Toi Islands. *S. P. Lau 25; J. C. Shaw 640; HK sheet 30229.*
Distribution: Hainan, Guangdong, Hunan, Jiangxi, Fujian, Taiwan; India, Nepal, Myanmar, Vietnam, Malaysia, Indonesia, Philippines.
Ecology: Wet places. Flowering & fruiting: Aug.–Nov.

3. Pycreus flavidus (Retz.) T. Koyama 球穗扁莎 **(Photos 255–256)**

J. Jap. Bot. 51: 316. 1976; FTW ed. 2, 5: 292. 2000; FYN 15: 648. 2003; FGD 8: 337. 2007; FOC. 23: 343. 2010.

Cyperus flavidus Retz., Observ. Bot. 5: 13. 1788.

Pycreus globosus Rchb., Fl. Germ. Excurs. 140. 1830; FKH 294. 1912; FRPS 11: 166. 1961.

Cyperus vulgaris Siebold ex Kunth, Enum. Pl. 2: 4. 1837; FHK 385. 1861.

Annual or perennial. Rhizome short; roots fibrous. Culms densely tufted, 8–60 cm tall, 1–1.5 mm thick, trigonous, smooth. Leaves shorter than culm; blade narrowly linear to setaceous, 2–24 cm × 1–2 mm, acuminate, flattish-plicate or canaliculate; sheath 1–10 cm, reddish brown. Involucral bracts 2–4, the longest up to 25 cm. Inflorescence simple, open congested and appearing ± capitate; primary branches 1–6, 0.5–7 cm. Spikes broadly ovoid to ± globose, 1–3 × 1.2–4 cm; axis 0.1–1 cm. Spikelets 5–20 per spike, spreading, linear or linear-oblong, 6–30 × 1.5–3 mm, axis straight. Glumes oblong-obovate, 1.5–2.5 × 1–1.5 mm, narrowly obtuse, sides chartaceous, pale brown to dark reddish brown, shiny, margins pale-hyaline, keel acute, 3-veined, greenish. Stamens 2; anthers 0.5 mm. Style short; stigmas 2. Achenes narrowly obovate to oblong-elliptic, 0.8–1.2 × 0.4–0.6 mm, dark brown, minutely punctate.

Locality: Common in Hong Kong. *J. C. Shaw & G. Reels 259; Y. S. Lau 2540; K. L. Yip 4044.*
Distribution: Widely distributed in China except NW regions; Japan, Korea, Mediterranean regions, S Africa, Australia.
Ecology: Wet places. Flowering & fruiting: Jun.–Nov.

4. Pycreus polystachyos (Rottb.) P. Beauv. 多枝扁莎(多穗扁莎) **(Photos 257–258)**

Fl. Oware 2: 48, t. 86, f. 2. 1807 ["*polystachyus*"]; FKH 294. 1912; FRPS 11: 169. 1961; FTW ed. 2, 5: 292. 2000; FGD 8: 337. 2007; FOC 23: 244. 2010.

Cyperus polystachyus Rottb., Descr. Icon. Rar. Pl. 21. 1773 ["*polystachyus*"]; FHK 385. 1861.

Annual or short-lived perennial. Rhizome absent; roots fibrous. Clums tufted, 10–80 cm tall, 1–3 mm thick, trigonous to triquetrous above, smooth. Leaves shorter than culm; blade linear, 4–25 cm × 1.5–3(–4) mm, apex acuminate, flattish-plicate, soft or subrigid; sheaths reddish brown. Involucral bract 3–5, lowest up to 20 cm. Inflorescence simple, open to congested or ± capitate; primary branches (when present) 2–8, up to 7 cm. Spikes 1.8–3 × 1.3–2.2 cm; axis 0.1–0.8 cm. Spikelets 4–25 per spike, erect or erect-patent, crowded, linear to linear-lanceolate, 5–13 × 1.5–2 mm, flattened; axis zigzag. Glumes oblong-ovate to ovate-elliptic, 1.7–2.5 × 0.8–1 mm, apex acute to sometimes narrowly obtuse, mucronate, sides thinly chartaceous, pale brown or greenish to reddish brown, margins narrowly white-hyaline, keel acute, 3-veined, greenish. Stamens (1–)2; anthers 0.5–1 mm. Style slender; stigmas 2. Achenes oblong to oblong-obovoid, 1–1.5 × 0.5 mm, dark brown, minutely punctate.

Locality: Common in Hong Kong. *L. T. Lo 91; HK sheet 30228, 39701.*
Distribution: Hainan, Guangdong, Guangxi, Fujian, Jiangsu, Zhejiang, Taiwan, Liaoning; tropical and warm temperate regions of the world.
Ecology: Streamsides and other wet places. Flowering & fruiting: May–Oct.

358. POACEAE (GRAMINEAE) 禾本科

XIA Nian-he 夏念和 • YU Hui 于慧 • LI Jing 李婧 • ZHAO Nan-xian 趙南先 • PENG Hua 彭華

Annual or perennial herbs, or woody bamboos. Culms often erect, sometimes prostrate or twisted, jointed, internodes hollow or solid. Leaves simple, arranged alternately in 2 ranks, differentiated into sheath, blade, and ligule; leaf sheath surrounding and supporting culm-internode, split to base or infrequently tubular with partially or completely fused margins, modified with reduced blade in bamboos (culm sheaths); leaf blades usually long, narrow and flat, veins parallel; ligule membranous or a line of hairs. Inflorescence terminal or axillary, spicate, capitates and paniculate. Spikelets composed of distichous bracts arranged along a slender axis (rachilla); typically 2 lowest bracts (glumes) empty, subtending 1–many florets. Florets composed of 2 opposing bracts enclosing a single small flower, outer bract (lemma) clasping the more delicate, usually 2-keeled inner bract (palea). Flowers bisexual or unisexual, often small; lodicules (small scales representing perianth) 2, rarely 3 or absent, 3–many in bamboos, hyaline or fleshy; stamens (1–)3(–6), or more in some bamboos, filaments capillary, anthers versatile, 2-celled, dehiscing along a longitudinal slit; ovary 1-locular, styles (1–)2(–3), free or united at base, stigmas feathery. Fruit normally a dry indehiscent caryopsis, fleshy in some bamboos; embryo small or large; hilum punctate to linear.

About 700 genera and 11000 species widely distributed all over the world; 226 genera and 1795 species in China; 95 genera, 227 species, 11 varieties and 6 cultivars in Hong Kong.

1a. Bamboos, culms woody; lower culm sheaths broad with rudimentary blades.
  2a. Rhizome pachymorph, thicker than culm; culms clumping.
    3a. Culms scrambling ..... 1. *Schizostachyum*
    3b. Culms erect.
      4a. Spikelet with 1 floret ..... 2. *Cephalostachyum*
      4b. Spikelet with 2–many florets.
        5a. Prophylls 2-keeled ..... 3. *Bambusa*
        5b. Prophylls 1-keeled.
          6a. Filaments distinct ..... 4. *Dendrocalamus*
          6b. Filaments connate into a tube ..... 5. *Gigantochloa*
  2b. Rhizome leptomorph, thinner than culm; culms solitary or pluricaespitose.
    7a. Basal culm internodes slightly tetragonous; basal nodes usually with thorns ..... 6. *Chimonobambusa*
    7b. Basal culm internodes usually terete; nodes without thorns.
      8a. Branches usually 2 per node ..... 7. *Phyllostachys*
      8b. Branches 1 or more than 2.
        9a. Shrubby bamboo, usually with 1 branch per node
          A9a. Branches usually 1 per node.. ..... 8. *Indocalamus*
          A9b. Lower branches 1 per node but upper branches (2–)3 per node ..... [*Sasa subglabra*]
        9b. Arborescent bamboo, usually with 3–many branches per node.
          10a. Branch base not appressed to culm ..... 9. *Sinobambusa*
          10b. Branch base appressed to culm ..... 10. *Arundinaria*

1b. Herbs, occasionally reeds or culms cane-like; lower culm sheaths with normal blades.
  11a. Spikelets with 2 florets, lower floret male or barren, sometimes reduced to an empty lemma, and the spikelet appears with only 1 floret; spikelets arranged in pairs (rarely triads) on fragile racemes, no rachilla extension.
    12a. Spikelets disarticulating at maturity above glumes.
      13a. Spikelets disarticulating above glumes; lemmas both orbicular to broadly elliptic, awnless; leaf blades lanceolate to ovate.
        14a. Upper lemma indurate ..... 11. *Isachne*
        14b. Upper lemma membranous.
          15a. Spikelets with 2 florets; glumes persistent ..... 12. *Coelachne*
          15b. Spikelets with 1 floret; glumes deciduous ..... 13. *Sphaerocaryum*
      13b. Spikelets disarticulating below fertile (upper) floret; lower lemma resembling upper glume, persistent, upper lemma terete, often awned; leaf blades linear.
        16a. Spikelets with 1 floret, falling entire ..... 14. *Garnotia*
        16b. Spikelets with 2 florets, breaking up at maturity ..... 15. *Arundinella*
    12b. Spikelets falling entire at maturity, either singly or with other spikelets and inflorescence parts attached.
      17a. Spikelets solitary, or if paired both spikelets alike; upper lemma and palea papery to crustaceous or leathery, awnless.
        18a. Plants dioecious; female inflorescence a large globose spiny head ..... 16. *Spinifex*
        18b. Plants bisexual; inflorescence not as above.
          19a. Spikelets of 2 kinds, with 1–2 persistent bisexual or female spikelets at the base of rachis and several deciduous male spikelets above ..... 17. *Thuarea*
          19b. Spikelets all alike.
            20a. Spikelets (at least some of them) subtended by bristles or a spiny involucre; or raceme rachis prolonged into a bristle or short point beyond the uppermost spikelet.

21a. Inflorescence of racemes, only the uppermost spikelet of each raceme subtended by a bristle or short (often inconspicuous) point ..... 18. *Stenotaphrum*

21b. Inflorescence paniculate, often spike-like, all or many of the spikelets subtended by bristles or a spiny involucre.

22a. Bristles persisting on the axis after the spikelets falling off ..... 19. *Setaria*

22b. Bristles or spines falling as involucres around the spikelets.

23a. Involucral bristles slender, free to the base ..... 20. *Pennisetum*

23b. Involucral bristles and spines flattened and connate below, forming a cup ..... 21. *Cenchrus*

20b. Spikelets not subtended by bristles; or raceme rachis terminating in a spikelet.

24a. Inflorescence an open, contracted or spike-like panicle; pedicels usually all slender and distinct.

25a. Spikelets laterally compressed.

26a. Upper floret with wings or scars at the base ..... 22. *Ichnanthus*

26b. Upper floret without basal wings or scars.

27a. Lower lemma usually obtuse or acute, awnless; upper lemma gibbously semiorbicular with a little greenish crest near the apex ..... 23. *Cyrtococcum*

27b. Lower lemma 2-lobed or shortly awned; upper lemma elliptic, not crested ..... 24. *Melinis*

25b. Spikelets dorsally compressed.

28a. Panicle spike-like.

29a. Upper glume gibbous ..... 25. *Sacciolepis*

29b. Upper glume not gibbous ..... 26. *Hymenachne*

28b. Panicle open, the spikelets evenly spaced or appressed along the primary branches.

30a. Upper glume as long as or only slightly shorter than the spikelet ..... 27. *Panicum*

30b. Upper glume 2/3 spikelet length or less.

31a. Upper glume very small, usually veinless; spikelets on long capillary pedicels ..... 28. *Digitaria*

31b. Upper glume 1/2–2/3 spikelet length, 3–5-veined; spikelets on short appressed secondary racemelets ..... 29. *Ottochloa*

24b. Inflorescence of unilateral racemes; spikelets usually solitary or paired; pedicels often very short, at least for one spikelet of a pair.

32a. Apex of upper lemma awned or crested.

33a. Upper lemma shortly awned; upper glume ciliate on the margins ..... 30. *Alloteropsis*

33b. Upper lemma apex crested; upper glume glabrous ..... 31. *Acroceras*

32b. Apex of upper lemma awnless, obtuse or mucronate, not crested.

34a. Spikelets laterally compressed, glumes awned ..... 32. *Oplismenus*

34b. Spikelets dorsally compressed; lower glume awnless.

35a. Spikelets densely packed in 4 rows or congested into clusters; lower lemma awned ..... 33. *Echinochloa*

35b. Spikelets mostly in 1 or 2 rows; lower lemma awnless.

36a. Spikelets supported on a basal globular bead-like swelling; lower glume vestigial ..... 34. *Eriochloa*

36b. Spikelets without a basal bead-like swelling.

37a. Lower glume present ..... 35. *Brachiaria*

37b. Lower glume absent.

38a. Back of upper lemma lying against rachis ..... 36. *Paspalum*

38b. Back of upper lemma facing away from rachis ..... 37. *Axonopus*

17b. Spikelets paired, usually one sessile and the other pedicellate, often dissimilar and arranged in fragile racemes; upper lemma and palea membranous or hyaline membranous, awned or awnless.

39a. Spikelets all unisexual, separated in different inflorescences or in different parts of the same inflorescence.

40a. Male and female spikelets in different parts of same inflorescence ..... 38. *Coix*

40b. Male and female spikelets in different inflorescences ..... 39. *Zea*

39b. Spikelets bisexual, or at least the sessile spikelet of a pair, male and female not separated.

41a. Spikelets solitary, without an accompanying vestigial spikelet or pedicel ..... 40. *Dimeria*

41b. Spikelets paired, but sometimes pedicellate spikelet vestigial or represented only by the pedicel.

42a. Rachis internodes and pedicels stout, angular, columnar or widening upward, internode and pedicel sometimes joined; upper lemma awnless.
43a. Inflorescence terminal, racemes solitary, subdigitate or spread along an elongate axis.
44a. Lower glume keels pectinately spiny comb-like spines ..... 41. *Eremochloa*
44b. Lower glume keels without pectinate margins ..... 42. *Mnesithea*
43b. Inflorescence of axillary racemes from the upper leaf axils.
45a. Spikelets of a pair similar; racemes tough ..... 43. *Hemarthria*
45b. Spikelets of a pair different; racemes easily fragile.
46a. Sessile spikelet globose; sessile spikelets not sunk within rachis ..... 44. *Hackelochloa*
46b. Sessile spikelet not globose; sessile spikelets sunk within into a cavity formed by rachis and adjacent pedicel ..... 45. *Rottboellia*
42b. Rachis internodes and pedicels slender, filiform to linear or, if widened upward, the upper lemma awned.
47a. Spikelets of a pair similar in shape, usually both fertile.
48a. Inflorescence with elongate central axis, longer than lowest raceme.
49a. Raceme rachis fragile; 1 spikelet of the pair sessile ..... 46. *Saccharum*
49b. Raceme rachis tough; all spikelets pedicellate ..... 47. *Imperata*
48b. Inflorescence of solitary or subdigitate racemes.
50a. Spikelets in groups of 3, 2 sessile and 1 pedicellate ..... 48. *Polytrias*
50b. Spikelets paired.
51a. Culms rambling; leaf blades lanceolate; lower glume concave to grooved along median line ..... 49. *Microstegium*
51b. Culms erect; leaf blades linear; lower glume convex to flat or slightly concave.
52a. Slender annuals.
53a. Raceme solitary ..... 50. *Pogonatherum*
53b. Racemes subdigitate ..... 51. *Pseudopogonatherum*
52b. Robust perennials.
54a. Raceme rachis tough, both spikelets of pair pedicellate ..... 52. *Miscanthus*
54b. Raceme rachis fragile; 1 spikelet of pair sessile ..... 53. *Eulalia*
47b. Spikelets of a pair different in shape and sex (rarely pedicellate spikelet vestigial or reduced to pedicel).
55a. Racemes borne on an elongate central axis or its branches, axis longer than lowest raceme, not supported by spathes.
56a. Upper lemma developed normal, usually 2-lobed, awned from the sinus or awnless.
57a. Lower glume of sessile spikelet laterally compressed; raceme often reduced to a triad. ..... 54. *Chrysopogon*
57b. Lower glume of sessile spikelet dorsally compressed; raceme of several spikelet pairs below terminal triad ..... 55. *Sorghum*
56b. Upper lemma reduced to stipitiform, awned from apex.
58a. Racemes of 1–5(–8) spikelet pairs, often reduced to triads ..... 56. *Capillipedium*
58b. Racemes of more than 8 spikelet pairs ..... 57. *Bothriochloa*
55b. Racemes solitary, paired or subdigitate, often supported by spathes (Arthraxon not spathes).
59a. Lower floret of sessile spikelet staminate, with well-developed palea.
60a. Sessile spikelet broadly truncate, apex with scarious coloured band ..... 58. *Apocopis*
60b. Sessile spikelet long ovate and oblong or lanceolate, apex not with scarious coloured band.
61a. Sessile spikelet laterally compressed, smooth; raceme solitary, reduced to spathate triad, these many, crowded into compound panicle ..... 59. *Apluda*
61b. Sessile spikelet dorsally compressed; racemes (1–)2 or more, terminal or axillary ..... 60. *Ischaemum*
59b. Lower floret of sessile spikelet barren, reduced to a lemma, palea absent.
62a. Lower glume of sessile spikelet 2-keeled; callus inserted into hollowed internode apex.

63a. Racemes solitary ..... 61. *Schizachyrium*
63b. Racemes paired or digitate.
64a. Leaves not aromatic ..... 62. *Andropogon*
64b. Leaves aromatic ..... 63. *Cymbopogon*
62b. Lower glume of sessile spikelet convexly rounded without keels, or keel only upward; callus attached obliquely, its apex visible.
65a. Upper lemma 2-toothed, awned from sinus ... 64. *Hyparrhenia*
65b. Upper lemma entire or slightly 2-lobed.
66a. Upper lemma awned from base ..... 65. *Arthraxon*
66b. Upper lemma awned from apex.
67a. Raceme with 2 large homogamous spikelet pairs at base, forming an involucre ..... 66. *Themeda*
67b. Raceme with or without homogamous spikelet pairs, but not forming an involucre.
68a. Sessile spikelet with pungent callus ..... 67. *Heteropogon*
68b. Sessile spikelet with obtuse callus ..... 68. *Dichanthium*

11b. Spikelets with 1–many florets (if 2 florets, then both fertile, or the lower fertile, or rachilla extension present); spikelets arranged singly in panicles or racemes (occasionally raceme fragile but spikelets single; or spikelets paired but raceme tough).
69a. Glumes absent or reduced to small scales at base of floret.
70a. Sterile florets reduced to 2 narrow lemmas at base of fertile floret ..... 69. *Oryza*
70b. Sterile florets scarce ..... 70. *Leersia*
69b. Glumes or at least one glume evident.
71a. Lemmas multi or 5-veined, or indurated and not evident (some species in Arundineae 3-veined); ligule usually no hairs (except Arundineae); mainly distribute in temperate and cold zone.
72a. Upper glume usually equal or longer than lower floret; awn geniculate with twisted column, from lemma back or apex sinus (for *Eriachne* sometimes merely acute).
73a. Spikelets with 2 or more fertile florets.
74a. Floret callus acute to pungent, bearded ..... 71. *Avena*
74b. Floret callus short, obtuse ..... 72. *Eriachne*
73b. Spikelets with 1 fertile floret.
75a. Fertile floret accompanied by male or sterile florets ..... 73. *Phalaris*
75b. Fertile floret solitary, with or without a rachilla extension.
76a. Spikelets shed with a basal stipe ..... 74. *Polypogon*
76b. Spikelets shed without a basal stipe ..... 75. *Alopecurus*
72b. Upper glume usually shorter than lower floret; lemmas awnless or a straight awn arising at or near apex.
77a. Lemmas or callus pilose or long-plumose.
78a. Pedicel falling with spikelet; spikelets very small ..... 76. *Thysanolaena*
78b. Pedicel persistent; spikelets middle-sized.
79a. Ligule membranous ..... 77. *Arundo*
79b. Ligule a line of hairs ..... 78. *Phragmites*
77b. Lemmas or callus not pilose plumose, or the hairs shorter than lemmas.
80a. Leaf blades broad, lanceolate or ovate.
81a. Lemmas awnless; spikelets breaking up above glumes ..... 79. *Centotheca*
81b. Lemmas awned; spikelets falling entire ..... 80. *Lophatherum*
80b. Leaf blades usually narrow and long, ribbon or linear.
82a. Inflorescence a single terminal spike-like raceme; spikelets sessile ..... 81. *Lolium*
82b. Inflorescence an open, contracted or dense panicle; spikelets pedicellate ..... 82. *Poa*
71b. Lemmas 3- or 1-veined; ligule a line of hairs; mainly in tropics and subtropics.
83a. Spikelets sessile or subsessile, on one side of rachis.
84a. Spikelets with 1 fertile floret ..... 83. *Sporobolus*
84b. Spikelets with 2 or more fertile florets.
85a. Lemmas emarginate or 2-toothed at apex or, if entire, marginal veins or flanks hairy.
86a. Plants tall, reed-like; inflorescence a large plumose panicle ..... 84. *Neyraudia*
86b. Plants smaller; inflorescence composed of racemes ..... 85. *Leptochloa*
85b. Lemmas usually entire at apex, glabrous.
87a. Inflorescence a panicle ..... 86. *Eragrostis*
87b. Inflorescence of one or more racemes.
88a. Racemes terminating in a sharp point ..... 87. *Dactyloctenium*
88b. Racemes terminating in a fertile or abortive spikelet ..... 88. *Eleusine*

83b. Spikelets usually pedicellate, or not on one side of rachis.
89a. Inflorescence cylindrical; racemes very short, borne along central axis, deciduous, or deciduous spikelets borne singly.
90a. Spikelets with long flexuous awns.
91a. Lemma hyaline, acute, ownless ..... 89. *Perotis*
91b. Lemma indurated; awn 3-branched, branches arising directly from lemma apex or seated on a straight or twisted column ..... 90. *Aristida*
90b. Spikelets awnless or mucronate ..... 91. *Zoysia*
89b. Inflorescence not cylindrical; racemes digitate, scattered or solitary, persistent or rarely deciduous.
92a. Fertile floret solitary.
93a. Racemes digitate; glumes shorter than the exposed floret ..... 92. *Cynodon*
93b. Racemes solitary; glumes longer than and enclosing floret ..... 93. *Microchloa*
92b. Fertile floret accompanied by male or sterile florets.
94a. Lemma keeled, caryopsis subterete ..... 94. *Chloris*
94b. Lemma back flat, caryopsis dorsally compressed ..... 95. *Enteropogon*

1. **Schizostachyum** Nees 簕竹屬

Arborescent bamboos, sometimes shrubby or scrambling. Rhizomes short necked, pachymorph. Culms erect, pendulous, or clambering, straight or slightly flexuose; internodes terete, distally often white powdery; wall usually thin; nodal ridge not prominent; sheath scar prominent. Branches many, subequal. Culm sheaths deciduous, leathery to thickly papery, usually rigid, white powdery, apex truncate or concave, sometimes with subcircular projection at base of one margin; auricles usually inconspicuous; oral setae usually developed; ligule short, truncate, margin serrulate or fimbriate; blade usually reflexed, adaxially densely hispid, apex usually involute. Leaf sheaths usually grooved; auricles usually inconspicuous; blade large, transverse veins partially visible abaxially. Inflorescence fully bracteate, iterauctant; with several to many sessile pseudospikelets in loose, spicate clusters on leafy or leafless flowering branches. Pseudospikelet prophyll triangular to linear-lanceolate; gemmiferous bracts 1–several; fertile florets 1–2, or florets 3–4 with only terminal or subterminal floret fertile; rachilla usually disarticulating, extending beyond fertile floret, glumes usually absent; lemma convolute; palea similar to lemma, but longer, not keeled; lodicules usually absent, sometimes 1–3. Stamens 6. Ovary stalked; style 1; stigmas 3, plumose. Caryopsis fusiform, apex with persistent style base.

About 50 species distributed in SE Asia; nine species (five endemic) in China; one species in Hong Kong.

1. Schizostachyum dumetorum (Hance ex Walp.) Munro
苗仔竹 **(Fig. 83; Photo 259)**

Bot. Voy. Herald. 424. 1857; FHK 435. 1861; FKH 331. 1912; HKB 76. 1985; FRPS 9(1): 20, pl. 3: 1–12. 1996; FOC 22: 52. 2006; FGD 9: 277. 2009.

Bambusa dumetorum Hance ex Walp., Ann. Bot. Syst. 3: 781. 1853.

Culms flexuose, 3–10 m long, 0.5–1.1 cm in diam., apically clambering; internodes to 60 cm, smooth and glabrous near base, otherwise white powdery and white strigose; wall ca. 1 mm thick. Branches ca. 40 cm. Culm sheaths deciduous, abaxially slightly glabrous, base of outer margin usually with a conspicuous subcircular expansion below point of attachment, apex truncate with equal sides; auricles usually inconspicuous; oral setae many, straight, 5–7 mm; ligule less than 1 mm, glabrous, margin undulate; blade reflexed, those on lower nodes of culm less than 1/2 length of sheath, those on upper nodes of culm longer. Leaves 5–7 per ultimate branch; sheaths 2–3.5 cm, glabrous; auricles usually inconspicuous; oral setae several, 3–5 mm; ligule less than 1 mm; blade lanceolate, 5–18 × 1.2–7 cm. Pseudospikelets fusiform, 1–2.2 cm; prophylls small; bracts 4–6, navicular, 1–5.5 mm, papery, rigid, keeled, apex obtuse; rachilla disarticulating. Glumes absent; lemma oblong-lanceolate, 1.2–1.4 cm, involute, many-veined, apex acute, mucronate; palea oblong-lanceolate, to 1.5 cm, markedly involute, thinly papery, apex truncate or emarginate; lodicules absent. Filaments white, ca. 2 cm, base ± connate; anthers yellow, 5–6 mm. Ovary ovoid,

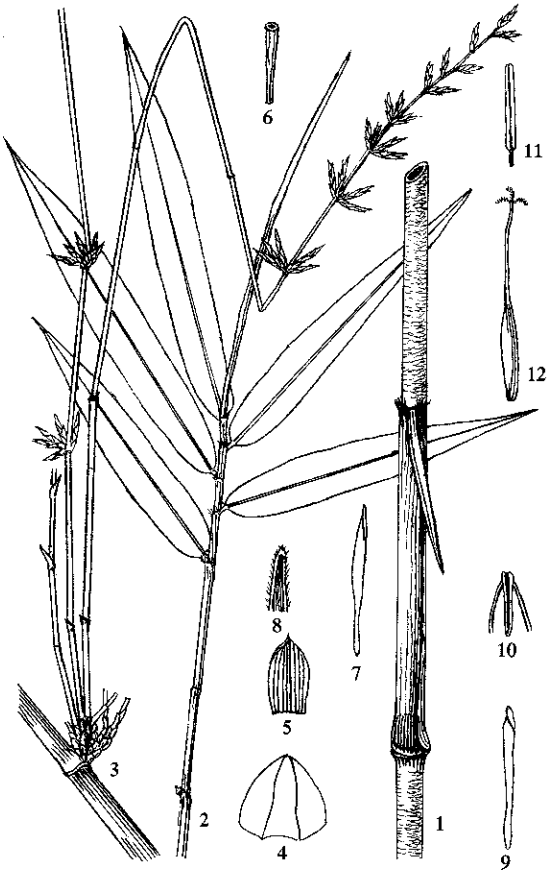

Figure 83. *Schizostachyum dumetorum* (Hance ex Walp.) Munro
1. portion of culm sheath and culm; *2.* leafy branchlet; *3.* flowering branchlet; *4.* prophyll; *5.* bract; *6.* apical rachis articulus; *7.* lemma; *8.* enlarged lateral view of lemma; *9.* palea; *10.* enlarged abaxial view of palea; *11.* stamens; *12.* pistil. (drawn by H. P. Yu)

glabrous, stalked; style purple; stigmas 3, purple-red, 3–5 mm, plumose. Caryopsis fusiform, 10–13 × ca. 1.5 mm, glabrous, apex beaked.

Locality: Common in Hong Kong. *Y. S. Lau 3053, 3154; Y. W. Lam 1895.*

Distribution: Guangdong, Jiangxi.

Ecology: Thickets, forests. New shoots: Summer.

Uses: Ornamental.

Notes: The type specimen was collected by H. F. Hance from Hong Kong before 1853.

2. Cephalostachyum Munro 空竹屬

Arborescent or shrubby bamboos. Rhizomes short necked, pachymorph. Culms straight, pendulous, or occasionally clambering; internodes terete, smooth, usually glabrous; wall usually thin; nodal ridge not prominent; sheath scar prominent. Branches many, subequal or occasionally with a dominant branch replacing main culm. Culm sheaths deciduous, thickly papery to leathery, usually rigid, apex truncate or concave; auricles usually conspicuous; oral setae usually developed, often fimbriate; ligule truncate, short, serrulate; blade reflexed, sometimes erect. Leaf sheaths pubescent; auricles usually conspicuous; blade lanceolate or ovate-elliptic, variable in size, transverse veins scarcely visible. Inflorescence fully bracteate, iterauctant, initially densely glomerate with many pseudospikelets, terminal to a leafy shoot, later spicate, lateral to leafless flowering branches, subtended by several large bracts. Spikelets 1-flowered, with a rachilla extension. Glumes 2–3, long mucronate or awned; lemmas similar to glumes, convolute. Palea thin, 2-keeled. Lodicules 3. Stamens 6; filaments free. Ovary stalked; style long, hollow; stigmas 2–3, plumose. Caryopsis nut-like, terete, apex with persistent style base.

About nine species distributed in S and SE Asia; six species in China (Xizang, Yunnan); one species cultivated in Hong Kong.

1. Cephalostachyum pergracile Munro 香糯竹 (Photos 260–261)

Trans. Linn. Soc. London. 26: 141. 1868; HKB 56. 1985; FRPS 9(1): 29, pl. 6: 1–10. 1996; FOC 22: 55. 2006; FGD 9: 279. 2009.

Schizostachyum pergracile (Munro) R. B. Majumdar, Fl. Ind. Enumerat.-Monocot. 282. 1989.

Culms erect, 9–12 m, 5–7.5 cm in diam., apically drooping; internodes 30–45 cm, initially densely appressed setose; wall thin. Culm sheaths tardily deciduous, brown, shorter than culms, 10–15 × 15–20 cm, thickly leathery, smooth, densely glossy black-brown setose; auricles rounded, undulate, hirsute near margins; ligule inconspicuous; blade reflexed, ovate-acuminate, ca. 5 cm, articulate with sheath, adaxially densely hairy. Leaf sheath margins ciliate; ligule ciliate; blade narrowly lanceolate, 15–35 × 2.5–3.8(–6) cm, base rounded. Inflorescences capitate, at nodes of leafless branch, 1.5–3 cm in diam., subtended by bracts. Pseudospikelet 1.2–2 × ca. 0.2 cm, densely yellow hirtellous, rachilla extended, 5–6 mm. Glumes 2–3, 0.6–1.1 cm; lemma 1.3–1.8 cm, densely hairy, apex long mucronate or awned; palea about as long as or longer than lemma, apex bifid; lodicules lanceolate, narrow, membranous, apex acute. Anthers purple. Stigmas 3. Caryopsis 6–8 × 2–3 mm, glabrous, apex with persistent style base.

Locality: Tai Po Kau (cultivated).

Distribution: S Yunnan; Myanmar, Thailand, Laos, Vietnam.

Ecology: Cultivated. New Shoots: Summer.

Uses: Ornamental.

3. Bambusa Schreb. 簕竹屬

Arborescent bamboos, occasionally shrubby or scrambling, 1–20 m. Rhizomes short necked, pachymorph. Culms unicaespitose, erect to pendulous, rarely subscandent; internodes terete; nodes not raised. Branches several to many, often 1–3 dominant (subequal in *Bambusa* subg. *Lingnania*), branchlets of lower branches sometimes forming tough or weak thorns. Culm sheaths deciduous, rarely persistent; auricles usually conspicuous, always with marginal oral setae; blade usually erect. Leaf blade variable in size, transverse veins inconspicuous. Inflorescence iterauctant, fully bracteate, subtended by a broad 2-keeled prophyll; pseudospikelets rarely solitary, usually several- to many-clustered to capitate on flowering branches. Pseudospikelets prophyllate; florets 2–many, terminal floret sterile or imperfect, sessile; fertile glumes preceded by 1 or more gemmiferous, glumaceous, or spathaceous bracts and/or 1–3 empty glumes; rachilla internodes usually distinct and usually disarticulating with florets, falling separately; lemma broad, many-veined; palea 2-keeled, apex acute or shortly bifid; lodicules 3 or 2. Stamens 6; filaments free. Ovary usually stalked, apex thickened and hairy; style solid, usually short; stigmas (1–)3, long, hairy, plumose. Caryopsis terete, apex hairy; pericarp slightly thickened.

More than 100 species distributed in tropical and subtropical Asia and cultivated in tropical and subtropical regions worldwide; 80 species (67 endemic) in China, mainly in the south and southwest; 16 species, 3 varieties and 6 cultivars in Hong Kong.

The following species are only cultivated in Tai Po Kau Nature Reserve and not treated here: *B. basihirsuta* McClure(扁竹), *B. cornigera* McClure(牛角竹), *B. dissimulator* McClure var. *albinodia* McClure(白節坭簕竹), *B. insularis* L. C. Chia & H. L. Fung(黎庵高竹), *B. malingensis* McClure(馬嶺竹), *B. mutabilis* McClure(黃竹仔) and *B. pervariabilis* McClure(撐篙竹).

1a. Branchlets of lower branches specialized into tough or weak leafless thorns.

2a. Branches on lower nodes of culms densely interwoven, with many, tough, sharp thorns.

3a. Culm sheath glabrous abaxially; ligule 5–7 mm ..... 1. *B. chunii*

3b. Culm sheath ± hairy; ligule 3–5 mm.

4a. Culm sheath pubescent only near base, apically subtruncate; auricles subequal, usually reflexed...2. *B. sinospinosa*
4b. Culm sheath sparsely hairy abaxially; apically broadly concave, with a triangular protuberance on each shoulder; auricles tiny or absent, narrowly filiform if present...3. *B. flexuosa*

2b. Branches on lower nodes of culms with tough and/or weak thorns but not densely interwoven.
5a. Culm sheath auricles large, to 2 cm wide.
6a. Lower culm internodes densely hairy; culm sheath apically subtruncate, larger auricles nearly 3 × size of smaller ones; leaf blade abaxially pubescent...4. *B. rutila*
6b. Lower culm internodes glabrous; culm sheath apically usually broadly convex, sometimes subtruncate, larger auricles to 2 × size of smaller ones; leaf blade abaxially glabrous...5. *B. lapidea*
5b. Culm sheath auricles small, less than 1 cm wide.
7a. Culm sheaths with a triangular protuberance on higher shoulder, blade not narrowed at base...6. *B. gibba*
7b. Culm sheaths without a protuberance on higher shoulder, blade basally narrowed and incurved...7. *B. ventricosa*

1b. Branchlets of lower branches normal, not specialized into tough or weak leafless thorns.
8a. Culm sheath blade reflexed...8. *B. chungii*
8b. Culm sheath blade erect.
9a. Culm sheath auricles small, rounded...9. *B. beecheyana*
9b. Culm sheath auricles large, rounded or irregular, or absent.
10a. Culm sheath apically concave.
11a. Culm green.
12a. Lower internodes normal...10. *B. vulgaris*
12b. Lower interodes condensed and swollen...10a. *B. vulgaris* 'Wamin'
11b. Culms yellow with green stripes...10b. *B. vulgaris* 'Vittata'
10b. Culm sheath apically truncate, ± arched.
13a. Culm sheath auricles to 1 cm or wider.
14a. Culm sheath auricles extremely unequal, the larger one decurrent downward...11. *B. eutuldoides*
14b. Culm sheath auricles unequal, the large one not decurrent...12. *B. tuldoides*
13b. Culm sheath auricles less than 1 cm wide, or if ca. 1 cm, then culm blade base less than 1/3 width of sheath apex.
15a. Leaf blade abaxially green or pale green.
16a. Culm sheath apically subtruncate...13. *B. gibboides*
16b. Culm sheath ± arched.
17a. Culm sheaths densely and uniformly dull brown hairy...14. *B. pachinensis* var. *hirsutissima*
17b. Culm sheath glabrous or hairy near margin.
18a. Culm sheath blade ca. 2/3 as long as sheath or longer, base ± cordate; ligule ca. 2 mm...15. *B. textilis* var. *textilis*
18b. Culm sheath blade less than 1/2 length of sheath proper, base slightly rounded; ligule 1–1.5 mm.
19a. Culm sheaths glabrous...15a. *B. textilis* var. *glabra*
19b. Culm sheath base and margins with sparse, stiff, dull brown hairs...15b. *B. textilis* var. *gracilis*
15b. Leaf blade abaxially pale and glaucous.
20a. Culm internodes green throughout.
21a. Culm internodes hollow.
22a. Ultimate branches with 5–12 leaves, leaf blade 5–6 × 0.7–1.6(–2) cm...16. *B. multiplex*
22b. Ultimate branches with 9–13 leaves, leaf blade 3.3–6.5 × 0.4–0.7 cm...16a. *B. multiplex* 'Fernleaf'
21b. Culm internodes solid, ultimate branches with 12–23 leaves...16b. *B. multiplex* var. *riviereorum*
20b. Culm internodes green or yellow, with discolour stripes.
23a. Culm internodes green, with a few white stripes...16c. *B. multiplex* 'Silverstripe'
23b. Culm internodes yellow, with green stripes.
24a. Ultimate branches with 5–12 leaves, leaf blade 4–14 cm...16d. *B. multiplex* 'Alphonse Karr'
24b. Ultimate branches with 12–20 leaves, leaf blade 1.6–3.8 cm...16e. *B. multiplex* 'Stripestem Fernleaf'

1. Bambusa chunii L. C. Chia & H. L. Fung 焕鏞簕竹**(Fig. 84)**
Kew Bull. 37: 593. 1983; HKB 29. 1985; FRPS 9(1): 58, pl. 13: 12. 1996; FOC 22: 13. 2006; FGD 9: 230. 2009.

Culms 10–12 m, 4.5–6.5 cm in diam., basally flexuose, apically drooping; internodes slightly curved, 25–30 cm, very thinly white powdery, very sparsely stiffly hairy, with a ring of grey hairs below each node; wall thick; branching to base. Branches at lower nodes usually solitary, with tough, sharp thorns, at upper nodes 3–several with central 3 longer and thicker. Culm sheaths tardily deciduous, with several marginal white stripes on each side, leathery, glabrous, apex obliquely truncate with unequal, triangular protuberance on each shoulder; auricles unequal, linear-lanceolate, small, usually wrinkled, abaxially hispidulous; oral setae well developed, 5–10 mm, undulate, hispidulous at base; ligule 5–7 mm, margin irregular, dentate, laciniate; blade erect, broadly lanceolate, abaxially glabrous, base nearly 1/2 width of sheath apex. Leaf blade lanceolate, 9.5–19 × 1.5–2 cm, abaxially pubescent, adaxially glabrous. Pseudospiklets linear, compressed, ca. 4.5 cm long, clustered at nodes of flowering branches; gemmiferous bracts 1–2, ovate, apex minutely obtuse or acute; fertile florets 5–14, and 1–2 sterile floret at apex; rachilla segments ca. 2 mm long, ciliate; lemma 9–10 × 4–4.5 mm, glossy and glabrous, veins in 9–11, apex acute; palea shorter than lemma, 8–9 × 3.5–4 mm, oblong, 2-keeled, glabrous, minutely ciliate on margins at its base, apex obtuse or sometimes emarginate; lodicules 3 subequal, ovate or obovate, 2 × 1 mm, 3-veined, the veins faint, fimbriate along margins; stamens 6, anthers 3 × 0.3 mm, apex obtuse. Ovary narrow obovoid, apex thickened and scabrous, ciliate; style short; stigmas 3, long, plumose; Fruit ovoid, deep furrow lined, 6–7 × 2–2.5 cm.

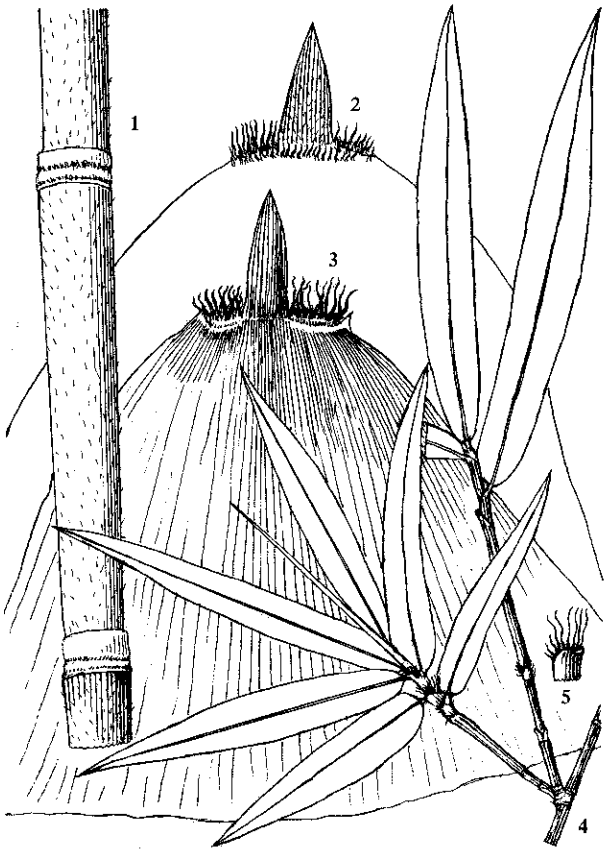

Figure 84. *Bambusa chunii* L. C. Chia & H. L. Fung
1. portion of culm; *2.* abaxial view of culm sheath; *3.* adaxial view of culm sheath; *4.* leafy branchlet; *5.* leafy sheath. (drawn by H. P. Yu)

Locality: Yuen Long. *HK sheet 35339, 35340.*
Distribution: Endemic to Hong Kong
Ecology: Cultivated around villages. New shoots: Summer.
Notes: The type specimen (*Nan-Zhu (南竹隊) 2802*, IBSC) was collected from Ko Po Tsuen, Yuen Long, New Territories in 1980. The species epithet is respectfully dedicated to Professor Woon-Young Chun, the founder and former Director of South China Botanical Garden. Listed in *Rare and Precious Plants of Hong Kong.*

2. Bambusa sinospinosa McClure 車筒竹 **(Photos 262–263)**
Lingnan Sci. J. 19: 411. 1940; HKB 46. 1985; FRPS 9(1): 56, pl. 13: 1–11. 1996; FOC 22: 12. 2006; FGD 9: 229. 2009.

Culms 15–24 m, 8–14 cm in diam., apically slightly drooping; internodes 20–26 cm, mainly glabrous but with a ring of grey silky hairs below basal 1 or 2 nodes; wall 10–30 mm thick; branching to base. Branches usually solitary at lower nodes, with tough thorns; branchlets interwoven; branches 3–several above lower nodes. Culm sheaths tardily deciduous, leathery, densely stiffly dark brown hairy toward base, apex truncate; auricles usually reflexed, oblong to obovate, subequal, rugose, adaxially densely strigose, margin with undulate or erect setae; ligule 3–5 mm, dentate, fimbriate; blade erect or recurved, base ca. 1/2 width of sheath apex. Leaf blade linear-lanceolate, 7–17 × 1.2–1.6 cm, both surfaces glabrous or abaxially proximally pilose. Pseudospikelets solitary or several clustered at each node of flowering branch, linear to linear-lanceolate, slightly compressed, to 4 cm, prophylls obtuse, keels ciliolate; gemmiferous bracts 3–5, narrowly triangular or subovate, glabrous, obtuse; fertile florets 6–12; rachilla internodes 2–4 mm. Glumes usually absent; lemma ovate-oblong, 5–9.5 mm, many-veined, apex obtusely acute or acute with fine tip; palea usually slightly longer than lemma, keels ciliolate, 3–5-veined between keels; lodicules 3, unequal, obovate, ca. 1.4 mm, obtuse, margins ciliate. Filaments distinct; anther obtuse at apex. Ovary narrow, apex thickened and hispidulous; style slender, hispidulous; stigmas 3.

Locality: New Territiories (cultivated). *Nan-Zhu 2772.*
Distribution: Guangdong, Guangxi, Hainan.
Ecology: Riversides, near villages. New shoots: May–Jun.; flowering: Aug.–Dec.
Uses: Materials (construction), environmental.
Notes: *Bambusa arundo* sensu Benth. (FHK 435. 1861) perhaps belongs to this species.

3. Bambusa flexuosa Munro 小簕竹
Trans. Linn. Soc. London. 26: 101. 1868; FKH 331. 1912; HKB 34. 1985; FOC 22: 12. 2006; FGD 9: 228. 2009.
Arundarbor flexuosa (Munro) Kuntze, Revis. Gen. Pl. 2: 760. 1891.
Bambusa scabriculma W. T. Lin, J. S. China Agric. Univ. 14(1): 46. 1993.

Culms 6–7 m, 3.5–6 cm in diam., basally flexuose, apically nodding; internodes 20–30 cm, sparsely stiffly brown strigose, with a ring of silky brown hairs below each node; wall thick. Branches to base, solitary at lower nodes, flexuose, densely interwoven, branchlets specialized into tough thorns, higher nodes with 3–several branches. Culm sheaths tardily deciduous, leathery, prominently ribbed-striate when dry, sparsely stiffly dark brown strigose, apex concave with a triangular protuberance on each shoulder; auricles narrowly filiform or absent; ligule 4–5 mm, dentate or laciniate, fimbriate; blade erect or recurved, ovate-lanceolate to lanceolate, base ca. 1/2 as wide as sheath apex. Leaf blade narrowly lanceolate to lanceolate, 7–11 × 1.2–1.6 cm, both surfaces glabrous. Pseudospikelets solitary or clustered, slightly compressed, 2–3 cm, gemmiferous bracts ca. 4; florets 8–12 with middle florets perfect; rachilla flexuose, internodes flat, 2–2.5 mm, hispid. Glumes usually absent; lemma oblong-lanceolate, 8–10 mm, apex acute; palea usually shorter than lemma, keels ciliate; lodicules 3, subequal, margins long ciliate, apex obtuse. Filaments enlarged at base; anther obtuse at apex. Style short; stigmas 3.

Locality: Sha Tin, Fanling, Lantau Island (cultivated). *H. C. Tang 1121; Y. S. Lau 2470; Nan-Zhu 2757.*

Distribution: Guangdong, Hainan.

Ecology: Hills, river banks. New shoots: Summer.

Uses: Hedges.

Notes: It has been named incorrectly by some authors as *Bambusa bambos* (L.) Voss.

4. Bambusa rutila McClure 木竹 **(Photos 264–265)**

Lingnan Sci. J. 19: 533. 1940; HKB 45. 1985; FRPS 9(1): 63, pl. 14: 11. 1996; FOC 22: 14. 2006; FGD 9: 232. 2009.

Bambusa shuangliuensis T. P. Yi, Bull. Bot. Res. (Harbin) 2(4): 100, fig. 2. 1982.

Culms 8–12 m, 4–6 cm in diam., basally slightly flexuose, apically slightly drooping; internodes 30–35 cm; wall thick; lower internodes usually initially densely stiffly dark brown strigose, basal internodes sometimes with several inconspicuous pale yellow stripes; nodes with a ring of grey-white silky hairs below and above sheath scar and a ring of stiff, brown hairs on sheath scar, several basal nodes usually with short aerial roots; branching from 3rd or 4th node up. Branches usually 3–12 on mid-culm and basal nodes; central 3 dominant, reflexed; those on lower nodes usually with branchlets specialized into weak or tough thorns. Culm sheaths tardily deciduous, ribbed-striate when dry, glabrous or with stiff, dark brown hairs near margins and base, apex slightly oblique and truncate; auricles extremely unequal, abaxially densely hispidulous; larger auricle ovate-oblong, oblong, or narrowly reniform, inflated outward, undulate, wrinkled, ca. 1.5 cm wide; smaller auricle subovate or elliptic, ca. 1 cm wide, undulate, wrinkled; ligule 4–5 mm, dentate, fimbriate; blade persistent, erect, subtriangular or ovate, base nearly 2/5 as wide as sheath apex. Leaf blade linear-lanceolate to narrowly lanceolate, usually 10–18 × 1–1.7 cm, abaxially densely pubescent, adaxially glabrous. Pseudospikelets linear-lanceolate, compressed, to 3 cm; prophylls obtuse at apex, keels ciliolate; gemmiferous bracts 3–8, ovate, 1–4 mm, margins ciliolate or subglabrous near apex, apex obtuse and finely tipped; florets ca. 9, apical 1–2 florets sterile; rachilla segments 2–3 mm, apex ciliolate. Glumes absent; lemma ovate-lanceolate, to 8 mm, abaxially glabrous, many-veined, margins ciliolate near apex, finely tipped, apex obtuse or acute and scabrous; palea longer or shorter than lemma, keels ciliate or scabrous at apex, 2–3-veined between keels, apex penicillate; lodicules 3, subequal, ovate or obovate, margins ciliate. Anther obtuse at apex. Ovary obovoid, apex thickened and hairy; style very short; stigmas 3, scabrid.

Locality: Fanling, Chung Mei (cultivated). *N. K. Chan 2755; HK sheet 16466.*

Distribution: Fujian, Guangdong, Guangxi, Sichuan.

Ecology: Open fields, around villages. New shoots: Summer; flowering: Oct.–Dec.

Uses: Materials (construction).

5. Bambusa lapidea McClure 油簕竹(油刺竹) **(Photos 266–267)**

Lingnan Sci. J. 19: 531. 1940; FGZ 774. 1956; HKB 41. 1985; FRPS 9(1): 63, pl. 15: 13. 1996; FOC 22: 15. 2006; FGD 9: 233. 2009.

Bambusa miyiensis T. P. Yi, Bull. Bot. Res., Harbin 2(4): 99. 1982.

Culms 7–17 m, 4–7 cm in diam., basally straight, apically slightly drooping; internodes 20–35 cm, obviously shorter and slightly swollen near base and sometimes inconspicuously pale green striped and purple streaked, glabrous; wall 1–2 cm thick; nodes with a ring of grey-white silky hairs below and above sheath scar, several basal nodes usually with short aerial roots, lower ones with a ring of silky hairs above sheath scar; branching from basal 3rd or 4th node up. Branches usually several to many, clustered at mid-culm and basal nodes, central 3 codominant; branchlets usually specialized into weak or tough thorns. Culm sheaths tardily deciduous, leathery, glossy when fresh, ribbed-striate when dry, glabrous or stiffly hairy at basal margins only, apex subtruncate or slightly asymmetrical, arched; auricles undulate, wrinkled, inflated outward, densely hispidulous or subglabrous abaxially, unequal; larger auricle slightly decurrent, orbicular or ovate, 3.5–4 × 1–1.5 cm; small ones oblong or ovate, ca. 3 × 1–1.5 cm; ligule 4–5 mm, margin nearly entire and densely fimbriate; blade persistent, erect, inflated outward, ovate to oval, base slightly narrowed and then extended toward both sides and joined to auricles, apex abruptly acuminate, sharply tipped. Leaf blade linear-lanceolate to lanceolate, usually 8–23 × 1–2 cm, both surfaces glabrous. Pseudospikelets linear, compressed, more than 2 cm; gemmiferous bracts 2–4; fertile florets 5–6, then 2 sterile florets; rachilla segments usually fistulose, ca. 2.5 cm, apex ciliolate. Glumes absent; lemma to 8.5 mm, abaxially glossy and glabrous, many-veined, margins glabrous, apex obtuse or acute and finely tipped; palea slightly shorter than lemma, keels ciliate near apex, 2-veined between and scabrous on either side of keels, apex obtuse or sometimes emarginate; lodicules 3, subequal, ovate or obovate, ca. 1.5 mm, margins ciliate, apex obtuse. Anthers ca. 4 mm, apex obtuse. Ovary narrowly obovoid, apex thickened and scabrous; style very short, scabrous; stigmas 3.

Locality: Tai Po Kau, Sheung Shui, Kam Tin (cultivated). *H. C. Tang 1104, 1132; N. K. Chan 2759.*

Distribution: Guangdong, Guangxi, Sichuan, Yunnan.

Ecology: Plains, hills, riversides, around villages. New shoots: Summer; flowering: Aug.–Sep.
Uses: Scaffolding, construction.

6. Bambusa gibba McClure 坭竹 **(Photos 268–269)**
Lingnan Univ. Sci. Bull. 9: 10. 1940; FHN 4: 354. 1977; HKB 35. 1985; FRPS 9(1): 68, pl. 14: 1–10. 1996; FOC 22: 16. 2006; FGD 9: 235. 2009.

Culms 7–10 m, 3.5–6 cm in diam., basally flexuose, apically suberect; internodes 30–40 cm, inflated near base, initially white powdery, basal internodes initially sparsely stiffly grey-white or brown strigose; wall 3–5 mm thick; nodes glabrous; branching to base. Branches usually 3 at lower nodes with branchlets sometimes specialized into weak thorns; several on middle and upper nodes, 3 central branches dominant. Culm sheaths deciduous, ribbed-striate when dry, glabrous, apex obliquely truncate, with a triangular protuberance on higher shoulder; auricles obviously unequal, sometimes weak; larger auricle ovate-lanceolate or narrowly oblong, 5–6 mm; smaller auricle ovate or elliptic, 2–3 mm; oral setae slender, undulate; ligule arched, 2–3 mm, finely dentate and fimbriate; blade deciduous, erect, narrowly triangular, base not narrowed, nearly 2/3 as wide as sheath apex. Leaf blade linear-lanceolate to narrowly lanceolate, 8.5–14.5 × 0.8–1.3 cm, abaxially densely pubescent, adaxially glabrous. Pseudospikelets linear, 2–3 cm; prophylls ovate, ca. 1.5 mm, keels ciliate, apex obtuse; gemmiferous bracts 4, ovate, 1.5–3.5 mm, apex obtuse and mucronate; florets 4–8; rachilla segments flat, ca. 3.5 mm, slightly hairy, apex inflated and ciliolate. Glume 1, ovate-elliptic, 6–6.5 mm, 15-veined, apex acute, mucronate; lemma ovate-oblong, ca. 1.1 cm, 17-veined, apex acute, mucronate; palea nearly as long as lemma or shorter, keels glabrous, 3-veined between and on either side of keels, apex obtuse with a cluster of white hairs; lodicules 3, subequal, ca. 1.5 mm, margins long ciliate toward apex, base thickened, anterior 2 broadly elliptic, posterior ovate. Anther obtuse at apex. Ovary ovoid, ca. 0.5 mm, base stalked, apex hairy; style ca. 0.5 mm; stigmas 3. Fruit unknown.

Locality: Victoria Peak, New Territories, Lantau Island (cultivated). *Nan-Zhu 2770.*
Distribution: Fujian, Guangdong, Guangxi, Hainan, Jiangxi; Vietnam.
Ecology: Low hills, around villages. New shoots: Summer.
Uses: Hedges, timber.

7. Bambusa ventricosa McClure 佛肚竹 **(Photo 270)**
Lingnan Sci. J. 17: 57. 1938; FGZ 770. 1956; FHN 4: 354. 1977; FTW 5: 764, pl. 1511. 1978; HKB 52. 1985; FRPS 9(1): 70, pl. 15: 1–12. 1996; FOC 22: 17. 2006; FGD 9: 236. 2009.
Leleba ventricosa (McClure) W. C. Lin, Bull. Taiwan Forest Res. Inst. 150: 1305, fig. 1. 1963.

Culms dimorphic; normal culms 8–10 m, 3–5 cm in diam., basally flexuose, apically slightly drooping; internodes 30–35 cm, basally slightly swollen, not white powdery, initially glabrous; lower nodes with rings of grey-white silky hairs below and above sheath scar; branching from 3rd or 4th node up, basal 1 or 2 nodes also with short aerial roots; branches 1–3 on lower nodes; branchlets of these sometimes condensed into weak thorns; branches several to many at mid-culm and upper nodes, with central 3 slightly longer and thicker. Abnormal culms (usual in potted plants) 25–50 cm, 1–2 cm in diam., internodes shortened and swollen at base, branch internodes also shortened and swollen; branches only on upper nodes, usually solitary, without thorns. Culm sheaths deciduous, obviously ribbed-striate, glabrous, apex nearly symmetrical, broadly arched or subtruncate; auricles unequal; larger auricle narrowly ovate to ovate-lanceolate, 5–6 mm; smaller auricle ovate, 3–5 mm; oral setae curved; ligule 0.5–1 mm, very shortly finely fimbriate; blade deciduous, erect or recurved, ovate to ovate-lanceolate, base slightly arched, narrowed, slightly narrower than sheath apex. Leaf sheath glabrous; ligule subtruncate, very short; auricles ovate or falcate; oral setae several, curved; blade linear-lanceolate to lanceolate, 9–18 × 1–2 cm, abaxially densely pubescent, adaxially glabrous. Pseudospikelets solitary or many clustered on each node, linear-lanceolate, slightly compressed, 3–4 cm; prophylls oval, 2.5–3 mm, 2-keeled, apex obtuse; gemmiferous bracts 1–2, narrowly ovate, 4–5 mm, 13–15-veined, apex acute; florets 6–8, basal 1–2 and apical 2–3 usually sterile; rachilla segments flat, 2–3 mm, apex inflated and cupular. Glumes absent or 1, ovate-elliptic, 6.5–8 mm, 15–17-veined, apex acute; lemma ovate-elliptic, 9–11 mm, glabrous, 19–21-veined, apex acute; palea nearly as long as lemma, ciliolate near apex, 4-veined between and on either side of keels, apex acuminate with a cluster of white hairs; lodicules 3, ca. 2 mm, margins long ciliate, anterior 2 slightly asymmetrical, posterior broadly elliptic. Filaments slender; anthers yellow, ca. 6 mm, apex obtuse. Ovary broadly ovoid, 1–1.2 mm, stalked, apex thickened and hairy; style very short, hairy; stigmas 3, ca. 6 mm. Fruit unknown.

Locality: Victoria Peak, Tai Po and gardens (cultivated). *S. C. Lau 793.*
Distribution: Guangdong.
Ecology: New shoots: Late summer to autumn.
Uses: Hedges, ornamental.

Notes: Widely cultivated in S China as an ornamental potted plant, this bamboo is sometimes considered to be a cultivar of *Bambusa tuldoides*, but the flowering material on which that decision was based, collected in the United States, may not represent this species. Moreover, in China the culm sheath of *B. ventricosa* is substantially different from that of *B. tuldoides*.

8. Bambusa chungii McClure
粉箪竹 **(Fig. 85; Photos 271–272)**

Lingnan Sci. J. 15: 639. 1936; HKB 28. 1985; FRPS 9(1): 120, pl. 29. 1996; FOC 22: 33. 2006; FGD 9: 258, fig. 132. 2009.

Lingnania chungii (McClure) McClure, Lingnan Univ. Sci. Bull. 9: 35. 1940.

Lingnania chungii (McClure) McClure var. *petilla* T. H. Wen, J. Bamboo. Res. 1(1): 34. 1982.

Culms 5–10(–18) m, 3–5(–7) cm in diam.; internodes 30–45(–100) cm, initially white powdery, glabrous; wall 3–5 mm thick; nodes flat; sheath scars corky, initially with a ring of dense, brown hairs; branching from distal nodes only. Branches many, subequal. Culm sheaths deciduous, thinly leathery, initially white powdery, silky hairy, apex later glabrous, concave; auricles narrowly oblong, glossy; ligule ca. 1.5 mm, serrulate or long fimbriate; blade deciduous, strongly reflexed, base 1/5–1/3 as wide as sheath apex, adaxially hispidulous. Leaf sheaths glabrous; auricles usually developed; oral setae straight; blade lanceolate, 10–16(–20) × 1–2(–3.5) cm. Pseudospikelets ca. 2 cm; gemmiferous bracts 1–2; florets 4–5. Glumes 1–2; lemma 9–12 mm; palea about as long as lemma. Styles 1–2 mm; stigmas 3 or 2. Caryopsis triangular, 8–9 mm.

Locality: Shing Mun, Sha Tin, Tai Po Kau (cultivated). *H. C. Tang 1125; Nan-Zhu 1125.*

Distribution: Fujian, Guangdong, Guangxi, S Hunan, SE Yunnan.

Ecology: New shoots: Summer.

Uses: Ornamental.

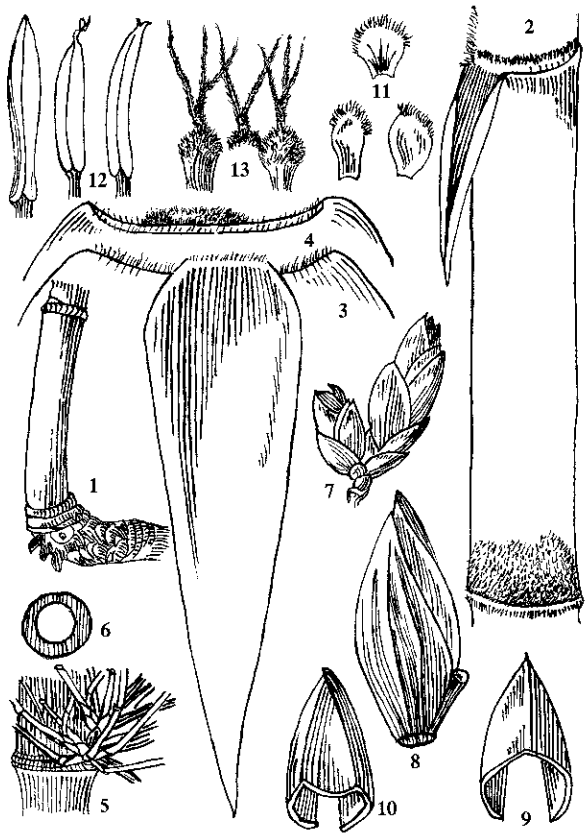

Figure 85. *Bambusa chungii* McClure

1. portion of culm base and rhizome; *2.* portion of young culm. showing culm sheath; *3.* abaxial view of culm sheath apex; *4.* adaxial view of culm sheath apex; *5.* portion of culm; showing branching pattern; *6.* cross section of culm; *7.* portion of inflorescence; *8.* floret; *9.* apex of lemma; *10.* apex of palea; *11.* lodicules; *12.* stamens; *13.* pistils. (drawn by X. L. Chen)

9. Bambusa beecheyana Munro 吊絲球竹 **(Fig. 86)**

Trans. Linn. Soc. London. 26: 108. 1868; FKH 331. 1912; HKB 27. 1985; FOC 22: 36. 2006; FGD 9: 265, fig. 133. 2009.

Arundarbor beecheyana (Munro) Kuntze, Revis. Gen. Pl. 2: 761. 1891.

Dendrocalamopsis beecheyana (Munro) Keng f., J. Bamboo Res. 2(1): 12. 1983; FRPS 9(1): 143. 1996.

Neosinocalamus beecheyanus (Munro) Keng f. & T. H. Wen, J. Bamboo Res. 4(2): 18. 1985.

Sinocalamus beecheyanus (Munro) McClure, Lingnan Univ. Sci. Bull. 9: 67. 1940.

Culms to 16 m, 9–10 cm in diam., apically long pendulous; internodes 34–41 cm, initially thickly white powdery, sparsely pubescent, without a brown pubescent ring below nodes; wall 1.5–2 cm thick; nodes flat, basal ones without branches. Branches several, 1–3 dominant. Culm sheaths deciduous, leathery, initially with uneven, dark brown, spinous hairs; auricles small at lower nodes, larger at distal nodes; oral setae present or absent; ligule 2–4 mm, ciliate; blade recurved, triangular, base 1/2–4/5 as wide as sheath apex, adaxially hirtellous. Leaf sheaths initially hirtellous; ligule truncate, 0.5–1 mm; auricles absent or minute; oral setae scarce or absent; blade oblong-lanceolate, 11–28 × 1.5–3.5 cm. Pseudospikelets 1.5–2 × 0.5–0.8 cm; florets 6–8; rachilla not disarticulating, internodes ca. 2 mm. Glumes 2, cordate, 4–5 mm, ciliate; lemma ca. 0.9 × 0.9 cm; palea 4–8 mm, abaxially hirtellous, apex acuminate or obtuse; lodicules 3, ciliate. Anthers ca. 5 mm. Ovary ovoid, ca. 1.5 mm; styles 3–4 mm; stigmas 2–4, ca. 6 mm. Caryopsis unknown.

Locality: Kowloon, Sha Tin, Tai Po Kau, Tai Po, Sheung Shui, Lantau Island (cultivated). *H. C. Tang 1127; Y. S. Lau 2671; L. T. Lo 637.*

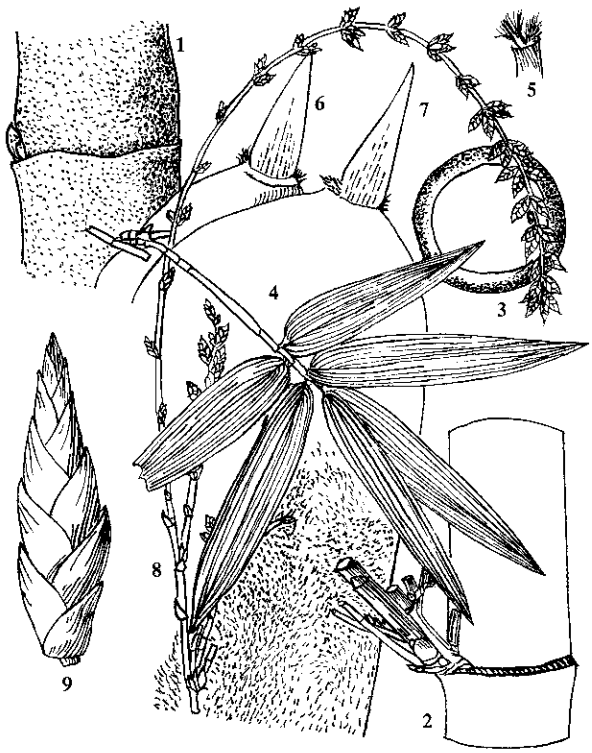

Figure 86. *Bambusa beecheyana* Munro

1. portion of culm (showing node); *2.* portion of culm (showing branchiness); *3.* cross section of culm; *4.* leafy branchlet; *5.* petiole and ligule; *6.* abaxial view of lower culm sheath; *7.* adaxial view of uper culm sheath; *8.* flowering branchlet; *9.* spikelet. (drawn by X. L. Chen)

Distribution: Guangdong, Guangxi, Hainan, Taiwan.
Ecology: New shoots: Jun.–Jul.; flowering: Sep.–Dec.
Uses: Vegetable.

10. Bambusa vulgaris Schrad. ex J. C. Wendl. 龍頭竹(銀竹、泰山竹) **(Photos 273–274)**
Coll. Pl. 2: 26. 1810; FTW 5: 765, pl. 1512. 1978; HKB 53. 1985; FRPS 9(1): 96, pl. 24: 1–3. 1996; FOC 22: 25. 2006; FGD 9: 254. 2009.

Clumps rather open. Culms 8–15 m, 5–9 cm in diam., basally straight or flexuose, apically drooping; internodes deep green, 20–30 cm, initially thinly white powdery, stiffly pale brown strigose; wall slightly thick; nodes slightly prominent, basal several with aerial roots and rings of greyish white silky hairs below and above sheath scar; usually branching from lower nodes. Branches several to many, clustered, central dominant. Culm sheaths deciduous, ribbed-striate when dry, densely stiffly deciduously dark brown hairy, apex arched below blade, concave below auricles; auricles conspicuous, ascending, nearly equal in shape and size, oblong or reniform, 8–10 mm; oral setae curved, fine; ligule 3–4 mm, serrate, very shortly white ciliolate; blade deciduous, erect or deflexed, broadly triangular to triangular, base slightly rounded, ca. 1/2 width of sheath apex, abaxially sparsely stiffly dull brown hairy, adaxially densely stiffly dull brown hairy between veins, apex involute, sharply apiculate. Leaf blade narrowly lanceolate, 10–30 × 1.3–2.5 cm, both surfaces glabrous. Pseudospikelets several, clustered at nodes, narrowly lanceolate to linear-lanceolate, slightly flattened, 2–3.5 × 0.4–0.5 mm, apparently bifid; gemmiferous bracts several; florets 5–10; rachilla segments 1.5–3 mm. Glumes 1–2, abaxially shortly hairy near apex, apex apiculate; lemma 8–10 mm, abaxially shortly hairy near apex, apex apiculate; palea slightly shorter than lemma, keels ciliolate; lodicules 3, 2–2.5 mm, margins long ciliate. Anthers ca. 6 mm, apex penicillate. Style 3–7 mm, slender; stigmas 3, short.

Locality: Tai Po Kau, Sheung Shui, Shing Mun Arboretum and gardens (cultivated). *H. C. Tang 1103; N. K. Chan 2763.*
Distribution: Yunnan; SE Asia; cultivated in the tropical and subtropical regions all over the world.
Ecology: Riversides, open forests. New shoots: Summer.
Uses: Ornamental.

10a. Bambusa vulgaris Schrad. ex J. C. Wendl. 'Wamin' 大佛肚竹 **(Photos 275–276)**
McClure, Bamb. 162, f. 72(5–6). 1966; FTW 5: 766. 1978; HKB 55. 1985; FRPS 9(1): 97. 1996; FGD 9: 255. 2009.
Bambusa ? wamin Brandis ex E. G. Camus, Bambus. 135. 1913.
Bambusa vulgaris Schrad. ex J. C. Wendl. f. *waminii* T. H. Wen, J. Bamboo Res. 4(2): 16. 1985.

It differs from *B. vulgaris* by culm internodes shortened and basally swollen.
Locality: Cultivated. *P. S. Choi 273.*
Distribution: Widely cultivated in the tropical and subtropical regions of the world.
Ecology: New shoots: Summer.
Uses: Ornamental.

10b. Bambusa vulgaris Schrad. ex J. C. Wendl. 'Vittata' 黃金間碧竹 **(Photo 277)**
Fieldiana, Bot., n.s. 24(2): 60. 1955; FRPS 9(1): 97. 1996; FGD 9: 254. 2009.
Bambusa striata Lodd. ex Lindl., Penny Cyclop. 3: 357. 1835.
Bambusa vulgaris Schrad. ex J. C. Wendl. var. *striata* (Lodd. ex Lindl.) Gamble, Ann. Roy. Bot. Gard. (Calcutta) 7: 44. 1896; FGZ 771. 1956; FHN 4: 354. 1977; FTW 5: 766. 1978.
Bambusa vulgaris Schrad. ex J. C. Wendl. var. *vittata* Rivière & C. Rivière, Bull. Soc. Natl. Acclim. France , ser. 3, 5: 640. 1878; HKB 54. 1985.

It differs from *B. vulgaris* by culm internodes yellow with green stripes.
Locality: Widely cultivated in Hong Kong. *K. S. Pang 13.*
Distribution: Widely cultivated in the tropical and subtropical regions of the world.
Ecology: New shoots: Summer.
Uses: Ornamental.

11. Bambusa eutuldoides McClure 大眼竹 **(Photos 278–279)**
Lingnan Univ. Sci. Bull. 9: 8. 1940; HKB 33. 1985; FRPS 9(1): 82, pl. 17: 1–12. 1996; FOC 22: 22. 2006; FGD 9: 241. 2009.

Culms 6–12 m, 4–6 cm in diam., basally straight, apically slightly drooping; internodes 30–40 cm, fistulose, initially thinly white powdery, sometimes sparsely deciduously stiffly hairy below nodes; wall ca. 5 mm thick; nodes slightly prominent, basal several with rings of grey-white silky hairs below and above sheath scar; branching from 2nd or 3rd node up. Branches several or many, clustered, central 3 dominant. Culm sheaths deciduous, triangular to narrowly triangular, leathery, glabrous or sometimes very sparsely stiffly strigose, apex long slanted along one side, extremely asymmetric, arched; auricles extremely asymmetric, of various shapes, rigid, wrinkled; larger auricle extremely decurrent, oblanceolate to narrowly oblong, 5–6.5 × ca. 1.5 cm; smaller auricle suborbicular or oblong, ca. 1 cm in diam., or sometimes thoroughly joined to blade base; oral setae undulate; ligule 3–5 mm, irregularly dentate or laciniate, shortly fimbriate; blade deciduous, erect, asymmetric, triangular to narrowly triangular, base slightly narrowed and then extending outward to join auricles, nearly 3/5 width of sheath apex, abaxially sparsely stiffly deciduous-hairy. Leaf blade abaxially green, lanceolate to broadly lanceolate, usually 12–25 × 1.4–2.5 cm, abaxially densely pubescent, adaxially glabrous. Pseudospikelets sessile, clustered at each node of flowering branches and branchlets, linear, 2.5–5.5 cm, with several bud-bearing bracts at base; florets

5–6; rachilla segments flat, 3–4 mm, apex inflated and ciliolate. Glume 1, with very small purple spots, oblong, 9–10 mm, 11-veined, glabrous, apex acute, apiculate; lemma similar to glumes, oblong, 1.2–1.3 cm, 13–15-veined; palea lanceolate, ca. 1.1 cm, keels ciliolate toward tip, 4-veined between and 2-veined on either side of keels; lodicules 3, unequal, anterior 2 narrow, ca. 2 mm, apex long ciliate, posterior 1 larger, broadly ovate or suborbicular, ca. 2 mm. Anthers ca. 5 mm, apex bifid. Ovary subglobose, ca. 1 mm in diam., apex hispidulous; style very short, hispidulous; stigmas 3. Caryopsis initially nearly obovoid, ca. 5 mm, apex hispidulous with persistent style base.

Locality: Tai Po Kau, Sheung Shui (cultivated). *Nan-Zhu 2771; H. C. Tang 1100.*

Distribution: Guangdong, Guangxi.

Ecology: New shoots: Summer.

Uses: Environmental, ornamental.

12. Bambusa tuldoides Munro

青秆竹(花眉竹) **(Fig. 87; Photos 280–281)**

Trans. Linn. Soc. London. 26: 93. 1868; FKH 331. 1912; HKB 51. 1985; FRPS 9(1): 87, pl. 20: 1–10. 1996; FOC 22: 23. 2006; FGD 9: 243, fig. 131. 2009.

Bambusa angulata Munro, Trans. Linn. Soc. London 26(1): 94. 1868.

Bambusa breviflora Munro, Trans. Linn. Soc. London 26(1): 96. 1868.

Bambusa fauriei Hack., Bull. Herb. Boissier, sér. 2, 4(6): 529. 1904.

Bambusa flavonoda W. T. Lin, J. Bamboo Res. 1986(2): 23. 1986.

Bambusa longiflora W. T. Lin, Bull. Bot. Lab. N.-E. Forest. Inst., Harbin 1980(6): 85, fig. 1. 1980.

Bambusa parvifolia W. T. Lin, Bamboo Res. 1986(2): 22. 1986.

Chimonobambusa angulata (Munro) Nakai, Sci. Educ. (Tokyo) 15(16): 67. 1932.

Tetragonocalamus angulatus (Munro) Nakai, J. Jap. Bot. 9(2): 86, 88, pl. 10. 1933.

Bambusa tulda auct. non Roxb.: FHK 434. 1861.

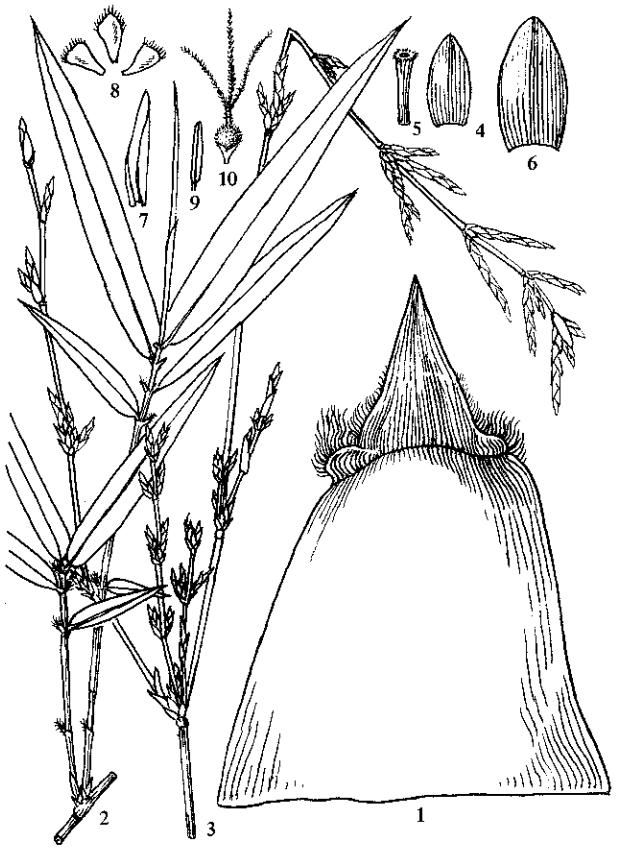

Figure 87. *Bambusa tuldoides* Munro

1. abaxial view of culm sheath; *2.* leafy branchlet; *3.* flowering branchlet; *4.* glume; *5.* rachilla internode; *6.* lemma; *7.* palea; *8.* lodicules; *9.* stamen; *10.* pistil. (drawn by H. P. Yu)

Culms 6–10 m, 3–5 cm in diam., apically slightly drooping; internodes 30–36 cm, initially thinly white powdery; wall thick; nodes slightly prominent, basal 1 or 2 with rings of grey-white silky hairs below and above sheath scar; branching from base up. Branches several to many, clustered, central 3 dominant. Culm sheaths deciduous, convex and slanted along outer margin for 1/10–1/8 of length of sheath, with 1–3 pale yellow stripes toward outer margin, glabrous, apex asymmetrically arched; auricles unequal, outer one larger, ovate to ovate-elliptic, ca. 2.5 × 1–1.4 cm, slightly wrinkled; inner one smaller, ovate to elliptic, ascending, ca. 1/2 size of larger; oral setae slender, undulate; ligule 3–4 mm, laciniate, dznsely fimbriate; blade deciduous, erect, asymmetrically ovate-triangular to narrowly triangular, sparsely deciduously stiffly brown or pale brown strigose, base slightly rounded and then extending outward to join auricles for 5–7 mm, nearly 2/3–3/4 width of sheath apex, margin slightly wrinkled near base and fringed, apex subulate, acuminate. Leaf blade lanceolate to narrowly lanceolate, 10–18 × 1.5–2 cm, abaxially densely pubescent, adaxially glabrous or sparsely pilose near base. Pseudospikelets several at each node of flowering branches, pale green, linear-lanceolate, slightly flat, 2–3 × 0.3–0.4 cm; prophylls 2-keeled, keels ciliate, subtended by sheath-like bracts; gemmiferous bracts 2, glabrous, apex obtuse; florets 6–7, proximally and distally sterile; rachilla segments flat, 3–4 mm, apex inflated and cupular, hairy. Glume 1, ovate-oblong, ca. 8.5 mm, glabrous, apex acute; lemma ovate-oblong, 1.1–1.4 cm, ca. 19-veined, glabrous, apex obtuse, mucronate; palea about as long as or slightly shorter than lemma, 4-veined between and 4-veined on either side of keels, penicillate; lodicules 3, anterior 2 obovate, oblique, short, ca. 2.5 mm, broad, margins long ciliate; posterior 1 long, ca. 3 mm, narrow. Anthers ca. 3 mm, apex emarginate. Ovary obovoid, ca. 1.2 mm, stalked, apex thickened and hispid; style ca. 0.7 mm, hispid; stigmas 3, ca. 5.5 mm. Caryopsis terete, slightly curved, ca. 8 mm, ca. 1.5 mm in diam., apex obtuse and thickened, hispid, with remains of style.

Locality: New Territories, Lantau Island. *H. C. Tang 1108; Y. S. Lau 849, 2686.*

Distribution: Guangdong, Guangxi.

Ecology: Low hills, river banks, commonly cultivated around villages. New shoots: Summer.

Uses: Timber, weaving.

Notes: The type specimen (*Hance 3657*, K) was collected from Hong Kong in 1862.

13. Bambusa gibboides W. T. Lin 魚肚腩竹 **(Photos 282–283)**

Acta Phytotax. Sin. 16(1): 70. 1978; HKB 36. 1985; FRPS 9(1): 98, pl. 18: 1–10. 1996; FOC 22: 26. 2006; FGD 9: 247. 2009.

Culms 10–12 m, 5–7 cm in diam., basally flexuose, apically drooping; internodes slightly curved, basally slightly swollen, 40–47 cm, initially thinly white powdery, stiffly brown strigose; wall slightly thick; nodes slightly prominent, basal 2 usually with rings of grey-white silky hairs; branching from basal or 2nd node up. Branches solitary on basal nodes, several to many at mid-culm and distal nodes, central obviously dominant. Culm sheaths deciduous, ribbed-striate when dry, with appressed, dull brown hairs near base, apex subtruncate; auricles unequal, horizontal along both sides of sheath apex, larger ones oblong to narrowly oblong, ca. 2 × 0.5–0.6 cm, smaller auricle elliptic, ca. 1/2 size of larger one; oral setae undulate; ligule 2–3 mm, dentate, shortly fringed; blade erect, narrowly ovate to ovate-triangular, ca. 1/2 as long as sheath, base slightly rounded and joined to auricles for ca. 3 mm, ca. 2/3 width of sheath apex. Leaf blade linear-lanceolate to narrowly lanceolate, 10–20 × 1.3–2 cm, abaxially densely pubescent, adaxially glabrous. Pseudospikelets several, clustered at nodes of flowering branches, linear-lanceolate, slightly flat, 3–4 cm; prophylls ovate, keels ciliolate toward apex, apex obtuse; gemmiferous bracts usually 2, ovate; florets 5–7, apical 1–2 usually sterile; rachilla segments flat, 3–4 mm, apex inflated and hairy. Glume 1, ovate, 6–8 mm, many-veined, apex mucronate; lemma ovate-elliptic, 1–1.4 cm, glabrous, many-veined, apex acute, mucronate; palea slightly longer than lemma, sparsely very shortly ciliolate near apex or sometimes subglabrous, 6–7-veined between and 3–4-veined on either side of keels, apex obtuse; lodicules 3, unequal, posterior 1 slightly larger, obovate, base thickened, margin finely ciliate. Filaments short; anthers yellow, apex obtuse. Ovary ovoid, apex hispidulous; style very short; stigmas 3. Caryopsis unknown.

Locality: Cultivated. *Y. S. Lau 3299; Nan-Zhu 2775.*

Distribution: Guangdong.

Ecology: New shoots: Summer.

Uses: Vegetable.

14. Bambusa pachinensis Hayata var. **hirsutissima** (Odash.) W. C. Lin 長毛米篩竹 **(Photos 284–285)**

Bull. Taiwan Forest. Res. Inst. 98: 21. 1964; FRPS 9(1): 105, pl. 25: 15–16. 1996; FOC 22: 28. 2006; FGD 9: 249. 2009.

Leleba beisitiku Odash. var. *hirsutissima* Odash., J. Soc. Trop. Agric. 8: 58. 1936.

Bambusa textilis McClure var. *fusca* McClure, Lingnan Univ. Sci. Bull. 9: 16. 1940; HKB 48. 1985.

Leleba pachinensis (Hayata) Nakai var. *hir-sutissima* (Odash.) W. C. Lin, Bull. Taiwan Forest. Res. Inst. 69: 61, fig. 28–29. 1961.

Culms 3–8 m, 1–4.5 cm in diam., apically slightly drooping; internodes 30–70 cm, initially thinly white powdery, sparsely stiffly pale or dark brown strigose; wall thin; nodes flat, basal 5 nodes usually with rings of grey-white silky hairs below and above sheath scar; branching from 8th to 10th node up. Branches several to many, clustered, 3 central dominant. Culm sheaths deciduous, leathery, rigid, broadly arched, uniformly stiffly dull brown strigose, apex slanted on outer side, asymmetrical; auricles unequal, slightly wrinkled, larger ones oblong or lanceolate, 1–1.5 × 0.4–0.5 cm, ends subrounded and slanted downward, smaller auricle subovate, ca. 1/3 size of larger one, ends slightly ascending; oral setae fine, curved, long; ligule ca. 1 mm, long fimbriate, fimbriae 5–10 mm; blade erect, slightly asymmetrically ovate to ovate-triangular, 1/3–1/2 length of sheath, base slightly cordate, narrowed and joined with auricles for 2–3 mm, abaxially very sparsely brown hairy, adaxially scabrous, apex acuminate, apiculate. Leaf blade linear to lanceolate, 8–18 × 1–2 cm, abaxially densely villous, adaxially glabrous. Pseudospikelets lanceolate to linear-lanceolate, 2–3.5 × 0.4–0.5 cm; prophylls ca. 2.5 mm, keels ciliolate; gemmiferous bracts 2–3, ovate, to 7 mm, glabrous, 15–17-veined, apex obtuse and mucronate. Lemma ovate-elliptic, ca. 1.2 cm, glabrous, 17–19-veined, apex acute, mucronate; palea lanceolate, ca. 1.1 cm, slightly shorter than lemma, keels not ciliate, 5–6-veined between and 3–4-veined on either side of keels, margin irregularly dentate, apex 3-fid and with a cluster of white long hairs; lodicules 3, unequal, anterior 2 spatulate, ca. 3 mm, margins long ciliate, posterior 1 nearly obovate-elliptic, ca. 1.6 mm. Filaments slender; anthers ca. 4 mm. Ovary ovoid, ca. 1.5 mm, base stalked, apex thickened and hispid; style ca. 0.5 mm, hispid; stigmas 3, ca. 5 mm. Mature caryopsis unknown.

Locality: Tai Po Kau, Sha Tin, Lantau Island. *Nan-Zhu 2776, 2785; HK sheet 0883.*

Distribution: Fujian, Guangdong, Guangxi, Taiwan, Zhejiang.

Ecology: Usually cultivated, low hills, around villages. New shoots: Summer.

Uses: Weaving.

15. Bambusa textilis McClure 青皮竹 **(Photo 286)**

Lingnan Univ. Sci. Bull. 9: 14. 1940; FGZ 772. 1956; HKB 47. 1985; FRPS 9(1): 122, pl. 30: 1–12. 1996; FOC 22: 29. 2006; FGD 9: 250. 2009.

Culms 8–10 m, 3–5 cm in diam., apically slightly drooping; internodes green, 40–70 cm, initially thinly white powdery, ± stiffly pale brown hairy; wall 2–5 mm thick; nodes flat, glabrous; branching from 7th to 11th node upward. Culm sheaths deciduous, leathery, rigid, slightly glossy, basally stiffly dull brown strigose, apex slightly slanted and asymmetric, broadly arched; auricles unequal, ends not decurrent, larger one narrowly oblong to lanceolate, slightly slanted, ca. 1.5 × 0.4–0.5 cm, smaller one oblong, not slanted, ca. 1/2 size of larger; oral setae slender, undulate; ligule ca. 2 mm, dentate or sometimes laciniate, ciliolate; blade deciduous, erect, narrowly ovate-triangular, ca. 2/3 as long as sheath, abaxially sometimes stiffly hairy between veins, basally sparsely dull brown hairy, adaxially scabrid, base slightly cordate, narrowed, nearly 2/3 as wide as sheath apex. Leaf blade linear-lanceolate to narrowly lanceolate, 9–17 × 1–2 cm, abaxially densely pubescent, adaxially glabrous. Pseudospikelets solitary or several to many, clustered at each node of flowering branches, dull purple when fresh, bronze-coloured when dry, linear-lanceolate, slightly curved, 3–4.5 × 0.5–0.8 cm; prophylls ovate, ca. 3 mm, keels glabrous; gemmiferous bracts 2–3, ovate, 3–4.5 mm, glabrous, apex acute, mucronate; florets 5–8, apical one sterile; rachilla

segments subterete or flat, ca. 4 mm, apex enlarged. Glume 1, ovate, ca. 6 mm, ca. 20-veined, glabrous, apex acute, mucronate; lemma elliptic, 1.1–1.4 cm, glabrous, ca. 25-veined, apex acute, mucronate; palea lanceolate, 1.2–1.4 cm, slightly longer than lemma, keels glabrous, ca. 10-veined between and 4-veined on either side of keels; lodicules unequal; anterior 2 subspatulate, ca. 3 mm, margins long ciliate; posterior obovate-elliptic, ca. 2 mm. Filaments slender; anthers yellow, ca. 5 mm. Ovary broadly ovoid, ca. 2 mm in diam., base stalked, apex thickened and hispidulous; style ca. 0.7 mm, hispidulous; stigmas 3, 6–7 mm. Mature caryopsis unknown.

Locality: Tai Po Kau, Kwun Yam Shan, Sheung Shui (cultivated). *H. C. Tang 1109; Nan-Zhu 2768; S. C. Lau 753.*

Distribution: Guangdong, Guangxi.

Ecology: Usually cultivated, along rivers, around villages. New shoots: Summer.

Uses: Weaving, ornamental.

15a. Bambusa textilis McClure var. **glabra** McClure 光秆青皮竹(黃竹) **(Photos 287–288)**

Lingnan Univ. Sci. Bull. 9: 16. 1940; HKB 49. 1985; FRPS 9(1): 125. 1996; FOC 22: 30. 2006; FGD 9: 251. 2009.

Culms 3–5 cm in diam.; internodes and sheaths glabrous. Culm sheath blade nearly 1/2 as long as sheath proper, base slightly rounded; ligule 1–1.5 mm.

Locality: Tai Po, Chung Mei (cultivated). *Nan-Zhu 2753.*

Distribution: Guangdong, Guangxi.

Ecology: New shoots: Summer.

Uses: Ornamental.

15b. Bambusa textilis McClure var. **gracilis** McClure 崖州竹 **(Photos 289–290)**

Lingnan Univ. Sci. Bull. 9: 16. 1940; HKB 50. 1985; FRPS 9(1): 126. 1996; FOC 22: 30. 2006; FGD 9: 251. 2009.

Culms slender, less than 3 cm in diam. Culm sheath with sparse, stiff, dull brown hairs near both sides and base, blade to 1/2 as long as sheath proper, base slightly rounded; ligule ca. 1 mm.

Locality: New Territories (cultivated). *Nan-Zhu 2764.*

Distribution: Guangdong, Guangxi.

Ecology: New shoots: Summer.

Uses: Ornamental.

16. Bambusa multiplex (Lour.) Raeusch. ex Schult. & Schult. f. 孝順竹(蓬萊竹) **(Photos 291–292)**

Syst. Veg. 7(2): 1350. 1830; FGZ 771. 1956; FHN 4: 355. 1977; FRPS 9(1): 108, pl. 26: 1–15. 1996; FOC 22: 30. 2006; FGD 9: 251. 2009.

Arundo multiplex Lour., Fl. Cochinch. 1: 58. 1790.

Arundinaria glaucescens (Willd.) P. Beauv., Ess. Agrostogr. 144, 152. 1812.

Bambusa glaucescens (Willd.) Merr., Philipp. J. Sci. 7(4): 230. 1912; HKB 37. 1985.

Bambusa nana Roxb., Fl. Ind. (ed. 1832) 2: 199. 1832.

Ludolfia glaucescens Willd., Ges. Naturf. Freunde Berlin Mag. Neuesten Entdeck. Gesammten Naturk. 2: 320. 1808.

Culms suberect or apically slightly drooping, 4–7 m, 1.5–2.5 cm in diam.; internodes 30–50 cm, thinly white powdery, distally stiffly deciduously brown or dull brown hairy, especially densely so below nodes; wall usually rather thin; nodes slightly prominent, glabrous; branching from 2nd or 3rd node up. Branches several to many, clustered, subequal or central slightly dominant. Culm sheaths deciduous, trapezoid, initially thinly white powdery, glabrous, asymmetrically arched, slanted along outer side, apex asymmetrically arched, convex; auricles very small to inconspicuous, oral setae few; ligule 1–1.5 mm, irregularly dentate; blade deciduous, erect, narrowly triangular, base nearly as wide as sheath apex, abaxially with scattered, stiff, dull brown hairs, adaxially scabrous, apex acuminate. Leaves 5–12 per ultimate branch; leaf blade abaxially pale glaucous, adaxially bright green, linear, 5–16 × 0.7–1.6 cm, abaxially densely pubescent, adaxially glabrous. Pseudospikelets solitary or several clustered at nodes of flowering branches, linear to linear-lanceolate, 3–6 cm; prophylls ca. 3.5 mm, 2-keeled, keels ciliolate; gemmiferous bracts usually 1 or 2, ovate to narrowly ovate, 4–7.5 mm, glabrous, 9–13-veined, apex obtuse or acute; florets (3–)5–13, middle ones fertile; rachilla segments flat, 4–4.5 mm, glabrous. Glumes absent; lemma asymmetrical, oblong-lanceolate, ca. 1.8 cm, glabrous, 19–21-veined, apex acute; palea linear, 1.4–1.6 cm, keels ciliolate, 6-veined between and 4-veined on one side and 3-veined on other side of keels, apex subtruncate, ciliolate, with a fine hairy tip on each side; lodicules 3, anterior 2 subovate, 2.5–3 mm, posterior narrowly lanceolate, 3–5 mm, margins glabrous. Filaments 0.8–1 cm; anthers purple, ca. 6 mm, apex penicillate. Ovary ovoid, ca. 1 mm, base with stalk ca. 1 mm, apex thickened and hispidulous; stigmas 3 or variable in number, ca. 5 mm, directly exserted from ovary apex. Mature caryopsis unknown.

Locality: Victoria Peak, Tai Po Kau, Sheung Shui (cultivated). *Y. S. Lau 3047; L. T. Lo 637; S. C. Lau 747.*

Distribution: Guangdong, Guangxi, Hainan, Yunnan; SE Asia.

Ecology: Wild and cultivated, fields, mountains, low hills, riversides. New shoots: Summer.

Uses: Ornamental, hedges.

16a. Bambusa multiplex (Lour.) Raeusch. ex Schult. & Schult. f. 'Fernleaf' 鳳尾竹 **(Photos 293–294)**

R. A. Young, Agric. Handb. 193: 40. 1961; FTW 5: 755. 1978; FRPS 9(1): 113. 1996.

Bambusa glaucescens (Willd.) Siebold ex Munro 'Fernleaf', Phytologia 52(4): 258. 1982; HKB 38. 1985.

Bambusa multiplex (Lour.) Raeusch. ex Schult. & Schult. f. var. *fernleaf* R. A. Young, Natl. Hort. Mag. 25: 261. 1946.

Bambusa multiplex (Lour.) Raeusch. ex Schult. & Schult. f. f. *fernleaf* (R. A. Young) T. P. Yi, J. Sichuan For. Sci. & Techn. 28(3): 17. 2007.

It differs from *B. multiplex* var. *riviereorum* by plants 3–6 m tall, culm internodes hollow, branchlets slightly curved downwards, with 9–13 leaves, leaf blade 3.3–6.5 × 0.4–0.7 cm.

Locality: Ma Liu Shui, Sheung Shui (cultivated). *H. C. Tang 1116.*

Distribution: S, E & SW China.

Ecology: Wild and cultivated, fields, mountains, low hills, riversides. New shoots: Summer.

Uses: Ornamental.

16b. Bambusa multiplex (Lour.) Raeusch. ex Schult. & Schult. f. var. **riviereorum** Maire 觀音竹
Fl. Afrique N. 1: 355. 1952; FRPS 9(1): 111. 1996; FOC 22: 31. 2006.

Bambusa glaucescens (Willd.) Siebold ex Munro var. *riviereorum* (Maire) L. C. Chia & H. L. Fung, Phytologyia 52(4): 257. 1982; HKB 39. 1985.

Bambusa multiplex (Lour) Raeusch ex Schult. & Schult. f. var. *nana* auct. non (Roxb.) Keng f.: FGZ 771. 1956.

It differs from *B. multiplex* var. *multiplex* by culms 1–3 m, 3–5 mm in diam., internodes solid, branches usually bent downward, bow-shaped, culm sheath slanted along one side, apex asymmetrically arched-convex, ultimate branches with 13–23 leaves, blades small, 1.6–3.2 × 0.3–0.7 cm.

Locality: Lantau Island (cultivated). *N. K. Chan 2795.*

Distribution: Guangdong.

Ecology: New shoots: Summer.

Uses: Ornamental.

16c. Bambusa multiplex (Lour.) Raeusch. ex Schult. & Schult. f. 'Silverstripe' 銀絲竹
R. A. Young, Agric. Handb. 193: 41. 1961; FRPS 9(1): 112. 1996.

Bambusa glaucescens (Willd.) Siebold ex Munro 'Silvrstripe' L.C. Chia & But; Phytologia 52(4): 259. 1982; HKB 39. 1985.

It differs from *B. multiplex* var. *multiplex* by lower internodes of culm, culm sheath and few foliage, leaves green with white stripes.

Locality: Tai Po Kau (cultivated). *Nan-Zhu 2774.*

Distribution: Guangdong.

Ecology: New shoots: Summer.

Uses: Ornamental.

16d. Bambusa multiplex (Lour.) Raeusch. ex Schult. & Schult. f. 'Alphonse Karr' 小琴絲竹 **(Photos 295–296)**
R. A. Young, Agr. Handb. 193: 40. 1961; FRPS 9(1): 112. 1996.

It differs from *B. multiplex* var. *multiplex* by culm internodes yellow with green stripes.

Locality: Cultivated.

Distribution: Guangdong.

Ecology: New shoots: Summer.

Uses: Ornamental.

16e. Bambusa multiplex (Lour.) Raeusch. ex Schult. & Schult. f. 'Stripestem Fernleaf' 小葉琴絲竹 **(Photos 297–298)**
R. A. Young, Agr. Handb. 193: 41. 1961; FRPS 9(1): 112. 1996.

It differs from *B. multiplex* 'Fernleaf' by plant shorter, 1–3 m, culms pale red first, turning yellow later, with green stripes, ultimate branches with 12–20 leaves, leaf blade 1.6–3.8 cm.

Locality: Sai Kung (cultivated). *HK sheet 37609.*

Distribution: Guangdong, Taiwan, Sichuan (cultivated).

Ecology: New shoots: Summer.

Uses: Ornamental.

4. Dendrocalamus Nees 牡竹屬

Arborescent bamboos, large-sized; clumps dense. Rhizomes short necked, pachymorph. Culms unicaespitose, erect, or occasionally scrambling, apex usually pendulous; internodes terete. Branches several to many, none to 3 dominant. Culm sheaths deciduous; ligule conspicuous; auricles often absent or small; blade usually recurved, or erect. Leaf blades usually large; ligule conspicuous; auricles usually absent; venation not tessellate. Inflorescence iterauctant, fully bracteate, subtended by a narrow single-keeled prophyll, pseudospikelets clustered in soft or spiky globose mass at nodes of leafless flowering branches. Pseudospikelets prophyllate, (1–)2–8-flowered, with or without rachilla extension and rudiment, sessile, fertile glumes preceded by 1 or more gemmiferous bracts and 0–2 empty glumes. Prophyll narrow, single-keeled. Rachilla internodes usually abbreviated and not disarticulating; florets falling together. Lemma broad, nearly equal to palea, many-veined, sometimes long mucronate; palea of lower florets 2-keeled, but rounded

or imperfectly keeled in terminal floret if rachilla extension small or absent, apex acute or shortly bifid; lodicules absent or variably 1–3. Stamens 6; filaments usually free, rarely united into a loose tube. Ovary stalked, apex thickened and hairy; style very short, solid; stigmas 1(–3), long, hairy, plumose. Caryopsis terete, apex hairy; pericarp slightly thickened.

About 40 species distributed in subtropical and tropical Asia; 27 species (15 endemic) in China, mostly in the southwest; three species in Hong Kong.

1a. Culm internodes pale brown hairy; ligule 7–10 mm ..... 1. *D. asper*
1b. Culm internodes glabrous to nearly glabrous; ligule 2–4 mm.
2a. Leaf blade 20–40 × 4–7.5 cm; foliage leaf ligule truncate ..... 2. *D. latiflorus*
2b. Leaf blade 13–20 × 2.5–3.3 cm; foliage leaf ligule arched ..... 3. *D. pulverulentus*

1. Dendrocalamus asper (Schult. & Schult. f.) Backer ex K. Heyne 馬來甜龍竹

Nutt. Pl. Ned.-Ind., ed. 2. 1: 301. 1927; HKB 58. 1985; FRPS 9(1): 193, pl. 49: 1–2. 1996; FOC 22: 43. 2006; FGD 9: 270. 2009.

Bambusa aspera Schult. & Schult. f., Syst. Veg. 7: 1352. 1830.

Dendrocalamus flagellifer Munro, Trans. Linn. Soc. London 26(1): 150. 1868.

Culms 15–20 m, 6–10(–12) cm in diam.; internodes 30–50 cm. Branches from ca. 9th node up, central branch dominant. Culm sheaths deciduous, initially light green, leathery, apex rounded; ligule 7–10 mm, margin with brown setae; auricles linear, ca. 20 × 7 mm, margin undulate; oral setae present; blade reflexed, lanceolate. Leaf sheaths initially sparsely hairy, becoming glabrous; ligule truncate, ca. 2 mm, entire or serrulate; blade variable, lanceolate or oblong-lanceolate, (10–)20–30(–35) × (1.5–)3–5 cm. Spikelets 6–9 mm; florets 4–5, apical one sterile. Glumes 1–2, ovate-lanceolate; lemma broadly ovate, margins ciliate; palea about as long as lemma, keels and margins ciliate, 1–3-veined between and 2-veined on either side of keels. Anthers 3–5 mm, apex apiculate. Ovary hairy; style hairy; stigma 1. Fruit unknown.

Locality: Sha Tin, Castle Peak (cultivated). *Nan-Zhu 2804.*

Distribution: Taiwan, Yunnan; Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand.

Ecology: New shoots: Summer.

Uses: Vegetable.

2. Dendrocalamus latiflorus Munro 麻竹 **(Photos 299–300)**

Trans. Linn. Soc. London. 26: 152. 1868; FKH 331. 1912; HKB 59. 1985; FRPS 9(1): 162. 1996; FOC 22: 45. 2006; FGD 9: 270. 2009.

Bambusa latiflora (Munro) Kurz, J. Asiat. Soc. Bengal, Pt. 2. Nat. Hist. 42(2): 250. 1873.

Sinocalamus latiflorus (Munro) McClure, Lingnan Univ. Sci. Bull. 9: 67. 1940.

Bambusa verticillata auct. non Willd.: FHK 434. 1861.

Culms 20–25 m, 15–30 cm in diam.; internodes 45–60 cm; wall 1–3 cm thick. Branches several, central branch dominant. Culm sheaths deciduous, thickly leathery; auricles small; ligule 1–3 mm, serrulate; blade reflexed, ovate to lanceolate. Leaf sheaths initially slightly hairy, becoming glabrous; ligule 1–2 mm, serrulate; blade oblong-lanceolate, 15–35(–50) × 2.5–7 cm. Pseudospikelets 1–7 or more per node. Spikelets 12–15 × 7–13 mm; florets 6–8. Glumes 2 or more, ca. 5 mm, margins ciliate; lemma 12–13 × 7–16 mm; palea 7–11 × 3–4 mm. Anthers yellow, 5–6 mm, apex mucronate. Ovary broadly ovoid; style white hairy; stigma 1. Caryopsis 8–12 mm.

Locality: Sha Tin, Tai Po, Sheung Shui, Lantau Island (cultivated). *H. C. Tang 1095, 1115; Y. S. Lau 3046.*

Distribution: Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Yunnan, cultivated in SW Jiangsu and S Zhejiang; Myanmar, Vietnam.

Ecology: New shoots: Summer.

Uses: Edible (shoot).

3. Dendrocalamus pulverulentus L. C. Chia & But 粉麻竹 **(Fig. 88; Photos 301–302)**

Kew Bull. 43: 115. 1988; HKB 60. 1985; FRPS 9(1): 177, pl. 44: 1–2. 1996; FOC 22: 42. 2006; FGD 9: 272. 2009.

Culms to 8 m, 4–6 cm in diam.; internodes 25–30 cm; wall thick. Branches usually from ca. 10th node upward, several, dominant branches longer and thicker. Culm sheaths deciduous, abaxially appressed brown setose; auricles small or absent; ligule

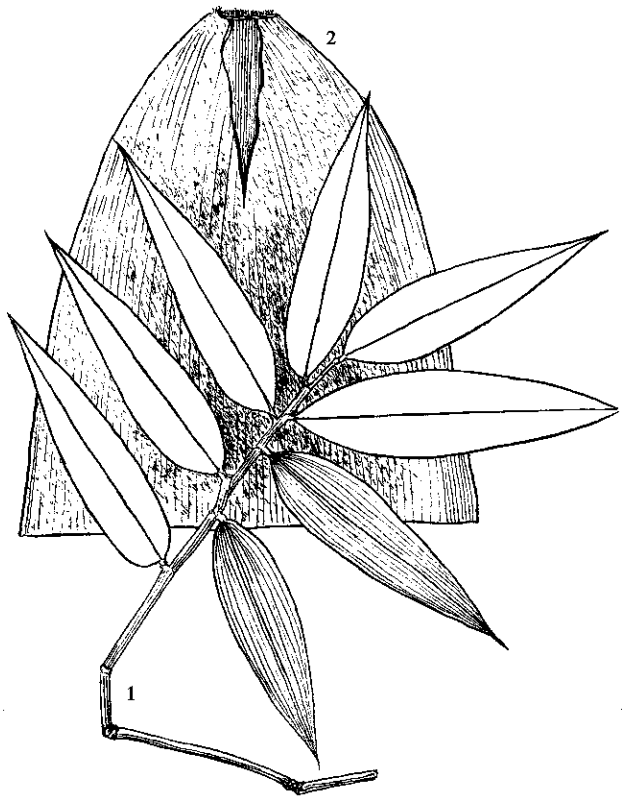

Figure 88. *Dendrocalamus pulverulentus* L. C. Chia & But
1, leafy branchlet; 2, abaxial view of culm sheath. (drawn by H. P. Yu)

ca. 4 mm, margin hairy, apex arched; blade reflexed, lanceolate. Leaf sheaths glabrous; ligule ca. 1 mm, serrulate; blade lanceolate to oblong-lanceolate, 13–20 × 2.5–3.3 cm. Inflorescence unknown.

Locality: Tai Po Kau and gardens (cultivated). *HK sheet 34844.*

Distribution: Guangdong.

Ecology: New shoots: Summer.

Uses: Ornamental.

Notes: The type specimen (*Nan-Zhu 2780*, IBSC) was collected from Tai Po Kau Nature Reserve in 1985.

5. Gigantochloa Kurz ex Munro 巨竹屬

Arborescent bamboos, large-sized; clumps dense. Rhizomes short necked, pachymorph. Culms unicaespitose, erect, pendulous at apex; internodes green initially, often with yellow stripes, terete. Branches several, 1 dominant. Culm sheaths deciduous, very broad, densely hairy; ligule conspicuous; auricles absent or small; blade recurved or erect. Leaves usually large, base cuneate; auricles usually absent; ligule conspicuous; blade cuneate at base, venation not tessellate. Inflorescence iterauctant, fully bracteate, subtended by a narrow single-keeled prophyll, pseudospikelets clustered in soft or spiky globose mass at nodes of leafless flowering branches. Pseudospikelets sessile, prophyllate; florets (1–)2–5, with a sterile terminal floret with lemma only, sessile. Fertile glumes preceded by 1 or more gemmiferous bracts and 0–2 empty glumes; rachilla very short, obscure, not disarticulating; lemma broad, many-veined; palea strongly 2-keeled; lodicules absent. Stamens 6; filaments united into a firm tube; anthers apiculate. Ovary stalked, apex thickened and hairy; stigma 1, long, hairy, plumose. Caryopsis terete, apex hairy; pericarp slightly thickened.

About 30 species distributed in tropical Asia; six species (two endemic) in China; two species cultivated in Hong Kong.

1a. Culms green with pale yellowish white stripes ..... 1. *G. verticillata*

1b. Culms green when young, with purplish red to black stripes, turning black ..... 2. *G. atroviolacea*

1. Gigantochloa verticillata (Willd.) Munro 花巨竹 **(Photos 303–304)**

Trans. Linn. Soc. London. 26: 123. 1868; FRPS 9(1): 200. 1996; FOC 22: 47. 2006; FGD 9: 275. 2009.

Bambusa verticillata Willd., Sp. Pl. 2: 245. 1799.

Arundo maxima Lour., Fl. Cochinch. 1: 58. 1790, *nom. illeg. hom.*

Bambusa maxima (Lour.) Poir., Encycl., Suppl. 8: 704. 1808, *nom. Illeg.*

Bambusa pseudoarundinacea Steud., Syn. Pl. Glumac. 1: 330. 1854.

Gigantochloa maxima (Lour.) Kurz, Natuurk. Tijdschr. Ned.-Indië 27: 226. 1864, *nom. illeg.*; HKB 61. 1985.

Gigantochloa pseudoarundinacea (Steud.) Widjaja, Reinwardtia 10(3): 305. 1987; Check List HK Plants 337. 2002; 118. 2004.

Culms 8–15 m, 7–10 cm in diam.; internodes yellow striate, 28–42 cm, white or brown hispid; wall ca. 1.6 cm thick. Branches several, central dominant. Culm sheaths deciduous, green, yellow striate initially, later brown, leathery, initially densely white hispid, margins ciliate; auricles minute, inconspicuous; oral setae absent; ligule ca. 3 mm, irregularly serrate or fimbriate; blade reflexed. Leaf sheath initially pubescent; ligule 5–10 mm, entire; blade 24–47 × 3.5–7 cm. Inflorescence unknown.

Locality: Cultivated. *P. S. Choi 270; Nan-Zhu 2868.*

Distribution: S Yunnan; India, Indonesia, Malaysia, Myanmar, Thailand, Vietnam.

Ecology: New shoots: Summer to early autumn.

Uses: Ornamental.

2. Gigantochloa atroviolacea Widjaja 黑毛巨竹 **(Fig. 89; Photos 305–306)**

Reinwardtia 10(3): 323. 1987.

Gigantochloa nigrociliata auct. non (Buse) Kurz: HKB 62. 1985; FRPS 9(1): 197, pl. 50: 12–14. 1996; FOC 22: 47. 2006; FGD 9: 274. 2009; Check List HK Plants 337. 2002; 118. 2004.

Culms 8–15 m, 4–10 cm in diam.; internodes 36–46 cm, yellow striate, brown hispid; wall thick. Branches several, central ones prominent. Culm sheaths deciduous, brown, 18–22 cm, leathery, densely dark brown hispid; auricles minute; ligule ca. 4 mm, serrulate; blade recurved. Ultimate branches with ca. 11 leaves. Leaf sheath initially sparsely pubescent; ligule ca. 1 mm;

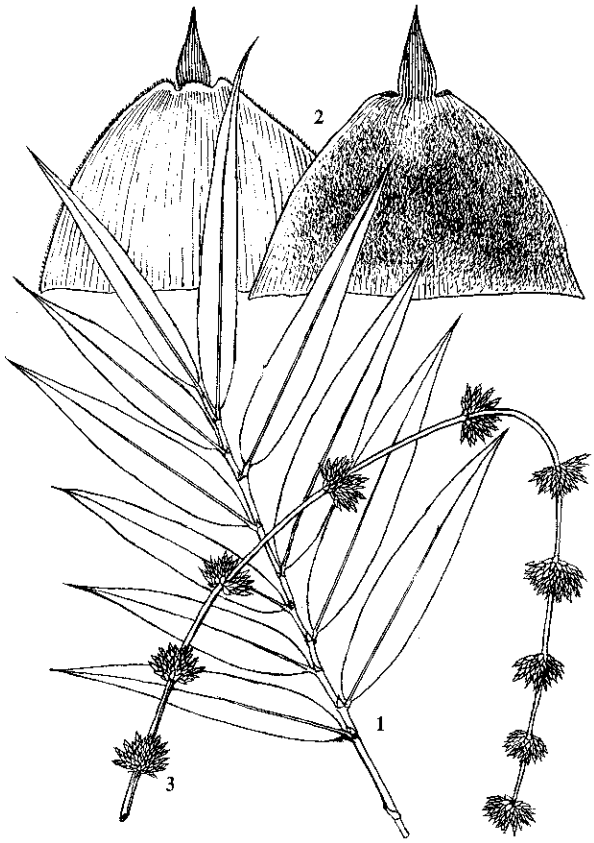

Figure 89. *Gigantochloa atroviolacea* Widjaja

1. leafy branchlet; *2.* abaxial and adaxial views of culm sheath; *3.* flower branchlet. (drawn by H. P. Yu)

blade 19–36 × 3–5 cm. Pseudospikelets in heads ca. 2.5 cm in diam. Spikelets 1–1.2 × 0.2–0.3 cm; florets 2. Glumes 2–3, ovate, dark brown ciliate; lemma margins dark brown ciliate; palea shorter than lemma. Anthers yellow. Ovary ovoid; style 6–7 mm; stigma 1. Caryopsis unknown.

Locality: HKU campus, Tsiu Hang (cultivated). *P. S. Choi 268; Nan-Zhu 2844.*

Distribution: Indonesia.

Ecology: New shoots: Summer.

Uses: Ornamental.

6. **Chimonobambusa** Makino 方竹屬

Shrubby bamboos, rarely subarborescent. Rhizomes leptomorph, with running underground stems. Culms usually diffuse, sometimes tillering (pluricaespitose), erect; internodes terete or 4-angled, often basally grooved above branches; nodes prominent to very prominent, basal nodes often with a ring of sparse or dense root thorns; sheath scars usually with a ring of pubescence or persistent base of culm sheath. Branches 3(–7 on upper culm), subequal, buds ovate-triangular, open at front, prophyll reduced. Culm sheaths deciduous and leathery, or sometimes persistent and papery; auricles minute or absent; blade reduced, to 1 cm, narrow. Leaves (1–)2–5 per ultimate branch; blade lanceolate, base cuneate. Inflorescence fully bracteate, weakly iterauctant, 1–3 single pseudospikelet racemes loosely fasciculate, subtended by gradually enlarged bracts. Spikelets several- to many-flowered, sessile. Rachilla disarticulating. Glumes usually 1–3, frequently 1 subtending a bud; lemma papery or membranous; palea membranous, 2-keeled, obtuse; lodicules 3, membranous. Stamens 3; filaments free. Ovary ellipsoidal; style 1, short; stigmas 2–3, plumose. Fruit a nut-like caryopsis with a hardened pericarp.

About 37 species distributed in E Asia; 34 species (31 endemic) in China; one species cultivated in Hong Kong.

1. Chimonobambusa quadrangularis (Franceschi) Makino 方竹(四方竹) **(Fig. 90; Photos 307–308)**

Bot. Mag. (Tokyo) 28: 153. 1914; HKB 57. 1985; FRPS 9(1): 340, pl. 93: 1–6. 1996; FOC 22: 158. 2006; FGD 9: 314, fig. 148. 2009.

Bambusa quadrangularis Franceschi, Bull. Soc. Tosc. Ortic. 5: 401. 1880.

Arundinaria quadrangularis (Franceschi) Makino, Bot. Mag. (Tokyo) 9: 71. 1895.

Phyllostachys quadrangularis (Franceschi) Rendle, J. Linn. Soc. 36: 443. 1904.

Culms erect, 3–8 m tall, to 2.5 cm in diam.; internodes obtusely 4-angled, 8–22 cm, sparsely coarsely scabrid, apically more densely so; nodes prominent, supra-nodal ridge raised at branching nodes, level at branchless nodes, lower nodes each with a ring of short, declined root thorns; sheath scar corky, initially with a fulvous, tomentose, minutely setose ring. Culm sheaths deciduous, shorter than internodes, papery, veins prominent, transverse veinlets purple-brown, margins ciliate; auricles, oral setae, and ligule absent; blade deciduous, subulate, 3–5 mm, articulate. Leaves 2–5 per ultimate branch; sheaths leathery, glabrous, margins apically ciliate; oral setae deciduous, erect, glabrate; ligule truncate, short, ciliate, with minute setae; pseudopetiole ca. 1.8 mm; blade elliptical to lanceolate, 8–29 × 1–2.7 cm, papery, abaxially initially pubescent, adaxially glabrous, secondary veins 4–7-paired, tertiary veins 5–7, apex acuminate. Inflorescence racemose or paniculate, terminal ones slender, glabrous, subtended by persistent, gradually enlarged bracts. Spikelets (1–)2–4, 2–3 cm, slender; florets 2–5, basal absent to 2 rudimentary. Glumes 1–3, lanceolate, 4–5 mm; lemma green, lanceolate or oblong-lanceolate, subequal to palea, papery, 5–7-veined; lodicules narrowly ovate. Anthers 3.5–4 mm. Stigmas 2.

Locality: Cultivated in gardens. *HK sheet 16457, 16459.*

Distribution: Anhui, Fujian, Guangxi, Hunan, Jiangsu, Jiangxi, Taiwan, Zhejiang; Japan, cultivated in Europe and N America.

Ecology: New shoots: Autumn.

Uses: Ornamental.

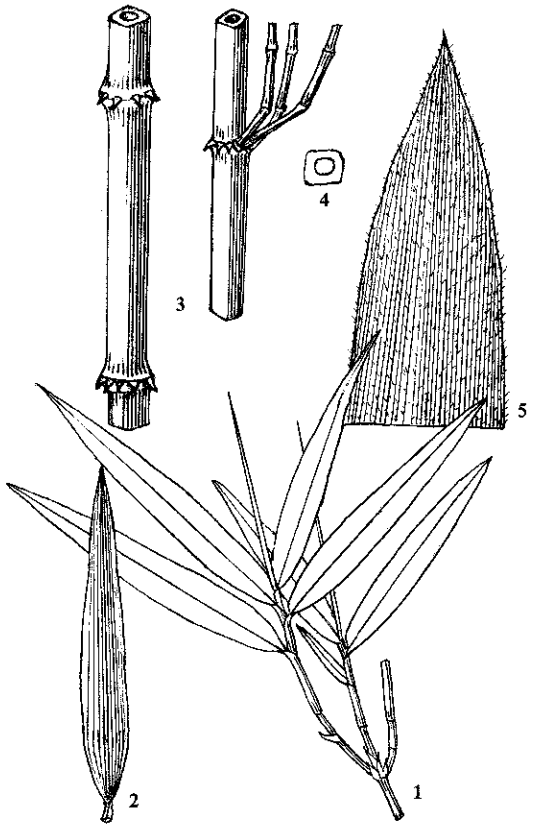

Figure 90. *Chimonobambusa quadrangularis* (Franceschi) Makino
1. leafy branchlet; *2.* leaf; *3.* portion of culm showing branching pattern and culm node; *4.* cross section of culm; *5.* abaxial view of culm sheath. (drawn by H. P. Yu)

7. Phyllostachys Siebold & Zucc., *nom. cons.* 剛竹屬

Arborescent or shrubby bamboos. Rhizomes leptomorph, with running underground stems. Culms diffuse; internodes profoundly flattened or grooved on one side above branches; nodes 2-ridged. Branches 2, subequal, rarely with a much smaller, central or lateral 3rd branch. Culm sheaths deciduous, papery to subleathery; ligule usually conspicuous; usually auricled with long bristles; blade usually recurved or reflexed. Leaf blade with distinct transverse veins, usually abaxially pilose proximally. Inflorescence bracteate, partially iterauctant, composed of 1–7-spikeleted racemes gathered into fascicles or globose mass subtended by a tiny, membranous, 2-keeled prophyll, 0–1 gemmiferous bract, 2–6, gradually enlarged scaly bracts, and 2–7 spathiform bracts. Spikelets with 2–7 florets, terminal one sterile. Glumes absent to 1(–3). Rachilla extending beyond uppermost floret, disarticulating just below fertile florets. Lemma variable in size and texture; palea 2-keeled, apex bifid; lodicules 3, ciliate. Stamens 3. Style long; stigmas (1–)3, plumose. Caryopsis elliptical to linear-lanceolate, dorsally grooved.

At least 51 species distributed in China, India, Japan, Myanmar; introduced to many other countries; 51 species (49 endemic) in China; four species in Hong Kong.

Phyllostachys sulphurea (Carrière) Rivière & C. Rivière 'Houzeau'(綠皮黃筋竹), *P. vivax* McClure(烏哺雞竹) and *P. glauca* McClure f. *yunzhu* J. L. Lu(筠竹) are only cultivated in Lung Chai, Lantau Island and not treated here.

1a. Lower culm internodes abnormal, usually irregularly condensed and swollen ..... 1. *P. aurea*
1b. Lower culm internodes normal.
2a. Culms purplish black when matured ..... 2. *P. nigra*
2b. Culms usually green or yellow.
3a. Culm sheath not spotted or patched; auricles present; blade erect ..... 3. *P. nidularia*
3b. Culm sheath spotted or patched; auricles absent; blade reflexed ..... 4. *P. reticulata*

1. Phyllostachys aurea Carrière ex Rivière & C. Rivière 人面竹

Bull. Soc. Natl. Acclim. France, sér. 3. 5: 716. 1878; FTW 5: 723, pl. 1489. 1978; HKB 67. 1985; FRPS 9(1): 255, pl. 67: 5–7. 1996; FOC 22: 168. 2006; FGD 9: 319, fig. 150. 2009.

Phyllostachys bambusoides Siebold & Zucc. var. *aurea* (Carrière ex Rivière & C. Rivière) Makino, Bot. Mag. (Tokyo) 11: 158. 1897.

Phyllostachys breviligula W. T. Lin & Z. M. Wu, Acta Phytotax. Sin. 26(3): 229, pl. 8. 1988.

Phyllostachys formosana Hayata, Icon. Pl. Form. 6: 140. 1916.

Phyllostachys reticulata (Ruprecht) K. Koch var. *aurea* (Carrière ex Rivière & C. Rivière) Makino, Bot. Mag. (Tokyo) 26: 22. 1912.

Culms 5–12 m, 2–5 cm in diam.; internodes 15–30 cm, usually strongly shortened and commonly ventricose at basal nodes, distally inflated for several minimetres below node at mid-culm and basal nodes, initially white powdery, glabrous; wall 4–8 mm thick; nodal ridge as prominent as sheath scar or slightly more prominent; sheath scar initially fringed with white pubescence. Culm sheaths yellow-green or pale red-brown, becoming straw-coloured, with variably sized brown spots, base edged with white pubescence; auricles and oral setae absent; ligule yellow-green, truncate or weakly convex at apex, very short, 1–2 mm, margin longer pale green ciliate; blade reflexed, green, with yellow margins, linear, flat or crinkled in upper sheaths. Leaves 2–3 per ultimate branch; sheath glabrous; auricles and oral setae absent or deciduous; ligule short; blade 6–12 × 1–1.8 cm, abaxially pilose especially near petiole.

Locality: Kadoorie Farm (cultivated). *Nan-Zhu 2874.*

Distribution: Guangdong, Fujian, Zhejiang.

Uses: Ornamental.

2. Phyllostachys nigra (Lodd. ex Lindl.) Munro 紫竹

Trans. Linn. Soc. London. 26: 38. 1868; FTW 5: 730, pl. 1493. 1978; HKB 71. 1985; FRPS 9(1): 288. 1996; FOC 22: 175. 2006; FGD 9: 321. 2009.

Bambusa nigra Lodd. ex Lindl., Penny Cyclop. 3: 357. 1835.

Phyllostachys filifera McClure, Lingnan Univ. Sci. Bull. 9: 42. 1940.

Phyllostachys nana Rendle, J. Linn. Soc. 36: 441. 1904.

Phyllostachys nigripes Hayata, Icon. Pl. Form. 6: 142, fig. 53. 1916.

Culms 4–8(–10) m, to 5 cm or more in diam.; initially green, gradually developing purple-brown or brown-black spots and patches, or finally becoming uniformly purple-brown or brown-black, 25–30 cm, initially white powdery, densely puberulent; wall ca. 3 mm thick; nodal ridge slightly more prominent than or equaling sheath scar; sheath scar initially brown hairy on margin. Culm sheaths red-brown, sometimes tinged with green, unmarked or densely extremely minutely and imperceptibly dark brown spotted, spots aggregating into a distal dark brown patch, thinly white powdery, brown strigose; auricles and oral setae well developed, purple-black; ligule purple, arcuate to acutely so, long ciliate; blade erect or gradually deflexed, green or tinged with purple on both sides, triangular to triangular-lanceolate, navicular, ± wavy. Leaves 2–3 per ultimate branch; auricles weak or absent; oral setae deciduous; ligule slightly exserted; blade thin, 7–10 × ca. 1.2 cm. Flowering branchlets shortly spicate, 3.5–5 cm, scaly bracts 4–8. Spathes 4–6, glabrous or puberulous; auricles absent; oral setae few or absent; blade usually subulate or ovate-lanceolate, small. Pseudospikelets 1–3 per spathe. Spikelets lanceolate, 1.5–2 cm; florets 2–3. Glumes (absent or)1–3, abaxially ± distally pubescent; rachilla pubescent; lemma 1.2–1.5 cm,

densely pubescent; palea shorter than lemma. Anthers ca. 8 mm. Stigmas 3.

Locality: Lung Tsai Ng Yuen (cultivated). *Nan-Zhu 2794; N. K. Chun 2840; HK sheet 35371.*

Distribution: S Hunan, cultivated elsewhere in China.

Ecology: New shoots: late Apr.; flowering: May.

Uses: Ornamental.

3. Phyllostachys nidularia Munro

篌竹(白筠竹、花竹) **(Fig. 91; Photos 309–310)**

Gard. Chron., n.s., 6: 773. 1876; FKH 330. 1912; FRPS 9(1): 304. 1996; FOC 22: 178. 2006; FGD 9: 324, fig. 152. 2009.

Phyllostachys cantoniensis W. T. Lin, J. S. China Agric. Univ. 14(3): 112, fig. 4. 1993.

Phyllostachys subulata W. T. Lin & Z. M. Wu, J. Bamboo Res. 13(2): 16, fig. 2. 1994.

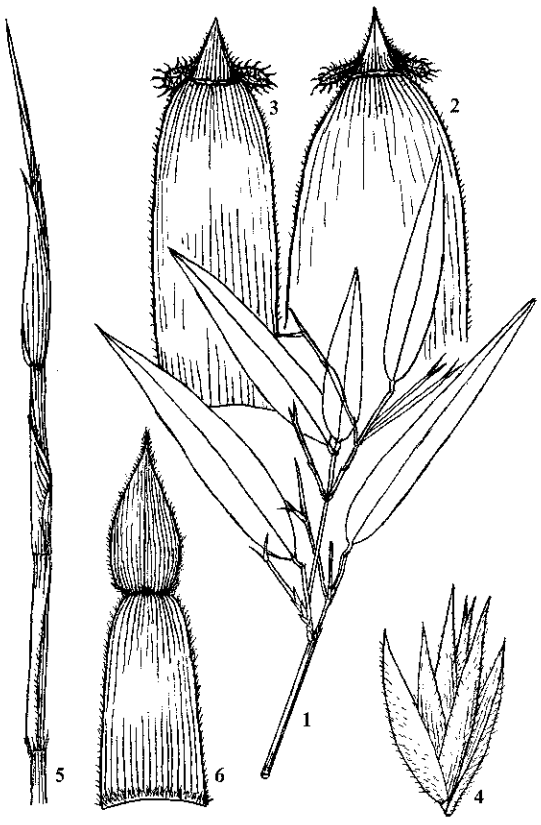

Figure 91. *Phyllostachys nidularia* Munro

1. branchlet; *2.* adaxial view of culm sheath; *3.* abaxial view of culm sheath; *4.* spikelet; *5.* upper portion of young culm; *6.* culm sheath. (drawn by H. P. Yu)

Culms to 10 m, to 4 cm in diam., straight; internodes to 30 cm, white powdery, glabrous or initially setulose below nodes; wall ca. 3 mm or more thick; nodal ridge conspicuously elevated, equaling or more prominent than sheath scar; sheath scar flared, glabrous or initially with margin brown setose. Culm sheaths green, unmarked, distally milky-white striped, otherwise usually purple striped, white powdery, densely brown strigose toward base or glabrous, margins purple-red or brown ciliate; auricles at culm apex green-purple, very broad, contiguous with and extending from swollen cupped base of blade; auricles absent on mid- and lower culm; oral setae absent or few, radiate, short; ligule purple-brown, slightly arcuate, broad, margin densely white ciliate; blade erect, broadly triangular to triangular, cupped. Leaves usually 1 per ultimate branch, pendulous; auricles and oral setae weakly developed or absent; ligule short, weakly or not exserted; blade 4–13 × 1–2 cm. Flowering branchlets densely capitate, 1.5–2 cm, scaly bracts 2–4; spathes 1–6, basal ones ovate, distal ones narrower and papery, to 1.6 cm, both sides and apex ± hairy, margins ciliate, blade inconspicuous to narrowly ovate. Pseudospikelets 2–8 per spathe; bracts narrow, variable in size or sometimes absent, membranous, keeled, 5–7-veined, pubescent on keels and near apex. Spikelets with 2–5 florets, distal 1–2 sterile. Glumes 1(–3), resembling uppermost bract, to 1.5 cm; rachilla internodes elevated, compressed and sparsely pubescent on side facing floret, apex truncate; lemma leafy, densely hirsute, many-veined, apex acuminate with an awn-like tip, 1st lemma 1–1.2(–1.6) cm; palea shorter than lemma, 0.6–1.1 cm, densely hirsute. Anthers 4.5–5.5 mm. Stigmas (1–)3.

Locality: Sai Kung, Ma On Shan, Mui Tsz Lam, Mau Ping, Sha Tin, Tai Mo Shan, Lantau Island. *Nan-Zhu 2773, 2865; HK sheet 16421.*

Distribution: Guangdong, Guangxi, Henan, Hubei, Jiangxi, Shaanxi, Yunnan, Zhejiang; introduced in Europe and N America.

Ecology: Forests, thickets. New shoots: Apr.–May; flowering: Apr.–May.

Uses: Vegetable (shoots), ornamental.

4. Phyllostachys reticulata (Rupr.) K. Koch 桂竹

Dendrologie. 2(2): 356. 1873; FOC 22: 176. 2006; FGD 9: 322. 2009.

Bambusa reticulata Rupr., Bambuseae, 58. 1839.

Phyllostachys bambusoides Siebold & Zucc., Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 3(3): 746, pl. 5, fig. 3. 1843; FTW 5: 725, pl. 1490. 1978; HKB 68. 1985; FRPS 9(1): 292. 1996; Check List HK Plants 344. 2002; 120. 2004.

Phyllostachys lithophila Hayata, Icon. Pl. Formosan. 6: 141, fig. 51. 1916.

Phyllostachys megastachya Steud., Flora 29: 21. 1846.

Phyllostachys pinyanensis T. H. Wen, Bull. Bot. Res., Harbin 2(1): 67, fig. 6. 1982.

Phyllostachys quilioi Rivière & C. Rivière, Bull. Soc. Natl. Acclim. France 5: 697, fig. 24–27. 1878.

Culms to 20 m, to ca. 15 cm in diam.; internodes to 40 cm, not white powdery or initially faintly so below nodes, glabrous; wall ca. 5 mm thick; nodal ridge slightly more prominent than sheath scar. Culm sheaths yellow-brown, sometimes tinged with green or purple, with dense, variably sized, purple-brown spots, glabrous or sparsely deciduously erectly brown hairy; auricles deciduous, sometimes absent, purple-brown, small to large and falcate; oral setae radiate; ligule brown or green, arcuate, ciliate; blade reflexed, green in centre, purple or brown on both sides, pale yellow along margins, linear, flat or sometimes slightly wavy at apex. Leaves 2–4 per ultimate branch; auricles suborbicular; oral setae well developed, radiate; ligule obviously exserted, arcuate or sometimes truncate; blade 5.5–15 × 1.5–2.5 cm. Flowering branchlets spicate, 5–8(–10) cm, scaly bracts 3–5; spathes 6–8; auricles small or inconspicuous, oral setae usually developed, blade orbicular-ovate to linear-lanceolate, base rounded, apex subulate-acuminate. Pseudospikelets 1–2(–3) per

spathe, absent from basal 1–3 deciduous spathes. Spikelets lanceolate, 2.5–3 cm; florets 1–2(–3). Glumes absent or 1; rachilla pubescent, extension glabrous, terminated with a rudimentary floret; lemma 2–2.5 cm, sparsely puberulent, apex aristulate-acuminate; palea slightly shorter than lemma, glabrous except for keels or pubescent at apex; lodicules rhomboid-oblong, 3.5–4 cm. Anthers 1.1–1.4 cm. Stigmas 3.

Locality: Victoria Peak, Sheung Shui, Lantau Island (cultivated). *Nan-Zhu 2877; S. C. Lau 760; HK sheet 16404.*

Distribution: Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang; Japan.

Ecology: New shoots: Late May.

Uses: Ornamental, materials (construction, flooring and furniture).

8. **Indocalamus** Nakai 箬竹屬

Shrubby bamboos. Rhizomes leptomorph, with running underground stems. Culms pluricaespitose, nodding; internodes usually terete, usually with a dense, persistent, apical, yellow-brown tomentose to setaceous ring below nodes, rarely apically glabrous; wall thick; nodes usually flat, sometimes prominent. Branches usually solitary, nearly as thick as culms. Culm sheaths persistent, usually shorter than internodes, papery or nearly leathery; auricles usually developed; blade usually recurved, lanceolate. Leaf sheaths cylindrical, very thick, smooth. Leaves usually large relative to culm size, transverse veins distinct. Inflorescence largely ebracteate, terminal, a raceme or open panicle; branches usually subtended by tiny bracts. Spikelets several- to many-flowered, pedicellate. Rachilla articulate. Glumes 2–3, ovate or lanceolate; lemma oblong or lanceolate, nearly leathery; palea 2-keeled, shorter than lemma; lodicules 3. Stamens 3, long exserted; anthers yellow. Ovary ovoid; style 1, short; stigmas usually 2, plumose. Caryopsis dark brown at maturity.

At least 23 species distributed in mainly China, one species in Japan; 22 species (all endemic) in China; three species in Hong Kong.

1a. Culm sheath auricles present, usually falcate ..... 1. *I. longiauritus*
1b. Culm sheath auricles absent.
2a. Culm sheath glabrous abaxially, leafy branch with 1–3 leaves ..... 2. *I. herklotsii*
2b. Culm sheath sparsely hairy; leafy branch with 5–9 leaves ..... 3. *I. sinicus*

1. **Indocalamus longiauritus** Hand.-Mazz. 箬葉竹 **(Fig. 92)**

Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 62: 254. 1925; HKB 64. 1985; FRPS 9(1): 695, pl. 213: 1–7. 1996; FOC 22: 138. 2006; FGD 9: 304, fig. 144. 2009.

Arundinaria longiaurita (Hand.-Mazz.) Hand.-Mazz., Symb. Sin. 7: 1271. 1936.

Culms 0.8–1 m, 0.35–0.8 cm in diam.; internodes dull green, (8–)10–55 cm, white pubescent, with a pale red-brown tomentose ring below nodes; wall 1.5–2 mm thick; nodes prominent. Culm sheaths purple-green, leathery, dark brown strigose and white tomentose, base with raised corky ring; auricles well developed, narrowly falcate, long, purple-green, becoming brown when dry; oral setae radiate, brown, ca. 1 cm; ligule truncate, 0.5–1 mm, ciliate or not; blade purple-green, narrowly triangular to ovate-lanceolate, base abruptly rounded, apex acuminate. Leaf sheath rigid, glabrous or abaxially initially finely strigose, outer margin ciliate; auricles usually developed; oral setae radiate, brown; ligule truncate, 1–1.5 mm, puberulent, fimbriate, margin setose; blade 10–35 × 1.5–6.5 cm, abaxially glabrous, secondary veins 5–12 pairs, veins forming rectangular tessellations, base cuneate, apex long acuminate. Panicles 8–15 cm, rather narrow, axis densely white tomentose. Spikelets greenish or straw-coloured at maturity, 1.5–3.7 cm; florets 4–6. Rachilla internodes compressed-clavate, 6.8–7.2 mm, angular, densely white tomentose, apex truncate. Glumes 2, acuminate with an awn-like point; 1st glume 3–5 mm, 3–5-veined, 2nd glume 6–8 mm, 7–9-veined; lemma oblong-lanceolate, apex awn-like, first lemma 1–1.4 cm, 11–13-veined; palea of 1st floret 0.7–1 cm, keels ciliate. Anthers ca. 5 mm. Stigmas 2. Caryopsis oblong.

Locality: Tai Mo Shan, Lam Tsuen Valley. *HK sheet 41768.*

Distribution: Fujian, Guangdong, Guangxi, Guizhou, Henan, Hunan, Jiangxi, Sichuan.

Ecology: Mountain slopes, hillsides, roadsides. New shoots: Apr.–May; flowering: May–Jul.

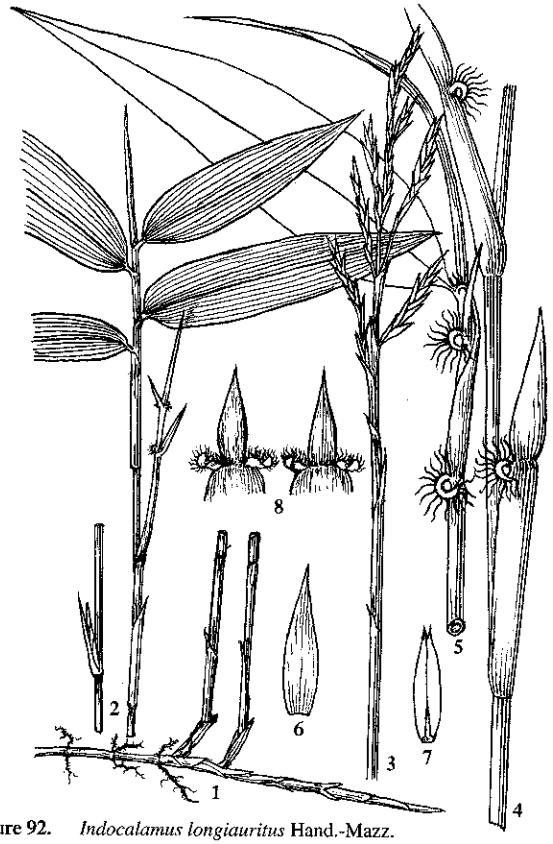

Figure 92. *Indocalamus longiauritus* Hand.-Mazz.
1. subterranean stem showing monopodial branching pattern; *2.* leafy branchlet showing branching pattern; *3.* flowering branchlet; *4.* portion of young culm showing culm sheath; *5.* upper portion of young culm; *6.* lemma; *7.* palea; *8.* culm sheath apex (left: abaxial view; right: adaxial view). (drawn by H. P. Yu)

2. Indocalamus herklotsii McClure 粽巴箬竹(光穆箬竹)
Lingnan Univ. Sci. Bull. 9: 22. 1940; HKB 63. 1985; FRPS 9(1): 686, pl. 210: 5–6. 1996; FOC 22: 137. 2006; FGD 9: 304. 2009.

Culms to 2 m, 3–6 mm in diam.; internodes glossy, glabrous, subsolid, with small lumen; nodes flat. Culm sheaths leathery, glossy, fragile, margins usually densely ciliate; auricles absent or minute; oral setae sometimes developed, few, dark brown, rigid, scabrid; ligule truncate or slightly arcuate, very short, hirtellous, ciliolate; blade erect, initially rosy red, ovate-lanceolate, thinly papery, glabrous, base broad and amplexicaul, apex long acuminate. Leaves ca. 3 per ultimate branch; sheath obscurely striate on upper part, margins densely brown ciliate; auricles usually absent; oral setae few or absent, dark brown or straw-coloured, rigid, scabrid; ligule short, hirtellous, ciliolate; pseudopetiole 1–4 mm, hirtellous toward apex; blade lanceolate or oblong-lanceolate, 14–29 × 1–5 cm, glabrous, secondary veins 6–9 pairs, tessellations rectangular, apex caudate. Panicle spreading, purple, 7–8 cm; peduncle to 8.5 cm, glabrous, axis and branches slender, glabrous. Spikelets oblong-lanceolate, to 1.5 cm, slightly compressed; pedicels 3–15 cm, pulvinate; florets ca. 4. Rachilla internodes glabrous on side facing floret, otherwise scabrous. Glumes 2, glabrous; lower glume 5–5.5 mm, apex obtuse; upper glume 6.5–8 mm, apex acute; lemma lanceolate, 6.5(–7) mm, thinly papery, fragile, glabrous, 5-veined, apex obtuse; palea slightly longer or sometimes shorter than lemma, glabrous, keels distally ciliate; lodicules transparent, anterior ca. 1.3 mm, posterior slightly longer. Anthers ca. 5 mm. Ovary fusiform, dorsi-ventrally compressed, subglabrous; stigmas 2.

Locality: Victoria Peak, Tai Mo Shan, Ma On Shan, Lantau Island. *HK sheet 42220.*

Distribution: Hong Kong.

Ecology: Open forests, thickets.

Notes: The type specimen (*F. A. McClure 20838*, US) was collected from Lantau Island between 5–13 Oct. 1938. It was named after G. A. C. Herklots (1902–1986), local naturalist, and Secretary for Development (who was considered former head of AFCD) after World War II, who invited F. A. McClure to study bamboos in Hong Kong in the late 1930s.

3. Indocalamus sinicus (Hance) Nakai 水銀竹(華箬竹)
J. Arnold Arbor. 6: 148. 1925; HKB 65. 1985; FRPS 9(1): 692, pl. 212: 1–7. 1996; FOC 22: 136. 2006; FGD 9: 305. 2009.
Arundinaria sinica Hance, Ann. Sci. Nat., Bot., sér. 4, 18: 235. 1862.
Arundinaria longiramea Munro, Trans. Linn. Soc. 26: 19. 1868.
Arundinaria wightii Nees ex Benth., FHK 434. 1861.

Culms 1–3.8 m, 0.5–1 cm in diam.; internodes green, straw-coloured when dry, glossy, glabrous; wall 3–4 mm thick; nodes flat. Culm sheaths purple-brown, leathery-papery, striate, sparsely white or colourless hairy, margins densely bright grey ciliate; auricles absent; oral setae several, to 1 cm; ligule red-brown, truncate, 1–1.4 mm, ciliate or not; blade erect to reflexed, narrowly triangular-subulate on mid-culm sheaths, ovate-lanceolate on upper ones, apex long acuminate. Leaves 7–14 per ultimate branch; sheath yellow-brown, leathery, glossy, glabrous; auricles absent; oral setae yellow-brown, to 1.6 cm; ligule red-brown, truncate, short, ciliolate or not; blade broadly lanceolate, 14–60 × 2.2–6.8 cm, thinly leathery, both surfaces usually glabrous, secondary veins 8–9 pairs, transverse veins sparse, tessellations narrowly rectangular, base cuneate, apex long acuminate. Panicles ample, 23.5–30 cm or more; branches spreading, pulvinate. Spikelets purple-green, pedicel 2–6 cm; florets 3–4. Rachilla internodes glabrous. Glumes 2, papery; lower glume oblong-lanceolate, 4.5–5 mm, 3-veined, apex slightly acute, upper glume 5–6.5 mm, 5-veined, apex acuminate; lemma 9–10 mm, papery, adaxially scabrid, 7-veined, apex acuminate; palea nearly as long as lemma, keels and apex ciliate; lodicules unequal in size, anterior pair larger. Stamens unknown. Style short; stigmas 2.

Locality: Common in Hong Kong. *L. T. Lo 563; Y. S. Lau 2976; N. K. Chan 2798.*

Distribution: Guangdong, Hainan.

Ecology: Open forests, thickets on hills and in valleys, alt. 600–700 m. New shoots: Apr.; flowering: May.

Notes: Bentham's *A. wightii* (FHK 434. 1861) is merely an orthographical variant of *A. wightiana* Nees. (Linnaea 9: 482. 1835). In FHK, "A. Wightii, Nees" is cited from Ruprecht, Bambuseae, 26. 1839, which in turn cites "A. WIGHTIANA NE 1834", i.e. *A. wightiana* Nees. Bentham misapplied the name described from "Peninsula Indiae orientalis" to a specimen from Hong Kong, while at the same time describing Indian plants.

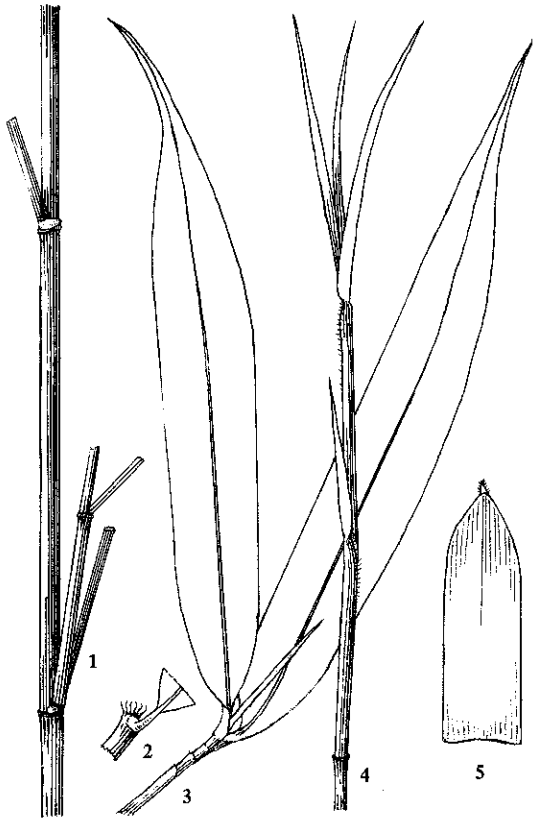

Figure 93. *Sasa subglabra* McClure
1. portion of culm; *2.* apex of leaf sheath and base of leaf blade; *3.* leafy branchlet; *4.* portion of culm showing persistent culm sheath; *5.* adaxial view of culm sheath apex. (drawn by H. P. Yu)

Uncertain species

1. Sasa subglabra McClure 光笹竹 **(Fig. 93; Photos 311–312)**
Lingnan Univ. Sci. Bull. 9: 24. 1940; HKB 75. 1985; FRPS 9(1): 674. 1996; FGD 9: 291. 2009.

Shrubby running bamboo; culms erect, 1.5–2 m tall, 5–6 mm in diam.; internodes terete, 15–20 cm long, smooth and glabrous. Branches usually solitary at each node, (2–)3 at upper nodes. Culm leaves persistent; sheaths tightly culm-clasping, minute hairy abaxially when young, glabrescent, subtruncate at apex, margin densely ciliate; auricles lacking; ligules 1–1.5 mm high; blades erect, lanceolate, hispidulous on both surfaces when young. Foliage leaves: sheaths puberulous when young; auricles lacking; ligules 1–1.5 mm high; blades ovate-lanceolate to oblong-lanceolate, 12–30 cm long, 2.5–5.5 cm wide, shortly pubescent toward base beneath, reticulate veinlets conspicuous.

Locality: Shatin. *Nan Zhu 2824, 2835* (CUHK); *HK sheet 37522, 37523.*

Distribution: Endemic to Hong Kong.

Ecology: Forests.

Notes: The type specimen (*H. Fung 21251*, SYS, holotype; US, isotype) was collected by H. Fung from Sha Tin Tsuen on 2 May 1938. Discovered in 1938 from Sha Tin Tsuen in ravines on moist clay, this species is endemic to Hong Kong. Up till now, no flowering specimen is available. Therefore its systematic position is still unclear and is thus of special botanical interest. The locality of its occurrence is very close to a village, and its distribution is likely due to folk use. Listed in *Rare and Precious Plants of Hong Kong.*

9. **Sinobambusa** Makino ex Nakai 唐竹屬

Arborescent or shrubby bamboos. Rhizomes leptomorph, with running underground stems. Culms diffuse, sometimes also clustering, erect to nodding; internodes substantially grooved above branches, initially usually pubescent; nodes prominent, sheath rings corky. Branches 3, rarely 5–7 at higher nodes, subequal, buds initially closed at front. Culm sheaths deciduous, setose; ligule serrate or entire; blade lanceolate. Leaves 3–9 per ultimate branch; blade lanceolate. Inflorescence fully bracteate, partially iterauctant, lateral, racemose, prophyllate. Spikelets 1–3, subtended by a prophyll and 2–more gradually enlarged bracts or glumes, apical 1–2 bracts usually with axillary buds, forming secondary pseudospikelets, lateral spikelets sessile, terminal spikelet variably pedicellate. Spikelets with several to many (up to 50) florets. Rachilla disarticulating between florets. Lemma leathery, apex acute; palea about as long as lemma or slightly shorter, 2-keeled, rounded at apex, ciliolate; lodicules 3, membranous, many-veined. Stamens 3, sometimes 2 or 4; filaments free. Ovary ellipsoidal; style 1, sometimes absent, usually long; stigmas 2–3, plumose. Fruit a caryopsis.

About ten species distributed in S and SW China, N Vietnam; introduced to Japan during the Tang Dynasty; ten species (nine endemic) in China; one species cultivated in Hong Kong.

1. **Sinobambusa tootsik** (Makino) Makino 唐竹 **(Fig. 94; Photo 313)**

J. Jap. Bot. 2: 8. 1918; FTW 5: 739, pl. 1499. 1978; HKB 77. 1985; FRPS 9(1): 226, pl. 60. 1996; FOC 22: 148. 2006; FGD 9: 309. 2009.

Arundinaria tootsik Makino, Bot. Mag. (Tokyo) 19: 63. 1905.

Arundinaria dolichantha Keng, Sinensia 7: 418, fig. 6. 1936.

Neobambos dolichanthus (Keng) P. C. Keng, Techn. Bull. Nat'l. For. Res. Bur. China No. 8: 15. 1948.

Pleioblastus dolichanthus (Keng) P. C. Keng, Clav. Gen. Sp. Gram. Prim. Sin. 154. 1957.

Semiarundinaria okuboi Makino, J. Jap. Bot. 8: 43. 1933.

Semiarundinaria tootsik (Makino) Muroi, Amat. Herb. 10: 210. 1942.

Culms 5–12 m, 2–6 cm in diam.; internodes initially deep green, flattened above branches, 30–40(–80) cm, glaucous, glabrous, apically minutely papillate. Culm sheaths initially red-brown, basally suboblong, leathery, slightly glaucous, setose, densely so at base, apex broadly rounded, margins ciliate; auricles very variable, scabrid, tomentose; oral setae curved, ca. 2 cm; ligule arcuate, ca. 3–4 mm, uniform; blade reflexed, green, lanceolate. Leaves 3–6(–9) per ultimate branch; sheath glabrous; auricles obscure; oral setae deciduous, radiate, ca. 1.5 cm, undulate; ligule truncate or subrounded; blade 6–22 × 1–3.5 cm, secondary veins 4–8-paired, margins serrulate, abaxially pubescent. Spikelets 1–3(–5), lateral spikelets sessile, terminal spikelet on 2–11 mm pedicel, linear, 8–20 × 0.2–0.3 cm; florets 7–12 mm, glabrous. Lemma ovate, ca. 7 mm wide, margins ciliate, apex acute; palea elliptic; lodicules nearly rhombic, elliptic or ovate, ca. 2.5 mm, ciliolate, with 7–9 veins. Anthers light yellow. Ovary glabrous; style 1, extremely short; stigmas 3, 3–4 mm.

Locality: Victoria Peak, HKU campus, Sha Tin (cultivated). *Nan-Zhu 2778, 2845.*

Distribution: Fujian, Guangdong, Guangxi; N Vietnam, introduced in Japan.

Ecology: New shoots: Apr.–May.

Uses: Ornamental.

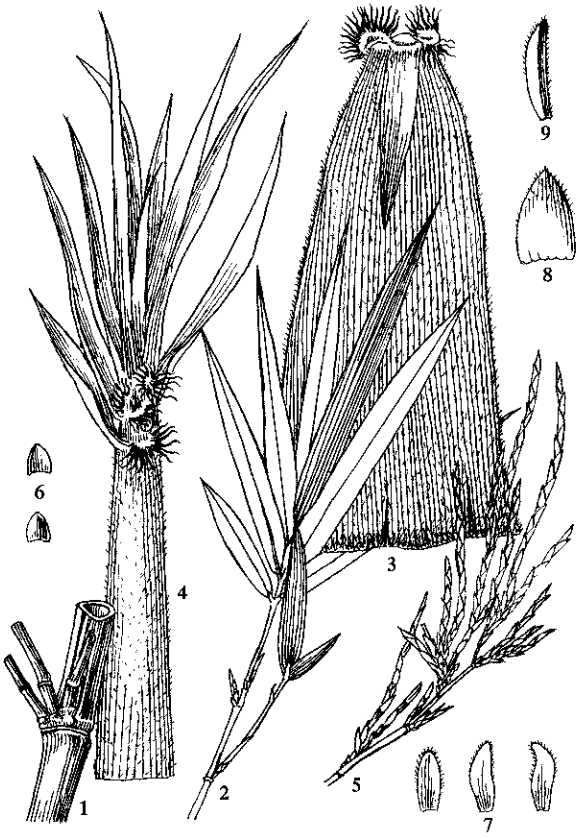

Figure 94. *Sinobambusa tootsik* (Makino) Makino
1. portion of culm; *2.* leafy branchlet; *3.* culm sheath; *4.* upper portion of shoot; *5.* flowering branchlet; *6.* prophyll; *7.* lodicule; *8.* lemma; *9.* palea. (drawn by H. P. Yu)

10. Arundinaria Michaux. 青籬竹屬

Arborescent or shrubby bamboos. Rhizomes leptomorph. Culms diffuse or pluricaespitose, erect or slightly nodding at top; internode terete or flat and grooved on the branching side. Branches (1–)3(–7) at each node, appressed to culm at base, primary ones dominant. Culm leaves persistent or deciduous, blade reflexed or erect. Foliage leaf sheath persistent, blade small to medium sized, transverse veinlets conspicuous. Inflorescences semelauctant, racemose or paniculate. Spikelets petiolate, florets several to many, terminal one imperfect; rachilla segments elongate, disarticulate below each floret; glumes 1–2(–5), mucronate at apex; lemma similar as glumes; palea 2-keeled, apex bifid or entire; lodicules 3; stamens 3, filaments distinct; style 1, short; stigmas 2–3. Fruit a caryopsis, with persistent style at apex, furrowed abaxially.

About 65 species distributed in E Asia and N America; 40 species in China; four species in Hong Kong.

In addition, *A. graminea* (Bean) Munro(大明竹) is only cultivated in gardens and not treated here.

1a. Culm leaf without auricle ..... 1. *A. amabilis*

1b. Culm leaf with auricles.

2a. Abaxial surface of foliage leaf sheath with purple spots ..... 2. *A. shiuyingiana*

2b. Abaxial surface of foliage leaf sheath without purple spots.

3a. Culm sheath apex subtruncate or slightly arched; foliage leaf without auricle ..... 3. *A. cantorii*

3b. Culm sheath apex arched; foliage leaf with auricles ..... 4. *A. hindsii*

1. Arundinaria amabilis McClure 茶秆竹(籬竹) (Photo 314)

Lingnan Sci. J. 10(1): 6, pl. 1–8. 1931; HKB 21. 1985; FGD 9: 292. 2009.

Pseudosasa amabilis (McClure) Keng f. ex S. L. Chen et al., FRPS 9(1): 641. 1996; FOC 22: 117. 2006.

Culms 7–13 m, 2–6 cm in diam.; internodes terete, olive-green, 30–40(–50) cm, sparsely brown hispidulous at first, glabrescent, initially grey waxy; wall thick; pith lamellate or spongy. Nodal ridge flat or weakly prominent. Branches (1–)3 per node, deflexed, secondary branchlets undeveloped. Culm sheaths gradually deciduous, dark brown, rigid, fragile when dry, densely brown setose abaxially, margins with ciliate, apex truncate; auricles absent; oral setae several, erect, ca. 1.5 cm, undulate; ligule arcuate, irregular, ciliate; blade erect, dark brown, narrowly triangular, scabrid. Leaves 2–3 per ultimate branch; sheath glabrous abaxially, margins ciliolate; auricles minute; oral setae curved, 0.7–1.5 mm; ligule 1–2 mm, densely ciliolate; blade narrowly lanceolate, 16–35 × 1.6–3.5 cm, glabrous, secondary veins 7–9-paired. Inflorescence paniculate with 3–15 spikelets; spikelets 2.5–5.5 cm, rachilla internodes ca. 3 mm; florets 5–16. Glumes 2, unequal, densely puberulous, margins apically densely ciliolate; lemma ovate-lanceolate, densely puberulous; palea broadly lanceolate, keels puberulous. Lodicules unequal. Ovary fusiform, glabrous. Caryopsis 5–6 mm.

Locality: Cultivated. *Nan-Zhu 2783, 2866; HK sheet 24998.*

Distribution: Guangdong, Guangxi, Hunan, S Jiangxi, Fujian.

Ecology: New shoots: Mar.–May.

Uses: Ornamental, environmental, cane (clums).

2. Arundinaria shiuyingiana Chia & But

秀英竹 **(Fig. 95; Photos 315–316)**

Kew Bull. 37: 591. 1983; HKB 25. 1985; FGD 9: 299, fig. 142. 2009.

Oligostachyum shiuyingianum (L. C. Chia & But) G. H. Ye & Z. P. Wang, J. Nanjing Univ., Nat. Sci. Ed. 26(3): 486. 1990; FRPS 9(1): 582, pl. 178: 1–3. 1996; FOC 22: 130. 2006.

Culms 4–6 m, 1–2 cm in diam.; internodes grey-green, usually with purple speckles, initially usually white powdery below nodes and sparsely setulose; nodes elevated, supra-nodal ridge more prominent than sheath scar. Culm sheaths yellow-green with purple-green base, brown strigose, margins ciliate; auricles small; oral setae 2–several; ligule truncate, ca. 1 mm, white ciliate; blade erect, brown-green, ovate-lanceolate or lanceolate, base ca. 1/2 as wide as apex of culm sheath. Leaves 5–9 per flowering branch; sheath with purple speckles, glabrous; auricles not developed; oral setae 2–3; ligule purple, truncate, 0.5–1 mm, weakly exserted,

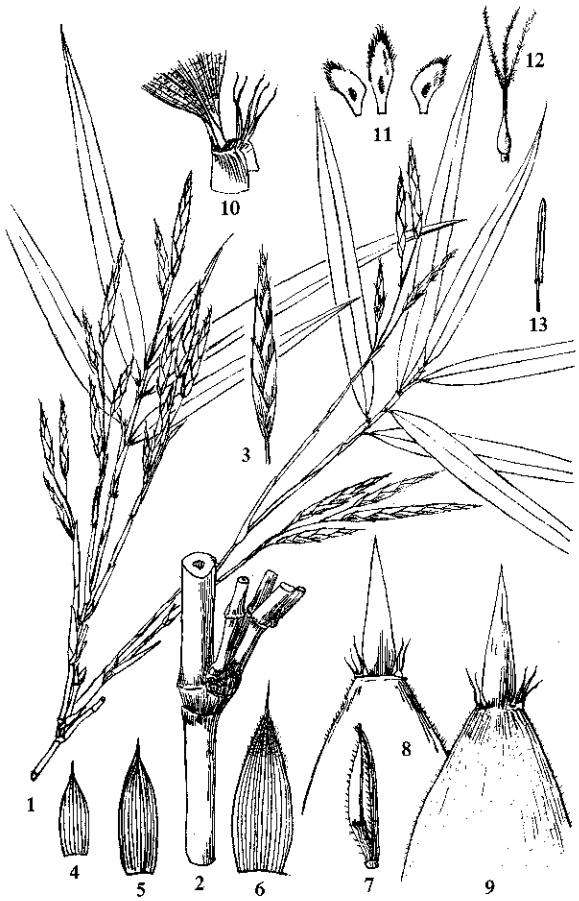

Figure 95. *Arundinaria shiuyingiana* Chia & But

1. flowering branchlet; *2.* portion of culm; *3.* spikelet; *4.* glume; *5.* lemma; *6.* palea; *7.* floret; *8.* adaxial view of culm sheath apex; *9.* abaxial view of culm sheath apex; *10.* apex of leaf sheath and ligule; *11.* lodicules; *12.* pistil; *13.* stamen. (drawn by X. L. Chen)

hairy; blade 12–20 × 0.8–1.3 cm, both surfaces glabrous, abaxially transverse veins distinct, rectangular. Racemes or small panicles with 2–4 spikelets, partially exserted from leaf sheaths; axis and branches slender, glabrous or branches sparsely hirtellous along angles. Spikelets lanceolate, 3–8 × ca. 0.5 cm; florets 5–15. Glumes 2, 1st smaller, 8–9 mm; lemma purple speckled, 1.7–2 cm, deciduously pubescent, apex with mucro 2–3 mm; palea 1.2–1.4 cm, pubescent, keels sparsely ciliolate, apex obtuse, thickly hairy; lodicules 3. Stamens 3. Style 1; stigmas 3.

Locality: New Territories. *Y. S. Lau 3163; Nan-Zhu 2809; F. W. Xing 9874.*

Distribution: Endemic to Hong Kong.

Ecology: Partially shaded slopes of hills, alt. below 100 m.

Uses: Environmental.

Notes: The type specimen (*Nan-Zhu 2862*, IBSC) was collected from Eagle's Nest on 21 June 1981. It was named in honour of Prof. Shiu- ying Hu. Listed in *Rare and Precious Plants of Hong Kong.*

3. Arundinaria cantorii (Munro) L. C. Chia
托竹 **(Fig. 96; Photos 317–318)**

Kew Bull. 37(4): 591. 1983; HKB 22. 1985; FGD 9: 294. 2009.

Bambusa cantorii Munro, Trans. Linn. Soc. London 26(1): 111. 1868; FKH 331. 1912.

Arundarbor cantorii (Munro) Kuntze, Revis. Gen. Pl. 2: 761. 1891.

Arundinaria basiaurita W. T. Lin, Acta Phytotax. Sin. 26(3): 231, pl. 10. 1988.

Arundinaria basigibbosa McClure, Lingnan Univ. Sci. Bull. 9: 1. 1940.

Arundinaria funghomii McClure, Lingnan Univ. Sci. Bull. 9: 3. 1940.

Arundinaria pubiannula W. T. Lin & Z. J. Feng, Acta Phytotax. Sin. 30(6): 560–561, pl. 2, fig. 5–8. 1992.

Pseudosasa cantorii (Munro) Keng f. ex S. L. Chen et al., FRPS 9(1): 654. 1996 ["*cantori*"]; FOC 22: 120. 2006.

Pseudosasa hainanensis G. A. Fu, J. Bamboo Res. 13(3): 1–3, fig. 1. 1994.

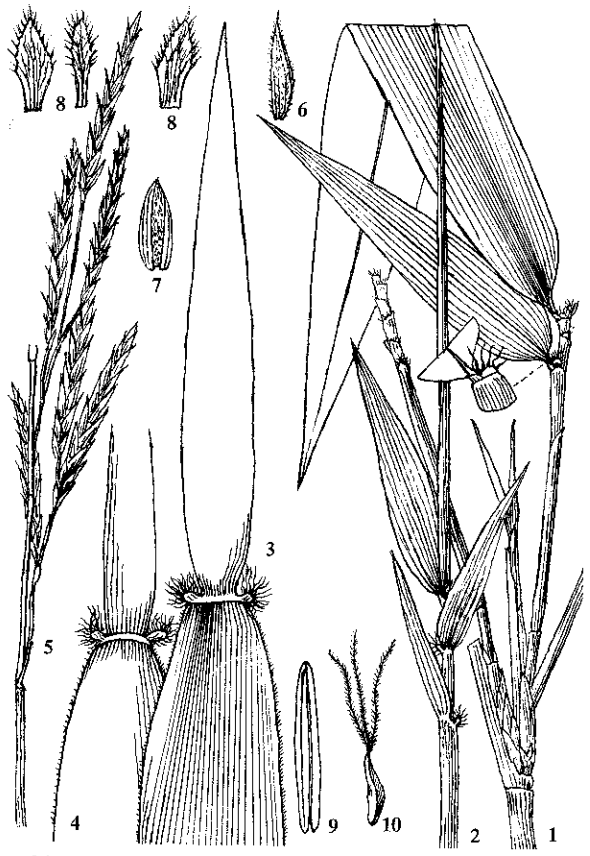

Figure 96. *Arundinaria cantorii* L. C. Chia
1. portion of culm; *2.* upper portion of young shoot; *3.* abaxial view of culm sheath; *4.* adaxial view of culm sheath; *5.* portion of flowering branchlet; *6.* floret; *7.* palea; *8.* lodicules; *9.* anther; *10.* pistil. (drawn by H. P. Yu)

Culms 2–4 m, 5–10 mm in diam.; internodes terete, 24–33 cm; nodal ridge obscure. Branches 3 per node. Culm sheaths tardily deciduous, thickly papery or thinly leathery, brownish yellow, ± purplish, ca. 1/2 as long as internodes, glabrous or sparsely brown setose, apex subtruncate or slightly convex, margins densely golden yellow ciliolate; auricles well-developed, semilunar or falcate; oral setae many, erect, wavy, 6–13 mm; ligule arcuate or truncate, slightly concave, scabrid, ciliolate; blade erect, narrowly ovate-lanceolate, glabrous abaxially, basally 1/2–3/5 as wide as sheath apex, margins serrulate. Leaves 5–10 per ultimate branch; sheath stramineous, purplish, ca. 4 mm, glabrous or puberulous abaxially, margins ciliate; auricles falcate or semilunar; oral setae ca. 5 mm, deciduous; ligule truncate, short, slightly hairy, entire or laciniate; blade narrowly lanceolate or oblong-lanceolate, 12–20(–32) × 1.2–2.5(–4.5) cm, both surfaces glabrous, base broadly cuneate, margins serrulate, secondary veins 5–9-paired. Inflorescence paniculate or racemose, terminal on lateral leafy branches; spikelets 3–4 cm, pedicel 0.5–1.5 cm; florets 4–9; rachilla internodes 4–6 mm, flat, thickened toward apex. Glumes 2; lemma 11 mm, 11–13-veined, glabrous abaxially, margins densely ciliolate; palea shorter than lemma, ciliolate along keels and margins, 2–3-veined between keels; lodicules oblong, 2–3 mm; anthers 6–7 mm. Ovary cylindrical, 1.5 mm, glabrous; styles very short; stigmas 3. Caryopsis unknown.

Locality: Sha Tin, Sai Kung, Tai Po Kau, Green Island, Lantau Island. *Nan-Zhu 2823, 2875; S. C. Ng 1308.*

Distribution: S Fujian, Guangdong, Hainan, S Jiangxi.

Ecology: Hillslopes. New shoots: Mar.

Uses: Environmental.

Notes: The type specimen (*Cantor s.n.*, K) was collected from Lantau Island in 1840. The species epithet was naming after the collector of type materials, Dr. Theodore Cantor.

4. Arundinaria hindsii Munro 箬竹

Trans. Linn. Soc. London 26(1): 31. 1868; FKH 330. 1912; FTW ed. 2, 5: 596. 2000; FGD 9: 293. 2009.

Pseudosasa hindsii (Munro) S. L. Chen & G. Y. Sheng ex T. G. Liang, Fujian Bamboos. 142. 1987; FRPS 9(1): 653, pl. 119: 11–12. 1996; FOC 22: 120. 2006.

Acidosasa denigrata W. T. Lin, J. South China Agr. Univ. 14(1): 48, fig. 4. 1998.

Arundinaria cerata McClure, Lingnan Univ. Sci. Bull. 9: 2. 1940.

Arundinaria flexuosa Hance, J. Bot. 14(167): 339. 1876.

Arundinaria hirtivaginata W. T. Lin, Bull. Bot. Res., Harbin 12(4): 354, fig. 4. 1992.
Arundinaria maudiae (Dunn) Keng ex Keng f., Techn. Bull. Natl. Forest. Res. Bur. 8: 13. 1948.
Arundinaria multifloscula W. T. Lin, Acta Phytotax. Sin. 26(3): 231–232, pl. 11. 1988.
Arundinaria orthotropoides (W. T. Lin) W. T. Lin, J. Bamboo Res. 19(1): 8. 2000.
Arundinaria panda Keng, Sinensia 7(3): 416, fig. 5. 1936.
Arundinaria quadrangula W. T. Lin & Z. J. Feng, Acta Phytotax. Sin. 30(6): 559, pl. 2, fig. 1–4. 1992.
Arundinaria yangshanensis W. T. Lin, J. Bamboo Res. 16(3): 26, fig. 3. 1997.
Oligostachyum orthotropoides W. T. Lin, J. South China Agr. Univ. 14(1): 49, fig. 5. 1993.
Phyllostachys maudiae Dunn, FKH 10: 330. 1912.
Pleioblastus hindsii (Munro) Nakai, J. Arnold Arbor. 6(3): 146. 1925.
Pleioblastus hispidulus W. T. Lin, J. South China Agr. Univ. 14(1): 50. 1993.
Pleioblastus pandus (Keng) Keng f., Techn. Bull. Natl. Forest. Res. Bur. 8: 14. 1949.
Pseudosasa aureo-vagina W. T. Lin, J. Bamboo Res. 12(3): 4, fig. 5. 1993.
Pseudosasa baiyunensis W. T. Lin, J. Bamboo Res. 13(2): 20, fig. 5. 1994.
Pseudosasa multifloscula (W. T. Lin) W. T. Lin, Guihaia 10(1): 18. 1990.
Pseudosasa nigronodis G. A. Fu, J. Bamboo Res. 15(1): 4, fig. 1. 1996 ["*nigro-nodis*"].
Thamnocalamus hindsii (Munro) E. G. Camus, Bambusées 52, pl. 25, fig. a. 1913.

Culms 3–5 m, ca. 1 cm in diam.; internodes dark green, 20–36 cm, basal ones glabrous but apical internodes hairy, initially glaucous. Branches 3–5 per node, erect. Culm sheaths persistent, sparsely white or light brown setose; auricles falcate; oral setae curved; ligule arcuate, ca. 3 mm; blade erect, broadly ovate-lanceolate, nearly as wide as sheath apex, base slightly constricted. Leaves 4–9 per ultimate branch; sheath deciduous, glabrous or sparsely setulose, margins ciliolate; auricles absent; oral setae few; ligule truncate, rigid, 1–1.5 mm; pseudopetiole ca. 2 mm; blade linear-lanceolate or narrowly oblong, 7–22 × ca. 1.6 cm, glabrous or abaxially slightly hairy, secondary veins 3–5-paired, base cuneate, one margin spinescently serrulate, other margin entire, apex acuminate. Inflorescence unknown.

Locality: Hong Kong Island, To Fung Shan, Tai Mo Shan, Ng Tung Chai, Lantau Island. *N. K. Chun 2841; Nan-Zhu 2799; HK sheet 40923.*

Distribution: Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang.

Ecology: Coastal hills, mountains. New shoots: May–Jun.

Uses: Environmental.

Notes: The type specimen was collected R. B. Hinds from Victoria Peak in 1841.

11. Isachne R. Br. 柳葉箬屬

Annual or perennial herbs; columns erect or procumbent. Leaf blades narrowly lanceolate to ovate, often with tubercle-based hairs; ligule a fringe of stiff hairs or obsolete. Inflorescence an open or contracted panicle, branches on all sides. Spikelets ovate or ovate-globose, always muticous, 2-flowered; the upper flower female or rarely hermaphrodite, the lower male or sometimes hermaphrodite, and both articulate on the rhachis; glumes subequal, herbaceous, falling soon after florets, 5–9-veined; lower lemma variable, similar to the upper or of different size and texture; upper lemma papery to leathery, glabrous or pubescent with short curved hairs, 5–7-veined; lodicules 2, small; stamens 3; styles 2, penicillate. Caryopsis ellipsoidal or subglobose.

About 90 species distributed in the tropics, but mainly in Asia; 18 species in China; three species in Hong Kong.

1a. Florets unequal in size and of different texture; lower floret longer, flatter and more delicate. ..... 1. *I. globosa*
1b. Florets equal in size or nearly so and of similar texture.
2a. Culms up to 30 cm tall; plant prostrate, branching and rooting at nodes ..... 2. *I. myosotis*
2b. Culms 30–100 cm tall; plant erect or ascending, tufted ..... 3. *I. albens*

1. Isachne globosa (Thunb. ex Murray) Kuntze 柳葉箬 **(Fig. 97; Photo 319)**

Revis. Gen. Pl. 2: 778. 1891; FHN 4: 401, fig. 1029. 1977; FRPS 10(1): 188. 1990; FFJ 6: 171, fig. 139. 1995; FTW ed. 2, 5: 448, pl. 185. 2000; FOC 22: 555. 2006; FGD 9: 371, fig. 180. 2009.

Milium globosum Thunb. ex Murray, Syst. Veg., ed. 14, 109. 1784.
Isachne australis R. Br., Prod. 1: 196. 1810; FHK 414. 1861; FKH 313. 1912.

Perennial herb. Culms rather slender, tufted, decumbent, creeping and rooting at the lower nodes, ascending to 80 cm tall or more, nodes glabrous. Leaf sheaths shorter than internode, ciliate on margins; leaf blades narrowly lanceolate, 3–10 × 0.4–0.8 cm, very rough with a minute pubescence, base rounded or slightly cordate; ligule 1–2 mm, a ring of hairs ciliate. Panicle open, ovoid, spreading, 4–11 cm, rather loose; pedicels variable in length, shorter or longer than spikelets, mostly marked with a pellucid discoloration or gland. Spikelets greenish or purplish brown, elliptic-globose, 1.5–2 mm; outer glumes glabrous; lower floret usually male, with a glabrous glume, upper floret female, pubescent; lower lemma oblong, soft texture, glabrous; upper lemma abaxial glabrous or puberulous, upper margins ciliate; lodicules cuneate, truncate and emarginate. Caryopsis subglobose.

Locality: Common in Hong Kong. *Y. W. Lam 1687, 2239; HK sheet 41607.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Shaanxi, Hebei, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; widely spread over Nepal, India, Malay Peninsula to Indonesia, New Guinea, Philippines, and

northward to Japan and Korea.

Ecology: Moist places of grasslands, path between paddy fields. Flowering & fruiting: Summer to autumn.

2. Isachne myosotis Nees 茸弱柳葉箬

Hooker's J. Bot. Kew Gard. Misc. 2: 98. 1850; FHK 415. 1861; FTW ed. 2, 5: 449, pl. 187. 2000; FOC 22: 558. 2006.

Isachne debilis Rendle, J. Linn. Soc. Bot. 36: 322. 1904; FRPS 10(1): 179, pl. 56: 11–14. 1990; FFJ 6: 168. 1995.

Isachne firmula Büse, Pl. Jungh. 3: 39. 1854; FKH 313. 1912; Check List HK Plants 338. 2002; 118. 2004.

Annual herb. Culms slender, decumbent, branching and rooting at nodes, flowering branches up to 10 cm tall. Leaf sheaths less than 1/2 length of the internode, thinly to densely hispid with spreading hairs, or hairs confined to margins; leaf blades ovate-lanceolate, 1–3 × 0.2–0.5 cm, rough, ± appressed-hairy on both surfaces, base rounded, apex acute; ligule a ring of hairs. Panicle ovate or contracted, 1.5–5 cm; branches spiculate to base, with short stiff branchlets and pedicels, smooth. Spikelets tinged purplish, subglobose, 1–1.5 mm; florets similar; glumes equal to spikelet, separated by a short internode, ovate-oblong, 5–7-veined, hispid, usually with a few stiff hairs toward the apex, obtuse; lemmas strongly convex, leathery, puberulous to densely pubescent.

Locality: Kam Shan, Tai Mo Shan. *L. T. Lo 226; HK sheet 14969, 35873.*

Distribution: Guangdong, Fujian, Taiwan; Philippines, Indonesia to New Guinea.

Ecology: Moist grassy fields. Flowering & fruiting: May–Oct.

Figure 97. *Isachne globosa* (Thunb. ex Murray) Kuntze *1.* plant; *2.* spikelet. (drawn by X. L. Chen)

3. Isachne albens Trin. 白花柳葉箬

Sp. Gram. 1(8): t. 85. 1828; FRPS 10(1): 185. 1990; FFJ 6: 169, fig. 138. 1995; FTW ed. 2, 5: 448. 2000; FOC 22: 559. 2006; FGD 9: 370. 2009.

Perennial herb. Culms slender, erect or decumbent at base, tufted, 30–100 cm tall, branching and rooting at basal nodes. Leaf sheaths usually shorter than the internode, with ciliate margins; leaf blades firm, narrowly lanceolate, 7–15 × 0.8–1.8 cm, abaxial surface glabrous, adaxial surface glabrous to hispidulous, margins thickened; ligule 1–2 mm, a row of hairs. Panicle pyramidal, 10–20 cm; branchlets and pedicels without glandular bands. Spikelets whitish green, elliptic-globose, 1–1.5 mm; florets similar, lower floret usually bisexual, upper floret usually female; glumes herbaceous, subequal to spikelet, usually glabrous, occasionally with a few stiff bristles above middle, obtuse, 5–7(–9)-veined; lower lemma globose to elliptic-ovate, leathery, puberulous or subglabrous, obtuse. Caryopsis elliptic.

Locality: Hong Kong (fide Corlett et al. 2000).

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Fujian, Taiwan; Bhutan, Nepal, N India, Myanmar, Thailand, Vietnam, Philippines, Indonesia.

Ecology: Hillsides, margins of forests, other moist open grassy fields. Flowering & fruiting: Summer to autumn.

12. Coelachne R. Br. 小麗草屬

Annual or perennial herbs. Culms slender, usually ascending from the decumbent base. Leaf blades flat, linear to lanceolate; ligule a line of hairs. Inflorescence a narrow panicle, sometimes contracted and spike-like. Spikelets 2-flowered, florets dissimilar, the lower bisexual, the upper female, separated by a slender rachilla internode; glumes persistent, subequal, shorter than the spikelet, 1–7-veined, broadly obtuse; lemmas both membranous, veinless or obscurely veined, glabrous or pubescent, apex obtuse, the upper a little shorter than the lower; palea similar to lemma. Stamens 2–3. Caryopsis ovate-elliptic.

About 11 species distributed in tropical regions of the Old World; one species in China and Hong Kong.

1. **Coelachne simpliciuscula** (Wight & Arn. ex Steud.) Munro ex Benth. 小麗草 **(Fig. 98)**

J. Linn. Soc. Bot. 19: 93. 1881; FFJ 6: 165, fig. 135. 1995; FOC 22: 560. 2006; FGD 9: 367, fig. 179. 2009.

Panicum simpliciusculum Wight & Arn. ex Steud., Syn. Pl. Glumac. 1: 96. 1854.

Coelachne pulchella auct. non R. Br.: FHK 428. 1861; FKH 326. 1912.

Annual herb, 10–20 cm tall. Culms slender, ascending from the decumbent base, rooting at lower nodes. Leaf blades soft, lanceolate, 1–3 × 0.2–0.5 cm, glabrous or hirtellous along veins; ligule a line of short hairs; leaf sheaths loose, glabrous or upper margins ciliolate. Panicle linear, loosely spiciform, 3–8 × 0.5–1 cm. Spikelets green or often purplish, 2–3 mm, borne on short erect branches; rachilla internode 0.6–0.8 mm; glumes broadly ovate, herbaceous with membranous margins, lower glume 0.9–1.2 mm, 1–3(–5)-veined, upper glume ca. 1.5 mm, 5–7-veined; lemmas lanceolate, lower lemma 2–2.3 mm, glabrous or puberulous, lower palea equal to lemma; upper lemma 1.6–1.7 mm, pubescent below middle on centre back and margins. Anthers 2–3, ca. 0.3 mm. Caryopsis brown at maturity, ca. 1.2 mm.

Locality: Hong Kong Wai. *C. Wilford 253* (K).

Distribution: Hainan, Guangdong, Guizhou, Yunnan, Sichuan; Vietnam, Cambodia, Myanmar, Thailand, Sri Lanka, India, Nepal.

Ecology: Marshy places and streamsides. Flowering & fruiting: Sep.–Dec.

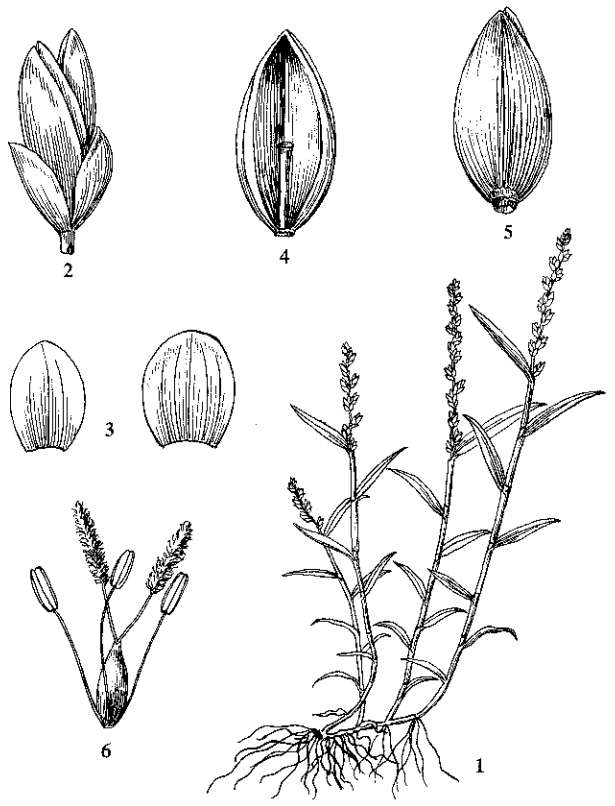

Figure 98. *Coelachne simpliciuscula* (Wight & Arn. ex Steud.) Munro ex Benth.

1. plant; *2.* spikelet; *3.* lower and upper glumes; *4.* lower floret; *5.* upper floret; *6.* stamens and pistil. (drawn by Y. X. Liu)

13. **Sphaerocaryum** Nees ex Hook. f. 稗蓋屬

Annual herbs. Culms creeping and rooting at nodes. Leaf sheaths hairy, shorter than internode; leaf blades ovate, base amplexicaul, apex acute; ligule a line of hairs. Inflorescence terminal, an ovoid outlined small panicle. Spikelets ovate, 1-flowered; floret bisexual, easily falling from the joint of the pedicel; glumes hyaline membranous, glabrous; lower glume shorter, veinless, upper glume as long as spikelet or slightly shorter than spikelet, 1-veined; lemma and palea thinly membranous, lemma broad ovate, dorsally pubescent, 1-veined; palea equal to lemma; stamens 3; style penicillate. Caryopsis ovate.

One species distributed from India to S China and Malay Peninsula; one species in Hong Kong.

1. **Sphaerocaryum malaccense** (Trin.) Pilg. 稗蓋 **(Fig. 99; Photos 320–321)**

Repert. Spec. Nov. Regni Veg. 45: 2. 1938; FHN 4: 393, fig. 1201. 1977; FRPS 10(1): 172, pl. 54. 1990; FFJ 6: 183, fig. 151. 1995; FTW ed. 2, 5: 446, pl. 184. 2000; FOC 22: 560. 2006; FGD 9: 372, fig. 181. 2009.

Panicum malaccense Trin., Gram. Panic. 204. 1826.

Isachne pulchella auct. non Roth.: FHK 414. 1861.

Sphaerocaryum elegans Nees ex Steud., Nomencl. Bot. (ed. 2) 2: 620. 1841; FKH 317. 1912.

Annual herb. Culms very slender, prostrate, 10–30 cm, rooting at lower nodes, nodes bearded. Leaf sheaths shorter than internode, ciliate along margins; leaf blades ovate-cordate, amplexicaul, 1–1.5 × 0.6–1 cm, ± hispidulous, margins ciliate-serrulate; ligule ca. 1 mm, a ring of hairs. Panicle shortly exserted from uppermost sheath, ovate, 2–5 × 1–2 cm, with many spikelets on 1–3 mm capillary glandular pedicels. Spikelets 1-flowered, ca. 1 mm; glumes hyaline, glabrous, the lower 2/3 spikelet length, veinless;

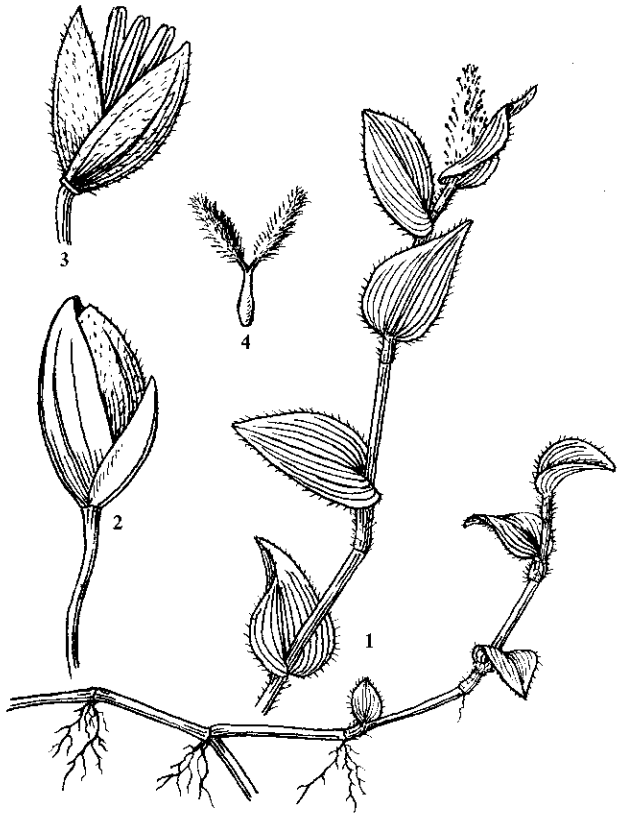

Figure 99. *Sphaerocaryum malaccense* (Trin.) Pilg.

1. portion of plant; *2.* spikelet; *3.* floret; *4.* gynoecium. (drawn by H. P. Yu)

the upper equal to spikelet or slightly shorter, 11-veined; lemma as long as spikelet, pubescent; palea similar to lemma; anthers 3, yellow. Caryopsis brownish at maturity.

Locality: Common in Hong Kong. *Y. S. Lau 3016; D. P. M. Guile 729; HK sheet 30747.*

Distribution: Guangdong, Guangxi, Yunnan, Jiangxi, Anhui, Zhejiang, Fujian, Taiwan; widespread over India, SE Asia and southward to Malay Peninsula and Indonesia

Ecology: Watersides and other damp places. Flowering & fruiting: Autumn.

14. Garnotia Brongn. 耳稃草屬

Perennial or annual erect herbs. Leaf blades linear to linear-lanceolate, flat or involute, usually tuberculate-pilose; ligule short, membranous. Panicle open or contracted; spikelets 1-flowered, dorsally compressed, usually paired, often with a tuft of short stiff hairs at base; glumes subequal, the lower slightly longer, thinly herbaceous, 3-veined, acute to acuminate, awned or awnless; lemma membranous, 1–3-veined, apex entire or 2-toothed, awned or rarely awnless; palea hyaline membranous, margins ciliate, auriculate at base, 2-veined; lodicules 2, thin; stamens 3, anthers linear; ovary glabrous, styles 2, free, short. Caryopsis free, oblong or linear.

About 30 species widely spread over India and Nepal eastward through SE Asia to Polynesia, Hawaii, and Australia (Queensland); five species and one variety in China; two species and one variety in Hong Kong.

1a. Panicle at maturity with stiffly spreading branches; culms 60–130 cm ..... 1. *G. patula*
1b. Panicle branches appressed or loosely ascending; culms 20–60 cm ..... 2. *G. acutigluma*

1. Garnotia patula (Munro) Benth. 耳稃草(葛氏草) **(Photo 322)**

FHK 416. 1861; FKH 317. 1912; FRPS 10(1): 140. 1990; FFJ 6: 182, fig. 149. 1995; FOC 22: 563. 2006; FGD 9: 363, fig. 175. 2009.

Berghausia patula Munro, Amer. Acad. Arts 4: 362. 1860.

Perennial herb. Culms erect, tufted, 60–130 cm tall, glabrous, nodes pubescent. Leaf sheaths keeled, longer than internode, glabrous or thinly pilose; leaf blades linear or linear-lanceolate, 15–60 × 0.4–1.2 cm, glabrous to sparsely pilose, sometimes with tubercle-based hairs, margins slightly scabrous; ligule membranous, 2–5 mm, ciliate. Panicle open, 15–40(–60) cm; branches stiff and very spreading, up to 12 cm. Spikelets narrow lanceolate, 4–4.5 mm, base shortly pubescent; glumes awned; awn of lower glume 2–8 mm; lemma as long as glume, glabrous, 3-veined, apex acuminate, awned; awn 7–15 mm, very slender.

Locality: Ma On Shan, Fo Tan, Lantau Island. *Y. S. Lau 3094; Y. W. Lam 1240; HK sheet 42038.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian; E Myanmar, N Vietnam.

Ecology: Margins of forests, moist grassy slopes. Flowering & fruiting: Aug.–Oct.

Notes: The type specimen was collected by C. Wright from Hong Kong Island between 1853 and 1856.

1a. Garnotia patula (Munro) Benth. var. **mutica** (Munro) Rendle 無芒耳稃草 **(Fig. 100)**

J. Linn. Soc. Bot. 36: 387. 1904; FOC 22: 563. 2006; FGD 9: 364. 2009.

Berghausia mutica Munro, Proc. Amer. Acad. Arts 4: 362. 1864.

Garnotia mutica (Munro) Druce, Bot. Exch. Club Soc. Brit. Isles 4: 624. 1917; FRPS 10(1): 136, pl. 42: 1–4. 1990; Check List HK Plants 336. 2002; 118. 2004.

Garnotia stricta auct. non Brongn.: FHK 416. 1861.

Culms 30–100 cm tall. Glumes acuminate or lower glume with a mucro; lemma acuminate, awnless or with a mucro to 1.5 mm.

Locality: No precise locality. *C. Wright s.n.* (K).

Distribution: Hainan, Guangdong, Guangxi, Yunnan; E Myanmar, N Vietnam.

Ecology: Margins of moist woodlands, streamsides. Flowering & fruiting: Sep.–Oct.

Notes: The type specimen was collected by C. Wright from Hong Kong Island between 1853 and 1856.

Figure 100. *Garnotia patula* var. *mutica* (Munro) Rendle
1. plant; *2.* spikelet; *3.* floret. (drawn by H. P. Yu)

2. Garnotia acutigluma (Steud.) Ohwi 三芒耳稃草

Bot. Mag. (Tokyo) 55: 393. 1941; FTW ed. 2, 5: 429. 2000; FOC 22: 563. 2006; FGD 9: 363. 2009.

Urachne acutigluma Steud., Syn. Pl. Glumac. 1: 121. 1854.

Garnotia triseta Hitchc., Lingnan Sci. J. 7: 200. 1931; FRPS 10(1): 139. 1990; FFJ 6: 182. 1995; Check List HK Plants 337. 2002; 118. 2004.

Perennial, tufted herb. Culms glabrous, 20–60 cm tall, nodes pubescent. Leaf sheaths longer than internodes, usually with a ring of stiff hairs along mouth and the membranous margins, otherwise glabrous; leaf blades linear to narrowly lanceolate, flat or folded, 5–20(–35) × 0.2–0.7 cm, adaxial surface hispid or scabrid, hairs tubercle-based or not, abaxial surface usually glabrous; ligule membranous, 0.2–0.5 mm. Panicle narrow, branches appressed or loosely erect or ascending, slightly scabrous; spikelets in threes at lower nodes, paired or solitary toward apex. Spikelets narrow lanceolate, 3–5 mm, base usually conspicuously pilose, pedicels slightly scabrous; glumes narrow lanceolate, subequal, membranous, scabrid on veins, apex acute to awned; lemma lanceolate, as long as glume, papery, smooth, 1–3-veined, acuminate and awned; awn slender, slightly scabrous, slightly flexuous, 8–15 mm; palea elliptic, slightly shorter than lemma, membranous, margins ciliate, 2-veined; lodicules 2, small, cuneate, emarginate, smooth.

Locality: Hong Kong (fide FGD 9: 363. 2009).

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Fujian, Taiwan; widespread over India, Myanmar, Vietnam through Indonesia, Malay Peninsula to Indonesia and Philippines.

Ecology: Moist mountain slopes and shady places along streams. Flowering & fruiting: Sep.–Oct.

15. Arundinella Raddi 野古草屬

Perennial or annual herbs. Culms terete, stout or slender. Leaf blades usually linear or linear-lanceolate, ciliate; ligule very short or almost absent and represented by a fringe of ciliate rim. Panicle open or contracted; spikelets paired, rarely solitary; pedicels unequal, slender. Spikelets 2-flowered; rachilla articulate between lower lemma and upper lemma; glume and lower floret persistent or articulate slowly; lower floret male or neuter, upper floret bisexual; glumes subequal or the lower shorter, herbaceous, (2–)3–5(–7)-veined; lower lemma herbaceous, persistent, smooth, 3–7-veined; upper lemma firmer in texture, chartaceous at maturity, scaberulous, awned or awnless; paleae equaling or slightly shorter than lemmas, membranous; lodicules 2; stamens 3; styles 2, free or connate at base.

About 60 species distributed in tropical and subtropical regions, but mainly in Asia; 20 species in China; two species in Hong Kong.

1a. Upper lemma awnless or with a solitary awn, lateral bristles absent; pedicels without stiff hairs at apex ..... 1. *A. nepalensis*

1b. Upper lemma with an awn and 2 lateral bristles; pedicels often with stiff hairs at apex ..... 2. *A. setosa*

1. Arundinella nepalensis Trin. 石芒草(石珍芒)

Gram. Panic. 62. 1826; FHK 416. 1861; FKH 318. 1912; FHN 4: 445. 1977; FFJ 6: 188, fig. 156. 1995; FRPS 10(1): 147, fig. 45: 1–3. 1990; FOC 22: 568. 2006; FGD 9: 398. 2009.

Perennial herb. Culms erect, stout, 0.6–2(–3) m tall, simple or branched, internodes usually glabrous, nodes appressed silky pubescent. Leaf sheaths shorter than internodes except 1–2 nodes at base, glabrous or pubescent; leaf blades linear or linear-lanceolate, 10–50 × 0.5–2 cm, glabrous or thinly to densely tuberculate-pilose, base rounded, apex long acuminate; ligule dry membranous, very short. Panicle open or loosely contracted; central axis ribbed, smooth; branches slender, alternate, fasciculate or subverticillate; pedicels unequal, glabrous. Glumes usually glabrous; lower glume ovate-lanceolate, 2–4 mm, 3–5-veined; upper glume as long as spikelet, 4.5–5.5 mm, 5-veined; lower floret staminate or barren; upper floret bisexual, lemma awned; awn geniculate with brown twisted column.

Locality: Common in Hong Kong. *S. P. Lau 583; Y. W. Lam 939; HK sheet 14993.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, SE Xizang, Hubei, Fujian; Bhutan, India, Myanmar, Nepal, Pakistan, Thailand, Vietnam, Africa, Australia.

Ecology: Mountain grasslands, hill thickets. Flowering & fruiting: Sep.–Nov.

2. Arundinella setosa Trin.

刺芒野古草 **(Fig. 101; Photos 323–324)**

Gram. Panic. 63. 1826; FHK 416. 1861; FKH 318. 1912; FHN 4: 445, fig. 1236. 1977; FFJ 6: 187, fig. 155. 1995; FRPS 10(1): 163, pl. 51: 1–3. 1990; FTW ed. 2, 5: 444, pl. 183. 2000; FOC 22: 565. 2006; FGD 9: 399. 2009.

Arundinella sinensis Rendle, J. Linn. Soc. Bot. 36: 342. 1904; FKH 318. 1912.

Perennial stout herb. Culms erect, tufted or solitary, (35–)60–190 cm tall, nodes glabrous or pubescent. Leaf sheaths glabrous or tuberculate-hispid; leaf blades linear, flat or margins slightly inrolled, 10–30(–70) × 0.3–1 cm, glabrous or tuberculate-hispid; ligule dry membranous, ca. 0.5 mm, ciliate. Panicle open or somewhat contracted, 10–45 cm; central axis and branches

Figure 101. *Arundinella setosa* Trin.
1. portion of plant; 2. spikelet. (drawn by X. L. Chen)

scabrid; branches spreading or ascending, usually solitary; pedicels scabrid, unequal, apex usually with several white long stiff hairs. Spikelets 5–7 mm; glumes ovate-lanceolate, apex acuminate and awn-pointed, glabrous or scaberulous along veins; lower glume 4–6 mm, 3–5-veined; upper glume 5–7 mm, 5-veined; lower floret male or barren; upper floret bisexual, awned, flanked by 2 slender erect bristles; bristles mostly 1–3 mm; awn geniculate with brown twisted column, 6–10 mm.

Locality: Hong Kong Island, Shatin Pass Rd., Ma Liu Shui, Ninepin Group, Lantau Island, Po Toi Islands. *Y. W. Lam 1059; HK sheet 41946, 42042.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Hubei, Henan, Anhui, Jiangxi, Jiangsu, Zhejiang, Fujian, Taiwan; widely spread over India, Indochina through Malay Peninsula to Indonesia, Philippines, New Guinea and Australia.

Ecology: Margins of forests, grassy hillsides. Flowering & fruiting: Aug.–Dec.

16. Spinifex L. 鬣刺屬

Perennial herbs, dioecious or sometimes androdioecious. Culms tufted, stout, solid, with creeping and rooting stolons. Leaf blades hard, linear to subulate-involute, ± rigid; ligule a line of hairs. Inflorescence terminal, composed of many solitary racemes subtended by prophylls and spathate sheaths and condensed into a compact fascicle; male inflorescence with exserted racemes bearing several spikelets and ending in a short point; female or bisexual inflorescence stellately globose, falling entire, composed of many racemes reduced to a solitary basal spikelet hidden among subtending spathes, its rachis prolonged into a long needle-like spine. Spikelets ovate-oblong, dorsally compressed; male spikelet herbaceous, few, alternate and dorsal in shallow cavities of rachis, deciduous with short pedicel, 2-floret, with shorter glumes; female spikelet papery, tardily deciduous as a whole at maturity, with glumes as long as spikelet or slightly shorter; lower lemma as long as spikelet, acute; upper lemma thicken papery, inrolled embraced same texture palea.

Four species distributed from India to SE Asia and Australia; one species in China and Hong Kong.

1. Spinifex littoreus (Burm. f.) Merr.
鬣刺 **(Fig. 102; Photo 325)**

Philipp. J. Sci. 7: 229. 1912; FHN 4: 444. 1977; FRPS 10(1): 391, pl. 119, 129: 18. 1990; FFJ 6: 188, fig. 157. 1995; FTW ed. 2, 5: 518, pl. 218. 2000; FOC 22: 553. 2006; FGD 9: 450, fig. 233. 2009.

Stipa littorea Burm. f., Fl. Ind. 29. 1767.

Spinifex squarrosus L., Mant. Pl. 300. 1771; FHK 415. 1861; FKH 317. 1912.

Perennial herb. Culms stoloniferous, hard, stout, many-noded, rooting and copiously branching at nodes, flowering shoots ascending to 30–100 cm or more. Leaf sheaths broad, glabrous or pubescent, imbricate, margins ciliate; leaf blades linear, 5–20 × 0.2–0.3 cm, very tough, involute-subulate, curved, glabrous, margins scabrous, apex spiny; ligule small, densely ciliate. Male inflorescence of 2–5 clustered; racemes 3–6 cm, bearing 5–10 loosely imbricate spikelets. Male spikelets lanceolate, 8–12 mm; glumes oblong-lanceolate, unequal, 7–9-veined; lower glume 1/2 spikelet length; upper glume 2/3 spikelet length; lower lemma 8–10 mm, 5-veined, palea as long as lemma, 2-veined. Female inflorescence globose; racemes with needle-like 10–18 cm rachis, with 1 spikelet at base. Female spikelets lanceolate-oblong, ca. 12 mm; glumes herbaceous; lower glume slightly shorter than spikelet, many-veined; lower lemma as long as spikelet, 5-veined, palea absent; upper lemma as long as palea, thickened papery, 5-veined.

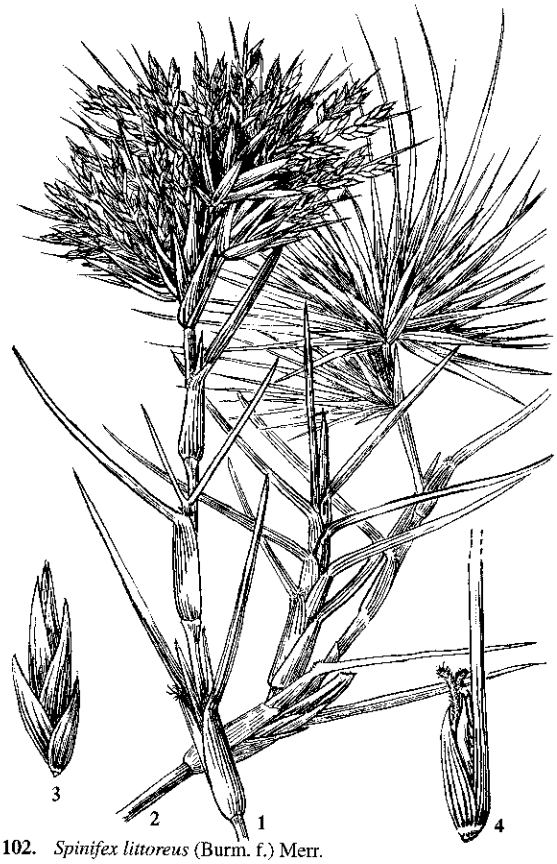

Figure 102. *Spinifex littoreus* (Burm. f.) Merr.
1. a branch with male inflorescence; *2.* a branch with female inflorescence; *3.* male spikelet; *4.* female spikelet. (drawn by X. L. Chen)

Locality: Long Ke, Tai Long Sai Wan, Ham Tin, Tai Wan, Lantau Island. *S. P. Lau 76; Y. S. Lau 2585; HK sheet 34662.*

Distribution: Hainan, Guangdong, Guangxi, Fujian, Taiwan; Vietnam, Cambodia, Thailand, Myanmar, India, Malay Peninsula, Indonesia, Philippines.

Ecology: Sandy beaches, seashore dunes. Flowering & fruiting: Summer to autumn.

17. Thuarea Pers. 蒺雷草屬

Perennial herbs. Culms solid, creeping, branching into many erect flowering culms. Leaf blades linear-lanceolate, stiff; ligule ciliate. Inflorescence monoecious, composed of a solitary deciduous raceme with spathe; rachis bearing 1–2 persistent bisexual or female spikelets at the base and several deciduous male spikelets above, spikelets secund in one row; male portion of the rachis shedding the spikelets after fertilization and folding onto the fertile spikelets, thus enclosing them in a capsule-like fruit-case. Lower glume small or

absent; upper glume equal to spikelet, 5-veined; lower floret barren or male, lemma as long as spikelet, palea well developed, stamen or not; upper floret fertile, thinly papery, lemma with flat margins and hairy apex, inrolled embraced same texture palea. Male spikelets similar but both florets staminate, smooth, with broadly inflexed margins.

Two species distributed from Madagascar to Polynesia; one species in China and Hong Kong.

1. Thuarea involuta (G. Forst.) R. Br. ex Sm.
蒺雷草 **(Fig. 103; Photo 326)**

Cycl. 35. 1817; FHN 4: 443. 1977; FRPS 10(1): 387, pl. 118. 1990; FTW ed. 2, 5: 518, pl. 219. 2000; FOC 22: 525. 2006; FGD 9: 449, fig. 232. 2009.

Ischaemum involutum G. Forst., Fl. Ins. Austr. 73. 1786.

Thuarea sarmentosa Pers., Syn. Pl. 1: 110. 1805; FHK 415. 1861; FKH 317. 1912.

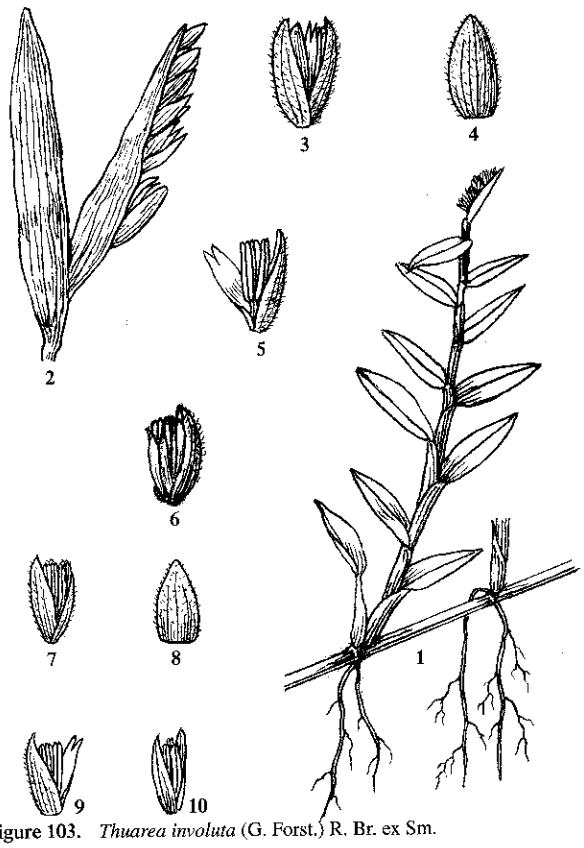

Figure 103. *Thuarea involuta* (G. Forst.) R. Br. ex Sm.
1. plant; *2.* inflorescence; *3.* bisexual spikelet; *4.* upper glume; *5.* lower floret of bisexual spikelet; *6.* upper floret of bisexual spikelet; *7.* male spikelet; *8.* upper glume of male spikelet; *9.* upper floret of male spikelet; *10.* upper floret on male spikelet. (drawn by H. P. Yu)

Perennial herb. Culms long and creeping, much branched, rooting at nodes, flowering culms up to 20 cm tall. Leaf sheaths loose, ca. 1/2 length of internode, pilose or only ciliate along margins; leaf blades lanceolate, 2–5 × 0.3–0.8 cm, usually puberulous on both surfaces, margins usually rugulose; ligule very short, a row of white short ciliate. Inflorescence a terminal one-sided raceme, enclosed by a spathe; rachis broad and wing-like in lower fertile part, narrowed above in staminate part. Bisexual spikelets ovate-lanceolate, 3.5–4.5 mm, 2-floret, only upper floret fertile; lower glume absent or narrow and small, membranous; upper glume subequal to spikelet, leathery, abaxially hairy, 7-veined; lower lemma herbaceous, 5–7-veined, palea membranous, stamen 3; upper lemma thick-papery, palea 2-veined, stamen 3. Male spikelet oblong-lanceolate, 3–4 mm; lower glume absent; upper glume herbaceous, abaxially hairy, 3–5-veined; lower lemma papery, broad lanceolate, 5-veined; palea membranous, 2-veined, 2-lobed; stamen 3; upper lemma papery, 5-veined; palea 2-veined; male spikelet deciduous at maturity, leaf-like rachis inrolled embraced fertile spikelet.

Locality: Hong Kong Island, Ping Chau. *H. F. Hance 10230* (BM).

Distribution: Guangdong, Hainan, Taiwan; widely spread over SE Asia, Malesia, Pacific islands, New Guinea, Australia, Indian Ocean islands and Madagascar.

Ecology: Sandy beaches. Flowering & fruiting: Apr.–Dec.

18. Stenotaphrum Trin. 鈍葉草屬

Perennials, stoloniferous. Leaf blades linear to narrowly lanceolate, obtuse or acute; ligule ciliate. Inflorescence of very short racemes bearing a few sessile spikelets; racemes arranged singly and sunk in pockets on one or both sides of a foliaceous or corky axis, raceme rachis ending in a point. Spikelets ovate-lanceolate to lanceolate, sessile or short pedicellate, alternating; glumes unequal, membranous, lower lemma small; upper lemma subequal to spikelet; lower floret staminate or neuter, lemma as long as the spikelet, usually coriaceous, rarely papery, smooth, acute; palea membranous, stamen present or not; upper lemma slightly shorter than lower lemma, indurate, smooth, inrolled embraced same texture palea.

Seven species distributed in tropical and subtropical coastal regions from the Indian Ocean to SE Asia and the Pacific Ocean; three species in China; two species in Hong Kong.

1a. Lower glume strongly veined, at least half as long as spikelet; rachis of individual raceme strongly winged ..... 1. *S. helferi*
1b. Lower glume faintly veined, less than half as long as spikelet; rachis of individual raceme angulate ..... 2. *S. secundatum*

1. Stenotaphrum helferi Munro ex Hook. f. 鈍葉草 **(Fig. 104; Photo 327)**

Fl. Brit. India. 7(21): 91. 1896 ["1897"]; FRPS 10(1): 385, pl. 117. 1990; FFJ 6: 190. 1995; FOC 22: 538. 2006; FGD 9: 449, fig. 231. 2009.

Stenotaphrum americanum Schrank, Pl. Rar. Hort. Monac. 2(10): t. 98. 1819[1822]; FKH 317. 1912.

Perennial herb. Culms creeping and rooting at base, flowering shoots 10–40 cm tall. Leaf sheaths loose, usually longer than internode, compressed, keeled, glabrous; leaf blades broadly linear, 5–17 × 0.5–1.1 cm, glabrous, base truncate or subrounded, apex slightly obtuse or mucronate, margins scabrous; ligule ca. 0.3 mm, apex with white short ciliate. Inflorescence 10–15 cm; axis flattened and winged, 3–5 mm wide, margins scabrous; racemes 7–18 mm, appressed within the curves of the midrib; raceme rachis triquetrous,

margins scabrous, tipped with a mucro arising from the terminal spikelet. Spikelets ovate-lanceolate, 4–4.5 mm; lower glume broadly ovate, 1/2–2/3 the length of spikelet, (3–)5–7-veined; upper glume as long as spikelet, 9–11-veined; lower floret staminate or neuter, lemma as long as spikelet, 7-veined, palea well developed, slightly shorter than lemma; upper lemma coriaceous, smooth, cuspidate-mucronate, margins inrolled embraced palea.

Locality: Hong Kong Island, Clear Water Bay. *P. P. H. But 248; HK sheet 8357, 42035.*

Distribution: Hainan, Guangdong, Fujian, Yunnan; Vietnam, Thailand, Myanmar, Malay Peninsula.

Ecology: Open forests, moist grasslands. Flowering & fruiting: Autumn.

Figure 104. *Stenotaphrum helferi* Munro ex Hook. f. *1.* plant; *2.* spikelet. (drawn by X. L. Chen)

2. Stenotaphrum secundatum (Walter) Kuntze 側鈍葉草

Revis. Gen. Pl. 2: 794. 1891; FOC 22: 538. 2006.

Ischaemum secundatum Walter, Fl. Carol. 249. 1788.

Perennial stoloniferous herb. Culms much branched, forming a dense turf; flowering shoots 10–30 cm tall. Leaf sheaths strongly keeled, often grouped in flabellate clusters; leaf blades broadly linear, folded when young, up to 15 × 0.4–1 cm, apex obtuse; ligule ca. 0.5 mm. Inflorescence 5–12 cm, slender, cylindrical; axis corky, disarticulating into segments at maturity; racemes 4–10 mm, reduced to 1–3 spikelets embedded in one face of the rachis, alternating on either side of the sinuous midrib; raceme rachis a stout pointed appendage within the axis cavity. Spikelets lanceolate, 4–5 mm, acute; lower glume up to 1/4 as long as spikelet; upper glume as long as spikelet; lower floret staminate, lemma cartilaginous, 3-veined, palea well developed; upper lemma papery, subequal to spikelet, smooth, acute.

Locality: Tai Tam, Tai Lung, Tai Mo Shan, Nim Shue Wan. *S. L. Thrower 1190; S. Y. Hu 9929* (CUHK).

Distribution: Maxico, USA, S America; widely naturalized, exact native range obscure.

Ecology: Cultivated as lawn grass in Hong Kong. Flowering & fruiting: Summer.

Notes: The species was reported as *Stenotaphrum dimidiatum* (L.) Brongn. previously (Check List HK Plants 349. 2002; 122. 2004).

19. Setaria P. Beauv. 狗尾草屬

Annual or perennial herbs. Culms usually tufted, erect geniculate at base, sometimes stoloniferous. Leaf blades linear to lanceolate, with a broad or attenuate base and acute tip; ligule divided into hair-like slips or ciliate. Inflorescence a panicle, dense and spike-like or open with the spikelets contracted around the primary branches; spikelets (or some of them) subtended by 1–several bristles which persist on the branches after the spikelets fall. Spikelets elliptic, awnless, florets 2; glumes and lower lemma membranous to herbaceous; lower glume ovate or triangular, 3–5-veined or veinless; upper glume 5–7-veined; lower floret staminate or neuter, palea present, reduced or absent; upper lemma coriaceous, strongly convex, rugose, punctate or smooth, margins inrolled embraced same texture palea; lodicules 2; stamens 3; styles 2. Caryopsis elliptic, globose or ovate-globose.

About 130 species distributed from tropical to warm-temperate regions of the world; 14 species in China; seven species in Hong Kong.

1a. Panicle open to contracted with obvious, spaced branches; spikelets usually subtended by a solitary bristle.
  2a. Leaf blades 2–7 cm wide; panicle branches up to 20 cm long; lower glume 1/3–1/2 spikelet length ..... 1. *S. palmifolia*
  2b. Leaf blades 1–3 cm wide; panicle branches up to 8 cm long; lower glume 1/4–1/3 spikelet length ..... 2. *S. plicata*

1b. Panicle densely spike-like with congested branchlets, sometimes lobed; spikelets subtended by several to many bristles.
  3a. Each branchlet from the main axis of inflorescence with only one mature spikelet; upper glume up to 1/2 as long as spikelet, upper floret clearly exposed.
    4a. Lower floret often staminate, palea ovate, as wide as upper floret; upper lemma coarsely rugose ..... 3. *S. pumila*
    4b. Lower floret neuter, palea lanceolate, much narrower than upper floret; upper lemma finely rugose ..... 4. *S. parviflora*
  3b. Each branchlet from the main axis of inflorescence with several mature spikelets; upper glume 2/3–3/4 or subequaling spikelet.
    5a. Upper glume 2/3–3/4 length of fertile floret; spikelets 2.8–3 mm, acute ..... 5. *S. faberi*
    5b. Upper glume subequaling fertile floret; spikelets 2–2.5(–3) mm, usually obtuse.
      6a. Upper floret falling free from the glumes and lower lemma at maturity; cultivated plants ..... 6. *S. italica*
      6b. Upper floret retained within spikelet, this falling whole; wild plants ..... 7. *S. verticillata*

1. Setaria palmifolia (J. König) Stapf 棕葉狗尾草 **(Photo 328)**

J. Linn. Soc., Bot. 42: 186. 1914; FHN 4: 436. 1977 ["palmaefolia"]; FRPS 10(1): 337, pl. 105: 1–8. 1990; FFJ 6: 193, fig. 159. 1995; FTW ed. 2, 5: 512, pl. 215, photo 57. 2000; FOC 22: 532. 2006; FGD 9: 439. 2009.

Panicum palmifolium J. König, Naturforscher 23: 208. 1788.

Perennial herb, with a short knotty rhizome. Culms erect or slightly geniculate, 75–200 cm tall. Leaf sheaths loose, usually sparsely hispid, margins tuberculate-ciliate near ligule, otherwise glabrous; leaf blades fusiform-lanceolate, 20–60 × 2–7 cm, glabrous or hispid, plicate, narrowed toward base and petiolate, margins tuberculate-ciliate, acuminate; ligule 1.5–2 m, a ring of hairs. Panicle open or slightly pyramid, 20–60 × 2–10 cm, branches up to 20 cm, laxly spreading, flexuous, some spikelets subtended by a solitary 5–15 mm bristle. Spikelets ovate-lanceolate, 3–4 mm, densely or sparsely arranged in one side; lower glume triangular-ovate, 1/3–1/2 length of spikelet, 3–5-veined; upper glume ovate, 1/2–3/4 length of spikelet, 5–7-veined, acute; lower lemma staminate or neuter, as long as spikelet or slightly longer, 5-veined, tipped with a short incurved beak; lower palea narrow, 2/3 length of lemma, hyaline; upper lemma indistinctly rugulose to almost smooth, slightly shiny, apex apiculate. Caryopsis ovate-lanceolate.

Locality: Common in Hong Kong. *Y. S. Lau 2011; L. T. Lo 103; HK sheet 40815.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Hubei, Hunan, Jiangxi, Anhui, Zhejiang, Fujian, Taiwan; tropical Asia, naturalized elsewhere.

Ecology: Open forests and other moist places. Flowering & fruiting: Aug.–Dec.

2. Setaria plicata (Lam.) T. Cooke 皺葉狗尾草 **(Photo 329)**

Fl. Bombay. 2: 919. 1908; FHN 4: 436. 1977; FRPS 10(1): 340, pl. 105: 9–17. 1990; FFJ 6: 193, fig. 160. 1995; FTW ed. 2, 5: 512, pl. 216. 2000; FOC 22: 532. 2006; FGD 9: 439. 2009.

Panicum plicatum Lam., Tab. Encycl. Meth. Bot. 4: 736. 1791; FHK 411. 1861.

Panicum excurrens Trin., Sp. Gram. 1(8): pl. 89. 1827; FHK 412. 1861.

Setaria mauritiana auct. non Spreng.: FKH 316. 1912.

Perennial herb. Culms loosely tufted, erect or decumbent from a knotty rootstock, 45–130 cm tall, glabrous or sparsely pubescent. Leaf sheaths submembranous, ± papillose-pilose, margins usually ciliate except at base; leaf blades narrowly lanceolate, thin, 10–45 × 1–3 cm, plicate, papillose-pilose, hispidulous or glabrous, narrowed toward base, apex attenuate; ligule ca. 2 mm, consisting of a ring of hairs. Panicle narrow oblong or linear, 15–35 cm, branches up to 8 cm, loose, ascending, some spikelets subtended by a solitary 10–20 mm bristle; central axis ribbed, finely pubescent and scabrous. Spikelets ovate-lanceolate, 3–4 mm; lower glume broad ovate, 1/4–1/3 length of spikelet, obtuse to truncate, 3–5-veined; upper glume 1/2–3/4 length of spikelet, obtuse or acute, 5–7-veined; lower lemma staminate or neuter, 5-veined; lower palea often well developed, margins slightly inrolled, 2-veined; upper lemma bisexual, as long as or slightly shorter than lower lemma, usually distinctly and finely rugose, rarely smooth, mucronate.

Locality: Hong Kong Island. *F. W. Xing 8032; Y. W. Lam 1556; HK sheet 40046.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; Japan, Indochina, Thailand, India, Nepal, Malay Peninsula.

Ecology: Margins of forests, ravines and shady pathsides. Flowering & fruiting: Jun.–Oct.

3. Setaria pumila (Poir.) Roem. & Schultes 金色狗尾草

Syst. Veg. 2: 891. 1817; FYN 9: 543, fig. 95: 7–9. 2003; FOC 22: 534. 2006.

Panicum pumilum Poir., Encycl., Suppl. 4: 273. 1816.

Setaria glauca auct. non (L.) P. Beauv.: FHN 4: 437. 1977; FRPS 10(1): 357. 1990; FFJ 6: 195, fig. 163. 1995; FTW ed. 2, 5: 510, photo 58. 2000; FGD 9: 442, fig. 226. 2009; Check List HK Plants 347. 2002; 121. 2004.

Annual herb. Culms erect or prostrate at base, 20–50(90) cm tall, smooth or scabrous just below inflorescence. Leaf sheaths keeled, glabrous; leaf blades linear-lanceolate or narrow lanceolate, 5–40 × 0.2–1 cm, adaxial surface scabrous or pilose at base, abaxial surface smooth, base rounded, acuminate; ligule ca. 1 mm, a ring of hairs. Panicle contracted cylindrical, densely, 3–17 × 0.4–0.8 cm; branches reduced to a solitary mature spikelet subtended by 5–10 or more bristles (sometimes an aborted spikelet also present); axis pubescent; bristles gold, brownish gold or sometimes purple, 2–3 times spikelet length. Spikelets broadly ovate, ca. 3 mm; lower glume broadly ovate or ovate, 1/3–1/2 length of spikelet, acute, 3-veined; upper glume broadly ovate, 1/2–2/3 length of spikelet, slightly obtuse, 5–7-veined; lower floret staminate or neuter, lower lemma as long as or slightly shorter than spikelet, 5-veined, palea membranous, stamen usually 3 or 0; upper floret bisexual, lemma coriaceous, as long as lower lemma, coriaceous, strongly and transversely rugose, acute.

Locality: Kwai Chung. *Y. S. Lau 2628.*

Distribution: Hainan, Guangdong, Guizhou, Sichuan, Yunnan, Xizang, Xinjiang, Ningxia, Shaanxi, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Shandong, Zhejiang, Fujian, Taiwan; widely spread over temperate and subtropical Asia and Europe.

Ecology: Wastelands, mountain slopes, roadsides. Flowering & fruiting: Jun.–Oct.

4. Setaria parviflora (Poir.) Kerguélen 幽狗尾草(褐毛狗尾草)

Lejeunia. 120: 161. 1987; FOC 22: 535. 2006; FGD 9: 442. 2009.

Cenchrus parviflorus Poir., Encycl. 6: 52. 1804.

Setaria glauca (L.) P. Beauv. var. *pallidefusca* (Schumach.) T. Koyama, J. Jap. Bot. 37(8): 237. 1962; FHN 4: 438, fig. 1228. 1977.

Setaria pallidefusca (Schumach.) Stapf & C. E. Hubb., Bull. Misc. Inform. Kew 1930: 259. 1930; FRPS 10(1): 358. 1990 ["*pallidifusca*"]; FFJ 6: 196. 1995 ["*pallidifusca*"]; FTW ed. 2, 5: 512. 2000; Check List HK Plants 347. 2002; 121. 2004 ["*pallidifusca*"].

Panicum glaucum auct. non L.: Benth., FHK 411. 1861.

Setaria glauca auct. non (L.) P. Beauv.: FKH 316. 1912.

Annual or biennial herb. Culms erect or geniculate at lower nodes, 20–90 cm tall. Leaf sheaths compressed, slightly keeled, glabrous; leaf blades linear-lanceolate, stiff, flat or slight infolded, 5–30 × 0.2–0.8 cm, glabrous or adaxial surface pilose at base, apex acuminate; ligule very short, margin a ring of ciliate. Panicle densely cylindrical, 2–15 × 0.5–1.2 cm; axis pubescent; bristles golden or purplish brown at maturity, 2–3 times spikelet length. Spikelets elliptic, 2–3 mm; lower glume triangular-ovate or broad ovate, 1/3–1/2 length of spikelet, acute, 3-veined; upper glume broadly ovate, ca. 1/2 length of spikelet, thin papery, 5-veined; lower floret neuter, lemma 5-veined, palea similar to upper lemma, membranous; upper floret bisexual, lemma cartilaginous, finely rugose, margins inrolled embraced same texture palea, mucronate; lodicules cuneate, apex finely fringed, stamens 3; styles 2, penicillate.

Locality: Wong Chuk Hang, Sai Kung. *Y. S. Lau 2188, 3185.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Jiangxi, Fujian, Taiwan; widely spread throughout the tropics and subtropics.

Ecology: Hillslopes, roadsides, wastelands. Flowering & fruiting: Oct.–Dec.

5. Setaria faberi R. A. W. Herrm. 大狗尾草 **(Fig. 105)**

Beitr. Biol. Pflanzen. 10: 51. 1910; FRPS 10(1): 356, pl. 109: 12–19. 1990; FFJ 6: 195, fig. 162. 1995 ["faberii"]; FTW ed. 2, 5: 510. 2000; FOC 22: 535. 2006; FGD 9: 441. 2009 ["faberii"].

Annual herb. Culms tufted, erect or geniculate at the lower nodes, 50–120 cm tall, glabrous. Leaf sheaths loose, ciliate on upper margins; leaf blades linear-lanceolate, 10–40 × 0.5–2 cm, glabrous or adaxial surface with scattered hairs, obtuse or narrowed to base, apex acuminate, margins serrate; ligule 1–2 mm, a ring of hairs. Panicle densely cylindrical, 5–24 × 0.6–1.3 cm, nodding, branchlets bearing several spikelets each subtended by 1–3 bristles; axis white-pilose; bristles green or brownish purple. Spikelets elliptic, ca. 3 mm; lower glume 1/3–1/2 length of spikelet, broad ovate, acute, 3-veined; upper glume 3/4 length of spikelet or slightly shorter, acute, 5–9-veined; lower floret neuter, lemma 5–8-veined; palea membranous, small; upper lemma strongly convex, distinctly transversely rugose-tuberculate, coriaceous, 5-veined. Caryopsis elliptic.

Locality: Sha Tin. *L. T. Lo 375.*

Distribution: Guangxi, Guizhou, Yunnan, Sichuan, Heilongjiang, Jilin, Henan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Shandong, Zhejiang, Fujian, Taiwan; Japan, Korea; naturalized elsewhere.

Ecology: Hillslopes, roadsides, wastelands. Flowering & fruiting: Jul.–Oct.

Figure 105. *Setaria faberi* Herrm.

1. plant; *2.* subtended spikelets and bristles; *3.* spikelet. (drawn by H. P. Yu)

6. Setaria italica (L.) P. Beauv. 粱

Ess. Agrostogr. 51. 1812; FKH 316. 1912; FRPS 10(1): 353. 1990; FFJ 6: 194. 1995; FTW ed. 2, 5: 510, pl. 214. 2000; FOC 22: 535. 2006; FGD 9: 441. 2009.

Panicum italicum L., Sp. Pl. 1: 56. 1753.

Annual herb. Culms stout, erect, up to 150 cm. Leaf sheaths loosely embraced culm, glabrous or tuberculate-pilose, margins ciliate; leaf blades long lanceolate or linear-lanceolate, 15–45 × 0.6–3 cm, adaxial surface scabrous, abaxial surface slightly smooth, base rounded and obtuse, apex acute; ligule 1–3 mm, a ring of hairs. Panicle cylindrical or subfusiform, nodding when mature, 6–40 × 0.5–5 cm; central axis densely hairy; spikelets subtended by several bristles 1–5 times as long as spikelet. Spikelets yellow, brown, orange or purple, elliptic or subglobose, 2–3 mm; lower glume 1/3–1/2 length of spikelet, 3-veined; upper glume subequal spikelet, 5–7(–9)-veined; lower lemma as long as spikelet, 5–7-veined; lower palea hyaline, lanceolate; upper lemma as long as lower lemma, oblong or ovate-oblong, cartilaginous, deciduous at maturity, finely rugose to smooth and shiny.

Locality: Cultivated. *Y. S. Lau 3221.*

Distribution: Widely cultivated, origin unknown.

Ecology: Flowering & fruiting: Summer to autumn.

Uses: Food (beverage base, cereal).

7. Setaria verticillata (L.) P. Beauv. 倒刺狗尾草

Ess. Agrostogr. 51. 1812; FRPS 10(1): 351, pl. 108: 11–18. 1990; FTW ed. 2, 5: 515. 2000; FYN 9: 543. 2003; FOC 22: 537. 2006; FGD 9: 441. 2009.

Panicum verticillatum L., Sp. Pl., ed. 2, 1: 82. 1762.

Annual herb. Culms tufted, ascending from geniculate base, much branched, 20–100 cm tall, glabrous. Leaf sheaths thin and soft, glabrous or papillose-puberulous, margins ciliolate; leaf blades linear-lanceolate, flaccid, 5–20 × 0.4–1.8 cm, usually glabrous or adaxially slightly scabrous, base subrounded, apex long acuminate, margins scabrous; ligule 0.5–1 mm, a ring of hairs. Panicle contracted, cylindrical, 4–15 cm, spikelets subtended by 1–4 bristles; bristles green or brownish, 3–8 mm, retrorsely barbed and often becoming entangled. Spikelets elliptic, 1.8–2.4 mm, obtuse; lower glume 1/3–1/2 length of spikelet, 3-veined; upper glume boat-shaped, as long as spikelet or slightly short, 5–7-veined; lower floret neuter, lower lemma as long as spikelet or slightly longer, 5-veined; lower palea much reduced; upper lemma as long as lower lemma or slightly short, dorsally compressed, finely and transversely rugose; lodicules cuneate, emarginate. Caryopsis elliptic.

Locality: Fung Kat Heung. *HK sheet 35660.*

Distribution: Nei Mongol, Taiwan, Yunnan; widespread tropical weed, originated from paleotropics.

Ecology: Roadsides, open weedy places. Flowering & fruiting: Jun.–Sep.

20. Pennisetum Rich. 狼尾草屬

Annual or perennial herbs. Culms stout and solid, erect or ascending. Leaf blades linear, flat conduplicate or inrolled, margins scabrid; ligule short, glabrous or ciliate. Inflorescence a spike-like panicle, cylindrical to subglobose; branches many, contracted into short clusters of 1 or more spikelets subtended by an involucre of bristles; involucres deciduous with the spikelets at maturity leaving peduncle stumps or scars on the main axis; bristles slender, scabrous, sometimes plumose. Spikelets solitary or 2–3-fasciculate, sessile or pedicellate, usually lanceolate, florets 2, falling off as a whole; glumes unequal, lower glume thin and small, 0–3-veined, upper glume longer than lower glume, 1–3-veined; lower floret staminate or neuter, lower lemma slightly shorter than spikelet, or sometimes as long, with broadly incurved margins, 3–8-veined; upper lemma bisexual, as long as spikelet or shorter, herbaceous or indurated thickened papery or coriaceous; lodicules 2; stamens 3; style base ± connate.

About 80 species spread throughout the tropics; 11 species in China; three species in Hong Kong.

1a. Inflorescence axis with sharp decurrent wings below each involucre; bristles densely woolly with crinkled hairs..... 1. *P. polystachion*

1b. Inflorescence axis not winged; bristles glabrous or hairs not crinkled, often tubercle-based.

2a. Culms robust, often 2 m or more; anthers with apical tuft of hairs..... 2. *P. purpureum*

2b. Culms usually less than 1.5 m; anthers without apical tuft of hairs..... 3. *P. alopecuroides*

1. Pennisetum polystachion (L.) Schult. 牧地狼尾草(多穗狼尾草) **(Photos 330–331)**

Mant. 2: 146. 1824; FTW ed. 2, 5: 505. 2000; FOC 22: 550. 2006; FGD 9: 444. 2009.

Panicum polystachion L., Syst. Nat., ed. 10, 2: 870. 1759.

Pennisetum setosum (Sw.) Rich., Syn. Pl. 1: 72. 1805; FRPS 10(1): 365. 1990.

Perennial or annual herb with short rhizomes. Culms tufted, 50–150 cm tall. Leaf sheath loose, hispid, margin ciliate. Leaf blades linear, 10–20 × 0.3–1.5 cm, hispid; ligule a ring of long hairs, ca. 1 mm. Panicle contracted panicle, yellow or purplish, 10–25 cm; bristles unequal, outer ones shorter, inner ones feathery, up to 1 cm. Spikelet ovate-lanceolate, 3–5 mm; lower glume absent or a small triangular scale; upper glume as long as spikelet or slightly longer, 5-veined; lower floret staminate or neuter, lemma similar but slightly shorter than spikelet, 5-veined, obtusely 3-lobed; upper floret shorter than spikelet, cartilaginous, smooth, shiny, readily deciduous at maturity.

Locality: New Territories. *L. T. Lo 411; Y. W. Lam 1205; HK sheet 42645.*

Distribution: Hainan, Taiwan; native to Africa, naturalized throughout the tropics.

Uses: Animal food (potential as forage).

Notes: The species was reported as *Pennisetum polystachyum* (L.) Schult. previously (Check List HK Plants 343. 2002; 120. 2004).

2. Pennisetum purpureum Schumach. 象草 **(Photo 332)**

Beskr. Guin. Pl. 44. 1827; FRPS 10(1): 373, pl. 111: 5–8. 1990; FFJ 6: 198, fig. 165. 1995; FTW ed. 2, 5: 505. 2000. FOC 22: 550. 2006; FGD 9: 443. 2009.

Perennial herb. Culms stout, erect, 2–4 m tall. Leaf sheaths glabrous or hispid; leaf blades linear, flat, 20–50 × 1–2 cm, adaxial surface hispid or papillos-pilose at base, abaxial surface glabrous, margins scabrous; ligule 1.5–5 mm, ciliate. Panicle golden, brownish or purplish, cylindrical, 10–30 × 1–3 cm; axis densely pilose, closely beset with small peduncle stumps. Spikelets solitary or 2–3-fasciculate, subsessile, lanceolate, 5–8 mm, subrounded by an involucre of bristles, falling off together with spikelet at maturity; lower glume ca. 0.5 mm or absent; upper glume lanceolate, 1/4–1/2 length of spikelet; lower floret staminate or neuters, lemma 1/2–4/5

spikelet length, 5–7-veined; upper lemma as long as spikelet, smooth and shiny, 5-veined; lodicules 2, small; stamens 3, anthers with a tuft of short hairs at tip; style base connate.

Locality: Cultivated. *Y. S. Lau 1674; L. T. Lo 38; Y. W. Lam 1206.*

Distribution: Fujian, Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Jiangxi, Jiangsu, Fujian, Taiwan; native to Africa.

Ecology: Flowering & fruiting: Aug.–Oct.

Uses: Environmental (erosion control), animal food (forage).

3. Pennisetum alopecuroides (L.) Spreng.
狼尾草 **(Fig. 106; Photo 333)**

Syst. Veg. 1: 303. 1825; FRPS 10(1): 366, pl. 111: 1–4. 1990; FFJ 6: 197, fig. 164. 1995; FTW ed. 2, 5: 502, pl. 209. 2000; FOC 22: 550. 2006; FGD 9: 444. 2009.

Panicum alopecuroides L., Sp. Pl. 1: 55. 1753.

Pennisetum compressum R. Br., Prod. 195. 1810; FKH 316. 1912.

Gymnothrix japonica Benth., FHK 413. 1860.

Perennial herb. Culms erect, tufted, 30–120 cm tall, hispid below inflorescence. Leaf sheaths longer than internode at the upper part, keeled, imbricate at base; leaf blades linear, flat or often involute, 10–80 × 0.3–1 cm, base papillose-hispid, apex long acuminate; ligule a ring of hairs, ca. 0.5 mm. Panicle cylindrical, spike-like, 5–25 × 1.5–3.5 cm; axis hispid, peduncle stumps short with crateriform tips; involucre usually enclosing one spikelet, rarely 2, basal stipe (1–)2–3 mm; bristles greenish or purple, longest 2–3 cm but not conspicuously longer than the others, all slender, hispid. Spikelet solitary, seldom paired, lanceolate, 5–8 mm; lower glume minute or absent; upper glume ovate-lanceolate, 1/3–2/3 length of spikelet, 3–5-veined; lower lemma as long as spikelet, 7–11-veined; upper lemma lanceolate, as long as spikelet, 3–7-veined, margins inrolled embraced same texture palea; lodicules 2; stamens 3, style base connate. Caryopsis oblong.

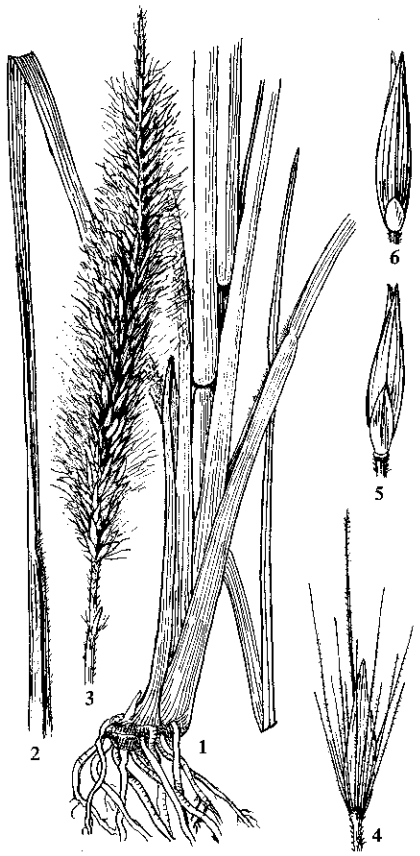

Figure 106. *Pennisetum alopecuroides* (L.) Spreng.
1. portion of plant; *2.* leaf; *3.* inflorescence; *4.* spikelet and bristle; *5.* adaxial view of spikelet; *6.* abaxial view of spikelet (drawn by X. L. Chen)

Locality: Common in Hong Kong. *Y. S. Lau 1504; HK sheet 39643, 40814.*

Distribution: Widely spread over most provinces of China; and tropical Asia, naturalized elsewhere.

Ecology: Grassy fields, roadsides, paths between paddy fields. Flowering & fruiting: Summer to autumn.

21. Cenchrus L. 蒺藜草屬

Annual or perennial herbs. Culms erect or ascending, often branched near the base. Leaf blades usually flat; ligule a ciliate rim. Inflorescence a spike-like panicle, composed of spiculate units, arranged on all sides of elongated central axis; units composed of 1–few spikelets inside an involucre, composed of bristles which are connate at lower part, or fixed to a flat disk at base of spikelets, often arranged in 2 heteromorphous rings; units shortly stipitate, each unit with small knob at base, often articulate, falling entire and acting as a bur; central axis protruding beyond uppermost unit. Sessile spikelets lanceolate, acute; glumes unequal, lower usually short or absent, upper usually shorter than spikelet; lower floret staminate or neuter, membranous, lemma thin papery to membranous, palea well developed, stamens 3; upper floret bisexual, lemma indurate at maturity, usually swollen, acuminate, margins thin and flat, palea the same texture; upper lemma firmer, with narrowly involute, firm margins embracing same texture palea; lodicules absent; stamens 3, anthers linear; styles 2, connate at base, exserted apically. Caryopsis elliptic-depressed-globose.

About 23 species distributed in tropical and warm-temperate regions of the world; four species in China; one species in Hong Kong.

1. Cenchrus echinatus L. 蒺藜草 **(Photos 334–335)**

Sp. Pl. 2: 1050. 1753; FRPS 10(1): 375, pl. 114: 14–22. 1990; FFJ 6: 191. 1995; FTW ed. 2, 5: 462, pl. 192. 2000; FOC 22: 553. 2006; FGD 9: 445, fig. 228. 2009.

Cenchrus calyculatus auct. non Gavan: FHN 4: 440, pl. 1231. 1977.

Annual herb. Culms geniculate, usually rooting at basal nodes, ca. 50 cm tall. Leaf sheaths loose, compressed, keeled, glabrous or upper margins ciliate, overlapping at base; leaf blades linear or linear-lanceolate, 5–20(–40) × 0.4–1 cm, glabrous to pubescent; ligule ca. 1 mm, a ring of hairs. Inflorescence a solitary raceme, 3–10 × ca. 1 cm; axis scabrous; burs globose, 0.4–1 cm, truncate, stipe pubescent, all spines and bristles whorled and retrorsely barbed, inner spines connate for 1/3–1/2 their length forming a globose cupule, dorsally fuzz, margins white ciliate, outer spines in 2 divergent whorls, a median whorl of stout rigid spines equaling the inner teeth, and an outermost whorl of relatively few short, slender bristles. Spikelets 2–4(–6) in bur, elliptic-lanceolate, 2-floret; lower glume

triangular-lanceolate, 1/3–1/2 spikelet length, acute, 1-veined; upper glume 2/3–3/4 spikelet length, 5-veined; lower floret staminate or neuter, lower lemma as long as spikelet, 5-veined, palea 2/3 length of lower lemma; upper floret bisexual, lemma 5-veined, inrolled embraced same texture palea; lodicules absent; style penicillate. Caryopsis depressed-globose.

Locality: Pok Fu Lam, Tai Hang, Kau Wa Keng, Sha Tin, Tai Po Kau. *Y. S. Lau 1560, 1972; Y. W. Lam 5.*

Distribution: Hainan, Guangdong, Yunnan, Fujian, Taiwan; a widespread weed of the tropics and subtropics, native to America.

Ecology: Sandy grasslands near seashores. Flowering & fruiting: Summer.

22. Ichnanthus P. Beauv. 距花黍屬

Perennial or annual herbs. Culms prostrate and branched at base. Leaf blades flat, usually broad. Inflorescence a panicle or the primary branches simple and raceme-like. Spikelets lanceolate, slightly laterally compressed, florets 2, solitary or paired at base; pedicels unequal; glumes herbaceous, 3–7-veined, subequal or lower glume slightly short, lower floret staminate or barren; lower glume and upper glume similar, palea membranous, narrow and small; upper floret bisexual; lemma leathery, with a semicircular to oblong callus, this laterally expanded into 2 membranous wings adnate to the lemma base, these often represented in dried material by scars, smooth and shiny, margins flat or inrolled palea; lodicules 2; style free from the base.

About 30 species mainly distributed in tropical and subtropical regions of the New World; one pantropical species occurs in China and Hong Kong.

1. Ichnanthus pallens (Sw.) Munro ex Benth. var. **major** (Nees) Stieber 大距花黍(距花黍) **(Fig. 107)**

Syst. Bot. 12: 207. 1987; FHK 414. 1861; FKH 316. 1912; FOC 22: 504. 2006; FGD 9: 407, fig. 208. 2009.

Panicum pallens Swartz var. *majus* Nees, Fl. Bras. Enum. Pl. 2: 138. 1829.

Ichnanthus vicinus (F. M. Bailey) Merr., FHN 4: 408, fig. 1212. 1977; FRPS 10(1): 219, pl. 66. 1990; FFJ 6: 208, fig. 176. 1995; FTW ed. 2, 5: 480, pl. 200. 2000; Check List HK Plants 338. 2002; 118. 2004.

Perennial herb. Culms slender, prostrate and rooting at the lower nodes. Leaf sheaths usually shorter than internode, pubescent or only ciliate; leaf blades ovate-lanceolate, flat, 3–9 × 1–2.5 cm, glabrous or puberulous on both surfaces, base asymmetrically cordate, apex acute or acuminate; ligule ca. 1 mm, a ciliate membrane. Panicles terminal and axillary from upper nodes, 5–15 cm; usually with soft hairs in the axils; branches spaced, loosely ascending, subracemose with laxly arranged spikelets. Spikelets lanceolate, 3–5 mm, laterally compressed; glumes open at maturity; lower glume 3–3.5 mm, 3-veined; upper glume equal to lower glume, 5-veined, acuminate; lower lemma herbaceous, 5-veined; lower palea elliptic, narrow, small, membranous, sometimes inrolled embraced stamens; upper lemma oblong, 2–2.5 mm, leathery, scars at base, obtuse.

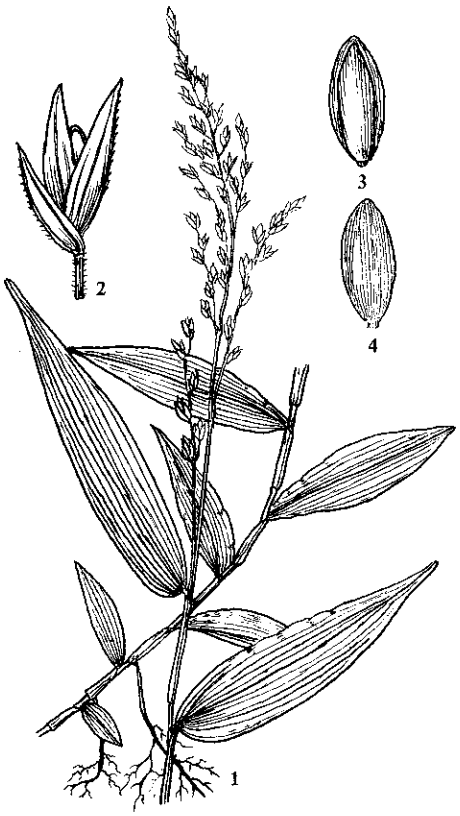

Figure 107. *Ichnanthus pallens* var. *major* (Nees) Stieber
1. plant; *2.* spikelet; *3.* adaxial view of upper floret; *4.* abaxial view of upper floret. (drawn by H. P. Yu)

Locality: Victoria Peak, Tai Mo Shan, Tseng Lan Shue, Tai Po Kau, Lantau Peak. *L. T. 298; Y. W. Lam 380; HK sheet 41991.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Hunan, Jiangxi, Fujian, Taiwan; widely spread over tropical Asia, W Africa, Australia (Queensland), Pacific islands (Polynesia) and S America.

Ecology: Moist places of hillslopes and grasslands. Flowering & fruiting: Aug.–Nov.

23. Cyrtococcum Stapf 弓果黍屬

Annual or perennial herbs. Culms prostrate and rooting at the lower nodes, upper part erect. Leaf blades linear-lanceolate to lanceolate; ligule membranous. Inflorescence an open or contracted panicle; pedicel usually slender, subequal. Spikelets laterally compressed, deciduous at maturity, florets 2, lower floret sterile, upper floret bisexual; glumes unequal, membranous to herbaceous, 3–5-veined, obtuse or acute; lower glume ovate, smaller; upper glume boat-shaped; lower lemma usually equal to spikelet, 5-veined, obtuse or acute, palea small or absent; upper lemma subleathery to crustaceous, dorsally convex, smooth or minutely pitted, a little greenish crest near the apex, upper palea dorsally slightly convex.

About 11 species distributed in tropical regions of the Old World; two species and one variety in China; one species and one variety in Hong Kong.

1. Cyrtococcum patens (L.) A. Camus 弓果黍 **(Photo 336)**

Bull. Mus. Natl. Hist. Nat. 27: 118. 1921; FHN 4: 412. 1977; FRPS 10(1): 195, pl. 59: 10. 1990; FFJ 6: 200, fig. 167. 1995; FTW ed. 2, 5: 465. 2000; FOC 22: 514. 2006; FGD 9: 409. 2009.

Panicum patens L., Sp. Pl. 1: 18. 1753; FKH 315. 1912.

Annual herb. Culms slender, smooth and glabrous, basal nodes branching and rooting, 15–30 cm tall. Leaf sheaths usually shorter than internode, glabrous or loosely pilose with tubercle-based hairs; leaf blades linear-lanceolate or lanceolate, 3–8 × 0.3–1 cm, pubescent on both surfaces or subglabrous, basal margins with a few long, stiff, tubercle-based hairs, apex acuminate; ligule membranous, 0.5–1 mm, rounded. Panicle 5–15 cm, often diffuse, branches loosely ascending to widely spreading, very slender, glabrous; pedicels filiform, longer than spikelets. Spikelets purplish at maturity, 1–2 mm, varying from glabrous to appressed-pubescent or shortly hispid with stiff, conspicuously tubercle-based hairs; glumes 3-veined, the lower ovate, ca. 1/2 length of spikelet, the upper boat-shaped, 2/3 length of spikelet; lower lemma subequal to spikelet, 5-veined, margins ciliate, obtuse; upper lemma ca. 1.5 mm, gibbous convex, with a scar at apex; upper palea oblong, included in upper lemma.

Locality: Common in Hong Kong. *Y. W. Lam 1627; HK sheet 42007.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Hunan, Jiangxi, Fujian, Taiwan; widely spread over tropical Asia and Pacific islands (Polynesia).

Ecology: Moist places in forests and grasslands. Flowering & fruiting: Sep.–Feb. of the following year.

1a. Cyrtococcum patens (L.) A. Camus var. **latifolium** (Honda) Ohwi 散穗弓果黍 **(Fig. 108)**

Acta Phytotax. Geobot. 11: 47. 1942; FRPS 10(1): 196, pl. 59: 9. 1990; FOC 22: 514. 2006; FGD 9: 410. 2009.

Panicum patens f. *latifolium* Honda, Bot. Mag. (Tokyo) 37: 25. 1923.

Cyrtococcum accrescens (Trin.) Stapf, Hooker's Icon. Pl. 31(4): 2, t. 3096. 1922; FHN 4: 412. 1977; FTW ed. 2, 5: 462, pl. 193. 2000; Check List HK Plants 330. 2002; 116. 2004.

It differs from var. *patens* by its culms up to 60 cm tall, leaf blades 7–15 × 1.2–2 cm; ligule 1–2 mm, panicle larger, 16–30 cm.

Locality: Common in Hong Kong. *Y. S. Lau 1030, 1664; P. S. Choi 281.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Hunan, Taiwan; India, Japan (Ryukyu Islands), Malay Peninsula, Thailand, Vietnam.

Ecology: Moist places in forests. Flowering & fruiting: Autumn to winter.

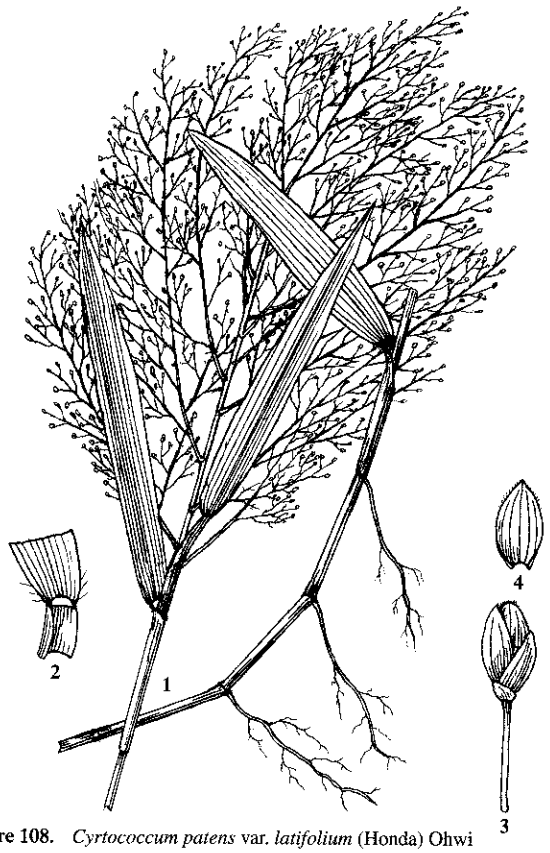

Figure 108. *Cyrtococcum patens* var. *latifolium* (Honda) Ohwi
1. portions of plant; *2.* ligule; *3.* spikelet; *4.* lemma. (drawn by H. P. Yu)

24. Melinis P. Beauv. 糖蜜草屬

Annual or perennial herbs. Culms tufted, often creeping and rooting at the base. Leaf sheaths shorter than internode, usually loose; leaf blades linear, flat; ligule a ciliate rim. Inflorescence a panicle, branched; pedicels slender, glabrous or with a few long hairs at the tip. Spikelets elliptic or oblong, ± laterally compressed, disarticulating below the glumes, hairy or glabrous; lower glume small or absent, veinless; upper glume as long as lower lemma, membranous to papery, 5–9-veined, emarginate or 2-lobed, awned or awnless, sometimes gibbous on the back and tapering to a beak; lower lemma resembling the upper glume, usually with a slender awn from sinus; upper lemma shorter, membranous, obscurely veined, awnless; palea as long as upper lemma; lodicules 2; stamens 3; styles 2; stigma plumose.

About 22 species distributed mainly in tropical regions and S Africa; two species in China and Hong Kong.

1a. Panicle dark purple; spikelets ca. 2 mm, usually glabrous ..... 1. *M. minutiflora*
1b. Panicle silvery-pink; spikelets 2–5 mm, conspicuously villous ..... 2. *M. repens*

1. Melinis minutiflora P. Beauv. 糖蜜草

Ess. Agrostogr. 54. 1812; FRPS 10(1): 228, pl. 69. 1990; FTW ed. 2, 5: 480. 2000; FYN 9: 548, fig. 94: 7–11. 2003; FOC 22: 539. 2006; FGD 9: 400, fig. 206. 2009.

Perennial herb, densely tomentose with glandular, slightly sticky hairs and a strong smell. Culms tufted, branched, rooting at lower nodes, 50–150 cm tall, nodes pubescent. Leaf sheaths shorter than internode, sparsely villous or tuberculate-pilose; leaf blades linear,

5–20 × 0.5–1.5 cm; ligule short, membranous, apex hairy. Panicle purplish, spreading, 10–20 cm. Spikelets narrowly ovate-oblong, ca. 2 mm, ± laterally compressed, glabrous; lower glume minute, veinless; upper glume oblong, 7-veined, 2-lobed, awnless or with a mucro to 1 mm from the sinus; lower floret neuter without a palea, lemma narrower oblong, 5-veined, 2-lobed, awnless or with a slender awn to 15 mm from the sinus; upper floret bisexual, lemma ovate-lanceolate, 3-veined, 2-lobed, hyaline; lodicules 2; styles 2. Caryopsis oblong.

Locality: So Kon Po, Yau Tong Wan (locally naturalized). *L. T. Lo 223; Y. S. Lau 2713; Y. W. Lam 1204.*

Distribution: Yunnan, Taiwan; a fodder grass of Africa origin.

Ecology: Flowering & fruiting: Jul.–Oct.

Uses: Animal food.

2. Melinis repens (Willd.) Zizka 紅毛草 **(Fig. 109; Photo 337)**

Biblioth. Bot. 138: 55. 1988; FOC 22: 539. 2006.

Saccharum repens Willd., Sp. Pl., ed. 4, 1: 322. 1797.

Rhynchelytrum repens (Willd.) C. E. Hubb., Kew Bull. 1934: 110. 1934; FRPS 10(1): 232, pl. 70. 1990; FFJ 6: 184, fig. 152. 1995; FTW ed, 2. 5: 507. 2000; FGD 9: 401. 2009; Check List HK Plants 345. 2002; 120. 2004.

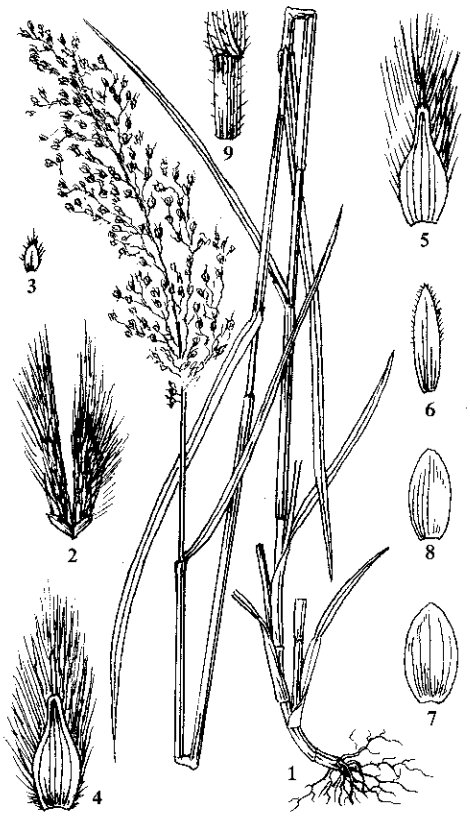

Figure 109. *Melinis repens* (Willd.) Zizka

1. plant; *2.* spikelet; *3.* lower glume; *4.* upper glume; *5.* lower lemma; *6.* lower palea; *7.* upper lemma; *8.* upper palea; *9.* culm (enlarged). (drawn by H. P. Yu)

Perennial herb. Culms erect, branched, up to 1(–1.5) m tall. Leaf sheaths loose, usually with tubercle-based hairs, mostly shorter than internode; leaf blades linear, up to 20 × 0.2–1.4 cm, glabrous; ligule a ring of long (ca. 1 mm) hairs. Panicle silvery-pink or purple, ovate to oblong, 8–20 cm; branches capillary; pedicels with a few long hairs. Spikelets ovate, laterally compressed, 2–5 mm, densely villous, hairs up to 6 mm; lower glume narrowly oblong, 0.3–1.5 mm, 1-veined, with stiff short hairs; upper glume 5-veined, pink hairs, gibbous below middle, tapering upward into a glabrous membranous beak, emarginate, mucronate or with short awn up to 1 mm; lower floret staminate, lemma similar to upper glume but narrower and less gibbous, pink hairs, palea keels ciliate; upper floret whitish, ca. 2 mm, thinly cartilaginous, smooth, shining; lodicules 2; stamens 3, anthers 2 mm; styles 2, free, stigma plumose.

Locality: Common in Hong Kong (naturalized). *H. C. Tang 628; Y. S. Lau 754; HK sheet 14556.*

Distribution: Guangdong, Guangxi, Fujian, Taiwan; originated from tropical S Africa, now introduced into most warm countries.

Ecology: Grasslands, wastelands. Flowering & fruiting: Jun.–Nov.

25. Sacciolepis Nash 囊穎草屬

Annual or perennial herbs. Culm erect or geniculate at the base. Leaf blades linear to convolute; ligule membranous. Inflorescence a dense and narrow cylindrical, spike-like panicle. Spikelets asymmetrical, lanceolate-oblong to ovate, usually laterally or rarely dorsally compressed, florets 2, lower floret staminate or barren, upper floret bisexual, deciduous from the swollen apex of pedicel; glumes unequal, lower glume slightly small, margins membranous; upper glume triangular-ovate, deeply concave and gibbous on the back, 7–11-veined; lower lemma similar to upper glume but less gibbous; palea often much reduced, hyaline; upper lemma oblong, dorsally compressed, often much shorter than spikelet, thinly leathery to cartilaginous, smooth, shiny, margins inrolled embraced palea. Lodicules 2; styles 2, free from the base.

About 30 species distributed in the tropics, but mainly in Africa; three species in China; one species in Hong Kong.

1. Sacciolepis indica (L.) Chase 囊穎草(滑草) **(Fig. 110; Photos 338–339)**

Proc. Biol. Soc. Washington. 21: 8. 1908; FHN 4: 410. 1977; FRPS 10(1): 224, pl. 68: 1–7. 1990; FFJ 6: 199, fig. 166. 1995; FTW ed. 2, 5: 509, pl. 212. 2000; FOC 22: 511. 2006; FGD 9: 410, fig. 211. 2009.

Aira indica L., Sp. Pl. 1: 63. 1753.

Panicum indicum auct. non Mill.: FHK 413. 1861; FKH 315. 1912.

Annual herb. Culms usually tufted, erect or geniculate at base, 20–100 cm tall. Leaf sheaths loose, slightly keeled, shorter than internode, glabrous or tuberculate-pilose; leaf blades linear, flat to slightly involute, 5–20 × 0.2–0.5 cm, glabrous or hairy, base slightly narrow, apex acute; ligule membranous, 0.2–0.5 mm, pubescent. Panicle spike-like, 10–16 × 0.3–0.5 cm. Spikelets green or purplish green, ovate-lanceolate, laterally compressed, 2–3 mm, glabrous or papillose-hispid; lower glume 1/3–1/2 length of spikelet, usually 3-veined; upper glume as long as spikelet, dorsally gibbous, 7–11-veined; lower lemma as long as upper glume, usually 9-veined; palea small and absent, hyaline; upper lemma yellowish, narrowly ovate, 1/2 length of spikelet, smooth and glossy. Caryopsis elliptic.

Locality: Common in Hong Kong. *Y. S. Lau 1867; K. L. Yip 4039; HK sheet 35849.*

Distribution: Widely spread over E, S, SW and C China; Bhutan, India, Japan, Myanmar, Nepal, Thailand, Vietnam, Africa, Australia, Pacific islands.

Ecology: Margins of paddy fields and other moist places. Flowering & fruiting: Jul.–Nov.

26. Hymenachne P. Beauv. 膜稃草屬

Perennial hydrophilous herbs. Culms spongy, creeping and rooting at lower nodes. Leaf blades linear or broadly linear, acute; ligule membranous. Inflorescence usually a cylindrical spike-like panicle. Spikelets lanceolate, deciduous with pedicels, dorsally compressed, fasciculate, pedicels very short, florets 2, lower floret staminate or neuter, upper floret bisexual; lower glume much shorter than spikelet; upper glume and lower lemma shorter than or subequalling spikelet, 3–5-veined, apex acute to shortly awned; lower palea absent; upper lemma membranous, margins thin and embracing upper palea except at apex; stamens 3; ovary glabrous, styles 2, free, stigma plumose, exserted laterally from upper part of spikelets.

Five species distributed in the tropics and warm regions of both hemisphere; three species in China; one species in Hong Kong.

1. Hymenachne amplexicaulis (Rudge) Nees
膜稃草 **(Fig. 111)**

Fl. Bras. Enum. Pl. 2: 276. 1829; FOC 22: 510. 2006; FGD 9: 430. 2009.

Panicum amplexicaule Rudge, Pl. Guian. 1: 21. 1805;

Hymenachne acutigluma (Steud.) Gilliland, Gard. Bull. Sing. 20: 314. 1964; FRPS 10(1): 298, pl. 92: 1–5. 1990; FYN 9: 501. 2003; Check List HK Plants 338. 2002; 118. 2004.

Hymenachne pseudointerrupta C. Muell., Bot. Zeit. 19: 333. 1861; FTW ed. 2, 5: 478, pl. 199. 2000.

Perennial herb. Culms spongy, creeping and rooting at the base, up to 1 m tall, many-noded, glabrous. Leaf sheath slightly shorter than internode, nodes pubescent. Leaf blades broadly linear, thick, 30–40 × ca. 2 cm, glabrous or the adaxial surface and margins loosely tuberculate-hairy, base rounded and slightly clasping, apex acuminate; ligule membranous, 1–2 mm. Panicle 20–40 × 1–2 cm; spike-like, branches 0.5–2 cm, erect, appressed; rachis winged, fasciculate spikelets in one side; pedicels very short, scabrous. Spikelets narrowly lanceolate, 3.5–5 mm; lower glume ovate, ca. 1.5 mm, membranous, 1-veined; upper glume and lower lemma lanceolate, 3–4 mm, herbaceous, apex with 0.5–2 mm awn; upper lemma ca. 3 mm, membranous, acuminate; palea 2, mucronate; anthers ca. 1 mm. Caryopsis ca. 1.5 mm, apex rounded.

Locality: Hong Kong. *HK sheet 33914.*

Distribution: Hainan, Yunnan, Taiwan; India, Thailand, Myanmar, Vietnam, Malay Peninsula, Philippines.

Ecology: Ponds and marshes in shallow water. Flowering & fruiting: Summer to autumn.

27. Panicum L. 黍屬

Annual or perennial herbs. Culms erect, ascending or prostrate. Leaf blades filiform or linear to ovate-lanceolate, usually flat. Inflorescence usually a terminal open panicle, branches spreading. Spikelets dorsally compressed, deciduous below the glumes, 2-floret, the lower floret staminate or barren; glumes herbaceous

Figure 110. *Sacciolepis indica* (L.) Chase
1. plant; *2.* spikelet; *3.* grain. (drawn by X. L. Chen)

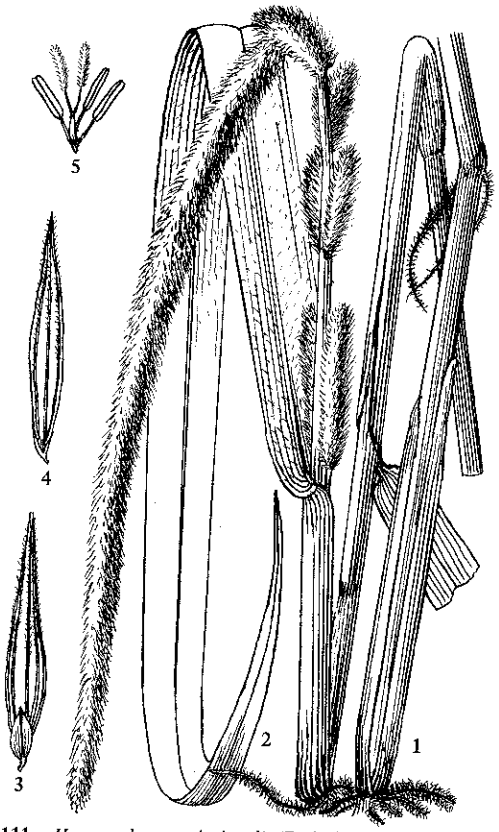

Figure 111. *Hymenachne amplexicaulis* (Rudge) Nees
1. lower portion of plant; *2.* upper portion of plant; *3.* spikelet (abaxial view); *4.* spikelet (adaxial view); *5.* stamens and pistil. (drawn by H. P. Yu)

to membranous, occasionally equal, usually unequal; lower usually shorter than the spikelet; upper as long as spikelet, or slightly shorter; lower lemma similar to upper glume, with or without a palea; upper floret bisexual, lemma leathery or cartilaginous, the margins inrolled embraced palea; lodicules 2; stamens 3; styles 2, free, stigma penicillate.

About 500 species distributed in tropical and warmer temperate regions of the world; 21 species in China; six species in Hong Kong.

1a. Upper floret rugose ..... 1. *P. maximum*
1b. Upper floret papillate or smooth.
2a. Leaf blades ovate to lanceolate.
3a. Culms herbaceous ..... 2. *P. brevifolium*
3b. Culms terete, woody.
4a. Lower glume separated by an internode; upper lemma glabrous at the apex ..... 3. *P. notatum*
4b. Lower glume not separated by an internode; upper lemma ciliolate at the apex ..... 4. *P. incomtum*
2b. Leaf blades linear to narrowly lanceolate.
5a. Plant annual; aquatic ..... 5. *P. dichotomiflorum*
5b. Plant perennial; terrestrial ..... 6. *P. repens*

1. Panicum maximum Jacq. 大黍 **(Photo 340)**

Icon. Pl. Rar. 1: 2. 1781; FKH 315. 1912; FHN 4: 405. 1977; FRPS 10(1): 214, pl. 63: 18–22. 1990; FFJ 6: 205. 1995; FTW ed. 2, 5: 490, pl. 205. 2000; FOC 22: 506. 2006; FGD 9: 405. 2009.

Perennial herb, rhizomatous. Culms stout, erect, 1–3 m tall, nodes glabrous or densely pilose. Leaf sheaths sparsely tuberculate-hispid; leaf blades linear to narrowly lanceolate, flat, 20–60 × 1–3 cm, adaxial surface tuberculate-hispid near base, base broad, taping downward, apex acuminate, margins scabrous; ligule 1–1.5 mm, membranous, long-ciliate. Panicle oblong, spreading, 20–35 cm, much branched; branches spreading, lowest arranged in a whorl. Spikelets oblong, ca. 3 mm; lower glume broadly ovate, 1/3–1/2 length of spikelet, 1–3-veined or veinless; upper glume elliptic, as long as spikelet, 5-veined, acute; lower floret staminate, lemma similar to upper glume, palea well developed, stamens 3; upper floret oblong, thinly coriaceous, shiny, finely transverse rugulose.

Locality: Cultivated for forage. *Y. S. Lau 2232, 2537; HK sheet 35001.*

Distribution: Guangdong, Fujian, Taiwan (introduced); Africa, Arabian Peninsula; widely naturalized in the tropics.

Ecology: Flowering & fruiting: Aug.–Oct.

Uses: Animal food (fodder, forage).

2. Panicum brevifolium L. 短葉黍 **(Photos 341–342)**

Sp. Pl. 1: 59. 1753; FKH 316. 1912; FHN 4: 404. 1977; FRPS 10(1): 216, pl. 64: 1–7. 1990; FFJ 6: 204, fig. 171. 1995; FTW ed. 2, 5: 487, pl. 204. 2000; FOC 22: 509. 2006; FGD 9: 406. 2009.

Panicum ovalifolium Poir., Encycl., Suppl. 4: 279. 1816; FHK 413. 1861.

Annual herb. Culms rambling and rooting at lower nodes, flowering branches 10–50 cm tall, nodes glabrous or pubescent. Leaf sheaths shorter than internode, puberulous or glabrous, margins ciliate; leaf blades ovate or ovate-lanceolate, 2–10 × 0.5–3 cm, glabrous or sparsely pilose, base cordate, amplexicaul, apex acute, margins scabrous or the base with tuberculate-ciliate; ligule ca. 0.2 mm, a ciliolate membrane. Panicle oblong or ovate in outline, spreading, much branched, usually glandular patches present. Spikelets elliptic, 1.5–2 mm, sparsely puberulous to pilose; lower glume oblong-lanceolate, slightly shorter than or as long as spikelet, 3-veined; upper glume as long as spikelet, 5-veined, dorsally convex, apex beak-like; lower lemma oblong, similar to upper glume, palea well developed; upper floret ovate.

Locality: Common in Hong Kong. *Y. S. Lau 2032; L. T. Lo 559; HK sheet 42039.*

Distribution: Guangdong, Guangxi, Yunnan, Guizhou, Jiangxi, Fujian, Taiwan; Indian Subcontinent, Indochina, Malay Peninsula, tropical Africa.

Ecology: Humid places in open fields and margins of forests. Flowering & fruiting: May–Dec.

3. Panicum notatum Retz. 心葉稷(山黍)

Observ. Bot. 4: 18. 1786; FHN 4: 404. 1977; FRPS 10(1): 210, pl. 63: 10–13. 1990; FFJ 6: 207, fig. 175. 1995; FTW ed. 2, 5: 491. 2000; FYN 9: 496. 2003; FOC 22: 509. 2006; FGD 9: 404. 2009.

Panicum montanum Roxb., Fl. Ind. 1: 315. 1820; FHK 412. 1861; FKH 315. 1912.

Perennial herb. Culms erect or geniculately ascending, often rooting at lower nodes, branched. Leaf sheaths shorter than internode, ciliate; leaf blades lanceolate, 5–12 × 1–3 cm, subglabrous to pubescent, cross veins present, base cordate, apex finely pointed to acuminate, margins scabrid; ligule very short, a ciliate membrane. Panicle broadly ovate, spreading, much branched; branches slender, spreading, glabrous, smooth or scabrid, bearing spikelets toward the extremities. Spikelets elliptic, 2–2.5 mm, glabrous or puberulous; lower glume ovate or oblong, nearly equaling or slightly shorter than the spikelet, 3–5-veined; upper glume as long as spikelet, 5-veined, acute; lower lemma similar to upper glume, 5-veined, palea absent; upper floret as long as spikelet, leathery, smooth, shiny.

Locality: New Territories. *Y. W. Lam 426; HK sheet 41979, 41980.*

Distribution: Guangdong, Guangxi, Yunnan, Xizang, Fujian, Taiwan; Indian Subcontinent, Indochina, Malesia.

Ecology: Margins of forests. Flowering & fruiting: May–Nov.

4. Panicum incomtum Trin. 藤竹草 **(Photo 343)**

Gram. Panic. 200. 1826; FHN 4: 406. 1977; FRPS 10(1): 211, pl. 63: 14–17. 1990; FFJ 6: 207. 1995; FOC 22: 509. 2006; FGD 9: 405. 2009.

Panicum sarmentosum auct. non Roxb.: FHK 412. 1861; FKH 315. 1912.

Perennial herb. Culms woody, branching and scrambling, up to 10 m. Leaf sheaths loose, puberulous; leaf blades narrowly lanceolate, 10–25 × 1–3 cm, pilose, base rounded, apex acuminate; ligule ca. 0.5–1 mm, ciliate. Panicle spreading, 10–20 cm; central axis erect, much branched, viscid. Spikelets ovate, 1.5–2.2 mm, obtuse or slightly acute; lower glume ovate, 2/3–3/4 length of spikelet, 3–5-veined, base inrolled embraced spikelet, acute or ciliate; upper glume as long as spikelet, 5-veined; lower lemma similar to upper glume, palea well developed; upper floret as long as spikelet, brown, smooth, shiny.

Locality: Causeway Bay, Fung Yuen, Ng Tung Chai, Cheung Chau. *Y. W. Lam 1314, 1735; HK sheet 41721.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Jiangxi, Fujian, Taiwan; Indochina, Indian Subcontinent, Malesia, Australia.

Ecology: Shade in forests. Flowering & fruiting: Jul.–Mar.

5. Panicum dichotomiflorum Michx. 洋野黍(水生黍) **(Photos 344–345)**

Fl. Bor. Amer. 1: 48. 1803; FRPS 10(1): 207. 1990; FTW ed. 2, 5: 490. 2000; FOC 22: 506. 2006; FGD 9: 403. 2009.

Panicum paludosum Roxb., Fl. Ind. 1: 310. 1820; FRPS 10(1): 206. 1990; Check List HK Plants 342. 2002; 119. 2004.

Annual or perennial hydrophilous herb. Culms creeping and rooting at lower nodes, branching, 30–110 cm, upper nodes glabrous. Leaves cauline; leaf sheaths striate, glabrous, longer than internode; leaf blades linear, flat, 7–35 × 0.5–1.5 cm, glabrous, scabrid, base straight or subcordate, apex acute; ligule 1–2 mm, a ciliate membrane. Panicle terminal or axillary, open, 10–30 cm, much branched; branches glabrous, scabrid, secondary and tertiary branches often appressed. Spikelets lanceolate to narrowly ovate, 3–4 mm, glabrous, acuminate; lower glume 1/6–1/3 length of spikelet, clasping at the base of the spikelet, membranous, 0–1-veined, apex obtuse to acute; upper glume as long as spikelet, 7–9-veined; lower lemma similar to upper glume, palea absent or well developed, narrow and small; upper floret green or pale yellow, 2/3 length of spikelet, smooth, shiny, acute.

Locality: New Territories. *Y. W. Lam 1574; HK sheet 41942, 42013.*

Distribution: Guangdong, Guangxi, Yunnan , Fujian, Taiwan; India, Malaysia, tropical regions of the New World.

Ecology: Swampy places in shallow waters. Flowering & fruiting: Jun.–Oct.

6. Panicum repens L. 鋪地黍 **(Fig. 112; Photos 346–347)**

Sp. Pl., ed. 2, 1: 87. 1762; FHK 412. 1861; FKH 315. 1912; FHN 4: 404. 1977; FRPS 10(1): 207, pl. 62: 1–8. 1990; FTW ed. 2, 5: 491. 2000; FOC 22: 506. 2006; FGD 9: 404. 2009.

Perennial, rhizomatous herb. Culms erect or decumbent, 20–120 cm tall. Leaf sheaths glabrous, puberulous to ciliate on margins; leaf blades linear, 5–25 × 0.2–0.8 cm, flat or convolute, often stiff and pungent, apex acute or acuminate; ligule 0.5–1.5 mm, a ciliate membrane. Panicle terminal, narrowly oblong, open, 5–20 cm; branches ascending. Spikelets oblong, ca. 3 mm, glabrous, acute; lower glume 1/4–1/3 length of spikelet, thin membranous, hyaline, clasping at the base of the spikelet, obtuse or truncate; upper glume as long as spikelet, membranous, 7–9-veined, beak-like; lower floret staminate, lemma similar to upper glume, stamens 3, palea well developed; upper floret bisexual, nearly equal to spikelet, oblong, acute, smooth and shiny.

Locality: Common in Hong Kong. *Y. S. Lau 1637, 2282; Y. W. Lam 760.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Jiangxi, Zhejiang, Fujian, Taiwan; pantropics.

Ecology: Streamsides, paddy fields and other moist places. Flowering & fruiting: Jun.–Nov.

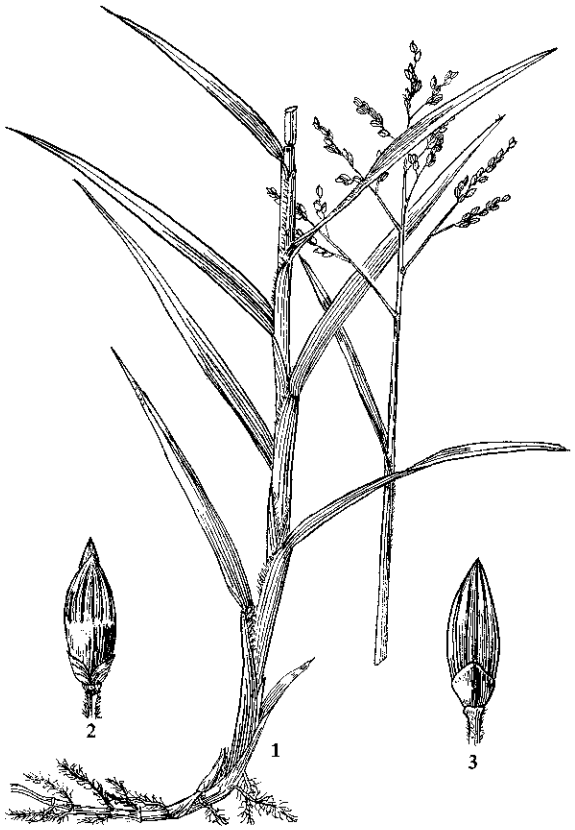

Figure 112. *Panicum repens* L.

1. plant; *2.* adaxial view of spikelet; *3.* abaxial view of spikelet (drawn by X. L. Chen)

28. Digitaria Haller 馬唐屬

Annual or perennial herbs. Culms erect or ascending from decumbent base. Leaf blades linear or linear-lanceolate; ligule membranous, well developed. Inflorescence of digitately arranged racemes, sometimes on a short axis or with secondary branchlets. Spikelets crowded, alternately 2–3-together along keel, unequally pedicellate in a group, sometimes subsessile, deciduous with widened tip of pedicel, dorsally compressed; lower glume absent or very small; upper glume lanceolate, usually pubescent; lower lemma usually ± equal to

spikelet, usually pilose or hairiness variable, 3–9-veined; lower palea absent or very small and adnate to base of upper lemma; upper lemma thicken papery or cartilaginous, apex acute, dorsally convex, densely striate and very finely tuberculate, palea the same texture, stamens 3; styles 2, free; lodicules 2. Caryopsis oblong-elliptic.

About 250 species widely spread over tropical and warm-temperate regions of the world; 22 species in China; ten species in Hong Kong.

1a. Spikelets diomorphic, lower spikelet glabrous or almost so, upper spikelet conspicuously hairy ..... 1. *D. heterantha*
1b. Spikelets all similar.
2a. Perennials; leaf sheaths breaking up into fibrous tussock at base ..... 2. *D. fibrosa*
2b. Annuals or short-lived perennials; leaf sheaths not forming fibrous tussock.
3a. Spikelets in groups of 3 or more (at least in middle part of raceme); pedicels usually with discoid tips.
4a. Upper lemma dark brown to blackish purple at maturity; plant usually tufted ..... 3. *D. violascens*
4b. Upper lemma pale yellowish brown or grey at maturity; plant stoloniferous ..... 4. *D. longiflora*
3b. Spikelets paired; pedicels with truncate tips.
5a. Lower glume absent or almost so ..... 5. *D. setigera*
5b. Lower glume small but clearly present.
6a. Raceme rachis with smooth margins; racemes 2–3 ..... 6. *D. radicosa*
6b. Raceme rachis with scabrous margins; racemes often more than 3.
7a. Upper glume 1/3–1/2 length of spikelet; lateral veins of lower lemma setiform- scabrous especially toward the apex.
8a. Lateral veins of lower lemma scabrous toward apex; upper glume subacute; upper lemma acuminate, equaling lower lemma ..... 7. *D. sanguinalis*
8b. Lateral veins of lower lemma smooth; upper glume rounded; upper lemma apiculate, exceeding lower lemma ..... 8. *D. cruciata*
7b. Upper glume 1/2–3/4 length of spikelet; lateral veins of lower lemma smooth.
9a. Racemes erect, forming a narrow fascicle; spikelets ca. 2.5 mm ..... 9. *D. henryi*
9b. Racemes widely spreading at maturity; spikelets 2.5–3.5 mm ..... 10. *D. ciliaris*

1. Digitaria heterantha (Hook. f.) Merr. 二型馬唐

Enum. Philipp. Fl. Pl. 1: 54. 1923; FHN 4: 433. 1977; FRPS 10(1): 332, pl. 104. 1990; FFJ 6: 231, fig. 198. 1995; FTW ed. 2, 5: 467. 2000; FOC 22: 541. 2006; FGD 9: 435, fig. 224. 2009.

Paspalum heteranthum Hook. f., Fl. Brit. Ind. 7: 16. 1896[1897], based on *Panicum heteranthum* Nees & Meyen (1841) not Link (1827).

Panicum barbatum auct non (Willd) Kunth: FHK 410. 1861.

Digitaria barbata auct. non Willd.: FKH 314. 1912.

Perennial herb, stoloniferous. Culms branching and rooting at lower nodes, 50–100 cm tall. Leaf sheaths usually shorter than internode, subcompressed, glabrous to papillose-pilose, densely pilose at the base; leaf blades broadly linear, 5–15 × 0.3–0.6 cm, glabrous to papillose-pilose on both surfaces; ligule membranous, 1–2 mm. Inflorescence digitate; racemes 2–4, 5–25 cm, the lower ± bare; rachis triquetrous, thick, rigid, winged. Spikelets paired, ca. 4 mm, pedicellate one villous, sessile one glabrous, rather far apart on rachis, lanceolate; lower glume very small, veinless; upper glume lanceolate, more than 1/2 length of spikelet, 3–5-veined, margins glabrous or ciliate above 1/3–1/2 in sessile spikelet, appressed pubescent in pedicellate spikelet; lower lemma glabrous in sessile spikelet and with spreading hairs in pedicellate spikelet, 5–9-veined, veins equally distant, thick, prominent, interspaces slit-like, acuminate; upper lemma lanceolate, pale and ± leathery, acuminate.

Locality: Common in Hong Kong. *HK sheet 42048, 42049.*

Distribution: Hainan, Guangdong, Fujian, Taiwan; Indochina, Malay Peninsula, Indonesia, Philippines.

Ecology: Sandy beaches. Flowering & fruiting: Jun.–Oct.

2. Digitaria fibrosa (Hack.) Stapf 纖維馬唐

Bull. Misc. Inform. Kew. 1912: 428. 1912; FRPS 10(1): 312. 1990; FFJ 6: 230, fig. 196. 1995; FOC 22: 541. 2006; FGD 9: 434. 2009.

Panicum fibrosum Hack., Oesterr. Bot. Z. 51: 330. 1901

Digitaria setifolia auct. non Stapf: FKH 314. 1912.

Perennial herb. Culms erect, tufted, 20–50 cm tall, girthed at base by fibrous remains of old leaf sheaths. Leaf sheaths pilose at lower part and mouth; leaf blades linear, flat or involute, 3–10 × 0.25–0.4 cm, pilose or subglabrous, apex acuminate, terminal blade short and small; ligule ca. 0.5 mm, membranous, truncate. Inflorescence subdigitate, axis usually glabrous; racemes 2–5, alternating; spikelets paired or ternate or solitary in the upper, loosely arranged; rachis slenderly triquetrous, smooth, glabrous, not winged; pedicels tips slightly swollen. Spikelets oblong-lanceolate, 3–3.5 mm; lower glume very small, subrounded or broad triangular; upper glume ca. 4/5 length of spikelet but narrow, pallid yellow-brown, 3-veined, pilose between veins and margins; lower lemma as long as spikelet, 7-veined, hairiness variable, usually glabrous on either side of midvein, 2nd intervein space and margins usually pilose, acuminate; upper lemma slightly shorter than or equal to spikelets.

Locality: Common in Hong Kong. *HK sheet 20646.*

Distribution: Fujian, Guangdong, Guangxi, Yunnan, Sichuan; Laos, Myanmar, Thailand.

Ecology: Hillslopes, roadsides. Flowering & fruiting: May–Aug.

3. Digitaria violascens Link 紫馬唐

Hort. Berol. 1: 229. 1827; FRPS 10(1): 308, pl. 95: 1–5. 1990; FFJ 6: 229, fig. 194. 1995; FTW ed. 2, 5: 471, pl. 196. 2000; FOC 22: 547. 2006; FGD 9: 434. 2009.

Digitaria violascens Link var. *villosa* Keng, Sunyatsenia 3: 19. 1935.

Annual herb. Culms tufted, 20–50(–70) cm tall, glabrous. Leaf sheaths mostly shorter than internode, glabrous or pilose; leaf blades linear-lanceolate, 5–15 × 0.2–0.7 cm, glabrous or adaxial surface pilose at base and mouth, margins scabrous; ligule 1–2 mm, membranous. Inflorescence subdigitate; racemes (2–)4–7(–10), ascending, 3–14 cm; rachis slightly scabrous; pedicels scabrous, with discoid tips. Spikelets elliptic, 2 or 3 per node, 1–2.5 mm; lower glume absent; upper glume lanceolate, slightly shorter than spikelet, 3-veined, intervein spaces and margins appressed-pubescent; lower lemma as long as spikelet, 5–7-veined, intervein spaces and margins pubescent, but usually glabrous flanking the middle vein; upper lemma dark brown or blackish purple at maturity, as long as spikelet, coriaceous, apex acute.

Locality: Common in Hong Kong. *HK sheet 8293, 30738, 31899.*

Distribution: Widely spread over C to S and E to W China; Indian Subcontinent, Indochina, Malay Peninsula, Indonesia, Australia, S America.

Ecology: Grassy hillsides, roadsides, weedy places. Flowering & fruiting: Jul.–Nov.

4. Digitaria longiflora (Retz.) Pers. 長花馬唐

Syn. Pl. 1: 85. 1805; FKH 314. 1912; FRPS 10(1): 308, pl. 95: 6–10. 1990; FFJ 6: 229. 1995; FTW ed. 2, 5: 469. 2000; FOC 22: 546. 2006; FGD 9: 433. 2009.

Paspalum longiflorum Retz., Observ. Bot. 4: 15. 1786.

Paspalum brevifolium Fluegge, Gram. Monogr. Paspalum 150. 1810; FHK 408. 1861.

Perennial herb, usually with slender stolons. Culms slender, glabrous, 10–40 cm tall. Leaf sheaths shorter than internode, pubescent or glabrous; leaf blades broadly linear to lanceolate, 1–5 × 0.2–0.5 cm, glabrous or papillose-pilose at base; ligule membranous, 1–1.5 mm, ± truncate. Inflorescence digitate; racemes 2–4, 2–8 cm, usually curving outward; rachis ribbon-like, winged, 0.5–0.8 mm wide, winged; pedicels cylindrical, smooth, with discoid tips. Spikelets elliptic, 1.2–1.5 mm, minutely pubescent near margins, acuminate; lower glume absent; upper glume as long as spikelet, 3–5-veined, back and margins densely appressed-pubescent; lower lemma as long as spikelet, 5–7-veined, glabrous between middle and lateral veins, otherwise pubescent; upper lemma yellowish brown, apex acuminate.

Locality: Common in Hong Kong. *Y. S. Lau 628, 2249; HK sheet 41978.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Jiangxi, Fujian, Taiwan; Indian Subcontinent, Indochina, Malay Peninsula, Old World tropics, America.

Ecology: Grassy fields, weedy places. Flowering & fruiting: Apr.–Oct.

5. Digitaria setigera Roth ex Roem. & Schult. 海南馬唐 **(Photos 348–349)**

Syst. Veg. 2: 474. 1817; FRPS 10(1): 324, pl. 101: 6–9. 1990; FTW ed. 2, 5: 471, pl. 195. 2000; FOC 22: 542. 2006; FGD 9: 436. 2009.

Digitaria microbachne Henrard, Mede. Rijks-Herb. 61: 13. 1930; Check List HK Plants 332. 2002; 116. 2004.

Annual or perennial herb. Culms tufted, creeping and rooting at lower nodes, 30–100 cm tall, many noded, glabrous. Leaf sheaths glabrous or papillose-pilose; leaf blades linear-lanceolate, 5–20 × 0.3–1.2 cm, glabrous on both surfaces, papillose-pilose at base, base subrounded, apex acuminate; ligule membranous, 1–2 mm. Inflorescence digitate or subdigitate, axis 1–4 cm; racemes 5–12, stiff, 5–15 cm; spikelets paired; rachis triquetrous, narrowly winged, margins scabrous. Spikelets narrowly lanceolate-oblong, 2–3 mm, acute; lower glume absent or a minute rim; upper glume up to 1/3 length of spikelet, 1–3-veined or veinless, margins ciliate; lower lemma as long as spikelet, 5–7-veined, veins evenly spaced or with a wider interspace flanking the midvein, lateral intervein spaces and margins appressed pubescent to villous, rarely ciliate or setose; upper lemma yellowish to grey, subequalling lower lemma, acuminate.

Locality: Happy Valley. *HK sheet 33912, 41964, 42031.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Fujian, Taiwan; tropical Asia.

Ecology: Margins of forests, open fields. Flowering & fruiting: Jun.–Nov.

6. Digitaria radicosa (J. Presl) Miq. 紅尾翎

Fl. Ned. Ind. 3: 437. 1857; FRPS 10(1): 325. 1990; FFJ 6: 233. 1995; FTW ed. 2, 5: 470. 2000; FOC 22: 542. 2006; FGD 9: 437. 2009.

Panicum radicosum J. Presl, Reliq. Haenk. 1: 297. 1830.

Digitaria tenuispica Rendle, J. Linn. Soc. Bot. 36(253): 326–327. 1904; FKH 314. 1912.

Annual herb. Culms slender, prostrate at base, branching, 20–50 cm tall, glabrous, lower nodes rooted. Leaf sheaths shorter than internode, usually glabrous or pubescent; leaf blades linear-lanceolate, 2–8 × 0.2–0.7 cm, adaxial surface glabrous, abaxial surface scabrous, pubescent or papillose-pilose at base; ligule membranous, truncate, 1–2 mm. Inflorescence digitate; racemes 2–3(–4), slender, 4–10 cm; rachis triquetrous, narrowly winged, margins smooth or almost so or slightly scabrous; spikelets narrowly lanceolate, 2.8–3 mm, acute or acuminate, paired, one pedicellate and other very shortly pedicellate or subsessile; lower glume triangular, 0.2–0.3 mm; upper glume lanceolate, 1/3–2/3 length of spikelet, villous, 1–3-veined; lower lemma as long as spikelet, 5–7-veined, a broad intervein space

on either side of midvein, lateral veins very close together near margin, lateral veins and margins pilose; upper lemma yellowish at maturity, narrowly lanceolate, thicken papery. Anthers 0.5–1 mm.

Locality: Hong Kong Island, New Territories. *HK sheet 40844, 41962, 42030.*

Distribution: Hainan, Guangdong, Yunnan, Anhui, Zhejiang, Fujian, Taiwan; SE Asia, Malesia, Australia, Indian Ocean islands, Madagascar.

Ecology: Moist weedy places, roadsides. Flowering & fruiting: Summer to autumn.

7. Digitaria sanguinalis (L.) Scop. 馬唐 **(Fig. 113)**

Fl. Carniol. ed. 2, 1: 52. 1771; FKH 314. 1912; FRPS 10(1): 329, pl. 103: 7–9. 1990; FTW ed. 2, 5: 470. 2000; FOC 22: 542. 2006; FGD 9: 436, fig. 225. 2009.

Panicum sanguinale L., Sp. Pl. 1: 57. 1753; FHK 410. 1861.

Panicum commutatum auct. non (Schult. f.) Nees: FHK 410. 1861.

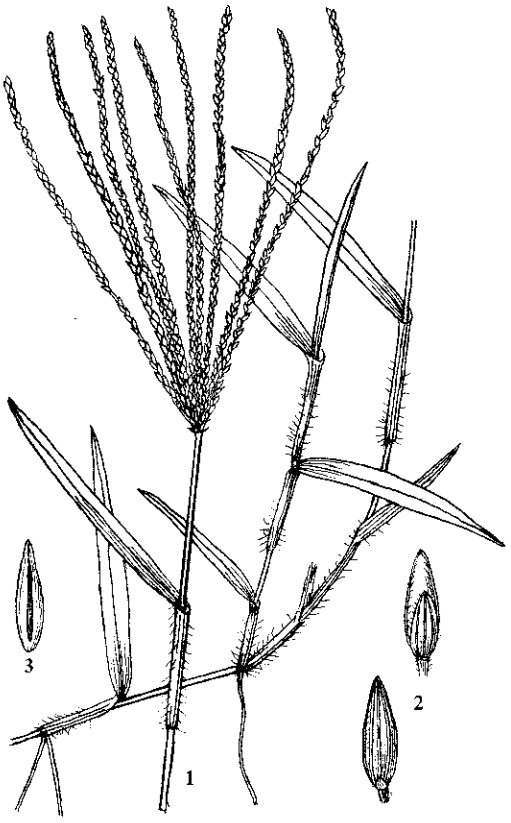

Figure 113. *Digitaria sanguinalis* (L.) Scop.
1. plant; *2.* spikelets (abaxial and adaxial views); *3.* grain. (drawn by H. P. Yu)

Annual herb. Culms erect or ascending from decumbent base, 10–100 cm tall, glabrous or hairy at nodes. Leaf sheaths usually shorter than internode, glabrous or sparsely papillose-pilose; leaf blades linear-lanceolate, 5–20 × 0.3–1.2 cm, glabrous or pilose, base rounded, margins thickened, scabrous; ligule 1–3 mm, membranous, obtuse. Inflorescence digitate or subdigitate, axis 1–2 cm; racemes 4–12, stiff, 5–18 cm, upper alternating or digitate, the base subverticillate; rachis winged, margins scabrous. Spikelets usually paired, one pedicellate and other sessile or shortly pedicellate, elliptic-lanceolate, 3–3.5 mm, acute; lower glume small, triangular, veinless; upper glume lanceolate, 1/3–3/4 spikelet length, 3-veined, pubescent, margins ciliate; lower lemma as long as spikelet, 5–7-veined, veins evenly spaced or a broader interspace flanking the midvein, midvein smooth, lateral veins setiform-scabrous especially toward the apex, appressed-pubescent on lateral intervein spaces and margins; upper lemma greenish grey, as long as spikelet, subcoriaceous, lanceolate, apex acuminate.

Locality: Tuen Mun. *HK sheet 14537, 34217.*

Distribution: Widely spread over most provinces of China; warm-temperate subtropical regions throughout the world.

Ecology: Roadsides, weedy places. Flowering & fruiting: Jun.–Sep.

8. Digitaria cruciata (Nees ex Steudel) A. Camus 十字馬唐

Lecomte, Fl. Indo-Chine. 7: 399. 1922; FRPS 10(1): 329. 1990; FYN 9: 553. 2003; FOC 22: 543. 2006.

Panicum cruciatum Nees ex Steudel, Syn. Pl. Glum. 1: 39. 1853.

Annual herb. Culms decumbent at base, branching and rooting at lower nodes, 30–100 cm tall, nodes thinly hispid. Leaf sheaths glabrous or hispid, usually shorter than internode; leaf blades linear-lanceolate, 5–20 × 0.3–1 cm, papillose-hispid on both surfaces or adaxial surface glabrous, margins thickened, undulate, scabrous; ligule 1–2.5 mm. Inflorescence subdigitate, axis 1–5 cm; racemes 5–8, 3–15 cm; spikelets paired, imbricate; rachis winged, ca. 1 mm broad, midrib triquetrous, margins slightly scabrous. Spikelets plumply elliptic-oblong, 2.5–3 mm, ca. 1.2 mm broad; lower glume minute, veinless; upper glume broadly ovate, 1/3 as long as spikelet, 3-veined, subglabrous, margins membranous, apex broadly obtuse; lower lemma slightly shorter than upper lemma, 7-veined with intervein spaces nearly equidistant, glabrous or margins pilose; upper lemma pale purplish grey at maturity, apex abruptly apiculate, exserted from spikelet.

Locality: Hong Kong Island. *Y. S. Lau 627.*

Distribution: Hubei, Sichuan, Guizhou, Yunnan, Xizang; India, Sikkim, Nepal.

Ecology: Grassy hillslopes. Flowering & fruiting: Jun.–Oct.

9. Digitaria henryi Rendle 亨利馬唐

J. Linn. Soc., Bot. 36: 323. 1904; FRPS 10(1): 325. 1990; FFJ 6: 233. 1995; FTW ed. 2, 5: 467, pl. 194. 2000; FOC 22: 543. 2006; FGD 9: 437. 2009.

Perennial herb. Culms tufted, slender, creeping and often rooting at base, 20–50 cm tall. Leaf sheaths glabrous; leaf blades narrowly lanceolate, 3–8 × 0.2–0.5 cm, glabrous or sparingly hispid near base; ligule membranous, 1–2 mm. Inflorescence subdigitate, axis short; racemes 3–10, 3–8 cm; spikelets lanceolate, ca. 2.5 mm, paired; rachis flat, winged, ca. 0.5 mm broad. Spikelets lanceolate, 2–3 mm, acuminate; lower glume ca. 0.2 mm; upper glume lanceolate, 1/2 as long as spikelet, 3–5-veined, margins pubescent; lower

lemma slightly longer than upper lemma, 7-veined with broader intervein spaces flanking the midvein, pilose along lateral intervein spaces and margins; upper lemma subleathery, acuminate.

Locality: Tai Mo Shan. *HK sheet 41963, 42009.*

Distribution: Guangdong, Guangxi, Hainan, Fujian, Taiwan; Japan, Vietnam, naturalized in Hawaii.

Ecology: Grassy fields, sandy seashores. Flowering & fruiting: Summer to autumn.

10. Digitaria ciliaris (Retz.) Koeler 纖毛馬唐(升馬唐)

Descr. Gram. 27. 1802; H. B. Gill. et al., Fl. Malaya 3: 196, fig. 40. 1971; FRPS 10(1): 326, pl. 102: 1–3. 1990; FFJ 6: 234, fig. 201. 1995; FTW ed. 2, 5: 466. 2000; FOC 22: 543. 2006; FGD 9: 438. 2009.

Panicum ciliare Retz., Observ. Bot. 4: 16. 1786.

Annual herb. Culms ascending from decumbent base, branching and rooting at lower nodes, 20–100 cm tall. Leaf sheaths usually shorter than internode, ± tubercle-based pilose; leaf blades linear to lanceolate, 3–25 × 0.2–1 2 cm, adaxial surface usually pilose, margins thickened and scabrous; ligule membranous, 1–3 mm. Inflorescence digitate or subdigitate, axis short; racemes 3–12, 5–17 cm; spikelets paired; rachis winged, ca. 1 mm wide, margins scabrous (serrate). Spikelets lanceolate, 2.5–3.5 mm, suppressed on one side of rachis; pedicels unequal, triangular, serrate; lower glume very small, triangular; upper glume lanceolate, 1/2–4/5 length of spikelet, narrow, margins ciliate, 3-veined; lower lemma as long as spikelet, 7-veined, veins evenly spaced or a broader glabrous interspace flanking the midvein, lateral interveins appressed pubescent to ciliate or villous; upper lemma elliptic, as long as spikelet, coriaceous, apex acuminate.

Locality: Common in Hong Kong. *Y. S. Lau 1693, 2252; Y. W. Lam 1064.*

Distribution: Widely spread over almost all provinces of China; and throughout the tropics and subtropics, but rare in Africa.

Ecology: Roadsides, weedy places. Flowering & fruiting: May–Oct.

29. Ottochloa Dandy 露籽草屬

Perennial herbs. Culms slender, decumbent and rooting at the lower nodes. Leaf sheath shorter than internode, margins ciliate; leaf blade lanceolate, open and flat; ligule truncate, ± ciliolate. Inflorescence an open panicle, primary branches spaced along the central axis, spikelets borne on short secondary branches, singly or in appressed secondary racemelets, falling off from pedicel, pedicel very short. Spikelets elliptic, dorsally compressed, 2-floret; glumes similar, 1/2–2/3 spikelet length, herbaceous, 3–5(–7)-veined; lower floret sterile or staminate, lemma as long as the spikelet, membranous, 7–9-veined; upper floret bisexual, lemma leathery to cartilaginous, 1/2–2/3 spikelet length, glabrous, 3–5-veined, margins narrow, hyaline, incurved upward embraced same texture palea, acute; lodicules thin, 5-veined; style free from the base.

Three species distributed in Old World tropics; one species and one variety in China and Hong Kong.

1. Ottochloa nodosa (Kunth) Dandy 露籽草

J. Bot. 69: 55. 1931; FHN 4: 409, fig. 1213. 1977; FRPS 10(1): 222, pl. 67: 1–9. 1990; FTW ed. 2, 5: 485, pl. 202. 2000; FOC 22: 512. 2006 ; FGD 9: 408, fig. 209. 2009.

Panicum nodosum Kunth, Enum. Pl. 1: 97. 1833, not Lamarck (1798); FHK 412. 1861; FKH 315. 1912.

Perennial herb. Culms slender, decumbent and rooting at the lower nodes, ascending up to 60 cm tall. Leaf sheaths conspicuously ciliate along one margin; leaf blades narrowly lanceolate, 4–11 × 0.5–1 cm, smooth, glabrous, base rounded or cordate, apex acuminate, margins scabrous; ligule ca. 0.3 mm. Panicle 10–15 cm, branches 3–8 cm, stiffly spreading, subverticillate in the lower part, the spikelets grouped in clusters or short racemelets, or sometimes loosely spaced. Spikelets elliptic to elliptic-oblong, 2.8–3.2 mm, acute; glumes lanceolate, lower glume 1/2 spikelet length, 3–5-veined; upper glume 1/2–2/3 spikelet length, 5–7-veined; lower lemma 7-veined; upper lemma smooth, apex laterally compressed to a very small crest.

Locality: Tai Mo Shan, Tai Po Kau, San Tau. *HK sheet 42018, 42021, 42025.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan; Indian Subcontinent, Indochina, Malesia, Pacific islands, Africa.

Ecology: Margins of forests, wet places in ravines. Flowering & fruiting: Jul.–Sep.

1a. Ottochloa nodosa (Kunth) Dandy var. **micrantha** (Balansa ex A. Camus) S. L. Chen & S. M. Phillips 小花露籽草 **(Fig. 114)**

Novon. 13: 467. 2003; FRPS 10(1): 222, pl. 67: 10–17. 1990; FFJ 6: 202. 1995; FOC 22: 513. 2006; FGD 9: 408. 2009.

Ottochloa nodosa (Kunth) Dandy var. *micrantha* (Balansa ex A. Camus) Keng f., Iconogr. Cormophytorum Sinicorum 5: 160, fig. 7150. 1976, *nom. inval.*

Hemigymnia arnottiana Stapf var. *micrantha* Balansa ex A. Camus, Fl. Indo-Chine 7: 455. 1922.

Spikelets 2–2.5 mm; upper glume ovate, ca. 1/2 spikelet length, 7-veined; lower lemma 5–7-veined.

Locality: Common in Hong Kong. *HK sheet 42003, 42006, 42008.*

Distribution: Hainan, Guangdong; Vietnam.

Ecology: Margins of forests. Flowering & fruiting: Jul.–Nov.

Notes: The species was reported as *Ottochloa malabarica* (L.) Dandy previously (Check List HK Plants 341. 2002; 119. 2004).

30. Alloteropsis J. Presl ex Presl 毛穎草屬

Annual or perennial herbs. Culms tufted, erect or decumbent. Leaf blades convolute, ovate-oblong to linear, glabrous or with tubercle-based hairs; ligule membranous, ciliate. Inflorescence composed of slender racemes, these digitate or in whorls on a short common axis, rachis triquetrous, spikelets on one side of rachis, sometimes solitary, mostly in pairs, rarely more together, falling as a whole. Spikelets ovate to elliptic, dorsally compressed, florets 2, pedicels unequal; lower glume 1/2 length of spikelet, membranous, 3-veined, acute; upper glume as long as spikelet, herbaceous, 5–7-veined, ciliate along margins; lower floret staminate, lemma herbaceous, glabrous; upper lemma cartilaginous, margins inrolled embraced same texture palea, 5-veined, shortly awned; lodicules 2; stamens 3; styles 2, free, stigmas exserted laterally. Caryopsis ellipsoidal.

Five species distributed in tropical regions of Old World; two species China and in Hong Kong.

1a. Perennial; leaf blades linear, base narrow; raceme rachis pilose ..... 1. *A. semialata*

1b. Annual; leaf blades lanceolate, base cordate; raceme rachis glabrous ..... 2. *A. cimicina*

1. Alloteropsis semialata (R. Br.) Hitchc. 毛穎草 **(Fig. 115)**

Contr. U. S. Natl. Herb. 12: 210. 1909; FHN 4: 429. 1977; FRPS 10(1): 301, pl. 93: 1–4. 1990; FFJ 6: 227, fig. 193. 1995; FTW ed. 2, 5: 454, pl. 188. 2000; FOC 22: 519. 2006; FGD 9: 432, fig. 223. 2009.

Panicum semialatum R. Br., Prodr. 192. 1810.

Axonopus semialatus (R. Br.) Hook. f., Fl. of Brit. Ind. 7(21): 64. 1897[1896]; FKH 313. 1912.

Perennial herb with a short rhizome. Culms erect, tufted, 30–70 cm, ± pubescent below inflorescence and bearded at nodes. Leaf sheaths persistent, densely and conspicuously silky hairy, upper glabrous or margins and mouth pilose; leaf blades linear, flat or convolute, stiff, 10–50 × 0.1–1 cm, abaxial surface glabrous, tuberculate-pilose, adaxial surface sparsely to densely hairy; ligule membranous, ca. 1 mm. Inflorescence digitate; racemes 2–4, 3–13 cm, rachis slender, triangled, pilose. Spikelets lanceolate, 5–6 mm, usually paired on one side; lower glume ovate, ca. 1/2 length of spikelet, 3-veined, mucronate or awn-tipped; upper glume as long as spikelet, 5-veined, margins ciliate, occasionally winged, awn-tipped; lower lemma as long as upper glume, awnless, often sparsely ciliate along margins, embraced a short hyaline, clefted, small palea; upper lemma ovate-lanceolate, ca. 4 mm, smooth, with a rigid 2–3 mm awn-point. Anthers orange, ca. 3 mm; style exserted apically.

Locality: Aberdeen, Kadoorie Farm, Tuen Mun. *S. C. Ng 2169; HK sheet 8231, 32244.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Fujian, Taiwan; Indian Subcontinent, Indochina, Malay Peninsula, Indonesia, Pacific islands, Africa.

Ecology: Hillslopes. Flowering & fruiting: Feb.–Aug.

2. Alloteropsis cimicina (L.) Stapf 臭蟲草

Fl. Trop. Afr. 9: 487. 1919; FHN 4: 430. 1977; FRPS 10(1): 303, pl. 93: 7–11. 1990; FOC 22: 519. 2006; FGD 9: 432. 2009.

Milium cimicinum L., Mant. Pl. 184. 1771.

Axonopus cimicinus (L.) P. Beauv., Ess. Agrostogr. 12, 154. 1812; FKH 313. 1912.

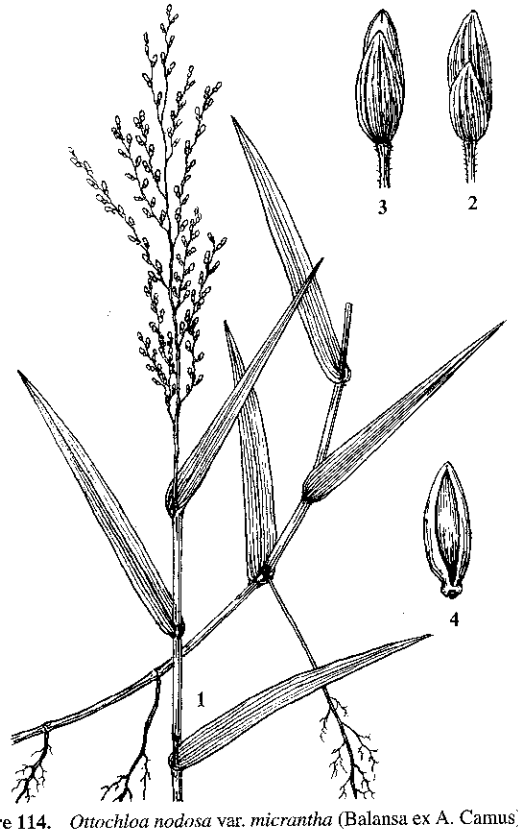

Figure 114. *Ottochloa nodosa* var. *micrantha* (Balansa ex A. Camus) S. L. Chen & S. M. Phillips)

1. plant; *2.* abaxial view of spikelet; *3.* adaxial view of spikelet; *4.* grain. (drawn by H. P. Yu)

Figure 115. *Alloteropsis semialata* (R. Br.) Hitchc.

1. plant; *2.* spikelet; *3.* upper floret. (drawn by X. L. Chen)

Annual herb. Culms tufted, ascending, up to 60 cm tall. Leaf sheaths tuberculate-hispid; leaf blades linear-lanceolate, cordate, 3–10 × 1–2 cm, glabrous, abaxial surface pectinate-setose along margins and veins, adaxial surface glabrous; ligule ca. 1 mm, ciliate. Inflorescence digitate; racemes 4–6, 10–15 cm, narrowly ascending, rachis glabrous, bare of spikelets in the lower part, spikelets paired or solitary. Lower glume ovate-lanceolate, ca. 2 mm, 3-veined, acuminate; upper glume as long as spikelet, papery, margins stiff ciliate, apex acute; lower lemma similar to upper glume but thicker and glabrous, palea small, stamens 3; upper lemma ovate-elliptic, tuberculate, awn 2–3 mm; upper palea papillose with swollen lacrimiform hairs.

Locality: Kowloon. *HK sheet 38086.*

Distribution: Hainan; Indian Subcontinent, Indochina, Malay Peninsula, Pacific islands, Cambodia, New Guinea, Australia, Africa.

Ecology: Weedy places, thin forests. Flowering: Sep.

31. Acroceras Stapf 鳳頭黍屬

Annual or perennial herbs. Culms creeping and often rooting near the base. Leaf blades lanceolate or linear-lanceolate, flat, usually with obscure transverse veins; ligule a narrow membrane. Inflorescence of lax racemes along a central axis, sometimes panicle-like due to irregular secondary branching. Spikelets paired or solitary, obscurely 2-rows, deciduous at maturity below the glumes, florets 2; lower floret staminate or barren, upper floret bisexual; glumes subequal or lower glume shorter, papery, 3–5-veined; upper glume and lower lemma equal, 5-veined, thickened and laterally compressed at apex to form a green crest; upper lemma dorsally compressed, crustaceous, the margins inrolled embraced and enclosed same texture palea, apex glabrous with a little green crest; upper palea with reflexed apex slightly protruding from lemma. Caryopsis elliptic.

About 19 species spread over the tropics; two species in China; one species in Hong Kong.

1. Acroceras tonkinense (Balansa) C. E. Hubbard ex Bor 山雞穀草 **(Fig. 116)**

Indian Forest Rec., Bot. 1(3): 78. 1938; FHN 4: 414. 1977; FOC 22: 515. 2006; FGD 9: 412. 2009.

Panicum tonkinense Balansa, J. Bot. (Morot) 4: 140. 1890.

Neohusnotia tonkinensis (Balansa) A. Camus, Bull. Mus. Natl. Hist. Nat. 26(7): 664. 1921; FRPS 10(1): 236. 1990.

Perennial. Culms 65(–100) cm tall, nodes densely pubescent with soft white hairs. Leaf sheaths glabrous or with tubercle-based hairs, one margin tuberculate-ciliate; leaf blades lanceolate, 10–20 × 1–3 cm, glabrous or abaxial surface pilose, margins thickened, pectinate-ciliate at base, scabrous, midvein prominent abaxially, apex narrowly acuminate; ligule ca. 1 mm, obtuse. Panicle open, 15–25 × 5–10 cm, axis and branches stiff, scabrous; racemes ascending, with secondary branching; spikelets widely spaced, paired or single in upper part. Spikelets 5–5.5 mm; lower glume broadly elliptic, 3/4 spikelet length, 5-veined; upper glume and lower lemma as long as spikelet, 5-veined, apex slightly thickened; lower palea hyaline, narrow; upper lemma smooth, shining, slightly shorter than spikelet, apex thickened and protruding.

Locality: Tai Mo Shan. *S. Y. Hu 9931.*

Distribution: Hainan, Yunnan; India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam.

Ecology: Margins of forests under shade. Flowering & fruiting: Apr.

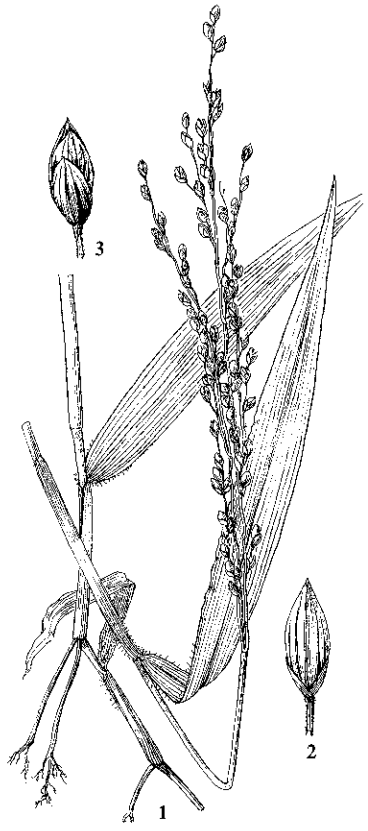

Figure 116. *Acroceras tonkinense* (Balansa) C. E. Hubbard ex Bor *1.* plant; *2.* adaxial view of spikelet; *3.* abaxial view of spikelet. (drawn by X. L. Chen)

Notes: This species is more robust in habit than *Acroceras munroanum* (鳳頭黍), with larger leaves and harshly scabrous leaf margins and inflorescence. The species was reported as *Acroceras munroanum* (Balansa) Henrard previously (Check List HK Plants 321. 2002; 113. 2004).

32. Oplismenus P. Beauv. 求米草屬

Perennial or annual herbs. Culms trailing, or ascending from the creeping base. Leaf blades ovate, lanceolate or linear-lanceolate, often with cross veins; ligule a ciliate membrane. Inflorescence composed of several racemes spaced along a central axis; spikelets usually paired or fascicles, sometimes solitary. Spikelets ovate-lanceolate to ovate, weakly laterally compressed, florets 2; glumes subequal, often pilose, the lower or both tipped by a viscid awn; lower floret barren, lemma as long as spikelet, acute to shortly awned, palea absent or much reduced; upper floret bisexual, lemma papery or subcoriaceous, smooth and shiny, with opaque inrolled margins embraced upper palea, acute; lodicules 2, thin membranous; styles free from the base.

About nine species spread over the tropics and subtropics; four species in China; one species in Hong Kong.

1. Oplismenus compositus (L.) P. Beauv. 竹葉草 **(Fig. 117)**
Ess. Agrostogr. 54. 1812; FKH 316. 1912; FHN 4: 416. 1977; FRPS 10(1): 245, pl. 75: 1–3. 1990; FFJ 6: 211, fig. 179. 1995; FTW ed. 2, 5: 482, pl. 201. 2000; FOC 22: 502. 2006.

Panicum compositum L., Sp. Pl. 1: 57. 1753; FHK 411. 1861; FGD 9: 416, fig. 215. 2009.

Perennial herb. Culms stoloniferous, creeping and rooting at lower nodes, upper part ascending, 20–80 cm. Leaf sheaths shorter or the upper longer than internode, glabrous, pilose or tuberculate-hairy; leaf blades lanceolate to ovate-lanceolate, 3–20 × 0.5–3 cm, subglabrous to tuberculate-hairy, base ± embraced stem and usually asymmetrical oblique. Inflorescence axis 5–15(–25) cm, glabrous to tuberculate-hairy; racemes 3–6, alternating, ascending to erect. Spikelets lanceolate, glabrous to thinly pilose; glumes herbaceous, subequal, ca. 1/2–2/3 length of spikelet, margins usually ciliate; lower glume awn 5–10 mm; upper glume awn to 1–2 mm or occasionally absent; lower floret neuter, lemma papery, 7–9-veined, acute or with a stout mucro, palea membranous, narrow or absent; upper lemma coriaceous, smooth, margins inrolled embraced same texture palea.

Locality: Common in Hong Kong. *Y. S. Lau 1031; HK sheet 42019, 42066.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Jiangxi, Zhejiang, Fujian, Taiwan; tropical Asia and Australia, extending westward through India to E Africa.

Ecology: Margins of forests, other moist places. Flowering & fruiting: Sep.–Nov.

Figure 117. *Oplismenus compositus* (L.) P. Beauv.
1. plant; *2.* spikelet; *3.* adaxial view of upper floret; *4.* abaxial view of upper floret. (drawn by X. L. Chen)

33. Echinochloa P. Beauv. 稗屬

Annual or perennial herbs. Culms tufted. Leaf blades linear or broadly linear, flat; ligule absent or a fringe of hairs. Inflorescence a panicle composed of racemes along a central axis; racemes simple or compound, densely spiculate. Spikelets paired or fasciculate, dorsally compressed, broadly elliptic, solitary, sometimes in pairs or 4(–10) together, falling as a whole, sessile or shortly pedicellate, 1–2-floret, lower floret staminate or barren, upper floret bisexual; lower glume triangular, 1/3–1/2(–3/5) spikelet length, acute; upper glume and lower lemma as long as spikelet, lower lemma with short or long awn; upper lemma coriaceous, laterally compressed, smooth, shiny, mucronate, margins inrolled embraced same texture palea; lodicules 2, 5–7-veined; style free from the base.

About 35 species distributed in tropical and warm-temperate regions of the world; eight species in China; four species and two varieties in Hong Kong.

1a. Lower lemma convex, hard and shining ..... 1. *E. glabrescens*
1b. Lower lemma flat on the back, herbaceous.
  2a. Racemes neatly 4-rowed, simple, openly spaced, often erect; spikelets awnless, acute ..... 2. *E. colona*
  2b. Racemes untidily 2–several-rowed, at least the longer often with short branchlets; spikelets acuminate to shortly awned.
    3a. Racemes distinctly compound with many short branchlets; awn of lower lemma 1–1.5 cm ..... 3. *E. cruspavonis*
    3b. Racemes simple or only inconspicuously branched; lower lemma acute to long-awned.
      4a. Racemes with some secondary branches ..... 4. *E. crusgalli* var. *crusgalli*
      4b. Racemes all simple.
        5a. Leaf blades 2–5 mm broad; racemes slender, erect, appressed to axis ..... 4a. *E. crusgalli* var. *austrojaponensis*
        5b. Leaf blades 4–10 mm broad; racemes not slender, ascending ..... 4b. *E. crusgalli* var. *breviseta*

1. Echinochloa glabrescens Munro ex Hook. f. 硬稈稗
Fl. Brit. Ind. 7(21): 31. 1897; FRPS 10(1): 258, pl. 78: 1–4. 1990; FYN 9: 515. 2003; FGD 9: 420. 2009.

Echinochloa crusgalli (L.) P. Beauv. var. *formosensis* Ohwi, Acta Phytotax. Geobot. 11(1): 38. 1942 ["Crus-galli"]; FHN 4: 419. 1977; FTW 5: 554. 1978.

Echinochloa glabrescens Kossenko, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR. 11: 40. 1949; FOC 22: 517. 2006.

Annual herb. Culms erect or slightly decumbent at base, 30–120 cm tall. Leaf sheaths smooth and glabrous; leaf blades linear-lanceolate or linear, flat, 10–38 × 0.6–1.5 cm, glabrous, margins thickened, acuminate; ligule absent. Inflorescence narrow panicle, 5–25 × 1–2(–4) cm; racemes 1–4 cm, simple or the middle subverticillate. Spikelets light green, 3.5–5 mm, glabrous or tuberculate-pilose; lower glume 1/3–1/2 length of spikelet, 3-veined, acute; upper glume equal to spikelet, 5-veined, inconspicuously scabrous to shortly hispid along veins; lower floret neuter; lemmas coriaceous, hard and shiny, especially down the centre, tuberculate-pilose on the

veins, the lower cuspidate to awned. Caryopsis broad elliptic.

Locality: Kowloon, Castle Peak, Yuen Long, Sai Kung. *Y. W. Lam 742, 2201; HK sheet 14441.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Jiangsu, Zhejiang; Bhutan, NE India, Japan, Korea, Nepal, Africa.

Ecology: Margins of ponds, other wet places. Flowering & fruiting: Summer to autumn.

2. Echinochloa colona (L.) Link 光頭稗 **(Photo 350)**

Hort. Berol. 2: 209. 1833; FHN 4: 418. 1977 ["*colonum*"]; FRPS 10(1): 252, pl. 77: 1–3. 1990 ["*colonum*"]; FFJ 6: 213, fig. 180. 1995 ["*colonum*"]; FTW ed. 2, 5: 474. 2000; FOC 22: 517. 2006; FGD 9: 418. 2009.

Panicum colonum L., Syst. Nat., ed. 10, 2: 870. 1759; FHK 411. 1861; FKH 315. 1912.

Annual herb. Culms erect, 10–60 cm tall, glabrous. Leaf sheaths compressed and keeled, glabrous; leaf blades linear, flat, 3–30 × 0.2–0.8 cm, glabrous, base rounded, apex acuminate, margins slightly scabrous; ligule absent. Panicle narrow, 5–10 cm; central axis slender, triquetrous, glabrous; racemes 1–2 cm, erect or sometimes stiffly diverging, simple, separated or overlapping by up to half their length or more, spikelets tightly congested in 4 neat rows. Spikelets ovate-oblong, 2–3 mm, hirtellous; lower glume triangular, 1/3 to 1/2 length of spikelet, 3-veined; upper glume similar to lower lemma, mucronate to awn-pointed, 5–7-veined; lower floret usually neuter, palea membranous, slightly shorter than lemma, obtuse, 2-keeled, with short ciliate on the keel; upper lemma elliptic, smooth and shiny, margins inrolled embraced a hyaline palea of equal length.

Locality: Common in Hong Kong. *Y. W. Lam 1342; HK sheet 40835, 41984.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Xinjiang, Shaanxi, Sichuan, Hebei, Henan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; warm regions throughout the world.

Ecology: A weed of farmlands and other wet places. Flowering & fruiting: Summer to autumn.

3. Echinochloa cruspavonis (Kunth) Schult.
孔雀稗 **(Fig. 118)**

Mant. 2: 269. 1824; FRPS 10(1): 256, pl. 78: 5–8. 1990; FFJ 6: 215. 1995; FOC 22: 517. 2006; FGD 9: 420. 2009.

Oplismenus cruspavonis Kunth, Nov. Gen. Sp. (quarto ed.) 1: 108. 1815 ["1816"].

Annual or perennial herb. Culms robust, straggling and rooting at base, 1.2–1.8 m tall. Leaf sheaths loose, smooth and glabrous; leaf blades linear, flat, 10–40 × 1–1.5 cm, glabrous, margins harshly scabrous; ligule absent. Inflorescence nodding, large, loose, 15–25 cm; branches mostly compound, spikelets many, crowded on secondary branchlets. Spikelets purple-tinged, ovate-lanceolate, 2–3 mm, hispid on veins, the hairs not tubercle-based; lower glume triangular, 1/3–2/5 length of spikelet, 3-veined; upper glume as long as spikelet, rostrate, 5-veined, stiff hairs on the veins; lower lemma sterile, herbaceous, 5–7-veined, with a stout awn, 1–1.5 cm; upper lemma leathery, smooth and shiny, mucronate.

Locality: Wan Chai Gap. *H. C. Tang 1969.*

Distribution: Hainan, Guangdong, Guizhou, Sichuan, Shaanxi, Anhui, Fujian; widely spread over tropical regions.

Ecology: Marshes and other damp places. Flowering & fruiting: Summer to autumn.

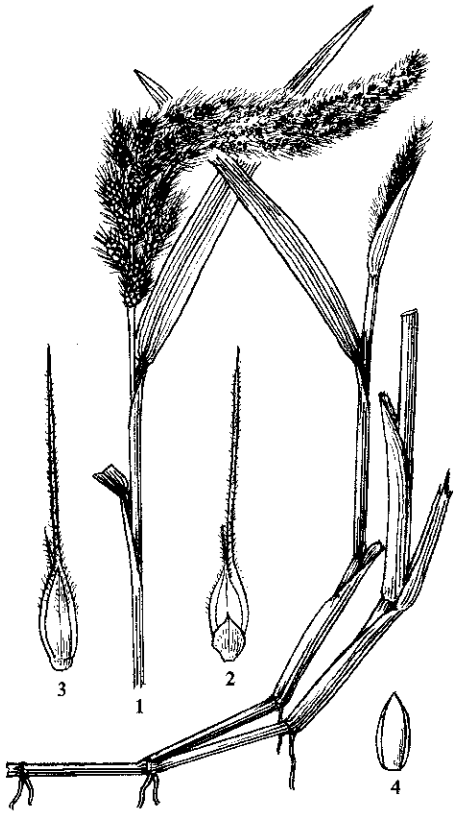

Figure 118. *Echinochloa cruspavonis* (Kunth) Schult.
1. portion of plant; *2.* abaxial view of spikelet; *3.* adaxial view of spikelet; *4.* adaxial view of upper floret. (drawn by H. P. Yu)

4. Echinochloa crusgalli (L.) P. Beauv. 稗

Ess. Agrostogr. 53. 1812; FHN 4: 419. 1977; FRPS 10(1): 252, pl. 77: 4–7. 1990; FFJ 6: 214, fig. 181. 1995; FTW ed. 2, 5: 474, pl. 197. 2000; FOC 22: 517. 2006; FGD 9: 418, fig. 216. 2009.

Panicum crusgalli L., Sp. Pl. 1: 56. 1753; FHK 411. 1861; FKH 315. 1912.

Annual herb. Culms erect, glabrous, 20–160 cm tall. Leaf sheath loose, glabrous, the lower longer and the upper shorter than internode; leaf blades linear, flat, 5–40 × 0.2–2 cm, usually glabrous, smooth except for scabrous margins, base rounded, apex acute or acuminate; ligule absent. Panicle erect, lanceolate to ovate or pyramidal, 6–26 cm; central axis ribbed, rib scabrous or usually with tubercle-based setae; racemes 2–10 cm, usually ascending or slightly close to central axis, simple or the longest with inconspicuous branchlets near the base, rachis scabrous or usually with tubercle-based setae, spikelets loosely to densely crowded. Spikelets green or purplish, ovate, 3–4 mm, spinulose along veins; lower glume triangular, ca. 1/3–1/2 length of spikelet, 3–5-veined, tuberculate-pilose on veins, base embraced spikelet, acute; floret neuter, lemmas herbaceous, 7-veined, tuberculate-pilose on veins, tipped with an robust awn arising from the apex, palea thin membranous, narrow, 2-keeled; upper lemma elliptic, smooth, shiny, mucronate.

Locality: Common in Hong Kong. *HK sheet 35647, 42202, 42203.*

Distribution: Widely spread over most provinces of China; throughout subtropical and warm-temperate regions of the world.

Ecology: Paddy fields, marshes, other wet places. Flowering & fruiting: Summer to autumn.

4a. Echinochloa crusgalli (L.) P. Beauv. var. **austrojaponensis** Ohwi 小旱稗(小果稗) **(Photos 351–352)**

Acta Phytotax. Geobot. 11: 38. 1942 ["*austro-japonensis*"]; FRPS 10(1): 253. 1990; FYN 9: 514. 2003; FOC 22: 518. 2006; FGD 9: 419. 2009.

Culms 20–40 cm tall. Leaf blades often involute, 0.2–0.5 cm broad. Inflorescence narrow and slender; racemes short, erect, appressed to axis, simple. Spikelets purplish, 2.5–3 mm, hispid along veins, lower lemma awnless or with a short awn.

Locality: Hong Kong Island, New Territories. *Y. S. Lau 1610; L. T. Lo 581; HK sheet 39688.*

Distribution: Guangdong, Guangxi, Yunnan, Guizhou, Hunan, Jiangxi, Jiangsu, Zhejiang, Fujian, Taiwan; Japan (Ryukyu Islands), Philippines.

Ecology: Marshes, ditches, damp grasslands.

4b. Echinochloa crusgalli (L.) P. Beauv. var. **breviseta** (Döll) Podp. 短芒稗

Prace Morav.-Slez. Akad. Ved. Prir. 2(sign. 20): 745. 1925; FHN 4: 419. 1977; FRPS 10(1): 253. 1990; FOC 22: 518. 2006; FGD 9: 419. 2009.

Panicum crusgalli L. var. *brevisetum* Döll, Fl. Bad. 1: 232. 1857.

Culms 30–75 cm tall. Leaf blades 8–15 × 0.4–0.6 cm. Inflorescence narrow, 8–10 cm; racemes simple. Spikelets green, ovate-elliptic, ca. 3 mm, hispid along veins, mucronate or with a short awn less than 5 mm.

Locality: Fanling, Peng Shan, Mai Po. *Y. W. Lam 1344; HK sheet 14443, 41966.*

Distribution: Guangdong, Taiwan; India, Malaysia, Sri Lanka, tropical Africa.

Ecology: Weedy places.

34. Eriochloa Kunth 野黍屬

Annual or perennial herbs. Culms erect or decumbent at base. Leaf blades linear, flat or rolled; ligule a fringe of short hairs. Inflorescence a terminal panicle, composed of racemes arranged on all sides along a central axis, spikelets pedicellate, single, paired or clustered on a narrow rachis. Spikelets lanceolate to elliptic, thinly biconvex, subcartilaginous, with acute to aristate apex and bead-like swelling at base, 2-flowered; lower glume vestigial; upper glume equalling spikelet, facing outward, often awn-pointed; lower lemma present or absent, neuter or staminate, with or without palea; upper lemma always shorter than spikelets, crustaceous, papillose, margins inrolled, apex obtuse and often mucronate. Caryopsis free between indurate upper lemma and upper palea, ellipsoidal, dorsally compressed.

About 30 species distributed in tropical and warm-temperate regions of the world, especially tropical Africa and America; two species in China; one species in Hong Kong.

1. Eriochloa procera (Retz.) C. E. Hubb.

高野黍 **(Fig. 119; Photo 353)**

Bull. Misc. Inform. Kew 1930: 256. 1930; FHN 4: 423, fig. 1222. 1977; FRPS 10(1): 277, pl. 83: 5–8. 1990; FFJ 6: 219. 1995; FTW ed. 2, 5: 476. 2000; FOC 22: 525. 2006; FGD 9: 425. 2009.

Agrostis procera Retz., Observ. Bot. 4: 19. 1786.

Eriochloa annulata (Flüggé) Kunth, Révis. Gramin 1: 30. 1829; FHK 409. 1861.

Eriochloa ramosa (Retz.) Kuntze, Revis. Gen. Pl. 2: 775. 1891; FKH 313. 1912.

Annual or short-lived perennial herb, 30–150 cm tall. Culms erect or ascending from the geniculate base, usually pubescent at nodes. Leaf blades linear, 8–20 × 0.2–0.8 cm, glabrous, apex acuminate; ligule a fringe of white hairs of ca. 0.6 mm; leaf sheaths keeled, glabrous. Panicle 10–20 cm, composed of several racemes; racemes 3–7 cm, loosely ascending, bare of spikelets proximally, which mostly paired, single toward raceme apex; axis and rachis very slender, puberulous, pedicels usually without setae, those of a pair often partially connate. Spikelets lanceolate, 3–4 mm, herbaceous, sharply acute, basal swelling ca. 0.3 mm and often purplish; lower glume minute; upper glume and lower lemma

Figure 119. *Eriochloa procera* (Retz.) C. E. Hubb.
1. plant; *2.* abaxial view of spikelet; *3.* adaxial view of spikele; *4.* adaxial view of grain. (drawn by H. P. Yu)

5-veined, pilose with appressed silky hairs, lower palea absent; upper lemma rugulose-punctulate, mucro 0.3–0.5 mm.

Locality: Sai Kung, Yuen Long. *Y. W. Lam 735; HK sheet 39648, 41619.*

Distribution: Hainan, Guangdong, Fujian, Taiwan; Indochina, Malesia, Indian Subcontinent.

Ecology: Wastelands, roadsides. Flowering & fruiting: Summer to autumn.

Uses: Animal food (forage).

35. Brachiaria (Trin.) Griseb. 臂形草屬

Annual or perennial herbs. Clums erect or ascending from the decumbent base. Leaf blades flat, linear to lanceolate, base broad, apex acute, often with cartilaginous margins; ligule very short, long ciliate, or a fringe of hairs. Inflorescence terminal, composed of 2–several racemes along a central axis; spikelets dorsally compressed, sessile or pedicellate, solitary or paired, rarely fascicles, alternating in 2-rows. Spikelets usually elliptic, falling as a whole, florets 1–2, lower floret staminate or neuter, upper floret bisexual; lower glume adaxial, varying in length and veinless to many-veined and subequaling spikelet, base sheathing, sometimes extended downward as a short stipe; upper glume similar and subequal to lower lemma; upper lemma leathery, smooth, striate or rugose, back facing away from rachis, margins inrolled, obtuse to acute, occasionally minutely mucronate; lodicules 2, 5–7-veined; styles 2, free from the base, stigmas plumose, exerted laterally.

About 100 species mainly distributed in tropical and subtropical regions of the Old World, especially Africa; nine species in China; three species in Hong Kong.

1a. Culms slender, up to 60 cm tall ..... 1. *B. subquadripara*

1b. Culms stout, up to 3 m tall.

2a. Spikelets 2.5–3.5 mm; lower glume triangular, 1-veined ..... 2. *B. mutica*

2b. Spikelets 4–6 mm; lower glume ovate, 7–11-veined ..... 3. *B. brizantha*

1. Brachiaria subquadripara (Trin.) Hitchc. 四生臂形草 **(Photo 354)**

Lingnan Sci. J. 7: 214. 1931 ["1929"]; FHN 4: 420. 1977; FRPS 10(1): 266, pl. 80: 1–5. 1990; FFJ 6: 217, fig. 184. 1995; FTW ed. 2, 5: 460. 2000; FOC 22: 522. 2006; FGD 9: 422, fig. 217. 2009.

Panicum subquadriparum Trin., Gram. Panic. 145. 1826.

Urochloa subquadripara (Trin.) R. D. Webster, Austral. Paniceae 252. 1987.

Annual herb. Culms slender, straggling, rooting at lower nodes, 20–60 cm tall, nodes pubescent. Leaf sheaths loose, usually glabrous, rarely with tubercle-based hairs; leaf blades lanceolate or linear-lanceolate, 4–15 × 0.4–1 cm, glabrous or pubescent, base subrounded, apex acute or acuminate, margins thicker and scabrous. Inflorescence axis 3–10 cm; racemes 3–6, 2–4 cm, divergent to reflexed; rachis, narrowly winged, nearly glabrous; spikelets single, in 2 rows; pedicels glabrous. Spikelets elliptic, 3.5–4 mm, glabrous, acute; lower glume broadly ovate, 1/3–1/2 spikelet length, 5–7-veined; upper glume as long as spikelet, 5–7-veined; lower lemma as long as spikelet, 7-veined; upper lemma finely rugose, margins slightly inrolled embraced same texture palea, subacute; stamens 3; style base free.

Locality: Aberdeen, Kowloon Peak, To Fung Shan, Plover Cove, Peng Chau. *Y. W. Lam 778, 989, 1610.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Fujian, Taiwan; E Asia, Indian Subcontinent, Indochina, Malesia, Australia, widely naturalized in the tropics.

Ecology: Grassy places of hillslopes, open fields and thin forests. Flowering & fruiting: Sep.–Nov.

2. Brachiaria mutica (Forssk.) Stapf 巴拉草 **(Photo 355)**

Fl. Trop. Afr. 9: 526. 1919; FRPS 10(1): 269. 1990; FFJ 6: 218. 1995; FTW ed. 2, 5: 458, pl. 190. 2000; FOC 22: 520. 2006; FGD 9: 423. 2009.

Panicum muticum Forssk., Fl. Aegypt.-Arab. 20. 1775.

Urochloa mutica (Forssk.) T. Q. Nguyen, Novosti Sist. Vysa. Rast. 1966: 13. 1966.

Perennial herb. Culms stout, to 3 m tall, nodes densely villous. Leaf sheaths glabrous or villous at mouth, longer than internode; leaf blades broadly linear, 10–30 × 1–2 cm, thinly pilose or subglabrous; ligule membranous, ca. 1 mm. Inflorescenee racemose; racemes 10–20 cm, solitary, paired or grouped; spikelets paired or solitary in upper part of raceme, in untidy rows or sometimes on short secondary branchlets in lower part of raceme. Spikelets green or purplish, elliptic, 2.5–3.5 mm; lower glume triangular, 1/4–1/3 length of spikelet, 1-veined; upper glume as long as spikelet, 5-veined; lower floret staminate, lower lemma 5-veined, rugulose, palea subequal to lemma; upper lemma ca. 3 mm, crustaceous, margins narrowly incurved.

Locality: Aberdeen, Sha Tin, Yuen Long, Nam Sang Wai, San Tin, Mai Po, Plover Cove, Tsing Yi. *Y. S. Lau 2533; L. T. Lo 552; HK sheet 39681.*

Distribution: Cultivated in Fujian and Taiwan, probably originated from tropical Africa, now widely introduced and naturalized in tropical regions.

Ecology: Streamsides, other wet places. Flowering & fruiting: Aug.–Nov.

Uses: Animal food (forage).

3. Brachiaria brizantha (Hochst. ex A. Rich) Stapf
栅狀臂形草(信號草) **(Fig. 120; Photos 356–357)**

Fl. trop. Afr. 9: 531. 1919.

Panicum brizanthum Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 363. 1851.

Perennial herb. Culms erect, or geniculately ascending, to 100–200(–300) cm tall. Leaf blades linear, or lanceolate; ligule a fringe of hairs. Inflorescence composed of racemes; racemes (1–)2–16; borne along a central axis; rhachis narrowly winged, margins ciliate. Spikelet single, packing adaxial, 1-rowed. Spikelets elliptic, 4–6 mm, falling entire, dorsally compressed, subacute or acute; glumes dissimilar; lower glume ovate, clasping, 1/3 length of spikelet, membranous, no keels, 7–11-veined, obtuse or acute; upper glume oblong, as long as spikelet, cartilaginous, no keels, 7–9-veined, glabrous or pubescent, obtuse or acute; lower florets staminate, with palea; lower lemma similar to upper glume; upper lemma elliptic, 3.5–5.5 mm.

Locality: Ta Kwu Ling. *Y. W. Lam 859; HK sheet 35005.*

Distribution: Africa; naturalized elsewhere in tropics.

Ecology: Wet places. Flowering & fruiting: Spring to autumn.

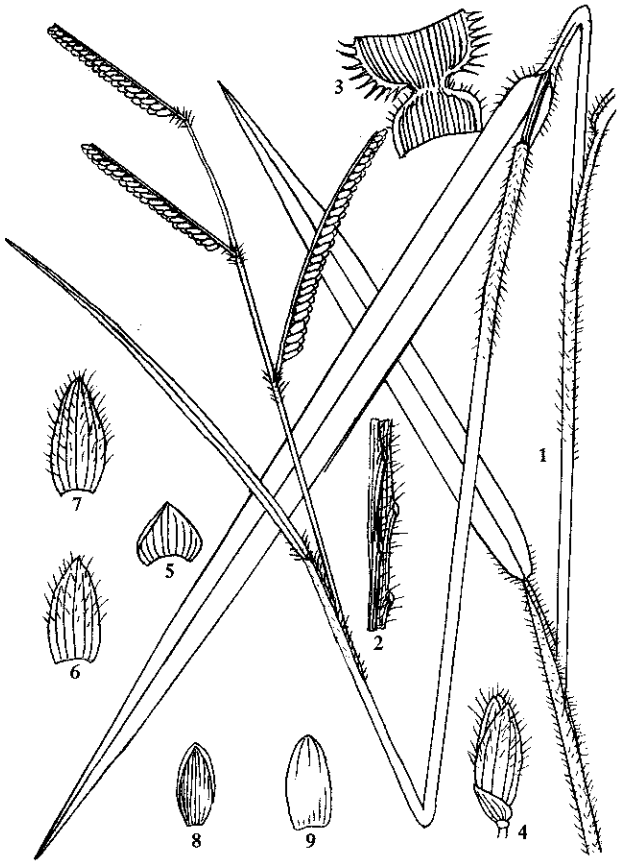

Figure 120. *Brachiaria brizantha* (Hochst. ex A. Rich) Stapf
1. habit; *2.* portion of spikelet rachis; *3.* adaxial view of leaf sheath apex and ligule; *4.* spikelet; *5.* lower glume; *6.* upper glume; *7.* lemma; *8.* palea; *9.* fruit. (drawn by H. P. Yu)

36. Paspalum L. 雀稗屬

Perennial or annual herbs. Culms tufted, erect, or with creeping rhizomes. Leaf blades linear or narrowly lanceolate, flat with involute margins; ligule short, membranous. Inflorescence composed of solitary, digitate or scattered racemes; rachis flat, often winged; spikelets solitary or paired, alternating in 2–4-rows on one side of axis, deciduous with pedicels. Spikelets elliptic or subelliptic or subrounded, 2-floret, dorsally compressed; lower glume absent or rarely present as a small scale; upper glume and lower lemma as long as spikelet or rarely upper glume shorter, membranous to subpapery, 3–7-veined; lower floret neuter, lower palea absent; upper floret bisexual, upper lemma usually coriaceous to crustaceous, rarely softer, margins inrolled embracing upper palea, upper palea similar to upper lemma, apex obtuse to apiculate; lodicules 2; stamens 3; style penicillate.

About 330 species widely distributed in tropical and subtropical regions; 16 species in China; seven species and one variety in Hong Kong.

1a. Spikelets with a marginal ciliate fringe of silky hairs; hairs 1–2 mm.
  2a. Racemes 2, paired; stoloniferous perennial.
    3a. Spikelet 1.5–1.8 mm; raceme 6–12 cm long ..... 1. *P. conjugatum*
    3b. Spikelet 3–3.5 mm; raceme 3–5 cm long ..... 2. *P. distichum*
  2b. Racemes usually more than 2, spread along on axis.
    4a. Spikelets 3–4 mm; upper floret equal to 2/3 length of spikelet ..... 3. *P. dilatatum*
    4b. Spikelets 2–3 mm; upper floret equal to or only slightly shorter than spikelet ..... 4. *P. urvillei*
1b. Spikelets glabrous or pubescent, without a marginal fringe of silky hairs.
  5a. Spikelets lanceolate to ovate or obovate, apex acute; upper glume without midvein ..... 5. *P. vaginatum*
  5b. Spikelets broadly elliptic, obovate or suborbicular, apex obtuse and rounded; upper glume with obvious midvein.
    6a. Fertile floret yellowish green to pale brown at maturity; spikelets usually paired, 4 rows ..... 6. *P. longifolium*
    6b. Fertile floret dark glossy brown at maturity; spikelets usually solitary, 2 rows.
      7a. Spikelets single, usually suborbicular, 2–3 mm; lower lemma 5–9-veined; upper lemma dark brown at maturity ..... 7. *P. scrobiculatum* var. *scrobiculatum*
      7b. Spikelets, or some of them, often paired, broadly obovate, 2–2.2 mm; lower lemma 3–5-veined; upper lemma yellow-brown or mid-brown ..... 7a. *P. scrobiculatum* var. *orbiculare*

1. Paspalum conjugatum P. J. Bergius 兩耳草 **(Photo 358)**

Acta Helv. Phys.-Math. 7: 129. 1772; FKH 313. 1912; FHN 4: 425. 1977; FRPS 10(1): 288, pl. 88: 1–6. 1990; FFJ 6: 220. 1995; FTW ed. 2, 5: 495, pl. 206, photo 56. 2000; FOC 22: 526. 2006; FGD 9: 427. 2009.

Perennial herb, rhizomatous. Culms in small tufts along rhizomes, 20–60 cm tall. Leaf sheaths keeled, glabrous or pilose along upper margins and mouth; leaf blades linear-lanceolate, thin, 5–20 × 0.5–1.3 cm, glabrous or papillose-pilose along margins, apex acute; ligule very short, a ring of hairs. Inflorescence of a pair of racemes, racemes 6–12 cm; spikelets solitary, in 2 rows; rachis

0.5–1 mm wide, serrate. Spikelets solitary, ovate to suborbicular, 1.5–1.8 mm, 2-floret; lower glume absent; upper glume as long as lower lemma, hyaline, thin, margins with long silky hairs; lower lemma similar but not ciliate; upper lemma pallid at maturity, ovate, margins inrolled embraced same texture palea.

Locality: Common in Hong Kong. *S. P. Lau 6; Y. S. Lau 1692, 3133.*

Distribution: Hainan, Guangxi, Yunnan, Fujian, Taiwan; tropics and subtropics throughout the world.

Ecology: Grassy fields, margins of forests. Flowering & fruiting: May–Sep.

2. Paspalum distichum L. 雙穗雀稗 **(Fig. 121)**

Syst. Nat. ed. 10, 2: 855. 1759; FKH 313. 1912; FHN 4: 426. 1977; FTW ed. 2, 5: 497, pl. 208. 2000; FOC 22: 528. 2006; FGD 9: 428. 2009.

Paspalum paspaloides (Michx.) Scribn., FRPS 10(1): 290, pl. 89: 6–11. 1990; FFJ 6: 220, fig. 186. 1995; Check List HK Plants 342. 2002; 120. 2004.

Perennial herb, rhizomatous. Culms ascending from creeping and rooting base, 20–60 cm tall, nodes usually pubescent. Leaf sheaths shorter than internode, keeled, glabrous, margins ciliate; leaf blades lanceolate, 5–15 × 0.3–0.7 cm, glabrous, apex acute; ligule membranous, 2–3 mm, glabrous. Racemes 2, arising together or separated by a short axis, raceme 3–5 cm; spikelets solitary, in 2 rows; rachis flat, 1.5–2 mm wide. Spikelets obovate-oblong, 3–3.5 mm, loosely pubescent, acute; lower glume usually absent or small; upper glume papery, 3–5-veined with distinct middle vein, loosely appressed pubescent; lower lemma 3–5-veined, usually glabrous, apex acute; upper lemma pale green, subequal to spikelet, cartilaginous, apex apiculate and minutely pubescent.

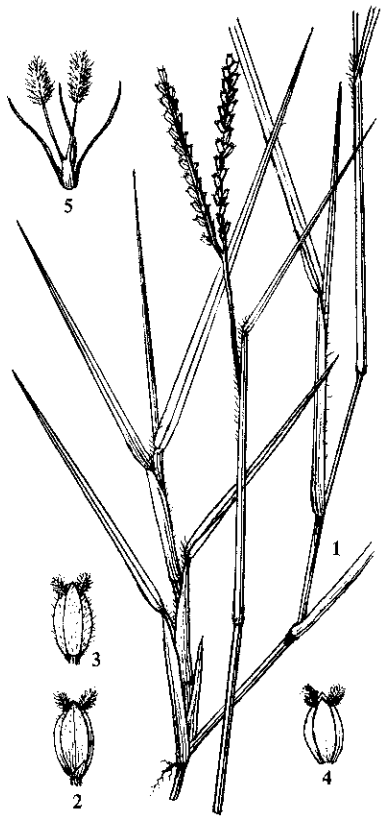

Figure 121. *Paspalum distichum* L.
1. plant; *2.* spikelet; *3–4.* grains; *5.* stamens and pistil. (drawn by H. P. Yu)

Locality: Common in Hong Kong. *Y. S. Lau 2255; Y. W. Lam 2223; HK sheet 39654.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Hubei, Henan, Jiangsu, Shandong, Anhui, Zhejiang, Fujian, Taiwan; tropical and warm-temperate regions of the world.

Ecology: Farmlands, grassy fields, roadsides, ditches and other disturbed places. Flowering & fruiting: May–Sep.

3. Paspalum dilatatum Poir. 毛花雀稗 **(Photo 359)**

Encycl. 5: 35. 1804; FRPS 10(1): 294, pl. 88: 7–12. 1990; FFJ 6: 221, fig. 187. 1995; FTW ed. 2, 5: 497, pl. 207. 2000; FOC 22: 527. 2006; FGD 9: 428. 2009.

Perennial herb. Culms tuft, erect from a short rhizome, 50–150 cm tall, glabrous. Leaf sheaths glabrous or pilose in the lower part; leaf blades linear, 10–45 × 0.3–1 cm, glabrous; ligule 2–5 mm, truncate, membranous, glabrous. Racemes 2–10, spaced, diverging, axils pilose. Spikelets broadly ovate, in 4-rows, 3–4 mm; lower glume absent; upper glume membranous, as long as spikelet, 5–9-veined, sparsely pubescent to almost glabrous on back, margins fringed with long white hairs; lower floret barren, lemma ovate-lanceolate, 5–7-veined, glabrous; upper lemma pallid at maturity, orbicular, ca. 2 mm, leathery, papillose-striate, apex rounded.

Locality: New Territories. *HK sheet 39684, 41557, 42050.*

Distribution: Guangdong, Guangxi, Yunnan, Guizhou, Hubei, Jiangxi, Jiangsu, Zhejiang, Fujian, Taiwan; originated from S America, naturalized elsewhere.

Ecology: Grassy fields, roadsides. Flowering & fruiting: May–Jul.

4. Paspalum urvillei Steud. 絲毛雀稗 **(Photos 360–361)**

Syn. Pl. Glumac. 1: 24. 1853; FRPS 10(1): 294. 1990; FFJ 6: 221. 1995; FTW ed. 2, 5: 501. 2000; FOC 22: 527. 2006; FGD 9: 428. 2009.

Perennial stout herb, with a short rhizome. Culms tufted, up to 2 m tall, glabrous. Leaf sheaths densely hispid, with long hairs at the mouth; leaf blades linear, 15–30 × 0.5–1.5 cm, glabrous or pilose at the base; ligule 3–5 mm, tipped with long hairs. Inflorescence axis 10–40 cm; racemes 10–25, 8–15 cm, narrowly ascending or suberect; spikelets paired, 2–3-rows on one side of rachis; rachis ca. 0.5 mm wide. Spikelets light green or purplish, ovate, 2–3 mm, margins densely covered with silky long hairs, sharply acute; lower glume reduced; upper glume membranous; lower lemma similar to upper glume; upper lemma elliptic, coriaceous, smooth, margins inrolled.

Locality: Hong Kong Island, New Territories. *Y. W. Lam 853; S. C. Ng 1850; HK sheet 40839.*

Distribution: Fujian, Taiwan (cultivated); native to S America, but widely introduced and naturalized in war areas.

Ecology: Flowering & fruiting: May–Oct.

5. Paspalum vaginatum Sw. 海雀稗 **(Photos 362–363)**

Prodr. 21. 1788; H. B. Gill. et al., Fl. Malaya 3: 182. 1971; FRPS 10(1): 290, pl. 89: 1–5. 1990; FTW ed. 2, 5: 501. 2000; FOC 22: 528. 2006; FGD 9: 428. 2009.

Perennial halophilous herb, with short rhizome and long stolons. Culms solitary or tufted, many-noded, flowering culm 6–60 cm tall. Leaf sheaths longer than internode, imbricate, often keeled, margins membranous, mouth with long pilose; leaf blades linear, 2.5–15 × 0.3–0.8 cm, inrolled, acute; ligule membranous, truncate, 0.5–1 mm. Inflorescence of (1–)2(–3) racemes arising together at culm apex; racemes 2–5 cm, usually closely approximate when young, later spreading; spikelets solitary, in 2 rows; rachis 1–2 mm wide, glabrous, triangular, often zigzag. Spikelets ovate-lanceolate, 3.5–4 mm, acute; lower glume absent or rarely a tiny vestige; upper glume thin papery or membranous, midvein often compressed, glabrous; lower lemma similar to upper glume, glabrous; upper lemma 2.5–3 mm, shorter than spikelet, cartilaginous, apex minutely pubescent; upper palea ca. 2/3 length of upper lemma.

Locality: Common in Hong Kong. *Y. W. Lam 1639; K. L. Yip 4208; HK sheet 37212.*

Distribution: Hainan, Taiwan, Yunnan; tropics and subtropics throughout the world.

Ecology: Sandy seashores, margins of streams. Flowering & fruiting: Jun.–Sep.

6. Paspalum longifolium Roxb. 長葉雀稗

Fl. Ind. 1: 283. 1820; FHN 4: 425. 1977; FRPS 10(1): 288, pl. 87: 1–5. 1990; FFJ 6: 222, fig. 188. 1995; FTW ed. 2, 5: 497. 2000; FOC 22: 530. 2006; FGD 9: 429. 2009.

Perennial stout herb. Culms tufted, erect, 80–150 cm tall, many-noded, glabrous. Leaf sheaths longer than internode, keeled, papillose-pilose along margins; leaf blades linear, 10–60 × 0.5–1.2 cm, glabrous, apex acuminate; ligule membranous, 1–2 mm. Inflorescence axis 4–10 cm; racemes 5–20, 4–8 cm, ascending; spikelets normally paired, occasionally solitary but 2nd vestigial spikelet present; densely overlapping; rachis broadly winged, purplish, margins scabrous with conspicuous close-set teeth. Spikelets purple or pale green, broadly obovate, paired, in 4 rows; lower glume absent; upper glume as long as lower lemma, membranous, 3-veined, minutely crisped-pubescent, apex slightly acute; upper lemma pallid, yellow-green, indurate.

Locality: Tai Tam, Lin Tong Mei. *P. S. Choi 521; HK sheet 41949.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Zhejiang, Fujian, Taiwan; Indian Subcontinent, Indochina, Malay Peninsula, Indonesia, Pacific islands, N Australia.

Ecology: Hillslopes, grassy fields, swampy places. Flowering & fruiting: Jul.–Oct.

7. Paspalum scrobiculatum L. 鴨嘴草

Mant. Pl. 1: 29. 1767; FHK 408. 1861; FKH 313. 1912; FRPS 10(1): 282, pl. 85: 1–6. 1990; FFJ 6: 223. 1995; FTW ed. 2, 5: 500. 2000; FOC 22: 528. 2006; FGD 9: 430. 2009.

Perennial or annual herb. Culms tufted, erect or decumbent at base, 90–150 cm tall. Leaf sheaths longer or upper shorter than internode, compressed, keeled, usually glabrous; leaf blades lanceolate or linear-lanceolate, 10–20 × 0.4–1.2 cm, usually glabrous, base subrounded, apex acuminate, margins scabrous; ligule membranous, 0.5–1 mm. Inflorescence of 2–5(–8) racemes, subdigitate or on a short axis; racemes 3–10 cm, ascending to widely spreading. Spikelets usually solitary, suborbicular or broadly elliptic, 2–3 mm, glabrous; lower glume absent; upper glume membranous, 7–13-veined; lower lemma 7–9-veined, veins often concolorous with back; upper lemma dark brown at maturity.

Locality: Common in Hong Kong. *Y. S. Lau 1037, 1870; HK sheet 36082.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; India, tropical SE Asia.

Ecology: Wastelands, roadsides. Flowering & fruiting: May–Sep.

7a. Paspalum scrobiculatum L. var. **orbiculare** (G. Forst.) Hack. 圓果雀稗 **(Photos 364–365)**

Bot. Jahrb. Syst. 6: 233. 1885; FOC 22: 529. 2006; FGD 9: 430. 2009.

Paspalum orbiculare G. Forst., Fl. Ins. Austr. 7. 1786; FHN 4: 427. 1977; FFJ 6: 223, fig. 190. 1995; FRPS 10(1): 284, pl. 87: 12–16. 1990; FTW ed. 2, 5: 500. 2000; Check List HK Plants 342. 2002; 120. 2004.

Spikelets elliptic or broadly obovate, 2–2.2 mm, often paired, imbricate, in 2 rows; lower glume absent; upper glume as long as lower lemma, membranous, 3–5-veined, slightly acute; upper lemma yellow-brown or mid-brown at maturity, as long as spikelet.

Locality: Common in Hong Kong. *Y. S. Lau 3181; Y. W. Lam 2176; HK sheet 41983.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hubei, Jiangxi, Jiangsu, Zhejiang, Fujian, Taiwan; SE Asia, Australia, Pacific islands (Polynesia).

Ecology: Hillslopes, roadsides, fields. Flowering & fruiting: Jun.–Nov.

37. Axonopus P. Beauv. 地毯草屬

Perennial or rarely annual herbs, stoloniferous. Culms tufted or decumbent. Leaf sheaths often strongly keeled-compressed and equitant; leaf blades flat or involute, often obtuse; ligule short, membranous-ciliolate. Inflorescence composed of 2–many slender spike-like racemes, mostly subdigitate but sometimes along a short central axis; spikelets single, subsessile, dorsally compressed, alternating or in 2 rows along the narrow triquetrous rachis, floret 1–2, falling off as a whole. Spikelets oblong; lower glume absent; upper glume and lower lemma as long as spikelet, lower palea absent; upper lemma and palea leathery; upper lemma with narrowly inrolled, opaque

margins, embracing upper palea to apex; lodicules 2; stamens 3; style 2, free; stigmas plumose, exserted laterally.

About 110 species distributed in tropical and subtropical America, one species in Africa; two species cultivated in China and in Hong Kong.

1a. Nodes of culm bearded; spikelets 2–2.7 mm; leaf blades 6–12 mm wide ..... 1. *A. compressus*
1b. Nodes of culm glabrous; spikelets 1.6–2 mm; leaf blades 3–6 mm wide ..... 2. *A. fissifolius*

1. Axonopus compressus (Sw.) P. Beauv. 地毯草 **(Photos 366–367)**

Ess. Agrostogr. 12. 1812; FHN 4: 424, fig. 1223. 1977; FRPS 10(1): 278, pl. 84. 1990; FFJ 6: 224. 1995; FTW ed. 2, 5: 456, pl. 189. 2000; FOC 22: 531. 2006; FGD 9: 426, fig. 220. 2009.

Milium compressum Sw., Prodr. 24. 1788.

Perennial herb, with creeping, long stolons. Culms 8–60 cm tall, nodes bearded. Leaf sheaths loose, strongly compressed, keeled, basal sheaths imbricate; leaf blades broadly linear to lanceolate, flat or folded, 5–20 × 0.6–1.2 cm, glabrous or adaxial surface pilose, apex rounded, margins sparsely ciliate at the base; ligule ca. 0.5 mm. Racemes 2–5, digitate or subdigitate, 4–10 cm; rachis triangular, glabrous; spikelets in 2-rows along one-side. Spikelets solitary, oblong-lanceolate, 2–3 mm, pilose or glabrous; lower lemma absent; upper glume as long as or longer than lower lemma, 2–4-veined, midvein absent; upper lemma oblong-elliptic, shorter than spikelet, leathery, margins slightly thicken and inrolled embraced same texture palea, obtuse with an apical tuft of hairs, mucronate and pubescent at apex; stigmas plumose, pale.

Locality: Common in Hong Kong (naturalised). *Y. S. Lau 1799, 2253; S. P. Lau 49.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Fujian, Taiwan; originated from tropical America, widely introduced elsewhere.

Ecology: Roadsides, weedy places on moist ground. Flowering & fruiting: Summer to autumn.

Uses: Environment (erosion control), animal food (forage).

2. Axonopus fissifolius (Raddi) Kuhlm. 類地毯草

Comm. Linh. Telegr., Bot. 67(Bot. 11): 87. 1922; FOC 22: 531. 2006; FGD 9: 426. 2009.

Paspalum fissifolium Raddi, Agrostogr. Bras. 26. 1823.

Axonopus affinis Chase, J. Wash. Acad. Sci 28: 180. fig. 1, 2. 1938; FRPS 10(1): 280. 1990; FTW ed. 2, 5: 456. 2000; Check List HK Plants 324. 2002; 114. 2004.

Perennial herb; stolons creeping. Culms compressed, 15–50 cm tall, nodes glabrous. Leaf sheaths compressed; leaf blades broadly linear, folded, 5–20 × 0.3–0.6 cm, obtuse; ligule ciliate. Racemes 2–4, 2-paired, any others spaced slightly below, 3–8 cm, only slightly diverging; rachis glabrous. Spikelets oblong-lanceolate, 1.5–2 mm, pilose near margins and apex or subglabrous; upper glume and lower lemma 2–4-veined, margins with silky hairs; upper floret bisexual, lemma pale, ovate, leathery, obtuse; stigmas purple. Caryopsis elliptic-oblong.

Locality: Tai Lung Farm (cultivated). *S. P. Lau 191; HK sheet 35848.*

Distribution: Taiwan, Xizang (cultivated or naturalised); native to tropical America, naturalized in paleotropics.

Ecology: Moist muddy or sandy meadows. Flowering & fruiting: Summer to autumn.

Uses: Environment (erosion control), animal food (forage).

38. Coix L. 薏苡屬

Annual or perennial herbs. Culms usually erect. Leaf blades large, usually broad, flat; ligule short, membranous. Inflorescences terminal and axillary, often many, each subtended by a globose or elongate ivory-like cupule (a modified leaf-sheath within which is a membranous prophyll) and comprising 2 racemes; female raceme enclosed by the cupule and consisting of 1 sessile spikelet accompanied by 2 barren pedicels; male raceme exserted from the mouth of the cupule, short, the spikelets imbricate and borne in pairs or threes, one pedicellate, the other(s) sessile. Female spikelet with glumes orbicular, membranous with a cartilaginous beak, the upper keeled; lower floret represented by an orbicular membranous lemma; upper floret with membranous lemma and palea, stigmas 2, exserted from the cupule. Male spikelet lanceolate to elliptic-oblong; lower glume flat on the back, 2-keeled, the keels winged above; upper glume boat-shaped; florets 2, lemma and palea membranous. Caryopsis subglobose to ellipsoidal.

Four species distributed in tropical Asia; two species in China; one species in Hong Kong.

1. Coix lacryma-jobi L. 薏苡 **(Fig. 122; Photo 368)**

Sp. Pl. 2: 972. 1753; FKH 317. 1912; FRPS 10(2): 293, pl. 73: 1–2. 1997; FFJ 6: 277, fig. 252. 1995; FTW ed. 2, 5: 536. 2000; FOC 22: 648. 2006; FGD 9: 510, fig. 272. 2009.

Annual herb. Culms erect, robust, 1–2 m tall, glabrous, branched. Leaf sheaths shorter than internode, glabrous; leaf blades linear-lanceolate, flat and open, 10–40 × 1.5–7 cm, usually glabrous, midvein stout, base subrounded or cordate, apex acuminate or long acuminate, margins scabrous; ligule ca.1 mm, dry membranous, ciliate. Male raceme 1–5 cm, spikelets in pairs with terminal triad. Male spikelets oblong-ovate; glumes many-veined, lower glume winged on keels, wing margin ciliolate; anthers 4–5 mm. Female

spikelet usually 3, one fertile, and 2 sterile at base; lower glume acuminate and beak-like; stamen usually absent; style thin and long, exserted apically from apex of involucre. Caryopsis ovoid or subglobose, ca. 5–8 mm in diam.

Locality: Common in Hong Kong. *Y. S. Lau 912, 1018, 2299.*

Distribution: Widely distributed in China; Indian Subcontinent, Indochina, Malesia, widely naturalized in tropics, cultivated in paleotropics.

Ecology: Wet places by streams, ditches and open fields, often cultivated. Flowering & fruiting: Jun.–Dec.

Uses: Food (beverage base), medicinal (folklore).

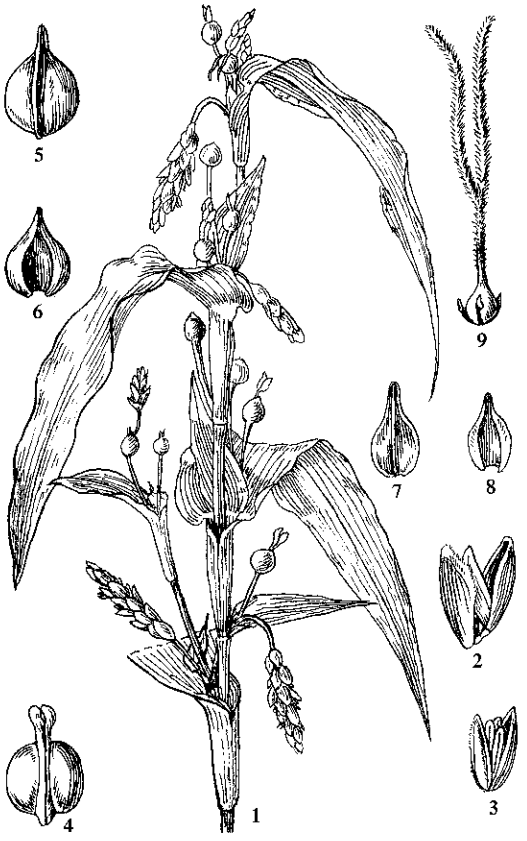

Figure 122. *Coix lacryma-jobi* L.
1. flowering branch; *2.* male spikelet; *3.* male floret; *4.* female spikelet; *5.* upper glume of female spikelet; *6.* lemma of sterile floret of female spikelet; *7.* lemma of fertile floret of female spikelet; *8.* palea of fertile floret of female spikelet; *9.* pistil and reduced stamens. (drawn by H. P. Yu)

39. Zea L. 玉蜀黍屬

Annual or perennial herbs. Culms stout, erect, many-noded. Leaf blades broad linear, flat. Spikelets unisexual, separated into male and female inflorescences, spikelets of a pair alike. Male inflorescence terminal, consisting of 1–many spike-like racemes; racemes racemosely arranged on all sides of the main axis and forming a large open panicle. Female inflorescence axillary, enclosed in enveloping foliaceous sheaths, consisting of stout, almost woody axis, which bears the spikelets in densely arranged even vertical rows; glumes broad, truncate or emarginate at apex; lemma hyaline, membranous; palea usually similar to lemma, but small or absent.

Five species distributed in C America, one cultivated (*Z. mays*) – an important food for mankind and livestock, widely cultivated elsewhere; one species cultivated in China and Hong Kong.

1. Zea mays L. 玉蜀黍 **(Photo 369)**

Sp. Pl. 2: 971. 1753; FKH 317. 1912; FHN 4: 488, fig. 1272. 1977; FRPS 10(2): 287, pl. 72: 1–3. 1997; FOC 22: 650. 2006; FGD 9: 511, fig. 273. 2009.

Annual herb. Culms erect, solid, 1–4 m tall. Leaf sheaths with transverse veinlets; leaf blades flat and broad, linear-lanceolate, 30–90 × 3–12 cm, glabrous or with tubercle-based hairs, base rounded, margins scabrid, midvein stout; ligule ca. 2 mm, membranous. Female inflorescence axillary, the spikelets in many rows on a thicken, almost woody axis, enclosed by many large foliaceous bracts or spathes; glumes equal, veinless, margins ciliate; florets hyaline, style extremely long and slender, like silky threads. Caryopsis globose or depressed globose. Male inflorescence a "tassel" of many digitate racemes, terminal; spikelets paired, pedicel unequal, one 1–2 mm, the other 2–4 mm, slender pilose; glumes subequal, membranous, ciliate; lemma and palea hyaline membranous, slightly shorter than glume; anthers orange, ca. 5 mm.

Locality: Cultivated. *Y. S. Lau 2753.*

Distribution: Originated from America, widely cultivated elsewhere.

Ecology: Flowering & fruiting: Summer to autumn.

Uses: Food (beverage base, oil/fat, starch, vegetable).

40. Dimeria R. Br. 鱔茅屬

Annual or perennial herbs. Culms erect to decumbent, glabrous. Leaf blades linear, flat; ligule short, membranous, truncate. Inflorescence terminal, composed of solitary or subdigitate racemes. Spikelets solitary, usually overlapping in 2 rows; rachis tough, spikelets deciduous from pedicels at maturity; pedicels very short, broad, margin truncate, apex concave. Spikelets lanceolate or narrowly oblong, strongly laterally compressed; callus truncate, shortly bearded; glumes herbaceous or thinly papery, folded with a median keel, keel often winged, lower glume narrower and slightly shorter than upper glume, conduplicate-keeled; lower floret reduced to a narrow hyaline lemma; upper floret bisexual, lemma hyaline, apex 2-toothed, awned from sinus; upper palea normally absent; lodicules 2; stamens 2. Caryopsis linear, laterally compressed.

About 40 species distributed in Indian Subcontinent, E Asia, Malesia and Australia; six species in China; three species in Hong Kong.

1a. Raceme with triquetrous rachis ..... 1. *D. ornithopoda*
1b. Raceme with flattened rachis.
2a. Racemes (1–)2–3; rachis usually glabrous along margins ..... 2. *D. falcata*
2b. Raceme solitary; rachis densely ciliate along margins ..... 3. *D. sinensis*

1. Dimeria ornithopoda Trin. 鱗茅 **(Fig. 123)**

Fund. Agrost. 167. 1820; FFJ 6: 235, fig. 202. 1995; FRPS 10(2): 171, pl. 42: 20. 1997; FTW ed. 2, 5: 540. 2000; FOC 22: 615. 2006; FGD 9: 452, fig. 234. 2009.

Annual herb. Culms slender, erect or geniculate at base, glabrous, 3–40 cm tall. Leaf sheaths keeled, with scattered tubercle-based hairs; leaf blades linear, soft, 1.5–5 × 0.1–0.3 cm, hispid with scattered tubercle-based hairs or glabrescent, acuminate; ligule 0.5–1 mm, ciliate at the apex. Racemes 2–3, subdigitate, ascending at first, then divergent; rachis triquetrous, flexuose or straight linear, scabrid on angles; pedicels glabrous, alternate in one side of rachis. Spikelets linear-oblong or narrow elliptic, strongly laterally compressed, usually purple or reddish brown; glumes herbaceous with broad scarious margins, sometimes with a few long stiff hairs near apex of keel, or stiffly pilose throughout, keel usually wingless, occasionally upper glume narrowly winged, with rounded midline or sharply keeled apex; lower lemma shorter than spikelet, extremely compressed, dorsally scabrid, stiffly pilose throughout, margins thin, acute; upper lemma as long as spikelet; laterally compressed, margin hyaline membranous, acute, 2-lobed, an slender awn from the sinus; awn geniculate; upper palea absent; stamens 2; styles 2. Caryopsis linear-oblong.

Locality: Hong Kong Island, New Territories. *Y. W. Lam 470, 1320; HK sheet 41993.*

Distribution: Guangdong, Guangxi, Yunnan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; Korea, Japan, India, Malaysia, Philippines, Australia.

Ecology: Streamsides and other moist places. Flowering & fruiting: Oct.–Nov.

Figure 123. *Dimeria ornithopoda* Trin.
1. plant; *2.* portion of inflorescence; *3.* spikelet; *4.* upper lemma. (drawn by H. P. Yu)

2. Dimeria falcata Hack. 鐮形鱗茅

Monogr. Phan. 6: 85. 1889; FKH 320. 1912; FFJ 6: 236, fig. 203. 1995; FRPS 10(2): 177, pl. 42: 1–9. 1997; FTW ed. 2, 5: 538, pl. 227. 2000; FOC 22: 615. 2006; FGD 9: 453. 2009.

Dimeria falcata Hack. var. *tenuior* Keng & Y. L. Yang, J. Nanjing Univ., Nat. Sci. ed. 1980(4): 106. 1980.

Dimeria fuscescens auct. non Trin.: FHK 419. 1861.

Annual herb. Culms erect, tufted, 20–70 cm tall. Leaf sheaths hirsute with short tubercle-based hairs or glabrous at base, the lower longer than internode and the upper shorter than internode; leaf blades dark green or reddish, linear, 4–20 × 0.2–0.3 mm, hirsute, apex finely acuminate; ligule 0.4–0.5 mm. Racemes 2–3, digitate, slightly curved; rachis flattened, margin scabrid or white-ciliate. Spikelets solitary, alternating, reddish brown or nearly purplish, linear-oblong, laterally compressed, base bearded; glumes papery, lower glume ca. 2.8 mm, chartaceous, dorsally keeled and ciliate, 1-veined; upper glume keeled, white-pilose near margins and on keel, margins broadly scabrous, apex acute; lower lemma oblanceolate, membranous, hyaline, 1-veined, upper margins ciliate; upper lemma shorter than upper glume, oblong-lanceolate, hyaline membranous, 2-lobed, a slender awn exserted from the sinus; awn 7–10 mm, geniculate; upper palea absent.

Locality: Victoria Peak, Lower Shing Mun, Wang Shan Keuk. *HK sheet 41943, 41947, 42005.*

Distribution: Guangdong, Guangxi, Fujian, Taiwan; India, Myanmar, Thailand.

Ecology: Moist grassy fields. Flowering & fruiting: Autumn.

3. Dimeria sinensis Rendle 華鱗茅 **(Photo 370)**

Linn. Soc., Bot. 36: 359. 1904; FKH 320. 1912; FFJ 6: 236. 1995; FRPS 10(2): 181, pl. 44: 1–9. 1997; FOC 22: 616. 2006; FGD 9: 453. 2009.

Annual herb. Culms slender, erect, 12–40 cm tall. Leaf sheaths hispid with tubercle-based hairs; leaf blades linear, 1.5–9 × 0.2–0.4 cm, setose with tubercle-based bristles; ligule ca. 0.5 mm, dry membranous. Raceme solitary, slightly flexuous, margins densely short ciliate; rachis flat, margins narrowly winged, densely ciliate with white silky hairs, white bearded on outer margin. Spikelets reddish brown or purplish brown, oblong, callus short and truncate, bearded; lower glume slightly shorter than spikelet, keel densely bearded,

margins and flank densely or sparsely white-ciliate, below the apex with sparsely hispid hairy near margins, acute; upper glume as long as spikelet, glabrous or sparsely ciliate, sharply keeled, margins hyaline membranous, silky-white villous near margin, apex acute keel with broadly wings; lower lemma lanceolate, hyaline membranous, margins sparsely ciliate, veinless; upper lemma hyaline membranous, 2-lobed, with an awn from the sinus, upper palea absent; awn geniculate in the middle, column twisted, yellowish brown; stamen 2; anthers ca. 1 mm; style base short, connate. Caryopsis oblong.

Locality: Hong Kong Island, New Territories. *F. W. Xing 9600; HK sheet 39423, 41952.*

Distribution: Guangdong, Guangxi, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian; Thailand.

Ecology: Moist places on hillsides, roadsides and grassy fields.

41. Eremochloa Büse 蜈蚣草屬

Perennial herbs. Culms slender, erect or decumbent at base, sometimes stoloniferous. Leaf sheaths ± compressed; leaf blades linear, flat or folded; ligule short, membranous. Inflorescence a solitary terminal raceme; raceme strongly flattened, axis elongate. Pedicellate spikelets reduced to only a pedicel; sessile spikelets dorsally compressed, 2-floret, overlapping along one side of rachis; rachis internodes narrowly clavate; lower glume elliptic-ovate to oblong, papery to leathery, marginally 2-keeled, keels pectinately spiny with comb-like spines; upper glume slightly boat-shaped, 3-veined; lower floret staminate, palea present; stamens 3; upper floret bisexual or female, upper lemma entire, awnless. Caryopsis oblong.

About 11 species distributed in Indian Subcontinent, SE Asia and Australia; five species in China; three species in Hong Kong.

1a. Plant with elongate stolons or rhizomes; lower glume broadly winged at apex ..... 1. *E. ophiuroides*

1b. Plant tufted; lower glume narrowly winged or wingless.

2a. Lower glume of sessile spikelet usually wingless, often pubescent on back ..... 2. *E. ciliaris*

2b. Lower glume of sessile spikelet narrowly winged toward apex, glabrous on back ..... 3. *E. zeylanica*

1. Eremochloa ophiuroides (Munro) Hack. 假儉草

Monogr. Phan. 6: 261. 1889; FKH 321. 1912; FHN 4: 463, fig. 1250. 1977; FFJ 6: 255, fig. 225. 1995; FRPS 10(2): 271, pl. 68: 1–2, 79: 1. 1997; FTW ed. 2, 5: 544, pl. 229. 2000; FOC 22: 645. 2006; FGD 9: 484, fig. 255. 2009.

Ischaemum ophiuroides Munro, Proc. Amer. Acad. Arts 4: 363. 1860; FHK 425. 1861.

Perennial herb, stoloniferous. Culms decumbent, 10–30 cm tall. Leaf sheaths compressed, overlapping at base, hairy at mouth; leaf blades flat, (1–)3–10 × 0.2–0.4 cm, usually glabrous, apex obtuse, terminal absent; ligule 0.2–5 mm, margin ciliate. Raceme terminal, compressed, erect or slightly curved; rachis internodes narrowly oblong-clavate. Sessile spikelet oblong, imbricate in axis along one side; lower glume oblong, ± leathery, glabrous, marginal spines short along incurving lower keels or reduced to knobs, apex acute but appearing broadly truncate because of flanking membranous wings, 5–7-veined; upper glume boat-shaped, thicken membranous, 3-veined; lower floret staminate, lemma membranous, subequal to glume; upper floret bisexual, lemma apex obtuse; style reddish brown. Pedicellate spikelet vestigial or absent; pedicel ± leaf-like, ellipsoidal-subulate.

Locality: Hong Kong Island, New Territories. *S. P. Lau 50; HK sheet 40710, 41956.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Sichuan, Hunan, Hubei, Henan, Anhui, Jiangxi, Jiangsu, Zhejiang, Fujian, Taiwan; Vietnam.

Ecology: Moist grassy fields, hillsides. Flowering & fruiting: Jun.–Oct.

2. Eremochloa ciliaris (L.) Merr. 蜈蚣草**(Fig. 124; Photo 371)**

Philipp. J. Sci. 1(Suppl. 5): 331. 1906; FHN 4: 464. 1977; FFJ 6: 256, fig. 226. 1995; FRPS 10(2): 271, pl. 68: 4. 1997; FTW ed. 2, 5: 542. 2000; FOC 22: 646. 2006; FGD 9: 485. 2009.

Nardus ciliaris L., Sp. Pl. 1: 53. 1753.

Ischaemum leersioides Munro, Proc. Amer. Acad. Arts 4: 363. 1860; FHK 425. 1861.

Eremochloa leersioides Hack., Monogr. Phan. 6: 264. 1889; FKH 321. 1912.

Perennial herb. Culms slender, erect, tufted, 20–60 cm tall. Leaf sheaths crowded at base of culm, overlapping, the upper shorter than internodes, mouth ciliate; leaf blades 3–15 × 0.1–0.4 cm, glabrous or pubescent, acute; ligule membranous,

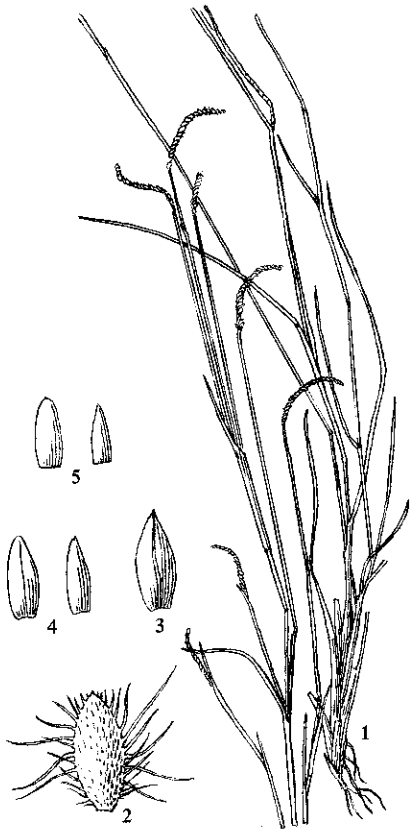

Figure 124. *Eremochloa ciliaris* (L.) Merr.

1. plant; *2*. spikelet; *3*. upper glume; *4*. lower lemma and palea; *5*. upper lemma and palea. (drawn by H. P. Yu)

0.5–1 mm. Raceme solitary, falcately curved; rachis internodes rib-like, puberulous to thinly hirsute. Sessile spikelet ovate, imbricate in one side of rachis; lower glume oblong-ovate, firmly papery, pubescent on back or subglabrous, marginal spines longer than glume width, longest 1.5–5 mm, 6–7-veined; upper glume as long as lower glume, thicken membranous, narrow wing on the lower part of keel, 3-veined; lower floret staminate, lemma slightly shorter than glume, ovate-oblong, apex obtuse; palea narrow; upper floret bisexual or pistillate, lemma oblong, slightly shorter than lower lemma, apex obtuse, palea narrow; style free, yellowish brown, penicillate. Caryopsis oblong. Pedicellate spikelet absent; pedicel narrowly ellipsoidal, ending in short point.

Locality: Common in Hong Kong. *HK sheet 39389, 39390, 41990.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Fujian, Taiwan; Indochina, Myanmar, Thailand, Malay Peninsula, Indonesia, New Guinea, Philippines, Australia.

Ecology: Open places on hills. Flowering & fruiting: Jul.–Oct.

3. Eremochloa zeylanica (Hack. ex Trimen) Hack. 馬陸草

Monogr. Phan. 6: 263. 1889; FRPS 10(2): 273, pl. 68: 3. 1997; FYN 9: 732. 2003; FOC 22: 646. 2006.

Ischaemum zeylanicum Hack. ex Trimen, Cat. Ceyl. Pl. 107. 1885.

Perennial herb. Culms erect, slender, tufted, 20–60 cm tall. Leaves mostly basal; leaf sheaths mostly imbricate at the base, glabrous; leaf blades linear, (1–)3–15 × 0.1–0.5 cm, glabrous or sparsely pilose, apex rounded, cuspidate; ligule ca. 0.5–1 mm, membranous. Raceme solitary, terminal, flexuous, erect or curved; rachis internodes clavate, with a ring of pilose at the base. Sessile spikelet elliptic, overlapping in one side; lower glume elliptic-ovate, hard papery, glabrous, marginal spines terete, equalling or much longer than glume width flanked by narrow wings, apex acute; upper glume boat-shaped, membranous, 2-keeled, the lower keel with narrow wings; lower floret staminate, lemma oblong, hyaline membranous, acute, 3-veined; palea as long as lemma and narrower; upper floret bisexual, lemma hyaline membranous, truncate. Pedicellate spikelet a very small rudiment; pedicel subulate.

Locality: Common in Hong Kong. *Y. W. Lam 1333; HK sheet 42004, 42060.*

Distribution: W Guangxi, Sichuan, SE Yunnan; Sri Lanka.

Ecology: Open grassy fields.

42. Mnesithea Kunth 毛俭草屬

Perennial, rarely annual herbs. Culms erect, tufted. Leaf blades linear, flat; ligule short, membranous. Racemes terminal, cylindrical or flattened; rachis internode clavate to pyriform, fragile, base truncate with central peg, spikelets paired, one sessile, the other pedicellate or occasionally in triplets of 2 sessile and 1 pedicellate. Sessile spikelet closely appressed or sunk in hollow in rachis, usually longer than adjacent internode; lower glume papery to leathery, ± flat, smooth or sculptured, marginally 2-keeled, keels winged at least at apex; upper glume boat-shaped, membranous; lower floret barren, with or without a small palea; upper floret bisexual with entire awnless lemma; stamens 3. Pedicellate spikelet varying from well developed to rudimentary or absent; pedicel oblong, clavate or leaf-like, free or partially or fully adnate to rachis internode.

About 30 species distributed throughout the tropics; four species in China; two species in Hong Kong.

1a. Leaves and culms softly pubescent; sessile spikelet ornamented; base of rachis joint ciliate.....1. *M. mollicoma*

1b. Leaves and culms glabrous; sessile spikelet smooth (rarely pitted); base of rachis joint glabrous.....2. *M. laevis*

1. Mnesithea mollicoma (Hance) A. Camus 毛俭草 **(Fig. 125)**

Bull. Mus. Natl. Hist. Nat. 25: 57. 1919; FHN 4: 468, fig. 1256. 1977; FRPS 10(2): 280, pl. 66: 1–3, 78: 4. 1997; FOC 22: 643. 2006; FGD 9: 483, fig. 254. 2009.

Rottboellia mollicoma Hance, J. Bot. 9: 134. 1871; FKH 321. 1912.

Perennial herb. Culms erect, up to 1.5 m, softly pilose. Leaf sheathes the upper usually shorter than internode, densely pilose or with caducous tubercle-based hairs; leaf blades linear-lanceolate, 10–60 × 0.5–2 cm, softly pubescent, tapering to both ends; ligule 1–2 mm, glabrous or ciliolate. Racemes 5–10 cm; rachis internode as long as or slightly shorter than spikelet, with short hairs at base; sessile spikelets 3–4 mm, paired at each node and separated by a pedicel, or occasionally only one sessile spikelet present; lower glume leathery, rib-like veins separated by deep slits, slits

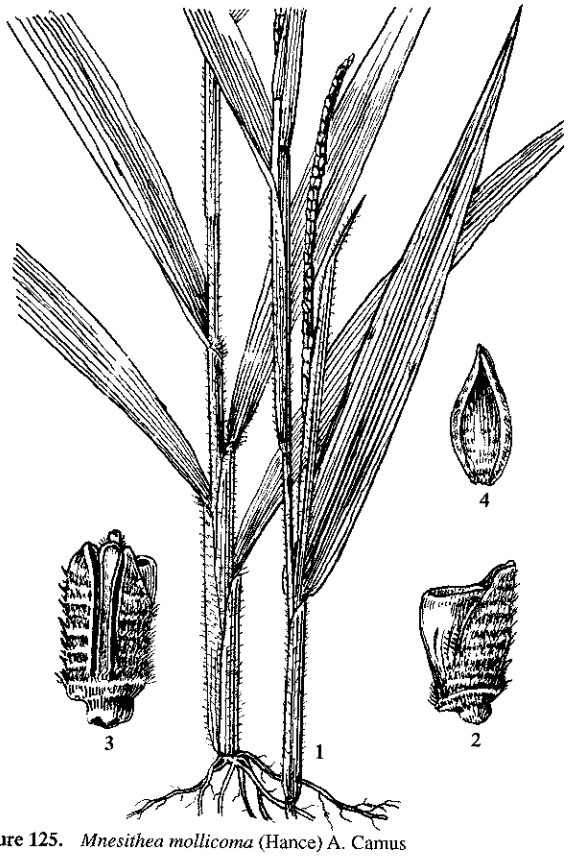

Figure 125. *Mnesithea mollicoma* (Hance) A. Camus

1. plant; *2.* portion of raceme showing sessile spikelet; *3.* portion of raceme showing arrangement of sessile and pedicellate spikelets; *4.* upper glume (adaxial view). (drawn by H. P. Yu)

interrupted by tubercle-based hairs along their length, margins narrowly winged toward apex; upper glume boat-shaped, keeled toward apex; lower floret usually reduced, lemma membranous, 3-veined; upper floret bisexual, upper lemma and palea subequal. Pedicellate spikelet ca. 0.5 mm, linear, flattened, pilose, reduced to a glume, pedicel subequal to sessile spikelet, ca. 0.5 mm wide.

Locality: Sha Tin. *P. P. H. But 284; S. Y. Hu 11197* (CUHK).

Distribution: Hainan, Guangdong, Guangxi; Vietnam, Thailand, Malay Peninsula, Indonesia.

Ecology: Grassy fields.

2. Mnesithea laevis (Retz.) Kunth 假蛇尾草

Révis. Gramin. 1: 154. 1829; FOC 22: 643. 2006; FGD 9: 483. 2009.

Rottboellia laevis Retz., Observ. Bot. 3: 11. 1783.

Heteropholis cochinchinensis (Lour.) Clayton, Kew Bull. 35(4): 816. 1981; FRPS 10(2): 276. pl. 67: 3–4. 1997; Check List HK Plants 337. 2002; 118. 2004.

Thaumastochloa cochinchinensis (Lour.) C. E. Hubb., FHN 4: 467, fig. 1255. 1977; FFJ 6: 259, fig. 230. 1995; FTW ed. 2, 5: 583, pl. 246. 2000.

Perennial herb. Culms tufted, erect, slender, glabrous, 15–70 cm tall. Leaf sheaths shorter than internode, glabrous, often keeled; leaf blades linear, 8–25 × 0.1–0.4 cm, glabrous; ligule 0.5–1 mm. Racemes solitary, terminal or axillary, cylindrical; sessile spikelets paired at each joint and separated by a pedicel, or triads present only at raceme base, or whole raceme with solitary sessile spikelets; rachis internodes clavate, 3.5–4 mm. Sessile spikelet 3–5 mm; lower glume oblong, smooth, or slightly sunken between lower part of veins, or ribbed throughout, rarely pitted, margins not winged, apex obtuse; upper glume boat-shaped, equal to lower glume, membranous; lower lemma slightly shorter than glumes, palea absent; upper lemma ca. 2.5 mm; stamens 3; style free. Pedicellate spikelet minute or absent; pedicel linear, adnate to rachis internode, when paired sessile spikelets present the pedicel between them often adnate only at apex.

Locality: Hong Kong Island. *Y. S. Lau 1039; Y. W. Lam 952; HK sheet 8435.*

Distribution: Hainan, Guangdong, Guangxi, Fujian, Taiwan; Indian Subcontinent, Indochina, Indonesia, Philippines, Pacific islands (Polynesia).

Ecology: Open grassy fields. Flowering & fruiting: Autumn.

43. Hemarthria R. Br. 牛鞭草屬

Perennial herbs. Culms erect or creeping and rooting at lower nodes. Leaf blades linear, flat; ligule narrow, membranous, margin ciliate. Inflorescence a spike-like raceme, solitary or in groups in upper leaf axils. Spikelet paired, one sessile, the other pedicellate, pairs alternating along rachis. Sessile spikelet appressed to hollow in rachis; lower glume narrowly elliptic, rigidly herbaceous to leathery, abaxial flat, margin 2-keeled, indistinctly winged on adaxial surface, obtuse to caudate or rarely 2-lobed; upper glume sometimes adnate to internode, mucronate or awned; lower floret barren, without palea; upper floret bisexual, lemma membranous, entire, awnless; stamens 3. Caryopsis ovate or oblong. Pedicellate spikelet similar to sessile, but base truncate and lacking callus.

About 14 species spread over tropical and subtropical regions of the Old World; six species in China; one species in Hong Kong.

1. Hemarthria compressa (L. f.) R. Br.

扁穗牛鞭草 **(Fig. 126; Photos 372–373)**

Prodr. 207. 1810; FHN 4: 464, fig. 1251. 1977; FFJ 6: 255, fig. 224. 1995; FRPS 10(2): 262, pl. 65: 4–6. 1997; FTW ed. 2, 5: 551, pl. 232. 2000; FOC 22: 642. 2006; FGD 9: 480, fig. 251. 2009.

Rottboellia compressa L. f., Suppl. Pl. 114. 1782 ["1781"]; FKH 321. 1912.

Hemarthria fasciculata auct. non (Lam.) Kunth: FHK 418. 1861.

Perennial herb, with horizontal rhizomes. Culms erect, 60–150 cm. Leaf sheaths glabrous or hairy along mouth, often shorter than internode; leaf blades linear, 2–15 × 0.2–0.5 cm, glabrous, base rounded, margins scabrous; ligule 0.3–1 mm. Racemes solitary or few per node, sometimes several aggregated. Sessile spikelet sunken in a cavity formed by the adnation of the rachis and the pedicel, long ovate, with a distinct callus of 1–2 mm; lower glume ovate-lanceolate, leathery, flat or subconvex on abaxial surface, marginally keeled, apex acute or slightly obtuse; upper glume boat-shaped, adnate to rachis, equalling lower glume; lower floret absent to lemma; upper floret bisexual, lemma hyaline

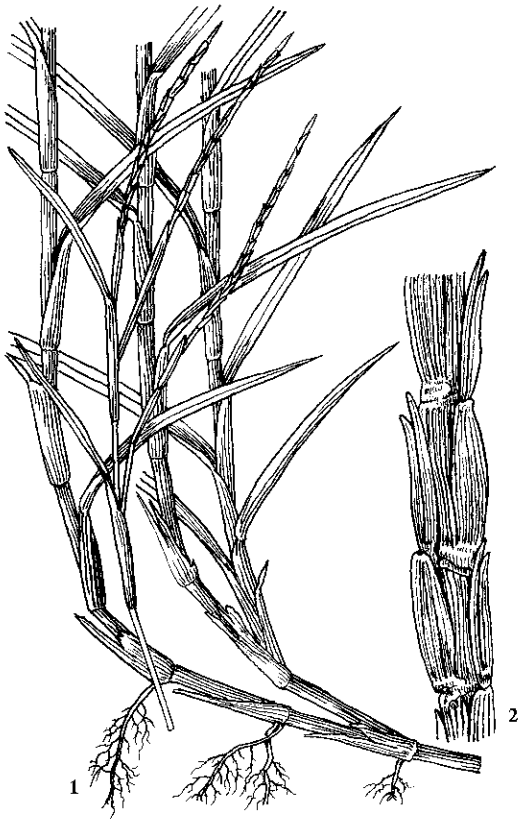

Figure 126. *Hemarthria compressa* (L. f.) R. Br.
1. portion of plant; 2. portion of raceme. (drawn by H. P. Yu)

membranous. Pedicellate spikelet lanceolate, as long as or slightly longer than sessile spikelet, lower glume ovate-lanceolate, herbaceous; upper glume boat-shaped, completely adnate to rachis cavity, acuminate-caudate.

Locality: Aberdeen, Shing Mun, Sai Kung, Wu Kau Tang. *Y. S. Lau 2281; Y. W. Lam 892, 2177.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Shaanxi, Nei Mongol, Fujian, Taiwan; Indian Subcontinent, Indochina, Malay Peninsula, SW Asia (Iraq).

Ecology: Farmlands and other wet places. Flowering & fruiting: Jul.–Sep.

44. Hackelochloa Kuntze 球穗草屬

Annual herbs. Culms erect, much branched. Leaf blades flat, linear or linear-lanceolate, with long tubercle-based hairs; ligule a short ciliate membrane. Inflorescence of solitary axillary racemes aggregated into a spathate compound panicle; racemes flattened, bearing paired spikelets, fragile, pedicel oblong, adnate to adjacent rachis internode, junction with internode marked by a line. Sessile spikelet hemispherical, bisexual; lower glume leathery, pitted to honeycombed, adaxially semi-globose concave; upper glume thicken papery, shorter and narrower, sunk into cavity of rachis; lower floret barren, without a palea; upper floret with entire awnless lemma. Pedicellate spikelet narrowly ovate, staminate or neuter, lemma thicken papery, stamens 3. Caryopsis broad elliptic.

Two species, one pantropical, the other confined to Asia; two species in China; one species in Hong Kong.

1. Hackelochloa granularis (L.) Kuntze 球穗草 **(Fig. 127)**

Revis. Gen. Pl. 2: 776. 1891; FHN 4: 465, fig. 1252. 1977; FFJ 6: 257, fig. 227. 1995; FRPS 10(2): 278, pl. 70: 1–3, 79: 2. 1997; FTW ed. 2, 5: 549, pl. 231. 2000; FOC 22: 647. 2006; FGD 9: 485, fig. 256. 2009.

Cenchrus granularis L., Mant. Pl. 2: 575. 1771.

Annual herb. Culms tufted, erect, branched, 20–60(–100) cm tall, glabrous or sparsely hispid. Leaf sheaths loose, usually shorter than internode, papillose-hispid; leaf blades linear-lanceolate, 5–20 × 0.4–1 cm, coarsely hispid, base ± cordate, apex subacute; ligule ca. 1 mm, membranous, margins ciliate. Racemes lower part usually included in terminal sheaths, rachis-joint and pedicel grown together. Sessile spikelet hemispherical, usually cream-coloured at maturity; lower glume leathery, hemispherical, coarsely reticulate-rugose, pits shallow and separated by broad rounded ribs; upper glume thicken membranous, hyaline, appressed to the cavity formed by rachis-joint and pedicel, 3-veined; lower lemma hyaline; upper lemma hyaline; stamens 3. Pedicellate spikelet ovate, glumes with prominent green veins and whitish wings.

Locality: Fanling, Po Toi Islands. *Y. W. Lam 1047; HK sheet 15312.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Anhui, Zhejiang, Fujian, Taiwan; spread throughout the tropics.

Ecology: Farmlands, open grassy places. Flowering & fruiting: Jun.–Oct.

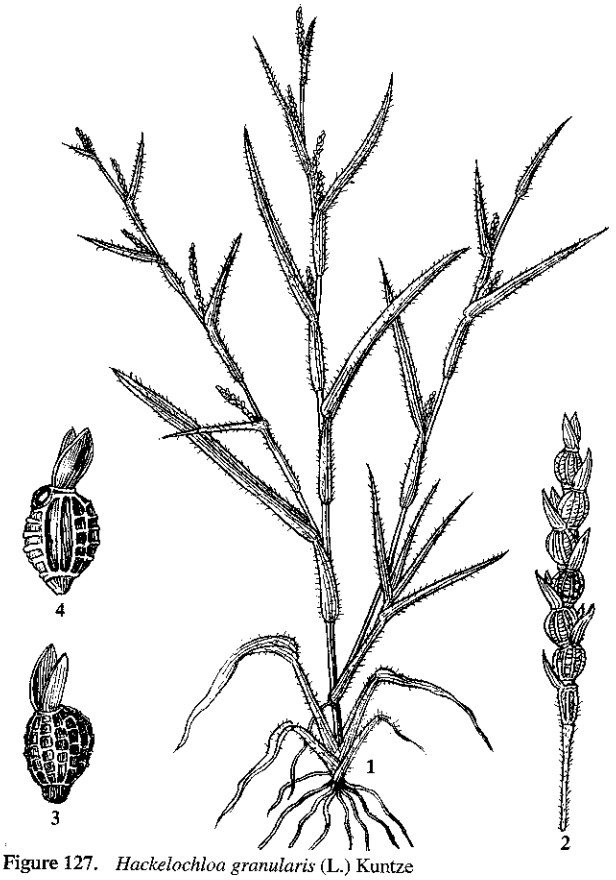

Figure 127. *Hackelochloa granularis* (L.) Kuntze
1. portion of plant; *2.* raceme. *3–4.* abaxial and adaxial views of sessile spikelet. (drawn by H. P. Yu)

45. Rottboellia L. f. 筒軸茅屬

Annual or perennial herbs. Culms erect or geniculate at base. Leaf blades linear, flat, glabrous or with tubercle-based hairs; ligule short, truncate. Inflorescence of single axillary racemes; racemes cylindrical, fragile, transversely articulate. Pedicellate spikelet tightly erect, as long as or shorter than sessile spikelet, herbaceous; pedicel broad, partly or wholly adnate to adjacent rachis internode; sessile spikelets sunken within a cavity formed by rachis and adjacent pedicel, 1–2-floret; lower glume ovate-oblong, leathery, shallowly convex, marginally 2-keeled, narrowly winged along keel, apex obtuse or acute; upper glume boat-shaped; lower floret staminate, palea present; upper floret with entire awnless lemma; stamens 3; lodicules 2, cuneate; styles 2, free; stigmas plumose. Caryopsis ovate or oblong.

Five species distributed in Old World tropics; two species in China; one species in Hong Kong.

1. Rottboellia cochinchinensis (Lour.) Clayton
筒軸茅 **(Fig. 128; Photo 374)**

Kew Bull. 35: 817. 1981; FOC 22: 645. 2006; FGD 9: 481, fig. 252. 2009.

Stegosia cochinchinensis Lour., Fl. Cochinch. 51. 1790.

Rottboellia exaltata L. f., Suppl. Pl. 114. 1781[1782], not (L.) L. f. (1779); FKH 321. 1912; FHN 4: 466, fig. 1253. 1977; FFJ 6: 258, fig. 228. 1995; FRPS 10(2): 268, pl. 67: 1–2. 1997; Check List HK Plants 345. 2002; 121. 2004.

Annual herb. Culms stout, 1–3 m tall. Leaf sheaths tuberculate-hispid with stiff irritant hairs or sometimes glabrescent; leaf blades linear to linear-lanceolate, 20–50 × 0.5–2.5 cm, glabrous or adaxial surface hispidulous, very scabrid along margins, midrib broad, white, apex acuminate; ligule a ciliate membrane, 1–2 mm. Racemes yellow and green; rachis internode 4–7 mm. Sessile spikelet pale yellow, sunken in a cylindrical rachis-joint; lower glume ovate, minutely scaberulous on abaxial surface, 2-keeled only toward entire or very minutely 2–3-toothed apex, narrow wings along keels; upper glume abaxial convex and keeled, keel with narrow wings, acute; lower floret staminate, lemma oblong, acute, 3-veined; upper floret bisexual, upper lemma broad ovate, acute. Pedicellate spikelet green, variable, 3–5 mm, narrowly ovate, herbaceous.

Locality: Common in Hong Kong. *Y. S. Lau 1046; P. P. H. But 68; P. S. Choi 367.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Zhejiang, Fujian, Taiwan; widely spread over Old World tropics.

Ecology: Open grassy fields, farmlands. Flowering & fruiting: Jul.–Oct.

Figure 128. *Rottboellia cochinchinensis* (Lour.) Clayton
1. portion of plant; *2.* flowering branchlet; *3.* rachilla internode, sessile and pedicellate spikelets; *4.* upper lemma. (drawn by H. P. Yu)

46. Saccharum L. 甘蔗屬

Perennial stout herbs, rhizomatous. Culms erect, solid, usually unbranched. Leaves cauline, blades narrowly to broadly linear, margin scabrous, midrib broad and white; ligule membranous, margin ciliolate. Inflorescence terminal, a large plumose panicle with elongate central axis, its branches bearing many hairy racemes; racemes fragile, sessile and pedicellate spikelet of a pair similar, both fertile; rachis internodes and pedicels filiform with cupular apex, pedicels resembling internode but often shorter. Spikelets usually small, lanceolate, with hairs much longer than spikelets; lower glume flat to broadly convex, 2-keeled; upper glume boat-shaped, 1-keeled; lower floret reduced to an empty hyaline lemma; upper floret bisexual, lemma membranous hyaline, with or without a short straight awn; stamens 2–3.

Between 35 and 40 species distributed throughout the tropics and subtropics, but mainly in Asia; 12 species in China; four species in Hong Kong.

1a. Lower glume glabrous on back; callus hairs much longer than spikelet.
  2a. Plant rhizomatous, culm 1–2 m; leaf blades 0.2–0.8 cm wide; wild plant ..... 1. *S. spontaneum*
  2b. Plant clump-forming, culm 2–6 m; leaf blades 1–6 cm wide; cultivated plant ..... 2. *S. officinarum*
1b. Lower glume hairy on back; callus hairs equal to or shorter than spikelet.
  3a. Lower glume with white silky hairs, hairs 2–3 times longer than spikelet ..... 3. *S. arundinaceum*
  3b. Lower glume with brown hairs, hairs shorter than spikelet ..... 4. *S. fallax*

1. Saccharum spontaneum L. 甜根子草 **(Photo 375)**

Mant. Pl. 2: 183. 1771; FKH 319. 1912; FHN 4: 451, fig. 1240. 1977; FFJ 6: 251, fig. 219. 1995; FRPS 10(2): 40, pl. 9: 1–6. 1997; FTW ed. 2, 5: 574, pl. 242. 2000; FOC 22: 578. 2006; FGD 9: 457. 2009.

Perennial herb, with long rhizomes. Culms erect, 1–4 m tall, softly pilose below inflorescence. Leaf sheaths pilose at mouth and margin; leaf blades linear, 30–60 × 0.2–0.8 cm, glabrous, tapering to midrib at base, apex acuminate, margins serrate; ligule brown, ca. 2 mm, membranous, apex obtuse, shortly ciliate. Inflorescence a large panicle of about 20 cm; branches erect, rachis and pedicels slender, rachis internodes slightly swollen at apex, pilose with long silky hairs. Spikelets paired, 3–5 mm; callus hairs 3–4 times length of spikelet; lower glume lanceolate, 2-keeled, the upper slightly membranous, margins ciliate; upper glume boat-shaped, keel and margins ciliate, acuminate; lower lemma lanceolate, subequal to glumes, acute, fringed at the apex; upper lemma linear or linear-oblong, awnless; lodicules obovate, ca. 1 mm, ciliate; anthers 3. Pedicellate spikelet similar to the sessile, pedicel 2.5–3 mm.

Locality: Common in Hong Kong. *Y. S. Lau 3095; HK sheet 8394, 15150.*

Distribution: Widely distributed in the warmer regions of Old World.

Ecology: Hillslopes, rivers and stream banks. Flowering & fruiting: Jul.–Sep.

2. Saccharum officinarum L. 甘蔗 **(Photo 376)**

Sp. Pl. 1: 54. 1753; FHK 419. 1861; FKH 319. 1912; H. B. Gill. et al., Fl. Malaya 3: 327. 1971; FHN 4: 450. 1977; FFJ 6: 250. 1995; FRPS 10(2): 41. 1997; FTW ed. 2, 5: 574. 2000; FOC 22: 579. 2006; FGD 9: 458. 2009.

Perennial stout herb. Culms 2–4(–6) m tall, white ciliate below inflorescence, lower internode shorten and swollen. Leaf sheaths longer than internode, glabrous, imbricate, pilose at mouth; leaf blades 70–150 × 4–6 cm, usually glabrous, midrib large and white, margins sharply serrate; ligule 2 mm, membranous, truncate. Panicle dense, very large, up to 50 cm; rachis internode pubescent. Spikelets paired, one sessile, other pedicellate; callus hairs 2–3 times length of spikelet; lower glume oblong, subpapery, 2-keeled, margins membranous; upper glume boat-shaped, 3–5-veined, acute; lower lemma oblong-lanceolate, obscurely 1-veined, acute; upper lemma small, awnless or absent, palea lanceolate; stamens 3; lodicules glabrous. Pedicellate spikelet similar to sessile spikelet; pedicel 3–4 mm, glabrous, apex slightly swollen.

Locality: Cultivated.

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Xizang, Sichuan, S Hunan, S Jiangxi, Fujian, Taiwan (cultivated); widely cultivated in warm regions of the world.

Ecology: Flowering & fruiting: Autumn.

Uses: Food (sugar, alcohol, beverage base).

Figure 129. *Saccharum arundinaceum* Retz.
1. plant; *2.* portion of spiketlet; *3.* abaxial view of lower glume; *4.* lateral view of upper glume; *5.* adaxial view of lower lemma; *6.* upper lemma; *7.* upper palea. (drawn by Y. X. Liu)

3. Saccharum arundinaceum Retz. 斑茅(大密) **(Fig. 129; Photo 377)**

Observ. Bot. 4: 14. 1786; FKH 319. 1912; FHN 4: 450. 1977; FFJ 6: 250, fig. 218. 1995; FRPS 10(2): 43. 1997; FOC 22: 579. 2006; FGD 9: 458. 2009.

Perennial stout herb. Culms erect, 2–4 m tall, glabrous. Leaf sheaths longer than internode, pilose at mouth and margins; leaf blades linear-lanceolate, (60–)100–200 × 1–2.5 cm, glabrous or adaxial surface with long soft hairs on the base, base narrowing, apex acuminate, margins serrate scabrous; ligule 1–2 mm, membranous, truncate. Panicle large and dense, axis glabrous; rachis internode 3–6 mm, pilose with long silky hairs. Spikelets narrowly lanceolate, callus small, with hairs ca. 1 mm; glumes subequal, lower glume thinly cartilaginous, abaxial surface with silky hairs twice length of spikelet, 2-keeled; upper glume boat-shaped, upper margins ciliate, 3(–5)-veined; lower lemma oblong-lanceolate, subequal to glumes; upper lemma lanceolate, apex mucronate or with awn to 3 mm. Lodicules glabrous. Pedicellate spikelet similar to sessile spikelet; pedicel 3–3.5 mm, with long silk hairs, apex slightly swollen.

Locality: Common in Hong Kong. *Y. S. Lau 2481; HK sheet 42034.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Gansu, Shaanxi, Hebei, Henan, Hubei, Jiangxi, Anhui, Zhejiang, Fujian, Taiwan; Indian Subcontinent, Indochina, Malay Peninsula, Indonesia.

Ecology: Hillslopes, rivers and stream banks. Flowering & fruiting: Aug.–Dec.

Uses: Environmental (erosion control), animal food.

4. Saccharum fallax Balansa 金貓尾 **(Fig. 130)**

J. Bot. (Morot). 4: 80. 1890; FYN 9: 604, fig. 102: 9–11. 2003; FOC 22: 581. 2006.

Narenga fallax (Balansa) Bor, Kew Bull. 3: 162. 1948; FHN 4: 449. 1977; FRPS 10(2): 37, pl. 8. 1997; FGD 9: 459, fig. 238. 2009; Check List HK Plants 341. 2002; 119. 2004.

Perennial stout herb. Culms erect, 1.5–3 m tall, nodes bearded with golden-brown hairs, hirsute below panicle. Leaf sheaths usually longer than internode, margin brown-hirsute, nodes with yellow pilose; leaf blades stiff, 40–80 × 1–1.5 cm, uppermost usually very small, glabrous or tuberculate-pilose, base narrowed, apex acuminate, margins scabrid; ligule ca. 1.5 mm, thicken membranous. Panicle loosely oblong in outline, 30–60 cm, axis golden or ferruginous brown pilose, bearded at nodes, many branches per node, branches ascending, primary branches sparsely branched in lower part; racemes flexuosely ascending, densely spiculate; rachis internode and pedicel apex slightly swollen, ciliate. Spikelets oblong-lanceolate, 3–4 mm; callus hairs a little shorter than spikelet, brown; lower glume oblong-lanceolate, papery and becoming herbaceous toward apex, abaxially with brown hairs, apex narrowly truncate; upper

glume boat-shaped, 3-veined; lower lemma lanceolate, slightly shorter than glumes, margins ciliate; upper lemma oblong, 1/2 length of glume, obtuse and awnless or minutely mucronate, varying to shortly 2-toothed and awned from sinus; upper palea small; anthers 3.

Locality: Tai Po Kau. *Y. S. Lau 3015.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan; Indochina, Myanmar, NE India, Indonesia.

Ecology: Hillslopes. Flowering & fruiting: Aug.–Oct.

47. **Imperata** Cirillo 白茅屬

Perennial herbs, with long rhizomes. Culms erect, unbranched. Leaf blades lanceolate or linear, flat; ligule membranous. Inflorescence a contracted panicle, terminal, spike-like; spikelets paired, pedicellate, subequal, deciduous at maturity within a plumose involucre of hairs; rachis internodes and pedicels persistent, densely silky hairy; callus very small, pilose with long hairs usually exceeding out of the spikelet; glumes papery, subequal, lanceolate, abaxially long-pilose, apex and margins membranous; lower floret reduced to an empty hyaline veinless lemma, shorter than spikelet; upper lemma similar to the lower, hyaline membranous, veinless, awnless; palea short, broad; lodicules absent; stamens 1–2; styles 2, connate at base. Caryopsis elliptic.

About ten species distributed throughout the tropics and subtropics; three species in China; one species in Hong Kong.

1. Imperata cylindrica (L.) Raeusch. var. **major** (Nees) C. E. Hubb. 大白茅(絲茅) **(Fig. 131; Photos 378–379)**

Grass. of Mauritius & Rodriguez 96. 1940; FHN 4: 446. 1977; FFJ 6: 239, fig. 206. 1995; FTW ed. 2, 5: 554, pl. 234, photo 61. 2000; FOC 22: 584. 2006; FGD 9: 455, fig. 236. 2009.

Imperata koenigii (Retz.) P. Beauv. var. *major* Nees, Fl. Afr. Austral. Ill. 90. 1841.

Imperata koenigii (Retz.) P. Beauv., Ess. Agrostogr. 165. 1812; FRPS 10(2): 32, pl. 7: 1–8. 1997; Check List HK Plants 338. 2002; 118. 2004.

Imperata arundinacea Cirillo var. *koenigii* (Retz.) Benth., FHK 419. 1861.

Perennial herb; rhizomes long-spreading, white, articulate. Culms erect, 30–90 cm tall, nodes often bearded. Leaf sheaths glabrous or pilose at margin and mouth, basal fibrous; leaf blades flat, stiffly erect, 15–60 × 0.5–0.9 cm, adaxial surface puberulous, base narrowed, apex hard, spiny, margins scabrid; ligule ca. 1 mm. Panicle cylindrical, copiously hairy, 5–20 × 1.5–3 cm. Spikelets lanceolate or oblong, 2.5–4 mm; callus with 10–15 mm silky hairs; glumes 3–6-veined, back with long silky hairs ca. 3 times glume length, apex slightly obtuse or acuminate; lower lemma ovate-lanceolate, 2/3 length of glumes, ciliate, acute or denticulate; upper lemma ovate, 1/2 length of glumes, denticulate, ciliate, palea equal to lemma. Anthers 2–3 mm. Stigmas purplish black.

Locality: Common in Hong Kong. *P. P. H. But 19; Y. S. Lau 1921; S. P. Lau 29.*

Distribution: Widely spread over all provinces of China; warm and temperate parts of Asia, and extending to Australia, E and S Africa.

Ecology: Wastelands, disturbed lands, open grassy places, forming extensive colonies.

Uses: Medicinal (folklore).

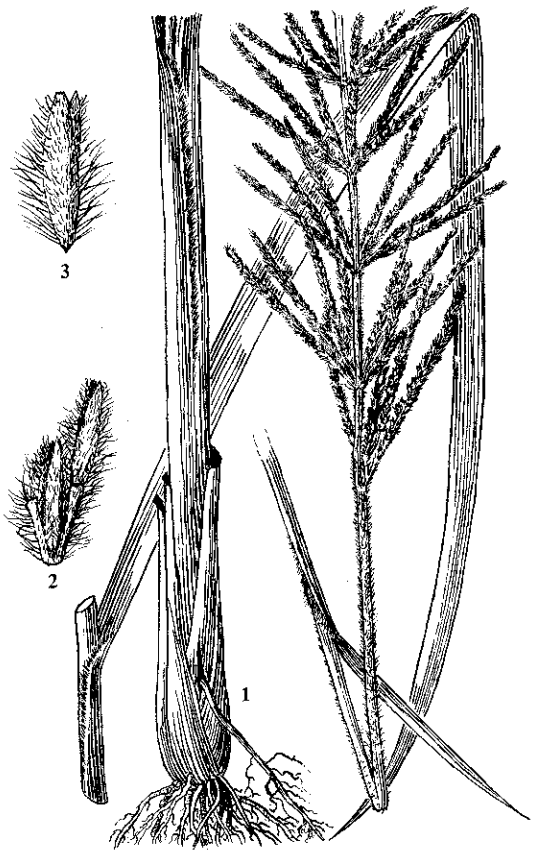

Figure 130. *Saccharum fallax* Balansa

1. portion of plant; *2.* portion of panicle showing sessile, petiolate spikelets and rachilla internode; *3.* sessile spikelet. (drawn by X. L. Chen)

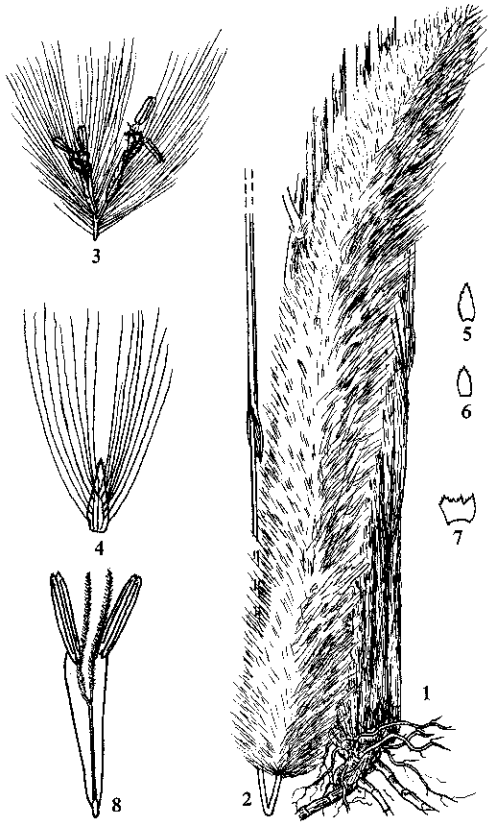

Figure 131. *Imperata cylindrica* var. *major* (Nees) C. E. Hubb.

1. portion of plant; *2.* spike-like panicle; *3.* spikelet pair; *4.* lower glume; *5.* lower lemma; *6.* upper lemma; *7.* upper palea; *8.* stamens and pistil. (drawn by H. P. Yu)

48. **Polytrias** Hack. 單序草屬

Perennial herbs, stoloniferous. Leaf blades broadly linear; ligule short, truncate, ciliolate. Inflorescence a solitary terminal raceme, fragile, with golden yellow or rusty hairy; rachis internodes broadly linear, densely ciliate on margins, shorter than spikelets, fragile at spikelet maturity; spikelets borne in threes, 2 sessile and 1 pedicellate at each node; sessile and pedicellate spikelets similar, both fertile or pedicellate spikelet male or barren, occasionally lowermost spikelets paired. Spikelets oblong; callus bearded; lower glume flat, villous, flanks keeled, apex truncate, ciliate; upper glume slightly longer than the lower, 1–3-veined, keeled along midvein; lower floret absent; upper lemma cordate, bidentate or subentire, awned; awn geniculate; palea very small or absent; stamens 3.

One species distributed in SE Asia, including China and Hong Kong.

1. Polytrias indica (Houtt.) Veldkamp 單序草 **(Fig. 132)**

Blumea 36: 180. 1991; FOC 22: 593. 2006.

Phleum indicum Houtt., Nat. Hist. 13: 198. 1782.

Polytrias amaura (Buse) Kuntze, Revis. Gen. Pl. 2: 788. 1891; FRPS 10(2): 99, pl. 23: 1–5. 1997.

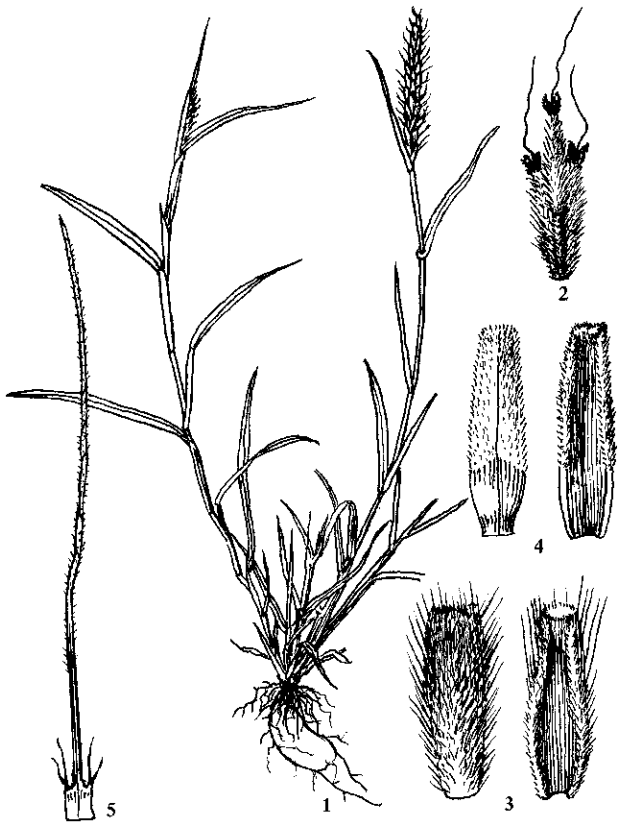

Figure 132. *Polytrias indica* (Houtt.) Veldkamp
1. plant; *2.* adaxial view of portion of raceme showing 3 spikelets per node; *3.* abaxial and adaxial views of lower glume; *4.* abaxial and adaxial views of upper glume; *5.* upper lemma. (drawn by H. P. Yu)

Perennial herb. Culms slender, creeping and rooting at lower nodes, flowering shoots ascending, 10–30 cm tall. Leaf sheaths lightly compressed, glabrous or rarely pubescent; leaf blades purplish glaucous, linear-lanceolate, 2–5 × 0.2–0.4 cm, stiffly pilose with tubercle-based hairs, apex acuminate; ligule 0.2–0.5 mm. Raceme 2–7 cm, densely pilose, shortly exserted from uppermost leaf sheath at maturity; rachis internodes and pedicels much shorter than spikelet, golden-ciliate. Spikelets 3 per node, oblong or linear-oblong, brown, densely hairy with soft golden hairs; callus hairs 1/3 spikelet length; lower glume membranous, long villous, hairs extending beyond glume apex; upper glume oblong, submembranous, truncate, densely pubescent except near base, keel villous on the upper; upper lemma shorter than upper glume, cordate, bidenate, ciliate, with an awn (ca. 1 cm) from the sinus, puberulous; anthers 2.5–3 mm, stigmas exserted from apex of spikelet.

Locality: Happy Valley, Repulse Bay. *L. T. Lo 216; Y. S. Lau 3079.*

Distribution: Vietnam, Myanmar, Malay Peninsula, Indonesia, New Guinea, Philippines; introduced elsewhere as a lawn grass.

Ecology: Grassy places. Flowering & fruiting: Summer to autumn.

49. **Microstegium** Nees 莠竹屬

Perennial or annual herbs. Culms slender, creeping or rambling, usually much branched. Leaf blades broadly linear to lanceolate; ligule membranous, truncate. Inflorescence terminal, composed of 1–many subdigitate racemes on a short axis; racemes usually fragile, with sessile and pedicellate spikelets in a pair, rarely both spikelets unequally pedicellate. Sessile spikelet lanceolate, dorsally compressed, falling off with adjacent rachis-joint; callus shortly bearded; glumes herbaceous to cartilaginous; lower glume flat or deeply grooved on back or with a broad median channel, 2-keeled at least toward apex, ciliate or scabrous on the keel, margins inflexed; upper glume boat-shaped, midvein keeled, 1–3-veined, acute to shortly awned; lower floret almost sterile, reduced to a single scale or absent; upper floret bisexual, lemma linear to cordate, deeply 2-lobed, shortly 2-toothed, or rarely entire, usually awned; awn slender and straight or geniculate; stamens 2–3. Caryopsis oblong. Pedicellate spikelet similar to the sessile but slightly narrower and less concave, occasionally slightly smaller and staminate, finally falling off from pedicel.

About 20 species distributed in Indian Subcontinent and SE Asia, a few species in Africa; 13 species in China; three species in Hong Kong.

1a. Awn often very short, included within spikelet ..... 1. *M. vimineum*

1b. Awn clearly exserted from spikelet.

2a. Upper glume with 0.3–3 mm awnlet; awn flexuose, column obscure ..... 2. *M. ciliatum*

2b. Upper glume acute or minutely mucronate; geniculate, column distinct ..... 3. *M. fasciculatum*

1. Microstegium vimineum (Trin.) A. Camus 柔枝莠竹(莠竹)

Ann. Soc. Linn. Lyon, N. S. 68: 201. 1921; FFJ 6: 242, fig. 210. 1995; FRPS 10(2): 76, pl. 15: 5–7. 1997; FTW ed. 2, 5: 565, pl. 238. 2000; FOC 22: 596. 2006; FGD 9: 462. 2009.

Microstegium nodosum (Kom.) Tzvelev, Bot. Mater. Gerb. Bot. Inst. Komarova Acad. Nauk SSSR 21: 23. 1961; Check List HK Plants 340. 2002; 119. 2004.

Arthraxon nodosus Kom., Trudy Glavn. Bot. Sada 18: 448. 1901.

Andropogon vimineus Trin., Mem. Acad. St. Petersb. VI. Math, Phys. Nat. 2: 268. 1832.

Annual herb. Culms slender, erect from the decumbent base, up to 1 m, with deep groove in one side, glabrous. Leaf sheaths shorter than internode, glabrous except margins and mouth pilose; leaf blades linear-lanceolate, 4–9 × 0.5–1 cm, often sparsely pubescent, midvein white, apex acuminate; ligule ca. 0.5 mm, membranous, truncate. Racemes 1–6, subdigitately arranged; rachis internode linear-clavate, ciliate, shorter than spikelet. Sessile spikelet 4–5.5 mm, callus with a few short hairs; lower glume narrowly lanceolate-oblong, abaxial deeply grooved, puberulous-scaberulous or occasionally hispidulous, 0–4-veined between keels, veins connected by veinlets below apex; upper glume boat-shaped, scabrid on keel, acuminate; lower floret reduced to an inconspicuous linear-lanceolate scale or absent; upper lemma very narrow, 1–1.5 mm, with a mucro or an awn of about 5 mm long, arising from the apex; awn weakly geniculate, often included within spikelet; upper palea ovate, ca. 1 mm; anthers 3.

Locality: Sha Tin. *S. P. Lau 586.*

Distribution: Widely distributed from N to S China; Indian Subcontinent, SW to E Asia, Indochina, Philippines, introduced in America and elsewhere.

Ecology: Margins of forests, moist grassy places.

2. Microstegium ciliatum (Trin.) A. Camus 剛莠竹 **(Photos 380–381)**

Ann. Soc. Linn. Lyon, N. S. 68: 201. 1921; FFJ 6: 242. 1995; FRPS 10(2): 69, pl. 16: 11–13. 1997; FTW ed. 2, 5: 563, photo 62. 2000; FOC 22: 597. 2006; FGD 9: 463. 2009.

Pollinia ciliata Trin., Mem. Acad. St. Petersb. ser. 6, 2: 305. 1833.

Perennial herb. Culms ascending from creeping base, up to 1 m tall, pubescent below inflorescence. Leaf sheaths longer or the upper shorter than internode, pilose or glabrous; leaf blades linear or linear-lanceolate, 6–20 × 0.5–1.8 cm, pubescent, base narrow, apex acuminate, margins scabrous; ligule 1–2 mm, membranous, ciliate. Racemes terminal, 3–20 digitate; rachis internodes linear, slightly inflated upward, margins ciliate. Sessile spikelet 3–3.5 mm, callus hairy; lower glume oblong, 2-keeled, 2–4-veined between keels, upper keels stiffly pectinate-ciliate, acute, obtuse or 2-toothed; upper glume boat-shaped, sharply keeled, apex acuminate into a 0.3–3 mm hair-like awnlet; lower lemma absent or very small; upper lemma linear or lanceolate, occasionally broader, 0.5–1 mm, apex usually entire; awn 1–2 cm, flexuose with weakly developed column and fine hair-like apex; anthers 3. Caryopsis oblong. Pedicellate spikelet similar to sessile spikelet; pedicel 2–3 mm, margins densely ciliate.

Locality: Common in Hong Kong. *Y. S. Lau 1684; L. T. Lo 115, 582.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Jiangxi, Fujian, Taiwan; Indian Subcontinent, Indochina, Malay Peninsula.

Ecology: Thin forests, open grassy fields. Flowering & fruiting: Sep.–Dec.

3. Microstegium fasciculatum (L.) Henrard

蔓生莠竹 **(Fig. 133)**

Blumea 3: 453. 1940; FOC 22: 597. 2006; FGD 9: 463, fig. 240. 2009.

Andropogon fasciculatus L., Sp. Pl. 2: 1047. 1753.

Microstegium vagans (Nees ex Steud.) A. Camus, Ann. Soc. Linn. Lyon, sér. 2, 68: 200. 1921[1922]; FRPS 10(2): 72, pl. 16: 1–5. 1997; Check List HK Plants 340. 2002; 119. 2004.

Perennial herb. Culms rambling, up to 1 m or more. Leaf sheaths glabrous or tuberculate-hispid; leaf blades linear-lanceolate, 10–18 × (0.5–)0.8–2 cm, pubescent, base narrow, stipe-like, apex acuminate into a setaceous point, margins scabrous; ligule 1–2 mm. Racemes 3–12, digitate in glabrous rachis, purplish; rachis internode ciliate at margins. Sessile spikelet oblong; callus hairs ca. 1 mm; lower glume elliptic-oblong, scabrid-hispidulous, 2-veined between keels, upper keels stiffly

Figure 133. *Microstegium fasciculatum* (L.) Henrard

1. portion of culm with leaves; *2.* inflorescence; *3.* spikelet pair; *4.* lower glume; *5.* upper lemma. (drawn by H. P. Yu)

pectinate-ciliate, abaxial shallowly grooved or almost flat, apex subentire or 2-lobed; upper glume sharply keeled, apex acuminate or with a brief mucro; lower floret usually absent; upper lemma ovate, ca. 0.5 mm, 2-lobed, with an awn arising from the sinus; awn geniculate with distinct column. Pedicellate spikelet similar to sessile spikelet, lower glume keel scabrous, glabrous.

Locality: Ma On Shan, Tai Mo Shan, Lantau Island. *S. Y. Hu 6204, 11157, 11239* (CUHK).

Distribution: Hainan, Guangdong, Guizhou, Yunnan, Sichuan, Hubei; Indian Subcontinent, Indochina, Malay Peninsula, Indonesia, Africa.

Ecology: Shade and moist banks, hillslopes. Flowering & fruiting: Aug.–Jan. of the following year.

50. Pogonatherum P. Beauv. 金髮草屬

Perennial herbs. Culms slender, densely tufted. Leaf blades linear or linear-lanceolate; ligule a membranous ciliate rim. Inflorescence of spike-like racemes, terminating the culm branches; sessile and pedicellate spikelets of a pair similar, both fertile; rachis internodes and pedicels shorter than spikelets; pedicel broad and flat, densely long pilose. Sessile spikelet oblong, laterally compressed; callus obtuse, bearded with long silky hairs; glumes subequal, membranous or thinly cartilaginous; lower glume strongly convex, dorsally compressed, 3–5-veined, apex truncate, ciliate; upper glume boat-shaped, slightly longer than lower glume, strongly compressed-keeled, apex 2-toothed, with an long and flexuose awn from sinus; upper lemma hyaline, 2-lobed for 1/3–1/2 of its length, awned; awn long, very slender, geniculate near base; stamens 1–2. Caryopsis oblong. Pedicellate spikelet often smaller, 1-floret, bisexual or female.

Four species distributed from India to SE Asia, NE Australia, and Polynesia; three species in China; two species in Hong Kong.

1a. Sessile spikelet 2.5—3 mm; stamens 2 ..... 1. *P. paniceum*
1b. Sessile spikelet 1.3—2 mm; stamen 1 ..... 2. *P. crinitum*

1. Pogonatherum paniceum (Lam.) Hack. 金髮草

Allg. Bot. Z. Syst. 12: 178. 1906; FRPS 10(2): 102, pl. 24: 1–13. 1997; FTW ed. 2, 5: 570. 2000; FYN 9: 631, fig. 106: 1–3. 2003; FOC 22: 592. 2006; FGD 9: 470. 2009.

Saccharum paniceum Lam., Encycl. 1: 595. 1785.

Pogonatherum saccharoideum P. Beauv., Ess. Agrostogr. 56: 176–177, pl. 11, fig. 7. 1812, *nom. illeg. superfl.*; FHK 421. 1861; FKH 320. 1912.

Perennial herb. Culms tufted, 30–60 cm tall, nodes bearded. Leaf sheaths glabrous or puberulous, mouth long ciliate; leaf blades stiff, 1.5–5.5 × 0.15–0.4 cm, scabrid, apex acuminate. Raceme 1.3–3 cm (excluding awns), yellowish; rachis internodes and pedicels ca. 1/2 spikelet length, hairs silky white. Sessile spikelet 2.5–3 mm, thinly cartilaginous; callus hairs shorter than spikelet; lower glume scabrid or puberulous on back, apex ciliate with 0.5–1 mm hairs; upper glume awn 1–2 cm; lower floret male, lemma slightly shorter than lower glume, palea subequaling lemma; awn of upper lemma 1.5–2 cm, weakly geniculate near base, column not strongly demarcated, limb very fine. Stamens 2, anthers ca. 1.8 mm. Pedicellate spikelet similar to sessile spikelet but smaller; lower glume awnless.

Locality: High Island, Sai Kung, Sha Lo Tung. *S. Y. Hu 8555, 8901; S. Y. Hu & P. P. H. But 20719* (CUHK).

Distribution: Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Taiwan, Yunnan; Afghanistan, Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Thailand, Vietnam, SW Asia (Arabia), Australia (Queensland).

Ecology: Hillslopes, roadsides, streams; alt. 100–2300 m. Flowering & fruiting: Mar.–Oct.

2. Pogonatherum crinitum (Thunb.) Kunth

金絲草 **(Fig. 134; Photo 382)**

Enum. Pl. 1: 478. 1833; FHN 4: 457, fig. 1246. 1977; FFJ 6: 237, fig. 204. 1995; FRPS 10(2): 106, pl. 24: 14–21. 1997; FTW ed. 2, 5: 570, pl. 240. 2000; FOC 22: 591. 2006; FGD 9: 470, fig. 245. 2009.

Andropogon crinitus Thunb., Syst. Veg. (ed. 14) 903. 1784.

Pogonatherum saccharoideum auct. non P. Beauv.: FHK 421. 1861; FKH 320. 1912.

Perennial herb. Culms erect or geniculate, tufted, 10–30 cm tall, nodes bearded. Leaf sheaths glabrous or puberulous, mouth

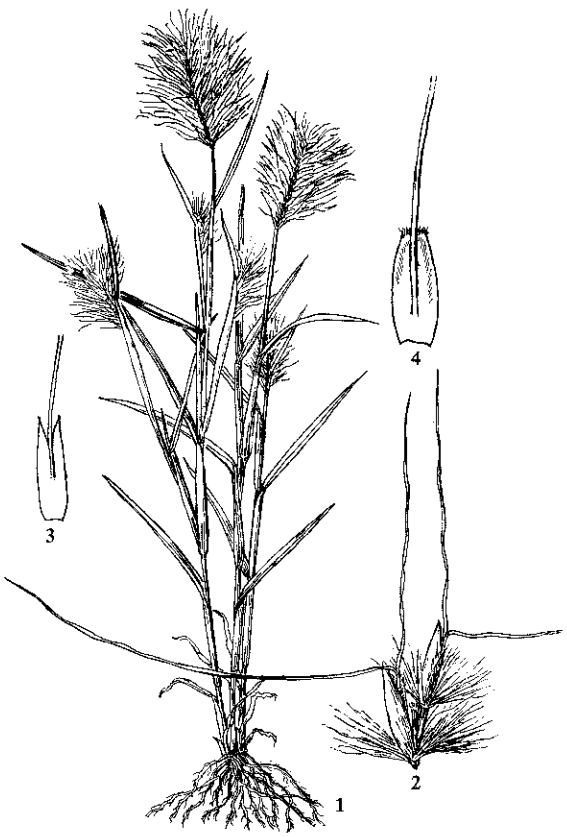

Figure 134. *Pogonatherum crinitum* (Thunb.) Kunth

1. plant; *2.* portion of raceme showing sessile and pedicellate spikelets and rachis internode; *3.* upper lemma with awn removed; *4.* upper glume with awn removed. (drawn by X. L. Chen)

long ciliate; leaf blades linear, flat, 1.5–5 × 0.1–0.4 cm, inrolled, scaberulous-puberulous, apex acute; ligule short, ciliate. Inflorescence a solitary raceme, yellowish; rachis internodes and pedicels both compressed, 1/3–2/3 spikelet length, hairs silky white. Sessile spikelet 1–2 mm, membranous; callus hairs equal to or slightly longer than spikelet; lower glume flat, scabrid on abaxial surface, apex truncate, ciliate with ca. 0.2 mm hairs; upper glume boat-shaped, 1-veined to keeled, awn 1.5–1.8 cm; lower floret absent or only lemma present; upper lemma slightly shorter than lower glume, 2-lobed, with an slender awn from the sinus; awn 1.5–2.5 cm, strongly geniculate near base, palea shorter than lemma, broad ovate, 2-veined; stamen 1, anther ca. 1 mm. Pedicellate spikelet similar to sessile spikelet but smaller; lower glume awnless. Caryopsis ovate-oblong.

Locality: Common in Hong Kong. *H. C. Tang 2177; Y. S. Lau 1041, 1791.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hubei, Hunan, Jiangxi, Anhui, Zhejiang, Fujian, Taiwan; Indian Subcontinent, Indochina, Malesia, New Guinea, Australia (Queensland).

Ecology: Forests, ravines, shade and moist places along roadsides and streams. Flowering & fruiting: May–Sep.

Uses. Medicinal (folklore).

51. Pseudopogonatherum A. Camus. 假金髮草屬

Annual herbs. Culms usually erect, slender, glabrous. Leaf blades narrowly linear, often inrolled; ligule a narrow membranous rim, margin densely ciliate. Inflorescence terminal, composed of several to many subdigitate racemes in a dense brush-like cluster; racemes tough or fragile, spikelets of a pair similar, usually both pedicellate on unequal pedicels, both fertile; rachis internodes and pedicels linear, hairy along angles. Spikelets lanceolate or lanceolate-oblong; callus obtuse to acuminate, shortly bearded; glumes membranous or papery; lower glume slightly convex, flanks rounded, 2-keeled upward, abaxial side usually hairy, keels ciliate toward apex, apex truncate or bidentate; upper glume boat-shaped, apex mucronate or awned; lower floret reduced to an oblong hyaline lemma or absent; upper floret bisexual; upper lemma usually extremely narrow, even reduced to base of awn, stipe-like, entire or 2-toothed, awned; awn well developed, geniculate; palea usually absent; stamens 1–3.

Three to five species distributed in NE India and Myanmar through SE Asia to the Philippines, Australia, Pacific islands; three species in China; two species in Hong Kong.

1a. Spikelets of a pair both pedicellate ..... 1. *P. contortum*
1b. Spikelets of a pair with one sessile and the other pedicellate ..... 2. *P. koretrostachys*

1. Pseudopogonatherum contortum (Brongn.) A. Camus 筆草
Ann. Soc. Linn. Lyon, sér. 2, 68: 205. 1921[1922]; FFJ 6: 247, fig. 215. 1995; FRPS 10(2): 93. 1997; FOC 22: 590. 2006.

Pogonatherum contortum Brongn., Voy. Monde 2(2): 90. 1831.

Annual herb. Culms slender, erect, 25–60 cm tall. Leaf sheaths glabrous; leaf blades narrow linear, involute, 10–30 × 0.1–0.2 cm, abaxial surface glabrous, adaxial surface thinly pilose; ligule ca. 0.2 mm. Racemes 3–6, subdigitate, white hairy, all spikelets pedicellate, falling from pedicels at maturity; pedicels usually unequal, as long as or shorter than internode, villous. Spikelets brown, glossy; callus hairs up to 1/2 spikelet length; lower glume narrowly oblong or lanceolate-oblong; upper glume with mucro or awn 0.5–4(–12) mm; upper lemma entire or minutely toothed; awn 1.5–3 cm, column pilose.

Locality: Sha Tin. *S. Y. Hu 12350* (CUHK).

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Jiangxi, Fujian; Bhutan, Indian Subcontinent, Indochina, Malay Peninsula, Indonesia, Pacific islands, Australia.

Ecology: Grassy hillslopes, open and disturbed grassy hillsides.

2. Pseudopogonatherum koretrostachys (Trin.) Henrard
刺葉假金髮草 **(Fig. 135)**
Blumea 4: 521. 1941; FOC 22: 591. 2006.

Andropogon koretrostachys Trin., Mém. Acad. Imp. Sci. St.-Pétersbourg, Sér. 6, Sci. Math. 2: 273. 1833.

Pseudopogonatherum setifolium (Nees) A. Camus in Lecomte, Fl. Gen. de L'IndoChine. 7: 256. 1922; FHN 4: 455. 1977; FRPS 10(2): 96. 1997; FYN 9: 634. 2003; Check List HK Plants 345. 2002; 120. 2004.

Annual herb. Culms erect or geniculately ascending, 30–60 cm tall, glabrous. Leaf sheaths glabrous; leaf blades narrowly linear,

Figure 135. *Pseudopogonatherum koretrostachys* (Trin.) Henrard
1. plant; *2.* portion of inflorescence showing sessile spikelet, pedicellate spikelet and rachis internode; *3.* sessile spikelet. (drawn by H. P. Yu)

usually involute, 5–20 × 0.1–0.2 cm, glabrous or adaxial surface pilose; ligule ca. 0.5 mm, ciliate. Racemes (1–)7–25 or more, subdigitate, 2–8 cm, white hairy, tardily fragile, one spikelet of a pair sessile, the other pedicellate; rachis internodes and pedicels 1/2 spikelet length, villous. Spikelets lanceolate, 2–3 mm, brown; callus hairs 1/5–1/4 spikelet length; lower glume narrowly lanceolate-oblong, villous except near apex, sometimes sparsely so or glabrous, upper flanks villous, apex 2-toothed or truncate and minutely 2-mucronate; upper glume boat-shaped, with 3–6 mm awn; lower lemma oblong, ca. 1 mm; upper lemma, shortly 2-toothed; awn 1.5–2 cm, column shortly ciliate, hairs ca. 0.25 mm. Anthers 3, 0.5–0.7 mm. Pedicellate spikelet similar to sessile ones, easily deciduous, maturing before sessile spikelet.

Locality: Sha Tin, Fanling. *HK sheet 15587, 31551.*

Distribution: S and E China, Yunnan; Malaysia, Indonesia.

Ecology: Hillslopes, roadsides. Flowering and fruiting: Sep.–Nov.

52. **Miscanthus** Andersson 芒屬

Perennial herbs, tufted or rhizomatous. Culms erect, solid. Leaves basal or cauline; leaf blades linear, flat; ligule membranous. Inflorescence a panicle, often large and plumose, composed of racemes arranged on a long or short axis; raceme axis tough, internodes slender, spikelets paired, pedicellate; pedicels slender, flattened, slightly clavate. Spikelets similar, lanceolate, dorsally compressed; callus bearded with hairs shorter than, as long as or longer than the spikelet; glumes papery or membranous; lower floret usually represented by a hyaline sterile lemma; upper floret bisexual, lemma hyaline, awned or awnless; stamens 2–3. Caryopsis oblong or ellipsoidal.

About 14 species mostly distributed in SE Asia and Pacific islands; seven species in China; two species in Hong Kong.

1a. Axis up to 1/2 the length of the panicle ..... 1. *M. sinensis*

1b. Axis more than 2/3 the length of the panicle ..... 2. *M. floridulus*

1. **Miscanthus sinensis** Andersson

芒 **(Fig. 136; Photos 383–384)**

Öfvers. Kongl. Vetensk.-Akad. Förh. 12: 166. 1855; FKH 319. 1912; FHN 4: 448, fig. 1238. 1977; FFJ 6: 241, fig. 209. 1995; FRPS 10(2): 6, pl. 1: 7–11. 1997; FTW ed. 2, 5: 567, photo 65. 2000; FOC 22: 582. 2006; FGD 9: 454. 2009.

Perennial herb. Culms tufted, 1–2 m tall, solid, unbranched, glabrous or puberulous at nodes. Leaf sheaths glabrous, longer than internode; leaf blades linear, flat, 20–50 × 0.6–1 cm, glabrous, glaucous or pilose, midrib prominent, base tapering or broad and rounded, apex acuminate, margins scabrid or smooth; ligule 0.5–4 mm, ciliolate. Panicle 20–50 cm; axis up to 1/2 the length of the panicle, subglabrous to pilose or puberulous. Raceme 10–30 cm; rachis internodes glabrous, scaberulous or smooth, nodes glabrous; lower pedicel 2 mm, upper pedicel 4–6 mm. Spikelets 4.5–5 mm, callus hairs as long as spikelet; lower glume 3–4-veined, abaxial surface glabrous or pilose, apex acuminate; upper glume 1-veined, upper margins inrolled and ciliate; lower lemma oblong, hyaline, margins ciliate; upper lemma shorter than lower lemma, bifid, with an awn from the sinus; awn geniculate, 9–12 mm; upper palea 1/2 length of upper lemma.

Locality: Common in Hong Kong. *HK sheet 41504, 41961.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Shaanxi, Hebei, Hubei, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; Japan, Korea.

Ecology: Hillslopes, rivers and stream banks. Flowering & fruiting: Jul.–Dec.

Figure 136. *Miscanthus sinensis* Andersson
1. portion of plant; *2.* portion of inflorescence; *3.* spikelet. (drawn by H. P. Yu)

2. **Miscanthus floridulus** (Labill.) Warb. ex K. Schum. & Lauterb. 五節芒 **(Photo 385)**

Fl. Schutzgeb. Südsee. 166. 1901; FHN 4: 448. 1977; FFJ 6: 240, fig. 208. 1995; FRPS 10(2): 4, pl. 1: 1–6. 1997; FTW ed. 2, 5: 567, pl. 239, photo 64. 2000; FOC 22: 582. 2006; FGD 9: 454. 2009.

Miscanthus japonicus (Trin.) Andersson, Öfvers. af Förh. Kongl. Svenska Vetensk.-Akad. 12: 166. 1855.

Eulalia japonicum Trin., Mém. Acad. Imp. Sci. St.-Pétersbourg, Sér. 6, Sci. Math. 2(3): 333. 1832; FHK 420. 1861.

Saccharum floridulum Labill., Sert. Austro-Caledon. 13: t. 18. 1824.

Perennial herb. Culms erect, 1.5–4 m tall, glabrous, unbranched. Leaf sheaths glabrous or margins sparsely ciliate, longer than internode or the upper slightly shorter than internode; ligule 1–3 mm, rounded, ciliate; leaf blades linear, flat, tough, 20–85 × 0.5–4 cm, glabrous or pilose on the base of adaxial surface, midrib prominent, margins scabrid. Panicle oblong or elliptic, dense, 30–50 cm; axis more than 2/3 the length of the panicle; racemes many, 10–30 cm, appressed or ascending, glabrous, scaberulous. Spikelets of a pair similar, unequally pedicellate along a slender continuous rachis; callus hairs as long as or slightly longer than the spikelet, white, spreading; glumes subequal, membranous, margins pilose near apex, veins obscure, acuminate; lower lemma boat-shaped, hyaline, pilose, acuminate; upper lemma similar to the lower, glabrous or margins sparsely short ciliate at the lower, acute, slightly 2-toothed; awn straight or geniculate; upper palea a small hyaline scale; anthers 3, 1–1.5 mm. Caryopsis oblong.

Locality: Common in Hong Kong. *Y. S. Lau 1865; K. L. Yip 4181, 4246.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Henan, Hubei, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; SE Asia.

Ecology: Hillslopes, valleys, open grassy fields.

53. Eulalia Kunth 黄金茅屬

Perennial, rarely annual herbs. Culms tufted, usually erect, rarely stoloniferous. Leaf blades linear to narrowly lanceolate; ligule short, membranous, margin ciliolate. Inflorescence terminal, composed of several to many racemes inserted digitately; racemes elongate with many spikelet pairs, hairy, sessile and pedicellate spikelets of a pair similar, pedicellate spikelets finally falling off entirely from the pedicel, sessile spikelets falling off with adjacent internode, rarely shortly pedicellate and then falling from pedicel; rachis internodes linear, ciliate along angles. Spikelets lanceolate to narrowly oblong, dorsally compressed; callus short, bearded; glumes cartilaginous to leathery; lower glume flat or slightly concave, hairy; upper glume boat-shaped, 1-keeled down midline; upper lemma linear to oblong, shortly 2-toothed or 2-lobed to middle, awned; awn geniculate; palea small or absent.

About 30 species distributed in tropical and subtropical regions of the Old World; 14 species in China; three species in Hong Kong.

1a. Basal leaf sheaths covered with dense woolly hairs.
  2a. Culms robust, 2–5 mm in diam.; leaf blades 25–50 cm ..... 1. *E. speciosa*
  2b. Culms slender, 1–1.7 mm in diam.; leaf blades 15–30 cm ..... 2. *E. phaeothrix*
1b. Basal leaf sheaths glabrous, or appressed hairy between veins ..... 3. *E. quadrinervis*

1. Eulalia speciosa (Debeaux) Kuntze 金茅

Revis. Gen. Pl. 2: 775. 1891; FHN 4: 453. 1977; FFJ 6: 245. 1995; FRPS 10(2): 83, pl. 19: 9–12. 1997; FTW ed. 2, 6: 548. 2000; FOC 22: 586. 2006; FGD 9: 465. 2009.

Erianthus speciosus Debeaux, Acta Soc. Linn. Bordeaux 32: 53. 1878.

Perennial herb. Culms stout, to 1 m tall. Basal leaf sheaths with golden brown hairs, finally fibrous; leaf blades linear-lanceolate, 25–50 × 0.4–0.7 cm, adaxially farinose, white pilose at base, otherwise glabrous, apex acuminate; ligule ca. 1 mm, truncate and ciliate. Racemes 4–7(–13) on a 3–4 cm axis, digitate, 10–25 cm, hairs whitish, yellowish or golden brown; rachis internodes and pedicels 2/3 as long to subequaling spikelet, ciliate. Sessile 4.6–5.7 mm, dark brown; callus hairs 1/6-1/3 spikelet length; lower glume narrowly lanceolate-oblong, back concave, villous below middle, veinless between keels, upper keels stiffly ciliate, apex subobtuse; upper lemma narrow, margin pilose, 2-toothed in upper 1/3; awn 1.5–2 cm. Anthers 2.5–3 mm.

Locality: Hong Kong Island, Tsing Yi, Lai Chi Chong. *S. Y. Hu 8330, 8472, 11193* (CUHK).

Distribution: Hainan, Guangdong, Guizhou, Yunnan, Sichuan, Shaanxi, Hubei, Henan, Shandong, Anhui, Jiangxi, Zhejiang, Fujian, Taiwan; India, SE Asia, Philippines.

Ecology: Hillslopes, grassy fields.

2. Eulalia phaeothrix (Hack.) Kuntze 棕茅

Revis. Gen. Pl. 2: 775. 1891; FHN 4: 454. 1977; FRPS 10(2): 85. 1997; FYN 9: 624. 2003; FOC 22: 587. 2006; FGD 9: 466. 2009.

Pollinia phaeothrix Hack., Monogr. Phan. 6: 168. 1889.

Perennial herb. Culms slender, 0.3–0.8(–1) m tall, white-villous below inflorescence. Leaf sheaths longer or the upper slightly shorter than internode, pilose or glabrescent, basal sheaths woolly with dark reddish brown hairs, finally fibrous; leaf blades narrowly linear, 15–45 × 0.1–0.6 cm, glabrous or pilose, apex acute; ligule 0.5–1 mm, truncate, ciliate. Racemes (1–)2–8, digitate, golden brown or yellowish brown; rachis internodes and pedicels 1/2–2/3 spikelet length, densely ciliate. Sessile spikelet oblong-lanceolate, dark brown; callus hairs 1/8 spikelet length; lower glume papery, oblong-lanceolate, abaxial flat or slightly concave; upper glume boat-shaped, apex slightly obtuse, tri-denticulate, pilose along upper margins and keel; lower lemma oblong-lanceolate, slightly shorter than glumes, narrower to the apex, the upper margins ciliate; lower palea absent; upper lemma narrow, 2-lobed nearly to the middle, an awn arising from the sinus; awn 1–2 cm, indistinct 2-geniculate; upper palea absent; stamen 3; anthers 2.5–3 mm. Pedicellate spikelet similar to sessile spikelet.

Locality: Kwun Tong. *HK sheet 15177.*

Distribution: Hainan, Sichuan, Yunnan; Vietnam, Thailand, S India, Sri Lanka.

Ecology: Grassy hillsides. Flowering & fruiting: Aug.–Nov.

3. Eulalia quadrinervis (Hack.) Kuntze 四脈金茅 **(Fig. 137)**

Revis. Gen. Pl. 2: 775. 1891; FFJ 6: 245, fig. 214. 1995; FRPS 10(2): 89, pl. 19: 1–8. 1997; FTW ed. 2, 5: 546. 2000; FOC 22: 587. 2006; FGD 9: 464. 2009.

Pollinia quadrinervis Hack., Monogr. Phan. 6: 158. 1889.

Perennial herb. Culms erect, 80–120 cm tall, glabrous or puberulous at nodes. Leaf sheaths glabrous, rarely thinly appressed pilose between veins, the lower longer and the upper shorter than internodes; leaf blades linear, 10–40 × 0.4–0.6 cm, glabrous to tuberculate-villous, abaxial surface glaucous, apex acuminate-filiform, terminal usually absent; ligule 1–1.5 mm, truncate. Racemes 2–7, subdigitate, brown yellow; rachis internodes and pedicels 1/2–2/3 spikelet length, silky villous. Sessile spikelet golden brown, oblong-lanceolate; callus hairs 1/6–1/3 spikelet length; lower glume narrowly elliptic, back slightly concave and villous below middle, 2–4 green veins between keels, connected by veinlets below apex and between lateral veins, upper keels shortly pectinate-ciliate, apex membranous, subacute; upper glume boat-shaped, membranous, glabrous, scabrous along keel, apex acute; lower floret usually 1 lemma, oblong-lanceolate, as long as or shorter than glume; upper lemma ovate-oblong, 2-lobed in upper 1/3, with an geniculate awn arising from the sinus; awn 1.2–2 cm; palea oblong-lanceolate; stamens 3. Pedicellate spikelet similar to sessile spikelet, pedicel as long as or slightly shorter than rachis internode.

Locality: Common in Hong Kong. *L. T. Lo 311, 564; Y. S. Lau 3011.*

Distribution: Guangdong, Guangxi, Yunnan, Sichuan, Henan, Anhui, Zhejiang, Fujian, Taiwan; Bhutan, Nepal, N India, Myanmar, Thailand, Vietnam, Japan, Korea, Philippines.

Ecology: Hillslopes, open grassy fields. Flowering & fruiting: Sep.–Nov.

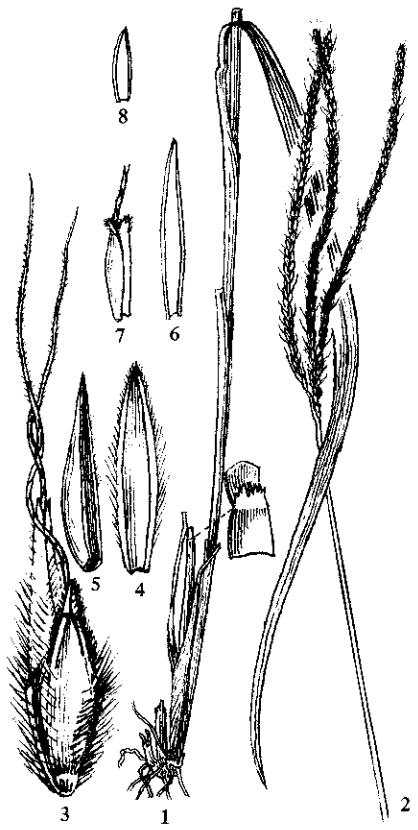

Figure 137. *Eulalia quadrinervis* (Hack.) Kuntze

1. plant; *2.* inflorescence; *3.* portion of raceme showing 2 spikelets per node; *4.* adaxial view of lower glume; *5.* lateral view of upper glume; *6.* lower lemma; *7.* upper lemma; *8.* upper palea. (drawn by H. P. Yu)

54. Chrysopogon Trin. 金鬚茅屬

Perennial or annual herbs. Culms erect or ascending. Leaf blades usually narrow; ligule a short ciliolate rim or a line of hairs. Inflorescence a lax terminal panicle; primary branches whorled, filiform, usually unbranched, each bearing a raceme; racemes usually a triad of 1 sessile bisexual spikelet flanked by 2 pedicellate staminate or barren spikelets, falling off together at maturity, rarely with another pair of spikelets below the triad; rachis internodes and pedicels slender. Sessile spikelet laterally compressed; callus slightly thicken and oblique, 2-floret; lower glume cartilaginous to subleathery, often spinulose; upper glume boat-shaped, usually shortly awned; lower floret reduced to an empty hyaline lemma; upper lemma linear, entire or 2-toothed, awned usually from apex; lodicules 2; stamens 3. Pedicellate spikelet dorsally compressed, well developed or reduced, staminate or barren. Caryopsis linear.

About 44 species distributed in tropical and subtropical regions of the Old World; four species in China; one species in Hong Kong.

1. Chrysopogon aciculatus (Retz.) Trin. 竹節草 **(Fig. 138; Photo 386)**

Fund. Agrost. 188. 1820; FHK 424. 1861; FKH 324. 1912; FHN 4: 472, fig. 1259. 1977; FFJ 6: 265, fig. 236. 1995; FRPS 10(2): 135, pl. 32: 1–7. 1997; FTW ed. 2, 5: 534, pl. 226. 2000; FOC 22: 604. 2006; FGD 9: 491, fig. 259. 2009.

Andropogon aciculatus Retz., Observ. Bot. 5: 22. 1789.

Perennial rhizomatous and stoloniferous herb. Culms erect or prostrate at the base, 20–50 cm tall. Leaf sheaths glabrous or ciliate

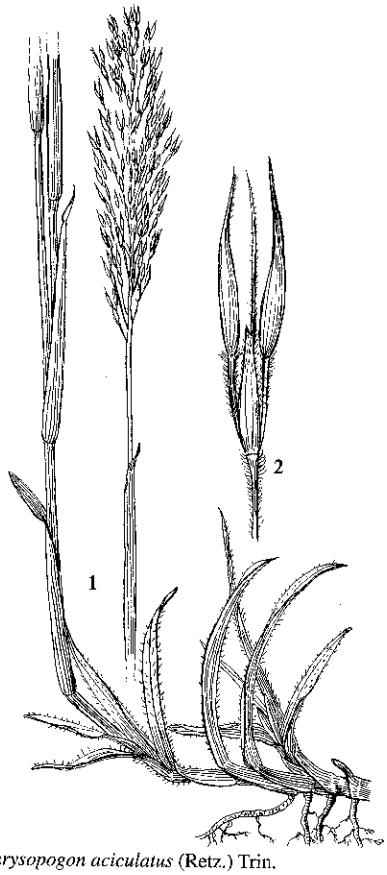

Figure 138. *Chrysopogon aciculatus* (Retz.) Trin.

1. portion of plant; *2.* portion of inflorescence showing 1 sessile and 2 pedicelled spikelets. (drawn by X. L. Chen)

at mouth; leaf blades linear-lanceolate, 2–5 × 0.3–0.5 cm, glabrous or adaxial surface pilose near base, apex obtuse, margins serrate; ligule short, 0.1–0.3 mm. Panicle terminal, purplish brown, oblong or linear-oblong; branches erect when dry, slender, usually whorled, each bearing one sessile and perfect, two pedicellate and sterile spikelet. Sessile spikelet cylindrical-lanceolate; callus acicular, 4–6 mm, bearded with golden hairs, obliquely attached to branch apex; glumes leathery; lower glume lanceolate, 2-keeled upward, keels hispidulous, apex acute to 2-toothed; upper glume boat-shaped, setulose on back and upper keel, acuminate or mucronate, mucro 1–2 mm; lower lemma linear-oblong, slightly shorter than glume; upper lemma entire, awned; awn straight, 4–7 mm. Pedicellate spikelet staminate, 3/4 length of sessile spikelet.

Locality: Common in Hong Kong. *Y. S. Lau 1854; S. P. Lau 4; HK sheet 40715.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Fujian, Taiwan; Indian Subcontinent, Indochina, Malay Peninsula, Indonesia, Philippines, Pacific islands, Australia.

Ecology: Open grassy fields, wastelands. Flowering & fruiting: Jun.–Oct.

55. Sorghum Moench 高粱屬

Perennial or annual herbs. Culms usually stout, erect. Leaf blades linear to linear-lanceolate; ligule a ciliate membrane. Inflorescence a large terminal panicle with elongate central axis; primary branches simple or branched, bearing short dense racemes of paired spikelets (one sessile, other short pedicellate, the uppermost pair forming a triad with a terminal spikelet, one sessile, two pedicellate); rachis internodes and pedicels linear, slender, ciliate. Sessile spikelet dorsally compressed; callus obtuse, bearded, inserted into internode apex; lower glume usually leathery, abaxial flat or convex, 2-keeled and winged upward; upper glume boat-shaped, keeled upward; lower floret reduced to an empty hyaline lemma; upper lemma oblong or oblong-lanceolate, entire and muticous or 2-lobed, awned from sinus or infrequently awnless; awn bigeniculate, glabrous; lodicules ciliate. Pedicellate spikelet well developed or reduced to a glume, usually much narrower than sessile spikelet, awnless.

About 30 species distributed worldwide in tropics and subtropics, temperate zones; five species in China and Hong Kong.

1a. Nodes of culms conspicuously bearded; panicle branches simple ..... 1. *S. nitidum*

1b. Nodes of culms glabrous or shortly pubescent; panicle branches subdivided.

2a. Plants with rhizomes; wild.

3a. Culms slender, 0.5–1.5 m tall; sessile spikelet elliptic; lower glume apex clearly 3-denticulate ..... 2. *S. halepense*

3b. Culms robust, 1.5–3 m tall; sessile spikelet ovate; lower glume apex apiculate or obscurely denticulate ..... 3. *S. propinquum*

2b. Plants without rhizomes; usually cultivated.

4a. Racemes usually tardily fragile at maturity; sessile spikelets elliptic; grain enclosed by the glumes ..... 4. *S. sudanense*

4b. Racemes tough at maturity; sessile spikelets ovate to subrotund; grain large, exposed between the gaping glumes ..... 5. *S. bicolor*

1. Sorghum nitidum (Vahl) Pers. 光高粱

Syn. Pl. 1: 101. 1805; FHN 4: 469. 1977; FFJ 6: 262, fig. 232. 1995; FRPS 10(2): 118, pl. 30: 8. 1997; FTW ed. 2, 5: 579, pl. 244. 2000; FOC 22: 600. 2006; FGD 9: 488, fig. 258. 2009.

Holcus nitidus Vahl, Symb. Bot. 2: 102. 1791.

Andropogon tropicus Spreng, Syst. Veg. 1: 287. 1825; FHK 423. 1861.

Sorghum fulvum (R. Br.) P. Beauv., Ess. Agrostogr. 164. 1812; FKH 324. 1912.

Perennial herb. Culms erect, 0.6–2 m tall; nodes bearded with pale spreading hairs. Leaf sheaths clasping, glabrous or pilose; leaf blades linear, 10–40(–50) × 0.4–1 cm, glabrous to hispid, dorsally convex; ligule obtuse, 1–1.5 mm. Panicle loose, glabrous but with soft hairs at the nodes; primary branches whorled, simple, flexuous, lower part bare; racemes borne at branch ends, fragile, composed of 2–4 spikelet pairs; internodes and pedicels brown-ciliate. Sessile spikelet ovate-lanceolate, brown bearded, callus obtuse; lower glume leathery, glossy, upper part and margins hispid with brown hairs; upper glume lightly boat-shaped; lower lemma slightly shorter than glume, thicken membranous, subchartaceous, margins inrolled, ciliate; upper lemma hyaline membranous; awn 1–1.7 cm, or awnless; lodicules 2, glabrous; style free, penicillate, brown. Caryopsis oblong. Pedicellate spikelet usually staminate, elliptic.

Locality: Hong Kong Island, New Territories. *Y. S. Lau 3006; HK sheet 15749, 38095.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; Indian Subcontinent, SE Asia, Indonesia, Philippines, Pacific islands, NE Australia.

Ecology: Grassy hillsides.

2. Sorghum halepense (L.) Pers. 石茅（亞刺伯高粱）

Syn. Pl. 1: 101. 1805; FKH 324. 1912; FHN 4: 469, fig. 1257. 1977; FFJ 6: 262. 1995; FRPS 10(2): 119, pl. 28. 1997; FTW ed. 2, 5: 579. 2000; FOC 22: 601. 2006; FGD 9: 489. 2009.

Holcus halepensis L., Sp. Pl. 2: 1047. 1753.

Perennial herb. Culms erect, 0.5–3 m tall. Leaf sheaths glabrous, or puberulous at base nodes; leaf blades linear or linear-lanceolate, 20–90 × 0.5–4 cm, glabrous, margins scabrous, midvein white, conspicuous; ligule membranous. Panicle lanceolate to pyramidal in outline, with soft white hairs in basal axil; primary branches solitary or whorled, spreading, lower part bare, upper part branched, the

secondary branches tipped by racemes; racemes fragile, composed of 2–5 spikelet pairs. Sessile spikelet elliptic or ovate-elliptic; callus obtuse, bearded; lower glume subleathery, veins distinct in upper part, keel winged, apex 3-denticulate; upper glume slightly boat-shaped, keeled in upper part; lower lemma lanceolate or oblong-lanceolate, hyaline membranous; upper lemma oblong, acute and mucronate or 2-lobed and awned; awn 1–1.6 cm; lodicules 2, broad obovate, emarginate; stamens 3; styles 2, base connate. Pedicellate spikelet staminate, narrowly lanceolate.

Locality: Ma Liu Shui, Tai Po. *P. P. H. But 73; Y. S. Lau 1978, 3111.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Anhui, Fujian, Taiwan; N Africa, Caucasus, C and W Asia, Indian Subcontinent, naturalized in warm temperate regions, exact native range obscure.

Ecology: Streams, valleys, wastelands, a weed in fields. Flowering & fruiting: Summer to autumn.

Uses: Animal food (forage).

3. Sorghum propinquum (Kunth) Hitchc. 擬高粱

Lingnan Sci. J. 7: 249. 1931 ["1929"] ; FFJ 6: 262. 1995; FRPS 10(2): 121, pl. 29. 1997; FTW ed. 2, 5: 579. 2000; FOC 22: 601. 2006; FGD 9: 490. 2009 ["*propinqum*"].

Andropogon propinquus Kunth, Enum. Pl. 1: 502. 1833.

Perennial herb, rhizomatous. Culms erect, 1–3 m tall, many-noded; nodes puberulous. Leaf sheaths glabrous, ciliate at mouth and margins; leaf blades linear or linear-lanceolate, 40–90 × 3–5 cm, glabrous, midvein robust, margins scabrous; ligule 0.5–1 mm, puberulous. Panicle open, ovate or broadly ovate; primary branches in whorls of 3–6; lower part bare, upper part branched, branches tipped by racemes; racemes fragile, composed of 3–7 spikelet pairs. Sessile spikelet elliptic or elliptic-lanceolate; callus obtuse, pubescent with pale hairs; lower glume subleathery, upper keeled, apex sharply acute, entire or tridenticulate; upper glume lanceolate, upper keeled, pilose; lower lemma lanceolate, hyaline membranous, ciliate; upper lemma broad oblong, acute or emarginate, awnless, rarely with short awn; palea very short; styles 2, free or base connate; stigma penicillate. Pedicellate spikelet staminate, linear-lanceolate, narrower than sessile spikelet, glabrous.

Locality: So Kon Po (cultivated). *HK sheet 8613.*

Distribution: Hainan, Guangdong, Yunnan, Sichuan, Fujian, Taiwan; S India, Sri Lanka, Malay Peninsula, Indonesia, Philippines.

Ecology: Flowering & fruiting: Summer to autumn.

4. Sorghum sudanense (Piper) Stapf 蘇丹草

Fl. Trop. Afr. 9: 113. 1917; FFJ 6: 263, fig. 234. 1995; FRPS 10(2): 124. 1997; FOC 22: 601. 2006; FGD 9: 490. 2009.

Andropogon sorghum (L.) Brot. subsp. *sudanensis* Piper, Proc. Biol. Soc. Washington 28(4): 33. 1915.

Annual herb. Culms erect, 1–3 m tall, nodes pubescent. Leaf sheaths longer than internodes at the base, the upper shorter than internodes, glabrous or pilose at mouth and base; leaf blades linear or linear-lanceolate; 15–40 × 1–5 cm, glabrous, abaxially convex, margins scabrous, midvein white; ligule hard membranous, apex ciliate. Panicle narrow ovate to pyramid, branches slender, subverticillate, obliquely spreading; racemes usually tardily fragile at maturity, composed of 2–5 spikelet pairs. Sessile spikelet elliptic or oblong-lanceolate; callus obtuse, pubescent; lower glume ovate, margins inrolled above the middle, keeled near apex, margins ciliate; upper glume boat-shaped, inrolled, margins membranous; lower lemma elliptic-lanceolate, hyaline membranous, glabrous or margins ciliate; upper lemma ovate or ovate-elliptic, apex 2-lobed, awned; awn 10–16 mm, geniculate; stamen 3; style 2. Caryopsis elliptic or obovate-elliptic. Pedicellate spikelet staminate or barren, linear-lanceolate, persistent.

Locality: So Kon Po (cultivated). *HK sheet 15804.*

Distribution: Hainan, Guangdong, Guizhou, Heilongjiang, Henan, Nei Mongol, Ningxia, Xinjiang, Shaanxi, Hebei, Henan, Anhui, Zhejiang, Fujian (cultivated or naturalized); native to Africa, now widely cultivated for forage.

Ecology: Flowering & fruiting: Jul.–Sep.

Uses: Animal food (forage).

5. Sorghum bicolor (L.) Moench 高粱 **(Photo 387)**

Methodus 207. 1794; FRPS 10(2): 128, pl. 30: 5–7, 75: 4. 1997; FTW ed. 2, 5: 578. 2000; FYN 9: 648, pl. 108: 5–7. 2003; FOC 22: 601. 2006; FGD 9: 490. 2009.

Holcus bicolor L., Mant. Alt. 301. 1771.

Sorghum vulgare (L.) Pers., Syn. Pl. 1: 101. 1805; FKH 324. 1912; FHN 4: 470. 1977; FFJ 6: 263, fig. 233. 1995.

Annual stout herb; culms solid, erect, 2–4 m tall. Leaf sheath usually shorter than internodes, glabrous; ligule ca. 12 mm, hard membranous, apex rounded; leaf blades linear-lanceolate or narrow lanceolate, 30–60 × 2–7 cm, glabrous, apex acuminate, margins scabrous. Panicle dense, 15–30 cm; branches subverticillate, base densely white pilose; rachis internode short, not fragile. Spikelets paired, dimorphic, sessile spikelets ca. 5 mm, ovate; glumes dark brown when mature, coriaceous, midsection glabrous, shiny, upper portion and callus hispid; lower glume ca. 5–6 mm, margins inrolled; upper glume ± boat-shaped, rounded; lower lemma long elliptic, membranous, margins inrolled, ciliate; upper lemma subtriangular, membranous, ciliate; awn geniculate ca. 10 mm; palea linear. Pedicellate spikelets short, staminate.

Locality: Cultivated. *P. P. H. But 124; L. T. Lo 179, 378.*

Distribution: Cultivated throughout tropical, subtropical and warm temperate regions.

Uses: Food (beverage base, cereal, sugar), animal food (fodder, forage).

56. Capillipedium Stapf 細柄草屬

Perennial or annual herbs. Culms erect or ascending from the decumbent base. Leaf blades linear; ligule membranous, margin ciliate. Inflorescence a terminal open panicle with elongate central axis, rachis internodes and pedicel slender, margins thickened; racemes of 1–5(–8) spikelet pairs, often reduced to triads. Sessile spikelet dorsally compressed; callus very short, obtuse, shortly bearded, falling off with pedicellate spikelet from the joint of rachis; lower glume herbaceous and cartilaginous, apex acute to obtuse, margins narrowly incurved and 2-keeled; upper glume boat-shaped, abaxially keeled; lower floret reduced to a small empty hyaline lemma; upper lemma stipitiform, entire, awned from apex; awn geniculate, glabrous or puberulous; lodicules 2; stamens 3 or absent; styles 2. Pedicellate spikelet similar to the sessile or smaller, herbaceous.

About 14 species distributed in tropics and subtropics in the Old World; five species in China; two species in Hong Kong.

1a. Leaf blades linear-lanceolate; pedicellate spikelet up to twice length of sessile spikelet; lower glume of sessile spikelet flat ..... 1. *C. assimile*

1b. Leaf blades linear; pedicellate spikelet equal to or slightly shorter than sessile spikelet; lower glume of sessile spikelet shallowly concave between veins ..... 2. *C. parviflorum*

1. Capillipedium assimile (Steud.) A. Camus 硬稈子草(竹枝細柄草)

Fl. Indo-Chine. 7: 314. 1922; FFJ 6: 268, fig. 240. 1995; FRPS 10(2): 152, pl. 36: 1–6, 77: 1. 1997; FTW ed. 2, 5: 530. 2000; FOC 22: 606. 2006; FGD 9: 495. 2009.

Andropogon montanus Roxb., Fl. Ind., ed. 1820, 1: 271. 1820; FHK 423. 1861.

Andropogon assimilis Steud., Syn. Pl. Glumac. 1: 397. 1854; FKH 323. 1912.

Perennial herb. Culms hard, 1.5–3.5 m tall, geniculate at base. Leaf sheaths glabrous, bearded at mouth; leaf blades linear-lanceolate, 4–15 × 0.2–0.6 cm, glabrous or hispidulous, base tapering, apex setaceously acuminate, margins scabrous; ligule 0.5–1 mm, dry membranous, truncate or obtuse. Panicle open, branches fascicles; branches pilose in axils; rachis internodes and pedicels long-ciliate, fragile. Sessile spikelet oblong, dorsally compressed, callus bearded; lower glume obtuse, scabrous or hispidulous, 2-keeled, ciliate-hispid on keel, 2–5-veined; upper glume as long as lower glume, 3-veined; lower lemma oblong, 2/3 upper lemma length, obtuse; upper lemma linear, an awn of 0.6–1.5 cm long arising from the apex. Pedicellate spikelet staminate, linear-lanceolate, up to twice length of sessile spikelet.

Locality: Victoria Peak, Shing Mun. *Y. S. Lau 2283; HK sheet 41992.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Henan, Hubei, Hunan, Jiangxi, Shandong, Zhejiang, Fujian, Taiwan; Japan, Indian Subcontinent, Indochina, Malay Peninsula, Indonesia.

Ecology: Forests, streamsides. Flowering & fruiting: Aug.–Dec.

2. Capillipedium parviflorum (R. Br.) Stapf
細柄草(吊絲草) **(Fig. 139)**

Fl. Trop. Afr. 9: 169. 1917; FHN 4: 475, fig. 1261. 1977; FFJ 6: 269, fig. 241. 1995; FRPS 10(2): 151, pl. 36: 7–11, 76: 4. 1997; FTW ed. 2, 5: 531, pl. 225. 2000; FOC 22: 606. 2006; FGD 9: 495, fig. 261. 2009.

Holcus parviflorus R. Br., Prodr. 199. 1810.

Perennial herb. Culms tufted, erect or slightly decumbent at base, 30–150 cm tall; nodes shortly bearded. Leaf sheaths shorter or longer than internode, glabrous or pilose, ciliate at mouth; leaf blades linear, 10–30 × 0.2–0.8 cm, glabrous or hispid, base rounded, apex acuminate; ligule dry membranous, 0.5–1.5 mm. Panicle oblong; branches fasciculate, pilose in axils; racemes usually composed of triads, occasionally with 1–2 additional spikelet pairs; rachis internodes and pedicels 1/2 the length of sessile spikelet, shortly ciliate at base. Sessile spikelet bisexual, oblong, 3–4 mm; lower glume shallowly concave between veins, 4-veined, margins keeled, hispidulous above middle keel, apex narrowly obtuse; upper glume boat-shaped, as long as lower glume, slightly scabrous on keel, acute, 3-veined, upper margins ciliate; lower lemma 1/4–1/3 glume length, obtuse or dentate; upper lemma linear, tipped with an awn of 1–1.5 cm. Pedicellate spikelet

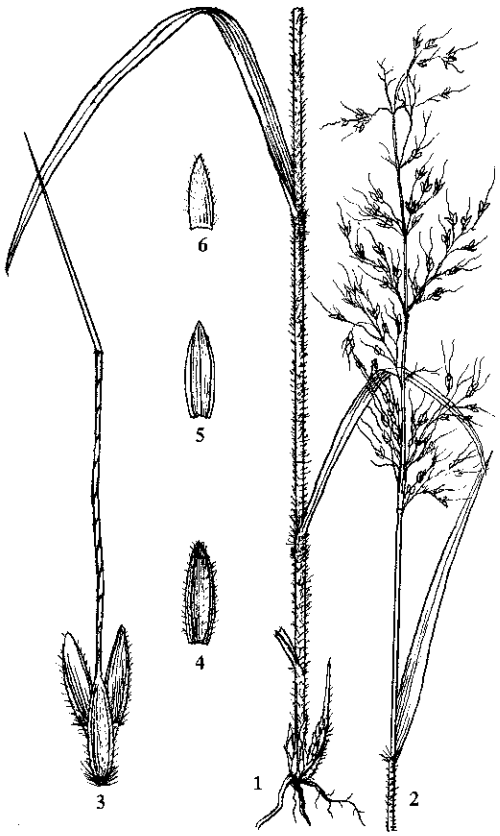

Figure 139. *Capillipedium parviflorum* (R. Br.) Stapf

1. lower portion of plant; *2.* portion of inflorescence showing sessile spikelet and pedicellate spikelets; *3.* spikelet triad with 1 sessile and 2 pedicellate spikelets; *4.* lower glume of sessile spikelet; *5.* upper glume of sessile spikelet; *6.* lower lemma of sessile spikelet. (drawn by H. P. Yu)

equal to the sessile spikelet and often staminate, or smaller and barren.

Locality: Common in Hong Kong. *Y. S. Lau 1866; P. S. Choi 107; Y. W. Lam 2171.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Shaanxi, Hebei, Henan, Hubei, Anhui, Shandong, Zhejiang, Fujain, Taiwan; tropical and subtropical regions of the Old World.

Ecology: Grassy field on hillslopes, streamsides. Flowering & fruiting: Aug.–Dec.

Uses: Animal food (forage).

57. **Bothriochloa** Kuntze 孔穎草屬

Perennial herbs. Culms solid, tufted. Leaf sheath keeled or rounded on back, with tubercle-based hairs, especially on nodes and often at the mouth; leaf blades linear or lanceolate; ligule short, membranous, margin ciliolate. Inflorescence composed of spike-like racemes, central axis branched, racemes digitately or racemosely arranged, or combined into panicles, more than 8 spikelet pairs; rachis internodes and pedicels slender with a median translucent stripe between thickened margins. Spikelets paired, one sessile, the other pedicellate, dorsally compressed. Sessile spikelet horizontally falling together with adjacent rachis joint and pedicel; callus short, obtuse, bearded; lower glume as long as spikelet, smooth or with 1 or more depressions and/or pits, 7–11-veined, margins inrolled and keeled; upper glume boat-shaped, acute, 3-veined; lower floret reduced to an empty hyaline lemma; upper lemma stipitiform, entire, awned from apex; awn geniculate, glabrous; lodicules 2; stamens 3. Pedicellate spikelet similar to the sessile or smaller, awnless, staminate or neuter; lower lemma and palea absent.

About 30 species distributed throughout the tropics and subtropics; three species in China and Hong Kong.

1a. Inflorescence with an elongate central axis ..... 1. *B. bladhii*

1b. Inflorescence subdigitate.

2a. Lower glume of sessile spikelet without a circular pit ..... 2. *B. ischaemum*

2b. Lower glume of sessile spikelet with a circular pit ..... 3. *B. pertusa*

1. **Bothriochloa bladhii** (Retz.) S. T. Blake 臭根子草

Proc. Roy. Soc. Queensland. 80: 62. 1969; FRPS 10(2): 148. 1997; FYN 9: 663, pl. 110: 4–6. 2003; FOC 22: 607. 2006; FGD 9: 494. 2009.

Andropogon bladhii Retz., Observ. Bot. 2: 27. 1761.

Andropogon intermedius R. Br., Prodr. 1: 202. 1810; FKH 323. 1912.

Andropogon vachellii Nees, Bot. Beechey Voy. 243. 1838; FHK 423. 1861.

Bothriochloa intermedia (R. Br.) A. Camus, Ann. Soc. Linn. Lyon, sér. 2, 76(1930): 164. 1931; FFJ 6: 267, fig. 239. 1995; FTW ed. 2, 5: 527. 2000.

Bothriochloa glabra (Roxb.) A. Camus, Ann. Soc. Linn. Lyon, sér. 2, 76: 164. 1931; FHN 4: 476, fig. 1262. 1977; FRPS 10(2): 149. 1997; FTW ed. 2, 5: 527, pl. 222. 2000.

Perennial herb. Culms erect or decumbent at base, 60–90(–150) cm tall. Leaf sheaths glabrous, the upper shorter and the lower longer than internodes; leaf blades linear, 10–30 × 0.2–1 cm, glabrous or with tubercle-based hairs on both surfaces; ligule membranous, 0.5–2 mm, truncate. Inflorescence composed of many racemes borne in loose whorls along an elongate central axis; rachis internodes and pedicels thinly ciliate. Sessile spikelet bisexual, oblong-lanceolate, callus white bearded; lower glume narrowly oblong-lanceolate, dorsally compressed, glabrous or pubescent below middle, abaxially slightly concave, margins inrolled to 2-keeled, ciliate on keel, 5–7-veined; upper glume boat-shaped, margins membranous and the upper ciliate, acute; lower lemma ovate or oblong-lanceolate, seldom margins and apex sparsely ciliate, acute; upper lemma absent, linear, a geniculate awn arising from the apex, awn 10–16 mm. Pedicellate spikelet barren or rarely staminate, narrower than sessile spikelet.

Locality: Common in Hong Kong. *L. T. Lo 120, 589; Y. S. Lau 2250.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Shaanxi, Xinjiang, Hubei, Hunan, Anhui, Fujian, Taiwan; Indian Subcontinent, Indochina, Malay Peninsula, Indonesia, SW Asia, Australia.

Ecology: Open grassy hillslopes, wastelands. Flowering & fruiting: Jul.–Oct.

2. **Bothriochloa ischaemum** (L.) Keng 白羊草

Contr. Biol. Lab. Chin. Assoc. Advancem. Sci., Sect. Bot. 10: 201. 1936; FHN 4: 476. 1977; FFJ 6: 266, fig. 238. 1995; FRPS 10(2): 144. 1997; FTW ed. 2, 5: 527, pl. 223. 2000; FOC 22: 608. 2006; FGD 9: 493. 2009.

Andropogon ischaemum L., Sp. Pl. 2: 1047. 1753; FKH 323. 1912.

Perennial herb. Culms tufted, erect or geniculately ascending, 30–70 cm tall. Leaf sheaths glabrous, congested at plant base; leaf blades linear, 3–18 × 0.2–0.3 cm, usually sparingly hairy with tubercle-based hairs, the lower glabrous, base rounded, apex acuminate; ligule ca. 1 mm, membranous, obtuse or rounded, ciliate. Inflorescence composed of 4–15 racemes, subdigitate; rachis internodes and pedicels ciliate with long white or pinkish silky hairs. Sessile spikelet oblong-lanceolate, callus bearded; lower glume usually cartilaginous, sometimes herbaceous, silky-pilose below 1/3 length, apex obtuse and membranous, margins inrolled, 5–7-veined; upper glume boat-shaped, keel scabrous, ciliate above the middle, margins submembranous; lower lemma oblong-lanceolate, apex acute, upper margins sparsely ciliate; upper lemma reduced to linear, with a geniculate awn arising from the apex; stamens 3. Pedicellate spikelet staminate or barren, subequal to sessile spikelet, glabrous.

Locality: Common in Hong Kong. *S. C. Ng 2023.*

Distribution: Hainan, Guangdong, Guizhou, Yunnan, Xizang, Sichuan, Shaanxi, Qinghai, Xinjiang, Ningxia, Nei Mongol, Hebei, Henan, Hubei, Hunan, Shandong, Anhui, Zhejiang, Fujian, Taiwan; C and SW Asia, Europe, N Africa, naturalized elsewhere.

Ecology: Grassy hillslopes, roadsides, disturbed places. Flowering & fruiting: Autumn.

Uses: Animal food (forage), environmental (erosion control).

3. Bothriochloa pertusa (L.) A. Camus 孔穎草 **(Fig. 140)**

Ann. Soc. Linn. Lyon, N. S. 76: 164. 1931 ["1930"]; H. B. Gill. et al, Fl. Malaya 3: 281. 1971; FRPS 10(2): 145, pl. 35: 1–6, 77: 2. 1997; FYN 9: 666, pl. 110: 9–10. 2003; FOC 22: 608. 2006; FGD 9: 493, fig. 260. 2009.

Holcus pertusus L., Mant. Pl. 2: 301. 1771.

Perennial herb. Culms erect or geniculately ascending, up to 100 cm tall, 5- or more-noded, nodes bearded. Leaf sheaths glabrous, keeled; leaf blades linear, 5–20 × 0.1–0.4 cm, tubercle-based hairs on both surfaces or abaxial surface glabrous, apex acute, margins scabrous; ligule 0.5–2 mm, dry membranous. Inflorescence composed of 3–8(–13) racemes, subdigitate; rachis internodes and pedicels ciliate with long silky hairs. Sessile spikelet lanceolate, callus bearded; lower glume papery, a circular pit in the upper 1/3, glabrous sparsely hirtellous to silky-pilose below middle, margins incurved and 2-keeled, scabrous on the keel, 5–7-veined; upper glume boat-shaped, acute; lower lemma oblong, glabrous; upper lemma linear, a geniculate awn arising from the apex, awn 1–2 cm long. Pedicellate spikelet staminate or barren, purplish, subequal to sessile spikelet, glabrous.

Locality: Quarry Bay. *HK sheet 15532.*

Distribution: Guangdong, Sichuan, Yunnan; Indian Subcontinent, Indochina, Malesia, naturalized elsewhere in tropics.

Ecology: Grassy hills, disturbed grounds, alt. 1200–1500 m. Flowering & fruiting: Jul.–Oct.

Uses: Animal food (forage), environmental (erosion control).

Figure 140. *Bothriochloa pertusa* (L.) A. Camus

1. plant; *2.* rachis internode showing pedicellate spikelet and sessile spikelet; *3.* abaxial and adaxial views of lower glume; *4.* abaxial and adaxial views of upper glume; *5.* abaxial and adaxial views of lower lemma. (drawn by H. P. Yu)

58. Apocopis Nees 楔穎草屬

Annual or perennial herbs. Leaf sheaths cylindrical, usually covered with tuberculate hairs on adaxial surface, shorter than internode; leaf blades linear or linear-lanceolate, flat, usually covered with tuberculate hairs, terminal leaf usually absent; ligule short, membranous. Inflorescence terminal, composed of (1–)2(–4) erect, closely appressed racemes; spikelets imbricate in one side, pedicellate spikelets completely absent or reduced to stipe-like, rarely a pistillate spikelet with geniculate awn. Sessile spikelet dorsally compressed, usually bisexual, falling off with internode at maturity; florets 2; lower glume broad, flattened, apex broadly truncate or emarginate, 7(–9)-veined; upper glume boat-shaped, midvein keeled; lower floret staminate; upper floret usually pistillate, seldom bisexual, rarely neuter; upper lemma linear-lanceolate, entire or 2-toothed, awnless or with geniculate puberulous awn, palea shorter and broader, membranous; lodicules absent; stamens 2. Caryopsis cylindrical.

About 15 species distributed in tropical Asia; four species in China; two species in Hong Kong.

1a. Sessile spikelet 3.5–6 mm, upper floret bisexual; pedicellate spikelet absent or rudimentary ..... 1. *A. wrightii*

1b. Sessile spikelet 6–9 mm, upper floret staminate or barren; pedicellate spikelet present, awned ..... 2. *A. intermedius*

1. Apocopis wrightii Munro 瑞氏楔穎草 **(Fig. 141)**

Proc. Amer. Acad. Arts. 4: 363. 1860; FHK 421. 1861; FKH 320. 1912; FRPS 10(2): 111. 1997; FOC 22: 599. 2006; FGD 9: 471. 2009.

Perennial herb. Culms tufted, 30–60 cm tall, branching above base, 6–7-noded. Leaf sheaths glabrous or pilose; leaf blades linear, 8–12 × 0.2–0.6 cm, tuberculate-pilose, rarely glabrous, apex acuminate; ligule ca. 1 mm. Racemes 2–5 cm, lowermost spikelets barren, awnless; rachis internodes 1.5–2 mm, yellowish brown ciliate; pedicel yellowish brown bearded. Sessile spikelet 3.5–6 mm; callus yellowish brown bearded; lower glume obovate-oblong, firmly herbaceous, glabrous or thinly hispid, greenish yellow with a scarious red-brown band across apex, veins green, straight, terminating below apex, connected there by transverse veinlets, apex truncate, ciliate; lower florets exserted from the apex, lemma oblong-lanceolate; upper floret bisexual, lemma apex 2-denticulate or subentire, awned; awn geniculate, 2–3 cm. Pedicellate spikelet absent or rudimentary.

Locality: Tai Mo Shan, High Island, Wang Shan Keuk. *S. Y. Hu 7769, 8501, 10881* (CUHK).

Distribution: Guangdong, Guangxi, Yunnan, Jiangxi, Anhui, Zhejiang, Fujian; Thailand.

Ecology: Open grassy hillsides. Flowering & fruiting: Aug.–Oct.

2. Apocopis intermedius (A. Camus) Chai-Anan 異穗楔穎草 Thai Forest Bull. Bot. 6: 46. 1972; FOC 22: 599. 2006; FGD 9: 472. 2009.

Lophopogon intermedium A. Camus, Bull. Mus. Natl. Hist. Nat. 25: 285. 1919.

Apocopis heterogamus Keng & S. L. Chen, FRPS 10(2): 112, pl. 26: 1–3. 1997; FYN 9: 644. 2003.

Apocopis wrightii Munro var. *macranthus* S. L. Chen, FRPS 10(2): 112. 1997; Check List HK Plants 322. 2002; 113. 2004.

Perennial herb. Culms erect, ca. 40–60 cm tall. Leaf sheaths glabrous to hirsute; leaf blades linear-lanceolate, 6–15 × 0.3–0.5 cm, tuberculate-pilose when young, or sometimes densely hispid; ligule ca. 1.5 mm. Racemes 2, 2–4 cm, lowermost spikelets barren, awnless; rachis internodes 2.5–3 mm, loosely ciliate with yellowish brown soft hairs. Sessile spikelet 6–9 mm; callus hairs yellowish brown; lower glume oblong, firmly herbaceous, glabrous or hispid, greenish yellow with a scarious brown or red band across apex, veins green, straight, connected there by transverse veinlets, terminating below apex, truncate or ciliate; upper glume oblong, as long as lower glume or slightly longer, submembranous, dark red on the upper, emarginate and short ciliate, 3-veined; lower lemma oblong-lanceolate, as long as lower glume or slightly shorter, hyaline membranous, apex ciliate; upper floret staminate or barren, lemma linear-lanceolate, apex entire or 2-toothed, awned or awnless; awn geniculate, 2–3 cm. Pedicellate spikelet developed, ca. 5 mm, awned.

Locality: Sai Wan, Tai Mo Shan. *H. C. Tang 2000; HK sheet 15247.*

Distribution: Guangdong, S Yunnan, Zhejiang; Thailand, N Vietnam.

Ecology: Open grassy fields. Flowering & fruiting: Autumn.

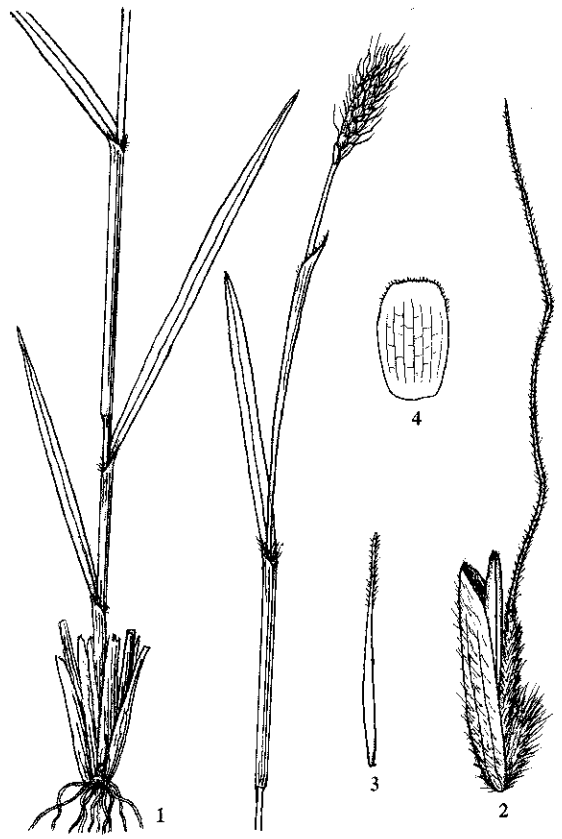

Figure 141. *Apocopis wrightii* Munro

1. plant; *2.* spikelet pair; *3.* upper lemma of sessile spikelet; *4.* lower glume of sessile spikelet (ventral view). (drawn by H. P. Yu)

59. Apluda L. 水蔗草屬

Perennial herbs. Culms erect or subrambling, much branched. Leaf blades linear-lanceolate, base gradually narrowed into a short pseudo-petiole; ligule membranous. Inflorescence a solitary short raceme encircled by a small boat-shaped spatheole, terminal; spatheoles many, crowded into a leafy compound panicle; raceme comprising 1 sessile and 2 pedicellate spikelets; pedicels both broad and flattened. Pedicellate spikelets awnless, unequal, 1 well developed, staminate, as large as sessile spikelet, the other rudimentary. Sessile spikelet laterally compressed, glabrous, 2-floret, lower floret staminate, upper floret bisexual or pistillate; lower glume herbaceous or subleathery toward base, abaxially convex, without keels or wings, 2-toothed; upper glume strongly convex, laterally compressed, membranous with hyaline margins, 1-keeled, awnless; lower lemma ovate-lanceolate, palea narrower; upper lemma deeply 2-lobed and awned from sinus, or entire to emarginate and awnless; awn 4–12 mm.

One species distributed in tropics and subtropics of the Old World; one species in China and Hong Kong.

1. Apluda mutica L. 水蔗草 **(Fig. 142; Photo 388)**

Sp. Pl. 1: 82. 1753; FHK 422. 1861; FKH 325. 1912; FHN 4: 462, fig. 1249. 1977; FFJ 6: 254, fig. 223. 1995; FRPS 10(2): 167, pl. 39: 1–10. 1997; FTW ed. 2, 5: 522, pl. 220. 2000; FOC 22: 614. 2006; FGD 9: 478, fig. 250. 2009.

Figure 142. *Apluda mutica* L.

1. flowering branchlet; *2.* portion of inflorescence. (drawn by H. P. Yu)

Perennial herb. Culms erect or ascending from decumbent base, up to 3 m tall. Leaf sheaths ciliate or not; leaf blades linear-lanceolate, 10–35× 0.3–2 cm, base petiolate, apex acuminate; ligule membranous, 1–2 mm. Spathate panicle up to 50 cm, branches very slender with spaced spathes subtending small clusters of spatheoles. Sessile spikelet 4–6 mm, bisexual; lower glume long ovate, rounded, margins slightly inrolled, obtuse; upper glume boat-shaped, 5–7-veined; lower lemma subequal to lower glume; upper lemma boat-shaped, deeply 2-lobed with 4–12 mm awn, or entire to emarginate and awnless. Pedicellate spikelet reduced to lemma; normal pedicellate spikelet 2-floret, lower glume long ovate, papery to thin-leathery, apex acute or slightly 2-toothed, upper glume as long as or slightly shorter than lower glume; lower floret staminate; upper floret staminate or seldom bisexual and fertile.

Locality: Common in Hong Kong. *Y. S. Lau 1029, 1044; HK sheet 35847.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Hunan, Jiangxi, Zhejiang, Fujian, Taiwan; SW Asia, Indian Subcontinent, Indochina, Malesia, Pacific islands, Australia (Queensland), Indian Ocean islands (Mascarenes), Madagascar.

Ecology: Margins of forests and thickets, sometimes forming large colonies. Flowering & fruiting: Jul.–Dec.

60. Ischaemum L. 鴨嘴草屬

Annual or perennial herbs. Culms erect or geniculate at base, often much branched. Leaf blades linear to lanceolate, sometimes with a pseudo-petiole; ligule membranous. Inflorescence of paired racemes as a solitary cylindrical raceme, or occasionally subdigitate, terminal and axillary, exserted or sometimes supported by a spatheole; spikelets paired, similar or not; rachis internodes and pedicels stoutly linear to thickly clavate, U-shaped or triquetrous in cross section, usually triquetrous or slightly compressed, fragile at maturity. Sessile spikelet dorsally compressed; callus truncate or obtuse, inserted into hollow internode apex; lower glume oblong or lanceolate, papery to leathery, often rugose, apex usually flat; upper glume boat-shaped, awnless or with straight awn from apex; lower floret staminate or neuter, palea developed; upper floret bisexual, lemma usually deeply 2-lobed, awned from sinus, rarely awnless; awn geniculate, glabrous; lodicules 2, obcuneate. Caryopsis oblong. Pedicellate spikelet similar to sessile or much smaller, upper lemma sometimes geniculately awned.

About 70 species spread throughout the tropics but mainly in Asia, especially in India; 12 species in China; five species and one variety in Hong Kong.

1a. Margins of lower glume of sessile spikelet broadly rounded in lower part, narrowly inflexed and keeled above, not coarsely rugose or knobbly.
  2a. Spikelets of a pair both clearly awned ..... 1. *I. ciliare*
  2b. Spikelets of a pair without obvious awns, or only sessile spikelet awned.
    3a. Inflorescence base enclosed in uppermost sheath; plant strongly rhizomatous ..... 2. *I. muticum*
    3b. Inflorescence long exserted from uppermost sheath; plant loosely tufted.
      4a. Lower glume of sessile spikelet obovate, broadly winged; awn present, geniculate, exserted from spikelet ..... 3. *I. aristatum* var. *aristatum*
      4b. Lower glume of sessile spikelet oblanceolate, winged; awn absent or imperfect, included within spikelet ..... 3a. *I. aristatum* var. *glaucum*
1b. Margins of lower glume of sessile spikelet narrowly and evenly inflexed and keeled along entire length, often coarsely rugose or knobbly.
  5a. Annual; lower glume of sessile spikelet coarsely rugose with 4–7 sharp transverse ridges across back ..... 4. *I. rugosum*
  5b. Perennial; lower glume of sessile spikelet with rounded knobs on keels in lower part, sometimes also with 2–4 weak ridges across back ..... 5. *I. barbatum*

1. Ischaemum ciliare Retz. 細毛鴨嘴草 **(Photo 389)**

Observ. Bot. 6: 36. 1791; FKH 322. 1912; FOC 22: 611. 2006; FGD 9: 475, fig. 248. 2009.

Spodiopogon obliquivalvis auct. non Nees: FHK 426. 1861.

Spodiopogon obliquivalvis Nees var. *villosus* Benth., FHK 426. 1861.

Ischaemum indicum auct. non (Houtt.) Merr.: FHN 4: 461. 1977; FFJ 6: 252. 1995; FRPS 10(2): 159. 1997; Check List HK Plants 339. 2002; 119. 2004.

Perennial herb. Culms tufted or creeping and rooting at the base, ascending or erect, 30–60 cm tall. Leaf sheaths sparsely to densely pilose with tubercle-based hairs, mouth haired; leaf blades linear or linear-lanceolate, 5–25 × 0.5–1cm, ± pubescent, base rounded, apex acuminate; ligule 1–2 mm, membranous. Racemes terminal, paired (seldom 3 or 4); rachis internodes and pedicels subequal, oblong, triquetrous, ciliate along angles. Sessile spikelet obovate-oblong, callus ca. 1 mm, pubescent; lower glume leathery with rounded flanks in lower half, upper half flat, papery, sometimes wrinkled, flanks keeled, winged, forming 2 rounded lobes at apex; upper glume boat-shaped, swollen and keeled above middle, keel narrowly winged; lower floret staminate, lemma papery, obscurely veined, apex acuminate; upper floret bisexual, lemma short, apex 2-clefted to the middle, with an awn arising from sinus; awn 1–1.5 cm. Pedicellate spikelet laterally compressed; lower glume with a solitary median winged keel; upper lemma awned.

Locality: Common in Hong Kong. *Y. W. Lam 931, 1261, 1321.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hubei, Hunan, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; Indian Subcontinent, Indochina, Malay Peninsula, Indonesia.

Ecology: Open grassy fields.

2. Ischaemum muticum L. 無芒鴨嘴草

Sp. Pl. 2: 1049. 1753; H. B. Gill. et al., Fl. Malaya 3: 255. 1971; FRPS 10(2): 161, pl. 38: 6. 1997; FTW ed. 2, 5: 560. 2000; FOC 22: 610. 2006.

Perennial herb, rhizomatous. Culms erect, geniculate at base, with a shallow groove along one side, glabrous. Leaf sheaths ciliate along outer margin, inner margin glabrous or sparsely appressed hairy; leaf blades long ovate-lanceolate to linear, lanceolate, tinged reddish brown, 2–10(–18) × 0.3–2 cm, base cordate, very shortly pseudo-petiolate, apex acute; ligule membranous, truncate, 0.2–0.6 mm. Racemes usually paired, appressed back to back, base enclosed by subtending sheath; rachis internodes and pedicels oblong, triquetrous, outer angle narrowly winged, inner angles glabrous or ciliolate. Sessile spikelet lanceolate; lower glume broad lanceolate, herbaceous, glabrous, winged from near base, apex entire; upper glume boat-shaped, thinly leathery, winged on upper keel, 3-veined; lower floret staminate, slightly shorter than glume, lemma and palea hyaline membranous; lodicules cuneate; pistil absent; upper floret bisexual, lemma long ovate, apex 2-toothed, midvein extend to a short and straight awn; upper lemma subentire, mucronate or with ca. 1 mm awnlet. Pedicellate spikelet laterally compressed, otherwise resembling sessile or smaller, awnless.

Locality: Hong Kong. *HK sheet 32263.*

Distribution: Taiwan; Japan (S Ryukyu Islands), India, Indochina, Malesia, Australia (Queensland).

Ecology: Coastal area.

3. Ischaemum aristatum L. 有芒鴨嘴草

Sp. Pl. 2: 1049. 1753; FKH 322. 1912; FHN 4: 460. 1977; FFJ 6: 252, fig. 221. 1995; FRPS 10(2): 163, pl. 38: 10–13. 1997; FTW ed. 2, 5: 557, pl. 235. 2000; FOC 22: 610. 2006; FGD 9: 474. 2009.

Ischaemum barbatum auct. non Retz.: FHK 425. 1861.

Perennial herb. Culms loosely tufted, ascending or branched, 40–90 cm tall, glabrous or bearded. Leaf sheaths glabrous or pilose, shorter than internode except the base, sometimes long-ciliate near mouth; leaf blades linear-lanceolate, 5–25 × 0.4–1 cm, glabrous or thinly pilose, apex acuminate, margins scabrous; ligule membranous, 2–3 mm. Racemes terminal, paired, appressed back to back, long exserted from uppermost sheath; rachis internodes clavate, triquetrous, scabrid or ciliate along outer angle. Sessile spikelet lanceolate; lower glume obtuse or slightly 2-toothed, broader and 2-keeled above, keels narrowly to broadly winged, wing margin scabrous, 5–7-veined; upper glume boat-shaped, as long as lower glume, keeled, margins ciliate, apex acute; lower floret staminate, slightly shorter than glume; lemma papery, acute, obscurely 3-veined; palea membranous, 2-keeled; upper floret bisexual, lemma 2-cleft to the middle, with a geniculate awn from sinus, exserted from spikelet; palea as long as or slightly shorter than lemma; stamens 3; style free. Pedicellate spikelet dorsally compressed, similar to sessile.

Locality: Common in Hong Kong. *S. L. Thrower s.n.; S. Y. Hu & P. P. H. But 20878, 22741* (CUHK).

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Liaoning, Hebei, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; Japan, Korea, Vietnam.

Ecology: Open grassy sandy places. Flowering & fruiting: Jul.–Oct.

3a. Ischaemum aristatum L. var. **glaucum** (Honda) T. Koyama 鴨嘴草 **(Fig. 143)**

J. Jap. Bot. 37: 239. 1962; FFJ 6: 253. 1995; FRPS 10(2): 163. 1997; FOC 22: 611. 2006; FGD 9: 475. 2009.

Ischaemum crassipes (steud.) Thell. var. *glaucum* Honda, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 3: 355. 1930.

Rachis internodes and pedicels scabrid or shortly ciliate on outer angle, inner angles glabrous or shortly ciliate. Sessile spikelet oblanceolate, narrowly to broadly winged, mucronate or shortly awned; awn included within spikelet.

Locality: Common in Hong Kong. *HK sheet 32262.*

Distribution: S Anhui, Hebei, Jiangsu, Liaoning, Shandong, Zhejiang; Japan, Korea, Vietnam.

Ecology: Sandy places, usually near the sea.

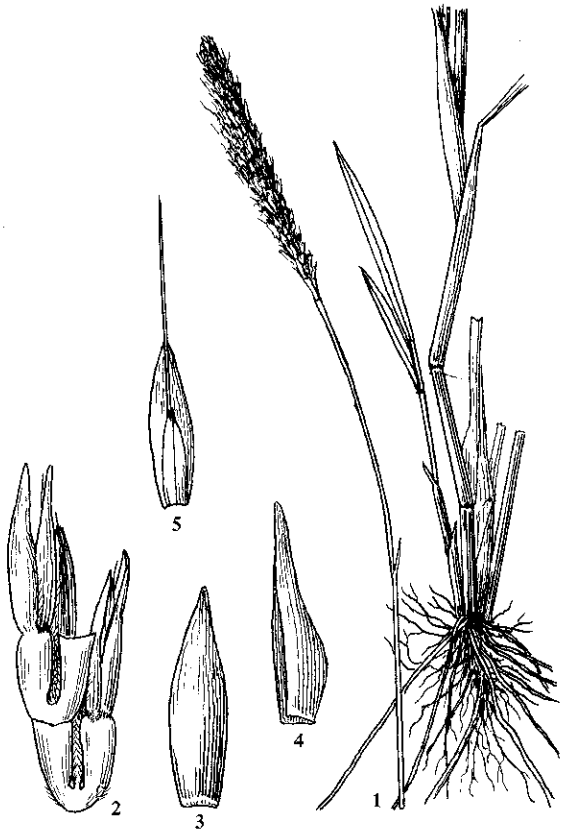

Figure 143. *Ischaemum aristatum* var. *glaucum* (Honda) T. Koyama

1. plant; *2.* portion of raceme; *3.* lower glume; *4.* upper glume; *5.* upper lemma. (drawn by H. P. Yu)

4. Ischaemum rugosum Salisb. 田間鴨嘴草

Icon. Stirp. Rar. 1, t. 1. 1791; FKH 322. 1912; FRPS 10(2): 158, pl. 37: 12. 1997; FYN 9: 672. 2003; FOC 22: 613. 2006; FGD 9: 474. 2009.

Annual herb. Culms erect, loosely tufted or solitary, 20–100 cm tall, nodes pubescent. Leaf sheaths longer or upper shorter than internode, glabrous or sparsely pilose, ciliate; leaf blades linear or linear-lanceolate, 5–30 × 0.5–2 cm, pilose or covered with scattered tubercle-based hairs, apex acuminate, margins scabrid;

ligule membranous, oblong, 2–5 mm. Racemes terminal and axillary, paired, appressed back to back, or usually separated, fragile; rachis internodes inflated, thickly clavate, outer margins ciliate. Sessile spikelet ovate; lower glume 2-keeled, crustaceous, transversely 4–7-ridged below, ridges sharp, mostly continuous, herbaceous above with many anastomosing green veins, keels scabrid, wingless or winged on one side, apex obliquely obtuse; upper glume boat-shaped, abaxially keeled; lower floret staminate, lemma as long as or slightly shorter than lower glume, apex acuminate; stamens 3; palea as long as or slightly shorter than lemma; upper floret bisexual, lemma membranous, apex 2-lobed to middle; awn exerted from sinus, geniculate and twisted; palea shorter than lemma. Pedicellate spikelet dorsally compressed, variable in size, often much reduced especially toward raceme apex, awnless; pedicel elongate when spikelet rudimentary.

Locality: High Island, Nai Chung. *S. Y. Hu 8087, 8466, 8679* (CUHK).

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Taiwan; Indian Subcontinent, SE Asia, Malesia, Australia (Queensland).

Ecology: Stream and ditch banks, other wet places. Flowering & fruiting: Summer to autumn.

5. Ischaemum barbatum Retz. 粗毛鴨嘴草 **(Photo 390)**

Observ. Bot. 6: 35. 1791; FHN 4: 460. 1977; FFJ 6: 253, fig. 222. 1995; FRPS 10(2): 156, pl. 37: 6–11. 1997; FOC 22: 613. 2006; FGD 9: 474. 2009.

Perennial herb. Culms erect or ascending, 30–100 cm tall. Leaf sheaths glabrous to villous; leaf blades linear or narrowly lanceolate, 5–30 × 0.3–0.8 cm, apex acute; ligule 1–5 mm. Racemes terminal, paired, usually appressed back to back; rachis internodes oblong, triquetrous, ciliate along outer angle, inner angles glabrous or shortly ciliate. Sessile spikelet lanceolate-oblong, callus bearded; lower glume leathery, herbaceous above with many anastomosing green veins, glabrous to villous, marginal nodules at lower 2/3, these sometimes extended into weak transverse ridges, 2-keeled, keels asymmetrically winged, one wing wider than the other; upper glume as long as lower glume, hard papery; lower floret staminate, lemma boat-shaped, 1-veined; upper floret bisexual, lemma hyaline membranous, 2-deeply-clefted, with a geniculate awn from sinus; palea slightly shorter than lemma. Pedicellate spikelet dorsally compressed, as large as sessile but marginal nodules less developed, awnless or awned.

Locality: Common in Hong Kong. *Y. W. Lam 817, 2174; HK sheet 40833.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; Japan, Indian Subcontinent, Indochina, Malesia, Australia, W Africa.

Ecology: Open grassy hillslopes. Flowering & fruiting: Summer and autumn.

61. Schizachyrium Nees 裂稃草屬

Perennial or annual herbs. Culms slender, branched, erect or prostrate at base. Leaf blades linear or oblong-linear; ligule membranous. Inflorescence a solitary slender fragile raceme, terminal or axillary, supported by a spatheole; rachis internodes and pedicels filiform to clavate, glabrous to ciliate or villous, apex cupular with scarious lobed rim; spikelets of a dissimilar pair. Sessile spikelet dorsally compressed or squeezed between internode and pedicel; callus obconical, obtuse, shortly bearded, inserted into internode apex; lower glume oblong-lanceolate, papery to subleathery, abaxially convex, flanks inflexed, often 2-keeled, usually wingless; upper glume boat-shaped; lower floret reduced to a hyaline lemma; upper floret bisexual, lemma hyaline, deeply 2-lobed, awned from sinus; awn geniculate, column glabrous. Caryopsis linear. Pedicellate spikelet staminate or barren, usually smaller than sessile spikelet, sometimes much reduced to a lemma, awned.

About 60 species spread throughout tropics and subtropics; four species in China; two species in Hong Kong.

1a. Perennial; leaf blades 5–50 cm; culm hard ..... 1. *S. sanguineum*
1b. Annual; leaf blades 1.5–8 cm; culm slender ..... 2. *S. brevifolium*

1. Schizachyrium sanguineum (Retz.) Alston 紅裂稃草 **(Photo 391)**

Handb. Fl. Ceylon. 6: 334. 1931; FHN 4: 483. 1977; FFJ 6: 273, fig. 247. 1995; FRPS 10(2): 212, pl. 52: 11–12. 1997; FOC 22: 622. 2006; FGD 9: 502. 2009.

Rottboellia sanguinea Retz., Observ. Bot. 3: 25. 1783.

Andropogon zeylanicus Arn. ex Benth., FHK 423. 1861, non Nees ex Steud (1854).

Andropogon hirtiflorus (Nees) Kunth, Rév. Gram. 2: 571. 1833; FKH 323. 1912.

Perennial herb, whole plant usually reddish brown. Culms erect, hard, 50–120 cm tall, simple or branched, glabrous. Leaf sheaths keeled, glabrous; leaf blades linear, flat, 5–25 × 0.1–0.5 cm, glabrous, apex acute, margins scabrid; ligule ca. 1 mm, membranous, apex subtruncate. Raceme solitary, dark purplish red, very slender, erect, 3–9 cm, finally long exserted from spatheole; rachis internodes and pedicels linear-clavate, equalling or slightly shorter than sessile spikelet, margin glabrous or white-ciliate. Sessile spikelet linear-lanceolate, slightly appressed into the cavity of rachis; lower glume linear, leathery, convex with inflexed margins, keeled from below middle to apex, abaxially scabrid; keels very narrowly winged toward apex, apex 2-toothed; upper glume boat-shaped, thicken membranous, narrow wings on the upper keel; lower lemma linear-lanceolate, slightly shorter than glume, margins ciliate; upper lemma 2-lobed to near base; awn 1–2 cm; styles 2. Caryopsis linear, flat. Pedicellate spikelet lanceolate, reduced to 1 or 2 glumes.

Locality: Common in Hong Kong. *Y. W. Lam 818, 949, 1332.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Xizang, Sichuan, Hunan, Jiangxi, Fujian; India, Sri Lanka, Myanmar, Thailand, Vietnam, Malay Peninsula, Indonesia, Philippines, Australia, Africa, America.

Ecology: Open grassy fields, hillslopes. Flowering & fruiting: Jul.–Dec.

2. Schizachyrium brevifolium (Sw.) Nees ex Büse
裂稃草 **(Fig. 144; Photos 392–393)**

Pl. Jungh. 3: 359. 1854; FHN 4: 482, fig. 1267. 1977; FFJ 6: 273, fig. 246. 1995; FRPS 10(2): 210, pl. 52: 1–10. 1997; FTW ed. 2, 5: 576, pl. 243. 2000; FOC 22: 622. 2006; FGD 9: 502, fig. 266. 2009.

Andropogon brevifolius Sw., Prodr. 26. 1788; FHK 423. 1861; FKH 323. 1912.

Annual herb. Culms erect or trailing, slender, 10–70 cm long. Leaf sheaths shorter than internode, keeled, glabrous; leaf blades linear to oblong, flat or folded, 1.5–4 × (0.1–)0.2–0.7 cm, glabrous, base subrounded, apex obtuse, margins scabrous; ligule short, membranous. Raceme slender, enclosed at base by spatheole; rachis internodes and pedicels inflated upward, apex cupular and oblique, glabrous to villous. Sessile spikelet linear-lanceolate, ca. 3 mm; lower glume linear-lanceolate, subleathery, abaxially flat, glabrous to thinly pilose, indistinctly 4–5-veined, flanks keeled toward apex, keels wingless, apex minutely 2-toothed; upper glume boat-shaped, thicken membranous, midvein keeled, 3-veined; lemma hyaline membranous; lower lemma linear-lanceolate, slightly shorter than glume, margins ciliate, apex acute; upper lemma 2/3 glume length, 2-lobed to near base; with a flexuous awn arising from sinus, geniculate; style free. Caryopsis linear, flat. Pedicellate spikelet reduced to 1 or 2 glumes, up to 0.7 mm, lower glume with 3–5 mm awn.

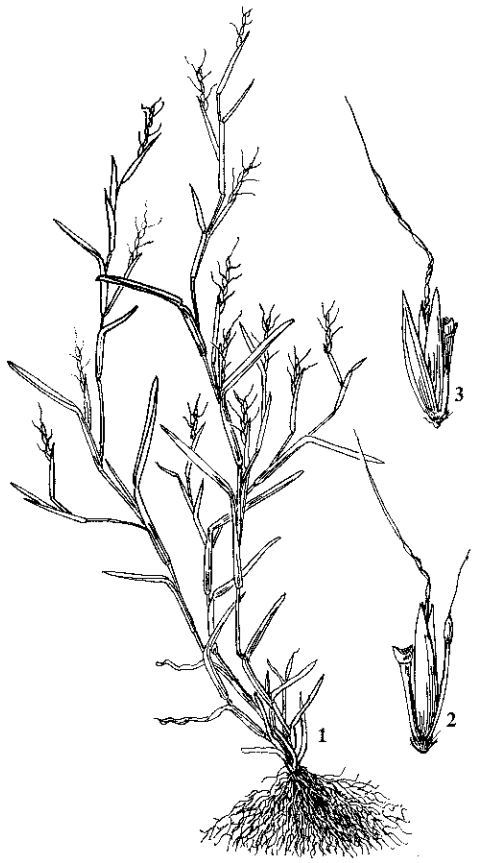

Figure 144. *Schizachyrium brevifolium* (Sw.) Nees ex Büse
1. plant; *2.* portion of raceme showing sessile and pedicellate spikelets and rachilla internode; *3.* idem (sessile spikelet and rachilla internode) (drawn by X. L. Chen)

Locality: Common in Hong Kong. *Y. S. Lau 1040; P. P. H. But 140; Y. W. Lam 425.*

Distribution: Hainan, Guangdong, Guizhou, Yunnan, Xizang, Sichuan, Hubei, Henan, Hebei, Shandong, Anhui, Jiangxi, Jiangsu, Zhejiang, Fujian, Taiwan; Indian Subcontinent, S and SE Asia, Indonesia, Philippines.

Ecology: Open grassy banks, margins of fields, weedy places. Flowering & fruiting: Jul.–Dec.

62. Andropogon L. 鬚芒草屬

Perennial herbs. Culms usually tufted. Leaf blades linear to narrowly linear; ligule scarious or reduced to a line of hairs. Racemes paired or digitate, terminal on the culm or axillary and gathered into a spathate compound panicle; rachis fragile; spikelets paired, 1 sessile, the other pedicellate. Sessile spikelet usually dorsally compressed, usually bisexual; callus short, obtuse, shortly bearded, inserted into internode apex; lower glume lanceolate, membranous to leathery, 2-keeled; upper glume boat-shaped, awned or awnless; lower floret reduced to a hyaline lemma; upper lemma hyaline, 2-lobed, awned from sinus; awn geniculate; stamens 1–3. Pedicellate spikelet male or barren, large or much reduced, awnless.

About 100 species distributed in tropical and warm-temperate regions of both hemispheres; two species in China; one species in Hong Kong.

1. Andropogon chinensis (Nees) Merr. 華鬚芒草 **(Fig. 145)**

Philipp. J. Sci. 12: 101. 1917; FHN 4: 478, fig. 1264. 1977; FFJ 6: 274, fig. 248. 1995; FRPS 10(2): 185, pl. 45: 1–15. 1997; FOC 22: 623. 2006; FGD 9: 497, fig. 263. 2009.

Homoeatherum chinense Nees, Nat. Syst. Bot., 448. 1836.

Perennial herb. Culms erect, tufted, 40–100 cm tall, glabrous. Leaf sheaths glabrous or pilose; leaf blades linear, flat or involute when dry, 8–25 × 0.2–0.3 cm; ligule 1–2.5 mm, membranous, obtuse. Racemes paired, 1.5–3(–5) cm, exserted from spatheole; spatheoles boat-shaped or linear; peduncle puberulous; rachis internodes subequal to pedicels, cuneate, the lower with 1–3 mm hairs, tips cupular, obliquely toothed. Sessile spikelet linear, ca. 5 mm, callus acute and pungent; lower glume deeply concave between dorsal keels, glabrous, shortly awned, mucronate or 2-toothed; upper glume boat-shaped, 2-lobed, with an awn from the sinus; awn 6–10 mm; lower lemma linear-oblong, hyaline membranous; upper lemma 2-lobed, an awn from the sinus; awn 2–3 cm; palea 1/2 length of lower glume, margins ciliate; lodicules 2; stamens 3; style free, glumose. Pedicellate spikelet oblong-lanceolate, ca. 4 mm, 2-awned; awn of lower glume 4–10 mm, awn of upper glume much shorter.

Locality: Hong Kong Island, Castle Peak. *S. C. Ng 1521.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan; India, Myanmar, Thailand, Indochina, Africa, SW Asia (Yemen).

Ecology: Open grassy fields, hillslopes. Flowering & fruiting: Aug.–Dec.

63. Cymbopogon Spreng. 香茅屬

Perennial, rarely annual herbs, usually aromatic. Culms erect. Leaf blades filiform to broadly linear; ligule dry membranous, scarious. Inflorescence a dense spathate compound panicle, each ultimate spatheole subtending a pair of short racemes on a short peduncle; spatheoles boat-shaped; lower raceme with one basal pair of homogamous spikelets below the fertile pairs; rachis internodes and pedicels linear, margins white-ciliate. Sessile spikelet dorsally compressed, bisexual or pistillate; callus obtuse, shortly bearded, inserted into internode apex; lower glume papery, flat or concave, sometimes grooved or wrinkled, 2-keeled; keels lateral, with or without wing above middle, with intercarinal veins or not; upper glume boat-shaped, awned or awnless; lower floret reduced to a hyaline lemma; upper lemma narrowly oblong, halfway divided into 2 narrow lobes, with a geniculate awn from sinus, or entire and muticous; lodicules 2, cuneate; stamens 3; styles 2, plumose. Pedicellate spikelet staminate or sterile or absent, narrowly lanceolate, awnless.

About 70 species distributed in tropics and subtropics of Africa, Asia, and Australia, introduced in tropical America; 24 species in China; five species in Hong Kong.

1a. Lower glume ovate-lanceolate, deeply grooved below middle.
  2a. Culms 30–80 cm tall ..... 1. *C. mekongensis*
  2b. Culms up to 3 m tall ..... 2. *C. martini*
1b. Lower glume flat or slightly concave toward base.
  3a. Sessile spikelet awnless or with short awn included within spikelet; cultivated plants ..... 3. *C. nardus*
  3b. Sessile spikelet with exserted geniculate awn; wild plants.
    4a. Sessile spikelet narrowly lanceolate-oblong, 3.5–4.5 mm; awn 7–10 mm ..... 4. *C. tortilis*
    4b. Sessile spikelet narrowly obovate, 4.5–6 mm; awn 10–20 mm ..... 5. *C. goeringii*

1. Cymbopogon mekongensis A. Camus 青香茅 **(Fig. 146)**

Bull. Mus. Natl. Hist. Nat. 26: 563. 1920; FOC 22: 626. 2006.

Cymbopogon caesius auct. non Stapf: FHN 4: 480. 1977; FRPS 10(2): 196, pl. 46: 8–14. 1997; FGD 9: 498. 2009; Check List HK Plants 329. 2002; 116. 2004.

Perennial herb. Culms erect or geniculate, tufted, 30–80 cm tall. Leaf sheaths glabrous, the upper shorter than internodes; leaf blades linear, glabrous, 10–25 × 0.2–0.6 cm, apex filiform; ligule 0.7–3 mm. Spathate compound panicle narrow, 10–30 cm, spathes densely clustered, racemes paired; rachis internodes and pedicels ca. 1.5 mm. Sessile spikelet oblanceolate; lower glume ovate-lanceolate, deeply grooved below middle; keels broadly winged above middle, veinless or obscurely 2-veined between keels; upper glume boat-shaped, narrow wing on the keel, margins membranous and ciliate, acute; upper lemma deeply 2-lobed; awn 1–1.5 cm, from the sinus, geniculate; stamens 3. Pedicellate spikelet 3–4 mm.

Locality: Common in Hong Kong. *W. J. Tutcher 5126; S. P. Lau 133; HK sheet 15738.*

Figure 145. *Andropogon chinensis* (Nees) Merr.
1. habit; *2.* portion of inflorescence showing sessile and pedicellate spikelet. (drawn by H. P. Yu)

Figure 146. *Cymbopogon mekongensis* A. Camus
1. portion of plant; *2.* rachis internode, sessile spikelet and pedicellate spikelet; *3.* abaxial view of sessile spikelet and 2 pedicellate spikelets. (drawn by H. P. Yu)

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Zhejiang; Laos, Thailand, Vietnam.

Ecology: Roadsides, hillslopes. Flowering & fruiting: Jul.–Sep.

2. Cymbopogon martini (Roxb.) W. Watson 鲁沙香茅

Himalayan Districts N.W. Prov. India. 392. 1882; FRPS 10(2): 192. 1997 ["*martinii*"]; FOC 22: 626. 2006.

Andropogon martini Roxb., Fl. Ind. 1: 280. 1820; FHK 424. 1861.

Cymbopogon schoenanthus Spreng., Pl. Min. Cogn. Pug. 2: 15. 1815; FKH 323. 1912.

Perennial herb, with a short woody rootstock. Culms tufted, up to 3 m tall, lower nodes often swollen, mealy. Leaf sheaths glabrous; leaf blades usually glaucous at abaxial surface, dark green at adaxial surface, lanceolate, up to 50 × 2–3 cm, glabrous, base cordate, often amplexicaul, apex filiform; ligule 2–4 mm. Spathate panicle narrow, dense, erect, 20–30 cm; spatheoles green becoming reddish, 2–4 cm; racemes 1.5–2 cm; rachis internodes and pedicels ciliate on margins; pedicel of homogamous pair swollen, barrel-shaped, shiny, fused to internode at base. Sessile spikelet oblong, 3.5–4.5 mm; lower glume deeply grooved below middle, appearing as a line or keel on inside; keels winged above middle, veinless or 2-veined between keels; upper lemma 2-lobed; awn 1.4–1.8 cm. Pedicellate spikelet 3.5–4 mm.

Locality: Cultivated. *S. L. Thrower s.n.* (CUHK).

Distribution: Sichuan, Yunnan; Indian Subcontinent, widely cultivated in tropical Asia.

Ecology: Grassy hillslopes. Flowering & fruiting: Jul.–Oct.

Uses: Material (essential oil).

3. Cymbopogon nardus (L.) Rendle 亞香茅 **(Photos 394–395)**

Cat. Afr. Pl. 2: 155. 1899; FKH 323. 1912; H. B. Gill. et al., Fl. Malaya 3: 296. 1971; FHN 4: 479, fig. 1265. 1977; FFJ 6: 276. 1995; FRPS 10(2): 199. 1997; FOC 22: 628. 2006; FGD 9: 499. 2009.

Andropogon nardus L., Sp. Pl. 2: 1046. 1753.

Perennial herb. Culms densely tufted. Leaf sheaths reddish purple at base, smooth, glabrous, the upper shorter than internode, most crowded at base of culm; leaf blades dark green or dark brown when dry, linear, flat, 30–50 × 0.5–2 cm, glabrous, adaxial surface smooth, abaxial surface scabrid, base narrow, apex attenuate to needle, margins scabrous; ligule 2–3 mm, membranous, glabrous. Spathate panicle large, narrow, congested, 60–90 cm; spatheoles reddish brown, 1–2.5 cm; racemes 1–2 cm; rachis internodes and pedicels ciliate on margins, back glabrous or pubescent. Sessile spikelet oblong-lanceolate; lower glume reddish brown or purplish upward, papery, flat or slightly concave, sharply 2-keeled; keels narrowly winged, veinless or obscurely veined between keels; upper glume boat-shaped, membranous, ciliate; lower lemma oblong, ciliate, veinless; upper lemma linear, entire or slightly 2-lobed, mucronate or very shortly awned; stamens 3. Pedicellate spikelet staminate or seldom neuter, 3.5–7 mm.

Locality: Cultivated. *HK sheet 31542, 33469.*

Distribution: Hainan, Guangdong, Yunnan, Fujian, Taiwan (cultivated); Indian Subcontinent, widely cultivated in tropical Asia.

Ecology: Flowering & fruiting: Nov.–Apr. of the following year.

Uses: Additive (flavoring), material (essential oil).

4. Cymbopogon tortilis (J. Presl) A. Camus 扭鞘香茅

Rev. Bot. Appl. Agric. Colon. 5: 206. 1925; FHN 4: 481. 1977; FFJ 6: 275, fig. 249. 1995; FTW ed. 2, 5: 536. 2000; FOC 22: 628. 2006.

Anthistiria tortilis J. Presl in C. Presl, Reliq. Haenk. 1: 347. 1830.

Cymbopogon hamatulus (Hook. & Arn.) A. Camus, Bot. Beechey Voy. 244. 1838; FRPS 10(2): 207, pl. 51: 1–7. 1997; FGD 9: 500. 2009.

Perennial herb. Culms tufted, slender, 50–150 cm tall, glabrous. Leaf sheaths glabrous, shorter than internode; leaf blades linear, flat, glabrous or tomentose near the base of adaxial surface, 25–60 × 0.2–0.7 cm, base gradually narrowed, apex finely acuminate; ligule 2–3 mm, dry membranous. Spathate compound panicle narrow, 20–35 cm, 2–3 tiers of branching; spatheoles reddish brown, 1.2–1.5 cm; racemes 1–1.5 cm, paired; rachis internodes and pedicels obliquely cupular, margins ciliate. Sessile spikelet oblong-lanceolate, 3.5–4.5 mm, callus very short; lower glume flat, sharply 2-keeled throughout; keels narrowly winged above middle, 2–5-veined between keels; upper glume boat-shaped, narrow wing on the keel, acute; lower lemma oblong-lanceolate, 2-keeled, ciliate; upper lemma very narrow, 2-lobed; awn 0.7–1 cm; palea absent. Pedicellate spikelet 3–3.5 mm, awnless.

Locality: Common in Hong Kong. *S. P. Lau 53; Y. S. Lau 2534; Y. W. Lam 6.*

Distribution: Hainan, Guangdong, Guizhou, Yunnan, Hunan, Jiangxi, Anhui, Zhejiang, Fujian, Taiwan; Philippines, Vietnam.

Ecology: Open grassy fields, hillslopes, roadsides. Flowering & fruiting: Jul.–Oct.

Notes: The species was reported as *Cymbopogon hamatulus* (Nees ex Hook. & Arn.) A. Camus previously (Check List HK Plants 330. 2002; 116. 2004).

5. Cymbopogon goeringii (Steud.) A. Camus 橘草

Rev. Bot. Appl. Agric. Colon. 1: 286. 1921; FRPS 10(2): 204, pl. 51: 8–14. 1997; FYN 9: 686, pl. 112: 14–17. 2003; FOC 22: 629. 2006; FGD 9: 499. 2009.

Andropogon goeringii Steud., Flora 29: 22. 1846.

Perennial herb. Culms erect, tufted, 50–110 cm tall. Leaf sheaths glabrous, the upper shorter than internode; leaf blades linear, 15–40 × 0.3–0.5 cm, glabrous, margins scabrous, apex finely acuminate; ligule 0.5–4.5 mm, obtuse and rounded. Spathate compound panicle narrow, loose, 15–35 cm, 1–2 tiers of branching; spatheoles 1.5–2 cm, purple; racemes often purplish, paired; rachis internodes and pedicels apex cupular, margins ciliate. Sessile spikelet oblong-lanceolate, 4.5–6 mm, callus ca. 0.5 mm, pubescent and subglabrous; lower glume flat or slightly concave toward base, sharply 2-keeled throughout; keels winged above middle; upper glume boat-shaped, margins narrow membranous and ciliate, narrow wing on the keel, acute; lower lemma about 3/4 length of glume, narrow and acuminate, 2-keeled, ciliate; upper lemma very narrow, ca. 3 mm, with a geniculate awn from sinus; upper lemma 2-lobed; awn 1–2 cm; palea absent; style brown, penicillate, exerted laterally. Pedicellate spikelet 4–6 mm, pedicel white long pilose.

Locality: Mount Parker, Cape D'Aguilar, Lantau Island. *HK sheet 38089, 41940, 42036.*

Distribution: Guangdong, Guangxi, Yunnan, Guizhou, Hunan, Hubei, Henan, Hebei, Shandong, Anhui, Jiangxi, Jiangsu, Zhejiang, Fujian, Taiwan; Japan, S Korea.

Ecology: Open grassy fields, hillslopes, roadsides. Flowering & fruiting: Jul.–Oct.

64. **Hyparrhenia** Andersson ex E. Fourn. 苞茅属

Perennial or annual. Culms erect or geniculate at base, usually tufted. Leaf blades linear, midvein distinct, apex acuminate; ligule membranous, truncate or rounded. Inflorescence a compound spathate panicle, each ultimate spatheole subtending a peduncle bearing a pair of short racemes; raceme pairs 2–many-awned, often reflexed at maturity. Racemes with 0–2 pairs of homogamous spikelets below the fertile pairs, these similar to pedicellate spikelets; pedicels and internodes slender. Sessile spikelet dorsally compressed or subterete; callus obtuse to pungent, bearded, its apex exposed; lower glume lanceolate to linear, incurving, convexly rounded without keels; upper glume boat-shaped, keeled, margins membranous hyaline, ciliate, 3-veined, awnless; lower floret reduced to a hyaline lemma; upper lemma stipiform, 2-toothed, awned between the teeth; awn geniculate with hairy column; palea small; lodicules 2, small; stamens 3; style free, stigma penicillate. Pedicellate spikelet staminate or barren, narrowly lanceolate, slightly longer than the sessile.

About 64 species distributed mainly in Africa, a few species extending to other tropical regions; five species in China; one species in Hong Kong.

1. Hyparrhenia diplandra (Hack.) Stapf 短梗苞茅 **(Fig. 147)**

Fl. Trop. Africa. 9: 368. 1919; FRPS 10(2): 235, pl. 58: 4. 1997; FYN 9: 705. 2003; FOC 22: 633. 2006; FGD 9: 501. 2009.

Andropogon diplandrus Hack., Flora 68: 123. 1855.

Hyparrhenia eberhardtii (A. Camus) Hitchc., Lingnan Sci. J. 7: 247–248. 1929[1931]; FHN 4: 482, fig. 1226. 1977.

Perennial herb. Culms tufted, coarse, 1–2 m tall. Leaf sheaths glabrous or upper margins hispidulous; leaf blades linear to narrowly linear, 30–60 × 0.3–0.6 cm, glabrous or hirsute at base, margins scabrid; ligule reddish brown, ca. 2 mm, dry membranous, apex obtuse and rounded, ciliate. Spathate panicle loose, peduncle scarcely exserted from spatheole, densely golden tuberculate-hirtose; racemes 4–8-awned per pair, reflexed at maturity; raceme bases subequal, flattened, short, broadly oblong, glabrous on outer face; usually 2 pairs of homogamous spikelets at base of both lower and upper raceme of pair; pedicel longer than rachis internodes, ca. 1/2 length of sessile spikelet. Sessile spikelet lanceolate, glabrous or pilose, callus acute and pungent, densely bearded; callus 1–1.5 mm, sharply acute, white bearded; lower glume lanceolate, margins inrolled, obtuse; upper glume slightly longer than lower glume, boat-shaped, apex rounded and obtuse, 3-veined; lower lemma lanceolate, hyaline membranous, ciliate; upper lemma linear, 2-lobed; awn geniculate, column with white or brown ca. 0.5 mm hairs; palea absent; stamens 3 or absent. Pedicellate spikelet narrow, staminate or barren.

Locality: Castle Peak. *HK sheet 15837.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan; Vietnam, Thailand, Indonesia, tropical Africa.

Ecology: Hillslopes, thickets. Flowering & fruiting: Aug.–Nov.

Figure 147. *Hyparrhenia diplandra* (Hack.) Stapf

1. upper portion of plant; *2.* upper lemma of sessile spikelet with awn removed. (drawn by H. P. Yu)

65. Arthraxon P. Beauv. 蓑草屬

Annual or perennial herbs. Clums slender, usually creeping, scrambling or ascending. Leaf blades lanceolate to ovate-lanceolate, base cordate, often clasping culm; ligule membranous. Inflorescence of subdigitate, slender, fragile racemes, terminal on culms and branches, not spathate; rachis internodes and pedicels filiform to linear, glabrous or ciliate on angles; spikelets pair dissimilar. Sessile spikelet linear to lanceolate, dorsally or laterally compressed, falling off with internodes; lower glume papery or subleathery, abaxially flat or convex, several-veined, with or without lateral keels, scaberulous to spinulose; upper glume boat-shaped, 2-keeled, apex acute to mucronate, 3-veined; lower floret reduced to an empty hyaline lemma; upper lemma hyaline, entire or shortly 2-toothed, awned from near base; palea small or absent; Stamens 2–3. Caryopsis terete. Pedicellate spikelet staminate or neuter, well developed, reduced, or represented by the pedicel only, sometimes almost completely suppressed.

About 26 species distributed in Old World tropics, mainly in India; introduced in America; 12 species in China; one species in Hong Kong.

1. Arthraxon hispidus (Thunb.) Makino 蓑草 **(Fig. 148)**

Bot. Mag. (Tokyo). 26: 214. 1912; FFJ 6: 260, fig. 231. 1995; FRPS 10(2): 218, pl. 54: 1–7. 1997; FTW ed. 2, 5: 524, pl. 221. 2000; FOC 22: 619. 2006; FGD 9: 487, fig. 257. 2009.

Phalaris hispida Thunb., Fl. Jap. 44. 1784.

Arthraxon pauciflorus Honda, Bot. Mag. (Tokyo) 39: 276. 1925; FTW ed. 2, 5: 526. 2000.

Arthraxon ciliaris P. Beauv, Ess. Agrostogr. 111, pl. 11, fig. 6. 1812; FKH 321. 1912.

Arthraxon hispidus (Thunb.) Makino var. *cryptatherus* (Hackel) Honda, FHN 4: 474. 1977; FRPS 10(2): 221. 1997.

Figure 148. *Arthraxon hispidus* (Thunb.) Makino

1. plant; *2.* inflorescence; *3.* sessile spikelet and pedicel of reduced pedicellate spikelet; *4.* sessile spikelet and rachis internode; *5.* lower glume; *6.* upper glume; *7.* lower and upper lemmas. (drawn by H. P. Yu)

Annual herb. Culms slender, glabrous, sprawling, creeping and rooting at lower nodes, 30–60 cm tall, many-branched. Leaf sheaths shorter than internode, glabrous or tuberculate-hispid; leaf blades ovate-lanceolate, 2–5 × 0.6–1.5 cm, glabrous, pubescent or tuberculate-pilose, base amplexicaul, margins pectinate-setose at least around base; ligule membranous, margins ciliate. Racemes slender, 2–10 or more, digitate or fascicles, terminal. Sessile spikelet greyish green or purplish, ovate-lanceolate, laterally compressed; lower glume lanceolate, herbaceous, abaxially rounded, margins membranous, 6–9-veined, veins scabrid-hispidulous to spinulose; upper glume boat-shaped, as long as lower glume, 3-veined; lower lemma oblong, 2/3 lower glume length, hyaline membranous, acute; upper lemma as long as lower palea, hyaline membranous, with a geniculate awn near the base; awn up to 12 mm, well developed and exserted from glumes, or sometimes reduced and included. Pedicellate spikelet usually absent; pedicel reduced to a minute stump, sometimes up to 2 mm or more.

Locality: Common in Hong Kong. *HK sheet 42047.*

Distribution: Widely spread over most provinces of China; tropical to temperate regions of the Old World.

Ecology: Shade and moist places. Flowering & fruiting: Sep.–Nov.

66. Themeda Forssk. 菅屬

Perennial or annual herbs. Culms erect tufted, glabrous. Leaf sheaths keeled, margins membranous, the upper usually shorter than internode; leaf blades linear, margins rough; ligule short, membranous or papery. Inflorescence a leafy compound panicle composed of short racemes; each raceme on a short peduncle subtended by a sheathing spatheole, loosely arranged or gathered into fan-shaped spathate fascicles. The lowest two pairs of raceme forming a kind of involucre, staminate or empty, muticous, sessile, all or partly persistent, the upper part of raceme 1–3-jointed, the upper joint with triad of one sessile bisexual and two pedicellate staminate or empty spikelets, occasionally lower joints except involucre, each with 1 sessile bisexual and 1 pedicellate staminate or empty spikelet. Sessile spikelet subterete or dorsally compressed; callus mostly acute to pungent, sometimes obtuse, bearded; lower glume usually leathery, margins membranous; upper glume abaxially carinate, laterally deeply grooved; lower floret reduced to a hyaline lemma; upper lemma stipitiform, entire, passing into a geniculate awn with pubescent column, occasionally awnless; lodicules 2, cuneate; stamens 0–3; style free from the base. Caryopsis oblong. Pedicellate spikelet mostly larger than sessile spikelet, staminate or neuter.

About 27 species distributed in tropical and subtropical regions of the Old World, mainly in Asia; 13 species in China; two species in Hong Kong.

1a. Raceme with 7 spikelets; homogamous spikelets all at same level; racemes congested in dense fascicles.... 1. *T. triandra*

1b. Raceme with (7 or) 9–17 spikelets; homogamous spikelets at slightly different levels; racemes loosely arranged..... .....2. *T. villosa*

1. Themeda triandra Forssk. 黄背草 **(Fig. 149)**

Fl. Aegypt.-Arab. 178. 1775; FKH 324. 1912; FRPS 10(2): 252. 1997; FYN 9: 721. 2003; FOC 22: 634. 2006; FGD 9: 507. 2009.

Themeda japonica (Willd.) Tanaka, Bult. Sci. Fak. Terk. Kjusu Imp. Univ. 1: 194. 1925; FHN 4: 484. 1977; FRPS 10(2): 253, pl. 63: 1–11, 79: 3. 1997; FTW ed. 2, 5: 585, pl. 247. 2000; Check List HK Plants 349. 2002; 122. 2004.

Anthistiria japonica Willd., Sp. Pl. 4: 901. 1805.

Perennial herb. Culms stout, erect or geniculate at the base, 0.5–1.5 m tall, glabrous. Leaf sheaths usually hispid with tubercle-based hairs; leaf blades linear, 10–50 × 0.4–0.8 cm, glabrous or pilose, base subrounded, apex finely acuminate; ligule 1–2 mm, truncate, ciliate. Compound panicle lax, open, with spaced, often nodding spathate fascicles; spathes and spatheoles narrowly lanceolate, glabrous or thinly to densely tuberculate-hispid. Raceme composed of a triad of 1 sessile and 2 pedicellate spikelets above the involucre of 2 homogamous pairs. Homogamous spikelets all sessile, arising at same level, staminate, both glumes present, oblong-lanceolate with lateral scarious wings, glabrous or hispid with tubercle-based hairs. Sessile spikelet bisexual, fusiform-cylindrical; callus 1.5–3 mm, pungent, brown bearded, apex exposed; lower glume dark brown, abaxially rounded, glossy, hispidulous in upper 1/3, smooth below; upper glume and lower glume the same texture, equal, linear-oblong; lower lemma shorter than glume, lanceolate, glabrous; upper lemma 1-veined, awned from the apex. Caryopsis oblong. Pedicellate spikelet similar to involucral spikelet, male or barren.

Figure 149. *Themeda triandra* Forssk.

1. plant; *2.* raceme and spathe; *3.* upper portion of raceme (showing terminal triad of spikelets); *4.* involucre (composed of 2 homogamous spikelets). (drawn by H. P. Yu)

Locality: Hong Kong Island, New Territories. *Y. S. Lau 184; Y. W. Lam 403, 1150.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Shaanxi, Hebei, Henan, Hubei, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; widely spread over E to S and SW Asia, Australia, Africa.

Ecology: Dry hillslopes, roadsides. Flowering & fruiting: Jun.–Dec.

2. Themeda villosa (Poir.) A. Camus 菅 **(Photo 396)**

Fl. Indo-Chine. 7: 364. 1922; H. B. Gill. et al., Fl. Malaya 3: 301, fig. 65. 1971; FRPS 10(2): 248, pl. 62: 5. 1997; FYN 9: 721, pl. 117: 1–2. 2003; FOC 22: 635. 2006; FGD 9: 506, fig. 269. 2009.

Anthistiria villosa Poir, Encycl. 1: 396. 1812.

Themeda gigantea (Cav.) Hack. var. *villosa* (Poir.) Hack., Monogr. Phan. 6: 675. 1889.

Themeda gigantea auct. non (Cav.) Hack.: FKH 324. 1912.

Perennial herb. Culms tufted, stout, 2–4 m tall, smooth. Leaf sheaths glabrous, basal sheaths strongly compressed; leaf blades linear, ca. 100 × 0.7–1.5 cm, scabrid, gradually narrowed to the thicken white midrib toward base, apex acuminate; ligule ca. 1 mm, membranous, ciliate. Inflorescence a leafy compound panicle composed of short racemes; raceme usually 2–3 cm, spathe boat-shaped, glabrous, composed of (1–)2 spikelet pairs and a terminal triad above the involucre of 2 homogamous pairs; homogamous spikelets arising at slightly different levels, staminate or barren, narrowly lanceolate, wingless, shortly pubescent. Sessile spikelet 7–8 mm; callus 1–2 mm, acute; lower glume oblong-lanceolate, abaxially compressed with shallow central groove, densely brown strigose, apex truncate, margins inrolled, abaxial surface and margins with dense brown hairs; upper glume margins embraced by lower glume, abaxial surface with brown hairs; upper lemma lanceolate, midvein produced into mucro or poorly developed short awn. Pedicellate spikelet similar to involucral spikelets.

Locality: New Territories. *Y. S. Lau 1092, 1681; Y. W. Lam 1285.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Henan, Hubei, Hunan, Jiangxi, Zhejiang, Fujian; Indian Subcontinent, Indochina, Malay Peninsula, Indonesia, Philippines.

Ecology: Open grassy fields, hillslopes, disturbed moist grassy places. Flowering & fruiting: Aug.–Jan. of the following year.

67. Heteropogon Pers. 黃茅屬

Perennial or annual herbs. Culms usually stout, tufted. Leaf sheaths usually keeled; leaf blades linear, flat; ligule membranous, sometimes with ciliate fringe. Inflorescence of solitary racemes, terminal or axillary and loosely aggregated into a spathate panicle. Racemes linear, dense, spikelets paired, one sessile and the other pedicellate, imbricate, 1–several pairs of homogamous spikelets (staminate or neuter) at base of raceme below fertile pairs, upper heterogamous. Homogamous spikelets herbaceous, flat, lanceolate-oblong. Sessile spikelet subterete; callus long, pungent, bearded, its apex exposed; lower glume leathery, base subrounded, margins inrolled embraced upper glume; upper glume awnless; lower floret reduced to a hyaline lemma; upper lemma stipe-like, with an awn arising from the apex; awn geniculate, with hairy column. Pedicellate spikelet staminate or barren, lanceolate-oblong, larger than sessile spikelet, similar to homogamous spikelets, awnless.

Six species distributed throughout the tropics and subtropics; three species in China; one species in Hong Kong.

Figure 150. *Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schult. *1.* portion of plant; *2.* fertile spikelet and sterile spikelet. (drawn by H. P. Yu)

1. Heteropogon contortus (L.) P. Beauv. ex Roem. & Schult. 黃茅 **(Fig. 150; Photo 397)**

Syst. Veg. 2: 836. 1817; FKH 322. 1912; FHN 4: 483, fig. 1268. 1977; FFJ 6: 269, fig. 242. 1995; FRPS 10(2): 240, pl. 60: 1–12. 1997; FTW ed. 2, 5: 551, pl. 233. 2000; FOC 22: 638. 2006; FGD 9: 503, fig. 267. 2009.

Andropogon contortus L., Sp. Pl. 2: 1045. 1753.

Heteropogon hirtus Pers., Syn. Pl. 2: 533. 1807; FHK 424. 1861.

Perennial herb. Culms slender, tufted, usually geniculate at base, glabrous, 20–100 cm tall. Leaf sheaths keeled, longer than the internode, pilose at mouth; leaf blades flat or folded, 10–30 × 0.3–0.6 cm, scabrid or adaxial surface pilose at base; ligule short, membranous, ciliate, truncate. Racemes 3–6(–10) cm, mostly long exserted, solitary or aggregated into a scanty false panicle, the awns forming a twisted spire. Spikelets paired, basal 3–10 spikelets imbricate, sterile, persistent, awnless; upper 7–12 spikelets paired, heterogamous, 1 pedicellate, other sessile. Sessile spikelet ca. 7 mm, bisexual; callus fiercely pungent, acute and pungent, brown bearded; lower glume narrow oblong, hispidulous, abaxially rounded, apex obtuse, margins embraced same texture upper glume; upper glume narrow, 2-veined, hispidulous between veins, apex obtuse, margins membranous; lower lemma oblong; upper lemma membranous, very narrow, apex tipped with a geniculate awn of 6–10 cm long, column twisted and hairy, dark brown, column white-hirtellous, tips of successive awns often twisting together; stamens 3. Pedicellate spikelet oblong-lanceolate, barren.

Locality: Common in Hong Kong. *Y. W. Lam 802, 987; K. L. Yip 4382.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Gansu, Shaanxi, Henan, Hubei, Hunan, Jiangxi, Zhejiang, Fujian, Taiwan; tropics and subtropics of the world, extending to Mediterranean and other warm-temperate areas.

Ecology: Grassy hillslopes, roadsides. Flowering & fruiting: Apr.–Dec.

68. Dichanthium Willemet 雙花草屬

Perennial, rarely annual herbs. Culms compressed. Leaf sheaths keeled, nodes glabrous or hairy; leaf blades linear, flat or inrolled; ligule membranous. Inflorescence of single or subdigitate racemes, terminal or also axillary and sometimes supported by spathes; rachis internodes and pedicels linear, without longitudinal grooved. Spikelets paired, alternate, 1 sessile, the other pedicellate. Sessile spikelet bisexual, dorsally compressed; callus short, obtuse, apex exposed; lower glume papery to cartilaginous, broadly convex to slightly concave, sometimes pitted, rounded on flanks, becoming 2-keeled upward, apex obtuse; upper glume boat-shaped, dorsally keeled, awnless; lower floret reduced to an empty hyaline lemma; upper lemma stipitiform, entire or slightly 2-lobed, awned from apex; awn geniculate, glabrous or puberulous; lodicules 2; stamens 2–3. Pedicellate spikelet similar to the sessile spikelet, staminate or barren, awnless.

About 20 species distributed in Africa through India to SE Asia and Australia; three species in China; one species in Hong Kong.

1. Dichanthium annulatum (Forssk.) Stapf
雙花草 **(Fig. 151; Photos 398–399)**

Fl. Trop. Afr. 9: 178. 1917; FHN 4: 477, fig. 1263. 1977; FRPS 10(2): 139, pl. 33: 1–10. 1997; FTW ed. 2, 5: 537. 2000; FYN 9: 657, fig. 109: 7–9. 2003; FOC 22: 605. 2006; FGD 9: 496, fig. 262. 2009.

Andropogon annulatus Forssk., Fl. Aegypt.-Arab. 173. 1775; FKH 323. 1912.

Perennial herb. Culms tufted, erect, 30–100 cm tall, nodes densely bearded. Leaf sheaths terete, shorter than internode except the base; leaf blades narrowly linear, 8–30 × 0.2–0.4 cm, adaxial surface covered with tubercle-based silky hairs, abaxial surface usually glabrous, base rounded, apex acuminate, margins scabrous; ligule 1–2 mm, dry membranous, ciliate. Inflorescence terminal; peduncle glabrous; racemes 2–8, subdigitate, with 0–6 pairs of homogamous spikelets; rachis internode and pedicel 1/2 length of sessile spikelet, margins long ciliate. Sessile spikelet bisexual, ovate-oblong or elliptic-oblong or oblong, 3–5 mm; lower glume dorsally flat, shallowly concave in the middle, apex membranous and obtuse, margins inrolled or keeled, keels shortly ciliate; upper glume boat-shaped, as long as lower glume, ciliate along keel and margins; lower lemma linear-oblong, hyaline membranous, veinless; upper lemma narrow, tipped with a long flexuose awn arising from the apex; awn 1.5–2.5 cm. Caryopsis obovate-oblong. Pedicellate spikelet as long as sessile spikelet, staminate or neuter.

Locality: Hong Kong Island, Kowloon. *Y. S. Lau 2591; L. T. Lo 588; HK sheet 41927.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hubei, Taiwan; Indian Subcontinent, Malay Peninsula, Indonesia, Philippines, Pacific islands, Africa.

Ecology: Hillslopes, disturbed places. Flowering & fruiting: Jun.–Nov.

Figure 151. *Dichanthium annulatum* (Forssk.) Stapf
1. portion of plant; *2.* portion of inflorescence showing pedicellate and sessile spikelets. (drawn by X. L. Chen)

69. Oryza L. 稻屬

Annual or perennial. Culms tufted, erect or ascending. Leaf blades mainly cauline, broadly linear, herbaceous, flat, with smooth or scabrid margins; ligule membranous. Inflorescence a panicle, often nodding, with raceme-like primary branches; pedicels short. Spikelets with 1 fertile floret above 2 sterile lemmas, strongly laterally compressed, disarticulating below sterile lemmas, persistent in cultivated species; glumes vestigial, remaining after disarticulation as a shallow lobed frill at pedicel apex; fertile lemma boat-shaped, strongly keeled, leathery, closely papillose, sometimes spinulose, infrequently smooth, prominently 5-veined, apex awnless to long awned; palea resembling lemma but narrower, 3-veined, apex beaked. Stamens 6. Caryopsis variable in shape, hilum linear.

Approximately 25 species in warm parts of Africa, Asia, Australia and C & S America; five species (two introduced) in China; one species (cultivated) in Hong Kong.

1. Oryza sativa L. 稻 **(Photo 400)**

Sp. Pl. 1: 333. 1753; FKH 317. 1912; FHN 4: 396. 1977; FTW ed. 2, 5: 323. 2000; FOC 22: 183. 2006; FGD 9: 332. 2009.

Oryza formosana Masam. & Suzuki, Trans. Nat. Hist. Soc. Formosa 25: 320. 1935.

Annual or short-lived perennial herb, 0.5–1.5 m tall. Culms tufted, erect. Leaf sheaths glabrous; auricles falcate, ciliate; leaf blades cauline, linear, 25–80 × 0.5–3 cm, glabrous, smooth or scabrid on both sides, margins scabrid, apex acuminate; ligule ovate to lanceolate, 10–40 mm, margins decurrent to the sheath; leaf sheaths slightly inflated below, upper sheaths tight, glabrous, auricles falcate, ciliate. Panicle loosely contracted, up to 30 cm, nodding at maturity; branches 1–3 at lowest node, longest 2–12 cm, axils bearded or glabrous. Spikelets flattened, oblong to oblong-lanceolate, 6–10 mm; sterile lemmas lanceolate, 1.5–4 mm, apex acuminate; fertile lemma 5-veined, hard, siliceous, hispidulous, apex acuminate, as long as spikelet; palea 3-veined, same texture and length as lemma; awn very variable, slender or stout, up to 60 mm or more, scaberulous, sometimes absent. Anthers 1–3 mm. Caryopsis ovate or elliptic to cylindrical, 5–7 mm, whitish yellow to brown or blackish.

Locality: Cultivated. *Y. S. Lau 2419; HK sheet 14939, 14943.*

Distribution: Cultivated throughout tropical, subtropical, and warm temperate regions.

Ecology: Usually two crops a year in Hong Kong.

Uses: Food (cereal).

70. Leersia Sol. ex Sw., *nom. cons.* 李氏禾屬

Perennial, aquatic or marsh herbs. Culms slender, with swollen, hairy nodes, erect or ascending from the creeping or floating base. Leaf blades mainly cauline, linear-lanceolate; ligule papery. Inflorescence a lax panicle, branches often simple and raceme-like, pedicels short. Spikelets 1-flowered, elliptic to narrowly oblong, strongly laterally compressed, not stipitate, disarticulating from pedicel; glumes absent; lemma boat-shaped, keeled, papery to leathery, prominently 5-veined, marginal veins interlocking with marginal veins of palea, keel scabrid to pectinate ciliate, apex acute or beaked, awnless or awned; palea resembling lemma but narrower, 3-veined, keel ciliate. Stamens 1, 2, 3, or 6. Caryopsis oblong; hilum linear.

Approximately 20 species in tropical and warm temperate regions of the world; four species in China; one species in Hong Kong.

1. Leersia hexandra Sw. 李氏禾 **(Fig. 152; Photos 401–402)**
Prodr. 21. 1788; FKH 317. 1912; FTW ed. 2, 6: 321. 2000; FRPS 9(2): 9, pl. 2: 4. 2002; FOC 22: 184. 2006; FGD 9: 333. 2009.

Perennial herb. Culms loosely tufted, erect from decumbent base, up to 50 cm or more tall, nodes swollen, retrorsely puberulent. Leaf blades narrowly linear-lanceolate, 3–12 × 0.2–0.6 cm, flat or sometimes rolled, abaxial surface scabrid on midrib, base contracted, apex sharply acute; ligules membranous, 1–3 mm, truncate; leaf sheaths smooth or scabrid. Panicle loose, lanceolate-oblong in outline, 5–10 cm. Spikelets narrowly elliptic to elliptic-oblong, 3–5 × 1.2–1.5 mm, pale green or purple tinged, contracted at base; lemma 5-veined, conspicuously pectinate-hispid on keel, lateral veins and sometimes surface sparsely spinulose, margins shortly hispid, apex contracted into a short obtuse beak; palea same texture and length as lemma, 3-veined. Stamens 6, anthers 2–2.5 mm.

Locality: Widely distributed in Hong Kong. *Y. W. Lam 891; HK sheet 30737, 41941.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Fujian, Taiwan; tropical regions of the world.

Ecology: Marshlands, stream banks, shallow water. Flowering & fruiting: May–Dec.

Figure 152. *Leersia hexandra* Sw.
1. plant; *2.* ligule; *3.* spikelet. (drawn by H. P. Yu)

71. Avena L. 燕麥屬

Annual herbs. Culms erect or geniculate at base, glabrous. Leaf blades linear, flat; ligule membranous. Inflorescence a terminal panicle with large pendulous spikelets. Spikelets more than 10 mm, pendulous, 2–several-flowered, the lower 1–3 florets bisexual, others ± reduced; rachilla pilose or glabrous, disarticulating below each floret or only above glumes, or not disarticulating (cultivated species); glumes lanceolate to elliptic, usually subequal and as long as spikelet, rarely strongly unequal or shorter than spikelet, herbaceous to membranous, 7–11-veined, back rounded, smooth, apex acuminate; floret callus acute to pungent, bearded; lemmas shorter than or equalling the glumes, lanceolate-oblong, rarely exserted, abaxially rounded, 5–9-veined, glabrous to hispid, awned usually from near middle of abaxial side, apex papery, 2-toothed to 2-fid, lobes sometimes extended into fine bristles, awn geniculate with twisted column (or rarely straight), sometimes reduced or absent (cultivated species); palea usually shorter than lemma, 2-keeled, keels ciliate. Stamens 3, stigmas 2. Ovary densely hairy. Caryopsis with long linear hilum.

About 25 species distributed in Mediterranean region, SW Asia, Europe and N Asia, and widely introduced and naturalized in other temperate regions; five species (all introduced) in China; two species and one variety in Hong Kong.

1a. Spikelets not regularly disarticulating; the 1st lemma glabrous abaxially, awnless or with a straight awn arising from abaxial side ..... 1. *A. sativa*
1b. Spikelets disarticulating below each floret; the 1st lemma hirsute below middle, awn usually well-developed and geniculate.
2a. Lemmas hispid in lower half, dark brown at maturity ..... 2. *A. fatua* var. *fatua*
2b. Lemmas glabrous, yellow at maturity ..... 2a. *A. fatua* var. *glabrata*

1. Avena sativa L. 燕麥

Sp. Pl. 1: 79. 1753; FRPS 9(3): 173, pl. 44: 9–11. 1987; FTW ed. 2, 5: 351. 2000; FOC 22: 324. 2006; FGD 9: 389. 2009.

Annual herb, 40–80 cm tall. Leaf blades linear, 8–30 × 0.4–1.5 cm, glabrous, margins sometimes scaberulous; ligule papery, tongue-shaped, 2–6 mm; leaf sheaths usually glabrous. Panicle (10–)20–40 cm, nodding; branches spreading or contracted. Spikelets nodding, 2–3 cm, 1–2-flowered; rachilla ± glabrous, straight, not disarticulating or fracturing irregularly at maturity, florets lacking a basal bearded callus; glumes lanceolate, subequal, as long as spikelet, 7–9-veined; lemmas 1.2–2.5 cm, leathery in lower half, herbaceous and distinctly veined above, apex minutely and irregularly 2–4-denticulate; awn 2.5–3.5 cm, weakly geniculate or rudimentary or absent; palea shorter than the lemma, minutely hairy on the two keels. Caryopsis hairy, adherent to lemma and palea at maturity, hilum linear.

Locality: So Kon Po, Castle Peak. *Y. S. Lau 3285; HK sheet 8637, 8638.*

Distribution: Cultivated throughout China.

Ecology: Flowering & fruiting: Apr.–Sep.

Uses: Food (cereal), animal food (fodder).

2. Avena fatua L. 野燕麥

Sp. Pl. 1: 80. 1753; FHK 430. 1861; FKH 326. 1912; FRPS 9(3): 172, pl. 44: 4–6. 1987; FFJ 6: 126, fig. 97. 1995; FTW ed. 2, 5: 351. 2000; FOC 22: 324. 2006; FGD 9: 389. 2009.

Avena fatua L. subsp. *meridionalis* Malzev, Trudy Prikl. Bot. 20: 140. 1929.

Avena meridionalis (Malzev) Roshev., Fl. Turkm. 1: 105. 1932; FRPS 9(3): 170. 1987.

Annual herb, 60–120 cm tall. Culms erect or geniculate at base, glabrous, 2–4-noded. Leaf blades linear, 10–30 × 0.4–1.5 cm, scabrid or adaxial surface and margins pilose; ligule tongue-shaped, 1–5 mm; leaf sheaths glabrous or basal sheaths puberulous. Panicle narrowly to broadly pyramidal, 10–40 cm, branches scabrid. Spikelets pendulous, 1.8–2.5 cm, 2–3-flowered; rachilla articulate beneath each floret, easily disarticulating at maturity, internodes hirsute or glabrous, callus densely bearded with hairs up to 4 mm; glumes lanceolate, subequal, herbaceous, 9–11-veined, apex finely acute; lemmas 1.5–2.5 cm, leathery, densely hispid in lower half, green and scaberulous above, awned from near middle, apex unequally and shortly 2–4-toothed; awn 2–4 cm, geniculate, column twisted, blackish brown; palea flattened, 2-keeled, margins ciliate. Caryopsis hairy; hilum linear.

Locality: Wong Chuk Hang, Tai Lung Farm. *HK sheet 30756.*

Distribution: Widely spread over all provinces of China; native to Europe and W Asia.

Ecology: Farmlands, margins of fields, and abandoned lands. Flowering & fruiting: Apr.–Sep.

Uses: Animal food (fodder).

2a. Avena fatua L. var. **glabrata** Peterm. 光稈野燕麥

Fl. Bienitz 13. 1841; FRPS 9(3): 173, pl. 44: 7. 1987; FFJ 6: 127. 1995; FOC 22: 325. 2006; FGD 9: 389. 2009.

It differs from the type variety by its lemmas being glabrous, and turning yellowish at maturity.

Locality: Fanling. *Y. S. Lau 3113.*

Distribution: The same as for the species.

Ecology: Grassy mountain slopes, roadsides, farmlands. Flowering & fruiting: Apr.–Sep.

72. Eriachne R. Br. 鷓鴣草屬

Perennials. Leaf blade narrow, mostly rolled and needle-like; ligule a fringe of hairs. Inflorescence a terminal panicle, open or contracted, with solitary, pedicellate spikelets. Spikelets all alike, 2-floret, disarticulating below each floret; rachilla very short, without extension; glumes subequal, rounded on the back, 1/2 as long to much exceeding the florets, papery with hyaline or scarious margins; floret callus short, obtuse; lemmas pilose, grooved or smooth, acute or more often awned; paleae usually similar to lemmas in texture and indumentum, entire or bidentate, keels rounded, sometimes excurrent into awns. Stamens (2–)3. Caryopsis ellipsoidal, dorsally compressed.

About 40 species mainly in Australia, with a few species spreading into S and SE Asia; one species in China and Hong Kong.

1. Eriachne pallescens R. Br. 鷓鴣草 **(Fig. 153)**

Prodr. 184. 1810; FKH 326. 1912; FHN 4: 371, fig. 1181. 1977; FRPS 9(3): 123, fig. 30: 4–6. 1987; FOC 22: 561. 2006; FGD 9: 341. 2009.

Perennial herb, 20–60 cm tall, with many wiry roots. Culms tufted, erect, sometimes branched from the base, glabrous. Leaf blade 2–10 cm, stiff, usually rolled and needle-like, usually papillose-pilose; ligule ca. 0.5 mm, ciliate; leaf sheaths usually shorter than internodes, ciliate along margins and mouth. Panicle open, 5–10 cm; branches very slender, smooth and glabrous. Spikelets purplish, 4–5.5 mm; glumes ovate-lanceolate, 3–4 mm, glabrous, 9–10-veined; lemmas 3–3.5 mm, densely hispid, apex constricted, bidentate, awned from sinus; awn erect, subequal to lemma body; palea equal to its lemma, dorsally hispid. Anthers 2, 2–2.5 mm. Caryopsis oblong, ca. 2 mm.

Locality: Common in Hong Kong. *L. T. Lo 562; HK sheet 41944, 41954.*

Distribution: Hainan, Guangdong, Guangxi, Jiangxi, Fujian; Indochina, Indian Subcontinent, Malay Peninsula, Indonesia, Philippines.

73. Phalaris L. 鵝草屬

Annual or perennial herbs. Culms usually tufted, sometimes the lowest internode swollen into a corm. Leaf blades flat, linear; ligule membranous. Inflorescence a contracted or spike-like panicle. Spikelets strongly laterally compressed, ovate, 3-flowered, the lower 2 floret usually reduced to sterile lemmas and uppermost floret bisexual, disarticulating above glumes at maturity, rachilla not or very rarely extended beyond uppermost floret; glumes subequal, boat-shaped, as long as spikelet and enclosing florets, herbaceous, prominently 3-veined, strongly keeled and often winged along midvein; sterile lemmas usually subulate and up to 1/2 length of fertile lemma, rarely chaffy or as little fleshy scales, sometimes reduced to an obscure knob; fertile lemma laterally compressed, leathery often becoming cartilaginous and shiny, rounded on back, obscurely 5-veined, awnless; palea resembling lemma, 2-veined. Stamens 3. Caryopsis tightly enclosed by lemma and palea; embryo small; hilum linear.

About 15 species distributed mainly in the Mediterranean region and warm-temperate parts of the New World; five species (four introduced) in China; one species in Hong Kong.

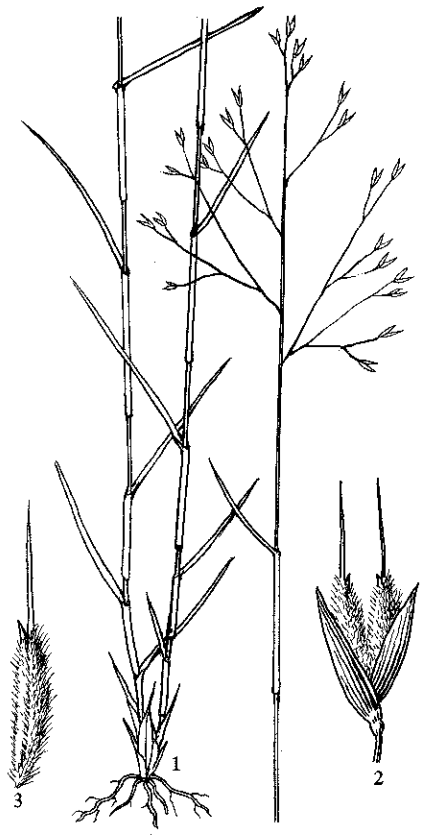

Figure 153. *Eriachne pallescens* R. Br.
1. plant; *2*. spikelet; *3*. floret. (drawn by H. P. Yu)

1. Phalaris canariensis L. 加那利鵝草(鵝草)
Sp. Pl. 1: 54. 1753; FTW ed. 2, 5: 361. 2000; FOC 22: 335. 2006.

Annual herb. Culms loosely tufted, 30–60(–100) cm tall, glabrous. Leaf blades 10–30 × 0.5–1.2 cm, glabrous; ligule acute, 3–8 mm; leaf sheaths cylindrical, mostly shorter than the internode. Panicle spike-like, 1.5–4 × 1.5–2 cm, ovate to oblong-ovate. Spikelets obovate, 3-flowered, extremely compressed, 6–9 mm; glumes 7–10 mm, oblanceolate, glabrous or puberulent, whitish with green longitudinal stripes, keel broadly winged above middle, apex acute; sterile lemmas 2, equal, narrowly elliptic, chaffy, 2.5–4 mm, appressed-pilose; fertile lemma lanceolate, 5–6 mm, shiny, densely appressed-pubescent; palea oblong, 2-veined. Anthers 3–4 mm.

Locality: Clear Water Bay (cultivated). *L. T. Lo 615.*

Distribution: Hebei, Shanghai, Taiwan (cultivated or naturalized); native to Madagascar and N Africa, naturalized throughout the world.

Ecology: Flowering & fruiting: Oct.

74. Polypogon Desf. 棒頭草屬

Annual or perennial herbs. Leaf blades flat, linear; ligule membranous. Panicle contracted to spike-like, often bristly with many small deciduous spikelets. Spikelets with 1-flowered, laterally compressed, narrowly oblong to oblong, falling entire together with pedicel or upper part of it; rachilla not prolonged; glumes longer than floret, subequal, papery, scabrid, 1-veined, apex entire to 2-lobed, often with slender awn from apex; lemma ca. 1/2 as long as glumes, truncate, hyaline, obscurely 5-veined, veins usually shortly excurrent from truncate apex, awnless or with fine subapical awnlet or geniculate dorsal awn; palea 1/2 as long to equalling lemma. Stamens 1–3.

About 25 species distributed in warm-temperate regions of the world and on tropical mountains; six species (at least four introduced) in China; two species in Hong Kong.

1a. Awn of glumes equal to or shorter than glume body ..... 1. *P. fugax*
1b. Awn of glumes 2.5–4 times as long as glume body ..... 2. *P. monspeliensis*

1. Polypogon fugax Nees ex Steud. 棒頭草 **(Photo 403)**
Syn. Pl. Glumac. 1: 184. 1854; FFJ 6: 123, fig. 92. 1995; FOC 22: 362. 2006; FGD 9: 393. 2009.
Polypogon littoralis auct. non Sm.: FHK 427. 1861; FKH 326. 1912.

Annual herb, 10–75 cm tall. Culms tufted, geniculate at base, mostly glabrous. Leaf blades narrowly to broadly linear, 2.5–15 × 3–4 cm, scabrid or abaxial surface smooth, apex acute; ligule membranous, 3–8 mm, apex 2-fid or irregularly toothed. Panicle spike-like, 4–15 × 1–3.5 cm, pale green or tinged with purple; branches narrowly ascending, up to 4 cm, bearing densely clustered spikelets. Spikelets narrowly oblong, 1-flowered, 2–2.5 mm; glumes narrowly oblong, puberulous, vein scabrid-aculeate, margins ciliate in lower half, slightly notched at the apex, with an awn equal to or shorter than glume body; lemma papery, elliptic, 1–1.2 mm, apex shortly 4-toothed, midvein extended into a fine, straight, ca. 2 mm awn; palea membranous, as long as lemma, oblong. Stamens 3. Anthers ca. 0.7 mm. Caryopsis ellipsoidal, ca. 1 mm.

Locality: No precise locality. *HK sheet 41965*.

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Xinjiang, Sichuan, Shaanxi, Shanxi, Henan, Hubei, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; tropical and warm-temperate regions of Asia.

Ecology: Farmlands and other moist places. Flowering & fruiting: Apr.–Sep.

2. Polypogon monspeliensis (L.) Desf. 長芒棒頭草 **(Fig. 154)**

Fl. Atlant. 1: 67. 1798; FKH 326. 1912; FRPS 9(3): 253, pl. 62: 1–3. 1987; FFJ 6: 123, fig. 93. 1995; FTW ed. 2, 5: 364. 2000; FOC 22: 362. 2006; FGD 9: 394, fig. 201. 2009.

Alopecurus monspeliensis L., Sp. Pl. 1: 61. 1753.

Annual herb, up to 60 cm tall. Culms tufted, erect or geniculate at base, 1.5 mm in diam., 2–3-noded. Leaf blades narrowly to broadly linear, 2–13 × 0.2–0.9 cm, adaxial surface and margins scabrid, abaxial surface smooth, apex acute; ligule papery, tongue-shaped, 3–8 mm. Panicle spike-like, 1.5–16 × 1–3.5 cm, pale green, thickly clothed in yellow bristles. Spikelets narrowly oblong, 1-flowered, 1.5–3 mm; glumes as long as the spikelet, papery, narrowly obovate-oblong, vein scabrid-aculeate, margins ciliate, slightly notched at the apex, with a 4–7 mm straight awn; lemma papery, obovate, 1–1.2 mm, apex slightly 4-toothed, midvein extended into a fine, readily deciduous awn; palea membranous, as long as lemma, oblong. Stamens 3. Anthers ca. 0.8 mm. Caryopsis obovate-oblong, ca. 1 mm.

Locality: Hong Kong Island. *H. G. Goddard s.n.* (CUHK).

Distribution: Widely spread over most provinces of China; tropical and warm-temperate regions throughout the world.

Ecology: Moist places, shallow waters. Flowering & fruiting: May–Oct.

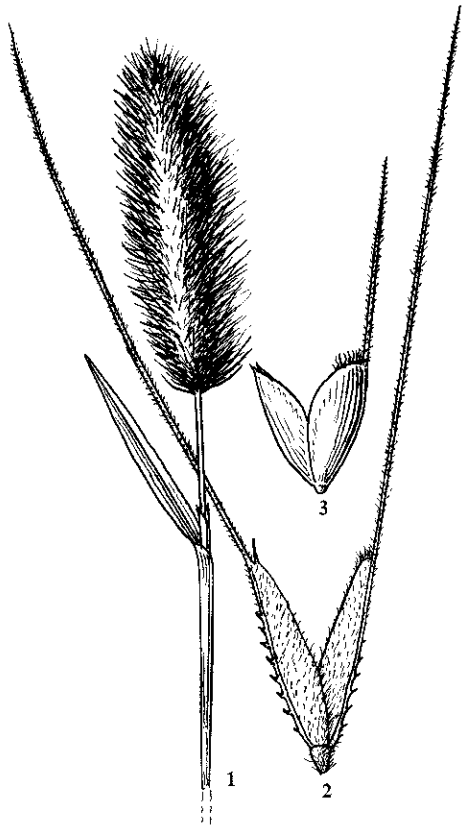

Figure 154. *Polypogon monspeliensis* (L.) Desf.
1. inflorescence; *2*. spikelet; *3*. floret. (drawn by H. P. Yu)

75. Alopecurus L. 看麥娘屬

Annual or perennial herbs. Culms solitary or tufted, usually geniculate at base. Leaf blades linear, flat; ligule membranous. Inflorescence a spike-like panicle, cylindrical to capitate, with many, closely packed spikelets; pedicels very short, apices cup-like. Spikelets strongly laterally compressed, 1-flowered, falling entire from pedicel; rachilla extension absent; glumes ± equaling and enclosing floret, broadly lanceolate to oblong, membranous to thinly leathery, prominently 3-veined, strongly keeled, keel usually ciliate, infrequently winged, lower margins almost free or connate for up to half their length, apex obtuse, acute or shortly awned; lemma broadly lanceolate to ovate, usually thinly membranous, keeled, obscurely 5-veined, smooth, glabrous, lower margins often connate, awned from lower back, apex truncate to acute; awn straight when short or geniculate when longer, column smooth, usually twisted at maturity, bristle scabrid; palea absent or very small; lodicules absent. Stigmas pubescent, protogynous; ovary glabrous. Caryopsis obliquely obovate in side view; endosperm sometimes liquid.

About 50 species in temperate and cold regions of the N hemisphere and S America; eight species in China; two species in Hong Kong.

1a. Spikelets 2–3 mm; palea 1; anthers bright orange, 0.5–0.8 mm ..... 1. *A. aequalis*
1b. Spikelets 4–6 mm; paleae 2; anthers pale yellow or white, 1–4 mm ..... 2. *A. japonicus*

1. Alopecurus aequalis Sobol. 看麥娘 **(Fig. 155; Photo 404)**

Fl. Petrop. 16. 1799; FKH 325. 1912; FRPS 9(3): 264, pl. 64: 8–9. 1987; FFJ 6: 113, fig. 85. 1995; FOC 22: 366. 2006; FGD 9: 396, fig. 203. 2009.

Alopecurus amurensis Kom., Izv. Imp. Bot. Sada Petra Velikago 16: 151. 1961.

Alopecurus aequalis Sobol. var. *amurensis* (Kom.) Ohwi, Bot. Mag. (Tokyo) 55: 360. 1941; FTW ed. 2, 5: 343. 2000.

Annual or short-lived perennial herb, 10–45 cm tall. Culms loosely tufted, ascending from geniculate base. Leaf blades soft, 2–10 cm × 2–6 mm, abaxial surface smooth, glabrous, adaxial surface closely ribbed, scaberulous; ligule 2–5 mm, obtuse; leaf sheaths smooth, slightly inflated. Panicle narrowly cylindrical, 2–7 × 3–6 mm, pale grey-green. Spikelets elliptic or oblong, 1.5–3 mm; glumes membranous, smooth, keels ciliate-hispid, lateral veins hispid on lower part, margins connate at base, ± parallel at the tips, apices obtuse; lemma equalling or slightly longer than glumes, margins connate below middle, awned from lower 1/4–1/3, apex obtuse; awn included within spikelet or exserted up to 1.2 mm, straight. Anthers orange, 0.5–0.8 mm.

Locality: Sha Tin, Sheung Shui, Lantau Island. *Y. S. Lau 836, 1539; S. P. Lau 106.*

Distribution: Spread over most provinces of China; widely distributed in Europe, temperate Asia and N America.

Ecology: Banks of ditches, rice fields, farmlands. Flowering & fruiting: Mar.–May.

2. Alopecurus japonicus Steud. 日本看麥娘

Syn. Pl. Glumac. 1: 149. 1854; FKH 325. 1912; FRPS 9(3): 262, pl. 64: 6–7. 1987; FFJ 6: 114. 1995; FOC 22: 366. 2006; FGD 9: 396. 2009.

Annual herb, 25–50 cm tall. Culms tufted, erect or geniculate at base, often forming large clump. Leaf blades soft, glaucous, 3–12 × 0.3–0.7 cm, abaxial surface smooth, adaxial surface scaberulous; ligule 2–5 mm. Panicle cylindrical, 3–10 cm, yellow-green; leaf sheaths lax, smooth, glabrous, upper sheaths inflated. Spikelets ovate-oblong, 4.8–7 mm; glumes herbaceous, smooth, keels wingless, stiffly ciliate, lateral veins pubescent near base or glabrous, margins connate only at extreme base, apices subacute; lemma slightly longer than glumes, herbaceous, margins connate in lower 2/5, awned from near base, apex subacute; awn exserted 5–8 mm from spikelet, weakly geniculate, column not twisted. Anthers white, ca. 1 mm.

Locality: Ma On Shan. *HK sheet 30736.*

Distribution: Guangdong, Guizhou, Yunnan, Sichuan, Hubei, Henan, Shaanxi, Anhui, Jiangsu, Zhejiang, Fujian; Japan, Korea.

Ecology: Banks of rice fields and other wet places. Flowering & fruiting: Feb.–May.

Figure 155. *Alopecurus aequalis* Sobol.
1. plant; *2.* spikelet; *3.* floret. (drawn by H. P. Yu)

76. Thysanolaena Nees 棕葉薑屬

Perennial herbs. Culms tufted, reed-like. Leaf blades flat, reticulately veined; ligule scarious. Inflorescence a large open panicle. Spikelets tiny, laterally compressed, 2-flowered, disarticulating above the glumes and between the florets; glumes ca. 1/2 length as the lemmas, hyaline, usually obtuse; lower floret barren and reduced to an acuminate membranous lemma, palea absent; upper floret bisexual, lemma ovate, acute or mucronate, ciliate on margins; a third, upmost floret exist or not, male or rudimentary, palea short, truncate. Stamens 2–3. Caryopsis subglobose; hilum punctiform.

A monotypic genus in SE Asia.

1. Thysanolaena latifolia (Roxb. ex Hornem.) Honda
棕葉薑 **(Fig. 156; Photos 405–406)**

J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 3: 312. 1930; FTW ed. 2, 5: 336. 2000; FOC 22: 446. 2006; FGD 9: 340, fig. 161. 2009.

Melica latifolia Roxb. ex Hornem., Suppl. Hort. Bot. Hafn. 117. 1819.

Thysanolaena maxima (Roxb.) Kuntze, Revis. Gen. Pl. 2: 794. 1891; FHN 4: 370, fig. 1180. 1977; FFJ 6: 128, fig. 99. 1995; FRPS 9(2): 30, pl. 4: 1. 2002.

Thysanolaena acarifera Arn. & Nees, Gramineae 49. 1841; FHK 417. 1861.

Thysanolaena agrostis Nees, Edinburgh New Philos. J. 18: 180. 1835; FKH 318. 1912; Check List HK Plants 349. 2002; 122. 2004.

Tall reed-like perennial herb, 1–4 m tall. Culms woody, with white pith. Leaf blades lanceolate, leathery, 30–50 × 3–7(–10) cm, base sub-amplexicaul, apex acuminate, glabrous; ligule 1–2 mm,

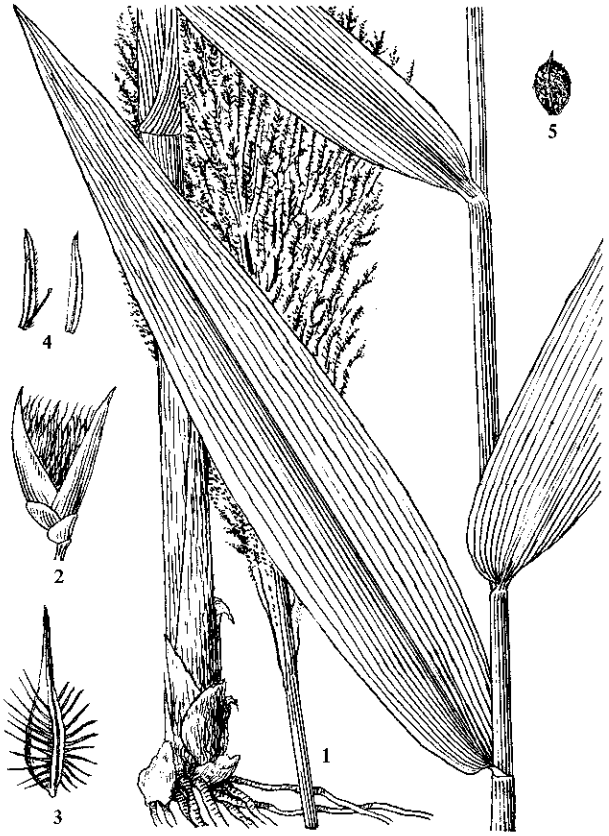

Figure 156. *Thysanolaena latifolia* (Roxb. ex Hornem.) Honda
1. portion of plant; *2.* spikelet; *3.* upper floret; *4.* paleae (adaxial and lateral views showing rachis between keels); *5.* caryopsis. (drawn by H. P. Yu)

subleathery, truncate. Panicle up to 60 cm, open or contracted, elliptic in outline; main branches 1–3 per node, pilose in axils; pedicels ca. 2 mm. Spikelets 1.5–2 mm, cylindrical, the margins ciliate-hispid, florets 2–3; lower floret reduced to only a ca. 1.5 mm lemma; upper floret ca. 1 mm; glumes 1/5–1/4 spikelet length, ovate-lanceolate, margins siliceous; lower glume apex with sinus; upper glume apex rounded; sterile lemma glabrous, as long as spikelet; fertile lemma slightly shorter than lower lemma, ciliate on the margin with 1 mm hairs, spreading at maturity, apex slightly recurved. Caryopsis oblong, ca. 0.5 mm.

Locality: Common in Hong Kong. *Y. S. Lau 2301, 3301; K. L. Yip 4081.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Taiwan; Indochina, Indian Subcontinent, Malesia, Indian Ocean islands.

Ecology: Margins of forests, moist grasslands. Flowering & fruiting: Mar.–Apr.

Uses: Animal food (forage), material (fiber).

77. Arundo L. 蘆竹屬

Tall rhizomatous perennial herbs. Culms erect, reed-like. Leaves cauline; leaf blades broadly linear, tough, flat, base rounded or cordate; ligule membranous with minutely ciliolate margins. Inflorescence a large terminal panicle, composed of many plumose branches and spikelets. Spikelets wedge-shaped, laterally compressed, 2–5-flowered, disarticulating above glumes and between florets; florets all fertile or the upper reduced; rachilla internodes glabrous; glumes subequal, narrow, as long as spikelet, membranous, 3–5-veined; floret callus short, laterally pilose; lemmas narrow, membranous, rounded on back, 3–9-veined, plumose below middle with spreading silky-white hairs, tapering to an entire or bidentate apex tipped by a straight awnlet in the sinus; palea 1/2–2/3 length of lemma, 2-keeled, densely ciliate on the keels. Stamens 3.

Three species distributed in Mediterranean region eastwards to China; two species in China; one species in Hong Kong.

1. Arundo donax L. 蘆竹 **(Fig. 157; Photo 407)**

Sp. Pl. 1: 81. 1753; FKH 327. 1912; FHN 4: 367. 1977; FFJ 6: 130, fig. 101. 1995; FTW ed. 2, 5: 326, pl. 123. 2000; FRPS 9(2): 20. 2002; FOC 22: 448. 2006; FGD 9: 339. 2009.

Perennial, reed-like herb, 2–6 m tall. Culms stout, erect, 1–3 cm in diam., often with slender branches from upper nodes. Leaf blades linear-lanceolate, flat, 30–60 × 2–5 cm, base rounded or cordate, amplexicaul, margins scabrous; ligule ca. 2 mm, fimbriate on upper margin, siliceous on dorsal side; leaf sheaths longer than internodes, usually glabrous except hairy at mouth. Panicle 30–70 × 5–8(10) cm, usually purplish, densely branched; branches 10–25 cm, ascending, axes strigose at nodes. Spikelets terete, 10–15 mm, 2–5-flowered; glumes subequal, (8–)10–13 mm, lanceolate to narrowly lanceolate, papery, siliceous, 3–5-veined, apex acute or with short awn; lower glume covered with a few silky hairs abaxially; lemma linear-lanceolate, (6–)8–13 mm, 3–7-veined, midvein prolonged into ca. 3 mm awn, 2 lateral veins also shortly extended, basal part densely covered with long silky hairs which are nearly as long as lemma; palea ca. 1/2 length of lemma, 2-keeled, margins ciliate, apex truncate; lodicules 2, truncate, veined. Stamens 3, anthers ca. 2.5 mm.

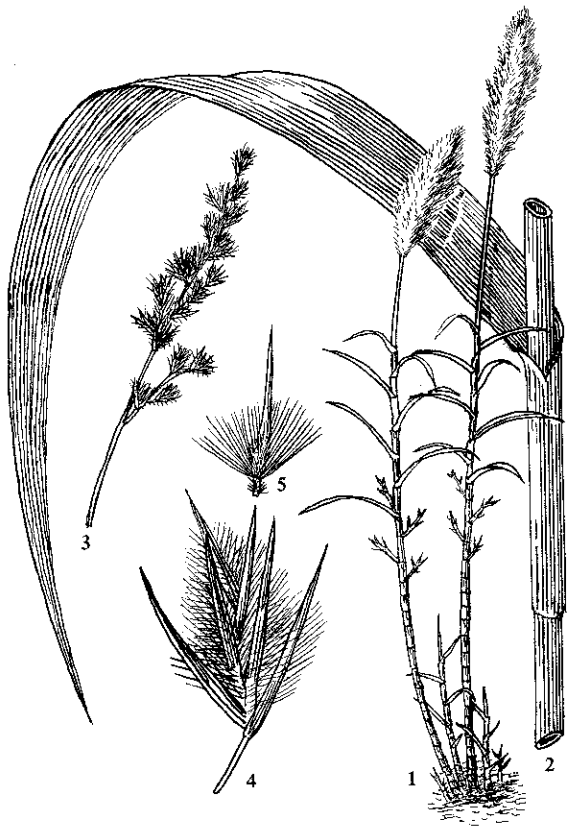

Figure 157. *Arundo donax* L.
1. plant; 2. leaf and portion of culm; *3.* portion of inflorescence; *4.* spikelet; *5.* floret. (drawn by H. P. Yu)

Locality: Siu Lek Yuen, Chuen Lung, Peng Chau. *Y. S. Lau 2538; L. Y. Lo 363; HK sheet 41736.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Hunan, Jiangsu, Zhejiang, Fujian, Taiwan (cultivated); Asia-Temperate, Indochina, Indian Subcontinent, N Africa, cultivated and naturalized elsewhere.

Ecology: River banks and other damp places. Flowering & fruiting: Oct.–Dec.

Uses: Ornamental, fuel (potential biomass for energy generation).

78. Phragmites Adans. 蘆葦屬

Perennial reeds, rhizomatous. Culms tall, erect. Leaves all cauline; leaf blades linear to narrowly lanceolate, flat; ligule membranous with ciliate margin. Inflorescence a large terminal panicle, composed of many branches and silky-hairy spikelets. Spikelets laterally compressed, with 3–11 loosely arranged florets, lowest floret masculine or empty, resembling glumes but longer, persistent, succeeding florets bisexual, the uppermost ± reduced; rachilla bearded above with long silky hairs, disarticulating between bisexual florets; glumes

3–5-veined, unequal, papery, much shorter than lowest lemma; floret callus linear, silky-plumose with long spreading hairs; lowest lemma 3–7-veined, ± persistent; fertile lemmas narrow, 1–3-veined, entire, acuminate, glabrous, rounded or slightly keeled on back; palea short, hyaline, ca. 2/3 length of lemma. Stamens 3, or 2 in the lowest floret.

A cosmopolitan genus of four or five species; three species in China; two species in Hong Kong.

1a. Culms up to 2 m tall; ligule up to 1.5 mm, long-ciliate; spikelets 10–18 mm ..... 1. *P. australis*
1b. Culms 4–6 m tall; ligule ca. 0.5 mm, shortly ciliate; spikelets 8–10 mm ..... 2. *P. vallatoria*

1. Phragmites australis (Cav.) Trin. ex Steud. 蘆葦 **(Photo 408)**

Nomecl. Bot. ed. 2, 1: 143. 1840; FFJ 6: 129, fig. 100. 1995; FTW ed. 2, 5: 329. 2000; FRPS 9(2): 27, pl. 4: 3, 3a. 2002; FOC 22: 449. 2006; FGD 9: 338, fig. 158. 2009.

Arundo australis Cav., Hist., Nat. 1: 100. 1799.

Arundo phragmites L., Sp. Pl. 81. 1753.

Phragmites communis Trin., Fund. Agrostis 134. 1820; FKH 328. 1912.

Perennial reed, with creeping rhizomes. Culms erect, 1.5–3(–6) m tall, ca. 6 mm in diam., usually farinose below nodes. Leaf blade linear-lanceolate, 15–45(–60) × 1–3.5 cm, smooth or margins scabrous; ligule a minute membranous rim, ca. 1 mm, ciliate, hairs 0.2–0.6 mm; leaf sheaths glabrous or thinly hairy. Panicle 10–40 cm, usually hirsute at axils of lower branches; pedicels 2–4 mm, glabrous or pilose at base. Spikelets 10–20 mm, florets 4–5; glumes lanceolate, 3-veined, lower glume up to 1/2 length of lowest lemma, 3–7 mm; upper glume 5–10 mm, sharply acute, usually apiculate; lowest lemma linear-lanceolate, 8–15 mm; floret callus elongate with hairs equal to lemma; palea 2.5–4 mm, 2-keeled, margins minutely ciliate, apex truncate.

Locality: New Territories, Lantau Island. *HK sheet 8663, 16103, 16109.*

Distribution: A worldwide weed.

Ecology: Beaches, river banks, margins of ponds. Flowering & fruiting: Jul.–Nov.

Uses: Environmental (ornamental, erosion control).

2. Phragmites vallatorius (L.) Veldkamp

卡開蘆 **(Fig. 158; Photos 409–410)**

Blumea 37(1): 233. 1992; FTW ed. 2, 5: 332. 2000.

Arundo vallatoria Pluk. ex L., Herb. Amb. 15. 1754.

Phragmites karka (Retz.) Trin. ex Steud., Nomenl. Bot., ed. 2, 1: 144. 1840; FKH 328. 1912; FHN 4: 368. 1977; FFJ 6: 129. 1995; FRPS 9(2): 25, pl. 4: 4, 4a. 2002; FOC 22: 449. 2006; FGD 9: 337. 2009; Check List HK Plants 344. 2002; 120. 2004.

Arundo karka Retz., Observ. Bot. 4: 21. 1786.

Phragmites karka (Retz.) Trin. ex Steud. var. *cincta* Hook. f., Fl. Brit. India 7: 305. 1897; FHN 4: 368. 1977.

Perennial reed, 4–6 m tall, with creeping rhizomes. Culms very stout, woody, 1.5–2.5 cm in diam. Leaf blades linear-lanceolate 20–50 × 2–3 cm, base slightly narrowed, apex long acuminate, glabrous; ligule 0.3–1 mm, upper margin ciliolate; leaf sheaths glabrous. Panicle 30–60 × 10–20 cm, copiously branched; branches mostly in whorls, the lowermost branches bare of spikelets toward base, ± glabrous at insertion. Spikelets 9–12 mm, 4–6-flowered, rachilla-hairs 4–7 mm, rather sparse; glumes lanceolate-elliptic, obtuse to acuminate, lower glume up to 1/2 length of the upper lowest lemma, 2.5–4 mm, upper glume 4–6 mm; lowest lemma narrowly elliptic, 7–12 mm; bisexual lemmas linear-lanceolate, 8.5–11 mm, apex long attenuate; floret callus elongate with 4–8 mm hairs; palea 3 mm, 2-keeled, margins minutely ciliate, apex truncate.

Locality: Mai Po, Castle Peak, Lin Au, Sai Kung, Lantau Island, Soko Islands. *Y. W. Lam 1300; HK sheet 40925, 41502.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Fujian, Taiwan; tropical Asia, N Australia, Pacific islands, Africa.

Ecology: Beaches, river banks, shady roadsides, swamps. Flowering & fruiting: Autumn.

Uses: Environmental (ornamental, erosion control).

Figure 158. *Phragmites vallatorius* (L.) Veldkamp
1. flowering branch; *2.* bisexual floret; *3.* pistil; *4.* spikelet. (drawn by H. P. Yu)

79. Centotheca Desv., *nom. et orth. cons.* 假淡竹葉屬

Perennial herbs. Culms tufted, erect. Leaf blades broadly linear to lanceolate, narrowed at base, with distinct cross veins; ligule membranous. Inflorescence a terminal panicle, much branched, the primary branches often reduced to racemes. Spikelets lanceolate, laterally compressed or subterete, comprising 1 fertile floret, or 2–3 fertile florets with a barren rachilla extension, or with diminished florets at the apex; glumes shorter than spikelet, unequal, separated by a short internode, 3–5-veined, dorsally keeled, apex acute or acuminate; lower glume 3/4–4/5 length of upper glume; lemmas oblong, dorsally rounded, 5–7-veined, apex acute or apiculate; palea narrower, equal to or shorter than its lemma, keels ciliate or glabrous; lodicules 2. Stamens 2–3.

Three or four species distributed in W Africa, tropical Asia, Australia and Pacific islands; one species in China and Hong Kong.

1. Centotheca lappacea (L.) Desv.
假淡竹葉 **(Fig. 159; Photo 411)**

Nouv. Bull. Sci. Soc. Philm. Paris 2: 189. 1810; FKH 329. 1912; FFJ 6: 132, fig. 104. 1995; FTW ed. 2, 5: 332. 2000; FRPS 9(2): 34, pl. 3: 4. 2002; FOC 22: 445. 2006; FGD 9: 384, fig. 192. 2009.

Cenchrus lappaceus L., Sp. Pl., ed. 2, 2: 1488. 1763.

Perennial herb, 40–100 cm tall. Culms loosely tufted, erect, smooth, 4–7-noded, clothed at base with few cataphylls. Leaf blades lanceolate-elliptic, 4–15 × 1–3 cm, base petiole-like, abaxial surface glabrous with cross veins, adaxial surface glabrous or loosely hispidulous, apex long attenuate; ligule 1–1.5 mm, apex rounded; leaf sheaths smooth or ciliate along one margin. Panicle large, open, 12–25 cm, primary branches up to 15 cm; pedicels 2.5–3 mm, slender, pubescent. Spikelets 4–8 mm, florets 2–3; glumes subleathery, elliptic, apex acute, (3–)5-veined; lower glume 2–2.5 mm, upper glume 3–3.5 mm; lowest lemma ca. 4 mm, subleathery, 7-veined, glabrous, apex acute; upper lemmas slightly smaller than the lowest, coarsely setose with tubercle-based, reflexing bristles near upper margins, the hairs retrorsely hispid when mature; paleae ca. 3 mm, firm, 2-keeled, ciliolate along keels, apex acute, hispid on the upper part of keel. Caryopsis ellipsoidal, 1–1.2 mm.

Locality: Common in Hong Kong. *S. Y. Hu & S. Liu 155; S. Y. Hu 8595* (CUHK).

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Jiangxi, Fujian, Taiwan; Indochina, Indian Subcontinent, Malesia, W tropical Africa, Australia, Pacific islands.

Ecology: Margins of forests, shady roadsides and other moist shady ground. Flowering & fruiting: Jun.–Oct.

Uses: Animal food (fodder).

Figure 159. *Centotheca lappacea* (L.) Desv.
1. plant; *2*. spikelet and stalk. (drawn by H. P. Yu)

80. Lophatherum Brongn. 淡竹葉屬

Perennial herbs; roots many, with small, spindle-shaped tubers. Culms unbranched. Leaves all cauline, narrowly lanceolate, many-veined and distinctly with cross veinlets, base contracted and petiole-like. Inflorescence a terminal panicle, composed of unilateral racemes. Spikelets falling entire, 1-flowered, rachilla extension bearing a bunch of up to 9 smaller sterile lemmas; cross veinlets evident on glumes and lemmas; glumes unequal, 5–7-veined, apex obtuse; fertile lemma 7-veined, all lemmas with a retrorsely scaberulous awn, those of the sterile lemmas developing into a fan of recurved hooks at maturity. Stamens 2 or 3.

Two species in warm temperate and tropical Asia; two species in China; one species in Hong Kong.

1. Lophatherum gracile Brongn. 淡竹葉 **(Fig. 160; Photos 412–413)**

Duperrey, Voy. Monde 2: 50. 1831; FHK 433. 1861; FKH 329. 1912; FHN 4. 366, fig. 1176. 1977; FFJ 6: 133. 1995; FTW ed. 2, 5: 334, pl. 128. 2000; FRPS 9(2): 35, pl. 3: 5. 2002; FOC 22: 445. 2006; FGD 9: 385, fig. 193. 2009.

Perennial herb, 60–150 cm tall, with short, knotty rhizomes and spindle-shaped root tubers. Culms loosely tufted, slender, stiffly erect. Leaf blades lanceolate, 5–30 × 2–5 cm, tesselate veined, base rounded to a 8–12 mm pseudopetiole, glabrous or with long hairs on both surfaces; ligule ca. 0.5 mm, brown, hispid on backside; leaf sheaths glabrous or pilose. Inflorescence loose, outline elliptic, 10–30 cm. Spikelets narrowly lanceolate, subterete, sessile, 7–12 mm, base glabrous or hairy, with 1 perfect and 3–7 neutral florets; glumes ovate, rounded on back, subleathery with membranous margins; lower glume 3–4.5 mm, 5-veined, glabrous or stiffly hairy near margins and apex, apex acute; upper glume ca. 5 mm, 5–7-veined, glabrous, apex obtuse; sterile lemma subleathery, 5–6 mm, siliceous,

7–9-veined, apex obtuse with 1.5–2 mm awn; fertile lemma oblong with straight back, 6–7 mm, awn 1.5–2 mm; palea lanceolate, hyaline, 2-keeled, ca. 5 mm. Caryopsis 3.5 mm.

Locality: Common in Hong Kong. *Y. S. Lau 149, 2028; HK sheet 42059.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; Japan, S Korea, Indochina, Myanmar, Thailand, India, Malesia.

Ecology: Shady slopes, roadsides and moist forests. Flowering & fruiting: Jun.–Oct.

Uses: Medicinal (folklore), animal food (fodder).

81. Lolium L. 黑麥草屬

Annual or perennial herbs. Leaf blades linear, flat or rolled, often auriculate at base; ligule membranous. Inflorescence a single, stiff, 2-sided raceme, spikelets arranged in 2 opposite rows, their inner edges sunk in hollows of the tough rachis. Spikelets laterally compressed, 3–12(–22)-flowered, uppermost floret reduced; glumes leathery, lower glume absent (except terminal spikelet); upper glume abaxial, narrow, persistent, shorter than lemmas to as long as spikelet; lemmas membranous to leathery, rounded on back, 5–9-veined, with or without a subterminal awn; palea usually equal to lemma. Caryopsis tightly enclosed by hardened lemma and palea; hilum linear.

About eight species in temperate N Africa, Asia and Europe, especially the Mediterranean region; six species (four introduced) in China; one species in Hong Kong.

Figure 160. *Lophatherum gracile* Brongn.
1. portion of plant; *2.* lower portion of plant showing root tubers; *3.* spikelet. (drawn by H. P. Yu)

1. Lolium perenne L. 黑麥草 **(Photos 414–415)**

Sp. Pl. 1: 83. 1753; FRPS 9(2): 289, pl. 33: 6. 2002; FOC 22: 244. 2006; FGD 9: 387. 2009.

Perennial herb, 20–90 cm tall. Culms tufted, erect or spreading, 1–2.5 mm in diam., 3–4-noded, sometimes prostrate and rooting from the lower nodes. Leaf blades linear, soft, 5–20(–30) cm × 3–6 mm, glabrous, folded when young, with or without 3 mm auricles at the base; ligule membranous, tongue-shaped, 1.5–2.5 mm; leaf sheaths 5–20 cm, glabrous. Raceme stiffly erect, or rarely slightly curved, 10–30 cm; rachis glabrous, smooth. Spikelets 0.5–2 cm, florets 3–10(–14); rachilla internodes ca. 1 mm, smooth, glabrous; lower glume absent, upper glume lanceolate, 1/3 as long to subequalling spikelet, 3–9-veined, margins narrowly membranous, apex acute or obtuse; lemmas oblong, herbaceous, 5–9 mm, 5-veined, smooth, apex obtuse to subacute, not turgid at maturity, usually awnless, rarely with an awn up to 8 mm; palea oblong, as long as the lemma, 2-keeled, minutely ciliate along keels, apex sinus. Anther ca. 3 mm. Caryopsis length more than 3 times width.

Locality: Cape D'Aguilar, Tseng Lan Shue (cultivated). *HK sheet 35645, 38096.*

Distribution: Commonly cultivated in China; widely distributed in Europe, N Africa and the temperate regions of Asia.

Ecology: Flowering & fruiting: May–Jul.

Uses: Environmental (erosion control), animal food (fodder, forage).

82. Poa L. 早熟禾屬

Annual or perennial herbs, tufted, sometimes stoloniferous. Culms with or without bulbous bases. Leaf blades flat, folded or involute, abaxially keeled, adaxially with 1 groove on either side of the midvein. Inflorescence an open or contracted panicle; branches 1–9 per node. Spikelets laterally compressed, 2–several-flowered, rachilla disarticulating above glumes and between florets, uppermost floret vestigial; glumes unequal, or subequal, lower glume 1- or 3-veined, upper glume 3 (or 5)-veined; lemmas laterally compressed, membranous but often with hyaline margins which tend to inflex at maturity, usually distinctly keeled, 5(–7)-veined, distal margins and apex membranous, apex awnless, rarely minutely mucronate; floret callus short, truncate, blunt, glabrous or with a web of woolly hairs; palea subequal or infrequently to 2/3 length as lemma, keels scaberulous to stiffly ciliolate. Stamens (1 or) 3. Anthers sometimes vestigial. Ovary glabrous. Caryopsis oblong to fusiform, triangular to oval in cross section, sometimes grooved, free or adhering to the palea; hilum basal and punctiform, rounded to oval.

About 500 species distributed in temperate regions throughout the world; 81 species in China; one species in Hong Kong.

1. Poa annua L. 早熟禾 **(Fig. 161)**

Sp. Pl. 1: 68. 1753; FFJ 6: 141. 1995; FTW ed. 2, 5: 386. 2000; FRPS 9(2): 159. 2002; FOC 22: 263. 2006; FGD 9: 386, fig. 194. 2009.

Annual or biennial herb, 6–30 cm tall. Culms loosely tufted, erect or geniculate at base, smooth. Leaf blades flat or folded, thin, 1–12 cm × 1–2(–5) mm, apex acutely prow-tipped, often transversely wrinkled, margins slightly scabrid; ligules membranous, collar-shaped, 1–3 mm, glabrous, apex obtuse, margin irregularly dentate, smooth; leaf sheaths slightly compressed, thin, smooth, uppermost closed for ca. 1/3 of length. Panicle open, broadly ovoid to pyramidal, (1–)3–10 cm. Spikelets ovate to oblong, dark to light green, (3–)4–6 mm, florets 3–5, distal fertile florets often female; rachilla internodes 0.5–1.5 mm, smooth, glabrous; glumes unequal, smooth or rarely keeled with hooks, the lower lanceolate to ovate, 1.5–3mm, 1-veined, the upper elliptic or oblong, 2–4 mm, 3-veined; lemmas ovate, 2.2–4 mm, apex and margins broadly membranous; palea narrowly lanceolate, apex blunt to acute, 2–2.5 mm, 2-veined, villous on veins. Anthers 0.6–1 mm. Caryopsis ellipsoidal, 1–1.5 mm, apex villous

Locality: Sha Tin. *Y. S. Lau 2958; HK sheet 30339.*

Distribution: A worldwide weed, also widely distributed in China.

Ecology: Moist shady places. Flowering: Apr.–May; fruiting: Apr.–Jul.

Uses: Animal food (fodder).

Figure 161. *Poa annua* L.
1. plant; *2.* ligule; *3.* apex of leave blade; *4.* spikelet; *5.* floret; *6.* palea. (drawn by H. P. Yu)

83. Sporobolus R. Br. 鼠尾粟屬

Annual or perennial herbs. Culms slender, tufted. Leaf blades linear to narrowly lanceolate, often rigidly ciliate; ligule a line of hairs. Inflorescence a contracted or divaricate panicle, rarely spiciform. Spikelets with 1 bisexual floret, subterete or ± compressed, awnless, glabrous; rachilla disarticulating above glumes; glumes usually shorter than lemma, unequal, membranous, deciduous or persistent, 1-veined or veinless, apex obtuse, acute or acuminate; lemma elliptic to narrowly ovate, thinly membranous, 1–3-veined, glabrous, rounded on back; palea resembling lemma, with 2 close veins, often split deeply between the veins as grain grows. Stamens 2–3. Ovary glabrous; styles 2, free, short, stigmas plumose, exserted laterally. Grain globose to ellipsoidal, rounded or truncate, pericarp free, commonly swelling when wet and expelling the grain, which often adheres to spikelet apex.

Approximately 150 species distributed in the tropics and subtropics, extending into warm-temperate regions; eight species (one introduced) in China; two species in Hong Kong.

1a. Panicle 19–45 cm; leaf blades 15–50 cm; lower glume less than 1/2 length of spikelet ..... 1. *S. fertilis*
1b. Panicle 2–10 cm; leaf blades 3–11 cm; lower glume 2/3–4/5 length of spikelet ..... 2. *S. virginicus*

1. Sporobolus fertilis (Steud.) Clayton 鼠尾粟 **(Fig. 162; Photo 416)**

Kew Bull. 19(2): 291. 1965; FRPS 10(1): 99, pl. 31: 6–10. 1990; FFJ 6: 178, fig. 146. 1995; FOC 22: 484. 2006; FGD 9: 360, fig. 173. 2009.

Agrostis fertilis Steud., Syn. Pl. Glumac. 1: 170. 1854.

Sporobolus indicus (L.) var. *major* (Buse) Baaijens, Blumea 35: 437. 1991; FTW ed. 2, 5: 435. 2000.

Sporobolus indicus auct. non R. Br.: FHK 426. 1861; FKH 325. 1912.

Figure 162. *Sporobolus fertilis* (Steud.) Clayton
1. plant; *2.* spikelet; *3.* seed. (drawn by H. P. Yu)

Perennial herb. Culms tufted, erect, 25–100(–120) cm tall. Leaf blades linear, flat or involute, 15–50(–65) × 0.2–0.5 cm, glabrous or thinly pilose on adaxial surface, tapering to a long filiform apex; ligule ca. 0.5 mm; leaf sheaths glabrous but margin ciliolate, basal sheaths papery, lightly keeled. Panicle linear, contracted to spike-like, 19–45 × 0.5–1.5 cm; branches 1–2.5(–5) cm, erect and appressed to main axis, or looser and narrowly ascending, densely spiculate throughout. Spikelets greyish or yellowish green, 1.7–2 mm; lower glume oblong, ca. 0.5 mm, veinless, apex truncate-erose; upper glume oblong-elliptic, 1/2–2/3 spikelet length, 1-veined, apex ± acute; lemma ovate, as long as spikelet, indistinctly 1(–3)-veined, acute. Anthers 3, 0.8–1 mm. Grain red-brown, obovate-elliptic, 0.9–1.2 mm, distinctly shorter than its lemma and palea, these gaping widely beyond its top, apex truncate.

Locality: Common in Hong Kong. *Y. S. Lau 1047; K. L. Yip 4042, 4483.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Gansu, Shaanxi, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; Indochina, Malesia, Indian Subcontinent.

Ecology: Roadsides, wastelands, grassy hillslopes. Flowering & fruiting: Mar.–Dec.

2. Sporobolus virginicus (L.) Kunth 鹽地鼠尾粟 **(Photo 417)**

Rev. Gramin. 1: 67. 1829; FRPS 10(1): 99, pl. 31: 11–14. 1990; FFJ 6: 179. 1995; FTW ed. 2, 5: 438. 2000; FOC 22: 483. 2006; FGD 9: 360. 2009.

Agrostis virginica L., Sp. Pl. 1: 63. 1753.

Perennial herb, with woody rhizomes. Culms erect or decumbent at base, 15–30(–60) cm tall, often fastigiately branched in upper part. Leaf blades leathery, glaucous, stiff, distichous, flat at first, soon inrolled and needle-like, 2–10 × 0.1–0.4 cm, abaxial surface smooth, adaxial surface scabrid, apex pungent; ligule ca. 0.2 mm, upper margin and abaxial surface ciliate; leaf sheaths tightly overlapping, loosely pubescent at mouth. Panicle linear, spike-like, 2–10 × 0.4–1 cm, branches 0.5–1.5 cm, erect, closely appressed to rachis. Spikelets grey-green or greenish yellow, fusiform, 2.3–2.7 mm, with 1 floret; glumes acute, papery; lower glume lanceolate, 2/3–4/5 spikelet length, 1-veined; upper glume narrowly ovate, as long as spikelet, 1-veined; lemma and palea the same texture with the glume; lemma ovate-lanceolate, 1-veined, boat-shaped, about 2 mm long; palea ovate, 2-keeled, truncate at the apex. Anthers 3, 1–1.5 mm. Grain subglobose 0.7–1 mm.

Locality: Common in Hong Kong. *S. P. Lau 155; Y. W. Lam 1584; K. Y. Tam 144.*

Distribution: Hainan, Guangdong, Zhejiang, Fujian, Taiwan; widespread in tropics and subtropics.

Ecology: Coastal sands. Flowering & fruiting: Jun.–Sep.

Uses: Environmental (erosion control).

84. Neyraudia Hook. f. 類蘆屬

Tall reed-like perennial herbs. Leaf cauline, blades linear, flat or rolled; ligule a line of hairs. Inflorescence a large plumose panicle, primary branches in clusters or solitary on central axis. Spikelets laterally compressed, 2–7-flowered; florets all bisexual with the upper reduced, or sometimes the lowest sterile and without a palea; glumes lanceolate, subequal or unequal, scarious-membranous, 1–3-veined, obtuse to acuminate or aristulate; lemmas longer than glumes, ovate-lanceolate, scarious-membranous, 3-veined, lateral veins long-ciliate with spreading hairs as long as lemma, apex setaceously bidentate with a short, often recurved awn from the sinus; palea almost as long as the lemma, hyaline, keels very shortly ciliate; callus obtuse, bearded. Caryopsis linear, subterete.

About five species distributed in the Old World tropics; four species (two endemic) in China; one species in Hong Kong.

1. Neyraudia reynaudiana (Kunth) Keng Hitchc.
類蘆(石珍茅) **(Fig. 163; Photo 418)**

Amer. J. Bot. 21(3): 131. 1934; FHN 4: 369, fig. 1176. 1977; FTW 5: 386. 1978; FFJ 6: 131. 1995; FRPS 9(2): 23, pl. 4: 5, 5a. 2002; FOC 22: 460. 2006; FGD 9: 340, fig. 160. 2009.

Arundo reynaudiana Kunth, Révis. Gramin. 1: 275. 1830.

Neyraudia arundinacea auct. non (L.) Henr.: FTW ed. 2, 5: 329. 2000.

Neyraudia madagascariensis auct. non (Kunth) Hook. f.: FKH 328. 1912.

Perennial herb, 1–3 m tall, with short, woody rhizomes. Culms reed-like, erect, 3–10 mm in diam., usually fasciculately branched, many-noded, internodes somewhat glaucous, nodes purple. Leaf

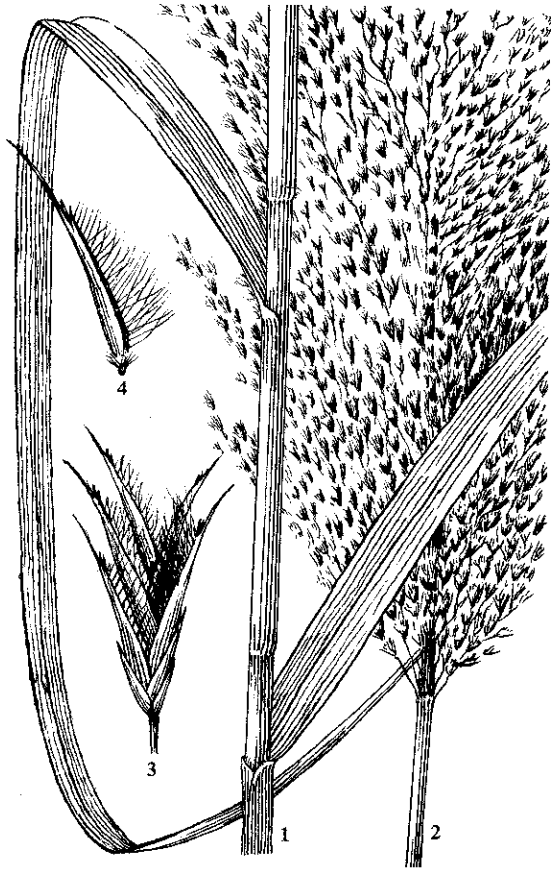

Figure 163. *Neyraudia reynaudiana* (Kunth) Keng Hitchc.
1. portion of plant; *2.* portion of inflorescence; *3.* spikelet; *4.* floret. (drawn by H. P. Yu)

blades flat or involute, 20–70 × 0.4–1 cm, glabrous or adaxial surface pilose, apex long acuminate; ligule 1–2 mm, truncate, shortly ciliate on dorsal side; leaf sheaths pilose at mouth. Panicle 30–70 cm, branches slender, ± nodding; pedicels 1–4 mm. Spikelets 5–9 mm, 4–10-flowered, the lowest floret sterile, resembling glumes but somewhat longer; glumes membranous, lanceolate, golden-brown or purplish, glabrous, subequal, 1.5–3 mm, apex acute; lemmas purplish, ca. 4 mm, lateral veins ciliate with white, soft, ca. 2 mm hairs, awn recurved, 1–2 mm; palea membranous, ca. 3 mm, 2–keeled, apex slightly cleft, minutely ciliate along keels.

Locality: Common in Hong Kong. *Y. S. Lau 3180; HK sheet 32294, 35659.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Gansu, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; Japan, Vietnam, Cambodia, Laos, Myanmar, Thailand, India, Nepal, Bhutan, Malaysia, Indonesia.

Ecology: Streamsides, hillslopes, rocky places. Flowering & fruiting: Aug.–Dec.

Uses: Environmental (erosion control).

85. Leptochloa P. Beauv. 千金子屬

Annuals or perennial herbs, tufted or rhizomatous. Culms erect or ascending, often rooting at base. Leaf blades linear or lanceolate, usually flat, margins involute; ligule short, membranous, sometimes with a ciliate fringe. Inflorescence open, composed of several to many slender secund racemes scattered along a central axis. Spikelets biseriate, usually crowded on abaxial side of rachis, sessile to shortly pedicellate, laterally compressed, one broad side appressed to rachis, usually overlapping, florets 1–several; rachilla disarticulating above glumes and between florets; glumes 1-veined, membranous, keeled, usually shorter than the lemmas, subequal to unequal, persistent; lemmas membranous, 3-veined, generally hairy along the veins, keeled or rounded, obtuse or 2-dentate, sometimes mucronate to short-awned; palea equal to or slightly shorter than lemma, 2-veined; lodicules 2, minute. Stamens (1–)3. Styles 2, short; stigmas plumose, laterally exserted. Caryopsis laterally or dorsally compressed.

About 30 species distributed in tropical and warm temperate regions; three species in China and Hong Kong.

1a. Perennials; spikelets 6–10 mm, subterete; lemmas shortly awned ..... 1. *L. fusca*

1b. Annuals; spikelets 1.4–4 mm, laterally compressed; lemmas awnless.

2a. Leaf sheaths and blades glabrous; racemes flexuose; spikelets 2–4 mm; florets 3–7 ..... 2. *L. chinensis*

2b. Leaf sheaths and blades pilose; racemes straight; spikelets 1.5–2 mm; florets 2–4 ..... 3. *L. panicea*

1. Leptochloa fusca (L.) Kunth 雙稃草 **(Fig. 164; Photo 419)**

Revis. Gramin. 1: 91. 1829; FOC 22: 469. 2006; FGD 9: 353. 2009.

Festuca fusca L., Syst. Nat., ed. 10, 2: 876. 1759.

Diplachne fusca (L.) P. Beauv., Ess. Agrost. 80, 163. 1812; FHN 4: 381. 1977; FRPS 10(1): 54, pl. 16: 1–6. 1990; FTW ed. 2, 5: 410. 2000; FYN 9: 433. 2003; Check List HK Plants 333. 2002; 117. 2004 [*"Diplachine"*].

Perennial herb, 60–150 cm tall. Culms tufted, erect or geniculate at base, often rooting and branching from the lower nodes. Leaf blades tough, usually inrolled and needle-like, 10–45 cm × 1.5–3 mm, scabrid, grey-green with a broad white central vein; ligule hyaline, ca. 2 mm, tongue-shaped; leaf sheath glabrous. Inflorescence a contracted panicle, 15–35 cm, composed of many slender racemes of 7–15 cm. Spikelets narrowly elliptic to elliptic, 8–15 mm, slightly overlapping, grey-green or olive-green, shortly pedicellate, 6–11-flowered; glumes papery, conspicuously 1-veined, keeled, scabrid on the keels, the lower lanceolate to narrowly lanceolate, 2–4.5 mm, apex acute or acuminate, the upper narrowly oblong, 3–7.5 mm, apex acute or obtuse and minutely mucronate; lemmas narrowly oblong, 3–6 mm, 3-veined, pilose on the lower part of the veins, 2- or more toothed and mucronate; midrib prolonged into a short awn of ca. 1.5 mm; palea elliptic, papery, 2-keeled, siliceous on keels. Anther ca. 0.5 mm. Caryopsis ca. 2 mm, dorso-ventrally flattened.

Locality: Sha Tin, Mai Po. *Y. W. Lam 852; HK sheet 34224, 39692.*

Distribution: Hainan, Guangdong, Yunnan, Hebei, Henan, Liaoning, Shandong, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; widely distributed from India through Malaysia, Indonesia to Australia, and extending to Africa.

Ecology: Swamps, marshes and other places with shallow water. Flowering & fruiting: Jun.–Sep.

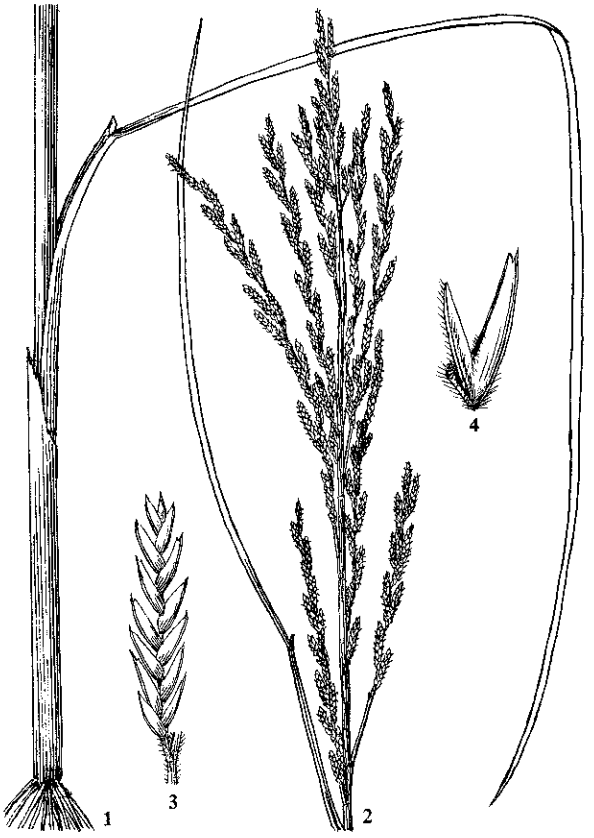

Figure 164. *Leptochloa fusca* (L.) Kunth

1. portion of plant; *2.* portion of inflorescence; *3.* portion of spikelet and rachis; *4.* floret. (drawn by H. P. Yu)

2. Leptochloa chinensis (L.) Nees
千金子 **(Fig. 165; Photo 420)**

Syll. Pl. Nov. 1: 4. 1824; FHK 430. 1861; FKH 327. 1912; FHN 4: 383. 1977; FRPS 10(1): 56, pl. 16: 7–12. 1990; FFJ 6: 158, fig. 130. 1995; FTW ed. 2, 5: 425. 2000; FOC 22: 470. 2006; FGD 9: 353. 2009.

Poa chinensis L., Sp. Pl. 1: 69. 1753.

Annual herb, 30–100 cm tall. Culms erect or geniculate at base, glabrous. Leaf blades flat or slightly involute, 5–25 × 0.2–0.9 cm, glabrous, scabrid on both surfaces or abaxial surface smooth, apex acuminate; ligule membranous, 1–5 mm; leaf sheaths glabrous. Panicle 10–50 cm, composed of many unilateral racemes; rachis scabrid. Spikelets usually purplish or brownish green, narrowly elliptic-oblong, laterally compressed, 2–4 mm, 3–7-flowered; glumes scabrid along keels and sometimes laterally; lower glume lanceolate, 1–1.5 mm, apex acute; upper glume elliptic-oblong, 1.2–2 mm, apex obtuse; lemmas elliptic-oblong, keeled, lowest ca. 1.5 mm, shortly appressed-hairy along lower margins and on either side of midvein, apex obtuse or minutely emarginate; palea minutely hispid on keels, appressed hairy on back and flaps. Anthers ca. 0.5 mm. Caryopsis oblong, 0.7–0.9 mm, plano-convex.

Locality: Common in Hong Kong. *Y. W. Lam 1352; HK sheet 42037, 42063.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Shaanxi, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; tropical and subtropical regions of Asia.

Ecology: Moist places in farmlands. Flowering & fruiting: Aug.–Nov.

Uses: Animal food (fodder).

Figure 165. *Leptochloa chinensis* (L.) Nees
1. plant; *2.* spikelet; *3.* floret. (drawn by H. P. Yu)

3. Leptochloa panicea (Retz.) Ohwi 蠅子草

Bot. Mag. (Tokyo) 55: 311. 1941; FHN 4: 382. 1977; FRPS 10(1): 57, pl. 16: 3. 1990; FFJ 6: 159. 1995; FTW ed. 2, 5: 427. 2000; FOC 22: 470. 2006; FGD 9: 354. 2009.

Poa panicea Retz., Observ. Bot. 3: 11. 1783.

Leptochloa filiformis auct. non Roem. & Schult: FKH 327. 1912.

Annual herb, 30–80 cm tall. Culms slender, tufted, ascending from the geniculate base. Leaf blades linear-lanceolate, 4–20 × 0.3–0.7 cm, glabrous or sparsely covered with tubercular hairs along lateral veins; ligule membranous, 1–2 mm, usually lacerate; leaf sheaths papillate-pilose. Panicle elliptic to oblong, 10–30(–50) cm, often purplish, composed of many slender unilateral racemes; rachis scabrid. Spikelets glaucous-green or purplish green, elliptic, ± laterally compressed, 1.4–2.5 mm, 2–5-flowered; glumes subequal, scabrid along keel; lower glume lanceolate, 0.7–1.5 mm, apex acuminate; upper glume narrowly oblong, 0.9–1.6 mm, apex acute or obtuse and mucronate; lemmas longer than the glumes, elliptic-oblong, keeled, lowest 0.8–1.3 mm, veins puberulous, usually also a few appressed hairs between veins, apex obtuse; palea keels scaberulous. Anthers ca. 0.2 mm. Caryopsis broadly elliptic, 0.7–0.8 mm, brown, obtusely trigonous, apex obtuse.

Locality: New Territories. *Y. S. Lau 1954; L. T. Lo 575.*

Distribution: Hainan, Guangdong, Guizhou, Yunnan, Sichuan, Shaanxi, Henan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; tropical and subtropical regions of Asia, Africa, America.

Ecology: Wastelands, roadsides, rice fields. Flowering & fruiting: Jul.–Oct.

Uses: Animal food (fodder).

86. Eragrostis Wolf 畫眉草屬

Annual or perennial herbs. Culms usually tufted. Leaf blades narrowly linear; ligule usually reduced to a ciliate rim, rarely membranous. Inflorescence an open, contracted, sometimes spike-like or even head-like panicle. Spikelets laterally compressed, 2–many-flowered, rarely only 1 fertile floret with sterile lemma above it; rachilla zigzag, or straight, tough or gradually breaking up at maturity, in the former case florets deciduous or paleae persistent; in the latter case florets deciduous with adjacent internode of rachilla; glumes mostly subequal, 1(–3)-veined; lemmas membranous to leathery, keeled or rounded, glabrous to asperulous or rarely hairy, 3-veined or the veins sometimes very faint and occasionally suppressed, apex entire, obtuse to acuminate, rarely mucronate; palea equalling lemma or shorter, keels sometimes winged or ciliate, deciduous with lemmas or tardily dropping off; lodicules 2. Stamens 2–3. Ovary glabrous; styles 2, short, stigmas exserted laterally. Fruit enclosed in lemma, globose, ellipsoidal or oblong, usually a caryopsis but

sometimes the pericarp free; hilum punctiform, basal.

About 350 species distributed mainly in the tropics and subtropics; 32 species (one introduced) in China; 14 species in Hong Kong.

1a. Florets disarticulating from above downward, falling together with the rachilla joints.
2a. Palea-keels long ciliate; branchlets and pedicels glandular ..... 1. *E. tenella*
2b. Palea-keels glabrous to ciliolate; branchlets and pedicels eglandular ..... 2. *E. japonica*
1b. Florets disarticulating from below upward, usually leaving the rachilla entire.
3a. Palea falling together with its lemma at maturity.
4a. Spikelets oblong, 5–10 × 2–4 mm, stamens 2, anthers 0.2–0.5 mm ..... 3. *E. unioloides*
4b. Spikelets filiform, 11–25 × 1–2.5 mm, stamens 3, anthers 0.7–0.9 mm ..... 4. *E. atrovirens*
3b. Palea persistent or tardily falling at maturity.
5a. Annual.
6a. Lower glume veinless, less than 1 mm; upper glume less than 1.4 mm ..... 5. *E. pilosa* var. *imberbis*
6b. Lower glume 1-veined, 1–2 mm; upper glume ca. 2 mm.
7a. Spikelets 3–5 × ca. 2 mm, 3–10-flowered ..... 6. *E. autumnalis*
7b. Spikelets 5–20 × 2–2.5 mm, 8–40-flowered ..... 7. *E. cumingii*
5b. Perennial.
8a. Panicle contracted and spike-like ..... 8. *E. cylindrica*
8b. Panicle open, not spike-like.
9a. Branches and pedicels glandular ..... 9. *E. ferruginea*
9b. Branches and pedicels eglandular.
10a. Inflorescence branches densely spiculate to base ..... 10. *E. brownii*
10b. Inflorescence branches naked at base.
11a. Leaf blades long pilose on both surfaces ..... 11. *E. pilosissima*
11b. Leaf blades glabrous, pubescent or pilose in part.
12a. Panicle sparse, with distant branches; florets 8–57 ..... 12. *E. spartinoides*
12b. Panicle open; florets 16 or less.
13a. Spikelets purplish, yellowish or greenish; leaf sheaths not compressed at the base ..... 13. *E. fauriei*
13b. Spikelets livid-green, black-green, purplish black, or plumbeous; leaf sheaths compressed at the base ..... 14. *E. curvula*

1. Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult. 鯽魚草 **(Photo 421)**

Syst. Veg. 2: 576. 1817; FKH 329. 1912; FHN 4: 374. 1977; FRPS 10(1): 28, pl. 123: 2. 1990; FFJ 6: 146, fig. 119. 1995; FOC 22: 478. 2006; FGD 9: 346. 2009.

Poa tenella L., Sp. Pl. 1: 69. 1753.

Eragrostis plumosa auct. non Link: FHK 431. 1861.

Annual herb. Culms slender, 10–60 cm tall, glabrous, striate. Leaf blades flat, 3–10 × 0.2–0.5 cm, adaxial surface scabrous, abaxial surface glabrous and smooth; ligule a line of short hairs; leaf sheaths shorter than internodes, pilose along margin and summit. Panicle open, 5–16 cm; branches spreading and with long hairs at axils, branchlets and pedicels with oblong yellowish glands. Spikelets ovate or oblong-ovate, 2–2.5 mm, 4–10-flowered; rachilla fragile, disarticulate between florets from above downward at maturity; glumes membranous, 1-veined, subequal, 0.5–1 mm, falling off when mature; lemmas broadly ovate, apex obtuse, smooth or scaberulous, ca. 1 mm; palea persistent or tardily deciduous, ciliate along keels, hairs ca. 0.3 mm, rigidly spreading at maturity. Stamens 3; anthers ca. 0.3 mm. Caryopsis red, ovoid, ca. 0.5 mm.

Locality: Common in Hong Kong. *Y. S. Lau 1686, 2800; S. P. Lau 7.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Xizang, Hubei, Anhui, Shandong, Fujian, Taiwan; widely spread over tropical regions of the Old World.

Ecology: Open fields, moist places. Flowering & fruiting: Apr.–Aug.

Uses: Animal food (fodder).

2. Eragrostis japonica (Thunb.) Trin. 亂草

Mém. Acad. Imp. Sci. St.-Pétersb., Sér. 6. 1: 405. 1831; FRPS 10(1): 30, pl. 123: 4. 1990; FFJ 6: 147. 1995; FTW ed. 2, 5: 420. 2000; FOC 22: 479. 2006; FGD 9: 347. 2009.

Poa japonica Thunb., Fl. Jap. 51. 1784.

Eragrostis tenella auct. non P. Beauv.: FHK 431. 1861.

Eragrostis interrupta auct. non P. Beauv.: FKH 328. 1912.

Annual herb. Culms tufted, 30–100 cm tall, 3–4-noded. Leaf blades flat, 3–25 × 0.3–0.5 cm, smooth and glabrous; ligule scarious, ca. 0.5 mm, truncate, ciliate at apex; leaf sheaths usually loose, longer than internodes, glabrous. Panicle elongate, 6–40 × 1.5–6 cm, branches 3–14 cm, slender, clustered or verticillate, glabrous in axils. Spikelets usually purplish at maturity, ovate, 1–2(–3) mm, 4–8-flowered; rachilla fragile, distarticulating between florets from top downward at maturity; glumes papery, ovate-lanceolate, subequal,

0.6–0.8 mm, 1-veined, apex acute to obtuse; lemmas papery, broadly elliptic, distinctly 3-veined, basal part inrolled, apex obtuse, lower lemma ca. 1 mm; palea subequal to lemma, 2-keeled, scabrous along keels. Stamens 2; anthers ca. 0.2 mm. Caryopsis red-brown, ovoid, circular in cross-section, 0.3–0.5 mm.

Locality: Hong Kong Island, New Territories. *HK sheet 8675.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Guizhou, Hubei, Henan, Jiangxi, Anhui, Zhejiang, Fujian, Taiwan; Japan, Vietnam, Myanmar, Thailand, India, Nepal, Bhutan, Malaysia, Indonesia, New Guinea, Philippines.

Ecology: Open fields, roadsides, stream banks and other moist places. Flowering & fruiting: Jun.–Nov.

3. Eragrostis unioloides (Retz.) Nees ex Steud. 牛虱草

Syn. Pl. Glumac. 1: 264. 1854; FHK 432. 1861; FHN 4: 375. 1977; FRPS 10(1): 27, pl. 121: 6 .1990; FFJ 6: 147, fig. 120. 1995; FTW ed. 2, 5: 425. 2000; FOC 22: 477. 2006; FGD 9: 347, fig. 165. 2009.

Poa unioloides Retz., Observ. Bot. 5: 19. 1788.

Poa amabilis L., Sp. Pl. 1: 68. 1753.

Eragrostis amabilis (L.) Wight & Arn., Cat. Indian Pl. 1834: no. 1777. 1834; FKH 329. 1912.

Eragrostis formosana Hayata, Bot. Mag. (Tokyo) 21: 53. 1907.

Annual or short-lived perennial herb. Culms erect from the geniculate base, 20–80 cm tall, 3–5-noded. Leaf blades linear, flat or inrolled, 2–20 × 0.2–0.4 cm, subamplexicaul at the base, adaxial surface long pilose, abaxial surface smooth; ligule membranous, ca. 0.8 mm; leaf sheaths glabrous and smooth, long pilose along the summit. Panicle open, 5–20 × 3–5 cm; branches slender, glabrous in axils. Spikelets purplish red at maturity, oblong, 5–10 × 2–4 mm, 10–20-flowered, closely imbricate, pedicel 0.2–1 cm, distarticulating between florets from base upwards at maturity; rachilla persistent; glumes narrowly lanceolate in side-view, 1-veined, the lower 1.5–2 mm, the upper 2–2.5 mm, apex subacute; lemmas broadly ovate to suborbicular when flattened, puncticulate, veins prominent, ca. 2 mm, mucronulate; palea slightly shorter than the lemma, 2-keeled, very narrowly winged and ciliolate, falling off together with its lemma at maturity. Stamens 2; anthers purple, 0.2–0.5 mm. Caryopsis orange-brown, laterally compressed, ellipsoidal, ca. 0.8 mm.

Locality: Widely distributed in Hong Kong. *Y. S. Lau 1638; L. T. Lo 113; HK sheet 16203.*

Distribution: Fujian, Jiangxi, Taiwan, Yunnan, S China.

Ecology: Mountain slopes, grasslands, roadsides. Flowering & fruiting: Jul.–Oct.

4. Eragrostis atrovirens (Desf.) Trin. ex Steud.
鼠妇草 **(Fig. 166; Photo 422)**

Nom. Bot., ed. 2, 1: 562. 1840; FHN 4: 376. 1977; FRPS 10(1): 16, pl. 4: 1–2. 1990; FFJ 6: 150. 1995; FOC 22: 474. 2006; FGD 9: 349. 2009.

Poa atrovirens Desf., Fl. Atlant. 1: 73, pl. 17. 1798.

Eragrostis elegantula (Kunth) Nees ex Steud., Syn. Pl. Glumac. 1: 266. 1854; FKH 329. 1912.

Perennial herb. Culms loosely tufted, erect from the geniculate base, 50–120 cm tall, 4–6(–8)-noded. Leaf blades flat or inrolled, 4–17 × 0.2–0.3 cm, adaxial surface scabrous, near base pilose, abaxial surface glabrous; ligules a ciliolate membrane, 0.2–0.3 mm; leaf sheaths glabrous but pilose along summit. Panicle open, 5–20(–25) × 2–15 cm; branches 1–several per node. Spikelets plumbeous and purplish, narrowly oblong, 5–15(–25) × 1.5–2.5 mm, 8–50-flowered, pedicels 0.5–5(–15) mm; breaking up from the base, rachilla persistent, glabrous in axils; glumes subequal, ovate-elliptic, 1-veined; lower glume ovate, 1–1.3 mm, apex acute; upper glume narrowly ovate, 1.3–2.3 mm, apex acuminate; lemmas broadly ovate and acute to subacute when flattened, 1.8–2.2 mm, apex acute; palea loosely ciliate along keel, 1.6–1.8 mm. Stamens 3; anthers 0.5–1 mm. Caryopsis ellipsoidal, ca. 1 mm.

Locality: Hong Kong Island, New Territories. *Y. W. Lam 809, 1323; HK sheet 42029.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan; tropical and subtropical regions of Asia and Africa.

Ecology: Roadsides, stream banks. Flowering & fruiting: Summer to autumn.

Figure 166. *Eragrostis atrovirens* (Desf.) Trin. ex Steud. *1.* plant; *2.* spikelet. (drawn by H. P. Yu)

5. Eragrostis pilosa (L.) P. Beauv. var. **imberbis** Franch. 無毛畫眉草

Nouv. Arch. Mus. Hist. Nat. Paris 11, 7: 145, 1884; Fl. Ill. Pl. Prim. Sin. Gram. 315. 1959; FRPS 10(1): 23, pl. 121: 1. 1990; FFJ 6: 150. 1995.

Eragrostis pilosa auct. non (L.) P. Beauv, Check List HK Plants 92. 1993.

Annual herb. Culms loosely tufted, erect or geniculate at base, 15–30 cm tall, 4-noded, smooth. Leaf blades flat or inrolled, 6–20 × 0.2–0.4 cm, glabrous; ligule ca. 0.4 mm, upper half turned into a fringe of hairs; leaf sheaths glabrous at mouth, compressed, margin submembranous. Panicle elliptic to ovate, 10–25 × 3.5–14 cm; branches solitary to verticillate, glabrous in axils, usually ascending, pedicels as long or longer than spikelets. Spikelets linear, 3–10 × 1–1.5 mm, purplish-green, 4–14-flowered, florets ± appressed to the rachilla, breaking up from the base, the rachilla persistent; glumes membranous, lanceolate, apex acuminate, lower glume without vein, 0.4–0.7 mm, upper glume indistinctly 1-veined, 0.7–1.3 mm; lemmas papery, ovate, apex acute, lower lemma ca. 1.8 mm; palea papery, oblanceolate, apex obtuse, ca. 1.5 mm, along keels persistent or tardily deciduous ciliate. Stamens 3; anthers 0.1–0.3 mm. Caryopsis ellipsoidal with one side straight, 0.6–1 mm.

Locality: Aberdeen, Wong Nai Chung. *H. C. Tang 1916; HK sheet 8677.*

Distribution: Widely spread over most provinces of China (except Xinjiang, Gansu); very widely distributed in tropical and warm regions of the Old World.

Ecology: Farmlands and other moist places. Flowering & fruiting : Jul.–Nov.

Uses: Animal food (forage).

6. Eragrostis autumnalis Keng 秋畫眉草

Contr. Biol. Lab. Chin. Assoc. Advancem. Sci. Sect. Bot. 10: 178. 1936; FRPS 10(1): 24, pl. 6: 4. 1990; FFJ 6: 149. 1995; FOC 22: 476. 2006; FGD 9: 348. 2009.

Annual herb. Culms erect from the geniculate base, 15–45 cm tall, 3–4-noded, often branched at the lower nodes. Leaf blades usually inrolled or plicate, 6–12 × 0.2–0.3 cm; ligules a line of hairs; leaf sheaths compressed, glabrous, along summit with long deciduous hairs. Panicle 6–15 × 3–5 cm; branches usually clustered, glabrous in axils. Spikelets grey-green, 3–5 × ca. 2 mm, 3–10-flowered, with pedicels 1–5 mm; glumes 1-veined, lower glume ca. 1.5 mm, upper glume ca. 2 mm; lemma broadly ovate, apex acute, lower lemma ca. 2 mm; palea ca. 1.5 mm, 2-keeled, along keels ciliate, persistent or tardily deciduous. Stamens 3; anthers ca. 0.5 mm. Caryopsis red-brown, ca. 1 mm.

Locality: Chuen Lung. *Y. S. Lau 2223; Y. W. Lam 938.*

Distribution: Hainan, Guangdong, Guizhou, Jiangxi, Hubei, Anhui, Shandong, Jiangsu, Zhejiang, Fujian.

Ecology: Grasslands, roadsides. Flowering & fruiting: Jul.–Nov.

Notes: The species was reported as *Eragrostis perennans* Keng previously (Check List HK Plants 92. 1993).

7. Eragrostis cumingii Steud. 珠芽畫眉草(扭枝畫眉草)

Syn. Pl. Glumac. 1: 266. 1854; FOC 22: 475. 2006; FGD 9: 348. 2009.

Eragrostis reflexa Hack., Philip. J. Sci. 3: 168. 1948; FRPS 10(1): 13, pl. 3: 3–5, 120: 2. 1990; Check List HK Plants 335. 2002; 117. 2004.

Annual herb. Culms erect, ca. 25 cm tall, glabrous, usually with scaly buds at base. Leaf blades linear, inrolled, 5–19 × 0.1–0.2 cm, glabrous on both surfaces, except with long pilose at base of adaxial surface; ligule 0.1–0.3 mm, fimbriate; leaf sheaths compressed at base, glabrous, but long pilose along summit. Panicle open, 8–30 × 4–8 cm; branches solitary, naked at lower part, glabrous in axils. Spikelets yellowish green or grey-green, narrowly oblong, 5–20 × 2–2.5 mm, 8–40-flowered, pedicels without glands; glumes papery, deltoid-oblong, easily falling off when mature, lower glume 1-veined, ca. 1 mm, upper glume 1–3-veined, ca. 1.3 mm; lemmas broadly ovate, lateral veins nearly parallel, lower lemma ca. 2 mm; palea papery, oblanceolate, persistent or tardily deciduous, strongly 2-keeled, along keels ciliolate. Anthers ca. 0.2 mm. Caryopsis elliptic, terete to laterally flattened, 0.8–1 mm.

Locality: Common in Hong Kong. *Y. S. Lau 2262; HK sheet 8665, 16143.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Hubei Anhui, Jiangsu, Zhejiang; Japan, SE Asia, Australia.

Ecology: Open fields, roadsides. Flowering & fruiting: Jul.–Sep.

8. Eragrostis cylindrica (Roxb.) Nees ex Hook. & Arn. 短穗畫眉草

Bot. Beechey Voy. 251. 1838; FFJ 6: 150, fig. 123. 1995; FTW ed. 2, 5: 418. 2000; FOC 22: 473. 2006; FGD 9: 350. 2009.

Poa cylindrica Roxb., Fl. Ind. 1: 335. 1820.

Eragrostis geniculata Nees & Meyen, Gramineae 71–72. 1841; FHK 433. 1861; FKH 329. 1912.

Perennial herb. Culms tufted, ascending from the geniculate base, 20–70 cm tall, glabrous, 3–4-noded. Leaf linear, usually inrolled, 3–15 cm × 2–5 mm, pilose; ligules reduced into a fringe of hairs; leaf sheaths shorter than internodes, pilose, especially near the summit. Panicle constricted and spike-like, 2–8 × 1–2.5 cm, lower branches 0.5–1.5 cm, erect-ascending, pilose in axils. Spikelets yellowish brown or tinged with purple, sessile or nearly so, ca. 7 cm × 22.5–3 mm, 4–17-flowered; glume 1-veined, lanceolate, apex acute, lower glume ca. 1.5 mm, upper glume ca. 2 mm; lemma papery, ovate-oblong, apex mucronate, lowest lemma ca. 2 mm; palea persistent, elliptic, papery, ca. 1.8 mm, apex acute, along keels and margins ciliate. Stamens 3. Caryopsis yellow, ellipsoidal, ca. 0.5 mm.

Locality: Victoria Peak, Lantau Island. *HK sheet 42012, 42014.*

Distribution: Hainan, Guangdong, Guangxi, Anhui, Jiangsu, Fujian, Taiwan.

Ecology: Grassy mountain slopes. Flowering & fruiting: Apr.–Oct.

9. Eragrostis ferruginea P. Beauv. 知風草

Ess. Agrostogr. 71. 1812; FRPS 10(1): 22, pl. 122: 8. 1990; FFJ 6: 151. 1995; FTW ed. 2, 5: 420. 2000; FOC 22: 475. 2006; FGD 9: 350. 2009.

Poa ferruginea Thunb., Syst. Veg., ed. 14 (J. A. Murray). 114. 1784.

Perennial herb. Culms tufted, erect or geniculate at base, 30–110 cm tall. Leaf blades linear-lanceolate, (4–)20–40 × 2–6 mm, glabrous or sparingly covered with silky hairs on basal part of adaxial surface; ligules a line of hairs, ca. 1 mm; leaf sheaths laterally compressed, densely pilose along margins and summit, sometimes glandular along main vein. Panicle large and open, 15–40 × 4–15 cm, 1–3-branched at each node, glabrous in axils; branchlet and pedicel usually glandular at middle or above middle. Spikelets oblong, blackish purple, grey-green, rarely yellowish green, 5–10 × 2–2.5 mm, (4–)7–12-flowered; glumes subleathery, lanceolate, open, 1-veined, apex acuminate, lower glume linear-lanceolate, 1–2 mm, upper glume lanceolate, 1.5–3 mm; lemmas subleathery, ovate-lanceolate to oblong, 2.4–3 mm, 3-veined, apex obtuse, lower lemma ca. 3 mm; palea persistent, papery, elliptic, ca. 2 mm, 2-keeled, ciliolate along keels. Anthers ca. 1 mm. Caryopsis rectangular-prismatic with a shallow, narrow adaxial groove, laterally compressed, faintly striate, reddish brown, 0.7–1.5 mm.

Locality: Clear Water Bay. *Y. S. Lau 3099, 3190.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Hubei, Henan, Hebei, Shaanxi, Anhui, Shandong, Zhejiang, Fujian, Taiwan; Japan, Korea, Vietnam, Laos, Nepal, Bhutan, Sikkim.

Ecology: Grassy hillslopes, roadsides. Flowering & fruiting: Aug.–Dec.

Uses: Animal food (fodder).

10. Eragrostis brownii (Kunth) Nees 長畫眉草

Cat. Indian Pl. 105. 1834; FOC 22: 473. 2006; FGD 9: 351. 2009.

Eragrostis zeylanica Nees & Meyen, Nov. Act. Acad. Caes Leop-Carol, 19(Suppl.): 204. 1843; FHK 433. 1861; FHN 4: 378. 1977; FRPS 10(1): 13, pl. 3: 1–2. 1990; Check List HK Plants 335. 2002; 117. 2004.

Eragrostis elongata auct. non Jacq.: FKH 329. 1912.

Perennial herb. Culms tufted, erect or geniculate at base, 15–60 cm tall, 2–5-noded, branched at lower nodes. Leaf blades flat or inrolled, 3–10 cm × 1–3 mm; ligules membranous, ca. 0.2 mm; leaf sheaths glabrous and smooth, pilose along summit. Panicle 3–18 cm; branches solitary with spikelets at base. Spikelets livid green, purplish or dark brown, oblong-elliptic, 4–20 × 1.5–2.5 mm, 7–many-flowered, subsessile or with very short pedicel, apex acute; glumes ovate-lanceolate, 1–2 mm; lower glume 1-veined, ca. 1.2 mm; upper glume 1–3-veined, the laterals usually faint, ca. 1.8 mm; lower lemmas 2–2.5 mm; palea slightly shorter than lemma, 1.5–2 mm, ciliolate along keels, apex emarginate. Stamens 3; anthers 0.3–1.3 mm. Caryopsis dark brown, ca. 0.5 mm.

Locality: Hong Kong Island. *HK sheet 8666, 16144, 42043.*

Distribution: Hainan, Guangdong, Yunnan, Anhui, Zhejiang, Fujian; widely spread over Japan, Indochina, Indian Subcontinent, Malesia, Pacific islands, Australia.

Ecology: Open fields, mountain slopes, roadsides. Flowering & fruiting: Spring.

11. Eragrostis pilosissima Link 多毛知風草

Hort. Berol. 1: 189. 1827; FHK 432. 1861; FKH 329. 1912; FHN 4: 377. 1977; FRPS 10(1): 18, pl. 122: 1. 1990; FFJ 6: 154. 1995; FTW ed. 2, 5: 423. 2000; FOC 22: 474. 2006; FGD 9: 352. 2009.

Perennial herb. Culms tufted, erect, slender and rigid, 30–40 cm tall. Leaf blades usually inrolled, 5–10 × 0.1–0.2 cm, densely pilose on both surfaces; ligule a fringe of hairs, ca. 0.3 mm; leaf sheaths densely pilose, usually shorter than internodes but longer than internodes at base. Panicle lax, 4–10 × 2–5 cm; branch usually solitary, slender, glabrous in axils. Spikelets yellow, oblong, 3–7 × ca. 2 mm, 7–14-flowered; rachilla zigzag-shaped; glumes papery, 1-veined, lanceolate; lower glume emarginate or obtuse at the apex, ca. 0.8 mm; upper glume obtuse at the apex, ca. 1.2 mm; lemmas ovate-oblong, papery, margins membranous, ca. 1.8 mm, 3-veined, lateral veins faint, mucronate, deciduous; palea slightly shorter than lemma, slightly arc-shaped, 2-keeled, ca. 1.6 mm, minutely ciliate along keels, persistent or tardily deciduous. Stamens 3; anthers ca. 0.8 mm. Caryopsis ovate, bluntly triangular in section, ca. 0.8 mm.

Locality: Common in Hong Kong. *S. P. Lau 159; Y. W. Lam 1066, 1034.*

Distribution: Fujian, Hainan, Guangdong, Jiangxi, Fujian, Taiwan; SE Asia.

Ecology: Dry hillslopes, open grassy fields. Flowering & fruiting: Aug.

12. Eragrostis spartinoides Steud. 呂宋畫眉草

Syn. Pl. Glum. 1: 265. 1854; Check List HK Plants 335. 2002.

Poa polymorpha var. α R. Br., Prodr. Fl. Nov. Holland. 180. 1810.

Eragrostis elongata (Willd.) J. Jacq. var. *brachyclados* Domin, Biblioth. Bot. 20(85): 400. 1915, *p.p.*

Eragrostis elongata (Willd.) J. Jacq. var. *festucoides* Domin, Biblioth. Bot. 20(85): 400. 1915.

Eragrostis cumingii Steud. var. *novaguineensis* Jansen, Reinwardtia 2: 271. 1953.

Perennial herb. Culms tufted, 20–80 cm tall. Leaf sheaths pilose or ciliolate on the outer or both margins; leaf blades usually involute (rarely flat), 1–3 mm wide, filiform or linear, sometimes with scattered hairs; ligules a fringe of hairs, 0.2–0.3 mm. Panicle open, linear or lanceolate, 5–60 × 3–6 cm; branches spreading to divaricate, sparsely divided, entirely spikelet-bearing or naked near axil. Spikelets linear, laterally compressed, 5–28 × 1.5–2.5 mm; rachilla zig-zagged, thick, wider at internode apex; fertile florets 8–57, pedicels

0.5–1.5 mm; breaking up at maturity, rachilla persistent; glumes subequal, ovate, 1-veined, apex acute; lower glume ca. 1.5 mm, upper glume 0.9–2.8 mm; lemmas lanceolate to ovate, 1.5–2.3 mm, apex acute, deciduous; palea ± as long as lemma, persistent and tardily deciduous. Stamens (2–)3; anthers 0.3–0.7 mm. Caryopsis strongly laterally compressed, oblong-ellipsoidal, ca. 0.6 mm; pericarp tardily free on moistening.

Locality: New Territories, CUHK campus. *HK sheet 35875.*

Distribution: Tropical Asia, Australia.

Ecology: Creek banks, sandy clay. Flowering & fruiting: All year round.

13. Eragrostis fauriei Ohwi 佛歐里畫眉草

Bot. Mag. (Tokyo). 55: 278. 1941; FTW ed. 2, 5: 420. 2000; FOC 22: 474. 2006.

Eragrostis stenophylla auct. non Hack.: FKH 329. 1912.

Perennial herb. Culms densely tufted, erect, glabrous, 30–60 cm tall. Leaf blades leathery, 10 × 2–5 mm, margins inrolled; ligule long ciliate; leaf sheaths shorter than the internode. Panicle 10–15 cm, loose, branches ascending, scabrous, axils glabrous. Spikelets lanceolate, slightly compressed, 5–10 × 2.5 mm, 6–15-flowered, ascending or slightly appressed, distinctly pedicellate, greyish or slightly tinged with purple; glumes broadly lanceolate, acuminate, 1-veined; lower glume 1–1.5 mm; upper glume 1.5–1.7 mm; lemmas ca. 2 mm, ovate, apex acute; minutely punctate, keels distinctly scabrous, lateral veins distinct, subparallel, ca. 2/3 length of lemma; palea persistent, keels arc-shaped, ciliate-scabrous; rachilla persistent, slightly compressed; stamens 3, anthers oblong, blackish purple, ca. 0.5 mm. Caryopsis elliptic, slightly compressed, obscurely striolate, ca. 0.7 mm.

Locality: Aberdeen, Sai Kung. *L. T. Lo 553; HK sheet 8688.*

Distribution: Taiwan.

Ecology: Flowering: Mar.–May; fruiting: Jul.–Aug.

14. Eragrostis curvula (Schrad.) Nees 彎葉畫眉草

Fl. Afr. Austral. Ill. 397. 1841; FRPS 10(1): 18, pl. 120: 9, 124: 1. 1990; FFJ 6: 152. 1995; FOC 22: 474. 2006.

Poa curvula Schrad., Gött. Gel. Anz. 3: 2073. 1821.

Perennial herb. Culms densely tufted, erect, 80–120 cm tall, slightly compressed at the base. Leaf blades linear to filiform, (5–)10–40 cm × 1–2.5(–3) mm, attenuate to a fine point, arcuate spreading, scabrous; leaf sheaths scabrous with retrorse hairs at lower part, glabrous upward, shorter than internodes, long pilose along the summit. Panicles open, 12–35 × 6–9 cm; branches solitary or in pairs, ascending, naked at base, at least the lower densely pilose in axils. Spikelets grey-green, (4–)6–11 × 1.5–2 mm, 5–16-flowered, breaking up from the base, rachilla persistent below but fragile above; glumes lanceolate, apex acuminate, 1-veined, lower glume lanceolate, 1–1.5 mm, upper glume narrowly ovate, 1.8–2.5 mm; lemmas broadly oblong, apex acute or obtuse, veins prominent, 1.8–2.6 mm, appressed to the rachilla; palea subequal to lemma, 2-keeled, smooth or minutely scaberulous on the keels, persistent or tardily deciduous. Stamens 3; anthers 0.8–1.2 mm. Caryopsis ellipsoidal to obovoid, dorsally compressed, adaxial surface with a shallow, broad groove or ungrooved, smooth, mostly translucent, light brown, 1–1.7 mm.

Locality: Mai Po, Shing Mun (introduced). *Y. S. Lau 3039; HK sheet 34228.*

Distribution: Cultivated in Guangxi, Yunnan, Xinjiang, Hubei, Jiangsu, Fujian; native to Africa.

Ecology: Flowering & fruiting: Apr.–Sep.

Uses: Animal food (fodder), ornamental.

87. Dactyloctenium Willd. 龍爪茅屬

Annual or perennial herbs. Culms erect or decumbent, ± compressed, glabrous. Leaf blades linear, flat or loosely folded; ligule membranous, truncate, often ciliolate. Inflorescence digitate, composed of several linear to narrowly oblong secund spikes, spikelets sessile, biseriate, closely imbricate, the uppermost spikelets abortive, terminating in a pointed extension of the flattened rachis. Spikelets elliptic to ovate, laterally compressed, florets several, disarticulating above glumes but not usually between florets; glumes keeled, 1-veined; lower glume smaller, sharply acute; upper glume with a stout oblique awn from just below the broadly rounded emarginate tip; lemmas longer than glumes, membranous, 3-veined, glabrous, strongly keeled, acute to shortly awned and often recurved at the apex; palea subequalling the lemma, the keels sometimes winged; lodicules 2, very small, cuneate. Stamens 3; anthers sometimes small. Ovary glabrous; styles 2, free, rather long, stigmas narrow, subapically exserted. Grain ellipsoidal, terete or compressed, angular, ornamented or smooth, enclosed within a free hyaline pericarp which ruptures at maturity; hilum punctiform, basal.

Approximately ten species, distributed mainly in Africa to India; one species widespread in warm regions of the Old World and introduced in America; one species in China and Hong Kong.

1. Dactyloctenium aegyptium (L.) Willd. 龍爪茅 **(Fig. 167; Photo 423)**

Enum. Pl. 2: 1029. 1809; FHK 429. 1861; FKH 327. 1912; FHN 4: 384. 1977; FRPS 10(1): 66, pl. 19. 1990; FFJ 6: 144, fig. 118. 1995; FTW ed. 2, 5: 410. 2000; FOC 22: 481. 2006; FGD 9: 358, fig. 171. 2009.

Cynosurus aegyptius L., Sp. Pl. 1: 72. 1753.

Annual herb. Culms erect or ascending from the decumbent base, 15–70 cm tall. Leaf blades flat, 3–25 × 0.2–0.7 cm, tuberculate-pilose on both surfaces, especially along the margins, apex acute or acuminate; ligule membranous, 1–2 mm, margin ciliate; leaf sheaths

with ciliate margin. Inflorescence of 2–7(–9) stout digitate spikes. Spikelets broadly ovate, 3–4.5 mm, 3–4-flowered; glumes subequal, 1.5–2.2 mm; lower glume narrowly lanceolate, keel thick, hispidulous; upper glume elliptic to narrowly obovate, keel smooth, extended into a stout scabrid awn 1/2–2 times length of glume body; lemmas ovate, 2.6–4 mm, keel gibbous, hispidulous above middle, often extended into a stout cusp or mucro up to 1 mm; palea equal to lemma, tip 2-toothed. Anthers 3, 0.25–0.8 mm. Grain ca. 1 mm, broadly obtriangular, transversely rugose.

Locality: Aberdeen, Repulse Bay, Wong Chuk Hang, Tai Mo Shan, Fanling, Tai A Chau. *HK sheet 39143, 41735, 42000.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Jiangxi, Zhejiang, Fujian, Taiwan; tropical and subtropical regions throughout the world.

Ecology: Open grassy fields, wastelands, roadsides and other weedy places. Flowering & fruiting: May–Oct.

Notes: The species was reported as *Dactyloctenium aegyptium* (L.) P. Beauv. previously (Check List HK Plants 330. 2002; 116. 2004).

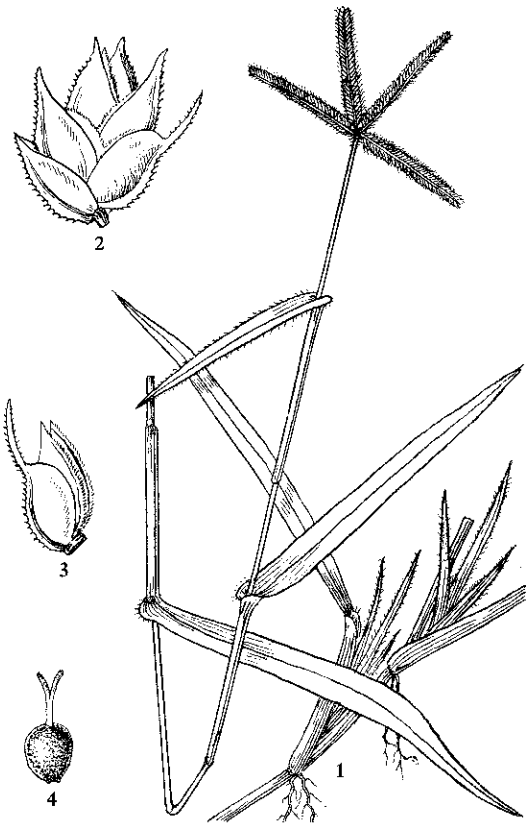

Figure 167. *Dactyloctenium aegyptium* (L.) Willd.
1. plant; *2.* spikelet; *3.* floret; *4.* caryopsis. (drawn by H. P. Yu)

88. Eleusine Gaertn. 穇屬

Annual or perennial herbs. Culms slightly compressed, usually with one long internode alternating with several short internodes, making the leaves ± in groups on the culm. Leaf blades linear, usually folded; ligule membranous, truncate, usually with a ciliate fringe; leaf sheaths strongly keeled. Inflorescence consisting of secund, subsessile, digitately arranged spikes, seldom a solitary spike. Spikelets several-flowered, ovate to narrowly oblong, laterally compressed, solitary, sessile, biseriate, imbricate; glumes shorter than spikelet, persistent, 1–3(–7)-veined, keeled, awnless; upper glumes at outer side, longer than the lower; lemmas longer than glumes, successively smaller upwards, membranous, 3-veined, glabrous, strongly keeled, keel thickened with 1–3 closely spaced additional veins, obtuse or acute; rachilla glabrous, articulate below lemmas, breaking up maturity or not; palea shorter, 2-veined; lodicules 2, small. Stamens 3; anthers short. Ovary glabrous, styles 2, free, with narrow stigmas. Grain enclosed within a thin, not adnate hyaline pericarp, ellipsoidal to subglobose, trigonous in section, ornamented, embryo basal, nearly circular; hilum basal, punctiform.

About nine species, distributed mostly in E and NE tropical Africa; one species pantropical and one commonly cultivated; two species in China; two species (one cultivated) in Hong Kong.

1a. Leaf blades 30–60 × 0.6–1.2 cm; spikelets not disarticulating at maturity; seeds exposed in the gaping floret when ripe ..... 1. *E. coracana*

1b. Leaf blades 10–15 × 0.3–0.5 cm; spikelets disarticulating at maturity; seeds not exposed when ripe ..... 2. *E. indica*

1. Eleusine coracana (L.) Gaertn. 穇

Fruct. Sem. Pl. 1: 8, t. 1, fig. 11. 1788; FKH 327. 1912; FHN 4: 384. 1977; FRPS 10(1): 66, pl. 18: 10–17. 1990; FFJ 6: 144. 1995; FTW ed. 2, 5: 412. 2000; FOC 22: 482. 2006; FGD 9: 357, fig. 170. 2009.

Cynosurus coracanus L., Syst. Nat. ed. 10, 2: 875. 1759.

Annual herb. Culms tufted, robust, erect or ascending, usually branched, 50–120 cm tall. Leaf blades flat, 30–60 × 0.6–1.2 cm, pilose or glabrous; ligule 1–2 mm, a fringe of hairs; leaf sheaths glabrous, overlapping. Inflorescence of subdigitate one-sided spikes; the spikes 5–10 cm × 8–10 mm, often incurved at maturity. Spikelets very closely imbricate, ovate, 5–9 mm, 6–9-flowered, not disarticulating at maturity; glumes lanceolate-oblong, scabrid along the winged keel; lower glume 3-veined, 1.5–3 mm; upper glume with additional veins in keel, 1.8–5 mm; lemmas triangular-ovate, 2.2–4.7 mm, keel 3-veined, scabrid and narrowly winged, subacute; palea as long as the lemma, narrowly ovate, keels scabrid, winged. Grain an utricle, ca. 1 mm, yellowish brown, globose, finely striate-punctuate.

Locality: Cultivated. *HK sheet 16002.*

Distribution: Hainan, Guangdong, Guizhou, Yunnan, Sichuan, Ningxia, Henan, Hubei, Shandong, Anhui, Jiangxi, Zhejiang, Fujian, Taiwan (cultivated); widely cultivated in Old World tropics.

Ecology: Flowering & fruiting: May–Sep.

Uses: Food (cereal), animal food (fodder).

2. Eleusine indica (L.) Gaertn. 牛筋草 **(Fig. 168; Photo 424)**

Fruct. Sem. Pl. 1: 8. 1789; FHK 429. 1861; FKH 327. 1912; FHN 4: 383. 1977; FRPS 10(1): 64, pl. 18: 1–9. 1990; FFJ 6: 143, fig. 117. 1995; FTW ed. 2, 5: 412. 2000; FOC 22: 482. 2006; FGD 9: 356. 2009.

Cynosurus indicus L., Sp. Pl. 1: 72. 1753.

Annual herb. Culms tufted, erect or geniculate at base, 10–90 cm tall. Leaf blades flat or folded, 10–15 × 0.3–0.5 cm, glabrous or tuberculate-pilose on adaxial surface; ligule ca. 1 mm, membranous, at most sparsely ciliolate. Leaf sheaths laterally compressed and keeled, glabrous or tuberculate-pilose. Inflorescence of 2–7 digitate spikes; the spikes ascending, 3–10 cm × 3–5 mm. Spikelets elliptic, 4.5–8 mm, 3–9-flowered; glumes lanceolate, scabrid along keel; lower glume 1-veined, 1.5–2 mm, lowest floret ca. 3 mm; upper glume with small additional veins in the thickened keel, 2–3 mm; lemmas ovate, 2–4 mm, keeled along small additional veins, keel acute; palea membranous, 2-keeled, shorter than the lemma. Anthers 3, ca. 0.6 mm. Grain ca. 1.5 mm, blackish, oblong or ovate, ventrally grooved, obliquely striate with fine close lines running vertically between the striae.

Locality: Common in Hong Kong. *Y. S. Lau 1025, 2233; S. P. Lau 17.*

Distribution: Widely spread over most provinces of China; tropical and subtropical regions worldwide.

Ecology: Wastelands, roadsides, open fields. Flowering & fruiting: Jul.–Oct.

Uses: Animal food (fodder).

Figure 168. *Eleusine indica* (L.) Gaertn.
1. plant; *2.* spikelet; *3.* floret; *4.* utricle; *5.* seed. (drawn by H. P. Yu)

89. Perotis Aiton 茅根屬

Annual or sometimes perennial herbs. Culms ascending from the decumbent base. Leaf blades short, broad, base slightly cordate, margins often pectinate-ciliate; ligule a membranous rim. Inflorescence a cylindrical, spike-like raceme. Spikelets all alike, 1-flowered, bisexual, borne directly on all sides of main axis, single or often ± in groups, falling entirely from a very short pedicel; glumes subequal, as long as spikelet and enclosing floret, papery, 1-veined, rounded, strongly convex, scabrous, apex with a long slender awn far exceeding glume body, lower glume tightly embraced by upper glume, its awn usually longer than upper glume awn; lemmas lanceolate, shorter than glumes, hyaline, 1-veined, glabrous, apex acute; palea hyaline, slightly shorter than lemma, flattened; lodicules 2. Stamens 3; anthers small. Styles very short, stigmas poorly developed. Caryopsis linear-lanceolate, terete or flattened, apex acute, almost as long as the glumes at maturity.

About ten species distributed in the Old World tropics; three species in China; two species in Hong Kong.

1a. Spikelets 1.5–2.5 mm; glume apex abruptly distinct from awn ..... 1. *P. indica*
1b. Spikelets 3.5–4.5 mm; glume apex tapering into awn ..... 2. *P. rara*

1. Perotis indica (L.) Kuntze 茅根

Rev. Gen. Pl. 2: 787. 1891; FHN 4: 393, fig. 1202. 1977; FRPS 10(1): 124. 1990; FTW ed. 2, 5: 431, pl. 176. 2000; FOC 22: 498. 2006; FGD 9: 365, fig. 177. 2009.

Anthoxanthum indicum L., Sp. Pl. 1: 28. 1753.

Perotis latifolia Aiton, Hort. Kew. 1: 85. 1789; FHK 418. 1861; FKH 318. 1912.

Annual herb. Culms loosely tufted, erect or decumbent at base, 20–30 cm tall. Leaf blades lanceolate to narrowly ovate, flat or margins involute, tough, 2–4 × 0.2–0.6 cm, glaucous, glabrous, margins spiny-scabrous especially near base, apex acute; ligule membranous, ca. 0.5 mm; leaf sheaths usually glabrous. Inflorescence a terminal raceme, up to 13 cm, ascending or horizontally spreading; rachis scabrous. Spikelets 1-flowered, 1.5–2.5 mm (excluding awns); basal callus 0.2–0.5 mm, subacute; glumes papery, narrowly lanceolate, back uniformly hirtellous with short white hairs, midvein scabrous, apex obtuse, clearly demarcated from awn; lower glume ca. 1.8 mm, awn ca. 10 mm; upper glume ca. 1.5 mm, awn ca. 5 mm; lemma hyaline, lanceolate, 0.5–1 mm. Anthers ca. 0.3 mm. Caryopsis terete, narrowly ellipsoidal, 1–1.8 mm.

Locality: Common in Hong Kong. *S. Y. Hu & P. P. H. But 22370.*

Distribution: Hainan, Guangdong, Yunnan, Shandong, Taiwan; Indochina, Malesia, Indian Subcontinent.

Ecology: Sandy stream banks, roadsides and other weedy places. Flowering & fruiting: Summer to autumn.

2. Perotis rara R. Br. 大花茅根 **(Fig. 169)**

Prodr. 172. 1810; FOC 22: 498. 2006; FGD 9: 365. 2009.

Perotis macrantha Honda, Bot. Mag. (Tokyo) 41: 638. 1927; FRPS 10(1): 122, pl. 38: 1–3. 1990; FFJ 6: 174, fig. 142. 1995; FTW ed. 2, 5: 431. 2000; Check List HK Plants 343. 2002; 120. 2004.

Annual or short-lived perennial herb. Culms loosely tufted, decumbent at base, 20–40 cm tall. Leaf blades lanceolate to narrowly ovate, flat or margins involute, tough, 1.5–5 × 0.2–0.5 cm, glabrous, glaucous, margins spiny-scabrous, pectinate at base, apex acute; ligule ca. 0.2 mm, minutely ciliate on upper margin; leaf sheaths glabrous. Inflorescence a single terminal raceme, up to 20 cm, with laxly arranged spikelets, horizontally spreading, lightly reflexed at maturity; rachis scaberulous-hirtellous. Spikelets 1-flowered, 3.5–4.5 mm (excluding awns); basal callus 0.5–1.5 mm, narrowly obconical, flattened, sometimes laterally pubescent; glumes linear-lanceolate, back evenly scaberulous-hirtellous with short white hairs, midvein scabrous with longer prickles toward awn, apex gradually tapering into awn; awn 1–2.5 cm; lemma lanceolate, hyaline, acute, 1.2–1.5 mm; palea hyaline, ca. 0.8 mm, minutely ciliate at the apex. Anthers ca. 0.6 mm. Caryopsis terete, subulate, ca. 2.5 mm.

Locality: Deep Water Bay, Sai Kung. *HK sheet 8830, 35664.*

Distribution: Hainan, Guangdong, Guangxi, Fujian, Taiwan; SE Asia, New Guinea, Australia.

Ecology: Coastal sandy places. Flowering & fruiting: Jun.–Nov.

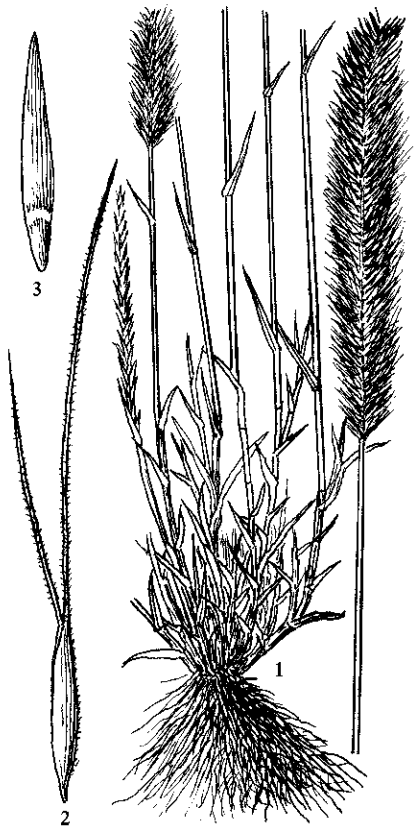

Figure 169. *Perotis rara* R. Br.
1. plant; *2.* spikelet; *3.* caryopsis. (drawn by H. P. Yu)

90. Aristida L. 三芒草屬

Perennials or annual herbs. Culms tufted. Leaf blades linear, flat or rolled; ligule a line of hairs. Inflorescence a contracted or open panicle. Spikelets 1-flowered, with long scarious glumes; lemma cylindrical or laterally compressed, indurate, glabrous or scabrid, rarely sparsely hairy, the margins convolute or involute; awn with or without a column, persistent or deciduous, articulate or not; branches glabrous or scabrid, never plumose; floret callus obtuse to pungent or bidentate; palea up to 1/2 length of lemma. Caryopsis terete, or grooved when lemma involute, embryo 1/3 its length.

About 250 species distributed throughout the tropics and subtropics, especially along the tropics of Cancer and Capricorn; 11 species in China; two species in Hong Kong.

1a. Perennials, 30–60 cm tall; culms usually unbranched; spikelets (7–)10–14 mm ..... 1. *A. chinensis*

1b. Annuals, 6–20 cm tall; spikelets 3–3.5 mm ..... 2. *A. cumingiana*

1. Aristida chinensis Munro 華三芒草 **(Fig. 170; Photo 425)**

Proc. Amer. Acad. Arts. 4: 363. 1860; FHK 427. 1861; FKH 325. 1912; FHN 4: 371, fig. 1182. 1977; FRPS 10(1): 115. 1990; FTW ed. 2, 5: 366. 2000; FOC 22: 454. 2006; FGD 9: 343, fig. 163. 2009.

Aristida formosana Honda, Bot. Mag. (Tokyo) 41: 379. 1927.

Perennial herb, 30–60 cm tall. Culms densely tufted, erect, glabrous, unbranched. Leaf blades involute, filiform, curling when dry, 10–20 cm × 1–1.5 mm, abaxial surface smooth, adaxial surface pubescent; ligule a fringe of hairs, ca. 0.2–0.5 mm. Panicle ovate in outline, open, loose, 1/3 to 1/2 length of plant; branches 3–15 cm, divaricate, solitary or in small widely spaced groups along central

Figure 170. *Aristida chinensis* Munro
1. portion of inflorescence; *2.* spikelet; *3.* floret. (drawn by H. L. Chen)

axis, bearded in axils, strongly scabrid, lower part naked. Spikelets ca. 8 mm, 1-flowered, grey-green to purple; glumes linear-lanceolate, subleathery, 1–3-veined, acuminate-mucronate, unequal, lower one 8–14 mm, scabrid on vein, the upper one shorter and smooth; callus ca. 0.5 mm; lemma 5–8 mm, terete, smooth, margin slightly inrolled; awn branches arising directly from lemma apex, central branch 1–1.5 cm, laterals slightly shorter or subequal to central branch; palea minute, linear-lanceolate, papery, 2–keeled, ca. 1.5 mm.

Locality: Common in Hong Kong. *P. P. H. But 157; HK sheet 8619, 30744.*

Distribution: Guangdong, Guangxi, Fujian, Taiwan; Vietnam, Cambodia, Thailand, Indonesia, Philippines.

Ecology: Grassy hillslopes. Flowering & fruiting: Apr.–Dec.

2. Aristida cumingiana Trin. & Rupr. 黃草毛(黃毛草)

Sp. Gram. Stipac. 141. 1842; FKH 325. 1912; FRPS 10(1): 119, pl. 37: 1–2. 1990; FOC 22: 453. 2006; FGD 9: 343. 2009.

Annual herb, 6–20 cm tall. Culms slender, erect from geniculate base, branched. Leaf blades linear, involute, 2.5–10 cm, abaxial surface glabrous, adaxial surface hairy; ligule ca. 0.2 mm, inconspicuous. Panicle oblong to ovate in outline, loose, open, 5–10 cm; branches slender, ascending, in pairs or 3 together along main axis; pedicel long. Spikelets 3–3.5 mm, green or purple; glumes unequal, 1-veined, scabrid on vein, apex acuminate-mucronate, lower glume lanceolate, 2–2.5 mm, upper glume narrowly lanceolate-oblong, 2.8–3.5 mm; callus small, broadly obtuse; lemma 1.7–2 mm, upper part scabrid; awn arising directly from lemma apex, stiffly spreading, central branch 5–8 mm, laterals about half as long.

Locality: Aberdeen (fide FKH 325. 1912).

Distribution: Guangdong, Yunnan, Hunan, Jiangsu, Zhejiang, Fujian; Vietnam, Laos, Myanmar, Thailand, India, Nepal, Indonesia, Philippines, New Guinea, N Australia, Africa.

Ecology: Hillslopes, dry grasslands. Flowering & fruiting: Summer to autumn.

91. Zoysia Willd., *nom. cons.* 結縷草屬

Perennial herbs with creeping rhizomes or partly stoloniferous. Culms arising from nodes along stolons, often densely branched at ground level. Leaf blades conspicuously distichous, stiff, flat or involute; ligule short, ciliolate. Inflorescence a cylindrical, dense, spike-like raceme, with spikelets arranged on all sides and appressed to axis, falling off entirely from pedicel. Spikelets laterally compressed, 1-flowered, bisexual; lower glume usually absent, or small, thinly membranous and veinless; upper glume as long as spikelet, enclosing floret, laterally compressed, leathery, apex acute or midvein excurrent into mucro; lemma smaller and hidden inside of the upper glume, membranous, 1–3-veined, apex acute or emarginate; palea reduced or absent; lodicules absent. Stamens 3. Styles 2, long, connate at base, stigmas apically exserted. Caryopsis oblong, free; hilum punctiform.

About ten species distributed in tropical and subtropical regions of Japan, China, India, New Guinea, and Australasia, several species widely cultivated elsewhere as tropical lawn grasses; five species in China; three species in Hong Kong.

1a. Spikelets 4–8 mm; leaf blades flat or sometimes involute .. .. 1. *Z. sinica*

1b. Spikelets 2–3 mm; leaf blades inrolled and needle-like.

2a. Leaf blades 1–2.5 mm wide; inflorescence 2–4 cm; spikelets 10–30 ..... 2. *Z. matrella*

2b. Leaf blades ca. 1 mm wide; inflorescence up to 1.5 cm; spikelets 6–12 ..... 3. *Z. pacifica*

1. Zoysia sinica Hance 中華結縷草 **(Fig. 171; Photo 426)**

J. Bot. 7: 168. 1869; FKH 318. 1912; FRPS 10(1): 126. 1990; FFJ 6: 176. 1995; FTW ed. 2, 5: 440. 2000; FOC 22: 497. 2006; FGD 9: 366. 2009.

Zoysia pengens auct. non Willd.: FHK 418. 1861.

Perennial herb with creeping rhizomes. Culms tufted, erect, arising from nodes of rhizome, stiff, 10–30 cm tall, branched at base. Leaf blades broadly linear, flat or margins involute, stiff, suberect to patent, 2–10 × 0.2–0.3 cm, green or grey-green, glabrous, apex pungent; ligule ca. 0.2 mm, upper part a fringe of hairs; leaf sheaths glabrous, usually persistent at base, pilose at mouth. Inflorescence linear-elliptic, 2–4(–8) × 0.4–0.5 cm, usually shortly exserted from uppermost leaf sheath, with many closely overlapping spikelets; pedicels shorter than spikelet, ca. 3 mm, widened at apex. Spikelets 1-flowered, 4–8 × 1–1.5 mm, yellowish brown or purplish brown; lower glume absent; upper glume as long as the spikelet, leathery, lanceolate-oblong to narrowly oblong, with slightly falcate apex, obscurely 7–11-veined, midvein usually shortly excurrent; lemma membranous, lanceolate-

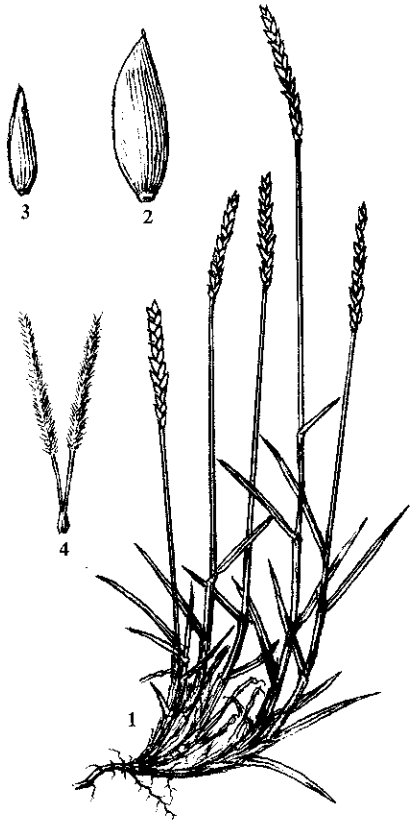

Figure 171. *Zoysia sinica* Hance

1. plant; *2.* spikelet; *3.* floret; *4.* pistil. (drawn by H. P. Yu)

oblong, 3–4 mm, truncate or with a sinus, 1-veined; palea and lodicule reduced. Anthers 1.5–2.5 mm.

Locality: Ma On Shan, Castle Peak, Sai Kung, Lantau Island. *Y. W. Lam 2167; K. L. Yip 4209; HK sheet 39436.*

Distribution: Guangdong, Guangxi, Hebei, Liaoning, Shandong, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; Japan, Korea.

Ecology: Coastal sands, river banks, roadsides and weedy places. Flowering & fruiting: May–Oct.

Notes: Listed in *Rare and Precious Plants in Hong Kong*.

2. Zoysia matrella (L.) Merr. 溝葉結縷草 **(Photos 427–428)**

Philipp. Sci. 7(4): 230. 1912; Fl. Ill. Pl. Prim. Sin. Gram. 737, pl. 685. 1959; FTW 5: 508. 1978; FRPS 10(1): 129. 1990; FFJ 6: 176, fig. 144. 1995; FOC 22: 497. 2006; FGD 9: 366, fig. 178. 2009.

Agrostis matrella L., Mant. Pl. 2: 185. 1771.

Zoysia pungens Willd., Ges. Naturf. Feunde Berlin Neue Schriften 3: 441. 1801; FKH 318. 1912.

Zoysia tenuifolia Thiele, Linnaea 9(3): 309. 1835.

Zoysia tenuifolia Willd. ex Trin., Mem. Acad. Sci. Petersb. ser. 6, 4: 96. 1836.

Perennial herb, rhizomatous or stoloniferous. Culms up to 20 cm tall. Leaf blades flat or involute, tough, suberect to spreading, 3–8 × 0.1–0.3 cm, glabrous or adaxial surface thinly pilose, apex acute; ligule a ring of hairs ca. 0.1 mm; leaf sheaths glabrous, bearded at mouth with 4–5 mm hairs. Inflorescence linear, 2–4 × 0.2–0.3 cm, exserted above leaves, composed of 10–30, loosely overlapping spikelets; rachis somewhat wavy; pedicels shorter than spikelet, 1–3 mm, widened at apex. Spikelets 1-flowered, 2–3 × ca. 1 mm, laterally compressed, lanceolate, yellowish brown or purplish brown, shortly pedicellate; lower glume usually absent; upper glume as long as the spikelet, lanceolate, 5-veined, midrib prominent, sometimes scabrous toward apex, lateral veins obscure, margins thinner and inrolled, apex obtuse; lemma oblong-ovate, 2–2.5 mm, obscurely 3-veined, midvein sometimes shortly excurrent; palea lanceolate, hyaline, 1/2 length as lemma. Anthers 1–1.5 mm. Caryopsis ca. 1.5 mm.

Locality: New Territories. *S. P. Lau 190; Y. S. Lau 2288; S. C. Ng 1220.*

Distribution: Hainan, Guangdong, Fujian, Taiwan; widely distributed in the tropical regions of Asia.

Ecology: Sandy places near seaside. Flowering & fruiting: Jul.–Oct.

3. Zoysia pacifica (Goudswaard) M. Hotta & Kuroki 細葉結縷草

Acta Phytotax. Geobot. 45: 71. 1994; FOC 22: 498. 2006; FGD 9: 367. 2009.

Zoysia matrella (L.) Merr. var. *pacifica* Goudswaard, Blumea 26: 172. 1980.

Zoysia tenuifolia auct. non Willd. ex Trin.: FRPS 10(1): 131, pl. 40: 4–5. 1990; FFJ 6: 177, fig. 145. 1995; FTW ed. 2, 5: 440. 2000; Check List HK Plants 350. 2002; 122. 2004.

Perennial herb, stoloniferous. Culms densely tufted, 5–10 cm tall, much branched. Leaf blades setaceous, soft, 4–6 × ca. 0.1 cm; ligule 0.3 mm, upper part a fringe of hairs; leaf sheaths glabrous, bearded at mouth with 2–5 mm hairs. Inflorescence linear, up to 1.5 cm, with 6–12 loosely overlapping spikelets; rachis somewhat wavy; pedicels shorter than spikelet, up to 1.6 mm, scabrous, slightly widened at apex. Spikelets lanceolate, 1-flowered, 2–3 × ca. 0.6 mm, straw-coloured tinged purplish; lower glume absent; upper glume as long as the spikelet, lanceolate, shiny, obscurely 5-veined, apex subacute, sometimes with subapical awn-point; lemma slightly shorter than upper glume, 1-veined; palea and lodicule reduced. Anthers 0.6–0.8 mm.

Locality: Cultivated. *Y. S. Lau 2199; Y. W. Lam 31; HK sheet 42001.*

Distribution: Taiwan; Japan, Philippines, Pacific islands; widely introduced in tropical and subtropical regions as lawn plant.

Ecology: Flowering & fruiting: Aug.–Dec.

Uses: Environmental (excellent for lawns).

92. Cynodon Rich., *nom cons.* 狗牙根屬

Perennial herbs, rhizomatous or stoloniferous. Culms usually slender, with alternately long and short internodes. Leaf blades linear or lanceolate, flat; ligule membranous, short, truncate, or only a fringe of hairs; leaf sheath bearded at mouth. Inflorescence 2–several, slender, digitately arranged spikes. Spikelets sessile, imbricate, biseriate; rachis flat or semiterete. Spikelets sessile, strongly laterally compressed, usually 1-flowered, awnless, imbricate in 2 rows along one side of rachis, disarticulating above glumes; rachilla articulate below lemma, protruding or not, sometimes with a rudimentary floret; glumes subequal, shorter or as long as floret, narrow, herbaceous, 1-veined or upper glume 3-veined, apex acuminate, both or only lower glume persistent; lemma keeled, boat-shaped, cartilaginous, 3-veined, usually pubescent on keel, apex entire, awnless; callus glabrous; lodicules 2, minute. Stamens 3. Ovary glabrous; styles 2, free, stigmas plumose, protruding sideways. Caryopsis ellipsoidal, terete or laterally compressed, pericarp easily separating when soaked, hilum linear.

About ten species distributed in tropical, subtropical and warm-temperate regions; two species in China; one species in Hong Kong.

1. Cynodon dactylon (L.) Pers. 狗牙根 **(Fig. 172; Photos 429–430)**

Syn. Pl. 1: 85. 1805; FHK 428. 1861; FKH 326. 1912; FHN 4: 387, fig. 1195. 1977; FRPS 10(1): 84, pl. 25: 1–6. 1990; FFJ 6: 163, fig. 133. 1995; FTW ed. 2, 5: 406. 2000; FOC 22: 493. 2006; FGD 9: 376, fig. 185. 2009.

Panicum dactylon L., Sp. Pl. 1: 85. 1753.

Perennial herb, stoloniferous. Culms slender, erect or ascending from the creeping stolons, 10–40 cm tall. Leaf blades linear, 1–12 × 0.1–0.4 cm, usually glabrous, scaberulous, apex subacute; auricles and orifices bearded; ligule a short ciliolate rim; leaf sheaths bearded at mouth, otherwise glabrous or thinly pilose. Spikes (2–)3–6, digitately arranged, 2–7 cm, spreading. Spikelets usually

1-flowered, sessile, imbricate in 2 rows on one side of axis, 2–2.7(–3) mm, purplish or green, breaking up above the glumes at maturity; glumes linear-lanceolate, membranous, often purplish, equal or slightly unequal, 1.5–2 mm, 1-veined, keel scabrous, thickened; lemma as long as spikelet, silky villous along keel, hairs straight, otherwise glabrous or lateral veins thinly villous, apex subacute; palea glabrous, keels scaberulous. Anthers 3, more than 1 mm. Caryopsis subterete, tightly enclosed between the hardened lemma and palea, usually turgid or scarcely laterally compressed.

Locality: Common in Hong Kong. *S. P. Lau 15; Y. S. Lau 2251; HK sheet 39699.*

Distribution: Widely distributed in regions S of Huanghe; tropical and warm-temperate regions of the world.

Ecology: Wastelands, roadsides, margins of fields. Flowering & fruiting: May–Oct.

Uses: Environmental (erosion control, ornamental), animal food (fodder, forage).

93. Microchloa R. Br. 小草屬

Low-growing perennial or annual herbs. Culms tufted, slender. Leaves mostly basal; leaf blades linear, inrolled; ligule short, ciliate from a membranous base. Inflorescence a single spike; spike unilateral, very slender, ± falcate; spikelets sessile, biseriate, closely imbricate; rachis crescentic in section. Spikelets small, lightly dorsally compressed, narrowly subterete, floret 1 without prolonged rachilla or sterile florets, disarticulating above glumes; glumes subequal, as long as spikelet and enclosing floret, firmly membranous, 1-veined, margins infolding, apex acute, both or only upper deciduous; lower glume keeled; upper glume rounded; lemma shorter than glumes, ovate, keeled, thinly membranous, 3-veined, ciliate on veins, apex acute or minutely emarginate and mucronulate; palea subequal to lemma, keels ciliate. Caryopsis ellipsoidal.

Six species spread throughout the tropics; one species in China and Hong Kong.

1. Microchloa indica (L. f.) P. Beauv. 小草 **(Fig. 173)**

Ess. Agrostogr. Expl. Pl. 13. 1812; FRPS 10(1): 87. 1990; FFJ 6: 163. 1995; FOC 22: 492. 2006; FGD 9: 378, fig. 187. 2009.

Microchloa setacea R. Br., Prodr. 208. 1810; FHK 428. 1861; FKH 326. 1912.

Perennial herb, 10–20 cm tall. Culms very slender, densely tufted and clothed at base with fibres of disintegrated leaf sheaths. Leaves mostly basal; leaf blades narrowly linear, 1–6 cm × 0.5–1.2 mm, adaxial surface usually with long scattered hairs, margins scabrous, midrib and submarginal veins thickened, apex obtuse; ligule 0.1–0.3 mm. Spike (3–)5–20(–25) cm, falcate when dry; rachis shortly ciliate on margins or glabrous. Spikelets light green, lanceolate, 1.6–4 mm, acute; lower glume slightly asymmetrical; lemma 1.5–3 mm, mucronate. Caryopsis ca. 1 mm.

Locality: No precise locality. *C. Wright s.n.* (K)

Distribution: Hainan, Guangdong, Yunnan, Fujian; tropical and subtropical regions of the world.

Ecology: Dry and stony places. Flowering & fruiting: Jul.–Oct.

94. Chloris Sw. 虎尾草屬

Annual or perennial herbs. Culms erect or ascending. Leaf blades linear, flat or folded; ligule membranous, short, ciliolate; leaf sheaths rounded or keeled and flabellate. Inflorescence of secund spikes, digitately arranged or occasionally in 2 or more

Figure 172. *Cynodon dactylon* (L.) Pers.
1. habit; *2.* lower floret, spikelet rachis and reduced floret. (drawn by X. L. Chen)

Figure 173. *Microchloa indica* (L. f.) P. Beauv.
1. plant; *2.* portion of inflorescence; *3.* lower glume; *4.* upper glume; *5.* lemma; *6.* palea. (drawn by Y. X. Liu)

whorls, with biseriate, closely imbricate spikelets. Spikelets sessile, laterally compressed, 2–4(–6)-flowered, lowermost bisexual, second bisexual or sterile, successive florets male or sterile and progressively reduced, disarticulating above glumes; glumes unequal, usually shorter than florets, lanceolate, membranous, 1-veined, acuminate to an awn-point; callus bearded; lemma of fertile floret keeled, lanceolate to obovate, cartilaginous to leathery, usually ciliate on margins and keel, apex entire or emarginate, subapically mucronate or awned; upper lemma and higher lemmas ± reduced or vestigial, awned or awnless, often epaleate and black at maturity; paleae usually of same length as lemma, 2-keeled; lodicules 2, small. Stamens 3. Ovary glabrous; styles 2, short, stigmas laterally exserted. Caryopsis crowned by thickened base of style, ellipsoidal to linear, usually trigonous; pericarp very thin, hyaline, free, embryo rather large; hilum punctiform.

Approximately 50 species distributed in tropical and warm-temperate regions throughout the world; five species (one introduced) in China; three species in Hong Kong.

Besides the three native species, *Chloris gayana* Kunth is newly introduced as ornamental plants and not treated here.

1a. Lowest lemma with spreading 2.5–4 mm hairs on upper margins ..... 1. *C. virgata*
1b. Lowest lemma with 0.5–1.5 mm hairs on upper margins.
2a. Sterile lemmas nearly as long as wide, inflated; inflorescence expanded ..... 2. *C. barbata*
2b. Sterile lemmas longer than wide, ± flattened; inflorescence usually contracted ..... 3. *C. formosana*

1. Chloris virgata Sw. 虎尾草 **(Fig. 174)**

Fl. Ind. Occid. 1: 203. 1797; FKH 327. 1912; FTW 5: 464. 1978; FRPS 10(1): 79. pl. 22: 1–4. 1990; FOC 22: 489. 2006; FGD 9: 374. 2009.

Chloris caudata Trin. ex Bunge, Enum. Pl. Chin. Bor. 70. 1833.

Annual. Culms erect or geniculately ascending, 12–75 cm tall. Basal leaf sheaths keeled, glabrous; leaf blades linear, flat or folded, 5–30 cm, 2–7 mm wide; ligule 0.5–1 mm. Racemes digitate, 5–12, erect or slightly slanting, 2–10 cm; rachis scabrous or hispid. Spikelets with 2 or 3 florets, 2-awned; lower glume 1.8–2.2 mm; upper glume 3–4 mm, acuminate; lemma of fertile floret obovate-lanceolate in side view, 2.8–3.5 mm, keel gibbous, conspicuously bearded on upper margins with a spreading tuft of 2.5–3.5 mm silky hairs, margins, keel and flanks silky-ciliate or glabrous; awn 5–15 mm; second floret sterile, oblong, glabrous, awn 4–10 mm; third floret occasionally present, reduced to a small clavate scale, awnless.

Locality: High Island Reservoir. *HK Sheet 34207.*

Distribution: Common in China; Afghanistan, Bhutan, India, Myanmar, Nepal, Pakistan; Africa, America, SW Asia, Australia, Pacific islands.

Ecology: Common on stony slopes, steppes, sandy riversides, roadsides, fields, plantations, frequent on walls and roofs, alt. 3700 m. Flowering and fruiting: Jun.–Oct.

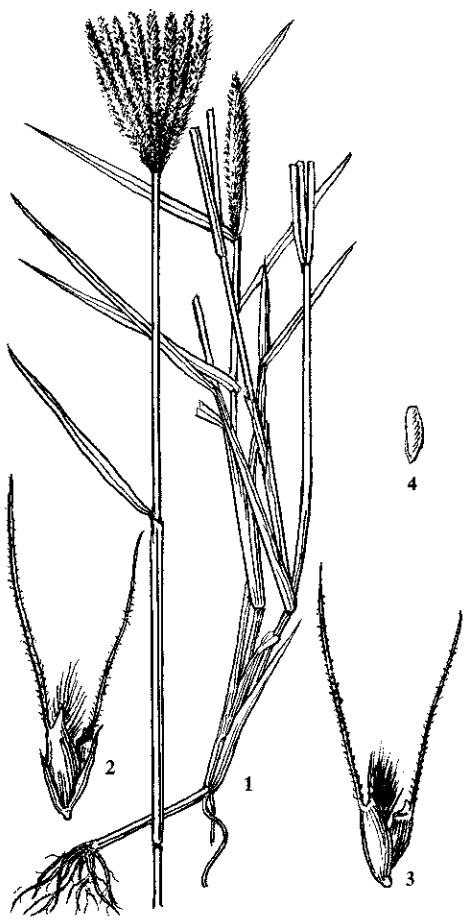

Figure 174. *Chloris virgata* Sw.
1. plant; *2.* spikelet; *3.* floret; *4.* caryopsis. (drawn by H. P. Yu)

2. Chloris barbata Sw. 孟仁草 **(Photo 431)**

Fl. Ind. Occid. 1: 200. 1797; FHK 429. 1861; FKH 327. 1912; FRPS 10(1): 75, pl. 23: 5–8. 1990; FFJ 6: 162. 1995; FTW ed. 2, 5: 403. 2000; FOC 22: 490. 2006; FGD 9: 374. 2009.

Andropogon barbatus L., Mant. Pl. Altera 302. 1771, non Linnaeus (1759).

Chloris inflata Link, Enum. Hort. Berol. 1: 105. 1821.

Annual or short-lived perennial herb. Culms ascending from the decumbent base, 0.2–1 m tall, usually rooting at lower nodes. Leaf blades usually folded, 10–40 × 0.3–0.8 cm, glabrous, apex acute; ligule ciliate, ca. 0.3 mm; leaf sheaths keeled, glabrous. Inflorescence of 5–9 digitately arranged spikes; spikes erect or ascending, 3–8 cm, ± flexuous and purplish; rachis scabrous. Spikelets with 3- or 4-flowered, 3(–4)-awned; glumes membranous, conspicuously 1-veined; the lower deltoid-lanceolate, 1.2–1.5 mm, apex acute; the upper narrowly lanceolate, 1.7–2.5 mm, apex shortly mucronate; lower floret fertile, lemmas elliptic in side view, 1.7–2.5 mm, pilose on keel, ciliate on upper margins with 1–1.5 mm hairs, awn 4.5–7 mm; palea ca. 2.2 mm; upper florets sterile, lemmas empty, inflated, overlapping to form a knob at side of fertile floret; second lemma turbinate, truncate, 1–1.5 mm, glabrous or sparsely appressed-pilose on back, awn 2.5–7 mm. Stamens 3, anthers ca. 0.5 mm. Caryopsis ca. 1.6 mm.

Locality: Common in Hong Kong. *Y. W. Lam 851, 882; HK sheet 42064.*

Distribution: Hainan, Guangdong, Fujian, Taiwan; widely spread over tropical to warm-temperate regions of the world.

Ecology: Beaches, wastelands, roadsides. Flowering & fruiting: Mar.–Aug.

3. Chloris formosana (Honda) Keng 台灣虎尾草

FHN 4: 385, fig. 1193. 1977; FTW ed. 2, 5: 403. 2000; FGD 9: 375. 2009;

Chloris barbata Sw. var. *formosana* Honda, Bot. Mag. (Tokyo) 40: 437. 1926.

Annual herb. Culms erect from the decumbent base, 20–70 cm tall, usually rooting at lower nodes. Leaf blades usually folded, 4–40 × 0.2–0.3 cm, glabrous, sometimes scabrous on adaxial surface and margins; ligule 0.5–1 mm, ciliate; leaf sheaths laterally compressed, keeled, glabrous, apex acute. Inflorescence of 4–9 digitately arranged spikes; spikes 3–8 cm, erect or somewhat lax, pallid or purplish; rachis puberulous. Spikelets 3-flowered, 3-awned, ca. 2.5 mm (excluding the awn), sessile; glumes membranous, 1-veined; lower glume 1–2 mm, lanceolate, apex acute; upper glume 2–3 mm, with a sinus at the apex, midrib prolong into an awn; lemma of fertile floret ovate, 2.3–3 mm, with a lateral groove, glabrous on keel, densely ciliate on upper margins with ca. 1 mm hairs; awn (2–)4–6 mm; palea as long as the lemma, rounded at the apex, 2-keeled; upper florets sterile, lemmas empty, flattened or only slightly inflated, overlapping to form a knob at side of fertile floret; second lemma oblanceolate, truncate, 1.6–2 mm, glabrous, awn 2.5–5 mm. Caryopsis ca. 1.6 mm, ellipsoidal.

Locality: Sai Kung, Tai Po Kau. *HK sheet 34207, 34660, 41957.*

Distribution: Hainan, Guangdong, Fujian, Taiwan; Vietnam.

Ecology: Sandy or gravelly soils near seashore. Flowering & fruiting: Aug.–Dec.

95. Enteropogon Nees 腸鬚草屬

Perennial, rarely annual herbs. Culms ± compressed. Leaf blades linear to filiform, apex tapering; ligule short, ciliate. Spikes unilateral, slender, single or 2–several digitately arranged, with biseriate, sessile, imbricate and awned spikelets. Spikelets lanceolate, dorsally compressed, 2(–3)-flowered, lowermost floret fertile, second male or neuter floret sometimes present, uppermost floret reduced to a rudimentary awned lemma at rachilla apex; rachilla articulating above the glumes, protruding and sometimes bearing a reduced floret; glumes shorter or as long as florets, lanceolate to subulate, membranous, 1-veined, apex acute to shortly awned; lemma of fertile floret broadly rounded to almost flat on back, subleathery, raised, scabrous, 3-veined, apex 2-toothed, midvein protruding into a slender awn; callus bearded, blunt; palea equalling the lemma, 2-keeled. Caryopsis narrowly elliptic, dorsally compressed; pericarp free.

About 19 species distributed throughout the tropics; two species in China; one species in Hong Kong.

1. Enteropogon dolichostachyus (Lag.) Keng ex Lazarides 腸鬚草 **(Fig. 175)**

Austral. J. Bot., Suppl. Ser. 5: 31. 1972; FOC 22: 490. 2006.

Chloris dolichostachya Lag., Gen. Sp. Pl. 5. 1816; FHN 4: 386, fig. 1194. 1977.

Enteropogon dolichostachyus (Lag.) Keng, Claves Gen. Sp. Gram. Prim. Sinic. 197. 1957 (nom. inval.); FTW ed. 2, 5: 406, pl. 165. 2000; FGD 9: 375, fig. 184. 2009; Check List HK Plants 334. 2002; 117. 2004.

Perennial herb. Culms tufted, erect or geniculate at base, (0.5–)1–1.5(–2) m tall. Leaf blades linear, flat or rolled, 15–45 × 0.4–1.5 cm, midrib white, conspicuous, surface scabrous, loosely glandular hairy, often tuberculate-hispid near ligule, apex setaceous; ligule ca. 0.5 mm, fimbriate; leaf sheaths glabrous or tuberculate-hispid, especially on margin, pilose at mouth. Spikes 10–20 cm, 3–5(–10) digitately arranged, ascending at first, later divaricate or drooping; rachis triquetrous, scabrous. Spikelets 5–7 mm, 2-flowered; glumes papery, deltoid-lanceolate, apex acute and aristate, conspicuously 1-veined; lower glume linear-lanceolate, 2–3 mm; upper glume lanceolate, 3–5 mm, awn-pointed; lemma of fertile floret purplish, oblong-lanceolate, 3.5–5 mm, glabrous, scabrous along either side of midvein and toward apex; awn 8–16 mm; palea linear-lanceolate, upper margin siliceous, with the same texture and length as the lemma, keels scabrous; upper floret reduced to an oblong 0.8–1.8 mm sterile lemma with 2–5 mm awn, appressed to fertile floret. Caryopsis reddish brown, ellipsoidal, ca. 3.5 mm.

Locality: Ping Chau. *S. C. Ng 2031.*

Distribution: Hainan, S Yunnan, Taiwan; Afghanistan through India to SE Asia.

Ecology: Open grassy fields, seashores. Flowering & fruiting: Aug.–Oct.

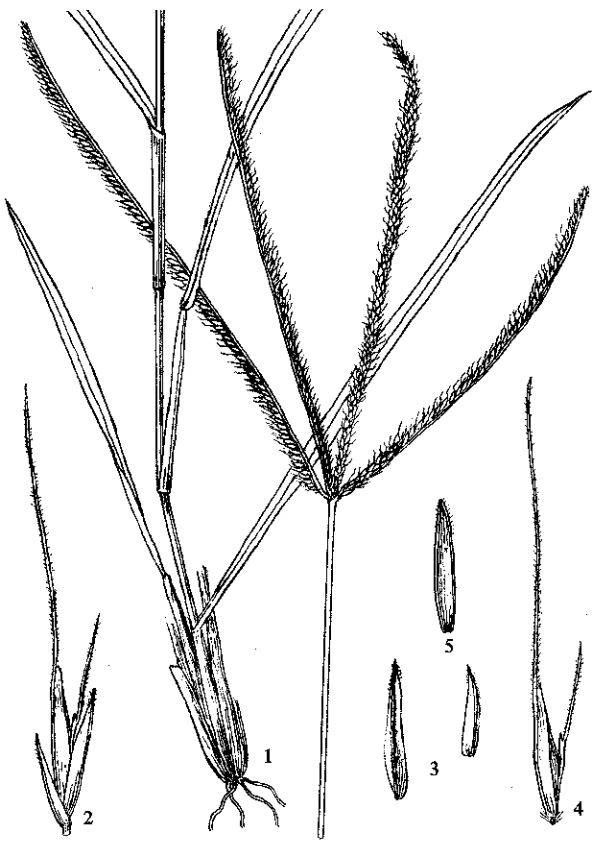

Figure 175. *Enteropogon dolichostachyus* (Lag.) Keng ex Lazarides

1. plant; *2.* spikelet; *3.* lower glume and upper glume; *4.* floret and rachis; *5.* palea. (drawn by H. P. Yu)

361. TYPHACEAE 香蒲科

HU Qi-ming 胡啓明

Perennial herbs, monoecious, with creeping rhizomes, growing in marshes and shallow freshwater. Leaves alternate, radical and cauline, distichous, sheathed at base; leaf blade linear, usually spongy, margin entire. Flowers unisexual, minute, many, densely crowded in a club-shaped spike with the staminate flowers occurring on the upper part and the pistillate flowers on the lower part; bracts deciduous or sometime absent. Perianth consist of many slender threads or elongated spoon-shaped scales mixed with ovaries or stamens; male flower: stamens 1–3, surrounded by hairs, filaments free or fused at base; anthers 2-thecous, basifixed, opening by longitudinal slits; connective thickened, enlarged at apex; pollen grains in monads or tetrads; female flowers: ovary 1-locular, on a long capillary stalk with many fine hairs or bracteoles at base; styles capillary; stigmas broadened or spatulate. Fruit minute, falling off together with pedicel.

One genus and about 16 species widely distributed in tropical and temperate regions; one genus and 12 species (two endemic) in China; one genus and one species in Hong Kong.

1. Typha L. 香蒲屬

Morphological characters and geographical distribution are the same as the family.

One species cultivated in Hong Kong.

1. Typha angustifolia L. 水燭 **(Fig. 176; Photos 432–433)**

Sp. Pl. 2: 971. 1753; FRPS 8: 7, pl. 2: 6–7. 1992; FFJ 6: 3, fig. 1. 1995; FGD 6: 379. 2005; FOC 23: 162. 2010.

Perennial marsh herb; stems erect, 0.5–1.5(–3) m tall, stout. Leaves linear, spongy, 50–80(–120) cm × 4–10 mm, transverse section semicircular. Inflorescences a club-shaped spike, 30–60 cm, with a naked gap about 0.5–10 cm between the upper staminate part and the lower pistillate part. Male flowers with 2–3 stamens; female flowers with many filiform bracteoles on the stalk of ovary. Fruit narrowly elliptical.

Locality: Cultivated. *Y. W. Lam 732, 1166; HK sheet 41712.*

Distribution: Widely distributed in China; temperate and subtropical regions of Asia, N Africa, Europe and N America.

Ecology: Marshes, swamps, shallow water of lakes and ponds. Flowering & fruiting: Jun.–Sep.

Uses: Medicinal (folklore).

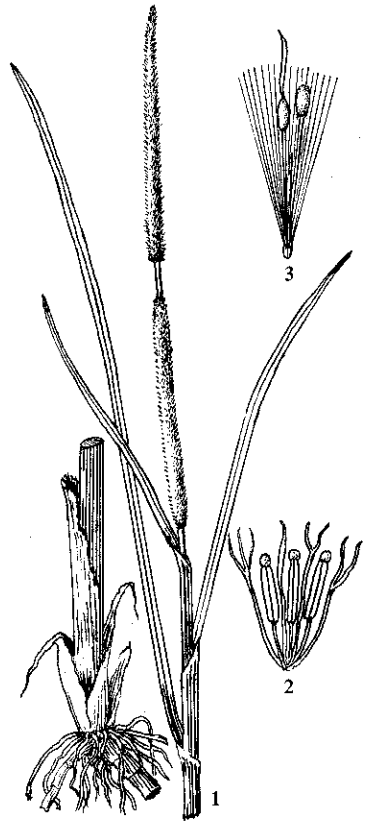

Figure 176. *Typha angustifolia* L.
1. plant; *2.* male flower; *3.* female flower. (drawn by H. P. Yu)

362. BROMELIACEAE 鳳梨科

WU De-lin 吳德鄰

Herbs or rarely shrubs, epiphytic, lithophytic, or terrestrial. Leaves spirally arranged, usually rosulate, sessile, simple, veins parallel, base dilated, sheathing, margin often spinose serrate or sometimes entire. Inflorescences terminal or lateral, scapose or sessile, a panicle, raceme, spike, or head, sometimes reduced to solitary, pseudolateral flowers. Bracts usually brightly coloured and conspicuous. Flowers bisexual or sometimes functionally unisexual, 3-merous. Sepals and petals each 3, distinct, free or basally connate; petals often brightly coloured, basal margin with a pair of scale-like appendages. Stamens 6, in 2 whorls of 3; filaments free, connate, or collectively or individually adnate to petals; anthers 2-celled, dehiscing by longitudinal slits. Gynoecium of 3 carpels united to form a compound, 3-locular, superior or very often partly or wholly inferior ovary; ovules few to usually ± many in each locule; placentation axile; styles terminal and often 3-parted; stigmas papillose. Berry or septicidal capsules often or seldom compound and fleshy. Seeds usually winged or plumose; endosperm mealy; embryo small to fairly large.

About 50 genera and 2000–2600 species, mainly in tropical America; about ten genera and 30 species introduced in China; five genera, six species and one variety introduced in Hong Kong.

1a. Ovary superior; fruit a capsule ..... 1. *Vriesea*
1b. Ovary inferior; fruit a berry.
  2a. Inflorescence sessile in centre of rosette; sepals united into a tube ..... 2. *Cryptanthus*
  2b. Inflorescence on a prominent scape or stem; sepals free or connate basally.

3a. Pistils fusing and forming a compound fruit; inflorescence and fruit bearing a crown of sterile foliaceous bracts at apex ..... 3. *Ananas*

3b. Pistils always separate, even in fruit; inflorescence and fruit usually without a crown of foliaceous bracts.

4a. Inflorescence not on a robust, white-woolly peduncle; flowers of a same branch not into 3 directions; sepals free ..... 4. *Billbergia*

4b. Inflorescence on a robust, white-woolly peduncle; flowers of a same branch into 3 directions; sepals connate basally ..... 5. *Aechmea*

1. Vriesea Lindl. 王鳳梨屬

Perennial acaulescent herbs, mostly epiphytic. Leaves in dense rosettes, rather broad, scurfy or becoming glabrous adaxially, not spinose, sometimes spotted, barred or striped. Scape usually conspicuous. Inflorescence usually of distichous-flowered spikes, in mostly flattened spikes with highly coloured large bracts. Flowers perfect. Sepals erect, free, coloured. Petals free, erect, often with recurved tops, exceeding the calyx, bearing 2 basal scales on inner side. Stamens included or exserted. Ovary nearly or quite superior; stigma conduplicate-spiral, simple-erect, or of the convolute-blade type; ovules many. Fruit a capsule, dehiscing septicidally from the base. Seeds fusiform with a long straight basal coma.

About 193 species distributed from Mexico and the West Indies to Argentina and Uruguay; two species cultivated in Hong Kong.

1a. Leaves green with many irregularly dark-brown cross bands on both surfaces; petals yellow ..... 1. *V. splendens*

1b. Leaves blue-green with maroon pencilling; petals green with purplish tips ..... 2. *V. fosteriana*

1. Vriesea splendens (Brongn.) Lem. 火劍

Fl. des Serres 162, f. 1850; L. H. Bailey, Man. Cult. Pl. 193. 1949, et Hortus Third. 1165. 1976.

Tillandsia splandens Brongn., Ann. Fl. Pomone 14: 311. 1845.

Plant to 90 cm tall. Leaves green with many irregularly dark-brown cross bands on both surfaces, ligulate or ligulate-lanceolate, 30–60 × 5–7 cm, concave above, with a rounded, shortly cuspidate tip. Scape equalling or exceeding foliage. Spike flalttened, densely imbricate bright red bracts. Sepals coriaceous, light yellow with a pale base, at the top whether or not tinged with red, 2–2.5 cm. Petals curved, slightly exceeding the bracts, yellow, obliquely opened at the top. Stamens exserted.

Locality: Cultivated.

Distribution: Native to tropical America.

Uses: Ornamental.

2. Vriesea fosteriana L. B. Sm. 紅票

Arq. Bot. Estado São Paulo (2)1: 116, pl. 121. 1943; L. H. Bailey, Hortus Third 1164. 1976.

Plant to 1.8 m tall. Leaves forming a dense compact rosette, blue-green with maroon pencilling, to 65 × 7 cm. Spikes prominent with 2 opposed rows of multiple bracts at top end, unbranched. Petals green with purplish tips, to 3 cm or more, longer than stamens.

Locality: Cultivated.

Distribution: Native to Brazil.

Uses: Ornamental.

2. Cryptanthus Otto & A. Dietr., *nom. cons.* 姬鳳梨屬

Stemless or caulescent. Leaves rosulate or evenly polystichous along the stem; blades narrowly triangular, sessile or slightly contracted to subpetiolate at base, spinose-serrate. Inflorescence capitate, sessile, nested in the centre of the rosette or at the apex of the stem, compound. Flowers polygamous in some species at least. Sepals much connate. Petals connate by their claws, naked or with two callosities. Stamens exserted from the throat of the corolla, usually highly adnate to the petal. Ovules usually few, obtuse; placentae apical or median; epigynous tube none or very shallow. Fruits small, rather dry. Seeds small, flat.

About 41 species, xerophytic, saxicolous, or terrestrial, NE Brazil; one species and one variety cultivated in Hong Kong.

1a. Leaves not striped ..... 1. *C. bromelioides*

1b. Leaves striped with ivory and green, overlaid with carmine-rose ..... 1a. *C. bromelioides* var. *tricolor*

1. Cryptanthus bromelioides Otto & A. Dietr. 銀背姬鳳梨

Allg. Gartenzeitung 4: 297. 1836; L. H. Bailey, Hortus Third 339. 1976.

Leaves all alike, not petioled, green adaxially, silvery abaxially, to 17 × 3.5 cm, spiny-margined. Inflorescences on a scape of 15 cm. Flowers many, in clusters of 4–6 in axils of keeled bracts, milky-white, ca. 4 cm, tube of calyx longer than lobes.

Locality: Cultivated.

Distribution: Native to Brazil, widely cultivated in tropical regions.

Uses: Ornamental.

1a. Cryptanthus bromelioides Otto & A. Dietr. var. **tricolor** M. B. Foster 三色鳳梨
Bull. Bromeliad Soc. 3: 30. 1953; L. H. Bailey, Hortus Third 339. 1976.

It differs from var. *bromelioides* by leaves striped with ivory-white and green, overlaid with carmine-rose.

Locality: Cultivated.

Distribution: Native to Brazil, widely cultivated in tropical regions.

Uses: Ornamental.

Notes: The species was reported as *Cryptanthus bromelioides* Otto & A. Dietr. cv. *Tricolor* previously (Check List HK Plants 350. 2002; 122. 2004).

3. Ananas Mill. 鳳梨屬

Perennial herbs. Leaves in a dense rosette on the simple, short stem; leaf sheath scarcely enlarged; leaf blade ensiform, margin spinose serrate. Inflorescence terminal, strobiliform, with a tuft of sterile leafy bracts at apex. Flowers bisexual, sessile, in the axils of closely and spirally arranged bracts. Sepals short, imbricate. Petals free, erect, each bearing 2 ligulate scales at base. Stamens 6. Ovaries inferior, coalescing and with bracts and rachis forming a compound, fleshy fruit (syncarp).

Eight species distributed in S America; one species cultivated in China and Hong Kong.

1. Ananas comosus (L.) Merr. 鳳梨 **(Fig. 177; Photo 434)**
Interpr. Herb. Amboin. 133. 1917; FHN 4: 86. 1977; FOC 24: 18. 2000.

Bromelia comosa L., Stickm. Herb. Amb. 21, 1754.

Perennial herb, with a simple, short stem, usually with suckers arising from the the base. Leaves closely and spirally arranged in a rosette, leaf blade sword-shaped, margin coarsely and laxly spinose-serrate. Inflorescence strobiliform, many-flowered, with a tuft of sterile leafy bracts at apex; floral bracts inconspicuous, margin serrulate or entire. Flowers many. Sepals free, slightly asymmetric, apex obtuse. Petals violet or reddish, free but connivent and tube-like. Stamens included. Syncarp globose, ovoid, or elongate, 15 cm or longer at maturity, becoming fleshy and fragrant. Seeds absent or very rare.

Locality: Cultivated.

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan (cultivated); widely cultivated in tropical and subtropical regions; native to tropical America.

Uses: Fruit.

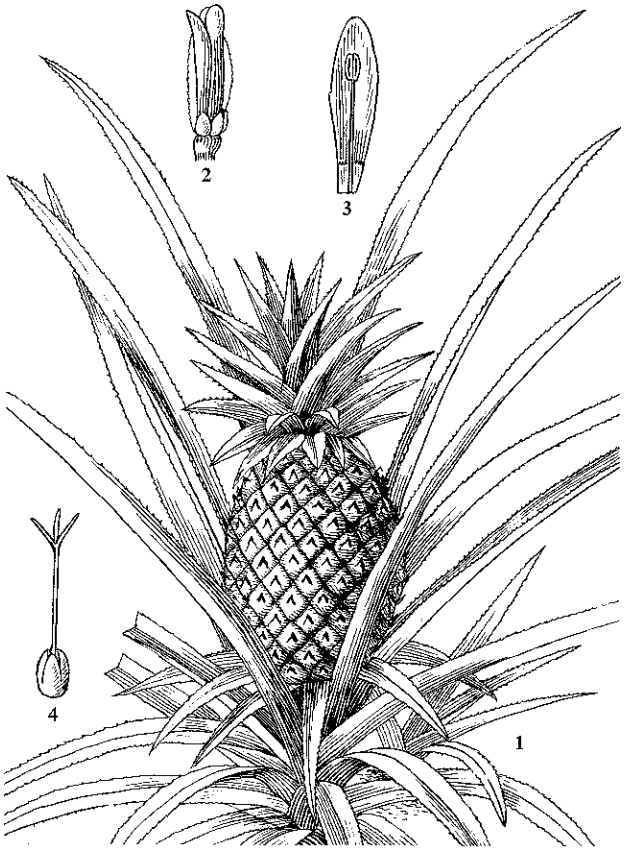

Figure 177. *Ananas comosus* (L.) Merr.
1. plant; *2*. flower; *3*. two scales showing the position of stamen; *4*. pistil. (drawn by H. P. Yu)

4. Billbergia Thunb. 水塔花屬

Terrestrial, saxicolous, and epiphytic herbs. Stemless or with very short stem. Leaves forming broadly funnelform to long-tubular rosettes; leaf blades linear or channel-shaped, margin serrate or serrulate, or rarely entire. Inflorescence a spike, racemes, or panicles; bracts often prominent and coloured. Flowers showy, blue, seldom red or greenish-yellow, actinomorphic or slightly zygomorphic. Sepals free, apex obtuse or rarely mucronate. Petals free, each with 2 ligulate scales at base. Stamens sub-equalling corolla or shorter, free or those opposite petals basally adnate to them; anthers medifixed. Ovary inferior; ovules many; style exceeding the stamens; stigma contorted or not. Fruit a dry berry.

About 62 species, native to tropical America; one species cultivated in Hong Kong.

1. Billbergia pyramidalis (Sims) Lindl. 水塔花 **(Fig. 178)**
Bot. Reg. 13: sub pl. 1068. 1827; FRPS 13(3): 67. 1997.

Bromelia pyramidalis Sims, Bot. Reg. 42: pl. 1732. 1815.

Stem very short. Leaves 6–15, forming a rosette; leaf blade lorate, 25 – 40 × 2–4 cm, apex acute or acuminate, with closely set, small marginal spines, abaxially usually with many white transverse bands, adaxially and basally pale or dark coloured. Spikes erect; bracts pink, lanceolate, 5–7 cm. Sepals 3, obtuse, pale red. Petals 3, bright red, ca. 4 cm, tipped with violet, during anthesis erect, with recurved, slightly broadened and rounded tips. Filaments equalling the corolla or slightly shorter; stigmas contorted, violet. Fruit a berry.

Locality: Cultivated. *HK sheet 28122, 28133.*

Distribution: Hainan, Guangdong (cultivated); native to tropical America, widely cultivated in tropical regions.

Ecology: Flowering: Sep.

Uses: Ornamental.

5. **Aechmea** Ruiz & Pav. 蜻蜓鳳梨屬

Terrestrial or epiphytic acaulescent herbs, stoloniferous. Leaves rosulate, linear or linear-lanceolate, with a broadened, channelled base, often with marginal spines, frequently scaly. Scape well developed. Inflorescence a spikes or panicle; flowers distichous or polystichous, sessile or stipitate, perfect. Sepals free or connate, usually strongly asymmetric. Petals free, each bearing 2 ± adnate basal scales on the inner side. Stamens included; anthers dorsifixed. Ovary inferior, with few to many ovules in each locule; style filiform; stigma contorted or not. Berry dry or fleshy, indehiscent, many-seeded.

More than 180 species, mostly in Mexico and the West Indies to Argentina; one species cultivated in Hong Kong.

1. Aechmea fasciata (Lindl.) Baker 蜻蜓鳳梨 **(Photo 435)**

J. Bot. 17: 231. 1879.

Billbergia fasciata Lindl., Bot. Reg. 13: t. 1130. 1828.

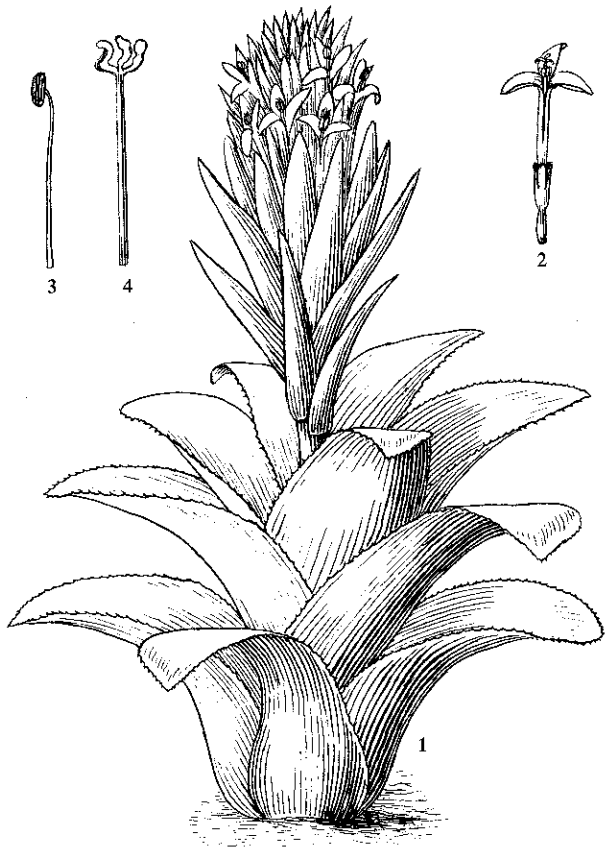

Figure 178. *Billbergia pyramidalis* (Sims) Lindl.
1. plant; *2.* flower; *3.* stamens; *4.* pistil. (drawn by H. P. Yu)

Perennial herb. Leaves rosulate; leaf sheath broad, usually brownish-red, leaf blade ligulate, outer ones apex acute, inner ones apex rounded, with a minutely cuspidate tip, green, glaucous, with very manifest transverse, white bars (consisting of white scales), margin with robust, brownish black spines. Inflorescence a panicle, terminal on a robust, white-woolly peduncle; flowers of a same branch arranged to 3 or more directions; floral bracts well-developed, lanceolate, outer ones to 10 cm, narrower and shorter inwards, margin serrulate, pink to crimson. Sepals keeled, basally connate, with a rounded, minutely apiculate tip, white hairy. Petals violet or red, rounded, 2–3 cm.

Locality: Cultivated.

Distribution: Native to Brazil.

Uses: Ornamental.

363. STRELITZIACEAE 旅人蕉科

HU Qi-ming 胡啓明

Stout perennial herbs, or musa-like trees. Stems formed by the sheathing leaf bases, or with a simple, unbranched trunk. Leaves medium-sized to very large, alternate and in 2 ranks, with a thick midrib and many pinnately paralled veins extending to the margin; petioles long, sheathed at base. Flowers bisexual, irregular, borne in terminal or lateral long-stalked cincinni and enclosed in a large spathe-like and boat-shaped bract; sepals 3, ± equal, free or ± adnate to the petals; petals 3, slightly to more often strongly dissimilar, the lateral ones larger than the median one; stamens usually 5, rarely 6 (in *Ravenala*), filaments rigid and elongate; anthers linear, opening by longitudinal slits; ovary inferior, 3-locular, with many ovules in each locule on the axile placentas. Fruit a woody capsule dehiscing loculicidally by 3 valves, or a fleshy schizocarp. Seeds many, contain a straight embryo in endosperm, arillate or not.

Three genera and seven species in tropical Africa; two genera and three species cultivated in China and Hong Kong.

1a. Plant tree-like; stamens 6; petals 3, the lateral ones like the sepals, the middle one slightly shorter and narrower.....1. *Ravenala*

1b. Plant not tree-like; stamens 5; petals 3, the middle one small, the lateral 2 connivent to form an arrow-shaped organ.....2. *Strelitzia*

1. **Ravenala** Adans. 旅人蕉屬

Tree-like plants. Leaves large, in 2 ranks toward top of stem; petioles long, with many air-canals, ± sheathing at base. Inflorescences axillary, much shorter than the leaves, with several stiff and boat-shaped, distichously and racemosely arranged bracts, each enveloping a compact, few-flowered helicoid cyme; sepals 3, free, subequal; petals 3, the lateral 2 like the sepals, the middle one slightly shorter and narrower; stamens 6, free; ovary 3-locular, each with many ovules on the axile placentas; style slender, stigma clavate. Fruit a 3-celled woody capsule, with many seeds.

A monotypic genus native to Madagascar.

1. Ravenala madagascariensis Sonn. 旅人蕉 **(Photo 436)**

Voy. Ind. Orient. 2: 223, pl. 124–126. 1782; FHN 4: 89. 1977; FRPS 16(2): 16, fig. 4. 1981; FGD 2: 396, fig. 272. 1991.

Trunk palm-like, woody, 5–6(–30) m tall. Leaves large, musa-like in 2 ranks toward top of stem, giving the plant a fan-shaped appearance; leaf blade oblong, 1.5–2 m × 50–75 cm, slightly narrower toward the rounded apex, base subtruncate, concolorous on both surfaces. Inflorescences axillary; bracts 6–12, large and boat-shaped, one above the other and distichously arranged, each enveloping 5–12 flowers; sepals 3, lanceolate, ca. 20 × 1.2 cm, leathery; petals like the sepals, but the middle one shorter and narrower; stamens 6, slender, 15–16 cm, anthers two times as long as the filaments; ovary depressed, 4–5 mm; style equaling the sepals, stigma fusiform. Capsule woody, dehiscing by 3 valves.

Locality: Cultivated in gardens.

Distribution: Native to Madagascar; widely cultivated in tropical areas.

Ecology: Fertile soils. Flowering: All year around.

Uses: Ornamental.

2. Strelitzia Aiton 鶴望蘭屬

Perennial herbs, or with a woody trunk. Leaves in two ranks, basal or crowded towards apex of stem, long petiolate; leaf blade oblong, entire. Inflorescences axillary, with 1–2 spathe-bracts, each enveloping a few-flowered helicoid cyme. Flowers bisexual, very irregular; sepals 3, white or yellow, narrow-lanceolate and long-pointed, much projecting; petals 3, white or blue, the middle one small, the other 2 connivent to form an arrow-shaped organ and enveloping the stamens in a groove; stamens 5, filaments slender; anthers linear, opening by longitudinal slits; ovary 3-locular, style 3-branched; ovules many. Capsule 3-angled, loculicidal.

Four species native to S Africa; two species cultivated in China and Hong Kong.

1a. Plant without woody trunk; peduncle almost as long as petiole; sepals orange ..... 1. *S. reginae*

1b. Plant with woody trunk; peduncle much shorter than petiole; sepals white ..... 2. *S. nicolai*

1. Strelitzia reginae Aiton 鶴望蘭 **(Photo 437)**

Hort. Kew 1: 285. 1789; FRPS 16(2): 16. 1981; FGD 2: 397, fig. 273. 1991.

Perennial herb, 1–1.5 m tall, trunkless. Leaves distichous, blade oblong-lanceolate, 25–45 × 10 cm, base broadly cuneate to subrounded, apex acute, margin entire or ± undulate; petiole equaling or longer than the blade. Peduncle rising from axils of leaves, nearly or quite as long as petiole, usually bearing 1 spathe-bract; spathe-bracts boat-shaped, to 20 cm, green with purple margins. Flowers several in a helicoids cyme, subtended and partly enveloped by the spathe-bracts; sepals lanceolate, orange, 7.5–10 cm; petals 3, the middle one small, the lateral 2 connivent and forming an arrow-shaped organ, auricled on either side, dark blue; stamens as long as petals, anthers linear; style exserted; stigma 3-branched.

Locality: Cultivated in gardens. *HK sheet 28108.*

Distribution: Native to S Africa.

Ecology: Flowering: Winter.

Uses: Ornamental.

2. Strelitzia nicolai Regel & Koern. 大鶴望蘭

Gartenflora 7: 265, pl. 235. 1858; FRPS 16(2): 18, pl. 5. 1981; FGD 2: 397. 1991.

Trunk up to 8 m, woody. Leaves in 2 ranks crowded toward apex of the trunk; leaf blade oblong, 90–120 × 45–60 cm, base subrounded, asymmetric, apex broadly obtuse; petiole to 1.8 m, sheathed at base. Inflorescences axillary; peduncle shorter than petiole, distally bearing 2 large spathe-bracts; spathe-bracts rigid, 25–32 cm, boat-shaped, ca. 6 cm across at the conduplicate base, green and tinged with purple. Flowers 4–9 in a helicoids cyme (cincinnus), with the lower part (ovary) enveloped in the spathe-bracts; sepals white, lanceolate, 13–17 × 1.5–3 cm, the anterior one narrower and keeled dorsally; petals 3, the middle one small, elliptic, 1.6 × 1.1 cm, apex mucronate, translucent, the lateral 2 connivent and forming an arrow-shaped organ, 10–12 cm, auricled on either side, dull blue; stamens concealed in the groove of the 2 connivent petals and slightly shorter than it, anthers linear, longer than the filaments; style rigid; stigma clavate, 3-branched.

Locality: Cultivated in gardens. *HK sheet 28106, 28107.*

Distribution: Native to S Africa, widely cultivated in tropical regions.

Ecology: Flowering: May–Jul.

Uses: Ornamental.

365. MUSACEAE 芭蕉科

WU De-lin 吳德鄰

Perennial or monocarpic herbs, growing from sympodial rhizomes or a massive, sympodial corm. Pseudostems composed of closely packed leaf sheaths. Leaves spirally arranged, petiolate; leaf blade entire, pinnately-veined. Inflorescence terminal or rarely axillary, cymose. Bracts large, spirally arranged, often brilliantly coloured, spathe-like. Flowers bisexual or unisexual by abortion, zygomorphic. Perianth in 2 whorls; 3 outer tepals and 2 inner ones united into a compound tepal; the third inner tepal free. Stamens 5, free; anthers 2-celled. Pistil 1. Ovary inferior, 3-locular, with many anatropous ovules in each locule; placentation axile; styles simple or capitate. Fruit a berry, fleshy or leathery and dry, indehiscent. Seeds hard, not arillate; embryo straight, surrounded by a ± well-developed endosperm and a mealy perisperm.

Three genera and ca. 40 species distributed in tropical and subtropical regions of Africa and Asia; three genera and 16 species in China; one genus and four species in Hong Kong.

1. Musa L. 芭蕉屬

Perennial herbs, tufted, rhizomatous and stoloniferous. Pseudostems composed of closely packed leaf sheaths, more than 60 cm, base slightly swollen. Leaves large; petiole long, base enlarged into a sheath; leaf blade oblong, entire. Inflorescence terminal, erect or pendulous. Bracts green, brown, dull purple, or rarely yellow, flat or furrowed, convolute or imbricate in bud, usually deciduous. Flowers in 1 or 2 rows per bract; flowers in proximal bracts always female (with reduced stamens) or bisexual; flowers in distal bracts usually male (with reduced gynoecium); sometimes (in cultivated or semicultivated forms) all flowers functionally sterile. Compound tepal tubular, soon splitting to base on 1 side, apex 5-toothed; free tepal inserted within compound tepal and opposite to it. Stamens 5; filaments short; anther linear, 2-celled. Berries elongate, fleshy, with many seeds (except in parthenocarpic forms). Seeds irregularly globose to lenticular.

About 30 species, mainly in SE Asia; 14 species in China; four species in Hong Kong.

1a. Inflorescence erect ..... 1. *M. coccinea*
1b. Inflorescence pendulous.
2a. Wild species; fruit with seeds, inedible; tepals purple ..... 2. *M. balbisiana*
2b. Cultivated species; fruit seedless, edible; tepals white to yellow.
3a. Rachis of inflorescence hairy; bracts acute at apex ..... 3. *M. acuminata* 'Dwarf cavendish'
3b. Rachis of inflorescence glabrous; bracts rounded at apex ..... 4. *M.* × *paradisiaca*

1. Musa coccinea Andrews 紅蕉

Bot. Repos. 1: pl. 47. 1799; FRPS 16(2): 14. 1981; FGD 2: 392. 1991; FOC 24: 316. 2000.

Musa uranoscopos Lour., Fl. Cochinch. 645. 1790.

Pseudostems 1–1.5 m tall, green. Petioles 30–40 cm, with narrow erect margins clasping pseudostem, not becoming scarious; leaf blade oblong or lanceolate, 55–100 × 15–25 cm, base rounded or obtuse, noticeably asymmetric, yellow-green, not pruinose. Inflorescence erect, elliptic, to 30 × 12 cm, very shortly pedunculate above sheath of topmost normal leaf, rachis glabrous. Bracts bright scarlet with green tips, lanceolate or oblong, 5.5–15 × 2.5–5.5 cm, after anthesis persisting during a very long time in an unfaded state. Male flowers 2 per bract, orange. Syntepalum 3.5– 4 cm, 5-obtuse-dentated at top, free tepal nearly equaling syntepalum. Female flowers 1–3 per bract; perianth as in male flowers. Ovary orange-yellow, dorsiventrally compressed. Berries orange-yellow at full maturity, oblong, 4–10 cm, crowned persistent perianth; stalk 3–3.5 cm. Seeds many, cylindrical, 6 × 4 mm.

Locality: Cultivated. *HK sheet 28086.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan (cultivated); Vietnam.

Ecology: Flowering: Nearly all year round.

Uses: Ornamental.

2. Musa balbisiana Colla 野蕉 **(Photos 438–439)**

Mem. Reale Accad. Sci. Torino 25: 384. 1820; Cheesm., Kew Bull. 1948(1): 14. 1948; FHN 4: 88. 1977; FRPS 16(2): 8. 1981; FGD 2: 393. 1991; FOC 24: 317. 2000.

Musa × *paradisiaca* L. subsp. *seminifera* (Lour.) Baker, Ann. Bot. 7: 213. 1893.

Musa seminifera Lour., Fl. Cochinch. 644. 1790.

Pseudostems clumped, to 6 m tall, yellow-green, often with black blotches. Petioles 60–75 cm, margin open, ca. 2 cm wide, often closed when young; leaf blade oblong, 2.9 m × 90 cm, base auriculate, asymmetric, adaxially green and slightly pruinose or not. Inflorescence pendulous, ca. 2.5 m; peduncle and rachis glabrous. Bracts of bisexual and male flowers adaxially purple-red, abaxially brownish purple to yellow-green and pruinose, ovate to lanceolate, persistent, apex obtuse, reflexed after flowering; bracts of female flowers deciduous. Male flowers up to 20 per bract, in 2 rows. Compound tepal abaxially pale purple, abaxially pale purple-white, 4–5 cm, striate, teeth yellow to orange; free tepal milky white, translucent, obovate, about half the length of compound tepal, apex emarginate, shortly mucronate-apiculate. Infructescence pendulous, with ca. 8 clusters ("hands") each of 15 or 16 berries in 2 rows.

Berries grey-green, obovoid, ca. 13 × 4 cm, distinctly angled at maturity, base narrowed into a stalk ca. 2.5 cm, apex contracted or not, into a short, angled column ca. 2 cm. Seeds many, brown, oblate, 5–10 mm in diam., minutely warty.

Locality: Tai Mo Shan. *Y. S. Lau 756; Y. W. Lam 1154.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan; S & SE Asia.

Ecology: Moist places in ravines.

3. Musa acuminata 'Dwarf Cavendish' 香蕉 **(Photo 440)**

Mem. Reale Accad. Sci. Torino 25: 394–395. 1820; FGD 2: 394. 1991; FOC 24: 316. 2000.

Musa nana Lour., Fl. Cochinch. 644. 1790; FRPS 16(2): 9. 1981.

Musa cavendishii Lamb. ex Paxt., Mag. Bot. 3: 51, pl. s.n. f. 1. 1837.

Musa chinensis Sweet, Hort. Britann. ed. 2, 596. 1826.

Pseudostems clumped, ca. 6 m tall, yellow-green, often with large, black markings. Petiole 60–75 cm, margin open, ca. 2 cm wide, often closed when young; leaf blade ovate-oblong, ca. 2.9 m × 90 cm, base auriculate, asymmetric, adaxially green and slightly pruinose or not. Inflorescence pendulous, ca. 2.5; peduncle and rachis glabrous. Bracts of bisexual and male flowers adaxially purple-red, abaxially brownish purple to yellow-green and pruinose, ovate to lanceolate, persistent, apex obtuse, reflexed after flowering; bracts of female flowers deciduous. Male flowers up to 20 per bract, in 2 rows. Compound tepal adaxially pale purple, abaxially pale purple-white, 4–5 cm, striate, teeth yellow to orange; free tepal milky white, translucent, obovate, about half the length of compound tepal, apex emarginate, shortly mucronate-apiculate. Infructescence pendulous, with ca. 8 clusters ("hands") each of 15 or 16 berries in 2 rows. Berries grey-green, obovoid, ca. 13 × 4 cm, distinctly angled at maturity, base arrowed into a stalk ca. 2.5 cm, apex contracted or not into a short, angled column ca. 2 cm. Seeds many, brown, oblate, 5–10 mm in diam., minutely warty.

Locality: Cultivated. *W. J. Tutcher 9189.*

Distribution: S China; widely cultivated in tropical regions.

Ecology: Flowering & fruiting: All year round.

Uses: Edible fruit.

Notes: The species was reported as *Musa acuminata* 'Cavendishii' previously (Check List HK Plants 351. 2002; 122. 2004).

4. Musa × paradisiaca L. 大蕉(甘蕉) **(Photo 441)**

Sp. Pl. 2: 1043. 1753; FHN 4: 87. 1977; FGD 2: 394. 1991; FOC 24: 317. 2000.

Musa saepientum L., Sp. Pl. ed. 2, 1477. 1763; FKH 273. 1912.

Musa paradisiaca L. subsp. *sapientum* (L.) Kuntze, Rev. Gen. 2: 692. 1891.

Pseudostems clumped, 3–7 m tall, pruinose. Petiole pruinose, more than 30 cm, margin closed; leaf blade oblong, 1.5–3 m × 40–60 cm, base subcordate to auriculate, subsymmetric, apex acute, adaxially deep green, abaxially light green and distinctly pruinose. Inflorescence pendulous; rachis glabrous. Bracts adaxially deep red, abaxially purple, ovate to ovate-lanceolate, 15–30 cm or more, deciduous. Flowers in 2 rows in each bract; male flowers with tepals yellow to pale yellow. Compound tepal 4–6.5 cm; free tepal suborbicular to oblong, about half the length of compound tepal, waxy, apex acuminate or rolling into a sac. Infructescence with 7 or 8 clusters of berries. Berries straight or slightly curved, oblong, 10–20 cm, angled; pulp sweet or sweet and acidic, not very fragrant; stalk elongate. Seeds absent or few.

Locality: Cultivated. *W. J. Tutcher 9190.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan; widely cultivated.

Ecology: Flowering & fruiting: All year round.

Uses: Edible fruit.

367. ZINGIBERACEAE 薑科

WU De-lin 吳德鄰

Perennial, terrestrial, rarely epiphytic, aromatic herbs, with fleshy, tuberous or non-tuberous rhizomes, often with tuber-bearing roots. Stems usually short, replaced by pseudostems formed by leaf sheaths. Leaves distichous, simple, those toward base of plant usually bladeless and reduced to sheaths; leaf sheath open; ligule usually present; petiole present or not, located between leaf blade and sheath, cushion-like in *Zingiber*; leaf blade suborbicular or lanceolate to narrowly strap-shaped, rolled longitudinally in bud, glabrous or hairy, margin entire; midvein prominent, lateral veins usually many, pinnate, parallel. Inflorescence terminal on pseudostems or on separate short, sheath-covered shoots arising from rhizomes, cylindrical or fusiform, sometimes globose, lax to dense, few- to many-flowered, sometimes with bracteolate cincinni in bract axils and then a thyrse, sometimes a raceme or spike; bracts present, bracteoles present or absent, often conspicuous, coloured. Flowers bisexual, epigynous, zygomorphic. Calyx usually tubular, thin, split on 1 side, sometimes spathe-like, apex 3-toothed or -lobed. Corolla proximally tubular, distally 3-lobed; lobes varying in size and shape. Androecium ancestrally of 6 stamens in 2 cycles of 3, but only median (adaxial) stamen of inner cycle functional, the other 2 stamens of inner cycle sterile and connate to form a petaloid staminode called a labellum, lateral 2 staminodes of outer cycle petaloid, or forming small teeth at base of labellum, or adnate to labellum, or absent, median staminode of outer cycle always reduced; filament of fertile stamen long or short; anther 2-celled, introrse, dehiscing by slits or occasionally pores; connective often extended basally into spurs and/or apically into a crest. Ovary inferior, 3-locular initially, 1- or 3-locular when mature; ovules ± many per locule; placentation parietal, basal, or axile.

Style 1, very thin, placed in a furrow of filament and between anther cells; stigma appearing above anther, funnelform, papillose, ± wet, margin often ciliate. Stylodes 2, reduced to nectaries at apex of ovary. Capsules fleshy or dry, dehiscent or indehiscent, sometimes berry-like. Seeds few or many, arillate; aril often lobed or lacerate.

About 54 genera and 1300 species; pantropical with centre of diversity in S and SE Asia, some species in America and subtropical and warm-temperate Asia; 20 genera and 216 species in China; four genera and 19 species in Hong Kong.

1a. Inflorescences terminal on pseudostems.
  2a. Lateral staminodes petaloid ..... 1. *Hedychium*
  2b. Lateral staminodes tooth-like at base of labellum or absent ..... 2. *Alpinia*
1b. Inflorescences on separate shoots arising from rhizomes.
  3a. Bracts partly connate forming pouches; anther base usually spurred, connective appendage absent ..... 3. *Curcuma*
  3b. Bracts separate; anther base not spurred, connective appendage elongate, wrapped around style ..... 4. *Zingiber*

1. Hedychium J. König 薑花屬

Terrestrial or epiphytic herbs, with tuberous rhizomes. Pseudostems erect, leafy. Ligule conspicuous; leaf blade usually oblong or lanceolate. Inflorescence a terminal spike, densely many flowered; bracts imbricate or lax, 1- or more flowered; bracteoles tubular. Calyx tubular, usually split on 1 side, apex truncate or 3-toothed. Corolla tube long, slender; lobes reflexed at anthesis, linear. Lateral staminodes petaloid, larger than corolla lobes. Labellum suborbicular, large, apex usually 2-cleft; claw long or short. Filament usually long, rarely absent; anther dorsifixed, base divaricate; connective appendage absent. Ovary 3-locular; placentation axile. Capsule globose, 3-valved. Seeds many; aril lacerate.

About 50 species in tropical and subtropical Asia, Africa (Madagascar); 28 species in China; one species in Hong Kong.

1. Hedychium coronarium J. König
薑花 **(Fig. 179; Photo 442)**

Observ Bot. 3: 73. 1783; FRPS 16(2): 26. 1981; FGD 2: 402. 1991; FOC 24: 372. 2000.

Pseudostems usually 1–1.5 m. Leaves sessile; ligule 2–3 cm, membranous; leaf blade oblong-lanceolate or lanceolate, 20–40 × 4.5–8 cm, base acute, apex long acuminate, adaxially glabrous, abaxially finely pubescent or thinly hairy. Spikes ellipsoidal, 10–20 × 4–8 cm; bracts imbricate, ovate, 4.5–5 × 2.5–4 cm, 2–3-flowered. Flowers white, fragrant. Calyx ca. 4 cm, split on 1 side. Corolla tube ca. 8 cm, slender; lobes lanceolate, ca. 5 cm, central one spatulate, apex mucronate. Lateral staminodes oblong-lanceolate, ca. 5 cm. Labellum white, pale yellow at base, obcordate, 4–6 × 4–6 cm, apex 2-cleft. Filament ca. 3 cm; anther ca. 1.5 cm. Ovary sericeous.

Locality: Cultivated. *Y. S. Lau 2086, 2421.*

Distribution: Guangdong, Guangxi, Hunan, Sichuan, Yunnan, Taiwan; Vietnam, Myanmar, Thailand, Nepal, Sikkim, Bhutan, India, Sri Lanka, Malaysia, Indonesia, Australia.

Uses: Medicinal (folklore), ornamental.

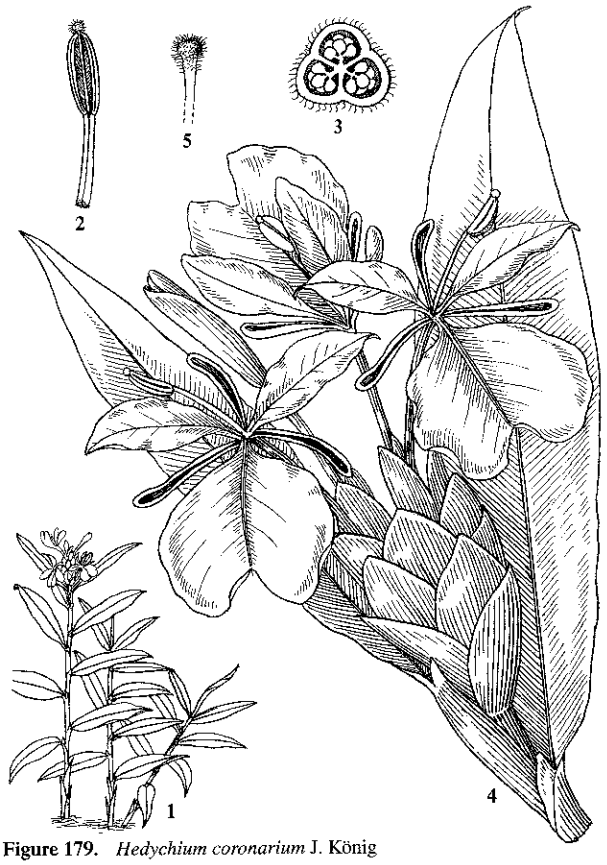

Figure 179. *Hedychium coronarium* J. König
1. plant; *2.* stamen; *3.* cross section of ovary; *4.* distal portion of flowering plant showing inflorescence; *5.* apex of stamen. (drawn by H. P. Yu)

2. Alpinia Roxb. 山薑屬

Rhizomes creeping, thick. Pseudostems many, well developed, rarely absent. Leaves many, rarely 1–4; leaf blade oblong or lanceolate. Inflorescence a terminal panicle, raceme, or spike, dense or lax, covered by 1–3 spatulate involucral bracts when immature. Bracts (when present) open to base, rarely hooded, each subtending 1 flower or a cincinnus of 2–many flowers; bracteoles open to base or tubular, rarely hooded, sometimes absent. Calyx usually tubular, sometimes split on 1 side. Corolla tube not or slightly longer than calyx, 3-lobed above, dorsal one ± hooded, usually wider than lateral lobes. Lateral staminodes small or absent, subulate or tooth-like, adnate to base of labellum. Labellum often showy, usually larger than corolla lobes, sometimes inconspicuous, margin variously lobed or entire. Filament present or absent; connective crested or not. Ovary usually 3-locular and placentation axile. Stigma usually well expanded, sometimes clavate, rarely geniculate. Stylodes often massive. Capsules usually globose, dry or fleshy, indehiscent or irregularly dehiscent. Seeds many, often angled, arillate.

About 230 species distributed in tropical and subtropical Asia, Australia, and Pacific islands; 51 species in China; ten species in Hong Kong.

1a. Labellum large, 2.7–6 cm.
2a. Capsule ribbed.
3a. Inflorescence erect, rachis subglabrous; labellum ca. 3 cm ..... 1. *A. formosana*
3b. Inflorescence drooping, rachis densely tomentose; labellum 4–6 cm ..... 2. *A. zerumbet*
2b. Capsule not ribbed.
4a. Inflorescence a panicle, less than 10 cm; labellum 2.7–3.5 cm ..... 3. *A. calcarata*
4b. Inflorescence a raceme, 10–30 cm; labellum 3.5–4.5 cm ..... 4. *A. hainanensis*
1b. Labellum small, 0.6–2 cm.
5a. Inflorescence a panicle.
6a. Pancle spreading, branches 2–4 cm; labellum ca. 2 cm ..... 5. *A. galanga*
6b. Panicle narrow, branches 3–10 mm; labellum 6–8 mm ..... 6. *A. oblongifolia*
5b. Inflorescence a raceme or spike.
7a. Inflorescence a spike with tomentose bracts ..... 7. *A. stachyodes*
7b. Inflorescence a raceme without tomentose bracts.
8a. Leaf blade hairy on both surfaces ..... 8. *A. japonica*
8b. Leaf blade glabrous on both surfaces.
9a. Leaf blade linear, 1.2–2.5 cm wide; ligule 2–3(–5) cm ..... 9. *A. officinarum*
9b. Leaf blade lanceolate to linear-lanceolate, 2–7 cm wide; ligule 2–3 mm ..... 10. *A. sichuanensis*

1. Alpinia formosana K. Schum. 美山薑
Bot. Jahrb. Syst. 27(3): 283. 1899; FRPS 16(2): 86. 1981; FOC 24: 336. 2000.

Pseudostems to 1(–3.5) m. Ligule to 1 cm, abaxially villous, apex obtuse; petiole absent or to 1 cm; leaf blade lanceolate or oblong-lanceolate, 50–70 × 8–12 cm, both ends acuminate. Panicles narrow, 15–20 cm; rachis glabrous or sparsely villous; branches 2–3-flowered; bracteoles elliptic, ca. 1.5 cm, apex mucronate. Pedicel ca. 3 mm. Calyx 1.3–1.7 cm, split on 1 side, apex 3-toothed, ciliate. Corolla tube ca. 1 cm, glabrous; lobes oblong, ca. 1.5 cm, apex ciliate. Lateral staminodes subulate, less than 2 mm. Labellum white tinged with yellow, marked with red stripes at centre, broadly ovate, ca. 3 cm, apex shortly 2-cleft, crisped. Stamen ca. 2 cm, with a knee-like bend. Ovary subglobose, white sericeous. Capsule vermilion, ellipsoidal, wrinkled.

Locality: Hong Kong Wai, Tai Mo Shan. *S. Y. Hu 5526* (CUHK).

Distribution: Taiwan; Japan.

Ecology: Flowering: May.

Uses: Ornamental.

2. Alpinia zerumbet (Pers.) B. L. Burtt & R. M. Sm.
豔山薑 **(Fig. 180; Photos 443–444)**
Notes Roy. Bot. Gard. Edinburgh 31(2): 204. 1972; FHN 4: 96. 1977; FRPS 16(2): 86. 1981; FGD 2: 415. 1991; FOC 24: 336. 2000.

Costus zerumbet Pers., Syn. Pl. 1: 3. 1805.

Alpinia speciosa (Wendl.) K. Schum., Pflanzenr. (IV.46): 339. 1904, non Dietr.(1839).

Alpinia nutans auct. non (L.) Rosc.: FHK 348. 1861; FKH 272. 1912.

Pseudostems 2–3 m. Ligule 5–10 mm, abaxially hairy; petiole 1–1.5 cm; leaf blade lanceolate, 30–60 × 5–10 cm, base attenuate, apex acuminate with a spiral mucro, glabrous except pubescent at margin. Panicles drooping, to 30 cm, enclosed by 2 long sheaths when young; rachis purple-red, velvety; branches very short, 1–2(–3)-flowered; bracteoles enclose flower buds, white with pink apex, elliptic, 3–3.5 cm, glabrous. Pedicel 1–2 cm. Calyx white, subcampanulate, ca. 2 cm, split on 1 side, apex toothed. Corolla tube shorter than calyx; lobes milky white with pink apex, oblong, ca. 3 mm; central lobe larger than lateral ones. Lateral staminodes subulate, ca. 2 mm. Labellum yellow with purple-red stripes, broadly ovate-spatulate, 4–6 cm, crisped. Stamen ca. 2.5 mm. Ovary golden yellow hirsute. Capsule vermilion, globose, ca. 2 cm in diam., ribbed, apex with persistent calyx. Seeds angled.

Locality: Common in Hong Kong. *HK sheet 42838.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; Vietnam, Cambodia, Laos, Thailand, Myanmar, Bangladesh, India, Sri Lanka, Malaysia, Indonesia, Philippines.

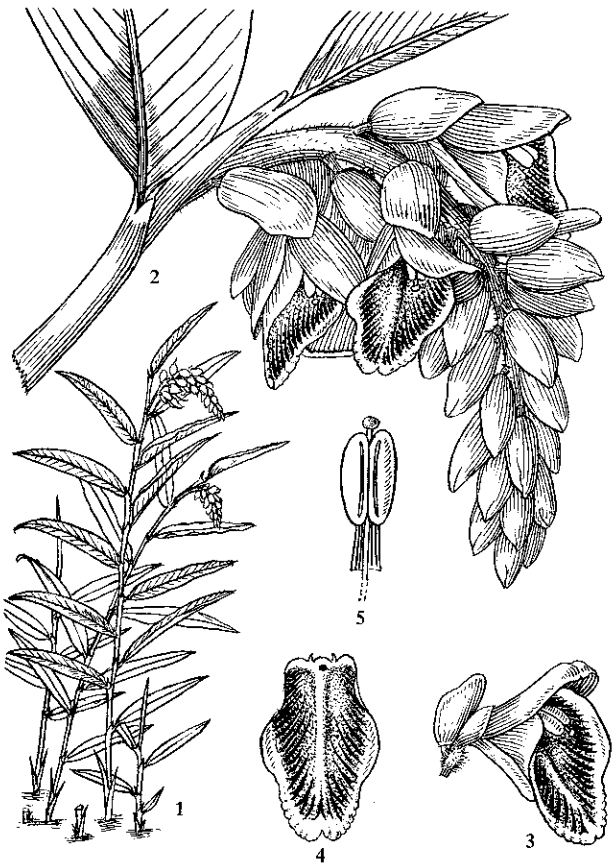

Figure 180. *Alpinia zerumbet* (Pers.) B. L. Burtt & R. M. Sm.
1. plant; *2.* inflorescence; *3.* flower; *4.* labellum; *5.* stamen. (drawn by H. P. Yu)

Ecology: Flowering: Apr.–Jun.; fruiting: Jul.–Oct.

Uses: Ornamental.

Notes: A cultivar (*Alpinia zerumbet* 'Variegata' 花葉豔山薑) is cultivated in Hong Kong for ornamental use. It is characterized by its leaves variegated in feather design with stripes and bands of creamy yellow.

3. Alpinia calcarata Roscoe 距花山薑 **(Photos 445–446)**

Trans. Linn. Soc. London 8: 347. 1807; FKH 272. 1912; FHN 4: 97. 1977; FRPS 16(2): 84. 1981; FOC 24: 336. 2000.

Pseudostems to 1.3 m. Leaves sessile; ligule 8–15 mm, glabrous, apex obtuse; leaf blade linear-lanceolate, 20–32 × 2–3.5 cm or narrower, base attenuate, apex acuminate and caudate-mucronate, margin with well-spaced, short bristles, glabrous. Panicles less than 10 cm; rachis slightly velvety; proximal branches 3–4-flowered. Bracteoles oblong, to 1.7 cm, membranous, apex obtuse. Pedicel ca. 3 mm. Calyx to 1.2 cm, split on 1 side, pubescent, apex 3-toothed. Corolla tube white, ca. 9 mm; lobes oblong, ca. 2.2 cm. Lateral staminodes red, subulate, ca. 3 mm, adnate to base of labellum. Labellum white with rose red and purple streaks, obovate, 2.7–3.5 × 1.5–2 cm, apex emarginate. Filaments ca. 1.3 cm; anther 5–7 mm. Ovary 3–4 mm in diam., sericeous. Capsules red, globose.

Locality: Clear Water Bay, Tai Au Mun, Tin Ha Village. *Y. S. Lau 2998; HK sheet 34821.*

Distribution: Guangdong; Myanmar, India, Sri Lanka.

Ecology: Forests. Flowering: May–Sep.

Uses: Ornamental.

4. Alpinia hainanensis K. Schum. 草豆蔻 **(Photos 447–448)**

Pflanzenr. 46(20): 335. 1904; FHN 4: 99. 1977; FRPS 16(2): 83. 1981; FGD 2: 414. 1991; FOC 24: 339. 2000.

Alpinia katsumada Hayata, Icon. Plan. Formosan. 5: 224. 1915; FPRS 16(2): 91. 1981; FGD 2: 416. 1991.

Alpinia henryi K. Schum., Pflanzenr. 20(IV.46): 335. 1904; FPRS 16(2): 92. 1981; FGD 2: 417. 1991.

Alpinia kainanntensis Masam., Trans. Nat. Hist. Soc. Taiwan 33: 28. 1943.

Pseudostems to 3 m. Ligule (3–)5–10 mm, abaxially hirsute; petiole absent to 2 cm; leaf blade linear-lanceolate, 20–65 × 2–12 cm, base obliquely attenuate, margin hairy, apex acuminate, with spirally caudate mucro, glabrous or rarely abaxially sparsely hirsute. Racemes erect, 10–30 cm, yellow hirsute; bracts 4–4.5 cm, glabrous; bracteoles milky white, broadly elliptic, 2–3.5 cm, hirsute at base and gradually becoming glabrous toward mucronate apex. Pedicel 2–3 mm. Calyx campanulate, 2–3 cm, split on 1 side, abaxially hairy, apex 2-toothed. Corolla tube 8–10 mm; lobes lanceolate, 2.5–3 cm, margin ciliate. Lateral staminodes subulate, ca. 3 mm. Labellum marked with radiate, purple stripes from centre to margin, triangular-ovate, 3.5–4.5 cm, apex shallowly 2-cleft. Filament ca. 1.5 cm; anther 1.2–1.5 cm. Ovary hirsute, ca. 5 mm in diam. Capsule globose, 2–3 cm in diam., yellow hirsute.

Locality: Common in Hong Kong. *H. C. Tang 173; L. T. Lo 24; HK sheet 28026.*

Distribution: Hainan, Guangdong, Guangxi.

Ecology: Forests. Flowering: Apr.–Jun.; fruiting: May–Aug.

Uses: Medicinal (folklore)

5. Alpinia galanga (L.) Willd. 紅豆蔻 **(Photos 449–450)**

Sp. Pl. 1(1): 12. 1797; FHK 348. 1861; FKH 272. 1912; FHN 4: 97. 1977; FRPS 16(2): 71. 1981; FGD 2: 411. 1991; FOC 24: 343. 2000.

Rhizomes tuberous. Pseudostems ca. 2 m. Ligule suborbicular, ca. 5 mm; petiole ca. 6 mm; leaf blade oblong or lanceolate, 25–35 × 6–10 cm, base attenuate, apex acute or acuminate, glabrous or abaxially pubescent. Panicles ca. 20 × 30 cm; rachis glabrous or pubescent; branches many, 2–4 cm, 3–6-flowered. Bracts and bracteoles persistent; bracteoles lanceolate, 5–8 mm. Flowers green-white, fragrant. Calyx tubular, 6–10 mm, persistent. Corolla tube 6–10 mm; lobes oblong, 1.6–1.8 cm. Lateral staminodes purple, subulate or linear, 2–10 mm. Labellum white with red lines, obovate-spatulate, ca. 2 cm, apex deeply 2-cleft. Filaments ca. 1 cm; anther ca. 7 mm. Capsules brown or red when dry, oblong, slightly contracted at middle, 1–1.5 cm × ca. 7 mm, thin, glabrous. Seeds 3–6.

Locality: Victoria Peak, Shing Mun, Ma Nam Wat, Tsung Tsai Yuen, Sha Lo Tung, Chung Mei, Nam Chung. *H. C. Tang 226; Y. S. Lau 2732; L. T. Lo 497.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan; tropical Asia.

Ecology: Secondary forests and thickets. Flowering: May–Aug.; fruiting: Sep.–Nov.

Uses: Medicinal (folklore).

6. Alpinia oblongifolia Hayata 華山薑 **(Photos 451–452)**

Icon. Pl. Formosan. 5: 215. 1915; FOC 24: 342. 2000.

Alpinia chinensis auct. non (Retz.) Rosc.: FHK 349. 1861; FKH 273. 1912; FHN 4: 96. 1977; FRPS 16(2): 77. 1981.

Alpinia suishaensis Hayata, Icon. Pl. Formosan. 9: 123. 1920; R. M. Sm, Edinb. J. Bot. 47(1): 59. 1990.

Pseudostems ca. 1 m. Ligule 4–10 mm, membranous, margin ciliate; petiole ca. 5 mm; leaf blade oblong, ovate-lanceolate or lanceolate, 20–30 × 3–10 cm, glabrous, base rounded or attenuate, apex acuminate or caudate-acuminate. Panicles narrow, 15–30 × 2–2.5 cm; branches 3–10 mm, 1–4-flowered; bracteoles 1–3 mm, deciduous. Pedicel to 1 mm. Calyx tubular, 5–7 mm, apex 3-toothed. Corolla tube slightly longer than calyx; lobes oblong, 6–7 mm. Lateral staminodes subulate, 1–2 mm. Labellum white with 2 red stripes from base to middle, ovate, 6–8 mm, apex 2-lobed. Filament ca. 5 mm; anther ca. 3 mm. Ovary globose. Capsule red, globose, 5–8 mm in diam. Seeds 5–8.

Locality: Hong Kong Island, Tai Mo Shan, Chuk Kok. *Y. W. Lam 2263; HK sheet 34246, 35852.*
Distribution: SW to SE China.
Ecology: Forests. Flowering: Apr.–Jun.; fruiting: Jun.–Nov.
Uses: Medicinal (folklore).

7. Alpinia stachyodes Hance 密苞山薑 **(Photos 453–454)**

J. Linn. Soc., Bot. 13: 126. 1873; FKH 272. 1912; FOC 24: 345. 2000.

Alpinia densibracteata T. L. Wu & Senjen, Acta Phytotax. Sin. 16(3): 32. 1978; FRPS 16(2): 80. 1981; FGD 2: 413. 1991.

Pseudostems 1–1.5 m. Leaf sheath tomentose; ligule orbicular, 2-cleft, ca. 1 cm, tomentose, margin ciliate; petiole 0.5–2 cm, tomentose; leaf blade oblong-lanceolate, 20–40 × 4–7 cm, leathery, base attenuate, apex acuminate, with caudate tip ca. 2.5 cm, glabrous except tomentose at margin and apex, or abaxially tomentose especially on median veins. Spikes erect, subsessile, cylindrical, 10–16 cm; involucral bract linear, 8–9 cm × 8–10 mm; bracts ovate or lanceolate, 1.5–2.5 cm, densely imbricate tomentose, 3-flowered, persistent; bracteoles lanceolate, 5–10 mm, tomentose, persistent. Flowers fragrant, tomentose. Calyx tubular, 1–1.5 cm, apex 3-toothed. Corolla tube ca. 1.2 cm; lobes oblong, ca. 6 mm, concave. Lateral staminodes linear, ca. 2 mm. Labellum striped at centre, rhomboidal-ovate, obscurely 3-lobed, ca. 7 × 3 mm, margin undulate.

Locality: Common in Hong Kong. *Y. S. Lau 94, 451, 667.*
Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Jiangxi.
Ecology: Thickets and thin forests. Flowering: Apr.–Sep.; fruiting: May–Nov.
Uses: Medicinal (forlklore).

8. Alpinia japonica (Thunb.) Miq. 山薑 **(Photo 455)**

Ann. Mus. Bot. Lugduno-Batavum 3: 140. 1867; FRPS 16(2): 102. 1981; FGD 2: 419. 1991; FOC 24: 341. 2000.

Globba japonica Thunb. in Murray, Syst. Veg., ed. 14, 73. 1784.

Pseudostems 35–70 cm. Ligule 2-cleft, ca. 2 mm, pubescent; petiole to 2 cm; leaf blade lanceolate, oblanceolate, or narrowly long elliptic, 25–40 × 4–7 cm, base attenuate, apex acuminate, mucronate, pubescent especially abaxially. Racemes 15–30 cm; rachis densely tomentose; involucral bracts lanceolate, ca. 9 cm, deciduous at anthesis; bracteoles very small, early deciduous. Flowers usually paired on rachis, often also with degenerate flowers; pedicel ca. 2 mm. Calyx clavate, 1–1.2 cm, pubescent, apex 3-toothed. Corolla tube ca. 1 cm, sparsely puberulent; lobes oblong, ca. 1 cm, abaxially tomentose, central one hood-like. Lateral staminodes linear, ca. 5 mm. Labellum white marked with red stripes, ovate, ca. 6 mm wide, margin irregularly notched, apex 2-cleft. Stamen 1.2–1.4 cm. Ovary densely tomentose. Capsule salmon red, globose or ellipsoidal, 1–1.5 cm in diam., pubescent, apex with persistent calyx. Seeds ca. 5 × 3 mm, many-angled, with camphor-like odour.

Locality: Sunset Peak. *F. W. Xing 7093; HK sheet 36003.*
Distribution: SE to SW China; Japan.
Ecology: Forests. Flowering: Apr.–Aug.; fruiting: Jul.–Dec.
Uses: Medicinal (folklore).

9. Alpinia officinarum Hance 高良薑 **(Photos 456–457)**

J. Linn. Soc., Bot. 13: 6. 1873; FHN 4: 98. 1977; FRPS 16(2): 100. 1981; FGD 2: 418. 1991; FOC 24: 340. 2000.

Rhizomes elongate, terete. Pseudostems 40–110 cm. Leaves sessile; ligule lanceolate, entire, 2–3(–5) cm, membranous; leaf blade linear, 20–30 × 1.2–2.5 cm, base attenuate, apex caudate, glabrous. Racemes erect, 6–10 cm; rachis tomentose; bracteoles very small, less than 1 cm. Pedicel 1–2 mm. Calyx 8–10 cm, puberulent, apex 3-toothed. Corolla tube slightly shorter than calyx; lobes oblong, ca. 1.5 cm, central one hood-like. Labellum white with red streaks, ovate, ca. 2 cm. Filament ca. 1 cm; anther ca. 6 mm. Ovary tomentose. Capsules red, globose, ca. 1 cm in diam.

Locality: Tai Au Mun, Clear Water Bay, Tung Lung Chau. *Y. S. Lau 2834; Y. W. Lam 1788; S. C. Ng 2816.*
Distribution: Hainan, Guangdong, Guangxi.
Ecology: Thickets and thin forests. Flowering: Apr.–Sep.; fruiting: May–Nov.
Uses: Medicinal (forklore).

10. Alpinia sichuanensis Z. Y. Zhu 四川山薑(箭秆風) **(Photos 458–459)**

Bull. Sichuan School Chin. Mat. Med. 8: 15. 1986; FOC 24: 342. 2000; Z. L. Zhao, Act. Phytotax. Sin. 41(6): 575. 2003.

Alpinia jianganfeng T. L. Wu, Novon 7: 441. 1997; FOC 24: 342. 2000.

Pseudostems to 1 m. Ligule 2-cleft, ca. 2 mm, margin ciliate; petiole absent to 4 cm; leaf blade lanceolate or linear-lanceolate, 20–30 × 2–4 (–6) cm, base attenuate, apex narrowly caudate, glabrous except hispid at subapical margin. Spikes erect, 10–20 cm; rachis tomentose; bracteoles very small. Flowers in clusters of 3 on rachis. Calyx cylindrical, abaxially pubescent, apex 3-cleft. Corolla tube subequaling or slightly longer than calyx; lobes oblong, 8–10 mm, abaxially villous. Lateral staminodes linear, ca. 2 mm. Labellum obovate, 0.7–1.3 cm, margin crisped, apex 2-cleft. Stamen longer than labellum; anther ca. 4 mm. Ovary globose, pubescent. Capsule globose, 7–8 mm in diam., pubescent, apex with persistent calyx. Seeds 5–6.

Locality: Sunset Peak. *HK sheet 34721, 34722, 36147.*
Distribution: Hainan, Guangdong, Guangxi.

Ecology: Thickets and thin forests. Flowering: Apr.–Jun.; fruiting: Jun.–Nov.
Uses: Medicinal (forklore).

3. Curcuma L. 薑黃屬

Rhizomes branched, fleshy, aromatic, often with tuber-bearing roots. Leaves basal; leaf blade broadly lanceolate or oblong, rarely narrowly linear. Inflorescence a terminal spike on pseudostems or on separate shoots arising from rhizomes, sometimes appearing before leaves; peduncle erect. Bracts connate for ca. 1/2 their length and forming pouches, spreading at free ends, each subtending a cincinnus of 2–7 flowers, apical bracts often differently coloured, large, sterile, forming a coma; bracteoles free to base. Calyx usually shortly tubular, split on 1 side, apex 2–3-lobed or -toothed. Corolla funnelform; lobes ovate or oblong, subequal or central lobe longer, apex mucronate. Lateral staminodes petaloid, basally adnate to filament and labellum. Labellum with a thickened, central portion and thinner, lateral lobes overlapping with lateral staminodes. Filament short, broad; anther versatile, base usually spurred; connective appendage absent. Ovary 3-locular. Capsule ellipsoidal, 3-valved, dehiscent.

About 50 species distributed in SE Asia, one species in Australia; 12 species (one introduced) in China; two species in Hong Kong.

1a. Inflorescences on separate shoots arising from rhizomes; plants flowering in summer; rhizomes yellow inside..... .....1. *A. aromatica*

1b. Inflorescences terminal on pseudostems; plants flowering in autumn; rhizomes orange inside..... 2. *C. longa*

1. Curcuma aromatica Salisb.
郁金(鬱金) **(Fig. 181; Photo 460)**

Parad. Lond. 1: pl. 96. 1807; FHN 4: 95. 1977; FRPS 16(2): 60. 1981; FGD 2: 407. 1991; FOC 24: 362. 2000.

Plants ca. 1 m tall. Rhizomes yellow inside, elliptic or narrowly so, fleshy, aromatic; roots with fusiform tubers. Petiole equaling leaf blade; leaf blade oblong, 30–60 × 10–20 cm, base attenuate, apex narrowly caudate, adaxially glabrous, abaxially pubescent. Inflorescences on separate shoots arising from rhizomes, usually appearing before leaves; spike cylindrical, ca. 15 × 8 cm; fertile bracts pale green, ovate, 4–5 cm; coma bracts white, tinged with red.

Locality: Shing Mun, Mau Ping, Tai Po. *Aubrey 11548; L. T. Lo 474; HK sheet 27957.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; tropical Asia.

Ecology: Thin Forests.

2. Curcuma longa L. 薑黃 **(Photo 461)**

Sp. Pl. 1: 2. 1753; FRPS 16(2): 62. 1981; FGD 2: 408. 1991; FOC 24: 361. 2000.

Curcuma domestica Valeton, Bull. Jard. Bot. Buitenz. 2 ser. 27: 31. 1918; FHN 4: 94. 1977.

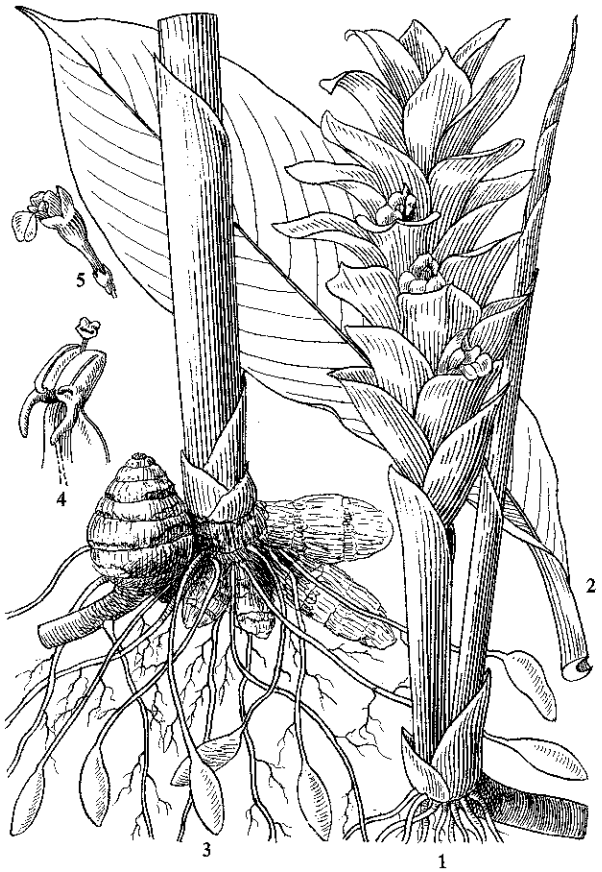

Figure 181. *Curcuma aromatica* Salisb.
1. plant; *2.* leaf; *3.* root; *4.* stamen; *5.* flower. (drawn by H. P. Yu)

Plants ca. 1 m tall. Rhizomes many-branched, orange inside, cylindrical, aromatic; roots tuberous at tip. Petiole 20–45 cm, leaf blade green, oblong or elliptic, 30–45(–90) × 15–18 cm, base attenuate, apex shortly acuminate, glabrous. Inflorescences terminal on pseudostems. Peduncle 12–20 cm; spike cylindrical, 12–18 × 4–9 cm; fertile bracts pale green, ovate or oblong, 3–5 cm, apex obtuse; coma bracts spreading, white and green, sometimes tinged reddish purple, apex acute. Calyx white, 0.8–1.2 cm, puberulent, apex unequally 3-toothed. Corolla pale yellow; tube to 3 cm; lobes deltoid, 1–1.5 cm, central one larger, apex mucronate. Lateral staminodes shorter than labellum. Labellum yellowish with central, yellow band, obovate, 1.2–2 cm. Anther spurred at base. Ovary sparsely hairy.

Locality: Cultivated. *HK sheet 27960.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; tropical Asia.

Ecology: Flowering: Aug.

Uses: Medicinal (forklore), spice.

4. Zingiber Mill. 薑屬

Rhizomes branched, tuberous, aromatic. Pseudostems erect, leafy. Leaves distichous, held in plane parallel to rhizome; petiole swollen, cushion-like; leaf blade oblong, lanceolate or linear. Inflorescences conical, arising from rhizomes on peduncle clothed with scale-like sheaths, rarely breaking through leaf sheaths without peduncle; bracts closely imbricate, green or other colour, 1-flowered,

persistent; bracteoles not tubular. Calyx tubular, split on 1 side, apex 3-toothed. Corolla tube slender; central lobe white or cream, usually wider than lateral lobes. Lateral staminodes adnate to labellum, forming a 3-lobed labellum; central lobe retuse or cleft at apex. Filament short; connective with elongate appendage wrapped around style. Ovary 3-locular; ovules many per locule; placentation axile. Style slender, extending beyond anther locules; stigma not expanded. Capsule dehiscent loculicidally or irregularly. Seeds black, covered by aril; aril white, margin irregularly lacerate.

Between 100 and 150 species in tropical to warm-temperate Asia; 42 species (one introduced) in China; six species in Hong Kong.

1a. Peduncle robust, erect, 10–30 cm tall.
  2a. Leaf blade 2–3 cm wide ..... 1. *Z. officinale*
  2b. Leaf blade 3–8 cm wide.
    3a. Ligule 1.5–2 cm; spikes conical, ovate-oblong; bracts apex obtuse ..... 2. *Z. zerumbet*
    3b. Ligule 2–4 cm; spikes oblong; bracts apex acute ..... 3. *Z. corallinum*
1b. Peduncle slender, not erect.
  4a. Labellum elliptic, not 3-lobed, lateral lobes reduced into 2 rounded teeth or absent ..... 4. *Z. integrilabrum*
  4b. Labellum 3-lobed.
    5a. Labellum yellow, ovate ..... 5. *Z. mioga*
    5b. Labellum pale purple, obovate ..... 6. *Z. striolatum*

1. Zingiber officinale Roscoe 薑 **(Photo 462)**

Trans. Linn. Soc. London 8: 348. 1807; FKH 272. 1912; FHN 4: 102. 1977; FRPS 16(2): 141. 1981; FGD 2: 429. 1991; FOC 24: 325. 2000.

Rhizomes branched, yellowish inside, thickened, fleshy, strongly aromatic. Pseudostems 50–100 cm. Leaves sessile; ligule slightly 2-lobed, 2–4 mm, membranous; leaf blade lanceolate or linear-lanceolate, 15–30 × 2–2.5 cm, glabrescent. Inflorescences arising from rhizomes, ovoid, 4–5 × ca. 1.5 cm; peduncle to 25 cm; bracts pale green, sometimes yellowish at margin, ovate, ca. 22.5 cm, apex mucronate; bracteoles equaling bracts. Calyx ca. 1 cm. Corolla yellowish green; tube 2–2.5 cm; lobes lanceolate, ca. 1.8 cm. Central lobe of labellum with purple stripes and cream blotches, oblong-obovate, shorter than corolla lobes; lateral lobes ovate, ca. 6 mm, free nearly to base. Stamen dark purple; anther ca. 9 mm; connective appendage curved, ca. 7 mm.

Locality: Cultivated. *HK sheet 27976, 32657.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Shaanxi, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Zhejiang, Fujian, Taiwan; widely cultivated in tropics in Asia.

Ecology: Cultivated in vegetable gardens. Flowering: Oct.

Uses: Flavour, medicinal (forklore).

2. Zingiber zerumbet (L.) Roscoe ex Sm.
紅球薑 **(Fig. 182; Photo 463)**

Exot. Bot. 2: 105. 1806; FKH 272. 1912; FHN 4: 102. 1977; FRPS 16(2): 142. 1981; FGD 2: 429. 1991; FOC 24: 326. 2000.

Amomum zerumbet L., Sp. Pl. 1: 1. 1753.

Rhizomes yellowish inside. Pseudostems 0.6–2 m. Leaves sessile or shortly petiolate; ligule entire, 1.5–2 cm, leaf blade lanceolate or oblong-lanceolate, 15–40 × 3–8 cm, base narrowed, apex acuminate, glabrescent or abaxially somewhat pilose. Inflorescences arising from rhizomes, conical or ovoid-oblong, 6–15 × 3.5–5 cm, apex obtuse; peduncle 10–30 cm; scale-like sheaths 5–7; bracts closely imbricate, green when young, red when old, slightly hairy, slimy adaxially, margin membranous; bracteoles ca. 1.5 cm. Calyx 1.2–2 cm, membranous, split on 1 side, apex 3-toothed. Corolla tube 2–3 cm, slender; lobes pale yellow, lanceolate, central one 1.5–2.5 cm. Labellum pale yellow, ca. 1.5 × 2.5 cm; central lobe suborbicular or subobovate, 1.5–2 × ca. 1.5 cm, apex emarginate; lateral lobes obovate, ca. 1 cm, free nearly to base. Stamen ca. 1 cm; connective appendage beak-like, ca. 8 mm. Ovary ca. 4 mm, glabrous. Capsule ellipsoidal, 0.8–1.2 cm. Seeds black.

Locality: Tai Tam Tuk, Pok Fu Lam, Peel Rise, Bowen Rd., Tung Chung. *H. C. Tang 2050; Y. S. Lau 1567; S. C. Ng 2633.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; Vietnam, Cambodia, Laos, Myanmar, Thailand, Malaysia, India, Sri Lanka.

Ecology: Moist places in forest. Flowering: Jul.–Sep.; fruiting: Oct.

Uses: Ornamental, medicinal (forklore).

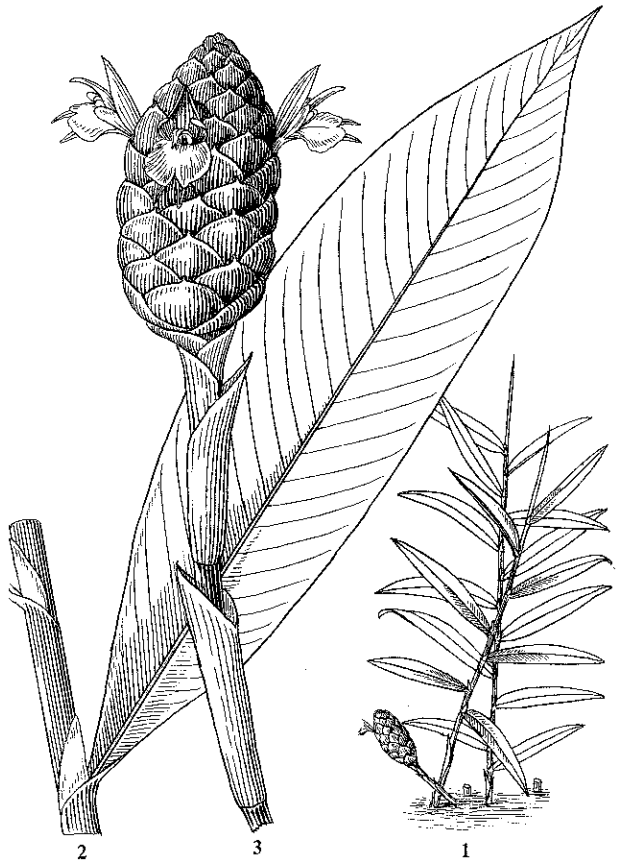

Figure 182. *Zingiber zerumbet* (L.) Roscoe ex Sm.
1. plant; *2.* leaf branch; *3.* inflorescence. (drawn by H. P. Yu)

3. Zingiber corallinum Hance 珊瑚薑

J. Bot. 18: 301. 1880; FHN 4: 102. 1977; FRPS 16(2): 142. 1981; FGD 2: 430. 1991; FOC 24: 326. 2000.

Pseudostems ca. 1 m tall. Leaves sessile; leaf sheath sparsely hairy or glabrous; ligule 2–4 mm; leaf blade oblong-lanceolate or lanceolate, 20–30 × 4–6 cm, adaxially glabrous, abaxially sparsely hairy or glabrous. Inflorescences arising from rhizomes, oblong, 15–30 cm; peduncle 15–20 cm; scale-like sheaths 4–5 cm; bracts red, ovate, 3–4 cm, apex acute. Calyx 1.5–1.8 cm, split to middle. Corolla tube 2.5 cm, lobes with purple stripes, oblong, ca. 1.5 cm, apex acute, central one larger than lateral ones; central lobe of labellum obovate, ca. 1.5 cm; lateral lobes ca. 8 mm, apex acute. Anther sessile, ca. 1 cm; connective appendage beak-like, curved, ca. 5 mm. Ovary 2–2.5 mm, sericeous. Seeds black, glossy.

Locality: Tai Mo Shan, Tai Long Sai Wan. *Y. S. Lau 1027; HK sheet 27972, 27973.*

Distribution: Hainan, Guangdong, Guangxi.

Ecology: Forests or cultivated. Flowering: May–Aug.; fruiting: Aug.–Oct.

Uses: Medicinal (forklore).

4. Zingiber integrilabrum Hance 全唇薑

J. Bot. 20: 80. 1882; FKH 272. 1912; FRPS 16(2): 148. 1981; FGD 2: 431. 1991; FOC 24: 327. 2000.

Rhizomes branched, odourless. Pseudostems 40–100 cm high. Ligule orbicular, 2-lobed, to 1 mm; petiole absent to 5 mm; leaf blade lanceolate, 15–18 × ca. 3 cm, adaxially glabrous, abaxially pubescent or pilose. Inflorescences arising from rhizomes, ca. 1/2 embedded in ground, 4–5-flowered; peduncle 1–2 times as long as inflorescence; scale-like sheaths 2–3 cm; bracts becoming brownish when old, lanceolate, 2–3 cm, glabrous; bracteoles ca. 2 cm, membranous. Calyx ca. 2 cm, split on one side, glabrous. Corolla ivory white; tube ca. 2.7 cm; lobes lanceolate ca. 1.8 cm. Labellum elliptic, lateral lobes reduced into rounded teeth or absent. Anther sessile, ca. 8 mm; connective appendage ca. 7 mm.

Locality: Mount Gough. *HK sheet 7228.*

Distribution: Endemic to Hong Kong.

Ecology: Forests. Flowering: Apr.–Oct.

Notes: The type specimen (*Hance Herb No. 21812,* BM) was collected by C. Ford from Mount Gough in April 1881. Listed in *Rare and Precious Plants of Hong Kong.*

5. Zingiber mioga (Thunb.) Roscoe 囊荷 **(Fig. 183; Photo 464)**

Trans. Linn. Soc. London 8: 348. 1807; FHN 4: 102. 1977; FRPS 16(2): 146. 1981; FGD 2: 430. 1991. FOC 24: 332. 2000.

Amomum mioga Thunb., Syst. Veg. (ed. 14) 51. 1784.

Rhizomes yellowish. Ligule 2-lobed, 3–12 mm, membranous; petiole absent to 1.7 cm; leaf blade lanceolate-elliptic or linear-lanceolate, 20–37 × 4–6 cm, apex caudate, glabrous or abaxially pilose. Inflorescences arising from rhizomes, ellipsoidal, 5–7 cm; peduncle absent to 17 cm; scale-like sheaths oblong; bracts reddish green with purple veins, elliptic. Calyx 2–3 cm. Corolla tube longer than calyx; lobes yellowish, lanceolate 2.7–3 cm × ca. 7 mm. Labellum ovate, ca. 3 cm; central lobe yellow with white margin, ca. 2.5 × 1.8 cm; lateral lobes 1.3 cm × 4 mm. Anther ca. 1 cm; connective appendage ca. 1 cm. Capsule obovoid, loculicidally dehiscent; pericarp red inside. Seeds black; aril white.

Locality: Ma On Shan, Sunset Peak. *F. W. Xing 7543; HK sheet 34827.*

Distribution: Guangdong, Guangxi, Yunnan, Guizhou, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang; Japan.

Ecology: Moist places in mountain valleys. Flowering: Aug.–Oct.

Uses: Medicinal (forklore), vegetable (young inflorescence).

Figure 183. *Zingiber mioga* (Thunb.) Roscoe

1. pseudostem and leaves; *2.* inflorescence; *3.* flower; *4.* labellum; *5.* stamen. (drawn by H. P. Yu)

6. Zingiber striolatum Diels 陽荷 **(Photos 465–466)**

Bot. Jahrb. Syst. 29: 262. 1901; FRPS 16(2): 146. 1981; FGD 2: 431. 1991; FOC 24: 332. 2000.

Rhizomes white, slightly fragrant. Pseudostems 1–1.5 m. Ligule brown striped, 2-lobed, 4–7 mm, membranous; petiole 0.8–1.2 cm; leaf blade lanceolate or elliptic-lanceolate, 25–35 × 3–6 cm, base attenuate, apex caudate, abaxially glabrous or sparsely villose. Inflorescences arising from rhizomes, subovoid; peduncle 1.5–2 cm or longer; scale-like sheaths 2–3; bracts red, broadly ovate or elliptic, 3–5 cm, pubescent. Calyx ca. 2.5 cm, membranous. Corolla tube white, 4–6 cm; lobes white or yellowish with purplish brown stripes, oblong-lanceolate, 3–3.5 cm. Labellum pale purple, obovate, ca. 3 × 2.6 cm; lateral lobes ca. 5 mm. Filaments very short; anther lanceolate, ca. 1.5 cm; connective appendage ca. 1.5 cm. Capsule loculicidally dehiscent; pericarp red inside. Seeds black; aril white.

Locality: Tai Mo Shan. *G. Barretto 254; HK sheet 34253.*
Distribution: Hainan, Guangdong, Guangxi, Guizhou, Sichuan, Hubei, Hunan, Jiangxi, Zhejiang.
Ecology: Forests. Flowering: Jul.–Oct.; fruiting: Sep.–Dec.
Uses: Medicinal (forklore).

368. COSTACEAE 閉鞘薑科

WU De-lin 吳德鄰

Perennial, terrestrial, not aromatic herbs, with ± fleshy rhizomes. Stems usually simple, often long, terete, sometimes spirally contorted, leafy; secondary branches (if present) breaking through leaf sheaths. Leaves spirally arranged, simple, those toward base of stem usually bladeless; leaf sheath tubular, closed; ligule present; petiole short; leaf blade narrowly to broadly elliptic, rolled longitudinally in bud, glabrous to hairy, margin entire. Inflorescence a cone-like spike, terminal on leafy shoots or on separate, short, leafless shoots arising from rhizomes. Bracts imbricate, with linear, nectariferous callus below apex, 1–2-flowered; bracteoles tubular, or folded. Flowers bisexual, epigynous, zygomorphic. Calyx tubular, 2–3-lobed or -toothed. Corolla proximally tubular, distally 3-lobed; lobes unequal, imbricate in bud. Staminodes 5, united into a labellum equaling or much longer than corolla, often ± 3-lobed with crisped margin, never deeply lobed. Fertile stamen 1; filament broad; anther borne below apex of filament or at apex with a connective crest, introrse, dehiscing by longitudinal slits. Ovary inferior, 2–3-locular; ovules many per locule; placentation axile. Developed style 1, filiform, usually enclosed between anther locules; stigma with or without abaxial appendage. Stylodes 2, reduced to septal, hollow nectaries at apex of ovary, or absent. Fruit a capsule, 2–3-valved and dehiscing loculicidally, or indehiscent and breaking up irregularly, apex with persistent calyx. Seeds many, black, arillate.

Four genera and ca. 120 species of pantropical with centre of diversity in America; one genus and five species (two endemic) in China; one genus and one species in Hong Kong.

1. Costus L. 閉鞘薑屬

Rhizomes horizontal. Stems sometimes branched, usually spirally twisted, leafy, rarely plants stemless. Leaf blade oblong to lanceolate. Inflorescences terminal or lateral on separate, short, leafless shoots arising from rhizomes, conical, densely many-flowered. Bracts imbricate, 1–2-flowered. Calyx 3-lobed or -toothed at apex. Corolla tube equalling or longer than calyx. Labellum obovate, large, margin incurved. Stamens petaloid; anther cells linear. Ovary 3-locular; ovules many per locule, superposed. Style filiform; stigma funnelform. Stylodes absent. Capsules subglobose or ovoid, woody. Seeds many, black; aril lacerate.

About 90 species distributed in tropical and subtropical regions; five species (two endemic) in China; one species in Hong Kong.

1. Costus speciosus (J. König) Sm.
閉鞘薑 **(Fig. 184; Photo 467)**

Trans. Linn. Soc. London 1: 249. 1791; FHN 4: 91. 1977; FRPS 16(2): 149. 1981; FGD 2: 432. 1991; FOC 24: 321. 2000.

Banksea speciosa J. König, Observ. Bot. 3: 75. 1783.

Stems 1–3 m, base slightly woody, apex branched and spirally twisted when old. Petiole 5–7 mm; leaf blade oblong or lanceolate, 15–20 × 6–10 cm, base subrounded, apex acuminate or caudate-acuminate, abaxially densely sericeous. Inflorescences terminal, ellipsoidal or ovoid, 5–15 cm. Bracts bright red, ovate, ca. 2 cm, leathery, pubescent, apex sharply pointed; bracteoles pale red, 1.2–1.5 cm. Calyx red, 1.8–2 cm, leathery, apex 3-lobed; lobes reddish black, rigid, and densely sericeous at apex. Corolla tube ca. 1 cm; lobes oblong-elliptic, ca. 5 cm, apex white or red. Labellum white, trumpet-shaped, 6.5–9 cm, apex toothed and crisped, with edges overlapping. Stamens petaloid, white with orange-yellow base, urceolate, ca. 4.5–1.3 cm, pubescent. Capsules red, globose, ca. 1.5 cm, slightly woody. Seeds black, glossy, ca. 3 mm.

Locality: Mount Gough, Tai Hang Rd., Lantau Peak. *H. C. Tang 605; Y. S. Lau 2123; HK sheet 39872.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Taiwan; tropical Asia.

Ecology: Thin forests. Flowering: Jul.–Sep.; fruiting: Sep.–Nov.

Uses: Medicinal (forklore).

Figure 184. *Costus speciosus* (J. König) Sm.
1. flowering plant; *2.* portion of plant with spiral arranged leaves; *3.* generative stamens and style; *4.* fruit. (drawn by H. P. Yu)

369. CANNACEAE 美人蕉科

WU De-lin 吳德鄰

Perennial herbs. Stems erect, robust, Rhizomes tuberous. Leaves alternate, spirally arranged, large, veins pinnate and parallel, base sheathing. Inflorescense a terminal raceme or panicle of showy, 1–2-flowered cincinni. Flowers bisexual, asymmetric, mostly large. Sepals 3, green, free, persistent. Corolla lobes 3, green or coloured, basally connate into a tube and adnate to staminodes. Staminodes and stamen in 2 whorls; outer whorls with (2–)3 conspicuous, petaloid staminodes, usually red or yellow; inner whorl with a reflexed staminode (labellum), narrower than outer staminodes, and a fertile stamen; filaments petaloid; anther 1-celled, adnate to apical margin of filament. Ovary inferior, 3-locular; ovules many per locule; placentation axile. Style petaloid. Capsule 3-valved, usually warty. Seeds many, globose; endosperm copious; embryo straight.

One genus and 10–20 species distributed in tropical and subtropical America; several species and hybrids cultivated in China; two species and one hybrid commonly cultivated in Hong Kong.

1. Canna L. 美人蕉屬

Morphological characters and geographic distribution are the same as those of the family.

1a. Staminodes smaller, 3.5–5.5 × up to 1 cm ..... 1. *C. indica*

1b. Staminodes larger, 5–10 × 2–3.5 cm.

2a. Leaves lanceolate; flowers loosely arranged, yellow, outer cycle staminodes not more then 2 cm broad ..... 2. *C. glauca*

2b. Leaves oblong; flowers densely arranged, red, yellow or various colour, outer cycle staminodes 2–5 cm broad ..... 3. *C.* × *generalis*

1. Canna indica L. 美人蕉 (Fig. 185; Photo 468)

Sp. Pl. 1: 1. 1753; FHK 349. 1861; FKH 273. 1912; FHN 4: 103. 1977; FRPS 16(2): 157. 1981; FGD 2: 435. 1991; FOC 24: 378. 2000.

Canna edulis Ker, Bot. Reg. 9: t. 775. 1823; FHN 4: 104. 1977; FRPS 16(2): 157. 1981; FGD 2: 435. 1991.

Rhizome developed, much branched. Stems stout, to 2.5 m. Leaf sheath green or purple; petiole short; leaf blade ovate-oblong to oblong, 30–60 × 10–20 cm, adaxially green, abaxially and at margin green or purple. Inflorescence a raceme of cincinni. Bracts light purple, ovate, ca. 8 mm. Flowers 1–2 per cincinnus. Sepals pale purplish green, lanceolate, ca. 1.5 cm. Corolla tube apricot yellow, ca. 1.5 cm; lobes erect, red to apricot yellow with purplish apex, lanceolate, ca. 4 cm. Staminodes 2(–3), erect, red with apricot yellow base, oblanceolate, 4–5.5 cm × 7–10 mm, 1 with apex emarginate; labellum red, sometimes with yellow spots, lanceolate, ca. 4.5 cm, margin revolute, apex emarginate; fertile stamen with filament reddish apricot yellow, lanceolate, ca. 4.2 cm. Anther ca. 9 mm. Ovary green, globose, ca. 6 mm in diam., warty. Style red to apricot yellow, narrow, ca. 6 cm, base adnate to staminode column. Capsule broadly ovoid, 1.2–1.8 cm.

Locality: Cultivated. *Y. S. Lau 2428, 3075; HK sheet 7351.*

Distribution: Widely cultivated in China; native to India.

Ecology: Flowering: Mar.–Dec.

Uses: Ornamental, medicinal (forklore), food (tuberous rhizome).

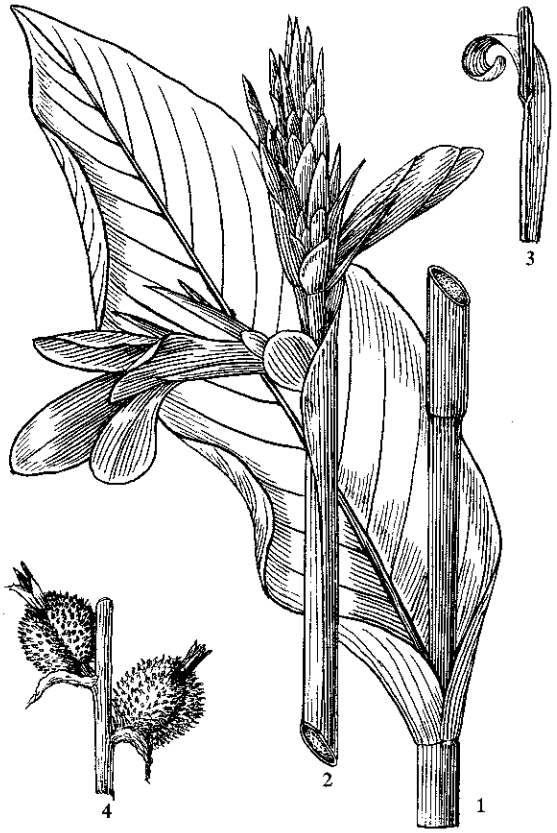

Figure 185. *Canna indica* L.

1. leaf; *2.* inflorescence; *3.* stamen and degenerative stamen; *4.* portion of infructescence. (drawn by H. P. Yu)

2. Canna glauca L. 粉美人蕉

Sp. Pl. 1: 1. 1753; FRPS 16(2): 155. 1981; FGD 2: 434. 1991.

Rhizomes elongate; stem 1.5–2 m, green. Leaves green, glaucous, lanceolate, to 50 × 10–15 cm, base attenuate, apex long-acuminate, margin hyaline. Racemes simple or sparingly branched, with a green, pruinose rachis; bracts round, brown; flowers in pairs, rarely in threes; light yellow, not dotted; sepals green, ovate, 1.2 cm; corolla tube 1–2 cm, lobes linear-lanceolate, 2.5–5 × 5 cm, erect; outer cycle staminodes 3, obovate-oblong, 6–7.5 × 2–3 cm, entire; labellum yellowish, much narrower, linear-lanceolate, bifid at apex, twisty at medium; stamens obovate-subfalcate, apex acute, revolute; style narrow-lanceolate. Capsules oblong, 3.5 cm.

Locality: Cultivated. *HK sheet 32948.*

Distribution: Widely cultivated in tropical and subtropical regions, native to S America.
Ecology: Flowering: Summer to autumn.
Uses: Ornamental.

3. Canna × generalis L. H. Bailey & E. Z. Bailey 大花美人蕉 **(Photo 469)**
Hortus 118. 1930, et Man. Cult. Pl. 291. 1949; FRPS 16(2): 155. 1981; FGD 2: 434. 1991.
Canna orchioides Bailey, Man. Cult. Pl. 291. 1949.

Plant ca. 1.5 m tall; stems, leaves and inflorescences glaucous. Leaves elliptic, to 40 × 20 cm, sheath and margins purple. Racemes terminal, 15–30 cm; flower large dense, 1–2 each bract; sepals lanceolate, 1.5–3 cm; corolla tube 5–10 mm, lobes lanceolate, 4.5–6.5 cm; outer cycle staminodes 3, obovate-spathulate, 5–10 × 2–5 cm, various coloured, red, orange, white, etc.; labellum obovate-spathulate, ca. 4.5 × 1.2–4 cm; stamen lanceolate, ca. 4 × 2.5 cm; style loriform.
Locality: Cultivated. *Y. S. Lau 2715.*
Distribution: Widely cultivated in tropical and subtropical regions.
Ecology: Flowering: Summer to autumn.
Uses: Ornamental.
Notes: There are many cultivars in this species, common ones are 'President', 'Striates', 'Scarlet Beauty' and 'King Humbert'.

370. MARANTACEAE 竹芋科

WU De-lin 吳德鄰

Perennial, rhizomatous herbs. Aerial stems present or absent. Leaves distichous, differentiated into an open sheath, petiole, and blade; petiole often winged but terete and pulviniform towards apex; blade usually large, sometimes with one straight and one curved side, with many closely parallel veins diverging obliquely from midrib. Inflorescences terminal or axillary, borne on leafy shoots or occasionally on separate, leafless shoots from rhizomes, compound, head-like, spicate, or diffuse and much branched, bracteate. Bracts each subtending a pair of flowers or a cincinnus of paired flowers. Flowers bisexual, asymmetric. Sepals 3, free. Corolla lobes 3, often slightly unequal, basally connate into a tube. Staminodes and stamen in 2 whorls; outer whorl with 1–2 petaloid staminodes, rarely absent; inner whorl with 1 hooded (cucullate) staminode enclosing terminal portion of pistil at anthesis and bearing a lateral appendage (trigger), 1 thicked and fleshy (callose) staminode, and 1 fertile stamen narrowly petaloid laterally; anther 1-celled. Ovary inferior, 1–3-locular, sometimes 2 of locules infertile; ovules 1 per locule. Style cylindrical, adnate to inside of corolla and staminode tube, free portion curved after explosive forward movement (tripping) when released. Capsule loculicidal, rarely indehiscent or berry-like. Seeds 1–3, usually arillate.

About 31 genera and ca. 525 species of pantropical but mostly in Americas, absent from Australia; four genera and nine species in China; four genera and seven species in Hong Kong.

1a. Inflorescence racemose or paniculate; bracts loosely arranged; ovary 1-locular.
2a. Inflorescence a raceme; bracts green; outer staminodes obovate, emarginate. ..... 1. *Maranta*
2b. Inflorescence a panicle; bracts red; outer staminodes linear, entire ..... 2. *Stromanthe*
1b. Inflorescence capitate; bracts densely arranged; ovary 3-locular.
3a. Outer staminodes 2; fruit indehiscent or late dehiscent; leaves wholly green ..... 3. *Phrynium*
3b. Outer staminode 1; fruit dehiscent into 3 valves; leaves often marked with beautiful lines adaxially or purple abaxially ..... 4. *Calathea*

1. Maranta L. 竹芋屬

Caulescent, erect or prostrate herbs, sometimes much branched, occasionally with tuberous, swollen rhizomes. Leaves both basal and cauline or all cauline; petiole sheathing at base. Inflorescences 2–several per leafy shoot, each a dichotomous panicle or raceme. Bracts green, few, distichous, each subtending 2–6 pedicellate flower pairs, herbaceous, late deciduous or persistent. Sepals green, herbaceous. Corolla white; tube 4–14 mm, base often inflated; lobes subequal. Staminodes white, occasionally tinged or marked with purple; tube usually short; outer staminodes 2, petaloid, obovate, exceeding corolla lobes; cucullate staminode with median or subterminal appendage; callose staminode obovate, apex petaloid. Ovary 1-locular by abortion. Style thick. Capsules obovoid to ellipsoidal, dehiscent. Seed 1.

About 32 species distributed in tropical America; two species (introduced) in China and Hong Kong.

1a. Stem erect, branched; leaves basal and cauline, green ..... 1. *M. arundinacea*
1b. Stem very short or absent; leaves basal, with dark brown spots adaxially ..... 2. *M. bicolor*

1. Maranta arundinacea L. 竹芋 **(Fig. 186; Photo 470)**
Sp. Pl. 1: 2. 1753; Curt's Bot. Mag. t. 2307. 1822; FHN 4: 106. 1977; FRPS 16(2): 167, pl. 59. 1981; FGD 2: 440. 1991; FOC 24: 382. 2000.

Herb, 40–130 cm tall. Rhizomes sympodial, spindle-shaped, fleshy, starchy. Stems slender, erect, dichotomous branched. Basal leaves 4–8; cauline leaves 1–8; petiole 3.5–20 cm in basal leaves, often absent in cauline leaves, pulvinus 5–10 mm; leaf blade green, ovate-oblong, 10–20 × 4–10 cm, base round, apex acuminate, abaxially glabrous or sparsely pilose. Racemes terminal, 15–20 cm, loose. Bracts linear-lanceolate, 3–4 cm, involute. Flowers mostly self-pollinating; pedicels ca. 1 cm. Sepals green, narrowly lanceolate, 1.2–1.4 cm. Corolla white; tube curved, ca. 1.3 cm, base inflated; lobes 8–10 mm. Staminodes white; outer staminodes 2, obovate, ca. 1 cm, inner staminodes 1/2 as long as outer ones. Ovary glabrous or pubescent. Capsules green or tinged reddish brown, oblong, 7–8 × 4–5 mm, dehiscent. Seeds brown, rugose; aril basal, white, 2-lobed.

Locality: Cultivated. *HK sheet 28063.*

Distribution: Widely cultivated elsewhere in tropics; native to tropical America.

Ecology: Flowering: Summer to autumn.

Uses: Ornamental, food (starch).

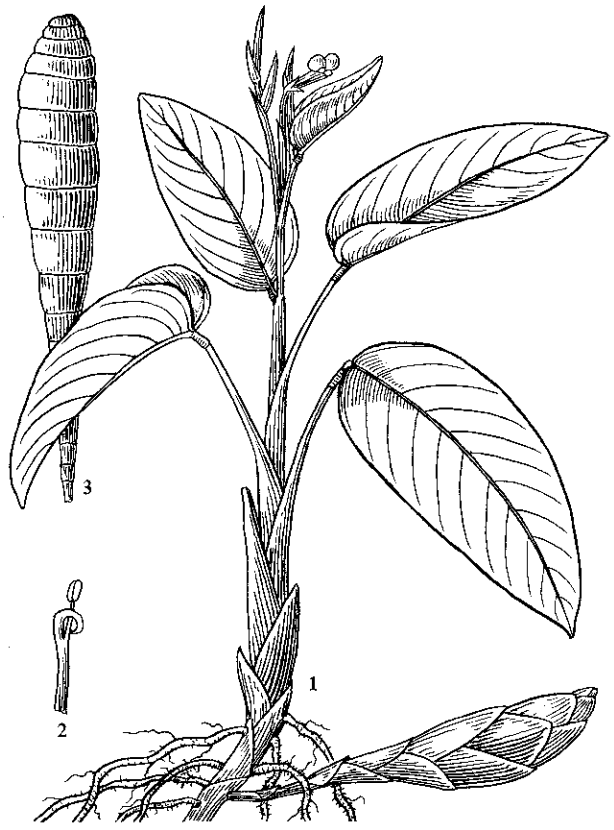

Figure 186. *Maranta arundinacea* L.
1. portion of plant; *2.* stamen and style; *3.* tuber without bract. (drawn by H. P. Yu)

2. Maranta bicolor Ker Gawl. 花葉竹芋
Bot. Reg. pl. 786. 1824; FRPS 16(2): 169. 1981; FGD 2: 440. 1991.

Herb compact, 25–40 cm tall, bearing tubers at base. Petioles up to 2.5 cm; pulvinus 5 mm; leaf blade oblong, elliptic or ovate, 7–12 × 5–7 cm, base rounded or cordate, apex round, mucronate, margin ± undulate, glaucous-green and with dark brown spots adaxially. Racemes simple; peduncle 6–10 cm; bracts 2–4, lanceolate, 2.5–3 cm; flower-pairs 3 each bract; sepals 5 mm; corolla white, tube 4 mm, lobes lanceolate, ca. 8 mm; outer 2 staminodes larger, obovate, emarginate, white with violet spots and striped, inner staminode very small.

Locality: Cultivated.

Distribution: Widely cultivated in tropical regions, native to Brazil.

Ecology: Flowering: Summer to autumn.

Uses: Ornamental.

2. Stromanthe Sond. 紫背竹芋屬

Perennial herbs with rhizomes. Stems erect or absent. Leaves distichous, long-petiolate. Inflorescence a raceme or panicle, rachis often zigzag; bracts often brightly coloured and caducous; bracteoles absent or scale-like. Sepals 3, free. Corolla tube short; outer staminodes 2 or absent, cucullate staminode with auricle, callose staminode broader, apex slightly emarginate; fertile stamen with appendage. Ovary 1-locular, smooth or warty. Fruit a capsule, seeds arillate.

Ten to 15 species spreading over the humid American tropics, but concentrated in C America and SE Brazil; one species introduced in China and Hong Kong.

1. Stromanthe sanguinea Sond. 紫背竹芋 **(Fig. 187; Photo 471)**
Hamburger Garten-Blumenzeitung 5: 225. 1849; FGD 2: 441. 1991.

Perennial herb, ca. 1 m tall, rhizomes creeping, nearly fleshy. Leaves basal and cauline; basal leaves long-petiolate, cauline leaves shortly petiolate or sessile; leaf blade elliptic-oblong, 30–45 × 6–12 cm, base rounded or acute, apex acuminate, dark green and shining adaxially, wine-purple or striped with green abaxially. Panicles with long peduncle, rachis slightly zigzag; bracts cherry-red, ovate, 1.5–3 cm; sepals cherry-red, oblong, 8–9 mm; corolla white, tube 1 mm; lobes lanceolate, 9 mm; 2 outer staminodes linear, subequal, inner staminode broader. Ovary sericeous.

Locality: Cultivated. *HK sheet 32243, 32962.*

Distribution: Guangdong (cultivated); native to Brazil.

Ecology: Flowering: Apr.–May.

Uses: Ornamental.

3. Phrynium Willd. 柊葉屬

Perennial herbs. Stems unbranched. Rhizomes creeping. Basal leaves 1 or more; cauline leaf 1 or absent; leaf sheath and petiole long. Inflorescences on leafy shoots, subtended by a cauline leaf or often in a very compact, congested group of few to many small spikes. Bracts spirally arranged, often shredding into fibers after anthesis, at least at apex. Flower pairs 2–many per bracts. Sepals usually longer than corolla tube, membranous. Corolla tube proximally ± solid, distally hollow; lobes 3, oblong, subequal. Outer staminodes 2, petaloid, obovate, staminode tube longer than corolla tube; callose staminode wholly callose, not petaloid at apex. Style curved after tripping; stigma enlarged, blunted. Fruit globose to ellipsoidal, dehiscent, often late dehiscent; pericarp hard. Seeds 1–3; aril membranous.

About 20 species distributed in tropical Asia; five species in China; two species in Hong Kong.

1a. Bracts with a spinescent acumen at apex; flowers white ..... 1. *P. placentarium*

1b. Bracts apically shredding into fibers after anthesis; flowers red..... 2. *P. rheedei*

1. Phrynium placentarium (Lour.) Merr.
尖苞柊葉 **(Fig. 188; Photo 472)**

Philip. J. Sci. 15: 230. 1919; FHN 4: 105. 1977; FRPS 16(2): 164. 1981; FGD 2: 439. 1991; FOC 24: 380. 2000.

Phyllodes placentaria Lour., Fl. Cochinch. 1: 13. 1790.

Plant ca. 1 m tall. Leaves basal 1(–2); petiole to 30 cm, pulvinus 2–3 cm; leaf blade thinly leathery, oblong-lanceolate or ovate-lanceolate, 30–55 × ca. 20 cm, glabrous, base rounded with an acute centre, apex acuminate. Inflorescence sessile, composed of 4–5 or more spikelets, globose, 3–8 m in diam. Bracts crowded, oblong, 2–2.5 cm, apex with a spinescent acumen. Flowers 2 per bract, white to yellowish white. Sepals linear, ca. 5 mm. Corolla tube ca. 8 mm; lobes elliptic, ca. 5 × 2 mm. Outer staminodes obovate, ca. 5 mm. Ovary glabrous or apically puberulent. Fruits oblong, ca. 1.2 cm; exocarp thin. Seed 1, ellipsoidal, ca. 1 cm; aril red.

Locality: Tai Po. *L. T. Lo 426; Y. S. Lau 2840.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan; S to SE Asia.

Ecology: Flowering: Feb.–May.

2. Phrynium rheedei Suresh & Nicolson 柊葉 **(Photo 473)**

Taxon 35: 355. 1986; FOC 24: 380. 2000.

Phrynium capitatum Willd., Sp. Pl. 1: 17. 1797, *nom. illeg.* (included *Pontederia ovata*); FHN 4: 105. 1977; FRPS 16(2): 162. 1981; FGD 2: 437. 1991.

Plant ca. 1 m tall, with tuberous rhizomes. Basal leaves several, thinly leathery; petiole to 60 cm, pulvinus 3–7 cm; leaf blade ovate-oblong to oblong, 25–50 × 10–12 cm, base acute, apex shortly acuminate, glabrous. Inflorescence sessile, composed of 4–5 or more spikelets, capitate, ca. 5 cm in diam. Bracts crowded, oblong-lanceolate, 2–3 cm, apex initially acute, shredding into fibers after anthesis. Flowers 3 per bract, sessile. Sepals linear, ca. 1 cm, sericeous. Corolla tube violet, shorter than calyx; lobes dark red, oblong-obovate. Outer staminodes light red, obovate, slightly corrugated; cucullate and callose staminodes yellowish, shorter than outer staminodes. Ovary sericeous. Fruit dark red, shining,

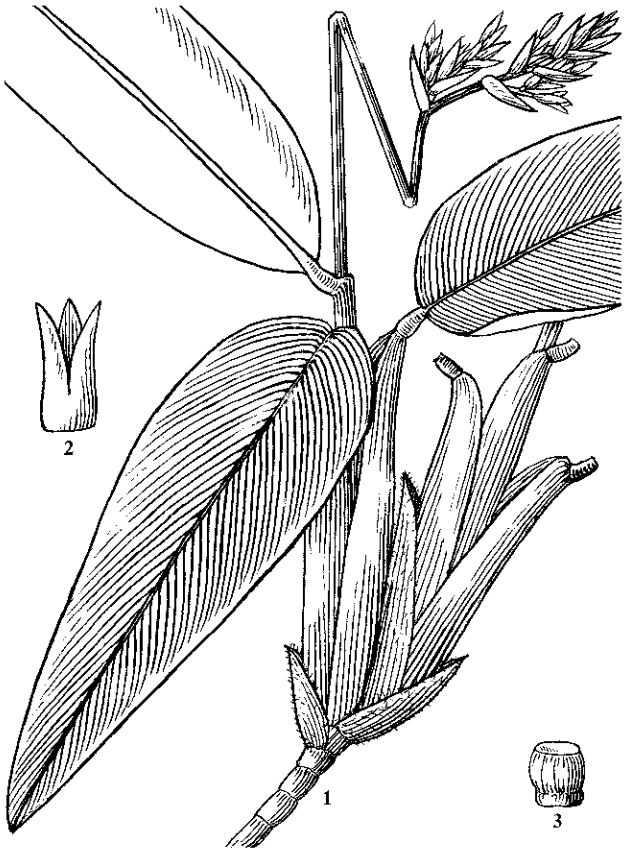

Figure 187. *Stromanthe sanguinea* Sond.
1. upper portion of plant; *2.* corolla; *3.* seed. (drawn by H. P. Yu)

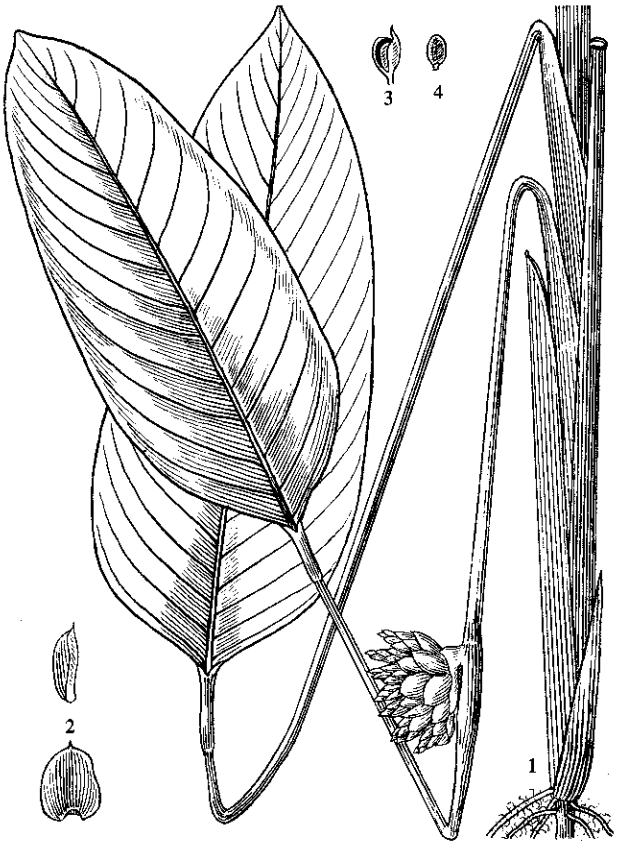

Figure 188. *Phrynium placentarium* (Lour.) Merr.
1. plant; *2.* frontal and lateral views of bract; *3.* fruit; *4.* seed. (drawn by H. P. Yu)

pyriform, ca. 1 cm, slightly 3-angled; exocarp hard. Seeds 2–3, shallowly grooved.

Locality: Tai Mo Shan, Ma On Shan. *HK sheet 42839.*

Distribution: Guangdong, Guangxi, Yunnan, Fujian; Vietnam, India.

Ecology: Wet and shaded places in forests. Flowering: May–Jul.

4. Calathea G. Mey. 肖竹芋屬

Perennial herbs, cespitose, erect or creeping, rhizomatous. Stem usually unbranched, rarely branched. Leaves all basal, or also cauline, rich in metallic hues, and many of them attractively barred, striped and blotched. Inflorescence mostly capitate or cone-like, subsessile or pedunculate; bracts few to many, imbricate, distichous or spiral. Fower-pairs usually 3 or more in axile of bract; bracteoles usually present; sepals 3, equal or subequal. Corolla 3-parted, tube almost equal to or longer than sepals; staminodes 3, outer staminode 1, rarely 0, usually large, petaloid, cucullate staminode smaller, with lateral lobe; callose staminode often large; fertile stamen 1 with a slightly petaloid appendage; ovary 3-locular. Capsules dehiscent, valves thin-leathery or hard; seeds 1–3, aril 2-lobed.

About 300 species distributed in tropical America; two species commonly cultivated in Hong Kong.

1a. Mature leaves plain, green adaxially. ..... 1. *C. ornata*

1b. Mature leaves velvety green and with alternating bars of pale yellow-green and olive-green extending outward from midrib adaxially ..... 2. *C. zebrina*

1. Calathea ornata (Lindl.) Körn. 肖竹芋

Bull. Soc. Imp. Naturalistes Moscou 35(1): 127. 1862; FRPS 16(2): 165. 1981.

Strong virgorous plant, 30–90 cm tall. Leaves oblong-lanceolate, 30–90 cm, young leaves often marked with pink and white lines along lateral veins; adult foliage rich green adaxially and dull purple-red abaxially, ± cordate at base, apex acute; petiole becoming 60 cm or more long with age. Spike ovoid, ca. 8 cm; peduncles to 35 cm; petals violet; staminode yellowish.

Locality: Cultivated.

Distribution: Taiwan (cultivated); native to S America.

Ecology: Flowering: May–Jun.

Uses: Ornamental.

2. Calathea zebrina (Sims) Lindl.

絨葉肖竹芋(斑葉肖竹芋) **(Fig. 189)**

Bot. Reg. sub pl. 1210. 1829; FRPS 16(2): 165. 1981; FGD 2: 439. 1991.

Maranta zebrina Sims, Curt's Bot. Mag. t. 1926. 1817.

Plant 50–100 cm tall. Leaves cauline; petioles to 45 cm; leaf blade oblong-lanceolate, 30–60 cm long and nearly or quite half as broad, base unequilateral, apex obtuse or very short-acute, velvety green and with alternating bars of pale yellow-green and olive-green extending outward from midrib adaxially, purplish-red abaxially in adult. Head solitary on scape, nearly globular or ovoid; bracts imbricate, dilate-ovate, ca. 5 cm wide, purple inside; sepals oblong, to 2.5 cm; corolla blue-purple or white, lobes oblong-lanceolate, 1.5 cm; staminode pale lilac, 1.7 cm.

Locality: Cultivated. *Y. S. Lau 3219, 3288; HK sheet 28072.*

Distribution: Guangdong, Taiwan (cultivated); native to Brazil.

Ecology: Flowering: May–Jun.

Uses: Ornamental.

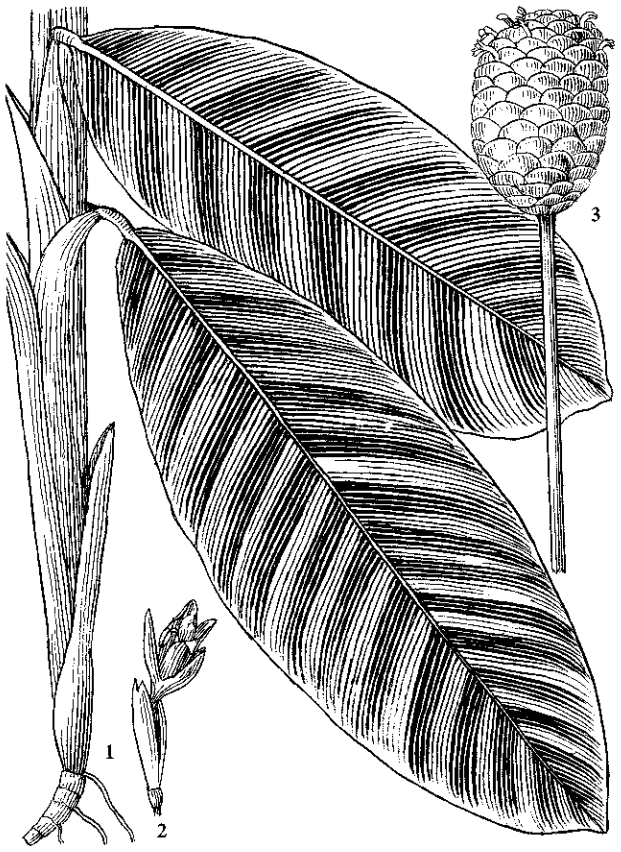

Figure 189. *Calathea zebrina* (Sims) Lindl.
1. plant; *2.* flower; *3.* inflorescence. (drawn by H. P. Yu)

371. PHILYDRACEAE 田葱科

Richard M. K. SAUNDERS

Erect, perennial herbs, with rhizome or corm. Leaves alternate, sheathing at base; basal leaves rosulate, equitant; cauline leaves distichous; leaf blade entire, linear to lanceolate, parallel-veined. Inflorescence a simple or compound terminal spike; floral bracts spathe-like. Flowers bisexual, zygomorphic, sessile. Perianth of 4 tepals, 2-whorled, white or yellow; 2 outer tepals larger, adaxial and abaxial respectively; 2 inner tepals smaller, lateral. Stamen single; filament flattened, free or adnate to tepals; anther dorsifixed, 2-loculate, extrorse to introrse; pollen grains binucleate, shed as monads or tetrads, 1–3-aperturate. Ovary single, superior, 1–3-loculate, with parietal or axile placentation; ovules many per locule, anatropous; style simple; stigma capitate or obscurely 3-lobed. Fruit a dry dehiscent capsule, loculicidal or splitting irregularly. Seeds many; testa spirally-striate; embryo straight; endosperm present.

Four genera and five species in Australia, S and SE Asia and W Pacific; one genus and one species in China and Hong Kong.

1. **Philydrum** Banks & Sol. ex Gaertn. 田葱屬

Herbs with short rhizome. Inflorescence scape 1 m or longer, with few cauline leaves gradually replaced by alternate bracts. Flowers perianth yellow. Stamens adnate with base of inner and adaxial tepals; anthers spirally twisted, extrorse; pollen grains shed as tetrads. Staminodes cuneate, acute, shorter than fertile stamens. Ovary 3-loculate, with parietal placentation. Fruit capsule loculicidal, triangular-oblong.

Monotypic, in Australia, S and SE Asia, W Pacific, China and Hong Kong.

1. Philydrum lanuginosum Banks & Sol. ex Gaertn.
田葱 **(Fig. 190; Photo 474)**

Fruct. Sem. Pl. 1: 62, fig. 16. 1788; FHK 380. 1861; FKH 282. 1912; FHN 4: 182. 1977; FRPS 13(3): 144. 1997; FOC 24: 43. 2000; FGD 5: 455. 2003.

Leaves 40–80 cm long (including basal sheath), glabrous, thick, aerenchymatous; sheath 14–30 × 1–1.5 cm. Inflorescence 20–60 cm long; scape slender, terete, glabrate below, villous towards the flowers; bracts ovate to subulate, 2–10 cm × 7.5–10 mm, woolly on abaxial side, short-acuminate to attenuate. Flowers with thin perianth, outer tepals 10–15 × ca. 10 mm, many-veined, long villous outside, the upper with 2 stronger veins and bidentate, acute, margins inflexed, inner tepals spathulate, ca. 8 × 2 mm, membranous, 3-veined, with base hairy outside. Stamen ca. 9 mm long, glabrous, anther ± spherical. Ovary densely long-woolly; style glabrous; stigma broad-triangular, long-papillose. Fruit 9–12 × 4–5 mm. Seeds dark reddish-brown, bulb-shaped, ca. 1 mm long.

Locality: Lan Nai Wan, Ham Tin, Sai Kung, Tai Lam Chung, Wu Kau Tang, Yung Shue O, Wang Toi Shan, Lantau Island. *R. M. K. Saunders s.n.* (HKU); *Y. S. Lau 2071, 1447.*

Distribution: Guangdong, Guangxi, Fujian, Taiwan; Japan, Vietnam, Thailand, Myanmar, Andaman Islands, Malaysia, Australia, New Guinea.

Ecology: Freshwater ponds and marshes at low altitudes. Flowering: Jun.–Jul.; fruiting: Sep.–Oct.

Uses: Medicinal (folklore).

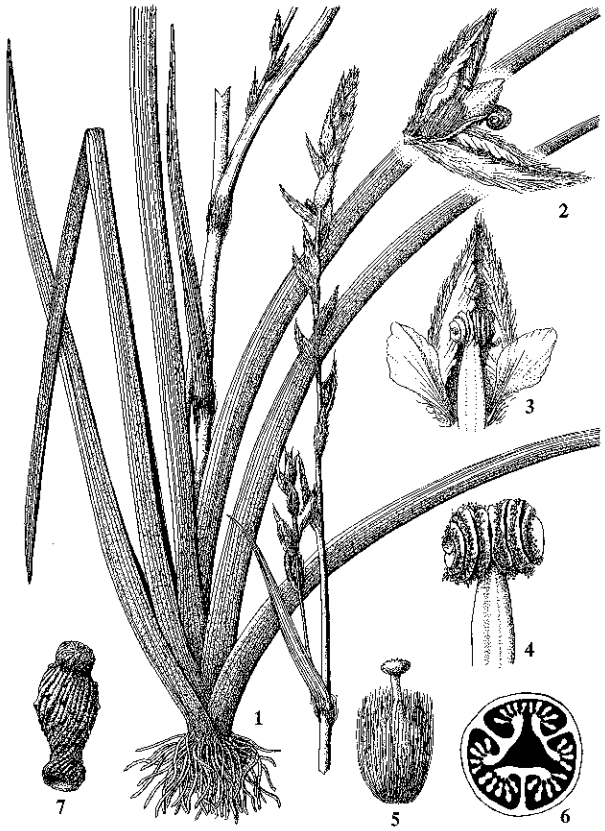

Figure 190. *Philydrum lanuginosum* Banks & Sol. ex Gaertn.
1. habit; *2.* flower with one lateral tepal removed; *3.* flower with carpel and adaxial tepal removed; *4.* stamen with spirally twisted anthers; *5.* carpel; *6.* transverse section of ovary with parietal placentation; *7.* seed with spirally striate testa. (Del. R. J. Nicholls, reproduced from Saunders (Gard. Bull., Singapore 46(2): 99-102. 1995), © National Parks Board, Singapore)

372. PONTEDERIACEAE 雨久花科

HU Qi-ming 胡啟明

Annual or perennial aquatic herbs. Rhizomes short and thick or creeping, with fibrous roots. Stem conspicuous or very short. Leaves rosulate or distichous, floating or submersed; petiole mostly distinct, sheathed at base, sometimes inflated; leaf blade broadly ovate, lanceolate, or broadly linear, with many parallel veins. Inflorescences a raceme or spike exserted from sheath of uppermost leaf. Flowers bisexual, mostly actinomorphic, sometimes zygomorphic. Perianth segments 6, in 2 whorls, petaloid, blue or purplish blue, free or basally connate into a tube. Stamens usually 6 in 2 whorls, rarely 3 or 1, inserted on perianth, often unequal or dissimilar; filaments slender, free; anthers 2-celled, introrse, dehiscing by longitudinal slits or rarely by pores. Ovary superior, 3-locular, with numerous

ovules in each locule; placenta parietal or axile; style simple; stigma entire or minutely 3-lobed. Fruit a 3-valved capsule or indehiscent.

Six genera and ca. 40 species widely spread over tropical and subtropical regions; two genera (one introduced) and five species in China; two genera and three species in Hong Kong.

1a. Flowers actinomorphic, perianth segments free nearly to base; one of the six stamens longer than others; petiole not inflated..... 1. *Monochoria*

1b. Flowers zygomorphic, perianth segments basally united into a tube; three of the six stamens much longer than others; petiole inflated..... 2. *Eichhornia*

1. Monochoria C. Presl 雨久花屬

Perennial herbs, aquatic or paludose with short or creeping rhizomes. Leaves radical or alternate on vegetative stems, usually solitary on flowering stem. Inflorescences a terminal raceme, enveloped in broad leaf sheaths when young; peduncle with a large bract at base. Flowers subsessile or shortly pedicellate; perianth segments free nearly to base, spreading during anthesis and afterward spirally contorted, inner segments wider than outer. Stamens 6, inserted at base of perianth, dimorphic: one with long filament and a lateral, oblique tooth, anther basifixed, blue, large; the others subequal, anthers basifixed, yellow, small. Ovary 3-locular, with many ovules in each locule; style filiform; stigma subentire or minutely 3-lobed. Capsule loculicidal, 3-valved.

Eight species distributed in tropical and subtropical Africa, Asia, and Australia; four species in China; two species in Hong Kong.

1a. Plant 12–45 cm tall; leaves ovate, oblong-ovate to lanceolate, base subrounded or shallowly cordate ..... 1. *M. vaginalis*

1b. Plant 50–200 cm tall; leaves triangular or triangular-ovate, base sagittate to hastate..... 2. *M. hastata*

1. Monochoria vaginalis (Burm. f.) C. Presl ex Kunth 鴨舌草 **(Photo 475)**

Enum. Pl. 4: 134. 1843; FHK 374. 1861; FKH 281. 1912; FHN 4: 121, fig. 1028. 1977; FFJ 6: 463, fig. 416. 1995; FRPS 13(3): 138, pl. 32: 1–6. 1997; FOC 24: 41. 2000; FTW ed. 2, 5: 135, pl. 52. 2000; FGD 8: 275. 2007.

Pontederia vaginalis Burm. f., Fl. Ind. 80. 1768.

Perennial aquatic herb, 12–45 cm tall, with very short rhizomes. Stems usually inconspicuous. Leaves radical or spirally arranged; leaf blade ovate, oblong-ovate to lanceolate, 2–6 × 1–4 cm, base subrounded or shallowly cordate, apex acute to acuminate, margin entire; petiole dilated and with a broad sheath at base. Racemes 2.5–5 cm, 2–20-flowered, initially erect, soon reflexed; peduncle 1–3 cm, base bracteate; bract lanceolate. Perianth segments purplish, ovate-lanceolate to oblong, 0.8–1.5 cm. Stamens 6, one larger and longer, the others smaller and shorter; anther 1.8–4 mm in larger stamen, 1.5–3 mm in smaller stamens. Capsule ovoid to ellipsoidal, 0.7–1 cm.

Locality: Sha Tin, Tai Wan, She Shan Tsuen, Tai Ho. *P. S. Choi 416; Y. W. Lam 2226; S. C. Ng 1043.*

Distribution: Widely spread throughout China; Korea, Japan, Indochina, Malesia, Indian Subcontinent, Africa, Australia.

Ecology: Paddy field, ponds and ditches. Flowering: Aug.–Sep.; fruiting: Sep.–Oct.

2. Monochoria hastata (L.) Solms 箭葉雨久花 **(Fig. 191)**

A. DC & C. DC, Monogr. Phan. 4: 523. 1883; FHN 4: 121. 1977; FFJ 6: 463. 1995; FRPS 13(3): 136, pl. 32: 11. 1997; FOC 24: 41. 2000; FGD 8: 274, fig. 168. 2007.

Pontederia hastata L., Sp. Pl. 1: 288. 1753.

Monochoria hastifolia C. Presl, Reliq. Haenk. 1(2): 128. 1827, *nom. illeg.* (included *Pontederia hastata*); FKH 281. 1912.

Perennial aquatic herb, 50–200 cm tall. Stems often long and robust. Leaves radical or alternate on stems; leaf blade triangular or triangular-ovate, 5–15 × 3–15 cm, base sagittate to hastate, apex acute to acuminate; petiole 7–10 cm, broadened and sheathed at base. Racemes 8–18 cm, 10–40-flowered, erect or suberect; peduncle distinctly shorter than associated leaf petiole. Perianth segments bluish with green median vein and reddish blotch, ovate, 1–1.6 cm. Stamens 6, one larger with blue anther (ca. 6 mm), the others smaller, with yellow anthers (ca. 3 mm); style hairy at apex. Capsule oblong, ca. 1 cm.

Locality: Fanling. *W. J. Tutcher 9626.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Fujian; Indochina, Malesia, Indian Subcontinent.

Ecology: Ponds, paddy fields. Flowering: Aug.–Mar. of the following year.

Figure 191. *Monochoria hastata* (L.) Solms
1, flowering plant; *2–3*, leaves. (drawn by Y. X. Liu)

2. Eichhornia Kunth, *nom. cons.* 鳳眼藍屬

Annual or perennial aquatic herbs, floating, with creeping rhizomes, rooting from nodes. Leaves rosulate or alternate; petiole sometimes inflated; leaf blade broadly ovate, cordate or linear-lanceolate. Flowers zygomorphic or subactinomorphic, in terminal spike-like raceme, 2–many-flowered; perianth united below middle into a tube, segments 6, light purplish blue, inner upper one with a yellow blotch in centre. Stamens 6, inserted on proximal part of perianth tube, often 3 longer and 3 shorter; filaments filiform, hairy; anthers dorsifixed, oblong. Ovary sessile, 3-locular, with many ovules in each locule; style filiform, curved; stigma slightly dilated or very shortly 3- or 6-lobed. Capsule ovoid, oblong, or linear-fusiform, included in marcescent perianth tube; pericarp membranous.

Seven species mainly distributed in tropical America, one species in tropical Africa; one species naturalized in China and Hong Kong.

1. Eichhornia crassipes (Mart.) Solms 鳳眼藍 **(Photo 476)**

A. DC & C. DC, Monogr. Phan. 4: 527. 1883; FHN 4: 122, fig. 1029. 1977; FFJ 6: 464, fig. 417. 1995; FRPS 13(3): 139, pl. 33. 1997; FOC 24: 41. 2000; FTW ed. 2, 5: 133. 2000; FGD 8: 275, fig. 169. 2007.

Pontederia crassipes Mart., Nov. Gen. Sp. Pl. 1: 9. 1823.

Eichhornia speciosa Kunth, Enum. Pl. 5(4): 131. 1843; FKH 281. 1912.

Aquatic herb, floating, 25–60 cm tall, with long stolons and many black fibrous roots. Stems very short. Leaves radical, rosulate; leaf blade orbicular, broadly ovate, or rhomboidal, 4.5–14.5 × 5–14 cm, leathery, glabrous, densely veined, base shallowly cordate, rounded, or broadly cuneate; petiole 10–40 cm, spongy, usually very much swollen at or below middle. Racemes 7–15-flowered; peduncle 35–45 cm. Perianth segments 6, purplish blue, petaloid, ovate to elliptic, upper one larger, with yellow blotch at centre adaxially, the others subequal but lower one narrower. Stamens 6, 3 long and 3 short; filaments curved, glandular hairy. Pistil heterostylic; stigma glandular hairy. Capsule ovoid.

Locality: Naturalised in Hong Kong. *HK sheet 29199.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, S Shaanxi, Hebei, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan (naturalized); native to Brazil, now widely introduced and naturalized in tropics and subtropics.

Ecology: Ponds, ditches, streams, paddy fields. Flowering: Jul.–Oct.; fruiting: Aug.–Nov.

Uses: Animal food (forage), noxious weed.

375. LILIACEAE (INCL. AMARYLLIDACEAE) 百合科

HU Qi-ming 胡啟明

Perennial herbs, with bulbs, corms, rhizomes, or tubers. Leaves basal or alternate, opposite, or whorled on stems, margin entire or spiny, parallel or rarely reticulate-veined. Inflorescence a spike, umbel, raceme, panicle, or flowers solitary. Flowers bisexual, rarely unisexual, actinomorphic or zygomorphic; bracts present or absent, sometimes spathaceous; bracteoles present or absent. Perianth segments usually 6, rarely 4, or 8, in 2 whorls, free or connate to form a short tube, with or without corona. Stamens 6, rarely 3, 4, or 8, inserted at perianth throat or at the base of segments and opposite to the segments; filaments free or sometimes connate into a corona; anthers usually 2-locular, basifixed or dorsifixed and versatile, introrse, latrorse, or extrorse, dehiscing usually by vertical slits. Ovary superior, semi-inferior or inferior, (2–)3(–4)-locular, with axile placentae, or rarely 1-locular with a parietal placenta; ovules few to many in each locule; style 1, rarely 3; stigma capitate or 3-lobed. Fruit a capsule or berry. Seeds with endosperm.

About 280 genera and 4000 species widespread throughout the world, especially in temperate and subtropical regions; 67 genera and 760 species in China; 24 genera and 33 species (ten cultivated) in Hong Kong.

1a. Plants bulbous, with 1 or more scaly bulbs underground.
  2a. Inflorescence an umbel.
    3a. Flowers small, less than 1 cm in diam.; ovary superior; plants with strong onion or garlick odour ..... 1. *Allium*
    3b. Flowers much larger; ovary inferior; plants without onion or garlick odour.
      4a. Corona present ..... 2. *Narcissus*
      4b. Corona absent.
        5a. Filaments united into a cup-shaped broad ring ..... 3. *Hymenocallis*
        5b. Filaments free.
          6a. Scape fistulous; flower-tube ca. 3 cm long; perianth segments broader than 2 cm ..... 4. *Hippeastrum*
          6b. Scape not fistulous, flower-tube slender, longer than 6 cm; perianth segments less than 1 cm broad ..... 5. *Crinum*
  2b. Inflorescence not umbellate.
    7a. Flowers solitary and terminal on scape or stem.
      8a. Leaves alternate on stems ..... 6. *Lilium* (part)
      8b. Leaves all radical.

9a. Leaves linear, less than 1 cm broad; perianth basally united into a slender tube; ovary inferior ..... 7. *Zephyranthes*
9b. Leaves lanceolate to ovate-lanceolate, broader than 2 cm; perianth segments free; ovary superior ..... 8. *Tulipa*
7b. Flowers in racemes.
10a. Racemes 3–5-flowered, subumbellate; leaves alternate on stems ..... 6. *Lilium* (part)
10b. Racemes densely flowered; leaves all radical ..... 9. *Barnardia*
1b. Plants not bulbous, with a rootstock or thickened often tuberous, ± branching underground parts.
11a. Leaves reduced to scales, branchlets becoming linear or needle-like cladodes ..... 10. *Asparagus*
11b. Leaves and branchlets not as above.
12a. Leaves 5–8 in a terminal whorl; flowers solitary, terminal ..... 11. *Paris*
12b. Leaves and flowers not as above.
13a. Fruit bursting irregularly at an early stage; seeds globose, each resembling a berry or small drupe.
14a. Leaves distinctly petiolate, subplicate-veined, with transverse veins between main veins ..... 12. *Peliosanthes*
14b. Leaves sessile, parallel veined, transverse veins indistinct.
15a. Flowers ± nodding; ovary semi-inferior; filaments much shorter than anthers; seeds blue ..... 13. *Ophiopogon*
15b. Flowers erect or suberect; ovary superior; filaments longer than anthers; seeds blackish ..... 14. *Liriope*
13b. Fruit a capsule or berry, not busting before seed maturation; seeds not berry- or drupe-like.
16a. Leaves radical; stem very short or absent.
17a. Inflorescence umbellate; pedicels jointed at base ..... 15. *Thysanotus*
17b. Inflorescence racemose, spicate or otherwise.
18a. Flowers distinctly zygomorphic, upper 3 or 4 perianth segments much larger than lower ones ..... 16. *Chionographis*
18b. Flowers actinomorphic.
19a. Flowers solitary, terminal on a very short scape arising from a creeping rhizome ..... 17. *Aspidistra*
19b. Flowers in few- or many-flowered inflorescence on a scape arising from a leaf tuft.
20a. Leaves hairy; ovary inferior.
20a. Fruit a berry; inflorescence usually many-flowered ..... 18. *Curculigo*
20b. Fruit a capsule; inflorescence 1- or 2-flowered ..... 19. *Hypoxis*
20b. Leaves glabrous; ovary superior.
22a. Inflorescence spicate; fruit a berry ..... 20. *Campylandra*
22b. Inflorescence racemose or paniculate; fruit a capsule ..... 21. *Chlorophytum*
16b. Stems and cauline leaves well developed.
23a. Fruit a capsule; leaves strongly plicate-veined ..... 22. *Veratrum*
23b. Fruit a berry; leaves parallel-veined.
24a. Leaves distichous, scabrous along margins and midvein ..... 23. *Dianella*
24b. Leaves not distichous, margin and midvein not as above ..... 24. *Disporum*

1. Allium L. 蔥屬

Perennial herbs, bulbiferous, usually with strong onion or garlick odour. Bulb tunicate, various in shape, ranging from cylindrical to globose. Leaves sessile, usually linear to linear-lanceolate, flat, angled or terete, fistulose or solid, with a closed leaf sheath at base. Scape terminal or lateral. Inflorescence a terminal umbel, enclosed in a spathe-like involucral bract before anthesis; bracteoles present or absent. Perianth segments 6, in 2 whorls, free or united into a tube at base. Stamens 6, in 2 whorls; filaments usually connate at base and adnate to perianth segments, entire or toothed. Ovary superior, often with nectaries at the base, 3-locular, with 1–several ovules in each locule; style simple; stigma entire or 3-cleft. Fruit a loculicidal capsule. Seeds black.

More than 600 species widely distributed in N hemisphere, but mainly in Asia; 133 species in China; four species commonly cultivated in Hong Kong.

1a. Leaves terete or semiterete, fistulose.
2a. Leaves terete, not angled; scape terminal; filaments not toothed ..... 1. *A. fistulosum*
2b. Leaves semiterete, 3–5-angled; scape lateral; filaments of inner stamens ..... 2. *A. chinense*
1b. Leaves flat or keeled, not fistulose.
3a. Bulb consisting of several bulbils enclosed in a common tunic; leaves 1.5–2.5 cm ..... 3. *A. sativum*
3b. Bulb not so consisted; leaves 2–8 mm broad ..... 4. *A. tuberosum*

1. Allium fistulosum L. 蔥 **(Photo 477)**

Sp. Pl. 1: 301. 1753; FRPS 14: 256, pl. 80. 1980; FOC 24: 193. 2000; FGD 5: 449. 2003.

Perennial herb. Bulb cylindrical, solitary or clustered, coated with white or red-brown tunic. Leaves cylindrical, fistulose, 25–50 × 0.5–1 cm, gradually narrowed toward the pointed apex. Scape erect, terete, fistulose, slightly longer than leaves, covered with leaf sheaths for ca. 1/3 its length. Involucral bract 2-valved, persistent. Umbel globose, many-flowered; pedicels subequal, slender, 2–3 times longer than perianth; bracteoles absent. Perianth white; segments 6 in 2 series, outer ones slightly shorter than inner ones, ovate, 4–7 × 2–3 mm, apex acuminate, with a reflexed point. Stamens 6; filaments equal, about 1.5–2 times longer than perianth segments, connate at base and adnate to perianth segments. Ovary obovoid, with inconspicuous nectaries at base; style exserted.

Locality: Cultivated. *Y. S. Lau 2679; K. S. Pang 8.*

Distribution: Possibly native to W China, but no wild plants have been collected; widely cultivated elsewhere.

Ecology: Flowering & fruiting: Apr.–Aug.

Uses: Additive (flavoring), food (vegetable).

2. Allium chinense G. Don 薤頭

Mem. Wern. Nat. Hist. Soc. 6: 83. 1827; FRPS 14: 259, pl. 84. 1980; FOC 24: 196. 2000; FGD 5: 448. 2003.

Perennial herb. Bulbs clustered, narrowly ovoid, 1–1.5 cm in diam.; coated with white or reddish tunic. Leaves radical, 2–5, semiterete, fistulose, 25–45 cm × 1–3 mm, obscurely 3–5-angled. Scape lateral, subequalling leaves, terete, covered with leaf sheaths only at base. Involucral bract 2-valved, persistent. Umbel nearly hemispheric, laxly flowered; pedicels subequal, 2–4 times longer than perianth, bracteolate. Perianth pale purple to dull purple; segments 6 in 2 series, outer ones slightly shorter than inner ones, broadly elliptic to suborbicular, 4–6 × 3–4 mm. Stamens 6; filaments equal, about one and a half the length of perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side. Ovary obovoid-globose, with concave nectaries covered by hood-like projections at base; style exserted.

Locality: Cultivated. *W. J. Tutcher 11871.*

Distribution: Widely cultivated in tropical and subtropical China, Hainan, Guangdong, Guangxi, Guizhou, Hunan, Hubei, Henan, Anhui, Jiangxi, Zhejiang, Fujian; Indochina, Japan.

Ecology: Flowering & fruiting: Oct.–Nov.

Uses: Food (vegetable).

3. Allium sativum L. 蒜頭

Sp. Pl. 1: 296. 1753; FRPS 14: 268, pl. 96. 1980; FOC 24: 200. 2000; FGD 5: 449. 2003.

Perennial herb. Bulb solitary, globose to applanate-globose, usually consisting of 6–10 bulbils enclosed in a common tunic; tunic white to purplish, membranous, entire. Leaves broadly linear to linear-lanceolate, flat or keeled abaxially, shorter than scape, to 2.5 cm wide, apex acuminate. Scape 25–60 cm, terete, covered with leaf sheaths for ca. 1/2 its length. Involucral bract united into a tube enclosing the umbel, upward gradually narrowed into a beak of 7–20 cm, deciduous. Umbel with many bulblets and few flowers; pedicels slender, longer than perianth; bracteoles ovate, rather large, membranous, apex acute. Perianth usually pale red; segments 6 in 2 series, outer ones ovate-lanceolate, ca. 4 × 1.4 mm; inner ones ovate, ca. 3 × 1.4 mm. Stamens 6; filaments shorter than perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side, teeth with apex filiform and longer than perianth segments. Ovary globose; style not exserted.

Locality: Cultivated. *K. S. Pang 9.*

Distribution: Only cultivated, possibly of W Asia origin.

Ecology: Flowering: Jul.

Uses: Additive (flavoring), food (vegetable), medicinal (folklore).

4. Allium tuberosum Rottler ex Spreng. 韭 **(Photo 478)**

Syst. Veg. 2: 38. 1825; FRPS 14: 221, pl. 47. 1980; FOC 24: 179. 2000; FGD 5: 450. 2003.

Allium odorum auct. non L.: FKH 280. 1912.

Perennial herb. Bulbs cylindrical, clustered, coated with yellowish brown tunic. Leaves radical, linear, flat and solid, 15–30 cm × 1.5–8 mm, margin smooth. Scape terete, 20–50 cm, ± 2-angled, covered with leaf sheaths only at base. Involucral bract 2–3-valved, persistent. Umbel hemispheric to subglobose, laxly many-flowered; pedicels subequal, 2–4 times longer than perianth, bracteolate. Perianth white; segments 6 in 2 series, outer ones oblong-ovate to oblong-lanceolate, 4–7 × 1.8–3 mm, inner ones oblong-ovate, 4–7 × 2–3.5 mm. Stamens 6; filaments equal, about 4/5 the length of perianth segments, connate at base and adnate to perianth segments. Ovary obconical-globose, without concave nectaries at base.

Locality: Cultivated. *Y. S. Lau 2594.*

Distribution: Widely cultivated in China and elsewhere.

Ecology: Flowering & fruiting: May–Oct.

Uses: Additive (flavoring), food (vegetable).

2. Narcissus L. 水仙屬

Perennial herbs, bulbiferous. Bulbs ovoid-globose, coated with tunic. Leaves basal, linear and flat or narrow and terete, appearing with the flowers. Scape erect, solid. Inflorescence a several-flowered umbel, rarely flowers solitary; involucres spathe-like, membranous, basally tubular. Flowers white or yellow, mostly declined or nodding, rarely erect. Perianth salverform, with a short cylindrical or funnelform tube; segments 6, erect or recurved, subequal; corona narrowly tubular, corolla-like or shallowly cupular. Stamens inserted in perianth tube; anther basifixed. Ovary inferior, 3-locular, with many ovules in each locule. Style filiform; stigma 3-lobed, small. Fruit a loculicidal capsule.

About 60 species distributed mainly in C Europe and the Mediterranean region; one species in China and Hong Kong.

1. Narcissus tazetta L. var. **chinensis** M. Roemer 水仙 **(Photo 479)**

Fam. Nat. Syn. Monogr. 4: 223. 1847; FRPS 16(1): 28, pl. 8: 1–2. 1985; FOC 24: 269. 2000; FGD 5: 444, fig. 237. 2003.

Perennial herb, whole plant somewhat glaucous. Bulbs ovoid. Leaves broadly linear, flat, 20–40 × 0.8–1.5 cm, apex obtuse, margin entire. Scape erect, about the length of the leaves. Umbels 4–10-flowered; involucres membranous. Flowers fragrant, spreading or nodding; pedicels unequal, perianth salverform; tube slender, ca. 2 cm, pale green, nearly 3-angled; segments 6, white, widely spreading, broadly elliptic to obovate, ca. 1.5 cm, apex shortly acute; corona pale yellow, shallowly cupular, scarcely half the length of the perianth, margin not undulate. Stamens 6, inserted at upper part of perianth tube; filaments very short. Ovary 3-angled, green, with a slender style and a 3-lobed stigma.

Locality: Cultivated. *HK sheet 28331.*

Distribution: Fujian, Zhejiang; possibly of Mediterranean origin.

Ecology: Usually the plant is cultivated in water as a pot plant, especially during the Chinese New Year. Flowering: Jan.–Feb.

Uses: Ornamental.

3. Hymenocallis Salisb. 水鬼蕉屬

Perennial herbs, bulbiferous. Leaves basal, ensiform or linear. Scape solid. Inflorescences umbellate, rarely flower solitary; involucres ovate-lanceolate, membranous. Flowers white, fragrant. Perianth actinomorphic salverform; tube slender, very long; segments 6, oblong, lanceolate, or linear. Stamens 6, inserted at throat of perianth tube; filament basally united by a petaloid staminal cup, free part erect, filiform; anther versatile, linear. Ovary inferior, 3-locular, with 2 ovules in each locule. Style slightly declinate, slender; stigma capitate, small. Fruit a capsule.

About 30–40 species in Mesoamerica and tropical America; one species introduced to China; one species in Hong Kong.

1. Hymenocallis littoralis (Jacq.) Salisb. 水鬼蕉(蜘蛛蘭) **(Photos 480–481)**

Trans. Hort. Soc. London 1: 338. 1812; FRPS 16(1): 14. 1985; FGD 5: 446, fig. 239. 2003.

Pancratium littorale Jacq., Select. Stirp. Amer. Hist. 99, t. 179, fig. 94. 1763.

Pancratium biflorum auct. non Roxb.: FHK 367. 1861; FKH 275. 1912.

Perennial herb, stout, bulbiferous, glabrous throughout. Leaves basal, ensiform, to 100 × 7.5 cm, slightly narrowed at base, tapering to apex, dark green, midvein impressed adaxially, keeled abaxially. Scape erect, to 1.5 m, slightly flattened and 2 ridged. Umbel 3–8-flowered; involucres 2, ovate-lanceolate, 5–8 cm, membranous; bracts lanceolate, ca. 4 cm; Flowers sessile, fragrant. Perianth tube slender, 5–13 cm, greenish white; segments white, linear, 6.5–10 × 0.5–0.7 cm, apex acuminate. Staminal cup white, petaloid, to 3 cm high, free parts of filament green, 4–5 cm; anther linear, versatile, ca. 1.8 cm, apex acuminate. Style exceeding stamens; stigma capitate.

Locality: Cultivated. *Y. S. Lau 1912.*

Distribution: Cultivated in Guangdong, Guangxi, Fujian, Taiwan; native to Mesoamerica.

Ecology: Flowering: Jun.–Aug.

Uses: Ornamental.

4. Hippeastrum Herb. 朱頂蘭屬

Perennial herbs, bulbiferous. Leaves basal, linear or strap-shaped. Scape hollow. Inflorescences umbellate; involucres 2, spreading or recurved. Flowers pedicellate. Perianth funnel-shaped, horizontal or declinate; tube usually short, with minute scales in the throat; segments 6, equal or the inner ones narrower, red or whitish and sometimes white-striped. Stamens 6, inserted in the throat, ± declinate; filament free, filiform; anthers versatile. Ovary inferior, 3-locular, with many ovules in each locule. Style erect or slightly declinate, with an entire or 3-lobed stigma. Fruit a capsule, subglobose, loculicidally 3-valved. Seeds usually flattened.

About 76 species in tropical America; two species cultivated in China; one species in Hong Kong.

1. Hippeastrum vittatum (L'Hér.) Herb. 花朱頂蘭 **(Photo 482)**

Appendix 31. 1821; FRPS 16(1): 15. 1985; FGD 5: 445, fig. 238. 2003.

Amaryllis vittata L'Hér., Sert. Angl. 8, pl. 15. 1788.

Perennial herb, glabrous throughout. Bulbs large, globose, to 7.5 cm in diam. Leaves basal, linear to strap-shaped, 30–40 × 2–6 cm, appearing with or after the flowers. Scape erect, hollow, 40–50(–70) cm. Umbel 2–6-flowered; involucres 2, lanceolate, 6–8.5 cm, recurved; bracts linear or lanceolate, 4–6.5 cm; pedicels 3.5–5 cm. Perianth funnel-shaped; tube ca. 3 cm, with minute scales at throat; segments obovate-elliptic, 10–15 × 2.5–4 cm, inner ones narrower, apex acute, red with white stripes. Stamens 6, insert in the throat, shorter than perianth segments. Style erect or slightly declinate, with a 3-lobed stigma. Capsule globose, loculicidally 3-valved.

Locality: Cultivated.

Distribution: Widely cultivated in China; native to S America.

Ecology: Flowering: Mar.–Apr.

Uses: Ornamental.

5. Crinum L. 文殊蘭屬

Perennial bulbous herbs. Leaves basal, often large, linear or ensiform. Scape solid. Inflorescences umbellate; involucres 2, large and broad, herbaceous. Flowers sessile or pedicellate. Perianth actinomorphic or slightly zygomorphic, salverform or subsalverform; tube slender, cylindrical; segments 6, lanceolate or linear, spreading or recurved, white or tinged with purple. Stamens inserted at the summit of perianth tube; filament free, filiform; anthers linear, versatile. Ovary inferior, 3-locular, with 2 ovules in each locule. Style filiform, with an entire or 3-lobed stigma. Fruit a capsule, subglobose, bursting irregularly. Seeds few, nearly globular, often converted into fleshy bulbs.

About 120 species in tropical and subtropical regions of both hemispheres, mainly in Africa; two species in China; one species in Hong Kong.

1. Crinum asiaticum L. var. **sinicum** (Roxb. ex Herb.) Baker 文殊蘭 **(Fig. 192; Photos 483–484)**

Handb. Amaryll. 75. 1888; FHN 4: 145, fig. 1050. 1977; FRPS 16(1): 8, pl. 2: 1–2. 1985; FGD 5: 446, fig. 240. 2003.

Crinum sinicum Roxb. ex Herb., Bot. Mag. 47: 7, sub pl. 2121. 1820.

Crinum asiaticum auct. non L.: FHK 388. 1861.

Stout perennial herb, glabrous throughout. Bulbs narrowly cylindrical, up to 30 cm long and 10–15 cm in diam. Leaves basal, linear-lanceolate, 50–120 × 6–10(–15) cm, apex shortly acuminate, sharply pointed, margin entire, dark green; midvein impressed adaxially, keeled abaxially. Scape solid, 0.6–1 m. Umbel 10–20-flowered; involucres 2, broadly lanceolate, 7–12.5 × 3.5–4.5 cm, green, herbaceous; bracts linear, 7–11 cm × 3–5 mm, membranous. Flowers white, fragrant; pedicels 0.5–2 cm. Perianth salverform; tube greenish white, straight, 6–9 cm; segments linear-lanceolate, 6–8 cm × 6–10 mm, apex acuminate. Stamens 6, subequal; filament ca. 4 cm, purplish apically; anther linear, 1.5–2 cm. Style filiform, slightly shorter than stamens, declinate. Capsule subglobose, 3–5 cm in diam.

Locality: Tai Long Sai Wan, Ham Tin, Tai Wan, Long Ke, Lantau Island. *L. T. Lo 508; Y. S. Lau 2317.*

Distribution: Hainan, Guangdong, Guangxi, Fujian, Taiwan.

Ecology: Sandy places near seaside and river banks. Flowering: Jun.–Sep.

Uses: Ornamental, medicinal (folklore).

Notes: *Crinum latifolium* L. is cultivated for ornamental purpose in Hong Kong. It can be easily recognized by its rose-purple and larger flower.

Figure 192. *Crinum asiaticum* var. *sinicum* (Roxb. ex Herb.) Baker *1.* inflorescence; *2.* leaf. (drawn by Y. X. Liu)

6. Lilium L. 百合屬

Perennial herbs, with underground scaly bulbs and erect simple leafy stem. Leaves alternate, rarely whorled, sessile or subsessile, usually linear to linear-lanceolate. Inflorescence terminal, a raceme or solitary flower, very rarely an umbel or corymb; bracts leaf-like. Flowers usually large, funnel-shaped. Perianth segments 6, free, narrowed and erect at the base, spreading or recurved at the top, white, yellow, greenish, or reddish to purplish, each bearing a nectar-groove or -furrow at base. Stamens 6, inserted at the base of perianth segments; filaments subulate or filiform, sometimes pubescent; anthers dorsifixed, versatile. Ovary superior, 3-locular, with many ovules

in each locule. Style elongate, slender; stigma 3-angled or 3-lobed. Fruit a capsule, loculicidally 3-valved. Seeds many, flat, narrowly winged, horizontally piled up in each valve.

About 115 species in temperate and alpine regions of N hemisphere, especially in E Asia; 54 species in China; one species in Hong Kong.

1. Lilium brownii F. E. Brown ex Miellez
野百合 **(Fig. 193; Photo 485)**

Cat. Expos. Soc. Hort. Lille. 1841; FKH 280. 1912; FRPS 14: 121, pl. 31: 7. 1980; FOC 24: 147. 2000; FGD 6: 339. 2005.

Lilium longiflorum auct. non Thunb.: FHK 374. 1861; FKH 280. 1912.

Perennial herb. Bulb globose, 3–5 cm in diam.; scales white, lanceolate, 2–4 cm. Stem 0.7–2 m, green or sometimes with purplish strips. Leaves scattered, lower leaves lanceolate to elliptic-lanceolate, or obovate, 5–15 × 0.6–2 cm, base gradually narrowed, apex acuminate, 5–7-veined; distal ones gradually becoming smaller, lanceolate or linear. Flowers funnel-shaped, fragrant, solitary or 2–3 on a short peduncle; pedicels 3–10 cm, bent downward; bracts lanceolate, 3–9 × 1–2 cm. Perianth segments 6, oblong-oblanceolate to spatulate, 13–18 × (1–)2–4.3 cm, spreading distally and recurved apically, milk white adaxially, unspotted, with bronzy purple markings abaxially; nectaries papillose on both surfaces. Stamens curved upward; filaments 10–12 cm, densely pilose to glabrous; anthers oblong, 1–1.5 cm. Style 8.5–11 cm. Capsule subcylindrical, 4.5–6 cm.

Figure 193. *Lilium brownii* F. E. Brown ex Miellez
1. bulb; *2*. flowering branch. (drawn by Y. X. Liu)

Locality: Mount Violet, Kowloon Peak, Shing Mun, Tai Mo Shan, Clear Water Bay, Tsing Yi. *Y. S. Lau 2497.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Gansu, Shaanxi, Shanxi, Hebei, Henan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian.

Ecology: Hillsides amongst grass. Flowering: May–Jun.; fruiting: Sep.–Oct.

Uses: Food, medicinal (folklore).

Notes: *Lilium longiflorum* Thunb. is cultivated for ornamental in Hong Kong. It resembles *L. brownii* in aspect but may be distinguished by its glabrous filaments and the not papillose nectaries.

7. Zephyranthes Herb., *nom. cons.* 葱蓮屬

Perennial herbs, bulbiferous. Bulbs ovoid-globose, coated with tunic. Leaves basal, few to several, linear, appearing with the flowers. Flower solitary, terminal to a slender, hollow scape. Involucre 1, basally tubular, splitting on one side beyond middle. Perianth funnel-shaped; tube short or long, often with minute scales near the throat; segments 6, subequal. Stamens 6, 3 long alternating with 3 short, inserted at throat or in tube of perianth; filaments erect to slightly declinate; anther linear, dorsifixed. Ovary inferior, 3-locular, with many ovules in each locule. Stigma 3-lobed or 3-notched. Fruit a capsule, subglobose, loculicidally 3-valved. Seeds black, slightly flattened.

About 40 species in warmer regions of W hemisphere; two species cultivated in China and Hong Kong.

1a. Perianth rose to pink, tube 1–2 cm; leaves 6–8 mm broad ..... 1. *Z. carinata*
1b. Perianth white or slightly tinged with rose abaxially; leaves 2–4 mm broad ..... 2. *Z. candida*

1. Zephyranthes carinata Herb. 韭蓮(風雨花) **(Fig. 194; Photo 486)**

Bot. Mag. 52: t. 2594. 1825; FOC 24: 265. 2000; FGD 5: 441, fig. 233. 2003.

Zephyranthes grandiflora Lindl., Bot. Reg. 11: pl. 902. 1825; FGZ 701. 1956; FRPS 16(1): 7, pl. 1: 4–5. 1985; Check List HK Plants 126. 2004.

Perennial herb, glabrous throughout. Bulbs ovoid, 2–3 cm in diam. Leaves all basal, linear, 15–35(–40) × 6–8 mm, nearly flat, midvein raised abaxially. Scape slender, erect, 18–25 cm, fistulose. Flowers solitary and terminal; involucre 1, spathiform, 3–4 cm, membranous, basically united into a tube, upper part splitting on one side; pedicels ca. 2.5–3.5 cm. Perianth tube 2–2.5 cm, green; segments elliptic, 5–6 × 1.8–2.5 cm, rose to pink. Stamens 6, subequal, ca. 2.3 cm; anthers linear, ca. 1.8 cm, versatile. Style slender, longer than stamens, with a 3–4-lobed stigma. Capsule subglobse.

Locality: Cultivated. *HK sheet 28336, 32971.*

Distribution: Widely cultivated in China; native to S America.

Ecology: Flowering: Jul.–Sep.
Uses: Ornamental.

2. Zephyranthes candida (Lindl.) Herb.
葱蓮(玉簾) **(Photo 487)**
Bot. Mag. 53: pl. 2607. 1826; FGZ 701. 1956; FRPS 16(1): 5, pl. 1: 3. 1985; FOC 24: 265. 2000; FGD 5: 440. 2003
Amaryllis candida Lindl., Bot. Reg. 9: pl. 724. 1823.

Perennial herb, glabrous throughout. Bulbs ovoid, 2–3 cm in diam. Leaves all basal, linear, 15–38 × 3–4 mm, adaxial surface ± concave, abaxial surface convex. Scape slender, erect, 18–25 cm, fistulose. Flowers solitary and terminal; involucre 1, spathiform, ca. 2.3 cm, membranous, basically united into a tube, upper part splitting on one side; pedicels ca. 1.5 cm. Perianth tube very short, 2–3 mm; segments 6, white, but green at base, outer 3 larger, obovate-elliptic, 3–3.5 × 1.3–1.6 cm, inner 3 narrower. Stamens 6, 7–9 mm, green; anthers linear, 7–8 mm. Style slender, slightly longer than stamens; stigma 3-notched. Capsule subglobose.
Locality: Cultivated. *Y. S. Lau 1956; HK sheet 28341.*
Distribution: Widely cultivated in China; native to S America.
Ecology: Flowering: Jul.–Sep.
Uses: Ornamental.

Figure 194. *Zephyranthes carinata* Herb.
1. flowering plant; *2.* flower; *3.* stigma. (drawn by Y. X. Liu)

8. Tulipa L. 鬱金香屬

Perennial herbs, bulbiferous. Stem usually simple, scape-like but leaf-bearing. Leaves basal and alternate on stem, linear to narrowly ovate, sessile and clasping at base. Flowers usually large, solitary and terminal; bracts absent or sometimes present. Perianth segments 6, free, often coloured, outer and inner ones different in shape. Stamens 6, equal or 3 longer; filaments sometimes hairy; anthers basifixed. Ovary superior, 3-locular, with many ovules in each locule. Style columnar or very short; stigma 3-lobed. Fruit a capsule, loculicidally 3-valved. Seeds flat, usually subdeltoid.

About 150 species in temperate regions of Asia, Europe and N Africa, mainly in C Asia and the Mediterranean region; 13 species in China; one species cultivated in Hong Kong.

1. Tulipa gesneriana L. 鬱金香 **(Photo 488)**
Sp. Pl. 1: 306. 1753; FRPS 14: 90. 1980; FGD 6: 338, fig. 194. 2005.

Perennial herb. Bulbs ovoid, slightly tapering upward, ca. 2 cm in diam.; tunic thin, papery, with a few appressed hairs near base and summit. Stem erect, 20–40 cm. Leaves 3–5, alternate, linear-lanceolate to ovate-lanceolate, 10–21 × 1–6 cm, sessile and clasping at base, fringed with a few short hairs near apex. Flowers large, solitary and terminal, variously coloured, ranging from white to yellow, pink to purple. Perianth segments 6, free, outer 3 elliptic to lanceolate, 5–7 × 2–4 cm, inner ones shorter and broader, obovate. Stamens 6, equal; filaments glabrous, dilated below middle; anthers basifixed. Style obsolete; stigma 3-lobed, lobes thickened. Capsule loculicidally 3-valved.
Locality: Cultivated. *K. S. Pang 11.*
Distribution: Cultivated in China and elsewhere; possibly originated from SW or S Asia.
Ecology: Flowering: Spring.
Uses: Ornamental.

9. Barnardia Lindl. 綿棗兒屬

Perennial herbs with tunicate bulbs. Leaves radical, sessile, mostly very narrow, parallel-veined. Scape erect, simple, naked. Inflorescence a terminal raceme, usually many-flowered; bracts small, membranous. Flowers campanulate or wide open, pink or blue; pedicels articulate. Perianth segments 6, nearly equal, free to slightly connate at base. Stamens 6, inserted below the middle or at the base of the segments; filaments slender or slightly dilated toward base; anthers dorsifixed, introrse. Ovary superior, 3-locular, with 1 or 2(or 8–10) ovules in each locule. Style filiform; stigma small. Fruit a capsule, globose to obovoid, loculicidal. Seeds black, sometimes angular.

Two species worldwide, one species in China, Japan, Korea, and Russia, the other in NW Africa and SW Europe; one species in Hong Kong.

1. Barnardia japonica (Thunb.) Schult. & Schult. f.
綿棗兒 **(Fig. 195; Photos 489–490)**

Syst. Veg. 7: 555. 1829; FOC 24: 203. 2000; FGD 6: 337, fig. 192. 2005.

Scilla chinensis Benth., FHK 373. 1861, *nom. illeg.* (included *B. scilloides* Lindl.).

Scilla scilloides (Lindl.) Druce, Rep. Bot. Soc. Exch. Club Brit. Isles. 4: 646. 1917; FRPS 14: 166, fig. 22. 1980; Check List HK Plants 126. 2004.

Barnardia scilloides Lindl., Sketch Veg. Swan R. pl. 1029. 1826.

Ornithogalum japonicum Thunb. Syst. Veg., ed. 14, 328. 1784.

Perennial herb. Bulbs ovoid, 1–3 cm across, covered with blackish brown tunic. Leaves narrow-linear, 15–30 cm × 2–8 mm. Scape erect, longer than leaves. Raceme 5–20 cm, densely flowered; bracts narrowly lanceolate, membranous; pedicels 6–12 mm. Perianth segments rose purple, pink, or white, obovate, elliptic, or narrowly elliptic, 2.5–4 × 1–2 mm, slightly connate and discoid at base. Stamens 2–3.5 mm; filaments sublanceolate, papillose-puberulent or glabrous. Ovary 1.5–2 mm, papillose-puberulent; style 1–1.3 mm. Capsule subobovoid, 3–6 × 2–4 mm. Seeds 1–3, 2.5–5 mm, black.

Locality: Cape D'Aguilar, Mount Violet, Tai Tam Tuk, Victoria Peak. *P. S. Choi 51; Y. S. Lau 2335.*

Distribution: Guangdong, Guangxi, Yunnan, Sichuan, Shanxi, Henan, Hebei, Nei Mongol, Jilin, Liaoning, Heilongjiang, Hubei, Hunan, Jiangxi, Jiangsu, Fujian, Taiwan; Japan, Korea, E Russia.

Ecology: Hillsides, amongst grass. Flowering & fruiting: Jul.–Nov.

Uses: Ornamental.

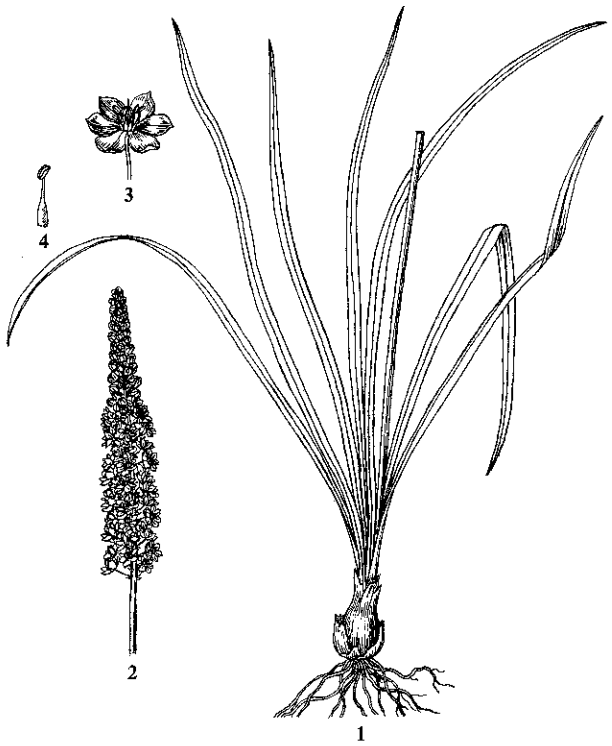

Figure 195. *Barnardia japonica* (Thunb.) Schult. & Schult. f.
1. portion of plant; *2.* inflorescence; *3.* flower; *4.* stamen. (drawn by Y. X. Liu)

10. Asparagus L. 天門冬屬

Perennial or subshrubs; roots cord-like, rhizomatous or tuberous. Stems erect or climbing, generally branching, sometimes ± woody. Leaves reduced to dry scales or spiny spurs, the foliage represented by green leaf-like branchlets or cladodes, which borne in clusters, rarely solitary, green, flat, 3-angled, or subterete. Flowers dioecious or hermaphroditic, in axillary clusters, racemes or umbels, rarely flowers solitary; pedicels articulate, subtended by membranous bracteoles. Perianth campanulate; segments free or occasionally connate at base. Stamens 6; filaments adnate to perianth segments; anthers dorsifixed. Ovary superior, 3-locular, with 2 or few ovules in each locule. Fruit a berry, 1–few-seeded.

About 130–140 species widely spread in temperate and tropical regions of Africa, Asia, and Europe; 31 species in China; one species native to Hong Kong.

1. Asparagus cochinchinensis (Lour.) Merr.
天門冬 **(Fig. 196; Photos 491–492)**

Fl. Indo-Chine 6: 780. 1908, et Philipp. J. Sci. 15: 230. 1919; FRPS 15: 106, pl. 33: 6–7. 1978; FOC 24: 211. 2000; FGD 6: 341, fig. 196. 2005.

Asparagus lucidus Lindl., Edwards's Bot. Reg. 7: 29. 1844; FHK 371. 1861; FKH 278. 1912.

Asparagus sinicus (Miq.) C. H. Wright, J. Linn. Soc. Bot. 36(250): 103. 1903; FKH 278. 1912.

Asparagopsis sinica Miq., J. Bot. Neerl. 1: 90. 1861.

Melanthium cochinchinense Lour., Fl. Cochinch. 1: 216. 1790.

Figure 196. *Asparagus cochinchinensis* (Lour.) Merr.
1. tubers; *2.* fruiting branch. (drawn by Y. X. Liu)

Perennial herb. Roots cord-like, often swollen or with tuberous part at end. Stems straggling or half-climbing, 1–2 m, often woody at base, much branched, with short frequently reflexed prickles under most of the branches. Cladodes usually in fascicles of 3, subfalcate, 0.5–8 cm × 1–2 mm, flat or slightly 3-angled. Flowers small, dioecious, 1–2(–8) in axillary cluster; pedicels 2–6 mm, articulate at middle. Male flowers: perianth segments 6, free, green or greenish white, obovate-oblanceoate, 2–3 mm; stamens 6, adnate to the base of perianth segments, included, anthers ovoid, ca. 0.5 mm; pistillode very small. Female flowers with staminode, ovary ca. 2 mm; style very short. Berry green, 6–7 mm in diam., 1–2-seeded.

Locality: Common in Hong Kong. *S. P. Lau 145; HK sheet 35876.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Gansu, Shaanxi, Shanxi, Hebei, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; Korea, Japan, Vietnam, Laos.

Ecology: Margins of forests, roadsides in ravines. Flowering: May–Jun.; fruiting: Aug.–Oct.

Uses: Medicinal (folklore), ornamental.

11. Paris L. 重樓屬

Perennial herbs, with thick or slender, horizontal, jointed and scarred rhizome. Stem erect, simple. Leaves 4–many in a terminal whorl, petiolate or sessile; blade lanceolate to ovate, usually with 3 main veins and netted veinlets. Flowers bisexual, solitary, terminal, pedunculate. Perianth segments (6–)8–14, free, in 2 whorls; outer ones leafy, green, rarely ± white, ovate to lanceolate; inner ones linear or occasionally absent. Stamens usually as many as perianth segments; filaments narrow, flat; anthers basifixed, often with convex connective apically. Ovary superior, 1-locular with parietal placentation or 4–10-locular with axile placentation; style short; stigma 4–10-lobed. Fruit a berry or a berry-like capsule, several- to many-seeded.

About 24 species distributed in tropical to temperate regions of Asia and Europe; 22 species in China, one species in Hong Kong.

1. Paris polyphylla Sm. var. **chinensis** (Franch.) H. Hara
華重樓(重樓) **(Fig. 197; Photos 493–494)**

J. Fac. Sci. Univ. Tokyo, Sect. 3, 10: 176. 1969; FRPS 15: 92. 1978; FOC 24: 91. 2000.

Paris chinensis Franch., Nouv. Arch. Mus. Hist. Nat., ser. 2, 10: 97. 1888.

Paris polyphylla auct. non Sm.: FKH 281. 1912.

Perennial herb, glabrous throughout, 30–100 cm tall, with thick horizontal jointed and scarred rhizome. Leaves 5–10, but usually 7, in a terminal whorl; petiole 0.5–3 cm; leaf blade variable, oblong-lanceolate or obovate-oblanceolate, 5–20 × 2–5 cm, base cuneate, apex acuminate or acute. Flower terminal, solitary; peduncle 1.8–10 cm. Outer perianth segments 5–6, ovate-lanceolate 2–6 × 1–2 cm, leaf-like, green or yellow-green; inner ones linear, usually shorter than outer ones, 1–1.5 mm wide, usually yellow-green. Stamens 8–10, in 2 series; filaments 5–6 mm; anthers 10–12 mm; free portion of connective 0.5–1.5 mm. Ovary subglobose, ribbed, 1-locular, sometimes tuberculate; style short, base enlarged, purple to white; stigma lobes (4–)5. Capsule globose, sometimes tuberculate. Seeds enveloped by red, succulent aril.

Locality: Mount Parker, Shek O Rd., Lantau Island, Sunset Peak. *Y. S. Lau 2126.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian, Taiwan; Vietnam, Laos, Thailand, Myanmar.

Ecology: Forests, ravines in humus soil. Flowering: May–Jul.; fruiting: Aug.–Nov.

Uses: Medicinal (folklore).

Notes: Listed in *Rare and Precious Plants of Hong Kong*.

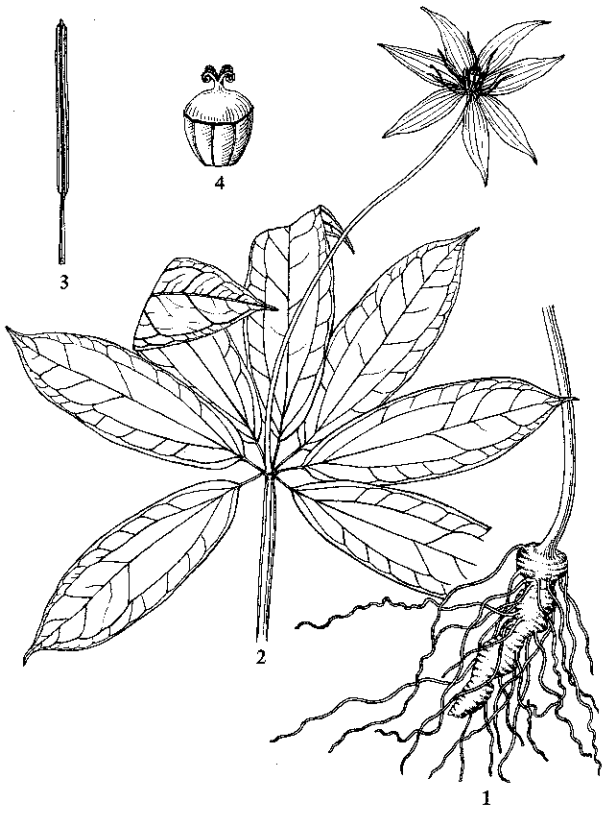

Figure 197. *Paris polyphylla* var. *chinensis* H. Hara
1. rhizome; *2.* plant; *3.* stamen; *4.* gynoecium. (drawn by Y. X. Liu)

12. Peliosanthes Andrews 球子草屬

Perennial herbs, with short rhizomes and thick roots. Stem usually short, rarely elongate and procumbent. Leaves basal or congested on stems, petiolate; leaf blade linear to elliptic-ovate, margin entire or serrulate, subplicate-veined, with conspicuous, transverse veins between main, parallel veins, glabrous. Inflorescence usually a raceme terminating on scape. Flowers solitary or in clusters of 2–5, subtended by a bract; pedicel articulate near apex; bracteole absent or 1. Perianth segments 6, basally united into a tube, free part spreading. Stamens 6; filaments dilated and connate into a fleshy ring, rarely free; anthers subsessile. Ovary semi-inferior, 3-locular,

with 2–4(–5) ovules in each locule; style shortly conical to columnar; stigma capitate to 3-lobed, small. Fruit bursting at an early stage and exposing young seeds. Seeds berry-like, ellipsoidal to globose, blue at maturity.

About 16 species distributed in topical and subtropical regions of Asia; six species in China; one species in Hong Kong.

1. Peliosanthes macrostegia Hance
大蓋球子草 **(Fig. 198; Photo 495)**

J. Bot. 23: 328. 1885; FKH 273. 1912; FRPS 15: 167, pl. 56: 1–2. 1978; FOC 24: 263. 2000; FGD 6: 357, fig. 212. 2005.

Perennial herb, with short rhizomes and thick roots. Leaves 2–5, basal; petiole 7–30 cm; leaf blade lanceolate-oblong, 14–27 × 3–6 cm, base attenuate, apex acuminate or acute, with 5–9 parallel veins, netted veins conspicuous. Scape 15–29 cm. Inflorescence a raceme, 10–22 cm, rachis purplish when dry; bracts ovate-lanceolate, 6–15 mm, membranous. Flowers solitary; pedicels 2–5 mm, articulate near apex; bracteole 1, 3–5 mm. Perianth purple; tube ca. 2 mm, basally adnate to ovary; segments 6, ovate-oblong, 4–5 mm. Stamens 6; filaments connate into a fleshy ring; anthers ca. 1 mm. Ovary 3-locular; style short; stigma 3-lobed. Seeds subglobose, ca. 1 cm, berry-like.

Locality: Tai Mo Shan. *Y. S. Lau 1726; HK sheet 30161.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, SE Yunnan, NE Sichuan, Hunan, Taiwan.

Ecology: Forests, thickets, shady and humid rocky places. Flowering: Apr.–Jun.; fruiting: Jul.–Sep.

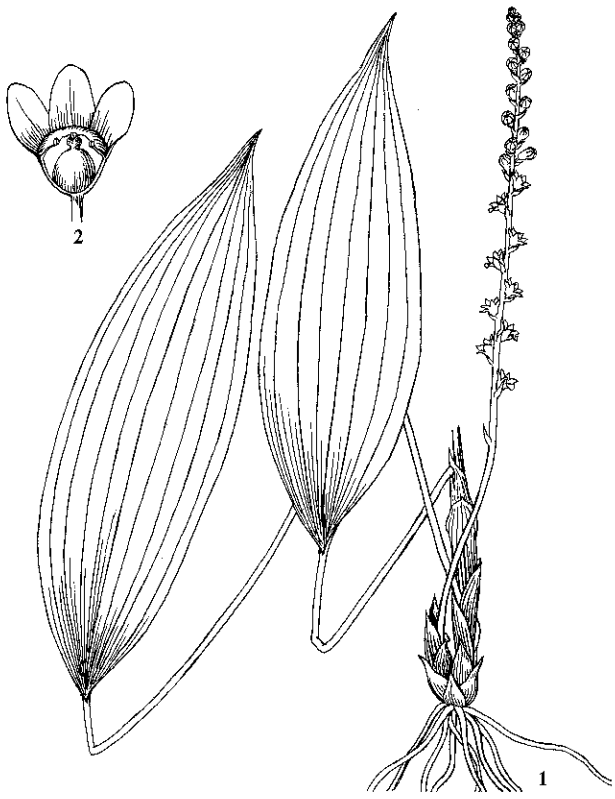

Figure 198. *Peliosanthes microstegia* Hance
1. flowering plant; 2. flower with portion of perianth removed. (drawn by Y. X. Liu)

13. Ophiopogon Ker Gawl., *nom. cons.* 沿階草屬

Perennial herbs, often stoloniferous, with short and thick rhizomes; roots sometimes with fleshy, tuberous part near tip. Stem suberect or prostrate, short or elongate, usually enclosed by leaf sheath. Leaves radical, tufted or scattered, sessile or petiolate; leaf blade linear to oblong, usually whitish streaked abaxially, parallel veined. Scape arising from a leaf axil. Inflorescence a raceme or reduced panicle terminal on a leafless scape; bracts small, membranous. Flowers small, bisexual, solitary or several-clustered in axil of bracts, usually nodding; pedicel articulate. Perianth segments 6, free, in 2 whorls, adnate near top of ovary. Stamens 6, inserted at base of perianth segments; filaments usually very short; anthers basifixed, sometimes connate. Ovary semi-inferior, 3-locular, with 2(–6) ovules in each locule; style 1, columnar; stigma capitate, small. Fruit bursting irregularly at an early stage and exposing young seeds. Seeds berry-like, usually blue at maturity.

About 65 species in warm-temperate, subtropical, and tropical Asia; 47 species in China; two species in Hong Kong.

1a. Plants stoloniferous; leaves 1.5–3 mm broad..... ..... 1. *O. japonicus*

1b. Plants not stoloniferous; leaves 3–8 mm broad..... ..... 2. *O. reversus*

1. Ophiopogon japonicus (L. f.) Ker Gawl.
麥冬(沿階草) **(Fig. 199; Photo 496)**

Bot. Mag. 27: pl. 1063. 1807; FKH 274. 1912; FRPS 15: 163, pl. 55: 3–5. 1978; FOC 24: 261. 2000; FGD 6: 361, fig. 214. 2005.

Convallaria japonica L. f., Suppl. Pl. 204. 1782.

Figure 199. *Ophiopogon japonicus* (L. f.) Ker Gawl.
1. fruiting plant; *2.* flower. (drawn by Y. X. Liu)

Perennial herb, stoloniferous. Roots cord-like, usually with tuberous part near middle or tip; tubers fusiform, 1–2 × 0.5–1 cm, fleshy. Leaves radical, tufted, sessile, grass-like, generally 15–45 cm × 1.5–3 mm, 3–7-veined, margin serrulate. Scape 6–15(–27) cm, much shorter than leaves. Inflorescence a raceme or reduced panicle, 2–5 cm, several- to more than 10-flowered; bracts lanceolate, basal one 7–8 mm. Flowers solitary or paired, usually nodding; pedicels 3–4 mm, articulate near middle. Perianth segments 6, white or purplish, lanceolate, ca. 5 × 2 mm. Stamens 6; filaments very short; anthers ca. 3 mm. Ovary semi-inferior, style somewhat narrowly conical, ca. 4 mm, narrowed gradually upward from the widened base. Seeds globose, 7–8 mm in diam.

Locality: Lantau Island. *W. J. Tutcher 7202.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Shaanxi, Hebei, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan; Korea, Japan.

Ecology: Forests, moist and shady places in ravines. Flowering: May–Aug.; fruiting: Aug.–Sep.

Uses: Medicinal (folklore), ornamental.

2. Ophiopogon reversus C. C. Huang 高節沿階草(廣東沿階草) **(Photo 497)**

FHN 4: 534. 1977; FRPS 15: 160. 1978; FOC 24: 260. 2000; FGD 6: 362. 2005.

Perennial herb, without creeping stolons and tuberous roots. Leaves radical, tufted, sessile, long linear, 18–50 cm × 3–8 mm, (5–)7–9-veined, base attenuate, without membranous sheath, margin subentire or serrulate distally. Scape 18–25 cm, slightly flattened and ridged. Inflorescence a raceme or reduced panicle, 5–7 cm, many-flowered; bracts deltoid to ovate, basal one to 2 cm. Flowers in clusters of 2–3 or solitary; pedicels curved, 5–10 mm, articulate above middle. Perianth purple, or white tinged with purple; segments 6, oblong-ovate, ca. 5 × 2 mm, 1-veined. Stamens 6; filaments short; anthers oblong. Style 5–6 mm, slender. Seeds ellipsoidal or globose, purple-blue at maturity.

Locality: Mount Violet, Mount Parker, Tai Mo Shan, Tai Po. *G. Barretto 275; HK sheet 36143.*

Distribution: Guangxi, Hainan.

Ecology: Moist places in forests. Flowering: Sep.–Oct.; fruiting: Dec.–Mar. of the following year.

14. Liriope Lour. 山麥冬屬

Perennial herbs, with short thick rhizome, often stoloniferous. Roots sometimes with fleshy, fusiform tuberous. Leaves radical, tufted, sessile, linear, parallel-veined. Inflorescence a raceme or a reduced panicle terminating on a leafless scape. Flowers bisexual, often in clusters of 2–4, sometimes solitary, small, subtended by a bract and a few bracteoles; pedicels articulate. Perianth segments 6, free, in 2 series, white or purplish. Stamens 6, inserted at base of perianth segments; filaments narrowly linear; anthers basifixed. Ovary superior, 3-locular, with 2 ovules in each locule; style columnar, slightly 3-angled; stigma small. Fruit bursting irregularly at an early stage and exposing young seeds. Seeds berry-like, globose or ellipsoidal, deep blue to purple at maturity.

Eight species distributed in E, and SE Asia; six species (three endemic) in China; one species in Hong Kong.

1. Liriope spicata (Thunb.) Lour.

山麥冬(麥門冬) **(Fig. 200; Photo 498)**

Fl. Cochinch. 1: 201. 1790; FKH 273. 1912; FRPS 15: 128, pl. 41: 1–2. 1978; FOC 24: 251. 2000; FGD 6: 359. 2005.

Ophiopogon spicatus (Thunb.) Ker Gawl., Bot. Reg. 7: pl. 593. 1821; FHK 371. 1861.

Convallaria spicata Thunb., Syst. Veg., ed. 14, 334. 1784.

Perennial herb, to 50 cm tall, with short rhizomes and creeping stolons; roots usually with fusiform, fleshy tuberous part near tip. Leaves radical, tufted, narrowly linear, grass-like, 20–60 cm × 4–6 mm, distinctly 5-veined, margin serrulate. Scape erect, about the length of leaves or longer. Flowers in clusters of (2–)3–5 in the axil of a scarious bract and surrounded by several smaller bracts, forming a rather dense narrow raceme of 6–18 cm; pedicels ca. 4 mm, articulate above middle or near apex. Perianth purplish or bluish; segments 6, in 2 series, suboblong, 4–5 × 2–2.5 mm. Stamens 6; filaments ca. 2 mm; anthers narrowly oblong, about the length of filaments. Ovary superior; style ca. 2 mm; stigma as wide as style. Seeds subglobose, ca. 5 mm in diam.

Locality: Common in Hong Kong. *S. P. Lau 82; HK sheet 30224.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Gansu, Shaanxi, Shanxi, Hebei, Henan, Hubei, Hunan, Jiangxi, Anhui, Shandong, Jiangsu, Zhejiang, Fujian, Taiwan;

Figure 200. *Liriope spicata* (Thunb.) Lour.
1. flowering plant; *2.* flower. (drawn by Y. X. Liu)

Korea, Japan, Vietnam.

Ecology: Forests, moist places in ravines. Flowering: May–Jul.; fruiting: Aug.–Oct.

Uses: Medicinal (folklore), ornamental.

15. Thysanotus R. Br., *nom. cons.* 異蕊草屬

Perennial herbs, with a short rhizome and fibrous or tuberous roots. Leaves radical or nearly so, grass-like, usually narrow-linear or subulate. Scape axillary. Inflorescence usually a terminal raceme or panicle, sometimes constricted into an umbel; bracts small. Flowers bisexual; pedicels articulate proximally. Perianth segments 6, free, 3-veined in the centre; outer 3 with thin entire edges, inner 3 very delicate and rolled inwards in the bud or ciliate on the edge. Stamens 6, inserted at the base of perianth segments, inner ones sometimes reduced; filaments slender; anthers basifixed, inner ones usually longer. Ovary superior, 3-locular , with 2 ovules in each locule; style filiform; stigma small. Fruit a loculicidal capsule.

About 50 species mainly distributed in Australia, only a few species extending to tropical Asia; one species in China; one species in Hong Kong.

1. Thysanotus chinensis Benth. 異蕊草 **(Fig. 201; Photo 499)**

FHK 372. 1861; FKH 280. 1912; FRPS 14: 48. 1980; FOC 24: 203. 2000; FGD 6: 356, fig. 211. 2005.

Figure 201. *Thysanotus chinensis* Benth.
1. flowering plant; *2.* tapels and stamens; *3.* pistil. (drawn by Y. X. Liu)

Perennial herb, with short rhizome and fibrous roots. Leaves radical, tufted, linear-subulate, erect and stiff, 13–20 cm × 1–1.5 mm, glabrous. Scape erect, slender, as long as or slightly longer than leaves, bearing a terminal umbel. Umbel 4–10-flowered; bracts ovate or lanceolate, 3–5 mm, membranous and scale-like; pedicels 1–1.5 cm, articulate near base, recurved after flowering. Perianth blue; segments 6, suboblong, 7–8 × 1–2 mm, membranous, 3–5-veined; inner ones sometimes fimbriate-denticulate at margin proximally. Stamens 6, 4–5 mm; outer anthers ca. 1.2 mm, inner ones ca. 2.2 mm. Capsule ellipsoidal, ca. 4 × 3 mm, 1–2-seeded.

Locality: Aberdeen, Fanling, So Kwun Wat. *Y. W. Lam 1725; HK sheet 38434.*

Distribution: Guangdong, Guangxi, Fujian, Taiwan; Philippines, Vietnam, Thailand, Malaysia, Indonesia, Australia.

Ecology: Thin forests, grassy hillslopes. Flowering & fruiting: May–Dec.

16. Chionographis Maxim., *nom. cons.* 白絲草屬

Perennial herbs, with short thick rhizome and fibrous roots. Leaves radical, rosulate, petiolate; leaf blade ellipitic to oblong-lanceolate, evergreen, margin entire or minutely undulate. Scape arising from centre of leaf rosette, erect, simple, with 3–30 small, bract-like leaves. Inflorescence a terminal spike, many-flowered; bract absent. Flowers sessile, zygomorphic, small. Perianth segments 6, free; upper 3–4 spatulate-linear to filiform, petal-like; lower 2–3 much shorter or absent. Stamens 6, inserted at base of perianth segments; anthers basifixed; extrorse, with locules confluent or free. Ovary superior, 3-locular, with 2 ovules in each locule; styles 3, stigmatic adaxially. Fruit a capsule, septicidally dehiscent. Seeds fusiform, winged at one end.

Four species distributed in China, Japan, Korea; one species in China and Hong Kong.

1. Chionographis chinensis K. Krause 白絲草(中國白絲草) **(Fig. 202; Photo 500)**

Notizbl. Bot. Gart. Berlin-Dahlem 10: 807. 1929; FRPS 14: 14. 1980; FOC 24: 88. 2000; FGD 6: 344, fig. 198. 2005.

Perennial herb, with short thick rhizome. Leaves radical, rosulate; petioles 1–6 cm; leaf blade ellipitic to ovate-oblong, (1–)3–7 × 1–3 cm, base attenuate, apex acute, margin slightly undulate, glabrous on both surfaces. Scape 14–40 cm, with 4–5 alternate, small, bract-like leaves. Flowers fragrant, in a dense flowered terminal spike. Perianth segments 6, white to pale yellow; upper 3–4 narrowly spatulate, 3–8 × 0.2–0.5 mm; lower 2–3 much smaller, sometimes absent. Stamens 6, unequal, 1–1.5 mm, 3 longer than others; anthers subcordate-ovate, with locules confluent. Capsule ellipsoidal to ± obovoid, ca. 4 × 2 mm, ± 3-angled, dehiscent distally.

Locality: Ma On Shan. *Y. W. Lam 217; HK sheet 30333.*

Distribution: Hainan, Guangdong, Guangxi, Hunan, Fujian.

Ecology: Forests, other shady and damp places. Flowering: Mar.–May; fruiting: Jun.–Sep.

Notes: The species was reported as *Chionographis japonica* Maxim. previously (Check List HK Plants 80. 1993).

17. Aspidistra Ker Gawl. 蜘蛛抱蛋屬

Perennial herbs, with horizontal rhizome and rather thick fibrous roots. Leaves radical, solitary or 2–4-tufted, long petiolate; leaf blade many-veined. Flowers bisexual, 1(–2) borne on a very short scape, at the surface of ground beneath the foliage, generally embraced by 1–2 bracts at perianth base. Perianth campanulate, urceolate, or cupular, fleshy, apically (4–)6–8(–10)-lobed. Stamens as many as and opposite to perianth segments, usually inserted in proximal part of perianth tube; filaments very short or absent; anthers dorsifixed. Ovary superior, 3–4-locular, with 2–several ovules in each locule; style short, sometimes articulate; stigma usually peltate or mushroom-shaped, large, entire or lobed at margin. Fruit a berry, globose to ovoid-ellipsoidal, usually 1-seeded.

About 55 species distributed in E and SE Asia; 49 species in China; four species in Hong Kong.

1a. Leaves solitary, spaced, less than 2.5 cm broad; perianth urceolate ..... 1. *A. minutiflora*
1b. Leaves 2–5-tufted, usually broader than 3 cm; perianth campanulate or subcupular.
2a. Perianth lobes fimbriate adaxially ..... 2. *A. fimbriata*
2b. Perianth lobes not fimbriate.
3a. Perianth pale green with purplish brown speckles abaxially, yellowish green and with 2 fleshy keels adaxially; stigma ca. 9 mm in diam., with 4 radial ridges ..... 3. *A. punctata*
3b. Perianth purplish red abaxially, dark purple adaxially and with 2–4 fleshy keels near the base; stigma 5–8 mm in diam., inconspicuously 4-lobed ..... 4. *A. lurida*

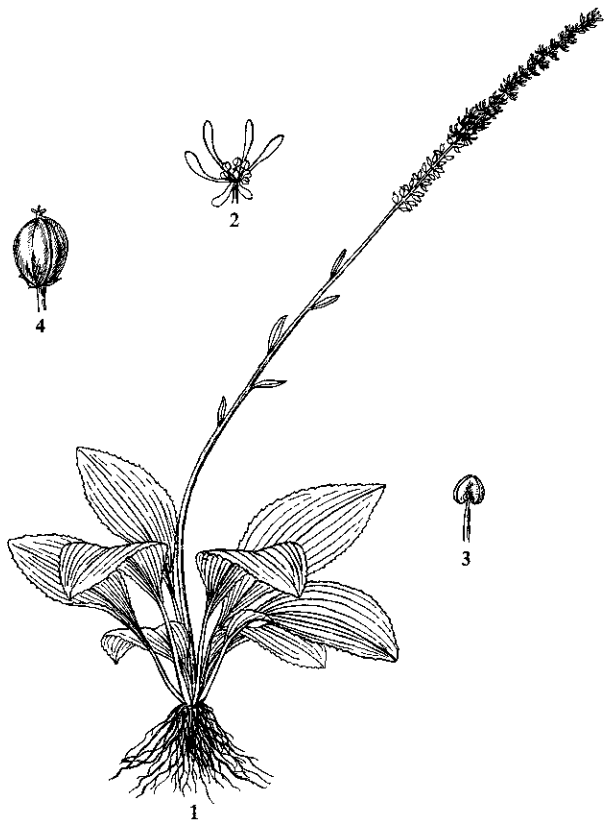

Figure 202. *Chionographis chinensis* K. Krause
1. flowering plant; *2.* flower; *3.* stamen; *4.* fruit. (drawn by Y. X. Liu)

1. Aspidistra minutiflora Stapf
小花蜘蛛抱蛋 **(Fig. 203; Photos 501–502)**

J. Linn. Soc., Bot. 36: 113. 1903; FKH 279. 1912; FRPS 15: 22, pl. 8: 5–6. 1978; FOC 24: 250. 2000; FGD 6: 365, fig. 218. 2005.

Perennial herb. Rhizome horizontal, subterete, 5–6 mm thick. Leaves 2–3-tufted, borne on nodes of rhizome; leaf blade linear, rarely lorate to lorate-oblanceolate, 26–65 × 1–2.5 cm, basally gradually narrowed into inconspicuous petiole, apex acuminate, parallel-veined, midvein distinct, margin entire or distally serrulate. Scape solitary, slender, 1–2.5 cm; bracts 2–4, broadly ovate. Flower solitary, terminal. Perianth urceolate, green, tinged and speckled with purple, 4.5–5 × 4–6 mm, ± fleshy, apex shallowly 4–6-lobed; lobes erect, deltoid, 1–2 × 1–1.5 mm. Stamens (4–)6, inserted at base of perianth tube, subsessile; anthers nearly broadly ovate, ca. 1.5 mm. Ovary 3-locular; style short; stigma orbicular, 1.5–2.5 mm in diam., margin (4–)6-crenate. Berry subglobose, ca. 5 mm in diam.

Locality: Tai Mo Shan, Lantau Island. *Y. W. Lam 388; HK sheet 30763.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Hunan.

Ecology: Moist places on hillsides, cliffs. Flowering: Oct.

Uses: Ornamental.

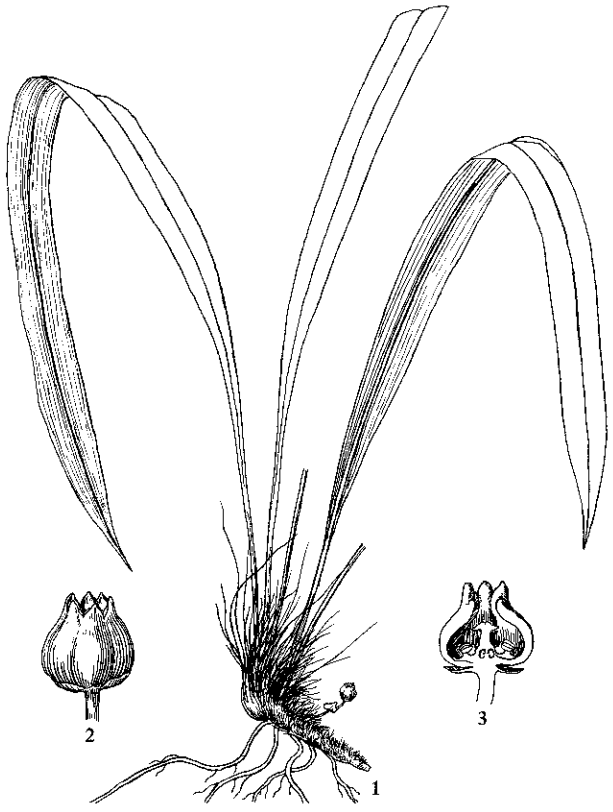

Figure 203. *Aspidistra minutiflora* Stapf
1. flowering plant; *2.* flower; *3.* vertical section of flower. (drawn by Y. X. Liu)

2. Aspidistra fimbriata F. T. Wang & K. Y. Lang
流蘇蜘蛛抱蛋 **(Photo 503)**

Acta Phytotax. Sin. 16(1): 76. 1978; FRPS 15: 22, pl. 7: 1–3. 1978; FOC 24: 245. 2000; FGD 6: 366. 2005.

Aspidistra lurida auct. non Ker Gawl.: FKH 279. 1912.

Perennial herb. Rhizome horizontal, subterete, 5–6 mm thick. Leaves solitary, 3–4 cm spaced; petiole 25–35 cm, stiff; leaf blade oblong-lanceolate, 30–45 × 3.5–6 cm, basally gradually narrowed, apex acuminate, margin entire or sometimes minutely serrulate. Scape 3–10 mm; bracts 4–5. Flower solitary. Perianth campanulate, tube 7–9 mm, 1–1.5 cm in diam., 8–10-lobed apically; lobes ovate-deltoid slightly spreading, 6–8 × 3.5–5 mm, purple speckled abaxially, pink and with 4 fleshy, fimbriate keels adaxially. Stamens 8–10, inserted proximally in perianth tube, subsessile; anthers broadly ovate, ca. 1.8 mm. Pistil ca. 4 mm; stigma purple, peltate, large, ca. 7 mm in diam., 4-lobed at margin, lobes emarginate at apex.

Locality: Tai Mo Shan, Mount Parker. *HK sheet 7600.*

Distribution: Hainan, Guangdong, Fujian.

Ecology: Forests along ravines. Flowering: Nov.–Dec.

Uses: Ornamental.

3. Aspidistra punctata Lindl. 紫點蜘蛛抱蛋 **(Photo 504)**

Bot. Reg. 12. pl. 799. 1826; FOC 24: 243. 2000; FGD 6: 366. 2005.

Perennial herb. Rhizome terete. Leaves solitary; petioles 7.5–50 cm, stiff; leaf blade lanceolate, 25–30 × 4.5–5.5 cm. Scape rather short; bracts ca. 5, dotted with purplish brown spots. Flower solitary, nodding. Perianth campanulate, pale green, dotted with purplish brown spots abaxially, fleshy, 8-lobed apically; lobes ovate, adaxially yellowish green and with 2 fleshy keels; keels dark purple, densely and minutely papillose. Stamens 8, inserted at middle of perianth tube, subsessile, lower than stigma in position; anthers oblong. Ovary with deeply coloured speckles, ovoid, angled; stigma white, orbicular, large, ca. 9 mm in diam., apically with 4 radial, fork-tipped ridges from centre to margin.

Locality: Hong Kong Island. *C. P. Lau 97, 100* (CUHK).

Distribution: Guangdong.

Ecology: Forests, streamsides. Flowering: Feb.–Mar.

4. Aspidistra lurida Ker Gawl. 九龍盤

Bot. Reg. 8: pl. 628. 1822; FKH 279. 1912; FRPS 15: 19. 1978; FOC 24: 246. 2000; FGD 6: 366. 2005.

Aspidistra elatior auct. non Blume: FKH 279. 1912; Check List HK Plants 125. 2004.

Aspidistra punctata auct. non Lindl.: FKH 279. 1912.

Perennial herb. Rhizome horizontal, terete, to 8 mm thick. Leaves solitary, 1–2 cm spaced; petioles 10–30 cm, stiff; leaf blade narrowly elliptic to oblong-lanceolate, 15–40 × 3–8 cm, base cuneate, apex acuminate, margin entire. Scape 1–3 cm, arching; bracts 3–4, broadly ovate, 7–8 mm, dark reddish, membranous. Flower solitary, nodding. Perianth campanulate, 10–15 mm, apex 6–8-lobed, purplish red abaxially, dark purple adaxially; tube 5–8 mm, 6–10 mm in diam.; lobes ovate-deltoid, spreading, 5–7 mm, with 2–4 papillose keels near the base adaxially. Stamens 6(–8), inserted proximally in perianth tube, subsessile. Pistil equalling perianth tube; ovary speckled with purple; stigma peltate, orbicular, 5–8 mm in diam., strongly convex, inconspicuously 4-lobed at margin, lobes entire at apex.

Locality: Wong Nai Chung Gap. *HK sheet 7603, 7604, 24985.*

Distribution: Guangdong, Guangxi.

Ecology: Forests. Flowering: Dec.

18. Curculigo Gaertn. 仙茅屬

Perennial herbs, usually with terete or tuberous rhizomes. Leaves mostly radical, sessile or petiolate, tufted; leaf blade usually lanceolate, plicate, parallel-veined. Scape emerging from leaf-axils, long or short, erect or apically bent downward. Flowers bisexual or unisexual, in terminal raceme, spike, or head. Perianth often yellow; segments 6, spreading, subequal, sometimes basally connate into a tube. Stamens 6, inserted at base of perianth segments; anther nearly basifixed or dorsifixed; filament very short, sometimes subequalling anther. Ovary inferior, 3-locular, usually hairy, with 2–many ovules in each locule; style columnar, slender; stigma 3-lobed. Fruit a berry.

About 20 species distributed in tropical and subtropical regions worldwide; seven species in China; two species in Hong Kong.

1a. Inflorescence racemose; leaves less than 4 cm broad, subsessile ..... 1. *C. orchioides*

1b. Inflorescence subcapitate; leaves 4–14 cm broad, long petiolate ..... 2. *C. capitulata*

1. Curculigo orchioides Gaertn. 仙茅 **(Photo 505)**

Fruct. Sem. Pl. 1: 63. 1788; FKH 275. 1912; FRPS 16(1): 37. 1985; FOC 24: 272. 2000; FGD 4: 413. 2000.

Curculigo orchioides Gaertn. var. *minor* Benth., FHK 366. 1861.

Perennial herb, 10–20(–40) cm tall. Rhizomes vertical, subterete, ca. 10 × 1 cm, similar to taproot. Leaves radical, grass-like, sessile or shortly petiolate; leaf blade lanceolate to linear, usually 10–20(–40) × 0.5–2.5 cm, base gradually narrowed, apex narrowly acuminate, laxly pilose or glabrous; veins inconspicuous. Scape short, 6–7 cm, nearly enclosed in base of sheathing petiole, pilose; bracts lanceolate, 2.5–5 cm, margin ciliate. Racemes umbel-like, 4–6-flowered; pedicels ca. 2 mm. Perianth yellow; tube filiform, ca. 18 mm; segments oblong-lanceolate, 8–12 × 2.5–3 mm, outer ones sometimes abaxially laxly pilose. Stamens 6, about half the length of perianth segments;

filament 1.5–2.5 mm; anther 2–4 mm. Ovary narrowly oblong, to 7.5 mm, pilose. Stigma lobes longer than style. Berry ± fusiform, ca. 1.5 cm, beaked at apex.

Locality: Common in Hong Kong. *HK sheet 28455, 32791.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Sichuan, Hunan, Jiangxi, Zhejiang, Fujian, Taiwan; Japan, Philippines, Indochina, Thailand, Myanmar, Pakistan, India, Indonesia, Papua New Guinea.

Ecology: Open grassy hillslopes, thin forests. Flowering & fruiting: Apr.–Sep.

Uses: Medicinal (folklore).

2. Curculigo capitulata (Lour.) Kuntze

大葉仙茅 **(Fig. 204; Photo 506)**

Revis. Gen. Pl. 2: 703. 1891; FKH 275. 1912; FRPS 16(1): 34. 1985; FOC 24: 271. 2000; FGD 4: 412, fig. 250. 2000.

Curculigo recurvata W. T. Aiton, FKH 275. 1912.

Leucojum capitulatum Lour., Fl. Cochinch. 1: 199. 1790.

Perennial stout herb, 0.8–1 m tall. Rhizomes tuberous, thick, with creeping, slender stolons. Leaves radical; petioles 30–50(–80) cm, base dilated and clasping the root stock, densely brown pubescent; leaf blade oblong-lanceolate to suboblong, 30–90 × 4–16 cm, apex acuminate, margin entire, veins conspicuous, plicate, adaxially glabrous, abaxially pubescent especially on veins. Scape 6–15(–20) cm, ± compressed, brown villous. Racemes densely flowered, condensed to a head, 2.5–5.5 cm in diam.; bracts lanceolate, 2–6 cm, brown villous on veins and margin; pedicels 8–10 mm, brown villous. Perianth ca. 2 cm, brown villous abaxially; tube ca. 1 cm; segments yellow, elliptic-lanceolate, 8–10 × 3.5–5 mm, apex obtuse. Stamens 6; filament slender, 2–3 mm; anther linear, 4–5 mm. Ovary subglobose to oblong, hairy; style longer than stamens, slender; stigma subcapitate. Berry white, subglobose, 4–5 mm in diam., beakless.

Locality: Mount Parker, Lantau Island. *Y. S. Lau 1696; L. T. Lo 477.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Fujian, Taiwan; Japan, Philippines, Indochina, Myanmar, Thailand, Bhutan, Sikkim, India, Sri Lanka, Indonesia, Papua New Guinea.

Ecology: Forests, moist places in ravines. Flowering: May–Sep.; fruiting: Aug.–Nov.

Uses: Ornamental.

Figure 204. *Curculigo capitulata* (Lour.) Kuntze
1. flowering plant; *2.* inflorescence. (drawn by Y. X. Liu)

19. Hypoxis L. 小金梅草屬

Perennial herbs. Rhizomes subglobose or tuberous. Leaves basal, linear, less than 1 cm broad, sessile. Flowering stems shorter than leaves, slender, usually pilose. Inflorescences terminal, umbellate or racemose, few-flowered or flower solitary. Perianth segments 6, free, persistent. Stamens inserted at base of perianth segments; filament short; anther nearly basifixed. Ovary inferior, 3-locular; style short; stigma 3-lobed. Fruit a capsule.

About 100 species widely distributed in tropical regions; one species in China and Hong Kong.

1. Hypoxis aurea Lour. 小金梅草 **(Fig. 205; Photos 507–508)**

Fl. Cochinch. 1: 200. 1790; FGZ 719. 1956; FRPS 16(1): 39. 1985; FOC 24: 273. 2000.

Perennial small herb, yellowish brown pilose throughout. Rhizomes globose to cylindrical, fleshy, covered with fibers.

Figure 205. *Hypoxis aurea* Lour.
1. fruiting plant; *2.* fruit. (drawn by Y. X. Liu)

Leaves basal, 4–12, linear, 7–30 cm × 2–6 mm, base membranous, apex narrowly acute. Flowering stems slender, 2.5–10 cm or more, bearing 1–2 flowers; bracts 2, setaceous, small. Perianth yellow; segments oblong, 6–8 mm, persistent. Stamens inserted at the base of perianth lobes; filaments short. Ovary 3–6 mm, pilose. Style short; stigma erect, 3-lobed. Capsule clavate, 6–12 mm, 3-valved. Seeds numerous, subglobose, tuberculate.

Locality: Tai Mo Shan. *HK sheet 41865, 41874.*

Distribution: Guangdong, Guangxi, Guizhou, Sichuan, Yunnan, Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Fujian, Taiwan; Bhutan, Cambodia, India, Indonesia, Japan, Korea, Laos, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Thailand, Vietnam.

Ecology: Grassy mountain slopes, alt. ca. 800 m. Flowering: May.

20. Campylandra Baker 開口箭屬

Perennial herbs. Rhizome stout, usually ascending, sometimes slightly woody. Stem usually very short or sometimes slightly elongate. Leaves basal or alternate on short stem, usually distichous equitant; leaf blade lorate to ovate-elliptic, basally dilated and amplexicaul. Scape axillary, erect. Inflorescence a terminal spike, densely flowered, bracts lanceolate to ovate, often longer than flowers, sometimes with several sterile bracts apically. Perianth segments 6, proximal 1/2–2/3 connate into a tube, fleshy, sometimes with a ring-like, fleshy appendage in throat; lobes spreading or incurved, sometimes fimbriate at margin. Stamens 6; filaments proximally adnate to perianth tube; anthers positioned as high as or higher than stigma, dorsifixed. Ovary superior, 3-locular, with 2–4 ovules in each locule; style short, 1(–3.5) mm, or absent; stigma small, 3-lobed. Fruit a berry, 1–3-seeded.

About 16 species distributed from India through Himalaya to China; 16 species in China; one species in Hong Kong.

1. Campylandra wattii C. B. Clarke
彎蕊開口箭 **(Fig. 206; Photo 509)**

J. Linn. Soc., Bot. 25: 78. 1889; FOC 24: 236. 2000; FGD 6: 346, fig. 201. 2005.

Campylandra cauliflora Chun, Sunyatsenia 1(4): 213–215. 1934.

Tupistra wattii (C. B. Clarke) Hook. f., Fl. Brit. India 6(18): 325. 1892; Check List HK Plants 126. 2004.

Perennial herb. Rhizome elongate, stem-like, ± curved, to 1.2 cm thick. Stem elongate. Leaves spirally arranged on stem, subdistichous; petioles 3–9 cm, basally dilated and amplexicaul; leaf blade ovate-elliptic to narrowly elliptic or elliptic-lanceolate, 8–20 × 3–7 cm, base attenuate, apex acuminate. Spikes 3–6, densely flowered, with several sterile bracts apically; peduncle 1.5–2.5 cm; fertile bracts linear-lanceolate, 1.2–1.8(–5) cm. Perianth tube 3–5 mm; segments red-brown or yellowish green, broadly ovate, 3.5–4 × 2–4 mm, fleshy. Stamens 6; filaments proximally widened and adnate to perianth tube, free part incurved, 1.5–2 mm. Ovary globose; style inconspicuous; stigma 3-lobed. Berry red at maturity, globose, 0.9–1.1 cm in diam.

Locality: Tai Mo Shan. *Y. W. Lam 166, 433.*

Distribution: Guangdong, Guangxi, Guizhou, Sichuan, Yunnan; Bhutan, India.

Ecology: Shaded and moist places in forests. Flowering: Feb.–May.

Figure 206. *Campylandra wattii* C. B. Clarke
1. fruiting plant; *2*. corolla opened showing stamen; *3*. bract. (drawn by Y. X. Liu)

21. Chlorophytum Ker Gawl. 吊蘭屬

Perennial herbs. Rhizome short, or sometimes slightly elongate, usually with ± thick or slightly fleshy roots. Leaves basal, subdistichous or fasciculate, sessile or petiolate, usually linear to linear-lanceolate, conduplicate, base sheathing. Scape axillary, slender, branched or not. Inflorescence a terminal raceme or panicle; bracts small. Flowers bisexual, usually white; pedicels articulate. Perianth segments 6, free, 3–7-veined, persistent or marcescent. Stamens 6, inserted at base of perianth segment; filaments filiform, usually slightly widened near middle; anthers nearly basifixed, introrse. Ovary superior, 3-locular, with 1–several ovules in each locule; style slender; stigma small. Fruit a capsule, acutely 3-angled, loculicidal. Seeds black-coated, flattened.

About 100–150 species distributed mainly in tropical areas, especially in Africa and India; four species in China; one species in Hong Kong.

1. Chlorophytum laxum R. Br.

小花吊蘭 **(Fig. 207; Photo 510)**

Prodr. 277. 1810; FKH 279. 1912; FRPS 14: 45, pl. 10: 4–5. 1980; FOC 24: 206. 2000; FGD 6: 364, fig. 217. 2005.

Anthericum parviflorum (Wight) Benth., FHK 373. 1861.

Phalangium parviflorum Wight, Icon. Pl. Ind. Orient., pl. 2039. 1840.

Perennial herb. Rhizome inconspicuous, with many ± fleshy roots. Leaves sessile, subdistichous, linear, grass-like, 10–20 cm × 3–5 mm, glabrous, 11–15-veined. Scape slender, erect or arching, 10–30 cm, simple or sometimes with 1–2 branches. Raceme laxly flowered; bracts narrowly deltoid to lanceolate, very small; pedicels 2–4 mm, lengthening to 5 mm in fruit, articulate proximally. Perianth segments 6, white to greenish white, lanceolate, ca. 3 mm, closely 3-veined. Stamens shorter than perianth segments; anthers subglobose, ca. 0.4 mm. Capsule broadly globose to broadly obcordate, ca. 3 × 5(–7.5) mm; seeds usually 1 per valve.

Locality: Chai Wan, Tai Tam Tuk, Lantau Island. *Y. S. Lau 2590; Y. W. Lam 907.*

Distribution: Hainan, Guangdong; Thailand, Myanmar, India, Sri Lanka, Malaysia, Indonesia, Australia, tropical Africa.

Ecology: Shade and moist places in forests. Flowering & fruiting: Almost all year round.

Uses: Ornamental.

Notes: *Chlorophytum comosum* (Thunb.) Jacques, native to S Africa, is cultivated in Hong Kong as an ornamental. It can be easily recognized by its rosulate (not subdistichous) leaves and larger flowers (perianth segments to 1 cm long).

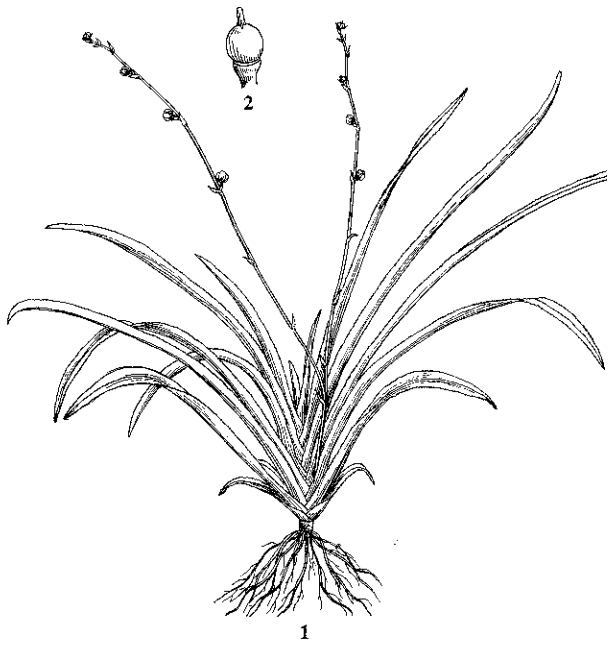

Figure 207. *Chlorophytum laxum* R. Br.
1. plant; *2.* pistil. (drawn by Y. X. Liu)

22. Veratrum L. 藜蘆屬

Perennial herbs. Rhizomes thick and short, with many ± fleshy roots. Stems erect, terete, leafy, usually enclosed by fibers disintegrated leaf sheaths at base. Leaves alternate, sheathed and clasping, strongly plicate-veined, usually gradually reduced in size upward and replaced by bracts. Inflorescence usually a terminal panicle, many-flowered. Flowers bisexual or polygamous, shortly pedicellate or subsessile; perianth segments 6, free, rarely connate at base, white, yellowish, green, or dark purple-brown, persistent in fruit. Stamens 6, inserted at base of perianth segments; anthers reniform to cordate-orbicular, with locules confluent and dehiscent by an apical valve. Ovary superior, 3-locular, slightly 3-lobed apically, usually with many ovules in each locule; styles 3, short, persistent, stigmatic adaxially. Fruit a septicidal capsule. Seeds several per valve, flattened, narrowly winged.

About 40 species distributed mainly in temperate regions of the N hemisphere; 13 species in China; one species in Hong Kong.

1. Veratrum schindleri Loes.

牯嶺藜蘆 **(Fig. 208; Photos 511–512)**

Verh. Bot. Vereins Prov. Brandenburg. 68: 139. 1926; FRPS 14: 28. 1980; FOC 24: 84. 2000; FGD 6: 347, fig. 203. 2005.

Veratrum nigrum auct. non L.: FKH 281. 1912.

Veratrum japonicum auct. non Loes.: FRPS 14: 28. 1980; Check List HK Plants 126. 2004.

Perennial herb. Stem simple, erect, to 1 m tall, clothed with brown, reticulate fibers of disintegrated leaf sheaths. Leaves basal and alternate on stem; petioles of basal leaves rather long and tightly enclosing the stem; stem leaves with a short, clasping

Figure 208. *Veratrum schindleri* Loes.
1. portion of plant; *2.* inflorescence; *3.* flower; *4.* fruit. (drawn by Y. X. Liu)

petiole; leaf blade broadly elliptic to lorate, 15–30 × 2–6(–10) cm, gradually reduce in size upward glabrous, base cuneate, apex acute to acuminate, strongly plicately veined. Panicle variable in length, laxly many-flowered; branches spreading; rachis and pedicels grey-white woolly; bracts ovate-lanceolate, 5–7 mm, abaxially woolly; pedicels 6–8(–14) mm. Perianth segments 6, yellowish green, greenish white or brownish, subelliptic, oblong, oblong-lanceolate, or obovate-elliptic, 5–8 × 2–3 mm, base not clawed, apex obtuse or subacute; outer segments pubescent at least at abaxial base. Stamens 6, 2–5 mm, inserted at the base of perianth segments. Ovary glabrous. Capsule erect, 1–2 × ca. 1 cm. Seeds black, flattened, narrowly winged.

Locality: Mount Parker, Tai Mo Shan, Sunset Peak, Lantau Peak. *H. C. Tang 2418; Y. S. Lau 2605.*

Distribution: Guangdong, Guangxi, Hunan, Hubei, Henan, Jiangxi, Anhui, Jiangsu, Zhejiang, Fujian.

Ecology: Shaded and moist places in forests and ravines. Flowering & fruiting: Aug.–Oct.

Uses: Medicinal (folklore).

23. Dianella Lam. 山菅屬

Perennial herbs, evergreen. Rhizome short, often branched. Stems erect, simple or branched, leafy at least at the base. Leaves basal and alternate on stem, distichous; leaf blade long and narrow, grass-like, base dilated and clasping, parallel-veined. Flowers in a terminal panicle; bracts rather small; pedicels articulate apically. Perianth segments 6, free, 3–7-veined. Stamens 6, inserted at base of perianth segments; filaments short, thickened under the erect anther; anthers basifixed, dehiscing by terminal pores. Ovary superior, 3-loculed, with 4–8 ovules in each locule; style filiform; stigma entire. Fruit a berry. Seeds black, often flattened.

About 20 species distributed mainly in tropical Asia, also in Africa (Madagascar), Australia, and Pacific islands; one species in China and Hong Kong.

1. Dianella ensifolia (L.) DC.

山菅(山菅蘭) **(Fig. 209; Photos 513–514)**

Liliac. 1: pl. 1. 1802; FHK 372. 1861; FRPS 14: 35. 1980; FOC 24: 161. 2000; FGD 6: 347, fig. 202. 2005.

Dianella nemorosa Lam., Encycl. 2(1): 276. 1786; FKH 280. 1912.

Dracaena ensifolia L., Mant. Pl. 1: 63. 1767.

Perennial evergreen herb, with creeping rhizomes. Stems erect, 0.7–1.5(–2) m tall, ± compressed. Leaves basal and distichous on the short base of the stem; upper stem-leaves 2–3, much reduced, bract-like; leaf sheath 7–15 cm, conduplicate, basally clasping; leaf blade leathery, linear-lanceolate, 30–70 × 1–3.5 cm, base gradually narrowed into the sheath, apex long acuminate, midvein abaxially and margin scabrous. Inflorescence a laxly branched panicle, 10–40 cm; pedicels 7–12 mm, usually arcuate. Perianth segments 6, spreading, lanceolate to narrowly oblong, 7–8 × 3–4 mm, inner 3 yellowish, outer ones brownish abaxially. Stamens 6, ca. 6 mm, slightly shorter than perianth; filaments ca. 2 mm, distally thickened, yellow and gland-like. Ovary globose; style ca. 6 mm. Berries deep blue, subglobose, 7–10 mm in diam., 3–6-seeded. Seeds ovoid, slightly compressed, ca. 3 × 4.5 mm, black and shining.

Locality: Common in Hong Kong. *Y. S. Lau 1926.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Jiangxi, Zhejiang, Fujian, Taiwan; tropical Asia, E Australia, Pacific islands, Africa (Madagascar).

Ecology: Grassy places on hillsides. Flowering & fruiting: Mar.–Aug.

Uses: Poisonous.

Figure 209. *Dianella ensifolia* (L.) DC.
1. portion of plant; *2.* flowering branch; *3.* pistil; *4.* stamen. (drawn by Y. X. Liu)

24. Disporum Salisb. ex D. Don 萬壽竹屬

Perennial herbs, with creeping rhizomes and fleshy roots. Stem erect, simple or branched in distal part. Leaves alternate, concentrated in distal part of stem (proximal part with only 1–several sheaths), alternate, often shortly petiolate, sometimes sessile; leaf blade linear to suborbicular, 3–7-veined. Inflorescences terminal or pseudolateral (terminal on a short, lateral branchlet opposite to a leaf), umbellate or with flowers paired or solitary; bract absent. Flowers bisexual, often nodding, tubular-campanulate. Perianth segments 6, free, white, greenish, yellow, pink, dark red, or dark purple, often saccate or spurred at base. Stamens 6, inserted at base of perianth segments; filaments usually ± flat; anthers basifixed to innate, extrorse. Ovary superior, 3-locular, with 2–6 ovules in each locule; style slender, 3-lobed to 3-fid apically with ± recurved lobes. Fruit a berry, dark blue to black, 2(–6)-seeded. Seeds globose or ovoid.

About 20 species distributed in E and SE Asia to Malesia; 14 species in China; one species in Hong Kong.

1. **Disporum uniflorum** Baker ex S. Moore
少花萬壽竹 **(Fig. 210; Photo 515)**
J. Bot. 13: 230. 1875; FOC 24: 157. 2000.

Disporum sessile auct. non D. Don: FKH 281. 1912; FRPS 15: 45, pl. 16: 4. 1978; Check List HK Plants 125. 2004.

Perennial herb, 20–80 cm tall. Rhizome fleshy, shortly creeping, often with stolons. Stems erect, smooth, simple or bifurcately branched on distal part. Leaves alternate; petioles 5–10 mm; leaf blade broadly elliptic, oblong-ovate to lanceolate, 4–9 × 1–6.5 cm, base subrounded to broadly cuneate, apex shortly acuminate to acute, glabrous, papillose on margin and veins. Flowers yellow, 1–3(–5) terminal on branches; pedicels 3–5 mm. Perianth segments 6, spatulate-oblanceolate to obovate, 2–3 cm × 5–10 mm, base gibbous-spurred; spurs 1–2 mm. Stamens 6, included; filaments 1.5–2 cm, minutely papillose proximally; anthers 4–8 mm. Ovary 4–5 mm; style 1.5–2.3 cm; stigma 3-lobed. Berries blue-black, subglobose, 8–10 mm in diam.

Locality: Tai Mo Shan, Ma On Shan. *P. S. Choi 196; Y. S. Lau 1529.*

Distribution: Guangdong, Jiangxi, Hubei, Sichuan, Shaanxi, Hebei, Anhui, Jiangsu, Shandong, Liaoning; Korea.

Ecology: Forests and thickets. Flowering: Mar.–May; fruiting: Jun.–Nov.

Uses: Medicinal (folklore).

Notes: *Disporum cantoniense* (Lour.) Merr., distributed in SW to SE China, is also cultivated in Hong Kong as an ornamental. It can be recognized by its creeping rhizome without stolon and slightly opening flowers and purplish tepals.

Figure 210. *Disporum uniflorum* Baker ex S. Moore
1. flowering plant; *2.* petal; *3.* stamen; *4.* pistil; *5.* fruit. (drawn by Y. X. Liu)

376. IRIDACEAE 鳶尾科

XIA Nian-he 夏念和

Perennial, rarely annual herbs, with rhizomes, bulbs, or corms. Leaves alternate, often 2-ranked, usually sword-shaped to linear, parallel veined, base sheathing. Inflorescence sometimes a spike or reduced to a solitary flower, more often of monochasial, umbellate cymes, each enclosed in 2 opposed bracts; bracts 1–several. Flowers bisexual, showy, actinomorphic or zygomorphic. Perianth segments 6, in 2 whorls, inner and outer ones equal or unequal; tube filiform or trumpet-shaped. Stamens (2–)3; anthers extrorse. Ovary inferior (or superior), 3-locular; ovules few to many; placentation axile. Style with filiform, slender, or petaloid branches, stigmas 3–6. Fruit a loculicidal capsule. Seeds many, with or without aril and wings.

About 70–80 genera and 1800–2000 species nearly worldwide, especially S Africa, Asia, and Europe; three genera and 61 species in China; three genera and three species in Hong Kong.

1a. Plants cormous ..... 1. *Gladiolus*
1b. Plants rhizomatous.
2a. Style branches petaloid; outer and inner perianth segments unequal ..... 2. *Iris*
2b. Style branches slender; outer and inner perianth segments ± similar ..... 3. *Belamcanda*

1. Gladiolus L. 唐菖蒲屬

Perennial herbs, with corms. Leaves sword-shaped or linear, in 2 ranks, overlapped each other. Scapes erect, unbranched, usually with several cauline leaves. Flowers sessile, zygomorphic, large and showy, often red, purple, yellow, white, pink and various colours, 5–8 cm in diam.; tube short and curved, perianth segments 6, in 2 whorls, elliptic or ovate, apex obtuse or mucronate; stamens 3, towards one side, filaments inserted on tube. Ovary inferior, 3-locular, placentation axile, ovules many; style slender, apex 3-lobed. Capsule ellipsoidal or obovoid, loculicidal. Seeds flat, winged.

About 250 species mainly distributed in Mediterranean coastal regions, tropical Africa, SW and C Asia; one species often cultivated in China; it is also cultivated in Hong Kong.

1. Gladiolus × gandavensis Van Houtte 唐菖蒲(劍蘭) **(Photo 516)**

Fl. Serres Jard. Eur. pl. 1. 1846; FGZ 706, fig. 370. 1956; FRPS 16(1): 124, pl. 39: 7–8. 1985; FGD 6: 386, fig. 231. 2005.

Perennial herb; bulbs compressed globose, 2.5–4.5 cm in diam., with brown or yellowish brown membranes. Leaves basal or alternate at the basal part of scapes, sword-shaped, 40–60 × 2–4 cm, base sheathing, apex acuminate, greyish green. Scapes erect, 50–80 cm, unbranched, with several basal leaves. Spikes terminal, 25–35 cm, bracts usually 2 below each flower, membranous, yellowish green, ovate or broadly lanceolate, 4–5 × 1.8–3 cm, midveins conspicuous. Flowers solitary in each bract, red, yellow or pink, etc., 6–8 cm in diam.; tube ca. 2.5 cm, curved at base; perianth segments ovate or elliptic, unequal, upper 3 (2 in outer whorl, 1 in inner whorl) slightly larger, the upper one of inner whorl much broader and larger, helmet-shaped; stamens 3, erect, adnate to the helmet-like inner segment, ca. 5.5 cm, anthers linear, reddish purple or dark purple, filaments white. Ovary ellipsoidal, green, style ca. 6 cm, apex 3-lobed, stigmas slightly enlarged, flat, tomentose.

Locality: Cultivated. *K. S. Pang 12.*

Distribution: Widely cultivated all over the world.

Ecology: Flowering: Jul.–Sep.; fruiting: Aug.–Dec.

Uses: Ornamental.

Notes: This species is a hybrid. Perhaps *G. psittacinus* Hook. and *G. cardinalis* Curtis are its parents. It is widely cultivated as a cutting-flower.

2. Iris L. 鳶尾屬

Perennial herbs, usually with short or long rhizomes (or bulbs), sometimes with swollen storage roots. Leaves mostly basal, 2-ranked, sword-shaped to linear. Aerial stem developed, much shorter than or longer than leaves. Inflorescence of rhipidia arranged in racemes, panicles, or solitary. Flowers white, yellow, blue, violet, or purple, relatively large, often fragrant. Perianth tube usually trumpet-shaped, sometimes very narrowly so, very short to long; outer 3 perianth segments (falls) ornamented or not, with a crested, bearded, or beardless claw (haft), and an expanded, usually reflexed limb (blade), the beard or crest (when present) extending along midvein of proximal part of limb adaxially; inner 3 perianth segments (standards) smaller, never ornamented, erect or spreading. Stamens opposed to style branches and appressed to them; filaments free, flattened. Style with 3 coloured, expanded, petaloid branches, arching over stamens, apex of branches extended as 2 lobes (crests) projecting beyond flap-like, abaxial stigma. Capsule globose, ellipsoidal, or cylindrical, apex beaked or not. Seeds pyriform, flattened and D-shaped, or irregularly angled, sometimes arillate.

About 225 species in temperate regions of the N hemisphere; 58 species (21 endemic) in China; one species in Hong Kong.

1. Iris speculatrix Hance 小花鳶尾 **(Fig. 211; Photo 517)**

J. Bot. 13: 196. 1875; FKH 274. 1912; FRPS 16(1): 174, pl. 56: 1–4. 1985; FOC 24: 309. 2000; FGD 6: 383, fig. 227. 2005.

Iris cavaleriei H. Lév., Liliac. & Chine 18. 1905.

Iris grijsii Maxim., Bull. Acad. Imp. Sci. Saint-Petersbourg 26: 527. 1880.

Rhizomes creeping. Roots thick. Leaves slightly curved, dark green, glossy, linear, 15–30 × 0.6–1.2 cm, veins 3–5. Flowering stems 20–25 cm, 1–2-leaved; spathes 2–3, green, lanceolate, 5.5–8 cm, 1–2-flowered, apex acuminate. Flowers violet or light blue, 5.6–6 cm in diam.; pedicel 3–7 cm. Perianth tube ca. 5 mm; outer segments spreading, spatulate, with a central, dark circular patch, 3–4 cm, crest yellow; inner segments erect, narrowly oblanceolate, 3–3.7 cm. Stamens ca. 1.2 cm; anthers white. Ovary fusiform, 1.6–2 cm. Style branches ca. 2.5 cm × 7 mm. Capsule ellipsoidal, ca. 5–5.5 cm, apex long beaked. Seeds dark brown, angled, with aril drying as a pale brown wing.

Locality: Cape D'Aguilar, Tai Tam, Sunset Peak, Po Toi Islands. *Y. S. Lau 2564; P. S. Choi 351, 459.*

Distribution: Guangdong, Hainan, Guangxi, Guizhou, Hubei, Hunan, Anhui, Jiangxi, Fujian, Zhejiang, Jiangsu, Qinghai, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan.

Ecology: Forests, moist grasslands. Flowering: May; fruiting: Jul.–Aug.

Uses: Ornamental (flowers).

Notes: The type specimen was collected by H. F. Hance (*Herb. No. 18465*, BM) from Victoria Peak and Mount Davis in April 1874. Listed in *Rare and Precious Plants of Hong Kong.*

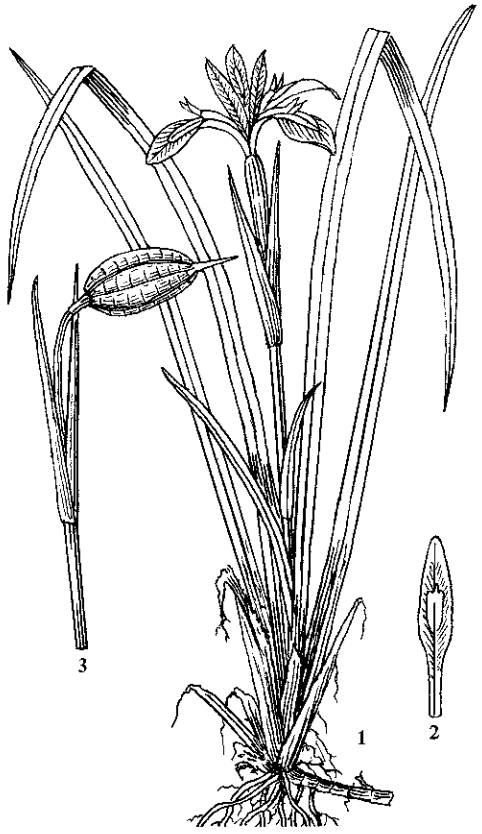

Figure 211. *Iris speculatrix* Hance

1. plant; *2.* outer perianth segment; *3.* fruiting branch. (drawn by H. P. Yu)

3. Belamcanda Adans., *nom. cons.* 射干屬

Perennial herbs. Rhizome knobby. Aerial stem well developed, erect, solid. Leaves cauline, 2-ranked, sword-shaped, flat. Inflorescence a terminal dichotomously branched panicle of rhipidia. Bracts small, membranous. Perianth tube short; segments nearly similar, outer ones slightly larger than inner ones. Stamens inserted at base of perianth segments. Style 1, slender, 3-lobed at apex. Capsule obovoid or ellipsoidal, dehiscing into 3 valves when mature. Seeds globose, black, glossy.

One species distributed in E and SE Asia.

1. Belamcanda chinensis (L.) DC. 射干 **(Photo 518)**

Liliac. 3: t. 121. 1805; FHK 365. 1861; FKH 274. 1912; FRPS 16(1): 131, pl. 42: 1–5. 1985; FOC 24: 312. 2000; FGD 6: 381, fig. 226. 2005.

Ixia chinensis L., Sp. Pl. 1: 36. 1753.

Belamcanda chinensis (L.) DC. var. *taiwanensis* S. S. Ying, Coloured Illustr. Pl. Taiwan 1: 273. 1980.

Belamcanda pampaninii H. Lév., Repert. Spec. Nov. Regni Veg. 8(160–162): 59–60. 1910.

Belamcanda punctata Moench, Methodus 529. 1794.

Pardanthus chinensis (L.) Ker Gawl., Ann. Bot. (König & Sims) 1: 246. 1805.

Rhizome yellow or pale brown. Stems 1–1.5 m. Leaves 20–60 × 2–4 cm, apex acuminate, midvein obscure. Flowers reddish orange with dark spots, 3–4 cm in diam.; pedicel slender, ca. 1.5 cm. Bracts lanceolate or ovate, membranous; outer perianth segments obovate or elliptic, ca. 2.5 × 1 cm, base cuneate, apex obtuse or emarginate; inner ones slightly narrower and shorter. Stamens 1.8–2 cm, filaments subterete, slightly broader at base, anthers linear, extrorse. Style 3-lobed at apex, lobes spreading. Capsule 2.5–3 × 1.5–2.5 cm, apex not beaked. Seeds ca. 5 mm in diam.

Locality: Cultivated. *HK sheet 7409, 28298.*

Distribution: All over China except NW part; SE Asia and Russia.

Ecology: Flowering: Jun.–Aug.; fruiting: Jul.–Sep.

Uses: Medicinal (folklore).

378. ALOEACEAE 蘆薈科

XIA Nian-he 夏念和

Perennial herbs or shrubs, or trees, often succulent, usually with dense rosettes of very fleshy leaves at base (common) or apex (when woody). Stems often very reduced but sometimes well developed. Leaves small to very large, alternate, spiral or distichous, often rosulate, amplexicaul, thick, succulent, sessile. Inflorescence a subterminal, ascending to erect raceme, often branched; peduncle usually well developed; bracts well developed, persistent, scarious. Pedicel usually much shorter than perianth. Perianth segments 6, in 2 whorls, sepaloid and petaloid, or petaloid, usually connate to form a tube, very rarely nearly free. Stamens 6, inserted at base of perianth tube, usually exserted; anthers dorsifixed, dehiscing by longitudinal slits, introrse. Ovary 3-locular, superior, placentation axile; ovules many per locule. Style apical; stigma singular. Fruit a loculicidal capsule. Seeds endospermic, often winged, endosperm oily.

Five genera and about 700 species distributed in Africa, Arabia and Madagascar; one genus and one species widely cultivated in China; it is also cultivated in Hong Kong.

1. Aloe L. 蘆薈屬

Perennial herbs, shrubs, or trees. Leaves rosulate, amplexicaul, thick, succulent, always glabrous, margin mostly hard dentate or spiny, apex sharply pointed. Inflorescence a subterminal, ascending to erect raceme, often branched; bracts persistent, scarious. Perianth usually red, orange, or yellow, rarely greenish or whitish, cylindrical to 3-sided, sometimes slightly curved or with swollen base; segments usually connate to form a tube, very rarely nearly free, usually glabrous, apex spreading. Stamens usually exserted; filaments subulate. Ovary 3-locular; ovules many per locule. Style filiform; stigma small. Fruit a loculicidal capsule. Seeds 3-angled or flattened, often winged.

About 350–400 species distributed in S and tropical Africa (including Madagascar), tropical Arabia; one species commonly cultivated in China and Hong Kong.

1. Aloe vera (L.) Burm. f. 蘆薈 **(Photo 519)**

Fl. Indica 83. 1768; FOC 24: 160. 2000; FGD 6: 355, fig. 210. 2005.

Aloe perfoliata L. var. *vera* L., Sp. Pl. 1: 320. 1753.

Aloe barbadensis Mill. var. *chinensis* Haw., Supp. Pl. Succ. 45. 1819.

Aloe chinensis (Haw.) Baker, Bot. Mag. pl. 6301. 1877.

Aloe vera (L.) Burm. f. var. *chinensis* (Haw.) A. Berger, Pflanzenr. 33(IV, 38, 3): 230. 1908; FRPS 14: 62, fig. 8. 1980; Check List HK Plants 365. 2002; 127. 2004.

A succulent herb. Stems short, suckering freely to form dense clumps. Leaves nearly basal, pale green, sometimes with pale spots in very young plants, linear-lanceolate, 15–35(–50) × 4–5(–7) cm, apex 2–3-dentate-pointed, margin sparsely spiny-dentate.

Inflorescence erect, 60–90 cm; peduncle to 2 cm thick; raceme 30–40 cm, sometimes with 1–2 branches, many-flowered; bracts whitish, broadly lanceolate, ca. 1 cm, veins 5–7, apex acute. Flowers reflexed; pedicel nearly half as long as bract. Perianth pale yellow mottled with red, slightly ventricose, 2.5(–3) cm, outer lobes slightly recurved at apex. Style conspicuously exserted.

Locality: Cultivated. *HK sheet 28788, 28789.*

Distribution: Widely cultivated in S and SW China; probably originated in Mediterranean region, widely cultivated and occasionally naturalized in tropical and subtropical regions.

Uses: Ornamental, medicinal (folklore).

379. AGAVACEAE 龍舌蘭科

XIA Nian-he 夏念和

Perennial herbs or shrubs, monoecious, dioecious, or polygamodioecious. Stems subterranean or aboveground, woody or not, sometimes branched. Leaves simple, usually aggregated at base of stem or crowded at apex of branches; blade thick and rigid or succulent. Inflorescences terminal or axillary spikes, racemose or paniculate, bracteate, often huge; bracts leaf-like proximally, scale-like distally. Flowers bisexual or functionally unisexual; perianth semisucculent, free or ± connate; tube short to rather long; segments 6, equal to subequal, apex glandular or glandular-pubescent; stamens 6 included or exserted; filaments free; anthers versatile, 2-celled, dehiscence longitudinal. Ovary superior or inferior, 3-locular or occasionally 1-locular, 3-angled, ovoid, or cylindrical, placentation axile; ovules 2–many per locule; style and stigmas various. Fruits a loculicidal capsule or occasionally baccate, or indehiscent and dry or fleshy. Seeds 1–many, globose or somewhat compressed.

About 18 genera and 550–600 species distributed worldwide, mainly in tropical and subtropical regions, only two genera and six species native to China; four genera and four species are commonly cultivated in Hong Kong.

In addition to the recorded species in this account, *Furcraea foetida* (L.) Haw.(縫線麻), *Polianthes tuberosa* L.(晚香玉) and *Yucca gloriosa* L.(大絲蘭) are occasionally cultivated as garden plants in Hong Kong.

1a. Shrubs, stem well developed.
  2a. Leaves conspicuously petiolate; ovules many per locule ..... 1. *Cordyline*
  2b. Leaves subsessile; ovule 1 per locule ..... 2. *Dracaena*
1b. Perennial herbs, stem very short or absent.
  3a. Leaves not rosulate, spineless; inflorescence racemose, nearly as long as leaves; ovary superior, fruit baccate ..... 3. *Sansevieria*
  3b. Leaves rosulate, often with hard spine at apex; inflorescence paniculate, much longer than leaves; ovary inferior, fruit a capsule ..... 4. *Agave*

1. Cordyline Comm. ex R. Br. 朱蕉屬

Arborescent or shrubby plants. Stems simple or few-branched, ± woody, with conspicuous circular leaf scars distally. Leaves crowded at apex of stems, often petiolate; leaf blade elliptic-lanceolate to sword-shaped, parallel veined, midvein conspicuous. Panicles arising from axils of distal leaves, large, many-branched. Flowers bisexual, solitary, usually tubular-campanulate or subcylindrical; pedicel usually short or subsessile. Perianth tube short; lobes 6, in 2 whorls of 3, subequal or the outer ones slightly shorter. Stamens 6, inserted in tube or throat of perianth; anthers versatile. Ovary superior, sessile, 3-locular; ovules 2–many per locule. Style slender; stigma capitate, small. Fruit a capsule, leathery, 1–several-seeded. Seeds black, coated with phytomelanin.

About 20 species distributed in S and SE Asia, Australia, Pacific islands, S America; one species (introduced) in China; it is also cultivated in Hong Kong.

1. Cordyline fruticosa (L.) A. Chev. 朱蕉 **(Photos 520–521)**

Cat. Pl. Jard. Bot. Saigon. 66. 1919; FRPS 14: 273, pl. 51: 2. 1980; FOC 24: 204. 2000; FGD 9: 212, fig. 121. 2009.

Convallaria fruticosa L., Herb. Amb. 16. 1754.

Asparagus terminalis L., Sp. Pl. (ed. 2) 1: 450. 1762, *nom. illeg. superfl.*(included *Convallaria fruticosa* L. 1754).

Dracaena terminalis L., Syst. Nat. (ed. 12) 12: 246. 1767.

Cordyline terminalis (L.) Kunth, Abh. Königl. Akad. Wiss. Berlin 30. 1820; FTW ed. 2, 5: 76. 2000.

Aletris chinensis Lam., Encycl. 1: 79. 1873.

Erect shrubby plant, 1–3 m. Stems simple or sometimes branched. Leaves petiolate; petiole 10–30 cm, sulcate adaxially; leaf blade green or variously coloured, oblong-lanceolate to narrowly oblong, 25–50 × 5–10 cm, midvein distinct and raised abaxially, base amplexicaul, apex aristate. Panicle 30–60 cm; branches many, spreading, 6–13 cm, many-flowered. Flowers subsessile or shortly pedicellate; bracteoles 3, ovate, 2–3 mm, apex cuspidate, margin broadly membranous. Perianth reddish, yellowish, or bluish purple; tube 5–6 mm; lobes erect or recurved, nearly as long as tube. Stamens inserted in throat of perianth, slightly shorter than perianth. Fruit reddish, several-seeded.

Locality: Cultivated.

Distribution: Fujian, Guangdong, Guangxi, Hainan; probably native to Pacific islands but cultivated pantropically.

Ecology: Flowering: Nov.–Mar. of the following year.

Uses: Ornamental.

2. Dracaena Vand. ex L. 龍血樹屬

Arborescent or shrubby plants. Stems simple or branched, ± woody, pithed and with secondary thickening. Leaves often crowded toward apex of stems or spaced along distal part of stems, sessile or petiolate, veins truly parallel from base, lateral veins absent. Inflorescence terminal, racemose or paniculate. Flowers bisexual, clustered, sometimes solitary; pedicel articulate. Perianth cylindrical, campanulate, or funnelform; tube short; lobes 6, similar. Stamens 6, inserted in tube or throat of perianth; anthers versatile. Ovary superior, 3-locular; ovules 1–2 per locule. Style slender; stigma capitate or 3-lobed. Fruit a berry, globose, 1–3-seeded.

About 50 species mainly distributed in tropical regions of Africa and Asia; six species in China; one species cultivated in Hong Kong.

1. Dracaena fragrans (L.) Ker Gawl. 巴西鐵樹 **(Photos 522–523)**

Bot. Mag. 27: pl. 1081. 1808; FTW ed. 2, 5: 77. 2000; FGD 9: 213. 2009.

Aletris fragrans L., Sp. Pl. (ed. 2) 456. 1762.

Arborescent or shrubby plant, to 6 m. Stem erect, simple or rarely branched at apex, greyish brown, smooth, with circular leaf scars when young. Leaves crowded at apex of stem and branches, oblong-lanceolate, 30–90 × 6–9 cm, apex acute, margin ± wavy, green or with white or yellow stripes, midveins raised on both surfaces. Panicles erect, 30–60 cm. Bracts acute, scarious; pedicels 7–21 cm. Flowers small, pale yellow, fragrant. Perianth campanulate, 1–2 cm, lobes ± reflexed. Ovary sessile. Berries globose, red.

Locality: Cultivated.

Distribution: Widely cultivated in tropical and subtropical regions, native to Africa.

Uses: Ornamental.

3. Sansevieria Thunb., *nom. cons.* 虎尾蘭屬

Perennial herbs, rhizomatous. Leaves 1–6, basal or on very short stem, thick, rigid, often fleshy, flat or subterete, often with transverse green stripes. Inflorescence spicate, racemose or paniculate. Flowers bisexual, solitary or clustered; pedicels articulate; perianth tube tubular, lobes 6, reflexed or spreading; stamens 6, inserted on the throat of perianth tube, exserted, filaments filiform, anthers dorsifixed, dehiscent introrsely. Ovary superior, 3-locular, ovule 1 per locule; style slender, stigma small. Fruit a berry, 1–3-seeded. About 50 species distributed in Africa and Asia.

1. Sansevieria trifasciata Prain 虎尾蘭 **(Photos 524–525)**

Beng. Pl. 2: 1054. 1903; FGZ 709. 1956; FRPS 14: 278, pl. 51: 1. 1980; FGD 9: 215, fig. 123. 2009.

Leaves basal, often 1–2, sometimes 3–6, erect, thickly leathery, flat, linear-lanceolate, 30–70(–120) × 3–5(–8) cm, with transverse green stripes, margin green, gradually attenuate toward base and forming sulcate petiole. Inflorescence 30–80 cm, with pale brown membranous sheath at base. Flowers pale green or white, 3–8 in clusters, arranged in racemes; pedicel 5–8 mm, articulate in middle; perianth 1.6–2.8 cm, tube nearly as long as lobes. Berries 7–8 mm in diam.

Locality: Cultivated. *HK sheet 28222, 38594.*

Distribution: Widely cultivated in China; native to W Africa.

Ecology: Flowering: Nov.–Dec.

Uses: Ornamental.

Notes: This species is widely cultivated in parks and gardens of Hong Kong.

4. Agave L. 龍舌蘭屬

Perennial stout herbs. Stems very short or indistinct. Leaves in a basal rosette, large, stout, leathery-fleshy or somewhat woody, containing many fibers, apex tipped with a spine, margin usually spiny, rarely entire. Flowering stems branched or simple, tall, stout. Inflorescence terminal, a spike or panicle, mostly very large. Perianth tube short; lobes narrow, subequal. Stamens inserted at throat or in tube of perianth; filament filiform, usually longer than perianth; anther versatile. Ovary inferior, 3-locular, ovules many per locule. Style slender; stigma 3-lobed. Fruit a capsule, oblong, 3-valved, loculicidal. Seeds many, black, thin, flattened.

About 200 species distributed in arid and semiarid regions of the W hemisphere; two species (introduced) in China; one species cultivated in Hong Kong.

Additionally, *A. angustifolia*(狹葉龍舌蘭) is also cultivated as garden plants in Hong Kong but not described in this account.

1. Agave americana L. 龍舌蘭 **(Photo 526)**

Sp. Pl. 1: 323. 1753; FHN 4: 157. 1977; FTW 5: 87. 1978; FRPS 16(1): 31. 1985; FTW ed. 2, 5: 75. 2000; FOC 24: 271. 2000; FGD 9: 219. 2009.

Stems indistinct. Leaves usually 30–40 or more, in a basal rosette, oblanceolate, 1–2 m × 15–20 cm, fleshy, apex recurved and tipped with a dark brown spine 1.5–2.5 cm, margin sparsely spiny, glaucous adaxially. Panicle large, many-branched, 6–12 m. Perianth greenish yellow, segments sometimes with 1 green stripe; tube ca. 1.2 cm; lobes 2.5–3 cm. Stamens ca. twice as long as perianth. Capsule ellipsoidal, ca. 5 cm.

Locality: Cultivated. *HK sheet 28381.*

Distribution: Widely cultivated in S and SW China, naturalized in some regions of S China; native to tropical America.

Uses: Material (fibre), ornamental.

382. TACCACEAE 蒟蒻薯科

XIA Nian-he 夏念和

Perennial herbs. Rhizomes solid, starchy, cylindrical to subcylindrical or tuberous, globose. Leaves all basal, large, entire, pinnatifid, palmately partite or palmatisect blade with pinnately divided segments, long-petiolate, base sheathing, palmately- or pinnately-veined. Inflorescence borne on a radical scape, cymose, umbel-like; involucral bracts (2–)4–6(–12), in 2 whorls, elongate or broad. Flowers bisexual, actinomorphic; bracteoles linear, narrower than bracts. Perianth tube adnate to ovary, lobes 6, in 2 whorls, petaloid, dark-coloured. Stamens 6, inserted on perianth lobes; filaments short, apex hooded or spatulate; anthers 2-celled, introrse. Ovary inferior, 6-ribbed, 3-carpellate, unilocular, with ± intruded parietal plancetas; ovules many, anatropous; style short; stigma 3-lobed, usually petaloid. Fruit a berry or rarely a loculicidal capsule. Seeds many; endosperm copious; embryo small.

Two genera and about 13 species distributed in pantropical regions of the world; two genera and six species in China; one genus and one species in Hong Kong.

1. Schizocapsa Hance 裂果薯屬

Rhizomes subcylindrical, short, thick. Leaf blade entire, pinnately-veined, base elongate. Inflorescence with 4 involucral bracts. Perianth campanulate, 6-lobed; lobes variable in size, caducous. Fruit a capsule. Seeds oblong, irregularly oblong, ovoid, or semilunar.

Two species distributed in China, Laos, Thailand, Vietnam; one species in Hong Kong.

1. Schizocapsa plantaginea Hance

裂果薯 **(Fig. 212; Photo 527)**

J. Bot. 19: 292. 1881; FKH 275. 1912; FRPS 16(1): 50, pl. 12: 1–7. 1985; FOC 24: 275. 2000; FGD 9: 223, fig. 129. 2009.

Tacca plantaginea (Hance) Drenth, Blumea 20(2): 391. 1972.

Plant 20–30 cm tall. Rhizomes thick and short, often curved. Petiole (5–)7–11(–16) cm, winged; leaf blade narrowly elliptic to narrowly elliptic-lanceolate, 10–15(–25) × 4–6(–8) cm, base decurrent, apex acuminate. Scape 6–13 cm; involucral bracts ovate to deltoid-ovate, 1–2 cm; umbel 8–15(–20)-flowered. Perianth light or dark green or light purple; lobes pointed at apex, outer lobes lanceolate, inner ones ovate, slightly shorter and wider than outer ones. Filaments extremely short, apical hood projected downward into 2 auricles. Stigma 3-lobed, lobes bifid. Capsule obovoid, 6–8 mm, 3-valved; valves splitting to base. Seeds semilunar, oblong or irregularly so, striate.

Locality: Repulse Bay, Lady Clementi's Ride. *H. C. Tang 1974; Y. S. Lau 642.*

Distribution: Guangdong, Guangxi, Guizhou, S Hunan, S Jiangxi, Yunnan; Laos, Thailand, Vietnam.

Ecology: Forests, along rivers, valleys. Flowering & fruiting: Apr.–Nov.

Uses: Medicinal (folklore).

Figure 212. *Schizocapsa plantaginea* Hance

1. flowering fruit; *2.* flower; *3.* vertical section of flower; *4.* stamens and lobe of outer perianth; *5.* pistils; *6.* fruit; *7.* pericarp; *8.* seed. (drawn by Y. X. Liu)

383. STEMONACEAE 百部科

XIA Nian-he 夏念和

Perennial erect twining or creeping herbs, rarely subshrubs, with tuberous roots or creeping rhizomes. Leaves whorled, opposite, or alternate, petiolate or sessile, basal veins 3 or more, transverse veinlets many, parallel. Inflorescence racemose or cymose, 1–several-flowered. Flowers bisexual, actinomorphic. Perianth segments 4, in 2 whorls, petaloid, distinct. Stamens 4; filaments distinct or slightly connate at base, very short; anthers dorsifixed or basifixed, 2-celled, erect, linear, introrse; connective usually appendaged. Ovary superior or subinferior, 1-locular; ovules 2 or more. Stigma sessile, small. Capsule slightly compressed, 2-valved. Seed appendages on or near funicle, arillate; testa leathery; endosperm copious; embryo hard, small.

Three genera and about 35 species distributed in Asia, tropical Australia, one species in E North America; two genera and eight species in China; one genus and one species in Hong Kong.

1. Stemona Lour. 百部屬

Perennial twining or creeping herbs, rarely subshrubs. Roots tufted, tuberous, fusiform, fleshy. Leaves whorled, opposite, or alternate, petiolate. Inflorescence axillary, racemose or 1–3 in clusters, sometimes borne on petiole or leaf midvein. Bracts subulate or lanceolate. Perianth segments subequal, lanceolate. Stamens erect, inserted at base of perianth segments; filaments distinct or ± connate at base; anthers basifixed, apex often adaxially appendaged; connective extended into a perianth-like, linear-lanceolate, long appendage. Ovary superior; ovules basally attached to placenta, style absent. Capsule ovoid to ellipsoidal. Seeds erect, ellipsoidal, longitudinally ribbed; funicle bearded.

About 27 species distributed in Asia, Australia; seven species (five endemic) in China; one species in Hong Kong.

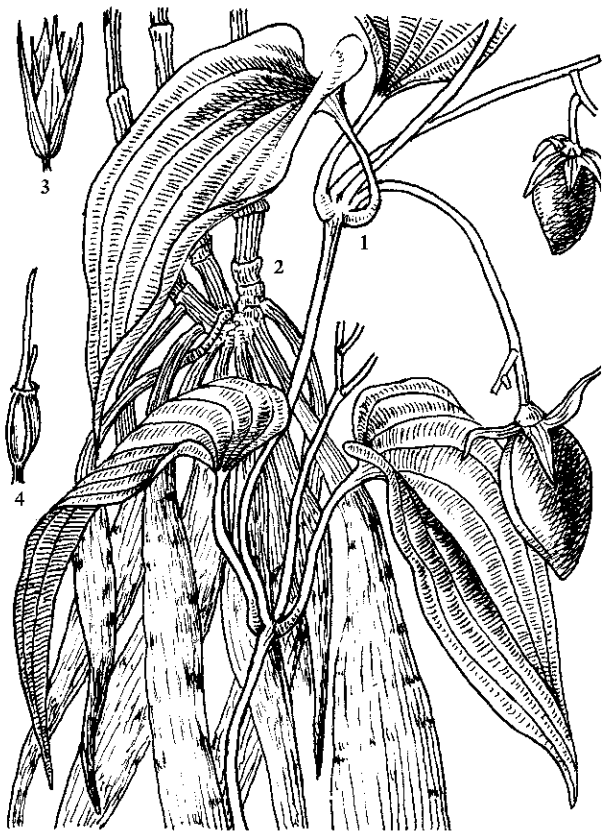

Figure 213. *Stemona tuberosa* Lour.
1. fruiting branch; *2.* roots; *3.* flower; *4.* stamen. (drawn by H. P. Yu)

1. Stemona tuberosa Lour.
大百部(百部) **(Fig. 213; Photo 528)**
Fl. Cochinch. 2: 404. 1790; FKH 276. 1912; FHN 4: 147, fig. 1053. 1977; FTW 5: 85, pl. 1287. 1978; FRPS 13(3): 256, pl. 62: 4–6. 1997; FOC 24: 71. 2000; FGD 9: 208. 2009.

Stemona acuta C. H. Wright, J. Linn. Soc. Bot. 32: 493. 1889; FKH 276. 1912.

Perennial twining herb, thoroughly glabrous. Tubers terete or fusiform, 15–30 cm. Stems often branched, base woody. Leaves opposite, rarely whorled or alternate; petiole slender, 3.5–7.5 cm; leaf blade ovate to ovate-lanceolate, 10–15 × 5–10 cm, membranous, base cordate, apex acuminate, margin slightly undulate, basal veins 7–13. Inflorescence racemose, 1–3-flowered; peduncle or pedicel axillary or rarely borne on petiole, 0.5–1.5 cm; bracts lanceolate, 0.5–1 cm. Perianth segments greenish with purplish veins, lanceolate, 4–6 × 1.5 cm. Stamens purple, slightly shorter than perianth; filaments stout, 2–5 mm; anthers linear, ca. 1 cm; appendages partially adherent. Capsule ovoid-ellipsoidal, 4–5 cm. Seeds several, ellipsoidal, ca. 7 mm.

Locality: Mount Parker, Plover Cove. *Y. W. Lam 1759; HK sheet 7548.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hubei, Hunan, Jiangxi, Fujian, Taiwan; Bangladesh, Cambodia, NE India, Laos, Myanmar, Philippines, Thailand, Vietnam.

Ecology: Margins of forests, thickets, mountain slopes. Flowering: Apr.–Jul.

Uses: Medicinal (folklore).

384. SMILACACEAE 菝葜科

XIA Nian-he 夏念和

Scandent shrubs and herbs, or lianas, rarely perennial or annual herbs, rhizomatous or tuberous. Stems prickly or not. Leaves simple, evergreen, alternate, rarely opposite, usually leathery, entire; petiolate to subsessile, palmately veined; petioles often sheathed and with tendrils. Leaf sheaths when present, with free margins. Flowers small, unisexual, dioecious, rarely bisexual, often aggregated in umbels, sometimes in spikes, racemes or panicles, rarely solitary. Perianth segments 6; distinct or connate, in 2 whorls, isomerous, petaloid (but usually inconspicuous); stamens usually 6, rarely 3 or more, filaments distinct or connate into a column, anthers 1-celled, basifixed, dehiscing by longitudinal slits, introrse or latrorse. Ovary superior, 3-locular, ovules 1–2 per locule; style absent or very short, stigmas 3. Fruit a berry, usually 3-seeded. Endosperm oily. Embryo well differentiated.

Three genera and 320 species distributed in pantropical, extending to temperate regions in both hemisphere; two genera and about 60 species in China; two genera and nine species in Hong Kong.

1a. Perianth segments connate, 3-dentate; male flowers with 3 stamens, filaments connate to a column; peduncle usually flat..... ..... 1. *Heterosmilax*

1b. Perianth segments 6, distinct; male flowers with 6 or more stamens, filaments distinct; peduncle usually terete .....2. *Smilax*

1. Heterosmilax Kunth 肖菝葜屬

Climbing vines, woody or somewhat herbaceous. Stem and branches not prickly. Leaves alternate, in 2 ranks, usually ovate or oblong-lanceolate, main veins 5–9; petioles with one pair of tendrils near base. Inflorescence a solitary, many-flowered umbel, borne in axil of leaf or scale-like bract; peduncle usually compressed. Flowers small; tepals connate into a tube with opening only at toothed apex. Male flowers: stamens 3, 6, or 9–12; filaments ± connate, forming a column; anthers distinct, introrse. Female flowers: ovary 3-locular; ovules 1–2 per locule; stigmas 3, usually recurved; staminodes 3–6. Fruit a berry, black, globose, 1–6-seeded.

About 12 species distributed in tropical and subtropical Asia; nine species (five endemic) in China; two species in Hong Kong.

1a. Filaments connate at lower half ..... 1. *H. japonica*
1b. Filaments nearly connate at its full length ..... 2. *H. gaudichaudiana*

1. Heterosmilax japonica Kunth

肖菝葜 **(Fig. 214; Photos 529–530)**

Enum. Pl. 5: 270. 1850; FTW 5: 137. 1978; FRPS 15: 242, pl. 80: 1–3. 1978; FTW ed. 2, 5: 100, pl. 32. 2000; FOC 24: 117. 2000; FGD 6: 377, fig. 224. 2005.

Climbing vine, glabrous. Stem woody, branches slightly ridged. Petiole 1–3 cm, narrowly winged at lower 1/4–1/3; tendrils well developed; leaf blade papery, ovate, ovate-lanceolate to nearly heart-shaped, 6–20 × 2.5–12 cm, base subcordate, apex acuminate, mucronate, main veins 5–7. Umbels borne in axil of leaf or scale-like bract, 20–50-flowered; peduncle 1–3 cm, ± flat; pedicels slender, 2–7 mm. Male flowers: perianth ellipsoidal or narrowly obovoid, 3.5–4.5 mm; stamens 3, as long as 2/3 of perianth; filaments connate at lower half, forming a column. Female flowers: perianth ovoid, 2.5–3 mm; stigmas erect; staminodes 3. Berries globose, slightly compressed, black, 6–10 mm in diam.

Locality: Pok Fu Lam. *HK sheet 10539.*

Distribution: Guangdong, Guangxi, Yunnan, Sichuan, Shaanxi, Gansu, Anhui, Hunan, Jiangxi, Fujian, Zhejiang, Taiwan; Bhutan, India, Japan.

Ecology: Thickets. Flowering: Jun.–Aug.; fruiting: Jul.–Nov.

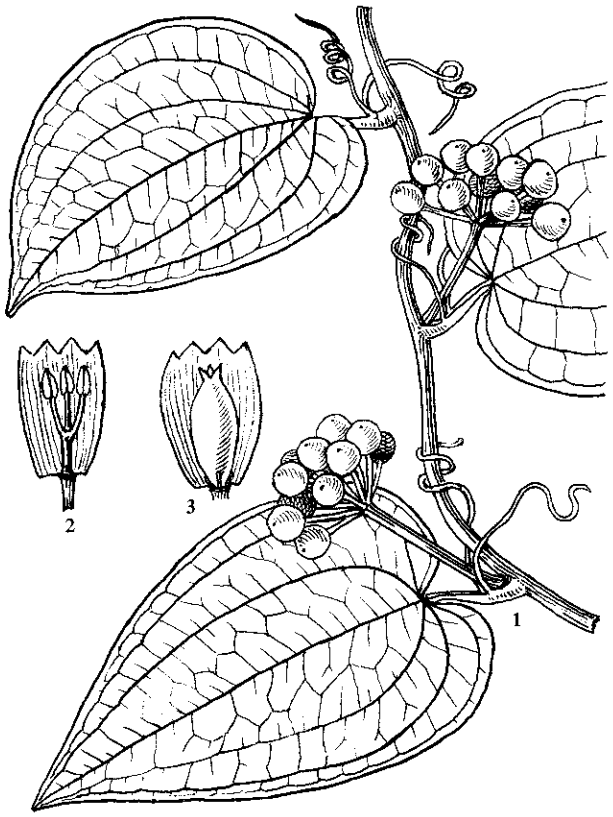

Figure 214. *Heterosmilax japonica* Kunth
1. fruiting branch; *2.* male flower opened up showing stamens; *3.* female flower opened up showing pistil. (drawn by H. P. Yu)

2. Heterosmilax gaudichaudiana (Kunth) Maxim. 合絲肖菝葜

Bull. Acad. Imp. Sci. Saint-Pétersbourg. 17: 176. 1872; FHK 370. 1861; FKH 277. 1912; FHN 4: 127, fig. 1031. 1977; FOC 24: 117. 2000; FGD 6: 377. 2005.

Smilax gaudichaudiana Kunth, Enum. Pl. 5: 252. 1850.

Heterosmilax gaudichaudiana (Kunth) Maxim. var. *hongkongensis* (Seem.) A. DC., Monogr. Phan. 1: 45. 1878.

Heterosmilax gaudichaudiana (Kunth) Maxim. var. *latifolia* Bodinier ex H. Lév., Liliac. etc. Chine 22. 1905.

Heterosmilax japonica Kunth var. *gaudichaudiana* (Kunth) F. T. Wang & T. Tang, FRPS 15: 244. 1978; Check List HK Plants 367. 2002; 128. 2004.

Oligosmilax gaudichaudiana (Kunth) Seem., J. Bot. 6(68): 258, pl. 83. 1868.

Smilax hongkongensis Seem., Bot. Voy. Herald 420. 1857.

Climbing vine. Stems woody, 3–6 m, glabrous. Petiole 1–2.5 cm, narrowly winged at lower part; tendrils well developed; leaf blade broadly ovate to orbicular, 5–15 × 2–8 cm, base truncate, rounded or cordate, apex long acuminate, 5–7(–9)-veined. Peduncle 1–3.5(–9) cm, slightly flat. Umbels often 20–40-flowered; pedicels slender, 0.5–1.5 cm. Male flowers: perianth tube red-purple, ovoid-ellipsoidal, 4–7 mm, teeth 3, deltoid; stamens 3, 3–4 mm; filaments nearly connate for its full length and forming a column; anthers ovoid, 0.5–0.7 mm. Female flowers slightly shorter than male ones, staminodes 3. Ovary ovoid. Berries purplish red, compressed globose, 6–9 mm in diam.

Locality: Common in Hong Kong. *H. C. Tang 2197; Y. S. Lau 324, 2592.*

Distribution: Hainan, Guangdong, Guangxi, Fujian; Vietnam.

Ecology: Forests and hillsides. Flowering: May–Jun.; fruiting: Jul.–Dec.

Notes: The syntypes (*Hance s.n., Seemann s.n.*) of *Smilax hongkongensis* Seem. were collected from Hong Kong Island in 1850s.

2. Smilax L. 菝葜屬

Climbing woody vines or shrubs, rarely herbs, usually with short, thick rhizomes. Stems and branches usually prickly. Leaves alternate, in 2 ranks; petiole usually with an abscission zone, narrowly winged on both sides; tendrils often present; leaf blade usually ovate to lanceolate, main veins 3–7. Inflorescence axillary, an umbel or a panicle, raceme, or spike of umbels; peduncle sometimes with a scale like prophyll at base. Flowers small; tepals 6, often distinct. Male flowers: stamens 6, rarely more, inserted at base of tepals, filaments distinct, anthers basifixed, introrse. Female flowers: ovary 3-locular; ovules 1 or 2 per locule; style very short; stigmas 3; staminodes 0–6. Berries red to black, globose, usually 1–3-seeded.

About 300 species distributed in tropical, subtropical, and temperate regions of both hemispheres; 79 species in China; seven species in Hong Kong.

1a. Stem ± prickly.
- 2a. Petiole wings well developed, each 0.5–2 cm wide, deeply clasping node ..... 1. *S. ocreata*
- 2b. Petiole wings weakly developed, not clasping node.
  - 3a. Umbels several together in axillary racemes or panicles; leaf blade ovate to suborbicular, 12–26 × 8–20 cm ..... 2. *S. retroflexa*
  - 3b. Umbels axillary, solitary; leaf blade ovate to orbicular, 3–10 × 2–9 cm ..... 3. *S. china*

1b. Stem unarmed.
- 4a. Tendrils absent ..... 4. *S. cocculoides*
- 4b. Tendrils usually present.
  - 5a. Leaf blade pale green abaxially ..... 5. *S. lanceifolia* var. *opaca*
  - 5b. Leaf blade ± glaucous abaxially.
    - 6a. Berries dark red when matured, not powdery ..... 6. *S. hypoglauca*
    - 6b. Berries blue-black when matured, white powdery ..... 7. *S. glabra*

1. Smilax ocreata A. DC. 抱莖菝葜

Monogr. Phan. 1: 191. 1878; FRPS 15: 234, pl. 75: 2. 1978; FOC 24: 114. 2000.

Smilax perulata H. Lév. & Vaniot, Repert. Spec. Nov. Regni Veg. 9(199–201): 78. 1910.

Climbing vine. Stem up to 7 m, woody, sparsely prickly. Petiole 2–3.5 cm, broadly winged at lower 1/3–1/2 of its length, wings 0.5–2 cm wide, basally deeply clasping node, abscission zone at middle or distal; tendrils usually developed; leaf blade leathery, ovate to elliptic, to 23 × 12.5 cm, base broadly cuneate to shallowly cordate, pale green abaxially. Flowers and fruits unknown.

Locality: Tsuen Wan. *S. C. Ng 3441.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Sichuan, Yunnan; Bhutan, India, Myanmar, Nepal, Vietnam.

Ecology: Open forests. Flowering: Mar.–Jun.; fruiting: Jul.–Oct.

Notes: It was treated as a synonym of *S. perfoliata* in FGD.

2. Smilax retroflexa (F. T. Wang & T. Tang) S. C. Chen 蒼白菝葜

Acta Phytotax. Sin. 34: 436. 1996; FOC 24: 107. 2000.

Smilax aberrans Gagnep. var. *retroflexa* F. T. Wang & Tang, FRPS 15: 254. 1978.

Smilax aberrans Gagnep. subsp. *retroflexa* (F. T. Wang & Tang) T. Koyama, Fl. Cambodge, Laos & Vietnam 20: 82. 1983.

Smilax ovalifolia auct. non Roxb. ex D. Don: FHK 370. 1861; FKH 278. 1912.

Climbing vine. Stem stout, branched, to 10 m, woody, prickly. Petiole 1.6–3 cm, narrowly winged at lower 1/2–2/3 of its length, abscission zone subapical, tendrils well developed; leaf blade ovate to suborbicular, 12–26 × 8–20 cm, main veins 5–7. Umbels several together in axillary racemes or panicles, 1.5–4 cm, 12–40-flowered, basally prophyllate; peduncle 1.3–3 cm. Male flowers: outer tepals 5–6 × ca. 1.5 mm, inner ones much narrower. Female flowers: tepals slightly smaller than male ones; staminodes 3. Berries dark red, ellipsoidal-globose, 0.9–1.2 cm in diam.

Locality: Victoria Peak, Sunset Peak. *W. J. Tutcher 10595; Y. W. Lam 2266.*

Distribution: Guangxi, Guizhou, Sichuan, Yunnan; Vietnam.

Ecology: Forests. Flowering: Apr.; fruiting: Nov.

3. Smilax china L. 菝葜 **(Fig. 215; Photos 531–532)**

Sp. Pl. 2: 1029. 1753; FKH 278. 1912; FGZ 685. 1956; FHN 4: 125. 1977; FTW 5: 117. 1978; FRPS 15: 193, pl. 63: 1–3. 1978; FTW ed. 2, 5: 106. 2000; FOC 24: 101. 2000; FGD 6: 374, fig. 222. 2005.

Coprosmanthus japonicus Kunth, Enum. Pl. 5: 268. 1850.

Smilax japonica A. Gray, Mem. Amer. Acad. Arts, n.s. 6(2): 412. 1858, *nom. illeg. superfl.*

Smilax china L. var. *taiheiensis* (Hayata) T. Koyama, Quart. J. Taiwan Mus. 10: 9. 1957.

Smilax pteropus Miq., J. Bot. Neerl. 1: 89. 1861.

Smilax taiheiensis Hayata, Icon. Pl. Formosan. 9: 134. 1920.

Smilax ferox auct. non Wall. ex Kunth: FHK 370. 1861.

Deciduous climbing vine. Rhizomes rigid, thick, irregular, 2–3 cm in thickness. Stem branched, terete, 1–5 m, woody, sparsely prickly. Petiole 0.5–1.5 cm, narrowly winged at lower 1/2–2/3 of its length, abscission zone just above winged portion, tendrils often present; leaf blade leathery to thickly papery, ovate to orbicular, 3–10 × 2–9 cm, base acute to cordate, apex acute, rounded to emarginate, pale green to glaucous abaxially, main veins 5–7. Umbels axillary, solitary, 10–25-flowered, not prophyllate at base; peduncle 1–2 cm; bracteoles many, small, ovate-lanceolate. Male flowers: tepals yellowish green, 4–5 mm; stamens 3–4 mm; filaments filiform. Female flowers: staminodes 6, linear. Berries globose, red, 0.6–1.5 cm in diam., minutely white powdery.

Locality: Common in Hong Kong. *W. J. Tutcher 11649; H. C. Tang 389; HK sheet 41500.*

Distribution: Areas S of Changjiang; Myanmar, Philippines, Thailand, Vietnam.

Ecology: Forests and thickets. Flowering: Feb.–May; fruiting: Sep.–Nov.

Uses: Medicinal (folklore).

Figure 215. *Smilax china* L.
1. rhizome; *2.* fruiting branch; *3.* male flower. (drawn by H. P. Yu)

4. Smilax cocculoides Warb. 銀葉菝葜

Bot. Jahrb. Syst. 29: 257. 1900; FRPS 15: 228, pl. 74: 1–4. 1978; FOC 24: 112. 2000; FGD 6: 373. 2005.

Subscandent shrub, unarmed. Stem suberect, branched, 0.5–2 m, woody, inconspicuously ridged. Petiole usually curved, 0.5–1 cm, narrowly winged at base, wings sometimes auriculate apically, abscission zone at middle, tendrils absent; leaf blade thickly papery to subleathery, elliptic-ovate or ovate-lanceolate, 5–12 × 2.5–4 cm, base broadly cuneate, apex long acuminate, abaxially pale green, slightly shiny, midvein slightly impressed adaxially. Umbels solitary, rarely paired, 3–15-flowered; peduncle 1–2 cm, prophyllate at base. Male flowers: tepals yellowish green, outer ones 2.5–3.5 × 1–1.5 mm, inner ones narrower; stamens very short. Berries globose, ca. 8 mm in diam., bluish black when matured.

Locality: Tai Mo Shan, Sunset Peak. *Y. W. Lam 167, 1292.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hubei, Hunan.

Ecology: Forests, thickets. Flowering: Feb.–Apr.; fruiting: Nov.

Notes: The species was reported as *Smilax astrosperma* F. T. Wang & Tang previously (Check List HK Plants 367. 2002; 128. 2004).

5. Smilax lanceifolia Roxb. var. **opaca** A. DC. 暗色菝葜 **(Photos 533–534)**

Monogr. Phan. 1: 57. 1878; FGZ 686. 1956; FRPS 15: 218, pl. 71: 3. 1978; FOC 24: 110. 2000.

Smilax kainantensis Masam., Trans. Nat. Hist. Soc. Taiwan 33: 27. 1943.

Smilax laevis Wall. ex A. DC., Monogr. Phan. 1. 6. 1878.

Smilax laevis Wall. ex A. DC. var. *ophirensis* A. DC., Monogr. Phan. 1: 57. 1878.

Smilax laevis Wall. ex A. DC. var. *parkii* A. DC., Monogr. Phan. 1: 57. 1878.

Smilax opaca (A. DC.) J. B. Norton, Pl. Wilson. 3(1): 11. 1916.

Smilax lanceifolia Roxb. subsp. *opaca* (A. DC.) T. Koyama, Fl. E. Himalaya 2: 172. 1971.

Smilax lanceifolia auct. non Roxb.: FHK 370. 1861; FKH 278. 1912; FTW ed. 2, 5: 117, pl. 43. 2000; FGD 6: 372. 2005; Check List HK Plants 81. 1993.

Climbing vine. Stem branched, terete, 1–2.5 m, woody, usually unarmed, rarely sparsely armed. Petiole 0.8–2.5 cm, narrowly winged at lower 1/5–1/4 of its length, abscission zone at middle, tendrils usually present; leaf blade leathery, oblong-lanceolate to ovate-lanceolate, 6–5 × 2–6 cm, base rounded to broadly cuneate, apex acute, obviously shiny adaxially, pale green abaxially; main veins 5, raised adaxially. Umbels axillary, many-flowered, basally prophyllate; peduncle 1–2 cm, proximally articulate. Male flowers: tepals yellowish green, 3–4.5 × ca. 1 mm, reflexed; stamens exserted, filaments 2.5–3.5 mm, anthers ca. 1 mm. Female flowers smaller, staminodes 6. Berries purplish black, globose, 6–8 mm in diam.

Locality: Aberdeen Reservoir, The Peak, Ma On Shan, Tai Mo Shan, Sunset Peak. *H. G. Ye et al. 1017; S. C. Ng 4114; F. W. Xing 7562.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Hunan, Jiangxi, Zhejiang, Fujian, Taiwan; Cambodia, Indonesia, Laos, Malaysia, Thailand, Vietnam.

Ecology: Thickets and sparse forests. Flowering: Sep.–Mar.; fruiting: Oct.–Nov.

6. Smilax hypoglauca Benth. 粉背菝葜 **(Photos 535–536)**

FHK 369. 1861; FKH 278. 1912; FRPS 15: 208, pl. 66: 1. 1978; FOC 24: 106. 2000.

Smilax corbularia Kunth var. *hypoglauca* (Benth.) T. Koyama, Quart. J. Taiwan Mus. 13: 15. 1960.

Smilax corbularia auct. non Kunth: FGD 6: 372. 2005, *quoad syn. Smilax hypoglauca* Benth.

Climbing vine. Stem branched, 2–(–4) m, woody, unarmed. Petiole 0.7–1.3 cm, narrowly winged at lower half, wings each with a lanceolate auricle apically, abscission zone apical, tendrils usually present; leaf blade leathery, narrowly elliptic to ovate-oblong, 5–12 × 2–5 cm, base subrounded, apex acuminate, margin slightly recurved, glaucous abaxially, main veins 3–5, reticulate veins conspicuous adaxially. Umbels axillary, 10–20-flowered, basally not prophyllate; peduncle 0.2–1.5 cm; bracteoles many, small, persistent. Male flowers: tepals greenish yellow, outer ones ca. 2.5 mm, inner ones smaller, filaments connate, forming a short column. Female flowers: tepals 2.2–2.5 mm; staminodes 3. Berries dark red, globose, 0.8–1.0 cm in diam.

Locality: Common in Hong Kong. *H. C. Tang 2234; Y. S. Lau 242, 1371.*

Distribution: Guangdong, Guizhou, Fujian, Jiangxi.

Ecology: Forests, thickets. Flowering: Jul.–Aug.; fruiting: Dec.

Notes: The syntypes were collected from Happy Valley. The species was reported as *Smilax corbularia* Kunth previously (Check List HK Plants 80. 1993; 128. 2004).

7. Smilax glabra Roxb. 土茯苓(光葉菝葜) **(Photo 537)**

Fl. Ind. ed. 1832, 3: 792. 1832; FHK 369. 1861; FKH 278. 1912; FGZ 685. 1956; FHN 4: 125, fig. 1030. 1977; FTW 5: 130. 1978; FRPS 15: 212, pl. 69. 1978; FOC 24: 108. 2000; FGD 6: 373. 2005.

Smilax blinii H. Lév., Fl. Kouy-Tchéou 256. 1914.

Smilax dunniana H. Lév., Repert. Spec. Nov. Regni Veg. 9(222–226): 446. 1911.

Smilax glabra Roxb. var. *maculata* Bodinier ex H. Lév., Liliac. etc. Chine 23. 1905.

Smilax mengmaensis R. H. Miao, Acta Sci. Nat. Univ. Sunyatseni 1982(3): 75. 1982

Smilax trigona Warb., Bot. Jahrb. Syst. 29(2): 258. 1900.

Climbing vine. Stem branched, terete, 1–4 m, woody, smooth, unarmed. Petiole 0.5–2.5 cm, narrowly winged at lower 1/4–3/5 of its length, abscission zone apical, tendrils well developed; leaf blade leathery to thinly leathery, elliptic-lanceolate to narrowly ovate-lanceolate, 3–15 × 1–7 cm, base rounded, apex acuminate, ± glaucous abaxially, main veins 5. Umbels 10–30(–60)-flowered, basally not prophyllate; peduncle 1–5 mm; bracteoles many, persistent. Male flowers: perianth greenish white, slightly 6-angled; outer tepals broadly obovate-orbicular, cucullate, ca. 2 mm, inner ones ca. 1 mm wide, margin irregularly denticulate; stamens nearly as long as inner tepals. Female flowers: staminodes 3. Berries globose, blue-black, 0.7–1 cm in diam., white powdery.

Locality: Common in Hong Kong. *Y. S. Lau 69, 2402; C. H. Tsou 1879.*

Distribution: Areas S of Changjiang; India, Myanmar, Thailand, Vietnam.

Ecology: Forests and thickets. Flowering: Jul.–Nov.; fruiting: Nov.–Apr. of the following year.

Uses: Medicinal (rhizome).

385. DIOSCOREACEAE 薯蕷科

XING Fu-wu 邢福武 • ZHENG Xi-long 鄭希龍 • WANG Fa-guo 王發國

Herbs usually twining, sometimes woody at the base, with rhizomatous or tuberous rootstock. Stem terete, ridged or winged, sometimes prickly. Leaves alternate, rarely opposite, petiolate, simple or palmately compound, with digitate or parallel veins and reticulate veins. Flowers usually unisexual (plants dioecious, rarely monoecious), in axillary spikes or racemes, simple or paniculate. Male flowers: perianth lobes 6, in 2 whorls, basally connate or free; stamens 6, sometimes 3 reduced to staminodes or absent, inserted on perianth or receptacle; ovary rudimentary or absent. Female flowers: similar to male ones; staminodes 3, 6, or absent; ovary inferior, 3-locular; ovules usually 2 per locule, placentation axile; styles 3, free. Fruit a capsule, berry, or samara. Seeds with a membranous wing or not.

Nine genera and 650 species widely distributed in tropical and temperate regions, especially in tropical America; one genus and 52 species (21 endemic, two introduced) in China; one genus and nine species in Hong Kong.

1. Dioscorea L. 薯蕷屬

Herbaceous or woody vines, with various tubers. Stems twining, often bearing bulbils at axils of leaves. Leaves alternate or opposite, petiolate, simple or palmately compound, basal veins 3–9. Flowers unisexual (plants dioecious, rarely monoecious), in axillary spikes, racemes or paniculate. Male flowers: stamens 6, 3 sometimes reduced to staminodes or absent. Female flowers: staminodes 3, 6, or absent. Capsule 3-angled or 3-lobed, opening loculicidally at the angles, often leaving the vein-like edge free. Seeds winged.

More than 600 species widely distributed in tropical and temperate regions; 52 species (21 endemic, two introduced) in China; nine species in Hong Kong.

1a. Leaves compound.

2a. Leaves palmately 3-foliolate ..... 1. *D. hispida*

2b. Leaves palmately 3–7-foliolate ..... 2. *D. pentaphylla*

1b. Leaves simple.
3a. Leaves alternate; stem twining left.
4a. Leaves sparsely strigose along veins on both surfaces ..... 3. *D. futschauensis*
4b. Leaves glabrous on both surfaces ..... 4. *D. bulbifera*
3b. Leaves at least opposite on the upper part of stems.
5a. Stems 4-winged ..... 5. *D. alata*
5b. Stem not winged.
6a. Leaves leathery; stems woody ..... 6. *D. cirrhosa*
6b. Leaves papery; stems herbaceous.
7a. Leaves oblong or obovate-oblong to ovate-lanceolate, 0.7–4 cm wide, base rounded ..... 7. *D. benthamii*
7b. Leaves not shaped as above, (1–)3–22 cm wide, base sagittate or hastate to deeply cordate or rounded with basal lobes.
8a. Stem often 4–8-ridged, glabrous; reticulation of veins conspicuous adaxially ..... 8. *D. hamiltonii*
8b. Stem terete, prickly at base; reticulation of veins inconspicuous adaxially ..... 9. *D. fordii*

1. Dioscorea hispida Dennst. 白薯莨

Schlussel Hortortus Malab. 15, 33. 1818; FRPS 16(1): 99, pl. 31: 1–5. 1985; FFJ 6: 543, fig. 477. 1995; FOC 24: 290. 2000; FTW ed. 2, 5: 93. 2000; FGD 6: 392. 2005; Wilkin P. & C. Thapuai, Fl. Thailand 10(1): 67, fig. 35, 36. 2009.

Herbaceous twining vines; tubers ovoid or irregularly shaped and variable in size. Stem terete, twining to left, to 25 m or longer, prickly, initially pubescent. Leaves alternate, palmately 3-foliolate; petiole to 30 cm, hairy; central leaflet ± ovate to elliptic, 6–12(–17.5) × 4–12 cm, base obtuse to truncate, apex acuminate, adaxially sparsely hispid, glabrescent, abaxially hispid, palmately-veined; lateral leaflets ovate-elliptic or nearly broadly oblong, oblique, smaller than middle leaflet, margin entire; petiolules terete, 0.5–1 cm. Male spikes in axillary panicles, 15–50 cm, densely tomentose; male flowers sessile, in dense clusters; stamens 6. Female spikes simple, to 40 cm. Capsule of 3 flat wing-like ellipsoidal lobes, 4–6 × 2.5–3 cm, leathery, densely pubescent. Seeds inserted near apex of capsule, winged toward base.

Locality: Hong Kong Island, Fung Yuen, Lin O. *W. J. Tutcher 10953, 11772; Y. S. Lau 2493.*

Distribution: Guangdong, Guangxi, Fujian, Taiwan, Yunnan, E Xizang; Bhutan, India, Sikkim, Thailand to Malesia.

Ecology: Margins of forests, thickets. Flowering: Apr.–May; fruiting: Jul.–Sep.

Uses: Medicinal (folklore).

2. Dioscorea pentaphylla L. 五葉薯蕷 **(Photo 538)**

Sp. Pl. 2: 1032. 1753; FRPS 16(1): 95, pl. 28: 7–10. 1985; FFJ 6: 544. 1995; FOC 24: 289. 2000; FGD 6: 393, fig. 234. 2005; Wilkin P. & C. Thapuai, Fl. Thailand 10(1): 95, fig. 52, 53. 2009.

Herbaceous twining vines; tubers variously shaped, usually long ovoid, with many fibrous roots. Stem terete, twining to left, prickly and sparsely puberulent when young, usually bearing bulblets in leaf axils. Leaves alternate, palmately 3–7-foliolate; petiole 3–13 cm, densely reddish brown pubescent; leaflets obovate-elliptic, oblong to elliptic (the outermost 2 lateral ones obliquely ovate-elliptic), 6.5–24 × 1.5–9 cm, base attenuate into a ± tomentose petiolule, apex acute, margin entire, adaxially appressed pubescent or subglabrous, abaxially sparsely pubescent, pinnately-veined. Male spikes in axillary panicles to 50 cm, with brown short pubescence on axis; male flowers sessile or subsessile, with bract and reniform bracteole forming an involucel around perianth, sparsely hairy; stamens 3. Female spikes simple or branched, to 25 cm, brown puberulent; female flowers subsessile; bracts, perianth, and ovary hairy. Capsule of 3 flat wing-like ellipsoidal lobes, 2–2.5 × 1–1.3 cm, thinly leathery, sparsely hairy, black at maturity. Seeds inserted near apex of capsule, winged toward base.

Locality: Ma On Shan, Tai Lam. *HK sheet 7524, 39080.*

Distribution: Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Yunnan, Xizang; Japan, Philippines, Vietnam, Myanmar, Laos, Nepal, India, Malaysia, Indonesia, New Guinea, Africa, Australia, Pacific islands.

Ecology: Margins of forests, thickets. Flowering: Aug.–Oct.; fruiting: Nov.–Feb. of the following year.

Uses: Medicinal (folklore).

3. Dioscorea futschauensis Uline ex R. Knuth 福州薯蕷 **(Photo 539)**

Pflanzenr. 87(IV. 43): 264. 1924; FRPS 16(1): 73, pl. 20: 1–4. 1985; FFJ 6: 548, fig. 481. 1995; FOC 24: 282. 2000; FGD 6: 393, fig. 235. 2005.

Herbaceous twining vines; rhizomes horizontal, irregularly cylindrical, hard, cork yellowish brown. Stem twining to left, glabrous. Leaves alternate, simple, ± leathery; petiole 4–5 cm; leaf blade ovate-triangular in outline, to 10 × 11 cm, base deeply cordate, apex acuminate, uniformly hispidulous, densely so abaxially, reticulate veins prominent; leaves on lower part of stem palmately 7-lobed; lobes variable in size, those on upper part of stem margin entire or slightly undulate. Male spikes axillary, usually forming panicles; male flowers solitary or occasionally paired; pedicel 1–1.5 mm; perianth orange, 4–5 mm, 6-lobed; lobes oblong-ovate, 1.5–2 mm, apex rounded; stamens 6, sometimes only 3 developed. Female spikes to 7 cm, few-flowered; female flowers with staminodes; ovary oblong-ellipsoidal. Capsule of 3 flat wing-like broadly obovoid lobes, 1.5–1.8 × 1–1.2 cm, base rounded, apex slightly emarginate to truncate, dark brown, not shiny. Seeds inserted near middle of capsule, 4–5 mm in diam. (excluding wing), winged all round.

Locality: Ping Chau. *F. W. Xing 9098; Y. W. Lam 275.*

Distribution: Fujian, Guangdong, Guangxi, Hunan, Zhejiang.

Ecology: Thickets, margins of forests, mountain slopes, ravines. Flowering: Jun.–Jul.; fruiting: Jul.–Oct.

Uses: Medicinal (folklore).

4. Dioscorea bulbifera L. 黄獨 **(Photos 540–541)**

Sp. Pl. 2: 1033. 1753; FKH 276. 1912; FHN 4: 151. 1977; FRPS 16(1): 88, pl. 26: 1–5. 1985; FFJ 6: 545. 1995; FOC 24: 287. 2000; FTW ed. 2, 5: 89. 2000; FGD 6: 395. 2005; Wilkin P. & C. Thapuai, Fl. Thailand 10(1): 25, fig. 9, 10. 2009.

Dioscorea sativa auct. non L.: FHK 368. 1861; FKH 276. 1912.

Herbaceous twining vines; tubers usually solitary, globular to pyriform, 4–10 cm thick, with black cork and many fibrous roots. Stem twining to left, glabrous, smooth, bearing bulblets in axils of leaves. Leaves alternate, simple; petiole 2.5–12 cm; leaf blade broadly cordate, 5–15(–26) × 4–14(–26) cm, apex caudate-acuminate, margin entire or slightly undulate, glabrous. Male spikes usually clustered in leaf axils, drooping, sometimes forming panicles, 3–10 cm or longer; male flowers solitary, ± contiguous along rachis; perianth purple; stamens 6, inserted at base of perianth, filaments nearly as long as anthers. Female spikes often 2 or more together, similar to male ones, 20–50 cm; female flowers sessile, erect; staminodes 6. Capsule of 3 flat wing-like oblong-orbicular lobes, 1.5–3 cm, straw-coloured, densely purplish dotted, glabrous, base and apex rounded. Seeds inserted near apex of capsule, dark brown, winged toward base.

Locality: Hong Kong Island, Tai Po Kau, Lam Tsuen, Sham Tseng, Ta Kwu Ling. *P. S. Choi 522; F. W. Xing 7396; HK sheet 40753.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Gansu, Shaanxi, Henan, Hubei, Hunan, Jiangxi, Jiangsu, Anhui, Zhejiang, Fujian, Taiwan; Korea, Japan, Vietnam, Cambodia, Myanmar, Thailand, India, Bhutan, Africa, Oceania.

Ecology: Margins of forests, thickets, ravines, river banks. Flowering: Jul.–Oct.; fruiting: Aug.–Nov.

Uses: Medicinal (folklore).

5. Dioscorea alata L. 參薯 **(Photo 542)**

Sp. Pl. 2: 1033. 1753; FHN 4: 152. 1977; FRPS 16(1): 117, pl. 37: 1–6. 1985; FFJ 6: 550. 1995; FOC 24: 296. 2000; FTW ed. 2, 5: 88. 2000; FGD 6: 395, fig. 236. 2005; Wilkin P. & C. Thapuai, Fl. Thailand 10(1): 11, fig. 1, 2. 2009.

Herbaceous twining vines; tubers variable, globose, conical or cylindrical, usually branched. Stem twining to right, glabrous, with 4 narrow ridges or membranous wings, sometimes prickly at base, usually bearing bulblets in leaf axils. Leaves alternate, but opposite distally on stem, simple; petiole green or purplish red, 3–10(–15) cm; leaf blade papery, ovate to triangular-ovate, 6–15(–20) × 3–13 cm, base sagittate to deeply cordate, apex shortly acuminate or caudate, glabrous on both surfaces, green or purplish red; basal veins 5–7. Male spikes solitary or a few together, 1.5–4 cm, sometimes forming a panicle to 20–30 cm; rachis ± zigzagged; male flowers light green, outer perianth lobes broadly ovate, 1.5–2 mm; stamens 6. Female spikes solitary or 2–3 together in leaf axils. Female flowers with 6 staminodes; ovary glabrous. Capsule of 3 flat wing-like oblate, sometimes obcordate lobes, 1.5–2.5 cm. Seeds inserted near middle of capsule, winged all round.

Locality: Cultivated. *K. S. Pang 10.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Xizang, Sichuan, Hunan, Hubei, Jiangxi, Zhejiang, Fujian, Taiwan; widely cultivated in tropical and subtropical area.

Ecology: Flowering: Nov.–Jan. of the following year; fruiting: Dec.–Jan. of the following year.

Uses: Food.

6. Dioscorea cirrhosa Lour. 薯莨 **(Fig. 216; Photo 543)**

Fl. Cochinch. 2: 625. 1790; FRPS 16(1): 108, pl. 34: 1–4. 1985; FFJ 6: 551, fig. 484. 1995; FOC 24: 294. 2000; FGD 6: 396. 2005; Wilkin P. & C. Thapuai, Fl. Thailand 10(1): 29, fig. 11, 12. 2009.

Dioscorea rhipogonoides Oliv., Hooker's Icon. Pl. t. 1868; FKH 276. 1912.

Dioscorea matsudae Hayata, Icon. Pl. Formosan. 96. 1896; FTW ed. 2, 5: 96. 2000.

Twining vines, glabrous throughout; tubers variable in shape, globose, ovoid, oblong or gourd-shaped, very hard; cork dark brown; transverse section light brown or red, purplish black when dry. Stem twining to right, to 18 m or longer, almost woody, prickly at base. Leaves alternate on the lower part of stem, opposite on the upper part of stem, simple; petiole 2–6 cm; leaf blade ovate to linear, 5–20 × 0.6–14 cm, leathery, base rounded, sometimes triangular lobed, apex acute or acuminate, margin entire, adaxially dark green, abaxially whitish, basal veins 3 or 5, reticulate veins prominent. Male spikes axillary, forming panicles of 2–14 cm or longer; rachis straight; male flowers with 6 stamens. Female spike

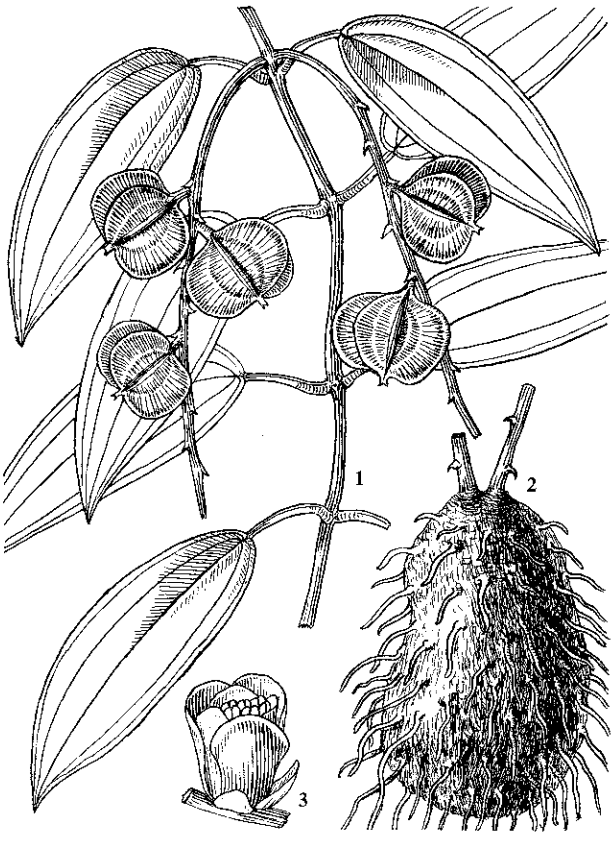

Figure 216. *Dioscorea cirrhosa* Lour.

1. fruiting branchlet; *2.* tuber; *3.* male flower. (drawn by H. P. Yu)

solitary, to 10 cm. Capsule of 3 flat wing-like oblate lobes, 2–3.5 cm, base emarginate, attenuate into pedicel ca. 7 mm. Seeds inserted near middle of capsule, winged all round.

Locality: Common in Hong Kong. *Y. S. Lau 2472; Y. W. Lam 14; K. L. Yip 4098.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Sichuan, Xizang, Yunnan, Hunan, Jiangxi, Zhejiang, Fujian, Taiwan; Vietnam, Thailand.

Ecology: Margins of forests, thickets on mountain slopes, and in ravines. Flowering: Apr.–Jun.; fruiting: Jul.–Jan. of the following year.

Uses: Material (tannin, dye), medicinal (folklore).

7. Dioscorea benthamii Prain & Burkill 大青薯(邊氏薯蕷) **(Photo 544)**

J. Asiat. Soc. Bengal 4: 448. 1908; FRPS 16(1): 108, pl. 33: 17–19. 1985; FFJ 6: 549. 1995; FOC 24: 294. 2000; FTW ed. 2, 5: 89. 2000; FGD 6: 397. 2005.

Dioscorea oppositifolia auct. non L.: FHK 367. 1861.

Herbaceous twining vines, glabrous throughout, with tuberous rootstock. Stem twining to right, slender, to 20 m. Leaves papery, usually opposite, simple; petiole 0.5–2 cm; leaf blade obovate-oblong or oblong to ovate-lanceolate, 2–7(–9) × 0.7–4 cm, base rounded, apex acute to acuminate, margin entire, abaxially whitish; basal veins 3 or 5(or 7). Male spikes solitary or 2–3 together in leaf axils, 2–3 cm, or forming short panicles; rachis obviously zigzagged; male flowers sessile; bracts and perianth lobes purplish brown dotted; stamens 6. Female spikes usually solitary or paired, 3–10 cm; female flowers subsessile, bracts ovate, apex acuminate; outer perianth lobes broadly ovate; staminodes 6. Capsule of 3 flat wing-like oblate lobes, ca. 1.5 cm. Seeds inserted near middle of capsule, winged all round.

Locality: Shek O, Sai Kung, Ma On Shan, Lantau Peak. *Y. W. Lam 284, 751; HK sheet 41994.*

Distribution: Guangdong, Guangxi, Fujian, Taiwan.

Ecology: Thickets on mountain slopes and in ravines. Flowering: May–Jun.; fruiting: Jul.–Sep.

Notes: The syntype specimens were collected from Little Hong Kong, Happy Valley and Tai Tam between 1878 and 1879.

8. Dioscorea hamiltonii Hook. f. 褐苞薯蕷 **(Photo 545)**

Fl. Brit. Ind. 6: 295. 1892; Prain & Burkill, J. Proc. Asiat. Soc. Bengal 10: 39. 1914; R. Knuth, Pflanzenr. 4, 43: 266. 1924; Wilkin P. & C. Thapuai, Fl. Thailand 10(1.): 63, fig. 33, 34. 2009.

Dioscorea persimilis Prain & Burkill, J. Proc. Asiat. Soc. Bengal 4: 454. 1908; FKH 276. 1912; FRPS 16(1): 114, pl. 37: 7–12. 1985; FFJ 6: 552, fig. 486. 1995; FOC 24: 295. 2000; FTW ed. 2, 5: 96. 2000; FGD 6: 398. 2005; Check List HK Plants 369. 2002; 128. 2004.

Herbaceous twining vines; tubers cylindrical, cork yellowish brown. Stem twining to right, glabrous, often 4–8-ridged. Leaves papery, simple, alternate on lower part of stem, opposite on upper part of stem; leaf blade orbicular, ovate, or triangular to elliptic-ovate, 3–13 × 1.5–8 cm, base sagittate or hastate or deeply or broadly cordate, apex acute, acuminate, or caudate, margin entire, glabrous on both surfaces, reddish brown when dry; basal veins 7 or 9, reticulate veins prominent. Male spikes axillary, solitary or 2–4 together, 1–4 cm, usually forming panicles to 40 cm; rachis obviously zigzagged; male flowers sessile; bracts and outer perianth lobes brown spotted; stamens 6. Female spikes solitary or paired, to 20 cm in fruiting time; female flowers subsessile; staminodes small. Capsule of 3 flat wing-like oblate lobes, 1.5–2.5 cm. Seeds inserted near middle of capsule, winged all round.

Locality: Tai Po, Lam Tsuen, Sai Kung, Man Kam To, Tai A Chau. *S. P. Lau 160; P. S. Choi 288; HK sheet 40256.*

Distribution: Guangdong, Guangxi, Yunnan, Guizhou, Hunan, Fujian, Taiwan; Vietnam.

Ecology: Mixed forests, thickets, on mountain slopes and in ravines. Flowering: Jul.–Dec.; fruiting: Sep.–Jan. of the following year.

Uses: Medicinal (folklore).

9. Dioscorea fordii Prain & Burkill 山薯 **(Photo 546)**

J. Asiat. Soc. Bengal 4: 450. 1908; FKH 276. 1912; FRPS 16(1): 114, pl. 36: 5–10. 1985; FFJ 6: 554, fig. 488. 1995; FOC 24: 295. 2000; FGD 6: 398. 2005.

Dioscorea batatas auct. non Decne: FHK 368. 1861; FKH 276. 1912.

Herbaceous twining vines; tubers vertical, cylindrical; cork brown. Stem twining to right, glabrous, prickly at base. Leaves papery, simple, alternate on lower part of stem, opposite on upper part of stem; petioles 3–6 cm; leaf blade broadly lanceolate, oblong-ovate to elliptic-ovate, 5–12 × 2.5–8.5 cm, base sagittate or hastate to deeply cordate or rounded, apex acuminate or caudate, margin entire, glabrous on both surfaces; basal veins 5 or 7, outermost ones near margin. Male spikes axillary, solitary or 2–4 together, 1.5–3 cm, or forming panicles to 40 cm; rachis zigzagged; male flowers sessile; outer perianth lobes broadly ovate, 1.5–2 mm, inner ones obovate, narrower but thicker than outer; stamens 6. Female spike often solitary, to 25 cm in fruit. Capsule of 3 flat, wing-like oblate lobes, 1.5–3 cm. Seeds inserted near middle of capsule, winged all round.

Locality: Hong Kong Island, Tai Po, Fung Yuen, Lantau Peak. *Y. S. Lau 766; L. T. Lo 314; HK sheet 40826.*

Distribution: Guangdong, Guangxi, Hunan, Zhejiang, Fujian.

Ecology: Margins of forests, thickets on mountain slopes and in ravines. Flowering: Oct.–Jan. of the following year; fruiting: Dec.–Jan. of the following year.

Notes: The syntype specimens (*C. Ford 6, K. Wong 659, Lamont 758*, K) were collected from Hong Kong Island and Lantau Island between 1851 and 1890s.

387. BURMANNIACEAE 水玉簪科

ZHANG Dian-xiang 張奠湘 • Richard M. K. SAUNDERS

Small myco- or autotrophic, annual or perennial herbs, often growing from rhizomes or tubers. Leaves simple, exstipulate, usually alternate, lamina entire; autotrophic species with basal rosette of linear or lanceolate green leaves; mycotrophic species with colourless to yellowish or reddish, scale-like leaves. Flowers bisexual, usually actinomorphic, solitary or in terminal cymes or racemes; perianth (3–)6-lobed, corolline, tubular or campanulate; tube occasionally 3-angled or 3-winged; outer perianth parts (sepals) valvate; inner perianth parts (petals) generally smaller, induplicate-valvate, occasionally absent; 3 or all 6 of the perianth-lobes often each with an elongate, slender, terminal appendage; stamens 3 or 6, if 3, then subsessile in the perianth throat, with anther dehiscence by horizontal slits, if 6, then pendent in perianth tube, with anther dehiscence by longitudinal slits; connectives large, often appendiculate; ovary inferior, 1-loculate with parietal placentation, or 3-loculate with axile placentation; ovules many, anatropous, bitegmic; style filiform, shortly cylindrical or conical; stigmas 3, sometimes connate. Fruit capsular, occasionally fleshy, with either persistent perianth tube and style or persistent basal ring of perianth only, dehiscence irregular or by transverse ventral slits. Seeds small, subglobose to linear, many, sometimes with a loose reticulate testa; endosperm present.

Approximately 21 genera and 165 species, widespread in tropical and subtropical regions; three genera and 12 species in China; two genera and six species in Hong Kong.

1a. Perianth tube salverform, cylindrical, trigonous, or campanulate; style ± as long as perianth tube; stamens 3 ..... 1. *Burmannia*
1b. Perianth tube urceolate, circumscissile; style very short; stamens 6 ..... 2. *Thismia*

1. Burmannia L. 水玉簪屬

Achlorophyllous mycoheterotrophic or green autotrophic, annual or perennial herbs; autotrophs with basal rosette of green leaves, and smaller green leaves appressed to stem; mycoheterotrophs with only small bract-like, achlorophyllous, stem leaves. Flowers solitary or in terminal cymes; perianth persistent after anthesis, often 3-winged, occasionally wingless; perianth tube generally 6-lobed, cylindrical to trigonous; outer perianth parts relatively large; inner perianth parts often minute, occasionally lacking; stamens 3, sessile or subsessile on perianth tube; connectives occasionally with (1–)2 apical glandular crests and/or a central, pendent, basal spur; ovary trigonous, 3-loculate, placentation axile; styles fused, branched towards the stigmas; stigmas 3, occasionally sessile, funnel-shaped. Fruit capsular, with persistent perianth, dehiscence generally irregular. Seeds many, oblong or ellipsoidal.

Approximately 57 species in tropical and subtropical regions; ten species in China; five species in Hong Kong.

1a. Chlorophyllous (autotrophic or semi-mycotrophic) herbs; basal rosette leaves present.
  2a. Stems up to 40 cm; cauline leaves 5–30 cm long; perianth tube 4.5–13 mm long; outer tepals with prominent double margin; inner tepals with double margin ..... 1. *B. coelestis*
  2b. Stems up to 24 cm; cauline leaves 5–18 cm long; perianth tube 4–7.5 mm long; outer tepals with single or shallow double margin; inner tepals with single margin ..... 2. *B. chinensis*
1b. Achlorophyllous (holomycotrophic) herbs; basal rosette leaves absent.
  3a. Stems, leaves and flowers ± white or yellow; seeds subglobose ..... 5. *B. championii*
  3b. Stems, leaves and flowers ± purple or blue; seeds ellipsoidal.
    4a. Perianth wings narrow or reduced to ribs; outer tepals ca. 1 mm long ..... 3. *B. wallichii*
    4b. Perianth wings conspicuous, 1–2 mm wide; outer tepals 1.5–2 mm long ..... 4. *B. itoana*

1. Burmannia coelestis D. Don

三品一支花(雞錫杖) **(Fig. 217; Photo 547)**

Prodr. Fl. Nepal. 44. 1825; Schultes, Syst. Veg. 7(2): 75. 1830; Hook. f., Fl. Brit. Ind. 5: 665. 1888; Ridl., J. Str. Br. Roy. As. Soc. 22: 333. 1890; Ridl., Mat. Fl. Mal. Penins. 2: 71. 1908; Ridl., Fl. Mal. Penins. 4: 304. 1924; Jonker, Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 51: 120. 1938; Jonker, Fl. Males., ser. I, 4(1): 17.

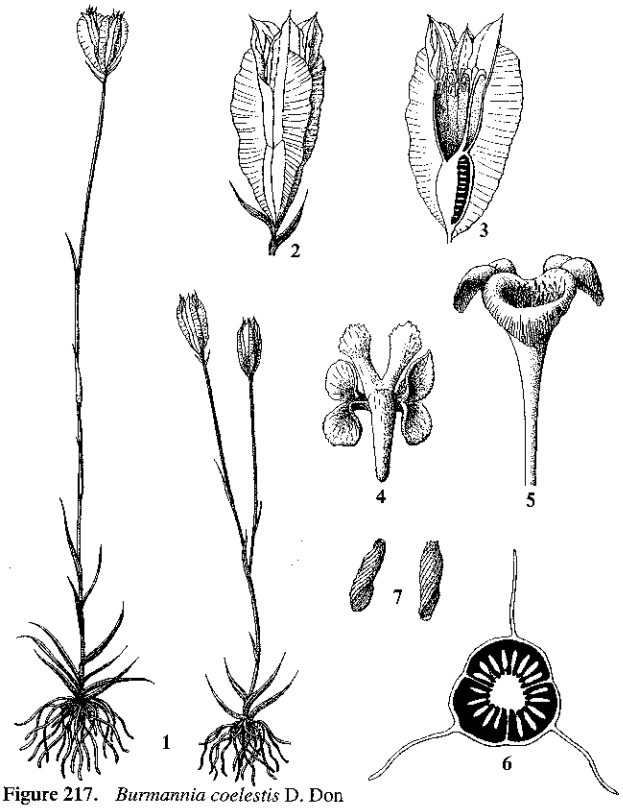

Figure 217. *Burmannia coelestis* D. Don

1. habit; *2.* entire flower; *3.* half flower; *4.* stamen with lateral thecae and connective consisting of two apical crests and a pendent basal spur; *5.* three stigmas with united style; *6.* transverse section of ovary. *7.* seeds. (Del. R. J. Nicholls; reproduced from Saunders (Gard. Bull., Singapore 48: 241-251. 1998), © National Parks Board, Singapore.)

1948; FRPS 16(2): 171. 1981; FGD 2: 479. 1991; D. X. Zhang & R. M. K. Saunders, Nord. J. Bot. 20: 388–391. 2000; FOC 23: 122. 2010.

Chlorophyllous, semi-mycotrophic herb, flowering at 10–40 cm. Stems green, slender. Basal rosette leaves few, linear-lanceolate, 0.5–2 cm × ca. 3 mm. Cauline leaves linear, 5–30 × ca. 2.5 mm. Bracts lanceolate, 3–6 mm. Inflorescences with (1–)2–6(–8) flowers. Flowers pedicellate or subsessile, blue-purple with yellow tepals, 10–15 mm long. Perianth tube 4.5–13 mm long; wings conspicuous, 1.5–3 mm wide; outer tepals ovate-triangular, 1–2 mm long, with prominent double margin; inner tepals triangular, 0.5–1 mm long, with double margin. Stamens sessile; connectives with 2 apical crests and a pendent basal spur. Ovary ellipsoidal or obovoid, 3–7 mm long. Capsule obovoid. Seeds ellipsoidal.

Locality: Sheung Shui. *W. J. Tutcher 8152.*

Distribution: Guangdong, Guangxi, Hainan; Bangladesh, Brunei, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Thailand, Vietnam, Australia.

Ecology: Generally wet grasslands. Flowering: Jun.–Oct.; fruiting: Oct.–Feb. of the following year.

2. Burmannia chinensis Gand. 香港水玉簪 **(Photo 548)**

Bull. Soc. Bot. Fr. 66: 290. 1919; D. X. Zhang & R. M. K. Saunders, Nord. J. Bot. 20: 391–392. 2000; FOC 23: 122. 2010.

Burmannia pusilla (Wall. ex Miers) Thwaites var. *hongkongensis* Jonker, Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 51: 131–132. 1938; FRPS 16(2): 171. 1981; FGD 2: 479. 1991; Check List HK Plants 369. 2002; 128. 2004.

Chlorophyllous, semi-mycotrophic herb, flowering at 4.5–20 cm. Stems green, slender. Basal rosette leaves few, lanceolate, 0.3–1.2 cm × 1–3 mm. Cauline leaves linear, 5–18 × ca. 2 mm. Bracts lanceolate, 5–6 mm. Inflorescences with 1–3(–4) flowers. Flowers pedicellate or subsessile, purple or yellow, 3–8 mm long. Perianth tube 4–6.5 mm long; wings conspicuous, 1–3 mm wide; outer tepals broadly ovate, 1–3 mm long, with single or shallow double margin; inner tepals spathulate, 0.5–1.2 mm long, with single margin. Stamens sessile; connectives with 2 apical crests and sometimes a pendent basal spur. Ovary ellipsoidal or obovoid, 2.5–7 mm long. Capsule obovoid. Seeds ellipsoidal.

Locality: Pok Fu Lam Reservoir, HKU Campus, Tai Tam Tuk, Ho Pui, Crescent Island. *E. Bodinier 924* (HK, LY, P); *E. Bodinier 924 bis* (E, HK, P); *HK sheet 7053.*

Distribution: Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Yunnan, Zhejiang; India, Laos, Thailand, Vietnam.

Ecology: Generally wet grasslands. Flowering: Jun.–Oct.; fruiting: Jul.–Jan. of the following year.

3. Burmannia wallichii (Miers) Hook. f. 亭立(華氏水玉簪) **(Photo 549)**

Fl. Brit. India 5: 666. 1888; Ridl., Mat. Fl. Mal. Penins. 2: 71. 1908; Gagnep. in Lecomte & Humbert, Fl. Gén. Indo-Chine 6: 21. 1908; Ridl., Fl. Mal. Penins. 4: 305. 1924; Jonker, Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 51: 145. 1938; FRPS 16(2): 173. 1981; FGD 2: 480. 1991; R. M. K. Saunders, Blumea 41: 336. 1996; FOC 23: 123. 2010.

Gonyanthes wallichii Miers, Trans. Linn. Soc. London 18: 537. 1841.

Achlorophyllous, holomycotrophic herb, flowering at 4–11.5 cm. Stem purple, slender. Basal rosette leaves absent. Cauline leaves triangular-subulate, 1.5–3.5 × 1–1.5 mm. Bracts triangular-lanceolate, 2–3.5 mm. Inflorescences with 1–3 flowers. Flowers sessile, blue-purple, 5–10 mm long. Perianth tube 2.5–5.5 mm long; wings narrow or reduced to ribs, 0.2–0.8 mm wide; outer tepals ovate-triangular, ca. 1 mm long, with single margin; inner tepals orbiculate, very small, with single margin. Stamens sessile; connectives lacking apical crests, sometimes with a pendent basal spur. Ovary ellipsoidal to subglobose, 1.5–3 mm long. Capsule subglobose. Seeds ellipsoidal.

Locality: Cape D'Aguilar, Tai Tam Tuk, Bride's Pool, Pat Sin Leng, Tai Po Kau, Wu Kau Tang. *S. Y. Hu 5921* (A, US), *13913* (A); *H.C. Tang 2513; Y. S. Lau 2057; D. X. Zhang 95001* (HKU).

Distribution: Guangdong, Hainan, Yunnan; Myanmar, Thailand, Vietnam, Peninsular Malaysia.

Ecology: Wet areas in dense forests. Flowering & fruiting: Jul.–Nov.

4. Burmannia itoana Makino 纖草 **(Photo 550)**

Bot. Mag. (Tokyo) 27: 1. 1913; Jonker, Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 51: 153. 1938; Ohwi, Fl. Jap., 337. 1953; T. L. Wu & S. Chen, FRPS 16(2): 173. 1981; FGD 2: 480. 1991; FOC 23: 123. 2010.

Burmannia takeoi Hayata, Icon. Pl. Formosan. 5: 212. 1915.

Burmannia pingbienensis H. Li, Acta Phytotax. Sin. 21(2): 127. 1983.

Achlorophyllous, holomycotrophic herb, flowering at 5–15 cm. Stem light blue, slender. Basal rosette leaves absent. Cauline leaves ovate-lanceolate, 2.5–3.5 × 1.5–2.5 mm. Bracts ovate-lanceolate, ca. 5 mm. Inflorescences with 1–3 flowers. Flowers pedicellate, blue-purple, 8–11 mm long. Perianth tube 3.5–5.5 mm long; wings conspicuous, 1–2 mm wide; outer tepals ovate-triangular, 1.5–2 mm long, with single margin; inner tepals orbiculate, very small, with single margin. Stamens sessile; connectives with 1 apical crest and a pendent basal spur. Ovary subglobose, 2–3.5 mm long. Capsule subglobose. Seeds ellipsoidal.

Locality: Tai Mo Shan, Lantau Island. *G. Siu & K. Chu s.n.* (HKU); *R. T. Corlett s.n.* (HKU); *D. X. Zhang 98001* (HKU); *Y. W. Lam 1787.*

Distribution: Guangdong, Guangxi, Hainan, Taiwan, Yunnan; Japan.

Ecology: Wet, evergreen forests. Flowering & fruiting: Jun.–Dec.

5. Burmannia championii Thwaites 頭花水玉簪 **(Photo 551)**

Enum. Pl. Zeyl. 325. 1864; Hook. f., Fl. Brit. Ind. 5: 666. 1890; Ridl., Mat. Fl. Mal. Penins. 2: 72. 1908; Ridl., Fl. Mal. Penins. 4: 306. 1924; Jonker, Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 51: 138. 1938; Jonker, Fl. Males., ser. I, 4(1): 17–18. 1948; Ohwi, Fl. Jap., 336. 1953; FRPS 16(2): 173. 1981; FGD 2: 480. 1991; FOC 23: 123. 2010.

Burmannia dazielii Rendle, J. Bot. 40: 311. 1902.

Burmannia hunanensis K. M. Liu & C. L. Long, Ann. Bot. Fennici 38: 211. 2001.

Achlorophyllous, holomycotrophic herb, flowering at 3–22 cm. Stem white, slender. Basal rosette leaves absent. Cauline leaves ovate-triangular, 1.5–6 × 1–3 mm. Bracts ovate-triangular, 1.5–6 mm. Inflorescences with 3–13 flowers. Flowers pedicellate or sessile, white with yellow tepals, 5–11 mm long. Perianth tube 3–5 mm long; wings reduced to ribs or absent; outer tepals narrowly triangular, 1.5–3 mm long, with single margin; inner tepals spathulate, 0.8–1.4 mm long, with single margin. Stamens sessile or with short filament, basally adnate to perianth; connectives sometimes with 2 small apical crests but lacking a pendent basal spur. Ovary ellipsoidal or obovoid, 2.5–3.5 mm long. Capsule subglobose. Seeds subglobose.

Locality: Mount Violet, Tai Mo Shan. *R. Barretto & K. Barretto s.n.; S. C. Ng s.n.* (HKU).

Distribution: Fujian, Guangdong, Hunan, Taiwan; India, Indonesia, Japan, Malaysia, New Guinea, Sri Lanka, Thailand, Pacific islands.

Ecology: Wet areas in forests. Flowering & fruiting: May–Aug.

2. Thismia Griff. 水玉杯屬

Achlorophyllous mycoheterotrophic herbs; tuberous. Stems simple or branched. Leaves cauline, bract-like, small. Flowers solitary, terminal. Perianth tube actinomorphic to zygomorphic, cylindrical, urceolate, or sometimes campanulate, with prominent annulus at mouth, lateral wings absent; tepals 6, apically distinct; outer tepals as long or shorter than inner tepals; inner tepals sometimes apically connivent or connate into an erect mitre. Stamens 6, generally laterally connate, pendent from annulus, occasionally distinct; connectives with 0–2 apical and 0–2 basal appendages. Ovary obconical or obovoid, 1-locular, with 3 parietal placentas; stigmas 3, simple or bilabiate. Fruit fleshy with persistent perianth base; dehiscence by abscission of apex.

About 43 species, pantropical; two species in China; one species in Hong Kong.

1. Thismia tentaculata K. Larsen & Averyanov

三絲水玉杯 **(Fig. 218; Photo 552)**

Rheedea 17: 16. 2007; Ho et al., J. Syst. Evol. 47: 605-607. 2009; FOC 23: 124. 2010.

Plant holomycotrophic. Stems white, unbranched, erect, 2.5–3 cm. Leaves scale-like, 1.5–5.7 × 0.8–1.1 mm. Flowers 1–4, subsessile, with subtending bracts. Perianth tube white, translucent, actinomorphic, urceolate, ca. 7.3 × 4.8 mm, circumscissile. Outer tepals broadly triangular, ca. 4 mm, lacking appendage. Inner tepals narrowly triangular, ca. 2.3 mm excluding appendage; appendage orangish red, spreading, filiform, ca. 1.7 cm. Stamens apically connate. Capsule white, translucent, cup-shaped. Seeds ellipsoidal.

Locality: Tai Mo Shan. *HK sheet 41925.*

Distribution: Vietnam.

Ecology: Evergreen montane forests. Flowering & fruiting: Aug.

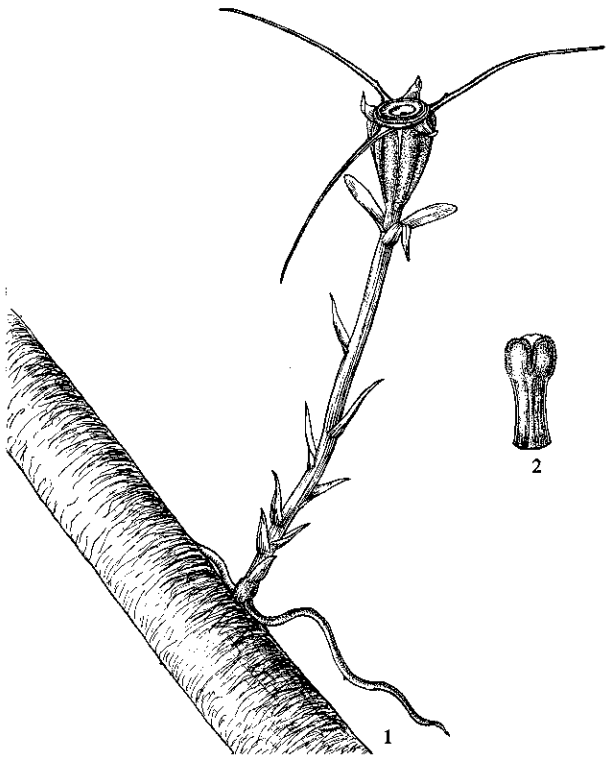

Figure 218. *Thismia tentaculata* K. Larsen & Averyanov
1. flowering plant; *2.* style and stigma. (drawn by Y. X. Liu)

389. ORCHIDACEAE 蘭科

HU Shiu-ying 胡秀英 • KONG Sau-lai, Corsica 江秀麗

Terrestrial, epiphytic, mycotrophic, rarely saprophytic perennial herbs or occasionally woody climbers. Stems erect, cane-like, rhizomatous, tuberous, pseudobulbous or cormous. Leaves basal, cauline or terminal to pseudobulb; convolute, duplicate, conduplicate, reduplicate or plicate; articulate or not. Flowers solitary, spicate, racemose or paniculate; bisexual, rarely unisexual, zygomorphic; perianth colourful, segments 6 in 2 whorls; sepals 3, distinct or connate at base; petals 3, one segment modified into a lip; resupinate or not; nectaries various; stamens 3 with filaments and free, or 2 on side of short stalk, or one with 2 cells erect on column, or one terminal and opercular on column, 1–2-locular; ovary inferior, unilocular with parietal placenta, or axile placenta and 3-locular. Column representing a connate organ of the filament and styles, with a rostrum between the anther and stigma; a foot extending from base of some columns. Pollinia 2–8, very variable, with or without stipe and viscidium. Fruit a capsule. Seed many, without endosperm.

About 796 genera and 17500 species distributed worldwide; 193 genera and 1387 species in China; 53 genera and 114 species in Hong Kong. Besides there are some tropical orchids with many horticultural varieties being cultivated in Hong Kong, but they were not treated in this Flora.

1a. Flowers having 2–3 fertile stamens with evident filaments; pollen grains not agglutinated into pollinia.
2a. Ovary 3-locular with axile placenta; anthers 3, longer than wide; sepals and petals almost similar in appearance, without a distinct specialized lip; leaves plicate (folding into plates) ..... 1. *Neuwiedia*
2b. Ovary unilocular with parietal placenta; anthers 2, rounded; sepals and petals different in shape and colour, with the lateral sepals connate and the lower petal modified into a slipper-like lip; leaves conduplicate (folding lengthwise) ..... 2. *Paphiopedilum*
1b. Flowers having 1 fertile stamen, without an obvious filament; pollen grains agglutinated into 2–8 pollinia.
3a. Leaves of photosynthetic species (or scales of saprophytes) spirally arranged; pollinia mealy, soft.
4a. Anthers appearing operculate on the apex of the column; plants over winter in form of tuberoids.
5a. Plants saprophytic; leaves small, bract-like; anthers oblong, with no stipe and viscidium; Hong Kong species being a saprophyte ..... 3. *Aphyllorchis*
5b. Plants with green leaves and underground root-stem tuberoid; leaves conduplicate; anther conical.
6a. Plant over 10 cm high; anther erect; lip with a basal spur.
7a. Stigma 1, concave; lip without lobes.
8a. Bracts foliaceous; lip pink, obcordate; petals and odd sepal connivent, forming a galea over the column rostellum folded, beak-like ..... 4. *Brachycorythis*
8b. Bracts membranous, small, lanceolate; lip yellowish green, tongue-like; petals and sepals separated; rostellum collar-like ..... 5. *Platanthera*
7b. Stigmas 2, convex; lip with trilobate epichile.
9a. Leaves well spaced on stem; flowers medium-sized to large, 2–6 cm across; sepals spreading sidewise.
10a. Flowers 2 cm or less across; petals lanceolate; lip with elongate hypochile; leaves oblong; spur longer than the ovary ..... 6. *Habenaria*
10b. Flowers 6 cm across; petals linear; hypochile inconspicuous; leaves ovate; spur twice or more times longer than the ovary ..... 7. *Pecteilis*
9b. Leaves 2–3, close near base of stem; flowers small, 3 mm across; lateral sepals suberect, close to the column ..... 8. *Peristylus*
6b. Plants small, tender, less than 10 cm tall, with subglobose corms; lip very narrow, folded at the middle and extending forward into a pendulous slender front lobe, 1 mm in diam. ..... 9. *Disperis*
4b. Anthers erect but not appearing operculate on the apex of the column; plants generally having a period of dormancy in form of fleshy roots or tuberoids in the winter dry season.
11a. Plants devoid of tuberoid; rostellum subequal to the anthers in length; viscidium attached to the apex of pollinia on caudicle.
12a. Plants with erect leafy shoots; rhizomes creeping, with slender internodes; leaves with sheathing petioles; pollinia sectile, with slender caudicles.
13a. Stems tough, bamboo-like; rhizomes woody; leaves plicate, with many elevated veins beneath; inflorescences axillary to leaves ..... 10. *Tropidia*
13b. Stems herbaceous; rhizomes succulent or fleshy; leaves flat, smooth, without elevated veins beneath; inflorescence terminal to a leafy shoot.
14a. Rhizomes succulent, worm-like, 4–6 cm long, clinging on wet boulders by dense hairs; sepals connate above the middle forming a tube ..... 11. *Cheirostylis*
14b. Rhizomes fleshy, slender, 10 cm or more long, creeping over wet forest floor by rather stout roots; sepals distinct, the lateral ones spreading.

15a. Flowers with the lip fringed and exposed in a horizontal position; spur conical, cleft at the apex; the odd sepals and the petals strongly recurved..... 12. *Anoectochilus*

15b. Flowers with small lip concealed by the sepals and petals, if exposed then not fringed; the odd sepals and the petals ovate and concave, not reflexed at the apex.

16a. Lip twisted, with slender claw; column slender, naked, twisted, without lateral glands; stigma 1, on plane surface in front of the column ..... 13. *Ludisia*

16b. Lip ventricose, saccate or calcarate, not twisted, without a claw; column stout, with or without lateral glands; stigmas (1–)2 below the rostellum.

17a. Flowers resupinate, the odd sepal uppermost; lip ventricose, the apical portion exposed, undivided and reflexed, or divergently bilobed.

18a. Lip entire, the apex reflexed, the base ventricose and papillose on the inside; column without lateral glands; stigma 1 ..... 14. *Goodyera*

18b. Lip constricted at the middle, hypochile saccate; column with 2 terminal glands; stigmas 2..... 15. *Zeuxine*

17b. Flowers non-resupinate, the odd sepal lowermost; lip concealed by the sepals and petals, concave, the apex obtuse or acute.

19a. Flowering bract shorter than the ovary; lip ventricose or saccate, the sac with erect papillae or stipitate calli; column appendaged in front; stigmas connivent below the rostellum ..... 16. *Hetaeria*

19b. Flowering bract longer than the ovary; lip calcarate, the spur oblong, pointing backward, with 2 hanging calli pointing to the tip; column short, stout, without front appendages; stigmas 2, not meeting below the rostellum ..... 17. *Vrydagzynea*

12b. Plants acaulescent; rootstock short and erect, concealed by the base of the petioles; pollinia finely granular.

20a. Flowers resupinate; sepals, petals, and lip overlapping; lip lowermost in position, concave and concealed by the sepals and petals; column medium-long; stigma (or stigmas) limited to small area of the column.

21a. Leaves linear, appearing with the flowers; stigma 1, with a defined margin, suborbicular or shield-like and tricuspidate at the upper margin; viscidium concealed below the rostellum between the lobes or obscure; lip with 2 spherical calli, one on each side of the base..... 18. *Spiranthes*

21b. Leaves elliptic, appearing after anthesis; stigmas 2, widely separated on a plane surface of the column, oblong; viscidia exposed at the apex of the lobes of the rostellum; lip unguiculate, with 2 subulate and hooked appendages, one on each side of the basal claw..... 19. *Pelexia*

20b. Flowers non-resupinate; sepals, petals and lip spreading; lip uppermost in position, flat, ovate, acute; column very short, stigma large, covering the entire front of the column ..... 20. *Cryptostylis*

11b. Plants with tuberoid bearing a winter bud at the apex; rostellum shorter than the anthers, viscidium usually obscure or none.

22a. Flowering stem leafless; plants without leaves, some species part of the time in a year.

23a. Saprophytes with fleshy coralloid underground stems; leaves lacking..... 21. *Epipogium*

23b. Phytosynthetic green plants; the aerial stem of a mature individual bearing leaves and flowers simultaneously (except in *Nervilia*).

24a. Vegetative growth consisting of one underground corm and a sessile cordate leaf lying flat on ground; flowering individuals leafless..... 22. *Nervilia*

24b. Vegetative growth consisting of erect, or creeping aerial stems or pseudobulbs; flowering individuals each bearing 1–many leaves.

25a. Creeping plants, upright portion consisting of a pseudobulb with a single internode, terminated by 2 opposite leaves; pollinia 4 in two pairs.

26a. Scape with basal scales; pseudobulb oblong; flowers few, usually 2–3 on an erect scape ..... 23. *Coelogyne*

26b. Scape without basal scales; pseudobulb ovoid; flowers usually appearing with the young shoot before the formation of the pseudobulb and the expansion of the leaves ..... 24. *Pholidota*

25b. Erect plants with or without pseudobulbs of various types but never with one internode and terminated by 2 opposite leaves; anther with 4 or 8 pollinia.

27a. Flowers with linear, spreading petals; lips simple, narrowed or auriculate at the base; pollinia 4.

28a. Flowers resupinate; lip spathulate, recurved from the middle, cuneate and with 2 calli at the base; column slender, arcuate and winged at the apical portion ..... 25. *Liparis*

28b. Flowers non-resupinate; lip flat and auriculate or the sides erect and the base auriculate; column very short, partially concealed in the depression at the base of the lip..... 26. *Malaxis*

27b. Flowers with lanceolate, oblong or ovate petals; lip lobed, saccate or spurred at base; pollinia 8.

29a. Leaves ovate or ovate-cordate; annual growth consisting of 1 leaf with or without a flowering scape, petiole articulation near the cordate base of the lamina.

30a. Rhizomes fleshy, bearing few roots; leaves ovate, variegated; flowers non-resupinate; without a mentum; lip calcarate, the spur enlarged at the end ..... 27. *Nephelaphyllum*

30b. Rhizomes cord-like, bearing many roots; leaves cordate, not variegated; flowers resupinate, with a mentum; lip not spurred ..... 28. *Mischobulbum*

29b. Leaves linear, lanceolate, elliptic or oblong; annual growth consisting of 1 or many leaves and the stem often developing into pseudobulbs; petioles never articulate at the distal end.

31a. Plants bamboo-like, with several slender stems; inflorescence lateral, flowering scapes emerging from the axils of cataphylls or lower leaves .....29. *Cephalantheropsis*

31b. Plants having one stem terminated with a flowering scape or having a fleshy tuberous rhizome bearing both a leafy shoot and a flowering scape.

32a. Inflorescences terminal to a leafy stem; pollinia 8, the connecting appendage and viscidium obsolete.....30. *Arundina*

32b. Inflorescences in axils of lower leaves or bracts, or associated to a pseudobulb; pollinia 8, with various types of connecting appendages.

33a. Plants caespitose; leaves elliptic, 5–11 cm across the middle; scape emerging from the axil of a lower leaf or a green cataphyll.

34a. Flowers with a mentum; sepals coherent, forming an oblique ventricose-urceolate tube enclosing the petals and lip..... 31. *Acanthephippium*

34b. Flowers without mentum; sepals and petals spreading; lip spurred.

35a. Spur conical, shorter than the ovary; lip attached to the base of the column, trumpet-shaped, the sides overlapping over the column and anther, the margin wavy.....32. *Phaius*

35b. Spur slender, longer than the ovary; lip 3-lobed, adnate to the sides of the column forming a pouch .....33. *Calanthe*

33b. Plants with pseudobulbs; leaves linear or narrowly elliptic, 3 cm or less across the middle.

36a. Pseudobulbs compressed globose, with many joints, the new ones emerging from the side of an old one.

37a. Flowers appearing before the leaves; pseudobulbs yoke-shaped; lip with a short mentum.....34. *Pachystoma*

37b. Flowers appearing with the new or the well-developed leaves; pseudobulbs oblong or obovate; lip without spur and not associated with mentum.

38a. Leaves basal to a flowering shoot; scapes glabrous; flowers purple-pink (white in a cultivar); midlobe of lip lamellate.....35. *Bletilla*

38b. Leafy and flowering shoots separated; scapes pubescent; flowers bright yellow; midlobe of lip with 3 short keels.....36. *Spathoglottis*

36b. Pseudobulbs ovoid or oblong-ovoid, with 1 joint; a new one terminal to a short rhizome.

39a. Lip not spurred; pseudobulbs cylindrical-conical; flowers with short mentum; pollinia discoid .....37. *Tainia*

39b. Lip spurred; pseudobulbs ovoid; flowers without mentum; pollinia unequal, obovoid ..... 38. *Ania*

22b. Stems erect or creeping, bearing distichous leaves or scales, terminal leaves terminal to pseudobulb; epiphytic.

40a. Lateral sepals adnate to the foot of column, forming a mentum; pollinia 8 without stipe .....39. *Eria*

40b. Lateral sepals free from column; pollinia various.

41a. Pollinia 6 or 8, on elongate stipes, each with a viscidium; flowers non-resupinate.
42a. Plants with slender stems, without pseudobulb; flowers on short axillary racemes; pollinia 6 ..... 40. *Appendicula*
42b. Plants with ovoid pseudobulb; flowers terminal to an elongate stipe; pollinia 8 ..... 41. *Thelasis*
41b. Pollinia 4, rarely 2 or 8, without stipes or viscidia; flowers generally resupinate.
43a. Pollinia of a pair equal; stems elongate with distichous leaves; rarely short with jointed pseudobulb ..... 42. *Dendrobium*
43b. Pollinia of a pair unequal, 1 large and 1 small; stems with ovoid pseudobulb.
44a. Flowers facing different directions in a subumbelliform raceme; 3 sepals almost similar in size and shape, the upper margin of the lateral ones not coherent beyond the mentum ..... 43. *Bulbophyllum*
44b. Umbels fan-shaped, all flowers facing one direction; lateral sepals 2–6 times longer than the odd one, twisted, with their upper margins meeting, coherent, forming a platform before the lip ..... 44. *Cirrhopetalum*

3b. Leaves of photosynthetic species distichous, often articulate at base; pollinia hard and waxy.
45a. Plants monopodial.
46a. Flowers ephemeral; sepals and petals lanceolate, acute; pollinia oblong, without evident stipe ..... 45. *Thrixspermum*
46b. Flowers lasting for days; sepals and petals oblong, ovate or rotundate; pollinia with stipes.
47a. Flowers small, less than 2 cm across, yellow; lip without spur or sac ..... 46. *Diploprora*
47b. Flowers usually large, 2 cm or more across; lip spurred or saccate.
48a. Sepals and petals maculate with horizontal-publish bars; leaves band-like, 20 cm long, 5 cm wide ..... 47. *Acampe*
48b. Sepals and petals without horizontal bars; leaves terrete, oblong or elliptic, less than 15 cm long.
49a. Lip ventricose, without callus or keel; flowers 2–3 in a small cymose cluster ..... 48. *Gastrochilus*
49b. Lip with conical, calcarate or subspherical spur; flowers many, in a raceme or panicle.
50a. Leaves linear-oblong, erose at the apex; anther acuminate and beaked; column with 2 arms at the apex ..... 49. *Robiquetia*
50b. Leaves terete, lanceolate or band-like, apex acute, obtuse or 2-lobed; column with 2 teeth at apex ..... 50. *Cleisostoma*
45b. Plants sympodial.
51a. Scape bending down; raceme nutant; stipe of pollinia slender and hyaline ..... 51. *Geodorum*
51b. Scape straight, upright; raceme erect; stipe of pollinia broad and short.
52a. Lip without spur; anther smooth ..... 52. *Cymbidium*
52b. Lip with a prominent spur; anther produced into obtuse-conical or bilobate appendage ..... 53. *Eulophia*

1. **Neuwiedia** Blume 三蕊蘭屬

Terrestrial herbs. Rhizome usually retrorse, with several stout aerial roots. Stem erect, often woody at base, not branched. Leaves several to many, plicate, basally contracted into a clasping, petiole-like stalk. Inflorescence erect, terminal, racemose, not branched; peduncle with several foliaceous sterile bracts; floral bracts relatively large, green. Flowers resupinate, almost actinomorphic, not opening widely. Sepals and petals often connivent. Sepals similar or lateral ones slightly oblique, fleshy. Petals similar; lip usually slightly different in shape and larger than petals. Column straight, often short, with 3 fertile stamens; central stamen often shorter than lateral ones; lateral stamens often with locules unequal in length; anthers free but filaments connate at base and adnate to style for much of their length; ovary 3-locular, distinct from pedicel; style narrowly cylindrical, apex with slightly dilated stigma. Fruit either a berry or a dry capsule dehiscent at maturity.

About ten species distributed from SE Asia through New Guinea to the SW Pacific islands; one species in China and Hong Kong.

1. Neuwiedia singapureana (Baker) Rolfe 三蕊蘭 **(Photos 553–554)**

Bull. Misc. Inform. Kew 1907: 412. 1907; FRPS 17: 15. 1999; FOC 25: 21. 2009.

Tupistra singapureana Baker, J. Linn. Soc. Bot. 14: 581. 1874.

Neuwiedia veratrifolia auct. non Blume: S. Y. Hu, Enum. Sperm. Hong Kong 107. 2004.

Perennial rhizomatous erect herb 40–50 cm tall. Leaves 4–5, elliptic or elliptic-lanceolate, 13–25 × 3.5–6.5 cm, base acute, apex acuminate; petioles 6–10 cm. Inflorescence racemose, 8–9 cm. Flowers white, fragrant; scapes bracteate; bracts 3–4 × 1.5–2 cm, hispid; perianth erect, 1.5 cm, connate at base forming a slender (about 4 mm) tube; anthers white, 5 mm; ovary inferior, ellipsoidal, 5 × 3 mm. Capsule ellipsoidal.

Locality: Hong Kong Island, Lantau Peak. *H. W. Mak ex N. H. Li 191* (CUHK); *HK sheet 36122, 35377.*

Distribution: Hainan, Yunnan; Vietnam, Thailand, Singapore, Indonesia.

Ecology: Forests. Flowering: May–Jun.

2. Paphiopedilum Pfitzer, *nom. cons.* 兜蘭屬

Terrestrial or epiphytic herbs with sympodial growth. New shoots arising from the base of an old one. Leaves oblong-linear, or band-like, distichous, uniformly green or tessellated with darker and paler green. Scape terminal to a leafy shoot. Flowers rather large and showy, solitary or in a loose raceme; odd sepal uppermost, large, colourful, lateral sepals connate forming a synsepalum generally hidden behind the lip; petals narrower than the odd sepal, spreading out horizontally; lip slipper-shaped, the margin of the basal half incurved, the base of the pouch raised slightly into an auricle on each side; column short, terete, terminated by a foliaceous staminode; fertile anthers 2, on the sides of the column, sessile, subglobose, locules 2, parallel; pollen grains dusty and in a sticky mass, not consolidated into pollinium; stigma discoid, on a short stalk; ovary cylindrical. Capsules fusiform.

About 66 species distributed in tropical Asia to Pacific islands; 18 species in China; one species native to Hong Kong.

1. Paphiopedilum purpuratum (Lindl.) Stein

紫紋兜蘭(香港兜蘭) **(Fig. 219; Photo 555)**

Orchideenbuch 481. 1892; S. Y. Hu, Genera Orchid. Hong Kong 27, fig. 5. 1977; FRPS 17: 69, pl. 8: 1. 1999; FGD 7: 330, fig. 160. 2006; Z. J. Liu *et al.*, Genus Paphiopedilum in China 181. 2009; FOC 25: 43. 2009.

Cypripedium purpuratum Lindl., Edward's Bot. Reg. 23: t. 1991. 1837; FHK 364. 1861.

Paphiopedilum purpuratum (Lindl.) Pfitzer, Bot. Jahrb. Syst. 19(1): 40. 1894; FKH 270. 1912.

Cypripedium sinicum Hance ex Rchb. f., Walp. Ann. 3: 602. 1853.

Terrestrial or semi-epiphytic herb. Leaves 4–8, distichous, elliptic to oblong-elliptic, 8–17 × 2–4 cm, tessellated dark and light green above, pale green beneath; margins ciliate near the base. Flower solitary; scape 15–20 cm, purple, pubescent; bract ovate-lanceolate, 1.5–2.5 × 1 cm, villose at margin; perianth 8 cm across; dorsal sepal ovate-cordate, 3–4 × 2.5–3 cm, white, veined purple-maroon; synsepalum ovate or ovate-lanceolate, 2–3 × 1–1.5 cm, pale green with dark veins; petals horizontal, elliptic-oblong, 4–5 × 1–1.5 cm, glossy maroon or pale chestnut with dark veins, flushed green-white and spotted black-maroon; lip 4 × 2 cm, incurved, lateral lobes verrucose, brown-maroon; staminode lunate, 8 ×10 mm, pale ochre-purple veined darker.

Locality: Hong Kong Island, Kowloon Peak, Tai Mo Shan, Pat Sin Leng, Clear Water Bay, Lantau Island. *K. K. Mark 38* (CUHK); *Y. S. Lau 632, 1762*.

Distribution: S Fujian, S Guangdong, Hainan, S Guangxi, SE Yunnan; N Vietnam.

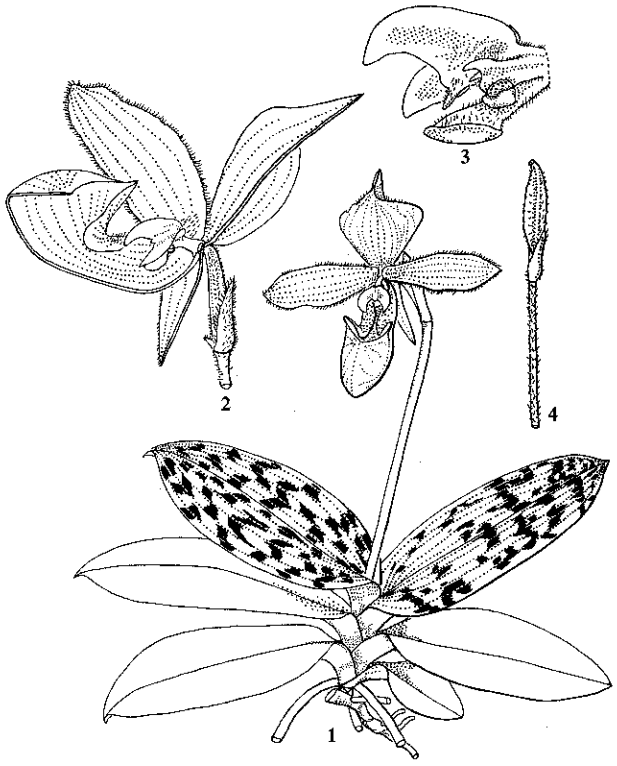

Figure 219. *Paphiopedilum purpuratum* (Lindl.) Stein
1. flowering plant; *2.* lateral view of a flower; *3.* portion of the column; *4.* young capsule. (drawn by Teresa F. Wong)

Ecology: Humus-rich stony places in forests. Flowering: Nov.–May of the following year.

Uses: Ornamental.

Notes: The holotype specimen of *Cypripedium sinicum* Hance ex Rchb. f. (*Hance s.n.*, W) was collected by H. F. Hance from Hong Kong Island around 1850. Listed in *Rare and Precious Plants of Hong Kong*.

3. Aphyllorchis Blume 無葉蘭屬

Herbs, saprophytic or parasitic, aphyllous. Roots fleshy, cord-like. Rhizomes short, horizontal, with membranous black scales, buds inconspicuous, subterminal, axillary to a scale. Cataphylls white, short, sheathing. Stem 30–50 cm tall, terminated by a loose raceme; bracts membranous, reflexed, parallel to the rachis, purple. Flowers small, yellow, in a terminal raceme; sepals subequal, similar, slightly spreading, rather fleshy, oblong, subcymbiform, obtuse at the apex, with a median longitudinal ridge on the back; petals linear-oblong, obtuse, slightly turning outward at the apical end, auriculate at the base, with a median longitudinal ridge; lip 3-lobed, the lateral lobes basal, triangular, acute, erect; the midlobe fleshy, ovate, attached to the glandular and rugose disk elastically, relatively large, concave, the margin wavy and crenate, the apex obtuse; column slender, cylindrical, curved, fleshy, smooth, without wing or any other decoration, the apex truncate; clinandrium truncate, cyathiform; anther fleshy, subglobose-ovate, concave, thecae lateral, parallel; pollinia 4 in 2 ellipsoidal pairs, powdery, often affixed to the rostellum; rostellum narrow, fleshy, hardly distinguishable from the stigma; stigma large and wide, obovate, the upper margin subtrilobed; ovary cylindrical, striate, violate-purple, slightly rugose. Capsules subfusiform, pendulous, strongly rostrate.

About 20 species distributed in tropical Asia and Australia; five species in China; one species in Hong Kong.

1. Aphyllorchis montana Rchb. f.
無葉蘭 **(Fig. 220; Photo 556)**
Linnaea 41: 57. 1877; S. Y. Hu, Genera Orchid. Hong Kong 54, fig. 24. 1977; FRPS 17: 84, pl. 10: 6–7. 1999; FTW ed. 2, 5: 749. 2000; FGD 7: 339, fig. 168. 2006; FOC 25: 178. 2009.

Saprophytic herb, 40–70 cm tall at flowering time; the lower portion of the stem marked by sheaths of 0.5–2 cm, the middle portion by scales of 1–1.3 cm, the apical portion being the raceme of 10–20 cm. Flowers pale yellow, subtended by linear-lanceolate bracts of 6–14 mm; dorsal sepal oblong-obovate, 9–11 mm, obtuse; lateral sepals slightly shorter; petals oblong; lip trilobed, 7–9 mm, the lateral lobes deltoid, the apical lobe ovate, 5–7 mm, obtuse; column 7–10 mm, enlarged at the distal end.

Locality: Sha Tin (Hu 1977), Tsuen Wan (Siu 2000).

Distribution: Hainan, Guangxi, Yunnan, Taiwan; widespread species occurring in N India to Sri Lanka thence eastward, through warm areas in China to Indonesia, Philippines, northward to Japan.

Ecology: Shade of large trees. Flowering: Aug.–Sep.

Notes: This species was first recorded in 1975. Recent studies (e.g. M. Roy et al., BMC Biology 7: 51. 2009) show that the species is associated with a board spectrum of ectomycorrhizal fungi.

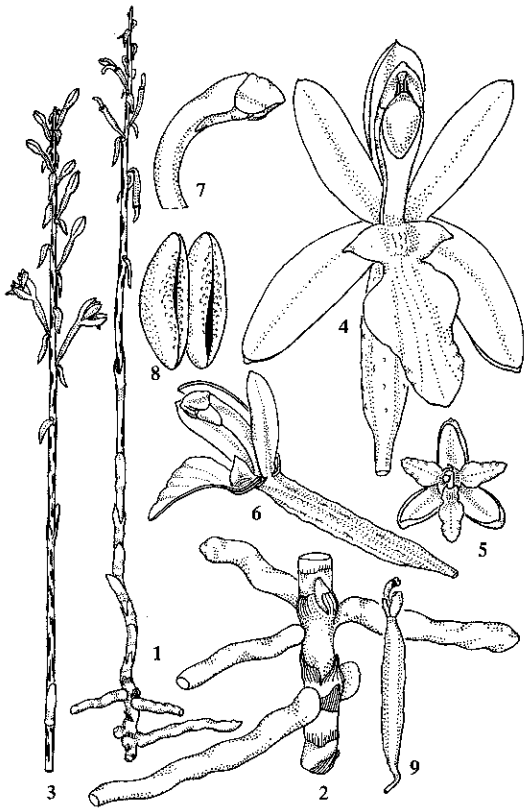

Figure 220. *Aphyllorchis montana* Rchb. f.
1. flowering plant; *2.* rhizome and roots; *3.* flowering shoot; *4.* front view of flower; *5.* abnormal flower; *6.* lateral view of flower with half of odd sepal, lateral sepals, and half of lip removed; *7.* lateral view of curved column; *8.* ellipsoidal pairs of pollinia; *9.* young fruit. (drawn by Teresa F. Wong)

4. Brachycorythis Lindl. 苞葉蘭屬

Terrestrial herbs requiring dormancy in the cool dry season, with fleshy oblong tubers. Stem leafy. Leaves lanceolate, 3–7 cm, sessile. Flowers medium-sized, subtended by foliaceous bracts or solitary in the axils of normal leaves; sepals free, odd one uppermost, ovate, concave, the lateral sepals spreading, oblique; petals small, below the odd sepal and with it forming a hood over the column; lip undivided, fleshy, obcordate, calcarate, the spur stout, short, bilobed at the apex; column short and stout, lateral glands prominent; rostellum yoke-shaped; anther 2-celled, the thecae proximate, parallel; pollinia 2, coarsely tessellate; caudicles short; viscidia large, exposed; stigma 1, large, occupying the front cavity of the column below the rostellum, glossy; ovary sessile, striate-sulcate, the ridges papillose. Capsules erect, narrowly oblong.

About 32 species distributed in Africa and tropical Asia; two species in China; one species in Hong Kong.

1. Brachycorythis galeandra (Rchb. f.) Summerh.
短距苞葉蘭(頭盔蘭) **(Fig. 221; Photos 557–558)**
Kew Bull. 10: 241. 1955; S. Y. Hu, Genera Orchid. Hong Kong 30, fig. 7. 1977; FRPS 17: 284, pl. 41: 4–6. 1999; FTW ed. 2, 5: 760. 2000; FGD 7: 765, fig. 186. 2006; FOC 25: 101. 2009.
Platanthera galeandra Rchb. f., Linnaea 25: 226. 1852.
Habenaria galeandra (Rchb. f.) Benth., FHK 363. 1861.
Platanthera obcordata auct. non Rchb. f.: FKH 269. 1912.

Terrestrial herb up to 25 cm tall, needing a resting period during winter dry season; underground tuber ellipsoidal, 1.5–2 cm thick. Leaves 9–15, all cauline, internodes 1.5–2 cm; petiolate; leaf blade lanceolate-elliptic, 3–4.5 × 1–1.5 cm. Flowers white with rose-lilac lines; lip spurred; column white; anthers with parallel thecae; pollinia 2; ovary cylindrical, 1.2 cm, papillose.

Locality: Victoria Peak, Kowloon Peak, Ma On Shan, Shing Mun. *K. K. Mark 25(2844)* (CUHK); *S. Y. Hu 10521* (CUHK); *Y. S. Lau 2495.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Taiwan.

Ecology: Short grasses on windy peaks of high mountains in Hong Kong. Flowering: Jun.–Jul.

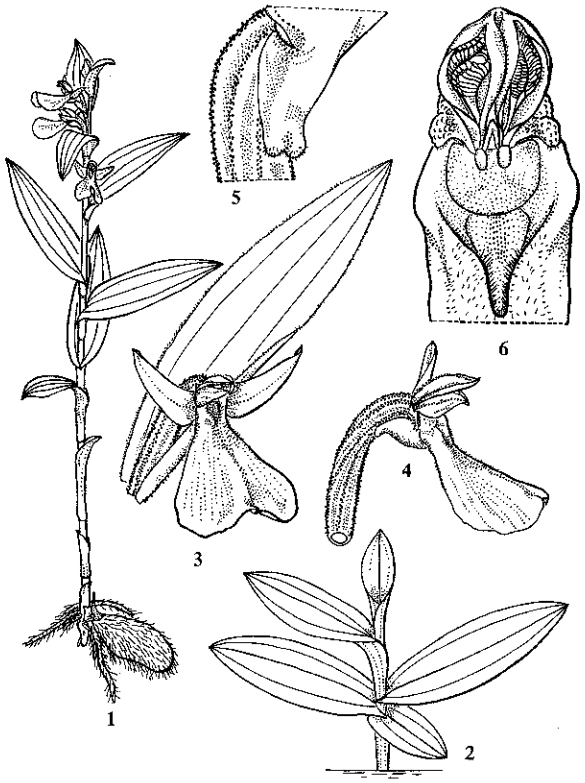

Figure 221. *Brachycorythis galeandra* (Rchb. f.) Summerh.
1. flowering plant; *2.* young plant; *3.* front view of flower and subtending leaf; *4.* lateral view of flower with 1 sepal removed; *5.* front view of spur showing 2 lobes at pollinia; *6.* adaxial view of column showing anther, staminodes, stigma and rostellum. (drawn by Teresa F. Wong)

5. Platanthera Rich. 舌唇蘭屬

Terrestrial herbs, requiring dormancy in the winter dry and cool season, with fusiform tubers each bearing a subterminal bud. Stem solitary, leafy. Leaves 1 at the ground level and 1 or 2 cauline, bract-like. Flowers small, in a terminal spike; sepals free, the odd one uppermost, ovate, concave, the lateral sepals reflexed; petals oblique ovate, the base of the lower side subcordate, apex acute or obtuse; lip undivided, tongue-like, hanging, calcarate; column short and stout, deeply retuse at the apex, the glands prominent; rostellum horizontal, collar-like, fleshy; anther 2-celled, the thecae divergent, widely separated; pollinia 2, finely tessellate, on slender caudicles; viscidia discoid; stigma situated above the lip below the rostellum, discoid, deeply depressed in the middle; ovary bending and slightly narrowed at the apex, the ridges winged. Capsules ellipsoidal.

About 150 species mainly in N temperate regions, with a few species extends southwards to S America, tropical Africa and Asia; 41 species and three subspecies in China; two species in Hong Kong.

According to FRPS (17: 307–308) and FOC (25: 104), *Platanthera tipuloides* (L. f.) Lindl.(筒距舌唇蘭)is also distributed in Hong Kong, but the present author did not see any specimen collected from Hong Kong.

1a. Spur curved downward with the apex pointing to the ground; petals equal or shorter than the odd sepal and with their upper margins connivent with it ..... 1. *P. minor*

1b. Spur curved upward with the apex pointing to the sky; petals longer than the odd sepal and with their apices pointing away from it ..... 2. *P. mandarinorum*

1. Platanthera minor (Miq.) Rchb. f.
小舌唇蘭 **(Fig. 222; Photo 559)**

Bot. Zeit. Berlin 36: 75. 1878; S. Y. Hu, Genera Orchid. Hong Kong 31, fig. 8. 1977; FRPS 17: 303, pl. 43: 4–5. 1999; FTW ed. 2, 5: 1014. 2000; FGD 7: 367, fig. 187. 2006; FOC 25: 109. 2009.

Habenaria japonica (Thunb.) A. Gray var. *minor* Miq., Ann. Mus. Bot. Lugduno-Batavum 2: 207. 1865.

Platanthera interrupta Maxim., Bull. Acad. Sci. St. Petersb. 31: 106. 1886; FKH 269. 1912.

Terrestrial herb, 15–30 cm tall at flowering time; stems 5-angled. Leaves one basal, the largest, ovate-elliptic to oblong-lanceolate, petiolate, petioles 1.5 cm; cauline leaves linear-lanceolate, sessile, 8–10 × 1.3–1.5 cm. Flowers yellowish green, 5–12 in a terminal spike; odd sepal ovate, 6 × 5 mm, acute; lateral sepals ovate-falcate, 7 × 2.5 mm; petals oblique-ovate, 6 mm, the upper margin connivent with odd sepal; lip calcarate, ovate-lanceolate, 9 × 3–3.5 mm, greenish yellow, with a slender spur 1.4 cm; column 2.5 mm; anthers 2, obovate, at each side of the column.

Locality: Tai Mo Shan, Shing Mun, Ma On Shan, Sunset Peak. *S. Y. Hu & P. P. H. But 20548* (CUHK); *Y. S. Lau 2171, 2972.*

Distribution: NE, E, C, S & SW China; Korea, Japan.

Ecology: Grasses on sunny mountain slopes or shade of ravines on humus-covered rock niches. Flowering: Apr.–Jun.

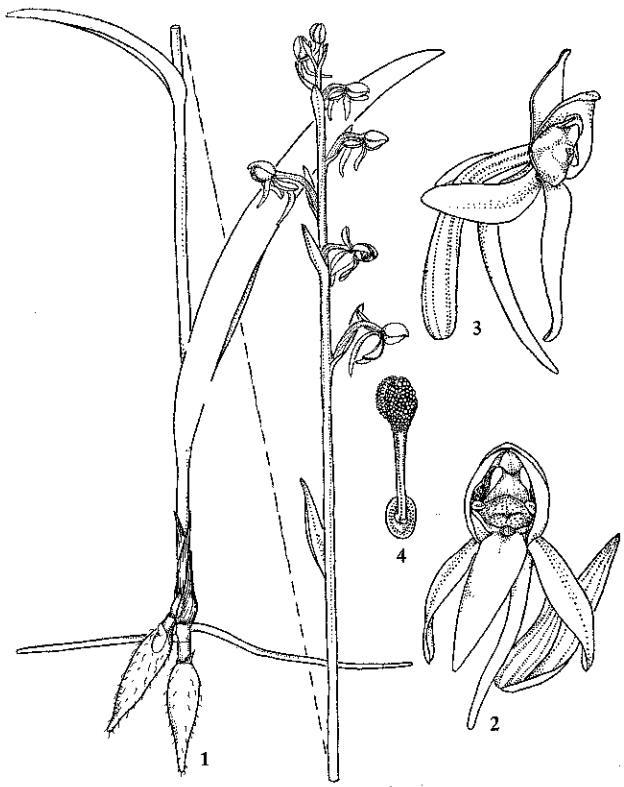

Figure 222. *Platanthera minor* (Miq.) Rchb. f.
1. flowering plant; *2.* front view of flower; *3.* lateral view of flower with half of dorsal sepal and 1 petal removed; *4.* pollinium on slender caudicle attached to discoid viscidium. (drawn by Teresa F. Wong)

2. Platanthera mandarinorum Rchb. f. 尾瓣舌唇蘭

Linnaea 25: 226. 1852; FKH 269. 1912; FFJ 6: 644, fig. 569. 1995 ["*mandarinonum*"]; FRPS 17: 298, pl. 43. 6–7. 1999; FGD 7: 366. 2006; FOC 25: 105. 2009.

Terrestrial herb, up to 20 cm tall at flowering time; stems angular. Leaves one normal, 2–4 strongly reduced; normal leaf elliptic-lanceolate, 3–5 × 0.8–1.7 cm, apex obtuse; the reduced upper leaves linear-lanceolate 1.5–3.5 × 4–7 mm. Flowers green, 5–12 in a terminal spike; dorsal sepal ovate-cordate, 4 mm long and wide, apex acuminate, acumen 1.5 mm; lateral sepals pointing downward, oblique linear-falcate, 8 × 2 mm, twisted at base; petals oblique ovate-lanceolate, pale green, 6–7 × 4 mm; lip tongue-like, 10 × 2 mm; spur slender, 1.5 cm, green; column creamy-white; anthers 2-thecae; pollinia 2, tessellate; ovary ellipsoidal, twisted and ridged.

Locality: Tai Mo Shan. *S. Y. Hu 11628A* (CUHK); *HK sheet 27798.*

Distribution: S, E & SW China, Henan, Shandong; Japan, Korea.

Ecology: Short grasses on exposed mountain tops. Flowering: Mar.–Jul.

6. Habenaria Willd. 玉鳳花屬

Terrestrial herbs requiring dormancy during the dry cool season; with fleshy subterranean tubers. Stems leafy, herbaceous, deciduous. Leaves convolute, tender, elliptic or lanceolate-elliptic, rarely ovate. Inflorescences racemose, terminal to leafy shoots. Flowers medium-sized or small; sepals subequal, free, the odd one ovate, concave, the lateral sepals spreading sidewise or twisted and curved below the lip; petals usually smaller than the sepals; lip trilobed, calcarate, spur longer than the ovary, the lateral lobes usually wider than the midlobe, spreading; column short, the back erect, the base broad and with a glandular auricle on each side; rostellum large, fleshy, yoke-shaped or beak-like, with slender long arms; anther 2-celled, thecae widely separated, broadly attached to the front of the column; pollinia 2, sectile, each on a slender caudicle with viscidium; stigmas 2, slightly curved below the rostellum-arms; ovary cylindrical, slightly narrowed at the apex, striate-sulcate. Capsules fusiform or ellipsoidal, pointed at both ends.

About 600 species widely distributed in tropical, subtropical to temperate regions; 55 species in China; seven species in Hong Kong.

1a. Flowers medium-sized, showy, red, bright yellow, or white, 1.5–3 cm across; spurs 3–4.5 cm long.
  2a. Flowers red; lateral sepals twisted at the base and curved behind the lip; rostellum beak-like ..... 1. *H. rhodocheila*
  2b. Flowers white or yellow; lateral sepals spreading sidewise; rostellum fleshy, yoke-shaped.
    3a. Lateral lobes of lip wider than the midlobe, irregularly dentate; leaves elliptic-oblong, 10–15 cm long, up to 4 cm wide ..... 2. *H. dentata*
    3b. Lateral lobes of lip narrower than the midlobe, entire; leaves linear-lanceolate, less than 10 cm long, 1.5 cm or less wide.
      4a. Flowers bright yellow; leaves 7.5–9.5 cm long, 0.7–1.4 cm wide ..... 3. *H. linguella*
      4b. Flowers white; leaves 2.5–5.2 cm long, 0.8–1.2 cm wide ..... 4. *H. coultousii*
1b. Flowers small, green or yellowish green, 1 cm or less across; spurs 2 cm or less long.
  5a. Leaves broad-ovate, subcordate, 2–3.5 cm long and wide; flowers 8 mm across; spur shorter than the ovary ..... 5. *H. reniformis*
  5b. Leaves linear-lanceolate, or ovate-lanceolate, 5–13 cm long, 1–2 cm wide; flowers 10 mm across; spur longer than the ovary.
    6a. Bracts and rachis glabrous; leaves linear-lanceolate, 1–1.5 cm wide; spur 1 cm long; rachis 7–10 cm long ..... 6. *H. leptoloba*
    6b. Bracts and rachis pilose; leaves ovate-lanceolate, 3 cm wide; spur 2 cm long, or longer; racemes 30 cm long ..... 7. *H. ciliolaris*

1. **Habenaria rhodocheila** Hance

橙黃玉鳳花(紅人蘭) **(Photo 560)**

Ann. Sci. Nat. Bot. ser. 5. 5: 243. 1856; FKH 270. 1912; FRPS 17: 470, pl. 79: 1–3. 1999; FGD 7: 374. 2006; FOC 25: 157. 2009.

Perennial herb 20–25 cm tall, with a winter resting stage underground. Leaves all cauline; the lowerest one ovate or oblong, 4–8 × 1.5–3 cm; the middle one oblong-elliptic, 8–15 × 1.7–3 cm, acute at apex. Flower coral red; racemes consisting of 5–10 flowers on scape of 12–15; dorsal sepal cucullate, 1 cm; petals linear; spur 3.5–4 cm; anther with 2 parallel thecae; ovary 9 mm. Fruit unknown.

Locality: Mount Parker, Aberdeen, Kowloon Peak, Shing Mun Reservoir, Tai Mo Shan, Ng Tung Chai, Ho Chung, Lantau Island. *S. Y. Hu 10738A* (CUHK); *K. Y. Chan 1153* (CUHK); *Y. S. Lau 1739.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Fujian; Vietnam, Laos, Cambodia, Thailand, Malaysia, Philippines.

Ecology: Rocks on the banks of streams. Flowering: Apr.–May.

Uses: Ornamental.

2. **Habenaria dentata** (Sw.) Schltr.

鵝毛玉鳳花(齒片鶯蘭) **(Fig. 223; Photo 561)**

Repert. Spec. Nov. Regni Veg. Beih. 4: 125. 1919; S. Y. Hu, Genera Orchid. Hong Kong 33, fig. 9. 1977; FRPS 17: 472, pl. 78. 2. 1999; FTW ed. 2, 5: 915. 2000; FGD 7: 375. 2006; FOC 25: 157. 2009.

Orchis dentata Sw., Kongl. Vetensk. Acad. Handl. 21: 207. 1800.

Habenaria miersiana Champ. ex Benth., J. Bot. Kew Misc. 7: 37. 1855; FHK 363. 1861; FKH 270. 1912.

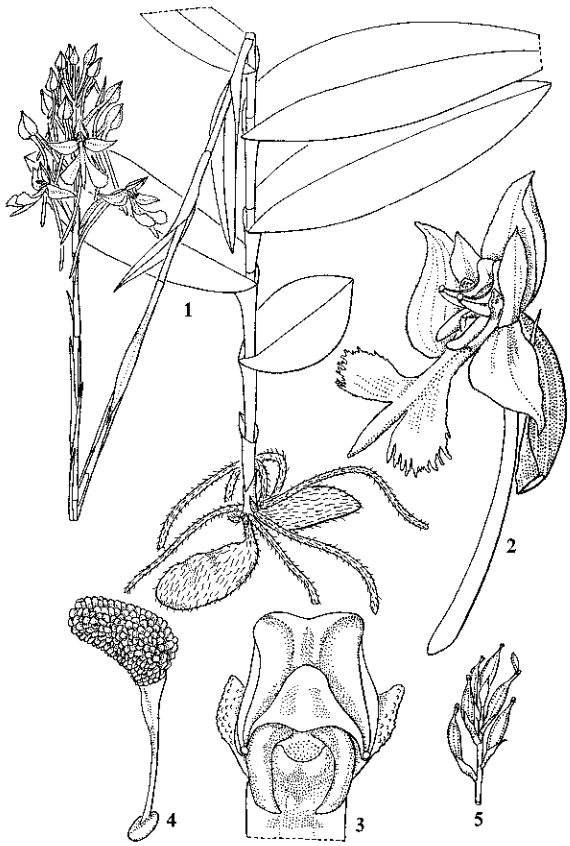

Figure 223. *Habenaria dentata* (Sw.) Schltr.
1. flowering plant; *2.* flower; *3.* front view of apical portion of column; *4.* pollinium on caudicle attached to viscidium; *5.* fruiting branch. (drawn by Teresa F. Wong)

Perennial herb 25–50 cm tall at flowering time. Leaves all cauline, the lowerest one ovate, 5 × 3 cm, apex acute; the upper ones elliptic-lanceolate, 10–15 × 2–4 cm, acute to acuminate at apex. Flowers white, in terminal spikes consisting of 8–20 flowers; sepals papillose along margin, the dorsal one ovate, 12–13 mm; lateral sepals spreading, oblique-ovate; petals small, falcate-lanceolate, 11 × 2.5 mm; lip 3-lobed, spur 4 cm; column broad; anther with divergent thecae; pollinia 2; ovary clavate, 2 cm, papillose.

Locality: Common in Hong Kong. *K. K. Mark 24(2821)* (CUHK); *P. S. Choi 5.*

Distribution: Areas S of Changjiang; Nepal, Sikkim, India, Myanmar, Vietnam, Laos, Thailand, Cambodia, Japan.

Ecology: Hillsides. Flowering: Jul.–Sep.

Uses: Ornamental.

Notes: The type specimens of *Habenaria miersiana* (*Champion 336*, K) was collected by J. G. Champion from Victoria Peak in Sep. 1847 and 1848.

3. Habenaria linguella Lindl. 坡參 **(Photo 562)**

Gen. Sp. Orchid. Pl. 325. 1835; FHK 362. 1861; FRPS 17: 467, pl. 80: 1–5. 1999; FGD 7: 372. 2006; FOC 25: 156. 2009.

Habenaria acuifera auct. non Lindl.: FKH 270. 1912.

Perennial herb up to 45–60 cm tall at flowering time. Leaves all cauline; leaf blade linear-lanceolate; 7.5–9.5 × 0.7–1.4 cm, amplexicaul at base, apex acute. Flowers bright sulphur-yellow, in a spike of 10–35 flowers; dorsal sepal ovate, 4 × 3.5 mm, obtuse; lateral sepals spreading side-wide, oblique-ovate, 4 × 2 mm; spur of lip 2.7 cm, column broad-triangular, 4 mm wide; pollinia 2; ovary clavate, 1.7 cm.

Locality: Hong Kong Island, Tai Mo Shan, Ma On Shan, Pat Sin Leng, Fanling, Yuen Long, Lantau Island. *S. Y. Hu 10706, 10784* (CUHK); *L. T. Lo 254.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan; Vietnam.

Ecology: Moist grassy slopes. Flowering: Jul.–Sep.

4. Habenaria coultousii Barretto 香港玉鳳花

Orchadian 7(1): 10, fig. 1. 1981; FRPS 17: 450. 1999; FOC 25: 152. 2009.

Perennial herb 15–45 cm tall, requiring a resting winter period underground. Leaves 3–4, lanceolate to ovate-lanceolate, 2.5–5.2 × 0.8–1.2 cm. Raceme 2–9-flowered; scape glabrous. Flowers white, 1.5–2 cm; petals oblique ovate; lip trilobate, 9–12 × 1.5 mm, spur pale yellow-green, 2–2.4 cm, longer than ovary and pedicel together; column greenish white; pollinia 2, yellow, viscidia exposed; rostellum erect, 1.5 mm, glands conical. Capsules 2.5–2.9 cm.

Locality: Violet Hill, Tai Tam. *HK sheet 34048.*

Distribution: Endemic to Hong Kong.

Ecology: Forests along streams, alt. 300 m. Flowering: Oct.

Notes: The type specimen was collected by B. Coultous from Violet Hill in 1978. Listed in *Rare and Precious Plants of Hong Kong.*

5. Habenaria reniformis (D. Don) Hook. f. 腎葉玉鳳花 **(Photos 563–564)**

Fl. Brit. India 6: 152. 1894; FKH 270. 1912; FHN 4: 192. 1977; FRPS 17: 436. 1999; FGD 7: 374. 2006; FOC 25: 149. 2009.

Listera reniformis D. Don, Prodr. Fl. Nepal 28. 1825.

Aopla reniformis Lindl., Bot. Reg. 20: t. 1701. 1834; FHK 363. 1861.

Perennial herb with a winter resting period, 18–20 cm tall at flowering time; underground tubers, 1 cm long, 7–8 mm thick. Leaves 2, basal, lying flat on the ground; the lower one larger, 2.5 cm. Flowers green-yellow, 3 to 8 in a terminal raceme; pedicels 2–3 mm; dorsal sepal ovate, 6 × 3 mm, obtuse; lateral sepals ovate, 6 × 2.5 mm, acute; petals linear-falcate, connivent with the dorsal sepal; lip yellow-green, lanceolate, 6 mm, 3-lobed; column V-shaped at apex; anther with 2 subparallel thecae; pollinia 2; ovary 1.2 cm.

Locality: Mount Parker, Victoria Peak, Ma On Shan, Sai Kung. *Y. S. Lau 1445; HK sheet 27749, 34221.*

Distribution: Hainan, Guangdong; Vietnam, Cambodia, Thailand, Nepal, India.

Ecology: Forests. Flowering: Aug.–Sep.

6. Habenaria leptoloba Benth. 細裂玉鳳花(天使蘭、仙子蘭) **(Photos 565–566)**

FHK 362. 1861; FKH 270. 1912; FRPS 17: 483. 1999; FOC 25: 159. 2009.

Perennial herb 25 cm tall, requiring winter rest; underground tubers ellipsoidal, ca. 2 cm long and 8 mm thick. Leaves basal and subcauline, oblong-lanceolate, 6–8 cm, the next two linear-lanceolate, 10–14 × 1–1.7 cm, acuminate and acute. Flowers light yellow-green, 6–14 on a terminal raceme; pedicels 1–2 mm; dorsal sepal ovate, 3.5 mm, obtuse, lateral sepals oblique-ovate; petals oblique-ovate, 4 mm; lip plane, spur calcarate; column deeply notched at apex; anther with widely separate thecae; pollinia 2; ovary cylindrical, 7–8 mm.

Locality: Victoria Peak, Cape D'Aguilar, Aberdeen, Ma On Shan, Fanling. *K. K. Mark 19(2765)* (CUHK); *K. Y. Chan 1181* (CUHK); *Y. S. Lau 2521.*

Distribution: Endemic to Hong Kong.

Ecology: Wet places near streams. Flowering: Aug.–Sep.

Notes: The type specimens were collected by C. Harland and H. F. Hance from Hong Kong Island before 1857. Listed in *Rare and Precious Plants of Hong Kong.*

7. Habenaria ciliolaris Kraenzl. 毛葶玉凰花

Bot. Jahrb. Syst. 16(2): 169. 1892, et Orch. Gen. Sp. 1: 367. 1898; FKH 270. 1912; FRPS 17: 462, pl. 76: 1–5. 1999; FTW ed. 2, 5: 914. 2000; FGD 7: 373, fig. 191. 2006; FOC 25: 155. 2009.

Perennial terrestrial herb requiring winter resting underground, to 30 cm tall at flowering time. Leaves basal, ovate or lanceolate, 8–12 × 3 cm. Flowers white or greenish-white, occasionally washed pink; 6–15 terminal to a raceme, 30 cm; rachis pedicels and ovary pilose; dorsal sepal ovate, 6–9 mm, acute or obtuse, lateral sepals ovate, recurved, 10 mm; petals erect, lanceolate, 6–7 mm; lip 3-lobed, the lateral one filiform; ovary pilose and stellate.

Locality: Hong Kong Peak. *HK sheet 7137.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Zhejiang, Fujian, Taiwan.

Ecology: Hillslopes or shaded places of forests. Flowering: Jul.–Sep.

Notes: The type specimen was collected by C. Ford (K, holotype) from Little Hong Kong in 1884.

7. Pecteilis Raf. 白蝶蘭屬

Terrestrial herbs, requiring dormancy in the cool and dry winter season. Leaves cauline, ovate-elliptic, up to 11 × 4.5 cm, entire. Flowers large, showy, in a terminal raceme; sepals ovate, spreading, all pointing upward, the lateral one connivent with the odd sepal; petals small, linear; lip 3-lobed, calcarate, the spur twice or more times longer than the ovary and pedicels together, the lateral lobes spreading, fringed, the midlobe linear, entire, obtuse; column broad, shield-like, retuse at the apex; rostellum fleshy, flat, broadly triangular, upright, rounded and notched at the apex, with long arms; anther cells divergent; pollinia 2, finely tessellate; caudicles slender, elongate; viscidia concealed; stigmas 2, below the rostellum, free from the auricles, grooved down the middle.

Seven species distributed in tropical and subtropical area of Asia; three species in China; one species in Hong Kong.

1. Pecteilis susannae (L.) Raf.

白蝶蘭(鵝毛白蝶花) **(Fig. 224; Photo 567)**

Fl. Tellur. 2: 38. 1837 ["*susanna*"]; S. Y. Hu, Genera Orchid. Hong Kong 28, fig. 6. 1977; FRPS 17: 395, pl. 62. 1–2. 1999; FGD 7: 370, fig. 190. 2006; FOC 25: 136. 2009.

Orchis susannae L., Sp. Pl. 939. 1753.

Habenaria susannae (L.) R. Br., Prod. Fl. Nepal 321. 1819; FHK 363. 1861.

Platanthera susannae (L.) Lindl., Gen. Sp. Orch. Pl. 295. 1835; FKH 269. 1912.

Perennial large herb requiring a winter rest period underground 30–40 cm tall at flowering time. Leaves all cauline, ovate-oblong, 5.5–11 × 2–4 cm, acute. Flowers fragrant, large, showy, 2–5 in a terminal raceme; pedicels 1.5 cm; dorsal sepals, suborbicular, 2.5 cm in diam.; lateral sepals 4–5 cm, pointing upward, apex obtuse; petals cornute, small, inconspicuous, 12 × 2 mm; lip long, 3-lobed at base, butterfly-like, the lateral lobes triangular, 3 × 4 cm, prominently fringed, midlobe linear, 3 × 0.6 cm; spur 12 cm, 2–3 mm in diam.; column fleshy, 1.7 × 1 cm, rounded and notched at apex; anther with widely separate thecae; pollinia 2; ovary ellipsoidal.

Locality: Hong Kong Island, Kowloon Peak, Tai Mo Shan, Pat Sin Leng, Clear Water Bay, Lantau Peak. *J. P. W. Woo 110* (CUHK); *S. P. Lau 31; Y. S. Lau 1604.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Jiangxi, Zhejiang, Fujian; Nepal, India, Myanmar, Malaysia, Indonesia.

Ecology: Forests, ditches or grassy slopes. Flowering: Jun.–Jul.

Uses: Ornamental.

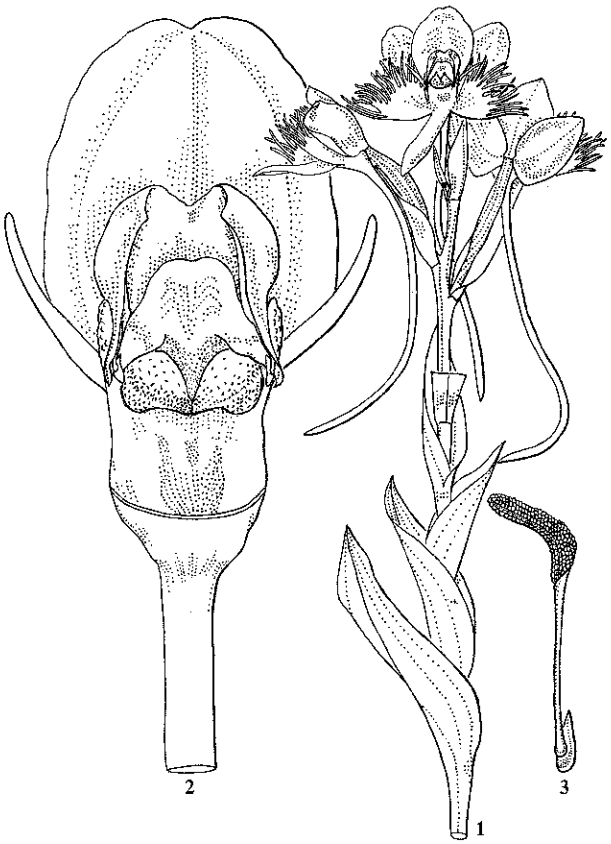

Figure 224. *Pecteilis susannae* (L.) Raf.
1. flowering shoot; *2.* front view of flower with lip and lateral sepals removed; *3.* pollinium on slender caudicle and viscidium. (drawn by Teresa F. Wong)

8. Peristylus Blume 鬧蕊蘭屬

Terrestrial herbs, with small oblong tubers on slender stalks, passing the dry cool winter in dormancy. Leaves 2 or 3, close together, usually at the ground level, 2–12 cm. Flowers small, spirally arranged in a terminal spike; sepals subequal, free, erect, connivent; petals small, below the odd sepal and with it forming a hood; lip trilobed and calcarate, the spur shorter than the ovary, the disk fleshy, recurved, often with a mound-like callus, the lateral lobes entire, filiform or rarely ovate, the midlobe ovate, obtuse; column short, conical, auricles prominent, the apex entire, rotundate; rostellum yoke-shaped; anther 2-celled, the thecae parallel; pollinia 2, obovoid, sectile, the

fragments relatively large, the caudicles short, equal or shorter than the pollinia; viscidia oblong or linear, relatively long; stigmas 2, convex, entirely adnate to the base of the lip and to the auricles of the column; ovary sessile. Capsules small, not much longer than the ovary, ellipsoidal, with persistent perianth.

About 60 species distributed in tropical and subtropical Asia and Pacific islands; 21 species in China; five species native to Hong Kong, growing along paths in forested areas or on exposed slopes.

1a. Flowers white, crowded in fusiform spikes; lobes of lip equal, ovate-triangular; spur globose, rounded at the apex; leaves 3–5.5 cm wide ..... 1. *P. goodyeroides*

1b. Flowers green or yellowish green, loosely spaced in slender spikes; lateral lobes of lip narrower than the midlobe; leaves 0.5–3.5 cm wide.

2a. Leaves ovate or ovate-elliptic, 2–4 cm long, lateral lobes of the lip ovate-falcate, 1 mm long, 0.7 mm wide; spur 4 mm long, truncate at the apex ..... 2. *P. densus*

2b. Leaves elliptic or oblong-elliptic, 3–12 cm long; lateral lobes of the lip linear or filiform, narrower than the midlobe, 0.5 mm or less wide; spur conical and pointed at the apex, or cylindrical and bilobed or pointed at the apex.

3b. Spur cylindrical, equal or longer than the lip, the apex pointed or bilobed; leaves oblong-lanceolate, 3.5–7.5 cm long, 1.5–2 cm wide ..... 3. *P. calcaratus*

3a. Spur conical, shorter than the lip, 2 mm long, the apex pointed; leaves elliptic-oblong or elliptic-lanceolate.

4a. Leaves 2 or 3, elliptic-oblong, 5–12 cm long, 1.5–3.5 cm wide ..... 4. *P. lacertifer*

4b. Leaves 3 or 4, elliptic-lanceolate, 3–6 cm long, 1–1.2 cm wide ..... 5. *P. tentaculatus*

1. Peristylus goodyeroides (D. Don) Lindl. 闊蕊蘭

Gen. Sp. Orchid. Pl. 299. 1835; FKH 269. 1912; FRPS 17: 415, pl. 66: 1–4. 1999; FTW ed. 2, 5: 995, pl. 423. 2000; FGD 7: 376. 2006; FOC 25: 141. 2009.

Habenaria goodyeroides D. Don, Prodr. Fl. Nepal. 25. 1825.

Terrestrial herb requiring a resting period in winter; natural flowering plants up to 40 cm tall, with the lower 15–20 cm bearing 2 or 3 sheathing cataphylls and 4–5 leaves in the middle. Leaves petiolate; petioles sheathing, 2.5 cm; leaf blade elliptic, 6–16 × 3–5.5 cm, base cuneate, margin undulate, apex acute. Flowers creamy-white, on scapes of 8 to 10 cm, forming a terminal, fusiform spike; dorsal sepal yellowish green, ovate, 5 × 3 mm, obtuse; lateral sepals oblique-ovate, 5 mm, obtuse, light green; petals creamy white, 4 mm long and wide, obtuse; lip white, trilobed, spur globose-ovoid; column wide, the base extending forward, united to lower margin of petals; anthers 2, thecae parallel, attached to sides of column; pollinia 2, sectile; ovary 4 mm.

Locality: Hong Kong Island, Tai Mo Shan, Lantau Island. *L. T. Lo 380; HK sheet 7155, 7156.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hubei, Hunan, Jiangxi, Zhejiang, Taiwan; Bhutan, Nepal, India, Myanmar, Laos, Vietnam, Thailand, Cambodia, Malaysia, Philippines, Indonesia, New Guinea.

Ecology: Exposed grassy hillsides. Flowering: Jul.–Aug.

2. Peristylus densus (Lindl.) Santapau & Kapadia 稠密闊蕊蘭(狹穗闊蕊蘭) **(Photos 568–569)**

J. Bomb. Nat. Hist. Soc. 57: 128. 1960; FRPS 17: 405, pl. 64: 1–3. 1999; FGD 7: 377, fig. 192. 2006; FOC 25: 139. 2009.

Coeloglossum densum Lindl., Gen. Sp. Orchid. Pl. 302. 1835.

Habenaria stenostachya (Lindl. ex Benth.) Benth., FHK 362. 1861.

Platanthera stenostachya Lindl. ex Benth., J. Bot. Kew Misc. 7: 37. 1855; FKH 269. 1912.

Terrestrial herb requiring a resting period in winter, 25 cm tall at flowering time. Leaves 6 or 7, petiolate; petioles sheathing, 7–10 mm; leaf blades ovate or ovate-elliptic, 2–4 × 0.5–2 cm, acute. Flowers yellowish green, sessile, in terminal spike of 6–7 cm; dorsal sepal 3 × 1.5 mm, apex rounded; lateral sepals 3 × 1 mm; petals erect, narrowly ovate-oblong, obtuse; lip 3-lobed; spur 4 mm; column short; anthers parallel.

Locality: Victoria Peak, Lantau Island. *HK sheet 7151, 27804.*

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Jiangxi, Fujian, Zhejiang; India, Burma, Myanmar, Thailand, Vietnam, Bangaladesh.

Ecology: Forests and grasses. Flowering: Jun.

Uses: Medicinal (folklore).

Notes: The type specimen of *Platanthera stenostachya* was collected by J. G. Champion from Hong Kong Island between 1847 and 1850.

3. Peristylus calcaratus (Rolfe) S. Y. Hu 長鬚闊蕊蘭 **(Photos 570–571)**

Quart. J. Taiwan Mus. 26: 398. 1973; 27: 160, 460, fig. 22. 1974; FRPS 17: 404. 1999; FTW ed. 2, 5: 994. 2000; FGD 7: 378. 2006; FOC 25: 139. 2009.

Glossula calcarata Rolfe, Bull. Misc. Inform. Kew 1913(4): 145. 1913.

Terrestrial herb 25–30 cm tall. Leaves 4, crowded at the base of stem just above ground level; leaf blades obovate-oblanceolate, the middle two larger, 3.5–7.5 × 1.5–2 cm, apex acute. Flowers green or yellowish green, 20–35 in a terminal spike; dorsal sepal ovate-oblong, 3 × 2 mm, obtuse; lateral sepals obovate, conduplicate and turning outward, 3.5 mm; petals light green, oblique-ovate, with the

inner half below the odd sepal, forming a hood, apex rounded, base connate to the column arm; lip yellow-green, 3-lobed, the lateral lobes filiform, 1–1.2 cm, midlobe tongue-like, 1.5 × 1 mm; spur clavate, 5 mm, apex bilobate; column short; anthers 2, parallel; pollinia 2; ovary 6 mm, cylindrical, slightly twisted at base.

Locality: Tai Tam Tuk, Cloudy Hill, Tsing Yi, Tung Chung. *S. Y. Hu 10860, 10946* (CUHK); *HK sheet 7158, 7159.*

Distribution: Guangdong, Guangxi, Yunnan, Jiangsu, Hunan, Zhejiang, Jiangxi, Taiwan; Indochina.

Ecology: Forests and grassy hillsides. Flowering: Aug.

Notes: The syntypes of *Glossula calcarata* (*Hongkong Herb. No. 9620, 9621*, K, HK) were collected by E. A. Voretzsch from Mount Gough in 1911.

4. Peristylus lacertifer (Lindl.) J. J. Sm.
撕唇闊蕊蘭 **(Fig. 225; Photo 572)**

Bull. Buitenz. 3. s. 9: 23. 1927; FRPS 17: 418, pl. 64: 9–11. 1999; FTW ed. 2, 5: 998. 2000; FOC 25: 142. 2009.

Peristylus chloranthus Lindl., J. Bot. Kew Misc. 7: 37. 1855; FKH 269. 1912.

Coeloglossum lacertiferum Lindl., Gen. Sp. Orchid. Pl. 302. 1835.

Habenaria lacertifera Benth., FHK 362. 1861.

Peristylus spiranthes (Schauer) S. Y. Hu, Chung Chi Journal 13(2): 2, fig. 1. 1976, et Genera Orchid. Hong Kong 34, fig. 10. 1977.

Perennial herb 1.5–3 cm tall. Leaves 2–3, crowded at ground level; leaf blades variable according to locality, lanceolate, ovate or ovate-elliptic, 5–12 × 1.5–3.5 cm, acute. Flowers small, 12–16 in a terminal spiral spike; the odd sepal erect, 1.8 mm wide; lateral sepals 3–3.5 mm; petals hidden by sepals; lip trilobate, lateral lobes linear; column green, 1.5 mm, spur pointed; column green; anther with parallel thecae; pollinia 2; ovary 1 cm, glabrous.

Locality: Common in Hong Kong. *Hu & But 21082* (CUHK); *H. C. Tang 1023; Y. S. Lau 128.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Fujian; SE Asia.

Ecology: Grassy hillside in partial shade at the foot of banks along seldom used paths, forests and thickets. Flowering: Jul.–Aug.

Notes: The species was reported as *Peristylus lacertiferus* (Lindl.) J. J. Sm. previously (Check List HK Plants 381. 2002; 132. 2004).

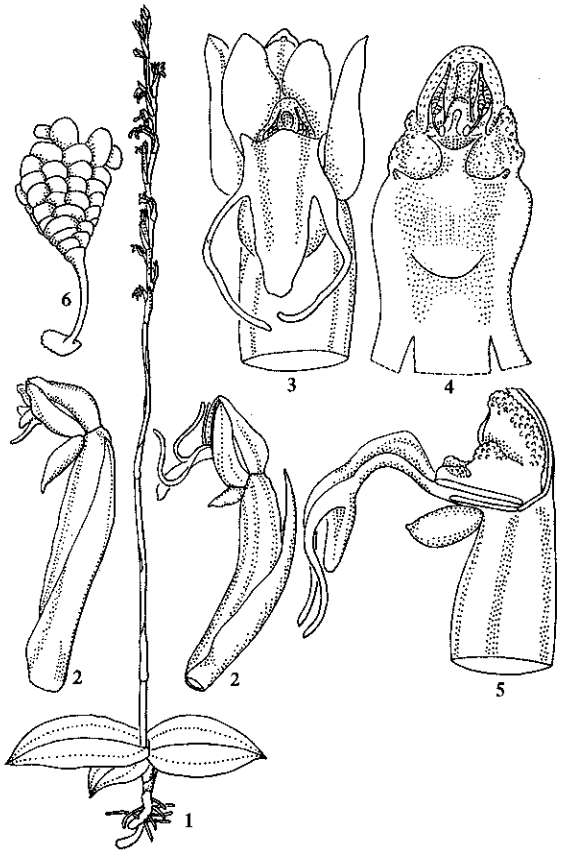

Figure 225. *Peristylus lacertifer* (Lindl.) J. J. Sm.
1. flowering plant; *2.* lateral view of flowers; *3.* front view of flower with portion of ovary removed; *4.* front view of flower with all sepals and petals removed; *5.* lateral view of flower; *6.* sectile pollinium with short caudicle and viscidium. (drawn by Teresa F. Wong)

5. Peristylus tentaculatus (Lindl.) J. J. Sm.
觸鬚闊蕊蘭 **(Photo 573)**

Fl. Buitenz. 6: 35. 1905; FRPS 17: 401, pl. 64: 4–6. 1999; FGD 7: 378. 2006; FOC 25: 139. 2009.

Glossula tentaculata Lindl., Bot. Reg. 10: pl. 862. 1825; FKH 270. 1912.

Glossaspis tentaculata (Lindl.) Spreng., Syst. 3: 694. 1826; FHK 361. 1861.

Terrestrial herb requiring a winter rest period underground; plants 17–30 cm high at flowering time. Leaves 3–4, crowded at the lower portion of stem; petioles sheathed, 4–6 mm; leaf blades elliptic, 3–6 × 1–1.2 cm, apex obtuse. Flowers green, 20–50 in a spike; sepals herbaceous, the dorsal one triangular, the lateral two oblique-falcate; petals light green, ovate, 3–4 mm; lip 3-lobed, the lateral lobes slender, elongate, filiform, 1–2.5 cm, the midlobe ovate-lanceolate, pointing down, 2–4 × 0.75 mm; spur subglobose, 2–2.75 mm; column short; ovary 6–7 mm, twisted.

Locality: Common in Hong Kong. *S. Y. Hu 11456, 13062* (CUHK); *HK sheet 35658.*

Distribution: Hainan, Guangdong, Guangxi, Zhejiang, Fujian; Vietnam, Thailand, Cambodia.

Ecology: Damp grassy banks, rocks along streams. Flowering: Sep.–Mar. of the following year.

Uses: Medicinal (folklore).

9. Disperis Sw. 雙袋蘭屬

Small succulent terrestrial herbs, overwinter in a dormant stage in form of small globose tubers. Stems slender, bearing 3 cataphylls and 2 tiny ovate cauline leaves. Flowers small, 1–2, axillary to leafy bracts, terminal to a tiny stem; sepals spreading, the odd one erect, suborbicular, with the petals forming a shield behind the column, the lateral sepals connate at the base, separated at the middle, bending at an angle of 90°, calcarate; petals erect; column conical, obtuse; rostellum broad triangular, stipitate, with slender long and curved arms;

anther 2-celled, the cells divergent; pollinia 2, small, sectile; caudicles elongate, the viscidia exposed; stigmas 2; ovary cylindrical.

About 75 species predominantly African, with a few species in tropical Asia, Australia and Pacific islands; two species in China; one species endemic to Hong Kong.

1. Disperis lantauensis S. Y. Hu
香港雙袋蘭(象鼻蘭) **(Fig. 226)**

Chung Chi Journal 11(1): 17, fig. 3(a–c). 1972; Quart. J. Taiwan Mus. 26(3–4): 376. 1973; Genera Orchid. Hong Kong 36, fig. 11. 1977; FRPS 17: 494. 1999 ["*D. nantauensis*"]; Kurzweil, Blumea 50: 145. 2005 & FOC 25: 165. 2009, pro syn. sub *Disperis neilgherrensis* Wight (1851).

Perennial terrestrial herb, 5 cm tall at flowering time, with an underground corm 4 mm in diam. Leaves cauline, sessile, ovate, 4 mm long and wide, entire, acute. Flowers solitary or two, terminal to stem; dorsal sepal erect, orbicular, 4 mm in diam.; petals oblique elliptic, 2 mm, base oblique cuneate, apex acute, forming a shield with the dorsal sepal, lateral sepals connate at base, 5 mm between apex, each with an obtuse spur; ovary and pedicel forming a cylinder of 6 mm.

Locality: Kowloon Peak, Ma On Shan, Sunset Peak, Lantau Peak. *G. Barretto 295.*

Distribution: Endemic to Hong Kong.

Ecology: Grassy mountain slopes. Flowering: Jul.

Notes: The holotype specimen (*S. Y. Hu 10812,* A) was collected by S. Y. Hu from Sunset Peak, Lantau Island on 30 Jul. 1970. Some authors (e.g. Seidenfaden, Bot. Tidsskr. 65: 103. 1969; Kurzweil, 2005) adopted a broad species concept which included all Asian species under the synonymy of *Disperis neilgherrensis, sensu lato,* which is known for the high variability in characters used previously to delimit such taxa.

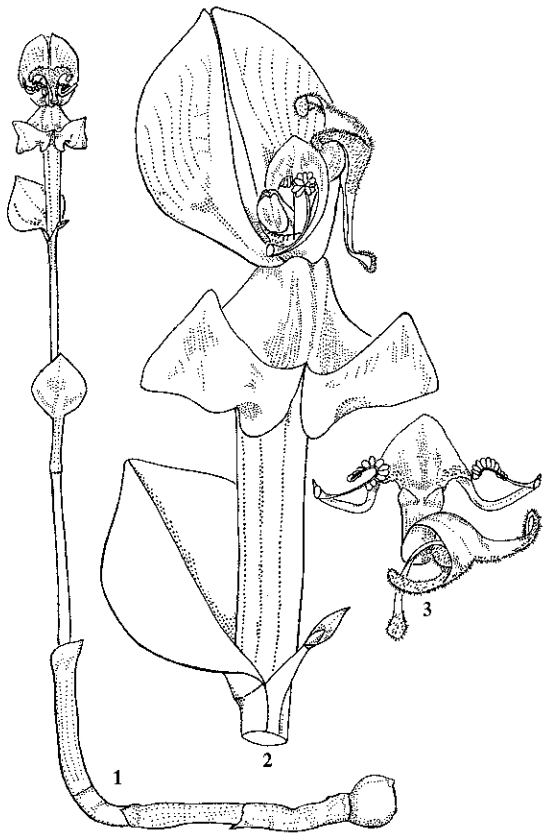

Figure 226. *Disperis lantauensis* S. Y. Hu
1. flowering plant; *2.* apical portion of plant; *3.* lip (front) and rostellum (back) with 2 lateral arms each bearing 1 viscidium. (drawn by Teresa F. Wong)

10. Tropidia Lindl. 竹莖蘭屬

Terrestrial herbs; rhizome ascending, stout; roots wiry, fibrous. Stem erect, rigid, branched or unbranched, noded, with sheaths at nodes. Leaves 2–many, plicate, ovate to narrowly lanceolate, base contracted into amplexicaul sheaths. Inflorescence a short raceme or panicle, terminal or arising from leaf axils near apex of stem, several- or many-flowered. Flowers usually in 2 alternate rows, rarely clustered; sepals narrow, subequal, the lateral ones broader than the odd one, connate at the base and enclosing the lip; petals subsimilar to the odd sepal; lip undivided, equal to the sepals in length, canaliculate, embracing the column, shortly calcarate, acuminate at the apex; column short, bearing the anther on the back; anther erect, ovate-acuminate; pollinia 2, caudicles subulate, viscidium peltate; rostellum elongate, the sides dilated and membranous partially covering the anther, the apex subulate, bifid; ovary oblong. Capsules ovoid-oblong.

About 20 species distributed in tropical Asia and Pacific islands; four species in China; one species in Hong Kong.

1. Tropidia curculigoides Lindl.
短穗竹莖蘭(仙茅竹莖蘭) **(Fig. 227; Photos 574–575)**

Gen. Sp. Orch. Pl. 497. 1840; FHK 359. 1861; FRPS 17: 122. 1999; FTW ed. 2, 5: 1057. 2000; FGD 7: 342, fig. 171. 2006; FOC 25: 195. 2009.

Tropidia hongkongensis Rolfe, J. Linn. Soc. Bot. 36(249): 40. 1903; FKH 267. 1912; S. Y. Hu, Genera Orchid. Hong Kong 53, fig. 23. 1977.

Figure 227. *Tropidia curculigoides* Lindl.
1. habit. (drawn by Teresa F. Wong)

Terrestrial herb, 30–70 cm tall at flowering time, with short and thick rhizome and fibrous roots. Stems erect, unbranched or occasionally branched, internodes usually 2–4 cm. Leaves elliptic-lanceolate, 15–25 × 2–4 cm, apex acuminate. Flowers green-white, in terminal or axillary racemes; sepals lanceolate, 7–10 mm, base of the lateral two connate; petals 6–8 mm; lip ovate-lanceolate, acute; column 3 mm; anthers 1.5 mm. Capsules oblong, 2 cm.

Locality: Hong Kong Island, Tai Mo Shan. *HK sheet 7119.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Xizang, Taiwan; India, Sikkim, Myanmar, Vietnam, Cambodia, Thailand, Malaysia, Indonesia.

Ecology: Shady area along streams. Flowering: Jul.–Aug.

11. Cheirostylis Blume 叉柱蘭屬

Terrestrial or epiphytic herbs; rhizomes short, hairy on the contact surface, clinging to wet boulders below trees along streams. Leaves basal, petiolate, ovate or elliptic. Flowers small, inconspicuous, in a terminal small raceme; sepals connate, forming a tube above the middle; petals white, very small, mostly concealed; lip adnate to the sides or rarely to the base of the column, unguiculate, the claw with inflexed margin or simple and without folding margin, the apex dilated, often bilobed and fringed or dentate, rarely undivided and entire, the base furnished with 2 calli, rarely without callus; column short, the apex furnished with 2 glossy glands and produced into an elongate appendage on each side; rostellum long and deeply cleft; anther ovate-acuminate, deeply sunk in the clinandrium; pollinia 4 in 2 pairs, sectile, with or without slender caudicle; viscidium oblong or obovate, cuneate; stigmas 2, connivent to the lateral glands; ovary ovoid or oblanceolate. Capsules succulent.

About 20 species distributed in tropical Africa, tropical Asia and Pacific islands; 13 species in China; five species in Hong Kong.

1a. Ovary and calyx tube hairy.
- 2a. Leafy stem 5–7 cm tall; leaves cauline, scattered ..... 1. *C. liukiuensis*
- 2b. Leafy stem usually no more than 3(–5) cm tall; leaves subrosulate or congested at base.
  - 3a. Lip fringed; hairs on ovary and calyx glandular; calli consisting of 2 rows of teeth ..... 2. *C. chinensis*
  - 3b. Lip dentate; hairs on ovary and calyx not glandular; calli tricuspidate ..... 3. *C. jamesleungii*

1b. Ovary and calyx tube glabrous.
- 4a. Lip bilobed and fringed at the apex; base of lip subsaccate, with two bifid and horn-like calli ..... 4. *C. monteiroi*
- 4b. Lip simple, entire; base of lip unguiculate, without any calli ..... 5. *C. clibborndyeri*

1. Cheirostylis liukiuensis Masam. 琉球叉柱蘭

J. Soc. Trop. Agric. 2: 36. 1930; FTW ed. 2, 5: 800. 2000; FOC 25: 60. 2009.

Perennial herb, 5–9 cm tall; rhizome moniliform, 8–10 mm in diam., sometimes branching, fleshy; roots hair-like. Leaves 3–4, scattered along stem; leaf blades ovate to ovate-orbicular, 2–3 × 1–2 cm, base rounded or slightly cordate, apex acute, abaxially reddish purple, adaxially dark greyish green; petiole-like base and sheath 0.7–1 cm. Flowers white or greenish white, 5 or 7 in a terminal raceme. Peduncle hairy, initially ca. 5 cm, gradually elongate to 10–20 cm after anthesis; pedicels 2–3 mm; calyx tubular, pubescent, 4.5–5 mm including the 2.5 mm free portions; petals white, 4.5 mm, oblong-oblanceolate; lip white, 6 mm, tripartite; column erect, 2.2–2.4 mm, with 2 arms at the apex; anther broadly ovoid; pollinia ca. 1.2 mm; ovary ellipsoidal, pubescent.

Locality: Sha Tin (Siu 2000).

Distribution: Taiwan; Japan (Ryukyus).

Ecology: Shade of forest-ravines. Flowering: Jan.–Feb.

2. Cheirostylis chinensis Rolfe

中華叉柱蘭(甌蘭) **(Fig. 228; Photo 576)**

Ann. Bot. 9: 158. 1895, et J. Linn. Soc. Bot. 36: 43. 1903; S. Y. Hu, Genera Orchid. Hong Kong 44, fig. 16. 1977; FRPS 17: 166, pl. 21: 12–15. 1999; FTW ed. 2, 5: 796, pl. 335. 2000; FGD 7: 355. 2006; FOC 25: 62. 2009.

Perennial saxicolous small herb; rhizomes succulent, 4.5 cm long, 1.2 cm thick; stem erect. Leaves ovate-cordate, 2.5–4 × 2–3 cm, acute. Flowers white, resupinate, 4–5 in a terminal raceme; scape 15–20 cm, villose glandular; pedicels 2–3 mm; calyx urceolate, 6–7 mm, tube 4 mm, 3-lobed, the odd lobe dorsal;

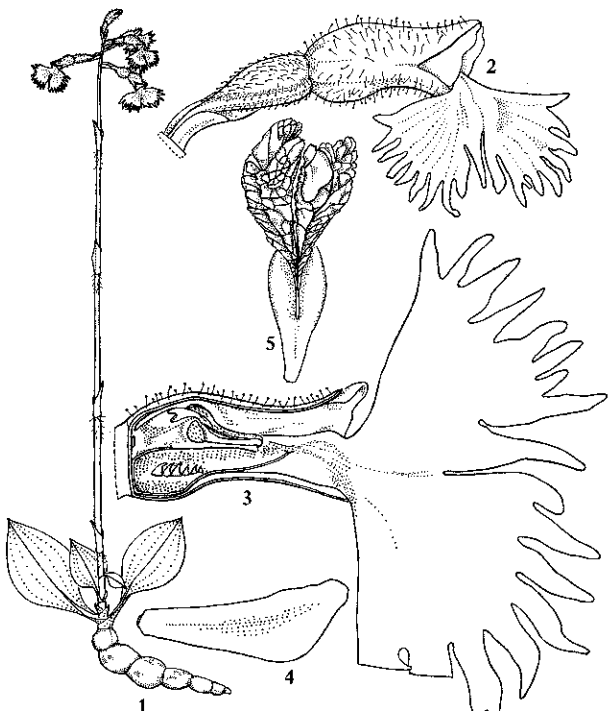

Figure 228. *Cheirostylis chinensis* Rolfe

1. flowering plant; *2.* lateral view of flower; *3.* lateral view of flower with half of calyx, half of basal portion of lip and 1 petal removed; *4.* oblanceolate petal obliquely truncate at apex; *5.* four pollinia in 2 pairs attached to elliptic viscidium. (drawn by Teresa F. Wong)

petals oblique lanceolate, 5 mm; lip bilobed, base gibbous, bilobed at the apex, fringed; column 2 mm; anthers orange; pollinia 4 in 2 pairs, granular; ovary glandular-villose.

Locality: New Territories, Lantau Island. *Y. W. Lam 205; HK sheet 33354.*

Distribution: Guangxi, Guizhou, Taiwan; Philippines.

Ecology: Damp moss-covered rocks in forests. Flowering: May–Jun.

3. Cheirostylis jamesleungii S. Y. Hu & Barreto 粉紅叉柱蘭(毛甌蘭)

Chung Chi Journal 13(2): 13, fig. 6. 1976; FRPS 17: 166. 1999; FGD 7: 355. 2006; FOC 25: 62. 2009.

Small succulent perennial herb, before flowering, the plant consisting of a worm-like rhizome, 4–5 cm long, 2–6 mm in diam., with 6–7 internodes. At flowering time, a slender scape 10 cm high emerged from the apical end. Leaves 3 terminal to rhizome, petiolate; leaf blade cordate, 3–8 mm long and wide, acute, papillose. Flowers 2–3, subsessile; calyx 4 mm, oblique tubular; petals oblique-lanceolate; lip white, 2-lobed, 5 mm, 3 mm across apex, each lobe with 5–6 coarse teeth; anther dorsal; pollinia 4 in 2 pairs; ovary villose, 5 mm, pink.

Locality: Lantau Island *S. Y. Hu 9720A* (K).

Distribution: Endemic to Hong Kong.

Ecology: Moist places, alt. 600 m. Flowering: Mar.

Notes: The holotype specimen (*S. Y. Hu 9720A*, K) was collected by J. Leung from Lantau Island on 22 Mar. 1970.

4. Cheirostylis monteiroi S. Y. Hu & Barreto 箭藥叉柱蘭(大花甌蘭) **(Photo 577)**

Chung Chi Journal 13(2): 15, fig. 7. 1976; FRPS 17: 169. 1999; FGD 7: 356. 2006; FOC 25: 61. 2009.

Cheirostylis flabellata auct. non Wight: Icon. Pl. Ind. Orient. 5: 16, pl. 1727. 1852; FKH 267. 1912.

Perennial succulent saxicolous herb; rhizomes fleshy, with 4–6 internodes. Leaves 2–3, ovate, 1.2–1.6 × 0.8–1 cm, acute or acuminate. Flowers white, 2–8 terminal to a scape of 7–9 cm; calyx tubular, without distinct sepals, glabrous, tube 3 mm; lobes 2 mm; petals white, oblique-lanceolate, 5 × 1.5 mm; lip bilobed, 4.5 mm, adnate to column, apical lobes suborbicular, 7 mm in diam., white with green centre, fringed; column 1 mm, with an anterior arm of 1.5 mm on each side; anther yellow, sagittate; pollinia 4 in 2 pairs; ovary cylindrical, 5–6 mm, glabrous.

Locality: Mount Parker, Violet Hill. *S. Y. Hu 13056* (CUHK); *U. A. On s.n.* (*HK sheet 7133*).

Distribution: Endemic to Hong Kong.

Ecology: Rocks in ravine of forests, alt. 300 m. Flowering: Mar.–May.

Notes: The type specimen (*S. Y. Hu 13056*, K, holotype; A, CUHK, HK, PE, isotypes) was collected by R. Clibborn-Dyer from Violet Hill on 6 Mar. 1973. Listed in *Rare and Precious Plants of Hong Kong*.

5. Cheirostylis clibborndyeri S. Y. Hu & Barreto 叉柱蘭(太魯閣叉柱蘭) **(Photos 578–579)**

Chung Chi Journal. 13(2): 15, fig. 8. 1976; FOC 25: 60. 2009.

Cheirostylis hungyehensis T. P. Lin, Native Orch. Taiwan 2: 73(f.) 1977; FTW ed. 2, 5: 798, pl. 336. 2000.

Cheirostylis tatewakii auct. non Masam.: Masam. ex S. S. Ying, Col. Illust. Fl. Taiwan 4: 802. 1992; FRPS 17: 164. 1999; FGD 7: 355. 2006; Check List HK Plants 373. 2002; 130. 2004.

Small succulent perennial herb, 12–15 cm tall at flowering time; rhizome worm-like, 4–6 cm, fleshy, consisting of 4 to 6 internodes, those on the ends thinner. Leaves 3 or 4, terminal to the apical end; leaf blades ovate, 1–2 × 0.7–1.2 cm, green and variegated with lighter green bands, apex acute. Flowers white or greenish white, 5 or 6 in a raceme terminal to a scape of 12–15 cm; pedicels 2 or 3 mm; calyx tubular, 5 mm including the 2 mm free portions; petals white, 5 mm, oblanceolate-spathulate; lip white, unguiculate, entire, 2–5 mm, apex tongue-like, 2 mm; column 1 mm, with 2 arms at the apex, each with a gland; anther sagittate, orange; pollinia 4 in 2 pairs, granular; ovary ellipsoidal, 5 cm, glabrous. Fruit ovoid-ellipsoidal, 7 mm, with tubercles on ridges.

Locality: Common in Hong Kong. *S. Y. Hu 9900, 13055* (CUHK); *L. T. Lo 289; Y. W. Lam 216.*

Distribution: Taiwan.

Ecology: Wet rocks in shade of forest-ravines and hillslopes. Flowering: Jan–Apr.

Notes: The type specimen (*S. Y. Hu 13055*, K, holotype; A, CUHK, HK, PE, isotypes) was collected by R. Clibborn-Dyer from Victoria Peak on 6 Mar. 1973.

12. Anoectochilus Blume 開唇蘭屬

Terrestrial herbs; rhizomes short, hairy on the contact surface, clinging to wet boulders below trees along streams. Leaves basal, petiolate, ovate or elliptic. Flowers small, inconspicuous, in a terminal small raceme; sepals connate, forming a tube above the middle; petals white, very small, mostly concealed; lip adnate to the sides or rarely to the base of the column, unguiculate, the claw with inflexed margin or simple and without folding margin, the apex dilated, often bilobed and fringed or dentate, rarely undivided and entire, the base furnished with 2 calli, rarely without callus; column short, the apex furnished with 2 glossy glands and produced into an elongate appendage on each side; rostellum long and deeply cleft; anther ovate-acuminate, deeply sunk in the clinandrium; pollinia 4 in 2 pairs, sectile, with or without slender caudicle; viscidium oblong or obovate, cuneate; stigmas 2, connivent to the lateral glands; ovary ovoid or oblanceolate. Capsules succulent.

About 40 species distributed in tropical Asia and Pacific islands; 20 species and two varieties in China; one species in Hong Kong.

1. Anoectochilus yungianus S. Y. Hu
香港金線蘭(容氏開唇蘭) **(Fig. 229; Photo 580)**

Quart. J. Taiwan Mus. 24(3–4): 257, fig. 1a, 2a–e. 1971; 25(1–2): 50. 1972; S. Y. Hu, Genera Orchid. Hong Kong 45, fig. 17. 1977; FRPS 17: 221. 1999; FGD 7: 364. 2006; FOC 25: 79. 2009, pro syn. sub *A. roxburghii*.

Terrestrial herb, 10–20 cm tall, the basal 3–5 internodes lying on the forest floor having the appearance of rhizome, the distal upright portion consisting of 4 or 5 internodes, short and bearing a rosette of leaves. Leaves petiolate, leaf blades ovate, 1.5–5 × 1–3 cm, base subtruncate, apex acute, velvety green above, purple beneath, with 5 coral-red veins and distinct reticulation of veinlets. Flowers white, 4–5, in a terminal raceme; pedicels 2–3 mm; sepal distinct, villose, the dorsal one ovate, strongly recurved at the apex, gibbous at base; the lateral two spreading, 6–7 mm; petals white, falcate, oblique, 6–7 mm, flush with the margin of the odd sepal and lining its inside; lip white, with a conical spur, attached to column, bending at an angle of 90°, fringed on the sides, prolonged into 2 terminal lobes (epichile); column short, with 2 front wings; anther ovoid, apex long, pointed; pollinia 2, sectile; ovary 13–16 mm, villose, hairs glandular.

Locality: Tai Mo Shan, Ma On Shan. *C. P. Lau 173* (CUHK); *Y. S. Lau 3230; Y. W. Lam 1171.*

Distribution: Endemic to Hong Kong.

Ecology: Shade and moist places in forests, alt. 400 m. Flowering: Nov.– Jan. of the following year.

Notes: The type specimen was collected by S. Y. Hu from Tai Mo Shan in 1971.

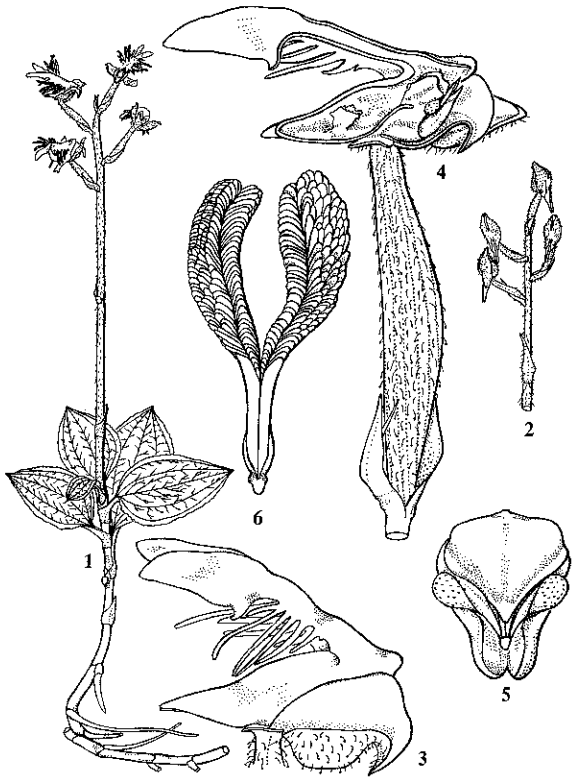

Figure 229. *Anoectochilus yungianus* S. Y. Hu
1. flowering plant; *2.* apical portion of scape; *3.* lateral view of upper portion of flower with 1 lateral sepal removed; *4.* lateral view of flower with bract and ovary, with half of dorsal sepal, 1 lateral sepal, 1 petal, and half of lip removed; *5.* apical portion of column; *6.* two pollinia with long caudicles and viscidium. (drawn by Teresa F. Wong)

13. Ludisia A. Rich. 血葉蘭屬

Terrestrial perennial herbs; rhizome creeping, rooted on nodes; stem erect. Leaves alternate, ovate, dark purple with golden veins. Flowers white, in a terminal raceme, resupinate; sepals subequal, lateral ones spreading backward; petals connivent with the dorsal sepal; lip twisted, saccate, widened, divergently bilobed; column twisted, apex enlarged; rostellum bilobed; anther ovate, acuminate, pollinia 2, sectile; viscidium oblong; stigma 1, on plain side of the column; ovary hairy.

About four species distributed in India, Myanmar, Indochina to Indonesia; one species in China and Hong Kong.

1. Ludisia discolor (Ker Gawl.) A. Rich.
血葉蘭(石靈) **(Fig. 230; Photos 581–582)**

Dict. Class. Hist. Nat. 7: 437. 1825; FHN 4: 199, fig. 1089. 1977; S. Y. Hu, Genera Orchid. Hong Kong 47, fig. 18. 1977; FRPS 17: 157. 1999; FGD 7: 353, fig. 178. 2006; FOC 25: 55. 2009.

Goodyera discolor Ker Gawl., Bot. Reg. 4: 271. 1818.

Haemaria discolor (Ker Gawl.) Lindl., Gen. Sp. Orch. 490. 1840; FHK 361. 1861; FKH 267. 1912.

Saxicolous herb clinging onto bare damp rock; stem creeping, succulent, 8–15 cm, internodes 7–8 mm in diam.; ascending stems 12–40 cm tall, bearing 4–5 leaves with pink petioles, midrib and margin. Leaves oblong-elliptic, 2.5–6 × 1.2–2.5 cm, apex acute and mucronate, metallic green above, reddish maroon beneath. Flowers white; dorsal sepal and petals forming a white shell of 9–10 mm long and 3 mm wide; lateral sepals white with pink tips,

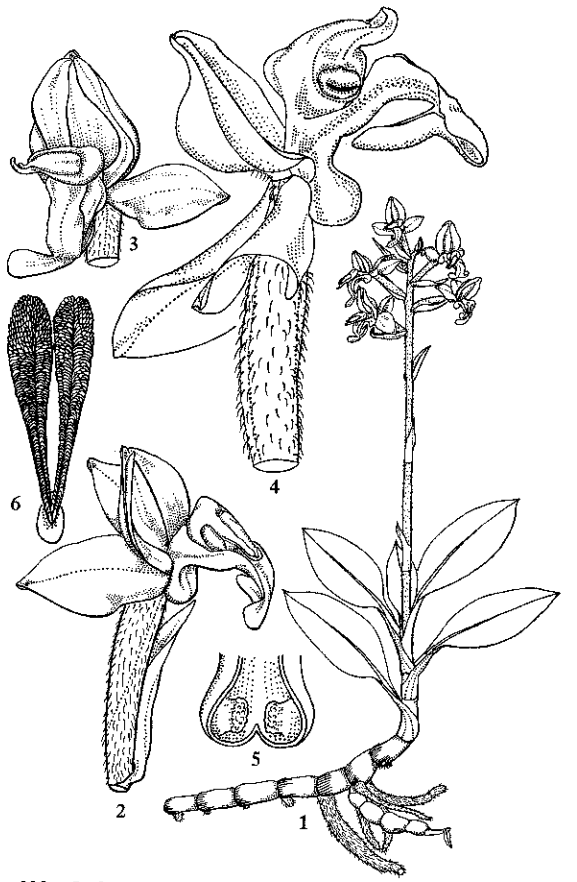

Figure 230. *Ludisia discolor* (Ker Gawl.) A. Rich.
1. flowering plant; *2–4.* flowers; *5.* spur of lip; *6.* two pollinia attached to viscidium. (drawn by Teresa F. Wong)

ovate, 8 × 5 mm, twisted at base, turning backward; petals falcate, 8–10 × 2.5 mm, obtuse; lip white, saccate at base, adnate to the column, the apical lobe tongue-like, bilobed, one curving backward, the other stretching forward; column 3 mm, apical end enlarged, the sides and front extending forward, forming a twisted beak-like rostellum; anther elongate-ovate, yellow, fitting into the centre of the beak, apex acuminate; pollinia 2, tessellate; ovary hairy. Fruit an oblong capsule.

Locality: Hong Kong Island, Castle Peak, Sha Tin, Pat Sin Leng, Lantau Island. *S. Y. Hu 13144, 13274* (CUHK); *HK sheet 41805.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan; Myanmar, Thailand, Vietnam, Malaysia, Indonesia.

Ecology: Shade and moist places in forests. Flowering: Mar.–Apr.

Uses: Medicinal (folklore), ornamental.

Notes: Listed in *Rare and Precious Plants of Hong Kong.*

14. Goodyera R. Br. 斑葉蘭屬

Terrestrial herbs with creeping or suberect rhizomes, and fibrous roots. Leaves cauline, petiolate, ovate or ovate-elliptic. Flowers small or medium-sized, in a terminal spike; sepals subequal, the odd one ovate, concave, the lateral ones spreading sidewise or backward; petals connivent with the odd sepal and with it forming a hood; lip adnate to the base or basal sides of the column, undivided, concave, ventricose, or subsaccate, fimbriate or villose on the inside, recurved at the apex; column subterrete, short; clinandrium dilated, the margin continued with the rostellum forming a cup; rostellum long, divided into 2 arms; anther ovate, acuminate; pollinia 4 in 2 pairs, sectile, oblong-acuminate; caudicles slender; viscidium oblong or linear; stigma concave, large; ovary subterete, striate-sulcate. Capsules erect, obovoid or oblong, erostrate, with persistent perianth at the apex.

About 40 species mainly in N temperate regions, but with some species extends southwards to Mexico, SE Asia, Australia and Pacific islands; 29 species in China; five species in Hong Kong.

1a. Leaves with fine white network on adaxial surface; petals irregularly toothed ..... 1. *G. yangmeishanensis*
1b. Leaves uniformly green, without white network, or only the 3 main veins silver-coloured; petals entire.
2a. Rhizomes suberect; leaves elliptic, 6–12 × 1.3–4.5 cm; scapes 8–35 cm; flowers 30 or more, 2–3 mm across, inconspicuous, white ..... 2. *G. procera*
2b. Rhizomes creeping; leaves ovate-elliptic, 2.5–7 × 1.5–3.6 cm; scapes 10–17 cm; flowers 1–5, 8–25 mm across.
3a. Lateral sepals spreading sidewise; ovary and sepals glandularly hairy; lip adnate to the basal sides of the column ..... 3. *G. foliosa*
3b. Lateral sepals spreading backward; ovary and sepals without glandular hairs; lip attached to the base of the column.
4a. Flowers 2–5 to a scape; lateral sepals 4 mm wide; stigma concealed by high margin of a pouch; leaves greyish brown ..... 4. *G. viridiflora*
4b. Flowers 1–3 to a scape; lateral sepals 7 mm wide; stigma subtruncate, not concealed by high margin; leaves shiny green ..... 5. *G. seikoomontana*

1. Goodyera yangmeishanensis T. P. Lin 小小斑葉蘭

Native. Orch. Taiwan 2: 173. 1977; FTW ed. 2, 5: 914. 2000; FOC 25: 54. 2009.

Goodyera shixingensis K. Y. Lang, Act. Phytotax. Sin. 34(6): 636, fig. 2. 1996; FRPS 17: 140, fig. 18: 5–6. 1999; FGD 7: 349. 2006.

Small terrestrial herb; stem erect from the creeping base, 8–11 cm tall, reddish or reddish brown, bearing 3–5 leaves near the base. Leaves petiolate; leaf blades ovate to elliptic, 1.5–4.5 × 0.8–1.5 cm, base rounded, apex acute, dark green, with fine white network on adaxial surface; petiole 1–1.5 cm, dilated and amplexicaul at base. Peduncle 5–8 cm, glabrous proximally, hairy distally; floral bracts ovate-lanceolate, ca. 6 × 3.2 mm, apex caudate-acuminate, serrulate or entire at base. Flowers small, several to more than 10 in a terminal raceme, and usually turning on one side; sepal greenish brown, dorsal one ovate-elliptic, 3–3.3 × 2.5 mm; lateral ones obliquely ovate, 4 × 2.8 mm; petals white, obliquely spatulate, ca. 3 × 1 mm; lip 4–5 mm, undivided, base deeply saccate, hairy inside, limb ovate, irregularly toothed at margin near apex; column 2–2.5 mm; anther cordate; pollinia 4; ovary and pedicel glabrous.

Locality: Hong Kong Island. *HK sheet 33355.*

Distribution: Guangdong, Hunan, Taiwan.

Ecology: Forests. Flowering: Jul.–Sep.

2. Goodyera procera (Ker Gawl.) Hook. 高斑葉蘭 (Fig. 231; Photo 583)

Exot. Fl. 1: t. 39. 1823; FHK 360. 1861; FKH 268. 1912; S. Y. Hu, Quart. J. Taiwan Mus. 26(3–4): 402. 1973, et Genera Orchid. Hong Kong 48, fig. 19. 1977; FRPS 17: 151. 1999; FTW ed. 2, 5: 908. 2000; FGD 7: 351. 2006; FOC 25: 51. 2009.

Neottia procera Ker Gawl., Bot. Reg. 8: t. 639. 1822.

Terrestrial herb; stem upright, to 35 cm tall, pubescent. Leaves petiolate; petioles 2.5–8 cm; leaf blades elliptic or lanceolate, 6–12 × 1.3–4.5 cm, reticulation obscure, apex acuminate or acute. Scape 32 cm; flowers small, greenish white, up to 120 in a terminal raceme; dorsal sepal 3 × 1.5 mm, lateral sepals 2.5 mm; petals white, forming a roof with the odd sepal; lip fleshy, white, 2.5 mm, attached to a column foot; column 2 mm; anther globose; pollinia 4 in 2 pairs; ovary and pedicel 3–4.5 cm.

Locality: Common in Hong Kong. *S. Y. Hu 9946, 11846* (CUHK); *HK sheet 40375.*

Distribution: S, E & SW China; Japan, Philippines, S to SE Asia.

Ecology: Earth pockets on rocks in stream bed. Flowering: Mar.–Apr.

Uses: Medicinal (folklore).

3. Goodyera foliosa (Lindl.) Benth. ex Clarke
多葉斑葉蘭 **(Photos 584–585)**

J. Linn. Soc., Bot. 25: 73. 1889; FKH 268. 1912; S. Y. Hu, Quart. J. Taiwan Mus. 26(3–4): 400. 1973; FRPS 17: 142. 1999; FTW ed. 2, 5: 904. 2000; FOC 25: 51. 2009.

Georchis foliosa Lindl., Gen. Sp. Orchid. Pl. 496. 1840.

Goodyera foliosa (Lindl.) Hook. f. var. *alba* S. Y. Hu & Barretto, Chung Chi Journal 13(2): 8. 1967; Check List HK Plants 376. 2002; 131. 2004.

Terrestrial herb, 10–17 cm tall at flowering time. Leaves ovate or oblong, 2.5–7 × 1.5–2.5 cm, acute; petioles 1–2 cm. Flower colour varying greatly, salmon-pink with orange lip white at apex; dorsal sepal pink with white margin, lateral sepals 5–7 × 0.4 cm, margin strongly curved; petals salmon-pink, creamy-white along margin, 5–7 × 4 mm; lip deep orange, white at apex, strongly saccate and round at base; column yellow, 2 mm; anther ovoid, 2.5 mm.

Locality: Tai Mo Shan. *S. Y. Hu 11037, 11059* (CUHK); *HK sheet 35642.*

Distribution: Guangdong, Yunnan, S China; Bhutan, Nepal, N India, Myanmar, Japan.

Ecology: Ravines near mountain streams. Flowering: Sep.–Jan. of the following year.

Notes: The holotype specimen of *G. foliosa* var. *alba* (*G. Barretto 100,* K) was collected by Ruy Barretto from Tai Mo Shan in Jul., 1970.

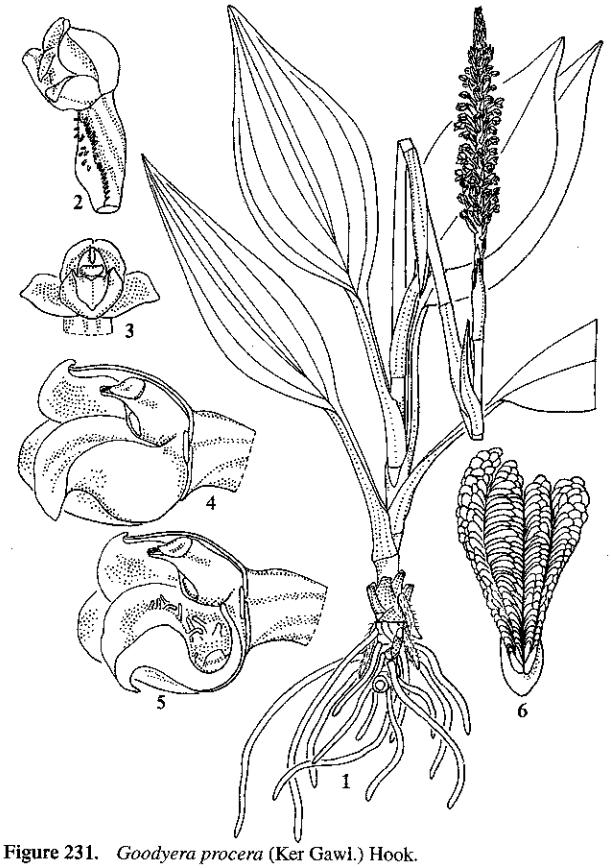

Figure 231. *Goodyera procera* (Ker Gawl.) Hook.
1. flowering plant; *2.* lateral view of flower; *3.* front view of flower; *4.* lateral view of flower with half of dorsal sepal, 1 lateral sepal, and 1 petal removed; *5.* lateral view of flower with half of lip removed; *6.* four pollinia in 2 pairs, attached to viscidium. (drawn by Teresa F. Wong)

4. Goodyera viridiflora (Blume) Blume 綠花斑葉蘭 **(Photo 586)**

Orch. Archip. Ind. 41, pl. 9c, f. 2(12–16). 1858; FRPS 17: 152. 1999; FTW ed. 2, 5: 912, photo 121. 2000; FOC 25: 50. 2009.

Neottia viridiflora Blume, Bijdr. 408. 1825.

Goodyera cordata (Lindl.) Benth. ex Hook. f., Fl. Brit. Ind. 6: 114. 1890, et Hooker's Icon. Pl. t. 2187. 1894; S. Y. Hu, Genera Orchid. Hong Kong 46. 1977.

Small terrestrial herb, 10–15 cm tall at flowering time; portion of stem lying on the damp ground as a rhizome, slightly swollen, internodes 5–7 mm long, 2 mm in diam., ascending and bearing a rosette of leaves. Leaves 3–5, petiolate; leaf blades ovate-cordate, 2.5–4.5 × 1.5–2.5 cm, apex acute. Flowers greenish pink, 2–5 in a terminal spike; odd sepal cucullate, 1 cm; lateral sepals same colour, ovate-lanceolate, 9–10 × 3–4 mm, reflexed; petals greenish-pink, whitish along margin, linear-falcate, 8 × 1.5 mm, upper margin coalescent with margin of odd sepal; lip white, tinged green, base slightly saccate, 8 mm; column green, very short (2.5 mm); anther ovate-cordate, beaked; pollinia 4; ovary and pedicel hairy.

Locality: Pok Fu Lam, Kowloon Peak, Tai Mo Shan, Fanling. *S. Y. Hu 9905* (CUHK); *HK sheet 41730.*

Distribution: Endemic to Hong Kong.

Ecology: Wet grounds along streams in shade.

5. Goodyera seikoomontana Yamam. 歌綠斑葉蘭(香港斑葉蘭) **(Photo 587)**

J. Soc. Trop. Agric. 4: 187, 1932; FRPS 17: 152. 1999; FOC 25: 49. 2009.

Goodyera youngsayei S. Y. Hu & Barretto, Chung Chi Journal 13(2): 10, fig. 5. 1976; FRPS 17: 153. 1999.

Small terrestrial herb, 10–15 cm tall; stems creeping, consisting of 5–10 internodes. Leaves petiolate; petiole 1.5–3 cm; leaf blades oblique-ovate, 3–7.5 × 1.7–3.6 cm, apex triangular-acute. Flowers pearl-colour, slightly pink at apex; 1–3 in a small spike terminal to a scape of 8–12 cm; odd sepal 1.5 × 0.6 cm, arcuate and hood-like; lateral sepals ovate-lanceolate, 1.4 × 0.6 cm, spreading and pointing backward; petals oblique oblanceolate-spathulate, 14 mm; lip ventricose, apex recurved; column ivory white; anther sagittate; pollinia 4 in 2 pairs; ovary cylindrical, 11–15 mm, villose at apex. Fruit a capsule.

Locality: Fo Tan Valley, Pat Sin Leng. *Y. S. Lau 1778; HK sheet 30752.*

Distribution: Endemic to Hong Kong.

Ecology: Shade and moist places in forests.

Notes: The type specimen of *G. youngsayei* (*G. Barretto 107,* K, holotype; A, isotype) was collected from Pat Sin Leng in 1975.

15. Zeuxine Lindl. 線柱蘭屬

Terrestrial herbs; rhizomes usually elongate, stem-like, creeping, rooting at nodes. Stems erect, terete, foliate. Leaves cauline. Flowers small, inconspicuous, hardly opening, in a terminal spike; sepals subequal, the odd one concave and gibbous at the base; the lateral sepals oblique-ovate; petals small, forming a hood with the odd sepal; lip fleshy, adnate to the sides of the column, parallel to the sepals and petals, fleshy, saccate at the base, bilobed or entire at the apex, the sac containing 2 calli, the apex transversely widened, often bilobed, connected to the saccate base by an elongate fleshy claw with inflexed margin; column short, stout, with 2 apical glands; rostellum large, deeply divided; clinandrium membranous, dilated, cupular; anther ovate-oblong, acute; pollinia 2, sectile, attached to a spathulate or linear-oblanceolate stipe; viscidium subdiscoid; stigmas 2, below the rostellum; ovary cylindrical or ellipsoidal, striate-sulcate. Capsules ellipsoidal, striate-sulcate.

About 50 species distributed from tropical Africa to tropical and subtropical Asia; 13 species in China; three species in Hong Kong.

1a. Leaves linear-oblong or lanceolate, evenly disposed on the stem; apical portion of lip entire or with 2 parallel lobes; calli cushion-like ..... 1. *Z. strateumatica*

1b. Leaves ovate, crowded together; apical portion of lip with divergent lobes; calli bifid at the apex, or lunate-ligulate.

2a. Lip white, yellow at the throat; calli bifid at the apex ..... 2. *Z. affinis*

2b. Lip bright yellow; calli lunate-ligulate ..... 3. *Z. parvifolia*

1. Zeuxine strateumatica (L.) Schltr. 線柱蘭 **(Photo 588)**

Bot. Jahrb. Syst. 45(3): 394. 1911; S. Y. Hu, Genera Orchid. Hong Kong 49. 1977; FRPS 17: 194. 1999; FTW ed. 2, 5: 1080. 2000; FGD 7: 360, fig. 183. 2006; FOC 25: 72. 2009.

Orchis strateumatica L., Sp. Pl. 2: 943. 1753.

Zeuxine membranacea Lindl., Gen. Sp. Orch. 486. 1840; S. Y. Hu, Genera Orchid. Hong Kong 49. 1977.

Zeuxine sulcata Lindl., Gen. Sp. Orch. Pl. 485. 1840; FHK 360. 1861; FKH 267. 1912.

Delicate terrestrial herb with a rhizome consisting of 4 internodes; stem upright. Leaves 8 or 9, olive-green with pink veins and margin, leaf blade linear-lanceolate, the middle larger ones 2.5–3.5 × 0.3–0.5 cm, glabrous. Flowers white, with pink veins 5–15 in a terminal spike 2 cm long, with pink lower bracts; dorsal sepal ovate-oblong, 6 mm, base saccate; lateral sepal 4 mm, ovate-oblong; petals oblique-linear, forming a hood with the odd sepal; column short; anther ovate-oblong; pollinia 2, sectile; ovary obovoid-ellipsoidal. Capsule 5 mm.

Locality: Victoria Peak, Sha Tin, Ma On Shan, Fanling, Tai Lung, Tsang Tsui, Sham Chung, Lantau Island. *S. Y. Hu 12807* (CUHK); *S. Y. Hu & P. P. H. But 23110* (CUHK); *Y. S. Lau 3202*.

Distribution: Guangdong, Guangxi, Yunnan, Sichuan, Hubei, Fujian, Taiwan; Japan, tropical Asia.

Ecology: Damp open grasslands, open ground between large trees in forests. Flowering: Nov.–Feb. of the following year.

2. Zeuxine affinis (Lindl.) Benth.
纖細線柱蘭 **(Fig. 232; Photo 589)**

Fl. Brit. India 6: 108. 1890; FOC 25: 75. 2009.

Monochilus affinis Lindl., Gen. Sp. Orchid. Pl. 487. 1840.

Zeuxine gracilis auct. non (Breda) Blume, S. Y. Hu, Genera Orchid. Hong Kong 50, fig. 20. 1977; Check List HK Plants 384. 2002; 133. 2004.

Small terrestrial herb; stems trailing, 3 mm in diam. Leaves 4–7, cauline, leaf blades ovate, 1–4 × 0.6–2 cm, apex acute. Flowers small, white, 5–10 in a terminal spike; odd sepal ovate, 6 × 5 mm at base, green with pink apex; lateral sepals elongate-triangular, 5 × 2 mm, apex obtuse; petals oblique-ovate, 4 mm, white, the upper margin adhere to odd sepal forming a galea; lip white, fleshy, wavy, saccate, apex 2-lobed; column 1 mm long; anther elongate-ovoid, 2.5 mm; pollinia 2, sectile; ovary woolly, 8 mm long. Capsule ellipsoidal, 7 mm, hairy.

Locality: Victoria Peak, Lugard Rd., Mount Parker, Tai Mo Shan, Ma On Shan. *S. Y. Hu 12276, 12277* (CUHK); *HK sheet 34778*.

Distribution: Hainan, Yunnan.

Ecology: Sunny slopes, roadsides. Flowering: Sep.–Oct.

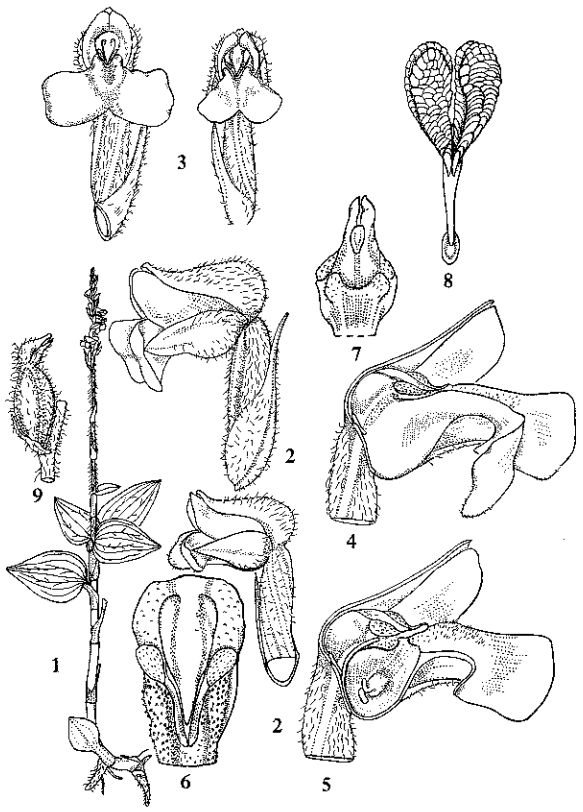

Figure 232. *Zeuxine affinis* (Lindl.) Benth.

1. flowering plant; *2.* lateral views of flowers; *3.* front views of flowers; *4.* lateral view of flower with lateral sepal, 1 petal and half of dorsal sepal removed; *5.* lateral view of flower with half of lip removed; *6.* top front view of column; *7.* front view of apical portion of column with rostellum pushed back; *8.* pollinia on linear lanceolate stipe and subdiscoid viscidium; *9.* fruit with persistent sepals. (drawn by Teresa F. Wong)

3. Zeuxine parvifolia (Ridl.) Seudebf. 白花線柱蘭

Dansk Bot. Ark. 32(2): 82. 1978; FRPS 17: 199, pl. 27: 5–7. 1999 ["*parviflora*"]; FGD 7: 361. 2006 ["*parviflora*"]; FOC 25: 74. 2009.

Hetaeria parvifolia Ridl., J. Straits Branch Roy. Asiat. Soc. 39: 87. 1903.

Zeuxine leucochila Schltr., Repert. Spec. Nov. Regni Veg. 3: 46. 1907; S. Y. Hu, Genera Orchid. Hong Kong 49. 1977.

Small terrestrial herb, 15–20 cm tall. Leaves 3–5, ovate-oblong, 2–4 × 1–1.5 cm, apex acute. Flowers small, white, 3–9 in a terminal raceme on stipe 10 cm; odd sepal ovate-lanceolate, 4 mm, lateral sepals oblong-ovate, 4.5 × 2 mm, acute; petals white, oblong-lanceolate, 4.5 mm, obtuse, forming a galea with the odd sepal; lip T-shaped, white and yellow at base, 4.5–5 mm, base saccate, apex 4 mm, 2-lobed, lobes oblong, entire or shallowly toothed.

Locality: New Territories (Hu 1977), Sai Kung (Siu 2000).

Distribution: Hainan, Yunnan, Taiwan; Thailand, Malaysia, Myanmar, Laos, Cambodia, Vietnam, Philippines, Japan.

Ecology: Forests and hillslopes. Flowering: Feb.–Apr.

Notes: The species was reported as *Zeuxine parviflora* (Blume) J. J. Sm. previously (Check List HK Plants 133. 2004).

16. Hetaeria Blume 翻唇蘭屬

Terrestrial herbs with creeping rhizomes. Leaves cauline, ovate, petiolate. Flowers non-resupinate, small, hardly opening, in a terminal raceme; sepals free, subequal, ovate; petals largely concealed; lip uppermost, adnate to the sides of the column, fleshy, undivided, strongly concave, the base furnished with papillose calli, the apex short and inflexed; column short, with 2 lateral glands, the apex with fleshy appendages and adnate to the lip; rostellum erect, elongate and bilobed; anther erect, ovate, acute; pollinia 2 or 4 in 2 pairs, sectile, obovoid and acuminate; caudicles slender; viscidium oblong, affixed between the lobes of the rostellum; stigma transversely 2-lobed, below the erect rostellum; ovary oblong-cylindrical, erect, striate-sulcate. Capsules oblong-ovoid, erect.

About 20 species mainly in tropical Asia; five species in China; two species in Hong Kong.

1a. Plants 30 cm or more high; sepals one-half as long as the ovary, glandularly hairy; lip ventricose, the calli papillose; appendage of the column dilated and reflexed at the apex; lip acute at the apex ..... 1. *H. youngsayei*

1b. Plants 20 cm or less high; sepals one-third as long as the ovary, pilose but not glandular; the calli subglobose and stipitate; appendage of the column dilated at the base; lip truncate at the apex and folded ..... 2. *H. abbreviata*

1. Hetaeria youngsayei Ormerod

香港翻唇蘭(卵葉翻唇蘭) **(Fig. 233; Photos 590–591)**

Oasis Suppl. 3: 7. 2004; FOC 25: 66. 2009.

Hetaeria shiuyingiana L. Li & F. W. Xing, Novon 19: 187–190. 2009.

Hetaeria nitida auct. non Ridl.: S. Y. Hu, Genera Orchid. Hong Kong 51, fig. 21. 1977, et Enum. Sperm. Hong Kong 104. 2002; Check List HK Plants 378. 2002; 131. 2004.

Terrestrial herb, 30–40 cm tall at flowering time; internodes 2–3 cm; annual growth bearing 3 large leaves at the apical end. Leaves petiolate; petioles sheathing, 2.5–3 cm; leaf blades oblique-ovate, 3–6 × 2–3.5 cm, shortly acuminate at apex. Flowers small, 9–10 in terminal spike; sepals 2 above, 1 below, densely glandularly hairy, ovate, 6–7 × 3–4 mm, all free, green with pink margin and apex; petals glabrous, obliquely ovate, 6 × 4 mm, apex obtuse, pink-white; lip honey-yellow, conical, 5 × 2 mm, slightly saccate; column fleshy, extending forward into a wing on each side; anther red; pollinia 4 in 2 pairs; ovary densely glandular, villose, 9 mm.

Locality: Mount Gough. *S. Y. Hu 13233* (CUHK).

Distribution: Hainan; Thailand.

Ecology: Along ravines in forests. Flowering: Apr.

2. Hetaeria abbreviata Lindl.

小片翻唇蘭(亮葉翻唇蘭) **(Photo 592)**

Gen. Sp. Orchid. Pl. 481. 1840.

Rhomboda abbreviata (Lindl.) Ormerod, Orchadian 11: 329. 1995; FOC 25: 68. 2009.

Hetaeria cristata auct. non Blume: FKH 268. 1917; FRPS 17: 183, pl. 25: 1–3. 1999; FGD 7: 358, fig. 182. 2006; Check List HK Plants 378. 2002; 131. 2004.

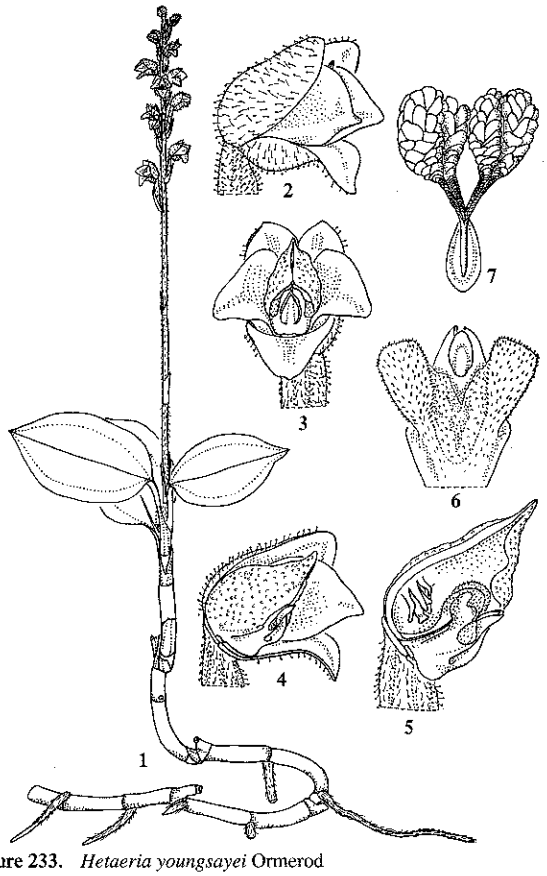

Figure 233. *Hetaeria youngsayei* Ormerod

1. flowering plant; *2.* lateral view of flower; *3.* front view of flower; *4.* lateral view of flower with 1 lateral sepal, half of odd sepal and 1 petal removed; *5.* lateral view of flower with half of lip removed; *6.* front view of column; *7.* four pollinia in 2 pairs, on slender stipe attached to oblong viscidium. (drawn by Teresa F. Wong)

Terrestrial herb; stems rhizome-like, lower part lying on ground, consisting of 6–7 internodes; the upright stem purple-green, including flowering portion up to 20 cm tall, usually lower. Leaves petiolate; petioles 1.5–3.5 cm, salmon-pink; leaf blades ovate-elliptic, 5–6 × 2–2.3 cm, dark green with inconspicuous lateral veins. Flowers creamy white, 5–13 in a terminal spike; odd sepal ovate, 4 × 2 mm, apex acute, sparsely hairy; lateral sepals oblique-ovate, 4 × 2.5 mm; petals forming a hood with the odd sepal over the column; lip uppermost, 4 mm, transparent and pink tinged, ovate, completely covered by lateral sepals, gibbose at base; apex truncate; column white, 1 mm, the front with 2 parallel wings, each with a large gland at apex; anther ovate; pollinia 2 on short caudicles; ovary glabrous, brown-red, 1 cm. Capsule oblong, 1 cm, dull red.

Locality: Hong Kong Island, Tsuen Wan, Tai Po, Wang Shan Keuk, Sha Tau Kok. *S. Y. Hu 12129, 12387A* (CUHK).

Distribution: Hainan, Guangdong, Guangxi, Guizhou; NE India, Myanmar, Nepal, Thailand.

Ecology: Humus in the shade of dense shrubs and along bank of streams. Flowering: Aug.–Oct.

Notes: The species was reported as *Anoectochilus abbreviatus* (Lindl.) Seidenf. previously (Check List HK Plants 369. 2002; 129. 2004).

17. Vrydagzynea Blume 二尾蘭屬

Terrestrial herbs with creeping rhizomes. Stems erect, leafy. Leaves ovate-elliptic, at the ground level, forming a rosette. Scapes with foliaceous bracts. Flowers small, non-resupinate, hardly open, in a terminal spike; sepals subequal, free, the odd one ovate, concave, the lateral ones obliquely auriculate at the base; petals smaller than the sepals and concealed by them; lip erect, undivided, spurred, fleshy, concave, the spur oblong-conical, with two hanging stipitate calli; column very short, stout; rostellum long, bifurcate; anther erect, ovate; pollinia 2, sectile, obovoid and acuminate; caudicles short; viscidium obovoid, between the arms of the rostellum; stigmas 2, below the rostellum; ovary oblong, striate-sulcate. Capsules oblong, erect, erostrate.

About 40 species distributed in S to SE Asia and Pacific islands; one species in China and Hong Kong.

1. Vrydagzynea nuda Blume 二尾蘭 **(Fig. 234; Photo 593)**

Fl. Jav. Orch. 61, t. 20, fig. 3(3–8). 1858; FKH 267. 1912; FHN 4: 204. 1977; S. Y. Hu, Genera Orchid. Hong Kong 52, fig. 22. 1977, et Enum. Sperm. Hong Kong 106. 2002; FRPS 17: 203. 1999; FTW ed. 2, 5: 1070, pl. 460. 2000; FGD 7: 362, fig. 184. 2006; FOC 25: 76. 2009.

Small glabrous herb, 5–15 cm tall; rhizome elongate, creeping, wire-like, up to 30 cm, internodes 2.5–3 cm, 3 mm in diam.; upright stem continuing the rhizome, bearing 3–4 leaves before flowering. Leaves petiolate; petioles 1.3–1.6 cm; leaf blades ovate-elliptic, 2.5–4 × 1.5–2 cm, apex acute. Flowers creamy-white; odd sepal ovate-oblong, 5 mm; lateral sepals oblique-ovate, 5 mm, the lower portion covering the spur; petals white, shorter than sepals, partially concealed by sepal; lip undivided, calcarate, concealed by the sepals; spur bladder-like; column green, 1.5 mm; anther discoid, orange-brown; pollinia 2; ovary cylindrical, 5–6 mm, hairy.

Locality: Hong Kong Island, Ma On Shan, Lantau Island. *S. Y. Hu 11810* (CUHK); *C. P. Lau 108* (CUHK); *HK sheet 38876*.

Distribution: Hainan, Guangdong, Taiwan; Indonesia.

Ecology: Well-drained soil in forests. Flowering: Apr.

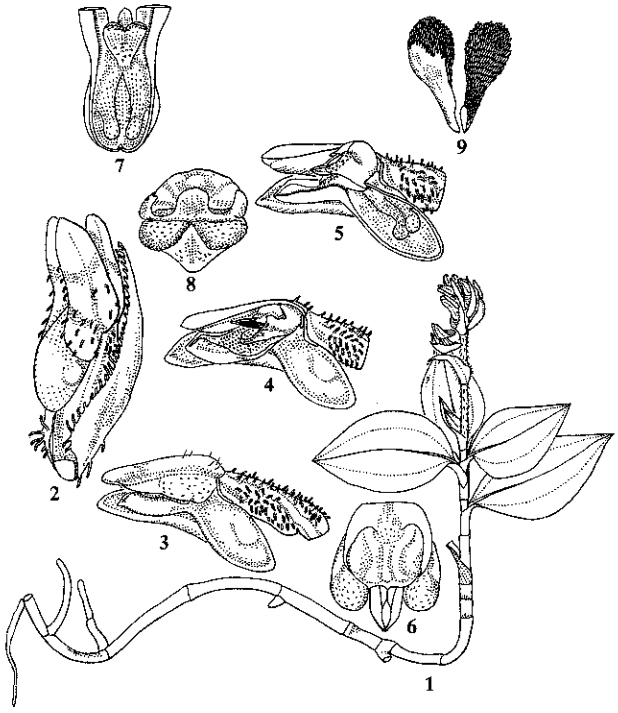

Figure 234. *Vrydagzynea nuda* Blume

1. flowering plant; *2.* lateral view of flower subtended by bract; *3.* flower with sepal removed; *4.* flower with portion of odd sepal, 1 lateral sepal, and 1 petal removed; *5.* flower with half of lip removed; *6.* top view of column; *7.* ventral view of column and portion of spur; *8.* front view of column with rostellum; *9.* dorsal view of pollinium (right), and the ventral view of the same (left). (drawn by Teresa F. Wong)

18. Spiranthes Rich. 綬草屬

Terrestrial caespitose herbs, lacking pseudobulbs. Leaves in a basal rosette. Inflorescence a spiral spike terminal to a stipe. Flowers compact; sepals free; petals narrow, hidden by dorsal sepal; lip sessile or clawed, concave, adnate to column; column terete, footless; clinandrium continued into rostellum, anther dorsal sessile; pollinia 2, with or without viscidium; stigma large, entire.

About 50 species distributed mainly in N America, only a few species found in S America, Europe, Asia, Africa and Australia; two species in China and Hong Kong.

1a. Rachis, bracts, sepals and ovary glabrous; stigma suborbicular; rostellum deltoid-acuminate, the apex bifid; viscidium elliptic ..... 1. *S. sinensis*

1b. Rachis, bracts, sepals and ovary glandularly hairy; stigma shield-like, tricuspidate along the upper margin; rostellum narrow, collar-like, attached to the middle of the pollinia; without obvious viscidium ..... 2. *S. hongkongensis*

1. Spiranthes sinensis (Pers.) Ames 綬草 **(Fig. 235)**

Orchidaceae 2: 53. 1908; S. Y. Hu, Genera Orchid. Hong Kong 41, fig. 14(G–K). 1977; FRPS 17: 228. 1999; FTW ed. 2, 5: 1034, pl. 442. 2000; FGD 7: 348, fig. 176. 2006; FOC 25: 85. 2009.

Neottia sinensis Pers., Syst. Pl. 2: 53. 1807.

Spiranthes australis Lindl., Bot. Reg. 10: sub. t. 823. 1824; FHK 360. 1861; FKH 267. 1912.

Terrestrial caespitose herb, glabrous throughout, requiring a resting period in winter. Leaves all basal, linear, 10–12 × 0.3–0.4 cm. Flowers pink, spirally arranged on a terminal spike; scape 15–20 cm; odd sepal dorsal, ovate-lanceolate, 3 mm; lateral sepals oblique-ovate, 3 × 1 mm, 4 mm between apices; petals adhering to dorsal sepal; lip white, recurved; column short, arcuate; anther buried in the clinandrium; pollinia 4 in 2 pairs; rostellum membranous, bifid; stigma discoid, green; ovary ovoid, 5 mm, glabrous. Capsule ellipsoidal.

Locality: Common in Hong Kong. *S. Y. Hu 10070, 13655* (CUHK); *HK sheet 36119.*

Distribution: Widely distributed in China; E Asia, S to SE Asia, Australia.

Ecology: Sunny grassy hillsides. Flowering: Apr.–Jun.

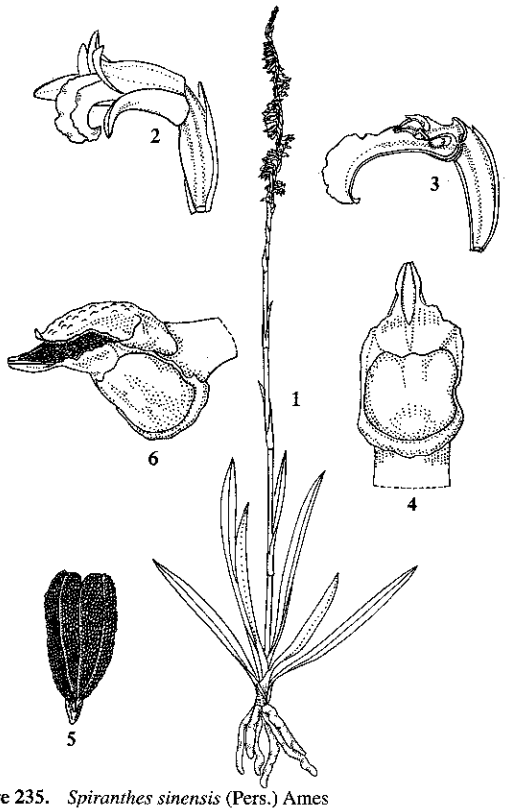

Figure 235. *Spiranthes sinensis* (Pers.) Ames

1. flowering plant; *2.* lateral view of flower; *3.* lateral view of flower with dorsal sepal, lateral sepals, 1 petal, and half of lip removed; *4.* front view of apical portion of column; *5.* four pollinia in 2 pairs attached to distinct elliptic viscidium; *6.* lateral view of apical portion of column. (drawn by Teresa F. Wong)

2. Spiranthes hongkongensis S. Y. Hu & Barretto 香港綬草 **(Fig. 236; Photo 594)**

Chung Chi Journal 13(2): 2, fig. 2b–f. 1976; S. Y. Hu, Genera Orchid. Hong Kong 41, fig. 14(B–F). 1977, et Enum. Sperm. Hong Kong 105. 2002; FOC 25: 85. 2009.

Acaulescent terrestrial orchid 12–37 cm tall at flowering time. Leaves all basal, oblanceolate, 4–12 × 0.5–0.9 cm, apex acute. Flowers white, many, spirally arranged in a hairy spike of 3–12 cm; sepals glandular hairy; odd sepal oblong, 4 mm, white, apex obtuse; lateral sepals white, tinged pink slightly; petals in close contact to odd sepal; lip straight, thickened at base, each side with a transparent gland; column 1 mm, triangular at apex; anther ovate; pollinia 4 in 2 pairs, powdery; rostellum narrow, membranous, truncate; stigma shield-like, trilobate along the upper margin. Ovary densely glandularly hairy.

Locality: Tsz Wan Shan, Shing Mun, Sai Kung, Lantau Island, Lamma Island. *S. Y. Hu 10035, 13552* (CUHK); *P. S. Choi 435.*

Distribution: Guangdong, Guizhou, Yunnan, Shandong, Zhejiang, Fujian; Japan, Australia.

Ecology: Along little streams, paths between paddy, sunny grassy hillsides, newly available open habitats. Flowering: Mar.–Apr.

Notes: The type specimen (*S. Y. Hu 13658,* K, holotype; A, CUHK, isotype) was collected from Tai Po in 1975. Further to Hu and Barretto's (1976) observations, Sun (1996a, Amer. J. Bot. 83: 252–260) discussed the allopolyploid origin of this self-fertile species, which is a tetraploid (chromosome number ≈60) with putative parents being *S. sinensis* and *S. spiralis* (L.) Chevall. *Spiranthes sinensis* is a pollinator-dependent outcrosser, whereas *S. hongkongensis* is a pollinator-independent selfer, flowering 2–3 weeks earlier than *S. sinensis* (Sun 1996b, Conservation Biol. 10: 785–795). *Spiranthes sinensis* is glabrous on floral parts and its flower colour is normally pink and occasionally white, in a prominent spiral spike, whereas *S. hongkongensis* has grandular hairs on its bracts, sepals and ovaries in the creamy white flowers, inconspicuously arranged on a spiral spike. Rare occurrence of natural hybrids have also been observed, featuring both pinkish flowers and glandular hairs on floral parts.

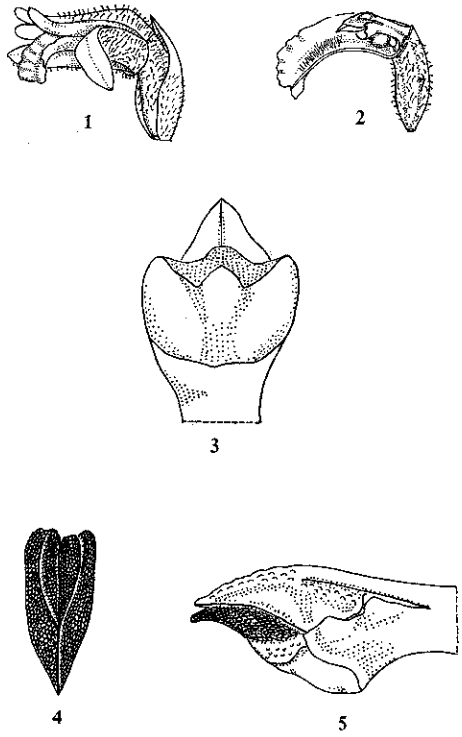

Figure 236. *Spiranthes hongkongensis* S. Y. Hu & Barretto

1. lateral view of flower; *2.* lateral view of flower with dorsal sepal, lateral sepals, 1 petal, and half of lip removed; *3.* front view of apical portion of column; *4.* four pollinia in 2 pairs, without evident viscidium; *5.* lateral view of apical portion of column. (drawn by Teresa F. Wong)

19. Pelexia Poit. ex Lindl., *nom. cons.* 肥根蘭屬

Terrestrial or occasionally paludose herbs, with a few fleshy roots. Leaves caespitose, all basal, shortly petiolate; leaf blades elliptic. Flowers small, in a terminal few-flowered raceme; sepals lanceolate, hiding the petals; lip fleshy, undivided; column short; anthers oblong-ovoid; pollinia 2, granular, viscidium terminal; stigmas 2.

About 67 species mainly distributed in tropical America and tropical Asia; one species in China and Hong Kong.

1. Pelexia obliqua (J. J. Sm.) Garay 肥根蘭 **(Fig. 237)**

Bot. Mus. Leafl. Harvard Univ. 28(4): 345. 1980; FRPS 17: 231. 1999; S. Y. Hu, Enum. Sperm. Hong Kong 107. 2003; FOC 25: 86. 2009.

Spiranthes obliqua J. J. Sm., Bull. Dep. Agric. Indes Neerl. 43: 74. 1910.

Manniella hongkongensis S. Y. Hu & Barretto, Chung Chi Journal 13(2): 6, fig. 13. 1976; S. Y. Hu, Genera Orchid. Hong Kong 42, fig. 15. 1977.

Terrestrial herb; leaves and flowering plants appearing in different seasons. Leaves caespitose, petiolate; petioles up to 1 cm; leaf blades elliptic to oblong-elliptic, 3.5–6.5 × 1.5–3.5 cm, apex acute. Flowers small, white, 5–18 terminal to a scape of 12–15 cm; sepals longer than petals, glandularly hairy on the basal portion, 4 mm, the lateral two connate at base; petals 4 mm; lip fleshy, the lower portion forming a groove and extending backward into 2 appendages, hooked at the ends in the spur; column short, apex ovoid; anther lanceolate; pollinia 2; rostellum ovate; stigmas 2; ovary glandularly hairy.

Locality: New Territories. *S. Y. Hu 13266* (CUHK).

Distribution: Indonesia.

Ecology: Ravines. Flowering: Sep.

Notes: The holotype specimen of *M. hongkongensis* (*S. Y. Hu 13266*, K) was collected from Sha Tin in 1965.

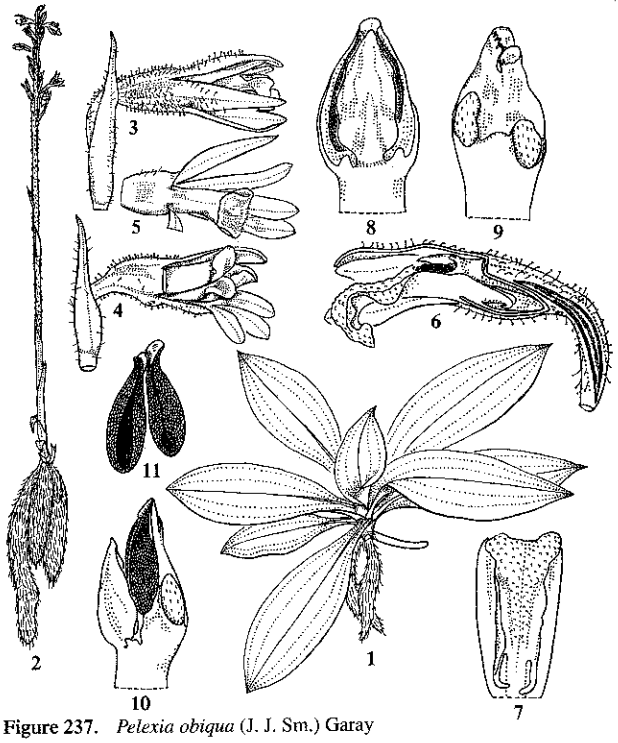

Figure 237. *Pelexia obiqua* (J. J. Sm.) Garay

1. plant with rosette of leaves, and fusiform fleshy roots; *2.* flowering plant; *3.* lateral view of flower; *4–5.* lateral view of abnormal flower with 1 sepal removed; *6.* lateral view of flower with 1 petal, 1 lateral sepal and portion of odd sepal removed; *7.* adaxial view of lip; *8.* dorsal view of column; *9.* ventral view of column; *10.* lateral view of column. (drawn by Teresa F. Wong)

20. Cryptostylis R. Br. 隱柱蘭屬

Terrestrial herbs, glabrous. Roots thick, spreading, hairy. Rootstocks very short, erect. Leaves 2, petiolate; petioles not sheathing; leaf blade elliptic, chartaceous. Scape simple, with imbricate cataphylls at the base. Flowers non-resupinate; sepals subequal, spreading, involute and acuminate; petals shorter than the sepals; lip erect, undivided, ovate, acute, strongly concave at the base and surrounding the column, velvety-hairy, spotted; column very short, glandularly auriculate; anther erect, acute; pollinia 4, powdery; viscidium large, in direct contact with the stigma, without evident rostellum; stigma discoid, prominent, fleshy, occupying the entire front of the column; ovary cylindrical. Capsules oblong, erect, erostrate.

About 20 species mainly distributed in Oceania and tropical Asia; one species and two varieties in China; one species in Hong Kong.

1. Cryptostylis arachnites (Blume) Hassk. 隱柱蘭 **(Fig. 238)**

Cat. Bog. 8. 1844; FKH 268. 1912; S. Y. Hu, Genera Orchid. Hong Kong 39, fig. 13. 1977, et Enum. Sperm. Hong Kong 102. 2002; FRPS 17: 237. 1999; FTW ed. 2, 5: 819. 2000; FGD 7: 346, fig. 147. 2006.

Zosterostylis arachnites Blume, Bijdr. 419. 1825.

Cryptostylis arachnites (Blume) Blume, Coll. Orchid. 133. 1859; FOC 25: 89. 2009.

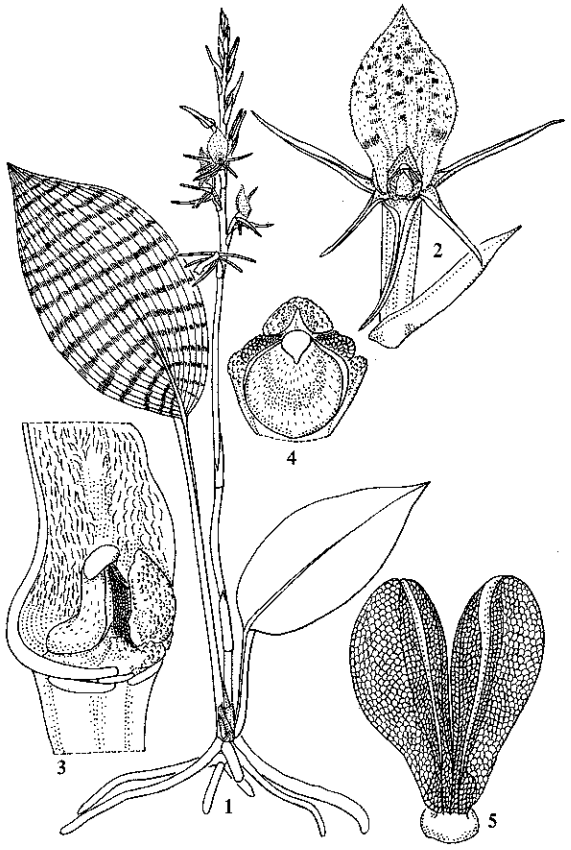

Figure 238. *Cryptostylis arachnites* (Blume) Hassk.

1. flowering plant; *2.* front view of flower; *3.* lateral view of flower with all sepals, and petals, and portion of lip removed; *4.* front view of column; *5.* four pollinia in 2 pairs. (drawn by Teresa F. Wong)

Terrestrial herb, 25–30 cm tall at flowering time. Leaves petiolate; petioles 4–12 cm; leaf blades ovate-elliptic, 8–11 × 3.5–5.5 cm, apex acuminate and apiculate, with many lateral veins running to the apex, purple-green beneath. Flowers very unusual; sepals 3, widely separate, linear, acuminate, light green, 1.2–1.3 × 0.2 cm at base, margin in-rolled, the lateral ones 2.5 cm between apices, the odd one shorter; petals shorter than sepals, lanceolate, aculeate, pale green, 7–8 mm, margin in-rolled; lip ovate, erect, reflexed, base concave and slightly saccate, apex acute, 1.2–1.3 × 0.6–0.8 cm, completely covered with velvet red-brown hairs, lemon-yellow, with 5 brown veins running palmately from base to margin and apex, with some red-brown patches; column 0.5 mm, with a glandular auricle on each side; anther erect, 2 mm, cap yellow and papillose; pollinia 4 in 2 pairs, viscidium violet; stigma large, discoid, covering the entire front of the column; ovary glabrous, 8 mm.

Locality: Hong Kong Island, Violet Hill, Sai Kung. *HK sheet 7134.*

Distribution: Guangdong, Guangxi, Taiwan; SE & S Asia, Pacific islands.

Ecology: Forests. Flowering: Mar.– Apr.

21. Epipogium J. F. Gmel. ex Borkh. 虎舌蘭屬

Saprophytic herbs; rhizome coralloid; flowering stems yellow-brown, bracteate. Flowers pink-white, in a terminal raceme, pendant on curved pedicel; sepals and petals similar, distinct, lanceolate, 1.5 × 0.2 cm; lip slightly widened, simple, fleshy, lateral lobes erect, with a conspicuous callus running throughout the middle; spur stout; column short, no foot; anther terminal, grooved on the back; filaments evident; pollinia 2, stipe elongate and curved at the apex, with slender stipe and a viscidium.

Two species widespread in temperate Eurasia, Australia, tropical Africa; both occurring in China; one species in Hong Kong.

1. Epipogium roseum (D. Don) Lindl. 虎舌蘭 **(Photos 595–596)**

J. Linn. Soc., Bot. 1: 177. 1857; Barretto, Mem. Hong Kong Nat. Hist. Soc. 18: 47, fig. 1. 1988; FRPS 18: 43. 1999; FTW ed. 2, 5: 863. 2000; FGD 7: 334, fig. 163. 2006; FOC 25: 208. 2009.

Limodorum roseum D. Don, Prodr. Fl. Nepal. 30. 1825.

Saprophytic herb, pink-white, lacking chlorophyll, 30–40 cm tall at flowering time; rhizome fusiform, 2–3 ×1–1.5 cm; upright stems, 20–30 cm tall, bearing scale-like bracts and terminal racemes. Flowers white to pink, pedicellate, resupinate, nutant after anthesis, about 10 in a raceme; bracts longer than ovary; pedicels 2 mm, bending; sepals and petals alike, ovate-lanceolate, 8–12 × 2–4 mm; lip white with irregular patches of rose-mauve, ovate, 8–10 mm, trowel-shaped, spur clavate, 5.5 mm; column 3.5–4 mm, apex auriculate; anther fleshy; pollinia 2, glandular. Capsule oblong, 7 mm.

Locality: Victoria Peak. *HK sheet 34554.*

Distribution: Hainan, Guangdong, Yunnan, Xizang, Taiwan; Nepal, Sikkim, India, Thailand, E Himalayan regions, then eastward to the Philippines and Australia.

Ecology: Shade places in forests. Flowering: May.

22. Nervilia Comm. ex Gaudich., *nom. cons.* 芋蘭屬

Terrestrial orchids requiring dormancy annually; rhizome slender, the end enlarged into a subglobose corm; erect stems short, subterranean, branched, each branch bearing a solitary, cordate leaf, lying flat over the ground. Scape delicate, aphyllous, bearing few scales and 2 flowers. Flowers appearing before the leaves; sepals and petals similar, subequal, free, parallel to the column and slightly divergent at the apex; lip undivided, ecalcarate, the basal portion embracing the column, the apical portion subrotundate, slightly cleft, the disk inverted-carinate, and the base gibbous; column slender and long, clavate, thin and curved above the base; rostellum fleshy and truncate; anther terminal, subglobose; pollinia 4 in 2 pairs, finely granular, without caudicle or viscidium; stigma suborbicular; ovary short, campanulate, deeply sulcate, bent at the juncture with the pedicel.

About 50 species distributed in tropical and subtropical regions of Asia and Oceania and Africa; seven species in China; one species in Hong Kong.

1. Nervilia fordii (Hance) Schltr. 毛唇芋蘭(毛葉芋蘭) **(Fig. 239; Photos 597–598)**

Bot. Jahrb. Syst. 45(3): 403. 1911; S. Y. Hu, Genera Orchid. Hong Kong 38, fig. 12. 1977, et Enum. Sperm. Hong Kong 104. 2002; FRPS 18: 25, pl. 4: 4–5.1999; FOC 25: 200. 2009.

Pogonia fordii Hance, J. Bot. 23(272): 247. 1885; FKH 268. 1912.

Pogonia pulchella auct. non Hook. f.: FKH 268. 1912.

Terrestrial herb without aerial stem except the scape; rhizome delicate, terminated by a globose corm 1.5–2 cm in diam. Leaves lying flat on ground, solitary, cordate, 5–9 cm in diam., green above, purple-green beneath. Flowers rose-pink, two terminal to a purple-pink scape of 12–15 cm, emerged from the corm before growth of leaf; pedicels 6 mm; sepals greenish pink, oblanceolate, the odd one 2–2.5 × 0.6 cm, apex truncate, cuspidate; lateral sepals narrower; petals linear-lanceolate, 2.4 × 0.3 cm, acute and cuspidate; lip 2.5 cm, embracing the column, slightly gibbous at base, apical one-third rose-pink, apex retuse and notched; column 7 × 2.5 mm, dumb-bell-shaped; anther 2-celled, white; pollinia 4 in 2 pairs, glandular; ovary 3–4 mm.

Locality: Tai Tam, Aberdeen, Clear Water Bay. *S. Y. Hu 13686* (CUHK); *P. S. Choi 530; S. C. Tse 427.*

Distribution: Guangdong, Guangxi, Sichuan, Yunnan; Thailand, Vietnam, India, Myanmar, Malaysia, Indonesia, Philippines.

Ecology: Forests. Flowering: May–Aug.

Uses: Medicinal (folklore).

Notes: The species was reported as *Nervilia plicata* (Andr.) Schltr. previously (Check List HK Plants 379. 2002; 132. 2004).

23. Coelogyne Lindl. 貝母蘭屬

Epiphytic perennial herbs creeping on the surface of boulders propped and anchored by slender tough roots. Leaves 2, apical to the oblong-ellipsoidal pseudobulb, leathery. Scape between leaves, with several persistent basal scales; flowering bracts deciduous. Flowers medium-sized, opening one at a time, 2 or 3 in a terminal raceme; sepals free, subequal, spreading; petals narrower than or rarely similar to the sepals; lip attached to the base of the column, 3-lobed or undivided, the base concave and slightly saccate, lateral lobes obsolete or erect, partially embracing the column; midlobe expanded and fimbriate or entire and acute, the disk lamellate; column elongate, winged at the apical portion, without foot; clinandrium oblique, membranous, dentate; rostellum membranous, projecting forward and arching over the stigma; anther attached under the margin of the clinandrium, incumbent; pollinia 4 in 2 pairs, waxy, obovoid, connected at the apex by a granular thin sheet; stigma suborbicular; ovary cylindrical. Capsules ellipsoidal, ridged, rostrate.

About 200 species distributed in tropical and subtropical Asia and Oceania; 26 species in China; two species in Hong Kong.

1a. Petals linear, narrower than the sepals; lip trilobed and fringed, the midlobe expanded, subtruncate at the apex .... 1. *C. fimbriata*

1b. Petals lanceolate, similar to the sepals; lip entire, lanceolate and acute at the apex ..... 2. *C. leungiana*

1. Coelogyne fimbriata Lindl.

流蘇貝母蘭 **(Fig. 240; Photo 599)**

Bot. Reg. 11: t. 868. 1825; FHK 354. 1861; FKH 264. 1912; S. Y. Hu, Genera Orchid. Hong Kong 83, fig. 45. 1977; FRPS 18: 344, pl. 57: 3–4. 1999; FGD 7: 463, fig. 232. 2006; FOC 25: 318. 2009.

Creeping terrestrial herb; rhizomes 2–3 mm thick consisting of 8–10 internodes; annual growth consisting of a rhizome ending with an oblong or ellipsoidal pseudobulb of 3–4 × 1–2 cm, terminated with 2 leaves. Leaves petiolate, petioles 5–6 mm; leaf blades oblong-elliptic, 4.5–10 × 1.5–2 cm, apex acute. Flowers lemon-yellow, 2 (sometimes 1 or 3) terminal to a short scape of 2–3 cm; sepals alike, oriented in an equal triangle, ovate, 2 × 0.8–0.9 cm, apex acute; petals linear, 2 × 0.2 cm; lip with fimbriate apical lobe, yellow and marked with cinnamon-brown lines and patches on the side; column 12–13 mm, winged; anther conical; pollinia 4 in 2 pairs; ovary 4 × 2 mm.

Locality: Common in Hong Kong. *S. Y. Hu 6176, 11094* (CUHK); *G. Barretto 316*.

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Xizang, Jiangxi; Sikkim, India, Vietnam, Thailand, Laos, Cambodia, Malaysia.

Ecology: Tree trunks or large rocks in forests. Flowering: Mar.–Dec.

2. Coelogyne leungiana S. Y. Hu 單唇貝母蘭

Quart. J. Taiwan Mus. 25: 223, fig. 9a–e. 1972, et Genera Orchid. Hong Kong 84. 1977; FRPS 18: 341. 1999; FGD 7: 463. 2006; FOC 25: 318. 2009.

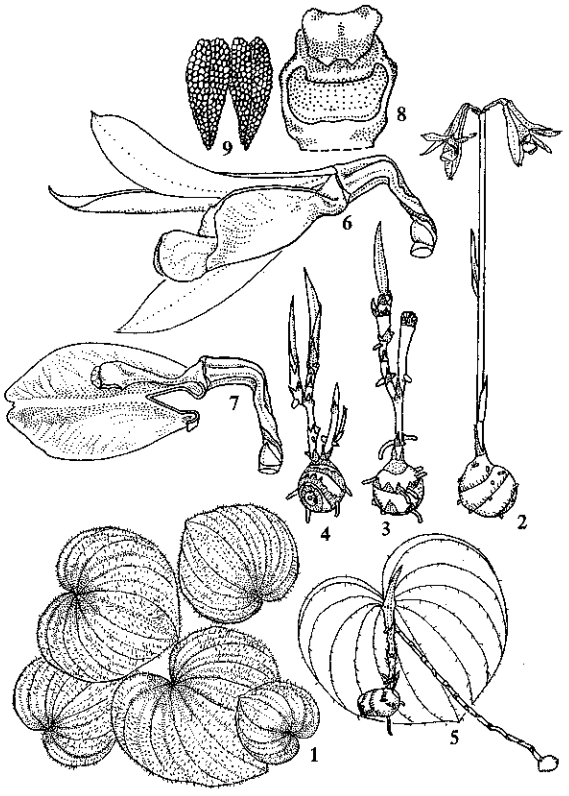

Figure 239. *Nervilia fordii* (Hance) Schltr.

1. colony of plants after anthesis; *2.* flowering plant; *3.* subterranean portion of plant just before the emergence of leaf; *4.* corm showing manner of development of leafy shoots; *5.* shoot emerged from a corm and bearing a leaf; *6.* lateral view of flower with 1 sepal and 1 petal removed; *7.* flower with sepals and petals removed and lip partially opened at base; *8.* front view of apex of column; *9.* four slender pollinia in 2 pairs, without caudicle and viscidium. (drawn by Teresa F. Wong)

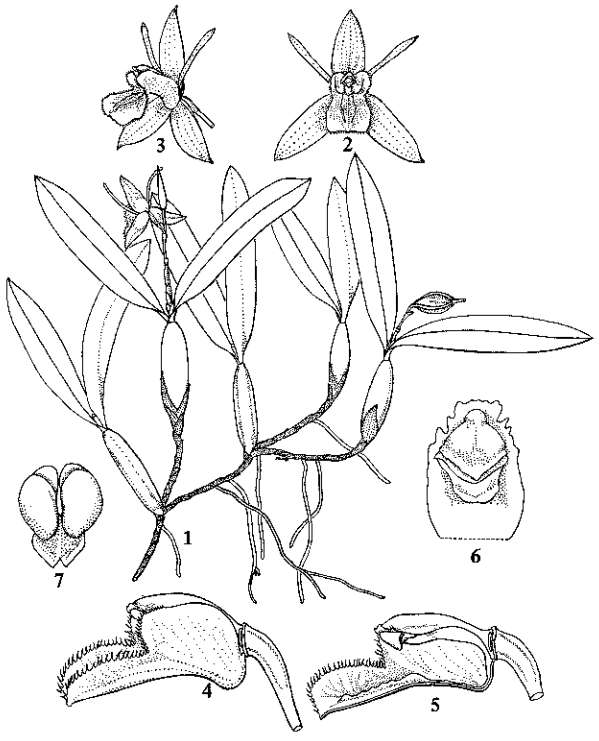

Figure 240. *Coelogyne fimbriata* Lindl.

1. flowering plant; *2.* front view of flower; *3.* lateral view of flower; *4.* laterial view of flower with sepals and petals removed; *5.* laterial view of flower with half of lip removed; *6.* front view of apical portion of column; *7.* four pollinia in 2 pairs attached to granular sheath. (drawn by Teresa F. Wong)

Epiphytic herb, rhizomes elongate, 1 mm thick, branched; pseudobulbs oblong-ellipsoidal, 2–4 × 0.8–1.5 cm, the base subtended by scales of 1–2 cm. Leaves petiolate, petioles 6–8 mm; leaf blades oblong-elliptic, 5–8 × 1.3–2.5 cm, apex acute. Flowers yellow, 1 or 2 apical to a scape of 2.5–3.5 cm; pedicels 3–4 mm; sepals and petals similar, ovate-lanceolate, 2 cm; lip entire, ovate-lanceolate, 2 × 0.7 cm across middle; column narrowly winged, 1.4 cm; anther ovoid, 3 mm across middle; pollinia 4 in 2 pairs; ovary subturbinate, 3–4 mm.

Locality: Pat Sin Leng. *S. Y. Hu 11004, 12454* (CUHK).

Distribution: Endemic to Hong Kong.

Ecology: Exposed rocks. Flowering: Mar.–Dec.

Notes: The type specimen was collected by J. Leung from New Territories in 1969.

24. **Pholidota** Lindl. ex Hook. 石仙桃屬

Epiphytic perennial herbs growing on damp rocks or rarely on trunks of trees along streams. Rhizomes covered by imbricate scales. New shoots emerging from the base of the pseudobulbs, each bearing a terminal raceme, after anthesis a joint behind the inflorescence changing into a pseudobulb with 2 leaves. Leaves terminal to pseudobulb, evergreen, elliptic or lanceolate. Flowering shoots horizontal, bearing green cataphylls and 2 underdeveloped leaves at anthesis, becoming erect and with the leaves and pseudobulbs developed after flowering. Flowers rather small, non-resupinate, in a terminal raceme; sepals subequal, ovate, spreading, slightly concave; petals slightly narrower than the sepals; lip strongly concave, subsaccate at the base, the lateral lobes small and erect, midlobe straight or recurved; column stout, the apex broadly winged; rostellum truncate, projected forward covering the stigmatic cavity; anther incumbent, subglobose; pollinia 4, waxy, ovoid, and acuminate; viscidium apical; stigma discoid; ovary cylindrical, striate. Capsules elliptic-obovoid, strongly ridged and grooved.

About 30 species distributed in tropical Asia, Australia and Pacific islands; 14 species in China; two species in Hong Kong.

1a. Leaves elliptic, 3–4 cm wide; racemes hanging; flowers 2 cm across; sepals ovate; midlobe of the lip recurved..... 1. *P. chinensis*

1b. Leaves linear-lanceolate, 4–7 mm wide; racemes erect; flowers 5 mm across; sepals ovate-oblong; midlobe of the lip short, acute, not recurved..... 2. *P. cantonensis*

1. Pholidota chinensis Lindl. 石仙桃 **(Fig. 241; Photo 600)**

J. Hort. Soc. London 2: 308. 1847; FHK 354. 1861; FKH 264. 1912; S. Y. Hu, Genera Orchid. Hong Kong 82, fig. 44. 1977; FRPS 18: 394, pl. 65: 5–6. 1999; FGD 7: 460. 2006; FOC 25: 338. 2009.

Coelogyne chinensis (Lindl.) Rchb. f., Ann. Bot. Syst. 6: 237. 1861.

Terrestrial herb; rhizomes creeping; pseudobulbs ovate-oblong, 2–8 cm. Leaves 2, terminal to pseudobulb; petioles 1–2 cm; leaf blades ovate-elliptic, 10–20 × 3–4 cm, apex acute to acuminate. Flowers white to pale yellow, 5–20 in a pendant raceme on scapes of 2–4 cm; dorsal sepal ovate-elliptic, 10–12 × 5–8 mm; lateral sepals 11 × 7 mm, broader; petals ovate-oblong, 9–10 × 4 mm; lip firmly attached to base of column, fleshy, enlarged and sac-like at base, the rounded front lobe turning downward; column white 5 mm, winged; anther suborbicular; pollinia 4; ovary cylindrical. Capsules ellipsoidal, 1.2–1.8 cm, 6 ridged.

Locality: Common in Hong Kong. *S. Y. Hu 11089, 12744* (CUHK); *P. S. Choi 199, 222*.

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Zhejiang, Fujian.

Ecology: Boulders in damp ravines in forests, high shaded valleys. Flowering: Jul.–Sep.

Uses: Ornamental, medicinal (folklore).

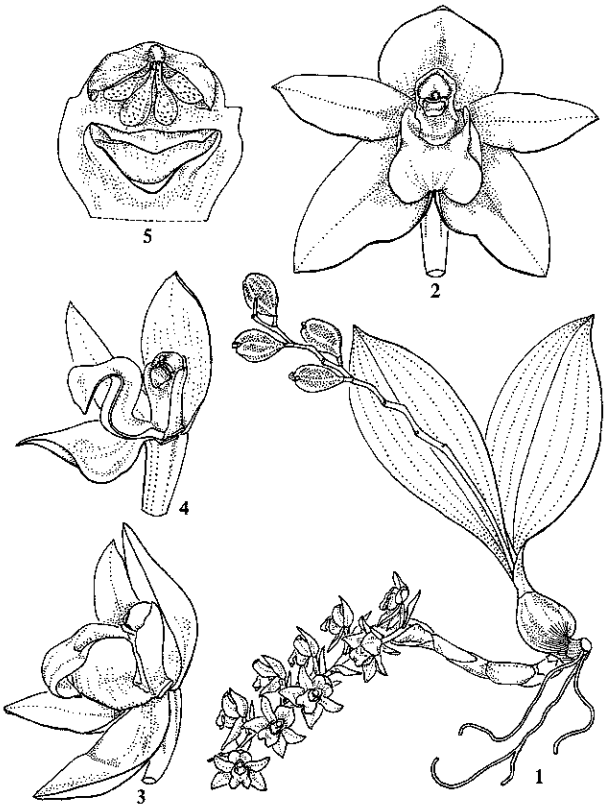

Figure 241. *Pholidota chinensis* Lindl.

1. flowering plant; *2.* front view of flower; *3.* lateral view of flower with 1 petal removed; *4.* lateral view of flower with 1 sepal, 1 petal, and half of lip removed; *5.* apical portion of column with anther slightly tipped back. (drawn by Teresa F. Wong)

2. Pholidota cantonensis Rolfe 細葉石仙桃

Kew Bull. 1896: 196. 1896, et J. Linn. Soc., Bot. 36: 23. 1903; FHK 354. 1861; FKH 264. 1912; FRPS 18: 392. 1999; FTW ed. 2, 5: 1005, pl. 427. 2000; FGD 7: 460, fig. 230. 2006; FOC 25: 338. 2009.

A small terrestrial herb; rhizome zig-zag, covered with brown scales; pseudobulbs globose-ovoid. Leaves petiolate, petioles 2–4 mm; leaf blades linear-lanceolate, 4–8 × 0.4–0.7 cm, acute. Flowers white-yellow, in a terminal raceme; pedicels 2 mm; sepals all white, 5 × 2.5 mm, acute; petals similar; lip undivided, ventricose, 3 mm, gibbose at base, apex subobtuse; column very short, 1.5 mm; anther suborbicular; pollinia 4; ovary 1 mm. Capsule ellipsoidal, 7 mm.

Locality: Tai Po, Lantau Island. *S. Y. Hu 9701* (CUHK).

Distribution: Guangdong, Guangxi, Jiangxi, Zhejiang, Fujian, Taiwan.
Ecology: Rocks in forests. Flowering: May–Jun.

25. Liparis Rich. 羊耳蒜屬

Epiphytic or terrestrial perennial herbs. Stems short, changing to compressed ovoid or cylindrical fleshy pseudobulbs. Leaves 1–4, persistent to the second year, ensiform or plicate-venose. Flowers small, many, in terminal racemes; sepals free, spreading, the odd one linear, erect, the lateral ones oblique-ovate, often recurved; petals linear or filiform, ± curved; lip undivided, cuneate at the base, with 2 tuberculate calli, gradually widened and bent at the middle, tongue-like, truncate or dentate, the apex emarginate; column semiterete, elongate, arcuate, the apical portion winged; rostellum truncate; anther terminal, incumbent, subglobose, acute, retuse or acuminate; pollinia 4 in 2 pairs, waxy, obovoid, without obvious viscidium; stigma 1, concave; ovary obconical. Capsules oblong-obovoid.

About 250 species widely distributed in tropical and subtropical regions of the world, with a few species occur in N temperate zone; 52 species in China; eight species in Hong Kong.

1a. Pseudobulbs cylindrical, 8–12 cm long; leaves elliptic (except *L. viridiflora*).
  2a. Leaves linear, 2–3 cm wide; lip rotundate at the apex; pseudobulbs 8–9 cm long, 0.4–1 cm across the middle, the longest internodes 6–8 cm long ..... 1. *L. viridiflora*
  2b. Leaves elliptic, 1.5–8.5 cm wide; lip dentate or notched at the apex; pseudobulbs 4.5–12 cm long, 0.8–1.5 cm in diam., the longest internodes 2.5–6 cm long.
    3a. Flowers fresh liver-colour; apical portion of lip 12–13 mm across, the margin irregularly dentate-fimbriate2. *L. gigantea*
    3b. Flowers yellowish green or lightly tinged purple; apical portion of lip 4.5–7 mm across, shallowly undulate-dentate.. ..... 3. *L. nervosa*
1b. Pseudobulbs ovoid or subglobose, 1–4 cm long; leaves linear.
  4a. Leaves solitary, 1 to each pseudobulb; apical wings of the column broad and auriculate at the base.
    5a. Anther retuse at the apex; odd sepal 7 mm long ..... 4. *L. bootanensis*
    5b. Anther long produced at the apex; odd sepal 11 mm long ..... 5. *L. ruybarrettoi*
  4b. Leaves 2–4 to each pseudobulb; apical wings of the column narrow, not auriculate at the base.
    6a. Leaves papery, articulate at base ..... 6. *L. stricklandiana*
    6b. Leaves membranous or herbaceous, not articulate at base.
      7a. Leaf blade 2–5 cm wide ..... 7. *L. odorata*
      7b. Leaf blade 0.8–1.2 cm wide ..... 8. *L. ferruginea*

1. Liparis viridiflora (Blume) Lindl. 長莖羊耳蒜 **(Photo 601)**

Gen. Sp. Orch. Pl. 31. 1830; S. Y. Hu, Quart. J. Taiwan Mus. 27(3–4). 428. 1974; FRPS 18: 90, pl. 16: 1–2. 1999; FTW ed. 2, 5: 950. 2000; FGD 7: 452. 2006; FOC 25: 224. 2009.

Malaxis viridiflora Blume, Bijdr. Fl. Ned. Ind. 392. 1825.

Liparis longipes (Lindl.) Rchb. f., Bonplondia 3: 250. 1855; FHK 352. 1861; FKH 261. 1912; S. Y. Hu, Genera Orchid. Hong Kong 72. 1977.

Caespitose herb, 10–25 cm tall; pseudobulbs 8–9 cm or longer, 0.4–1 cm in diam. Leaves 2, linear-lanceolate, 15–21 × 2–3 cm, apex acute. Flowers non-light green, many in a terminal raceme 7–12 cm; scapes 5–10 cm, odd sepals recurved backward, 3 × 0.7 mm; lateral sepals ovate-lanceolate, pointing forward, 3 × 1.5 mm; petals linear, turning backward, 3 mm; lip fleshy, light green, apical portion ovate, obtuse; column erect, 2 mm, cylindrical; anther green; pollinia 4; ovary cylindrical, 1.5 mm. Capsule obovoid, 4–5 mm.

Locality: Violet Hill, Tai Tam, Kowloon Peak, Tai Mo Shan, Lantau Peak. *S. Y. Hu 10629, 11097* (CUHK); *Y. S. Lau 1756*.

Distribution: Hainan, Guangdong, Yunnan, Xizang, Sichuan, Taiwan; S & SE Asia.

Ecology: Wet rocks and damp places in forests or ravines. Flowering: Sep.–Nov.

2. Liparis gigantea C. L. Tso 紫花羊耳蒜 **(Fig. 242; Photos 602–603)**

Sunyatsenia 1: 136. 1933; FOC 25: 219. 2009.

Liparis macrantha Rolfe, Ann. Bot. 9: 156. 1895, non Hook. f. 1854; S. Y. Hu, Genera Orchid. Hong Kong 72. 1977.

Liparis nigra auct. non Seidenf.: FRPS 18: 73, pl. 10: 4. 1999; FTW ed. 2, 5: 948. 2000; FGD 7: 449. 2006; Check List HK Plants 378. 2002; 132. 2004.

Terrestrial herb, 12–25 cm tall at flowering time; pseudobulbs cylindrical; the third year's plant bearing 2 leaves. Leaves petiolate; petioles 2–3 cm; leaf blades ovate-elliptic, 5–15 × 2.5–6.5 cm, apex acuminate. Flowers dark-purple, almost black, in a terminal raceme on scapes of 10–20 cm; pedicels 1–1.5 cm; odd sepal linear, 2 × 0.2–0.25 cm, curved backward, apex obtuse; lateral sepals 1.7 × 0.4 cm, falcate, pointing forwards, recurved, parallel to the lip; petals linear, 1.5–2 × 0.1 cm, pointing backward, obtuse; lip 1.2–2.2 cm, bent at middle, basal portion narrowed, apical portion 1–1.1 × 1.2–1.3 cm, truncate, sharply toothed; column 1 cm, light green, arcuate turning reddish purple at fading; anther subglobose; pollinia 4 in 2 pairs; ovary 4–6 mm.

Locality: Sai Kung, Lantau Island. *S. Y. Hu 13643* (CUHK).

Distribution: Hainan, Guangdong, Guangxi, Yunnan, SE Xizang, Taiwan.

Ecology: Rocks or shade places in forests. Flowering: Feb.–May.

3. Liparis nervosa (Thunb. ex A. Murray) Lindl.
見血青(脈羊耳蒜) **(Photos 604–605)**
Gen. Sp. Orch. Pl. 26. 1830; FHK 352. 1861; FKH 261. 1912; FRPS 18: 71, pl. 10: 1–3. 1999; FTW ed. 2, 5: 947. 2000; FGD 7: 448, fig. 226. 2006; FOC 25: 218. 2009.

Ophrys nervosa Thunb. ex A. Murray, Linn. Syst. Veg. ed. 14, 814. 1784.

Caespitose terrestrial herb, 15–25 cm tall at flowering time; pseudobulbs elongate-conical, 5–10 cm or longer, 0.8–1.3 cm thick. Leaves petiolate; petioles 1–4 cm, that of the lowest leaf the longest; leaf blades ovate-elliptic, 2–19 × 1.5–8.5 cm, base unequal, one side subcordate, the other cuneate, apex acuminate. Flowers dull purplish green, very variable, sepals green or rose-purple or purple tinged green, even greenish yellow; odd sepal oblong or ovate-falcate, pointing upward, 6–12 mm; lateral 2 ovate-falcate, 4.5–9 × 2–4 mm; petals rose-purple or greenish yellow, linear, 5–10 mm; lip purple and light-green at base, tongue-like, curving downward; column fleshy, winged at apical end, green; anther purple; pollinia 4 in 2 pairs; ovary striate-sulcate.

Locality: Common in Hong Kong. *S. Y. Hu 12885A, 13659* (CUHK); *Y. W. Lam 427*.

Distribution: S, E & SW China; widely distributed in tropical and subtropical regions.

Ecology: Rocks along streams in shade of forests. Flowering: Jan.–May.

Uses: Medicinal (folklore).

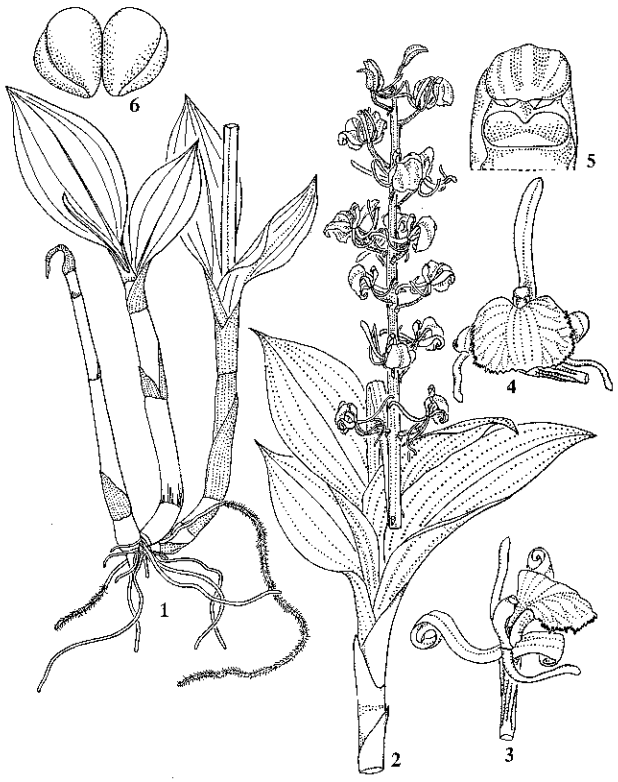

Figure 242. *Liparis gigantea* C. L. Tso
1. plant; *2.* current year's growth of a large plant with 4 leaves, and a scape with 3 bracts; *3.* lateral view of flower; *4.* front view of flower; *5.* apex of column; *6.* four pollinia in 2 pairs, without viscidium. (drawn by Teresa F. Wong)

4. Liparis bootanensis Griff. 鐮翅羊耳蒜 **(Photos 606–607)**
Not. Pl. Asiat. 3: 278. 1851; FRPS 18: 80, pl. 13: 1–3. 1999; FTW ed. 2, 5: 938. 2000; FGD 7: 450. 2006; FOC 25: 221. 2009.

Liparis plicata Franch. & Sav., Enum. Pl. Jap. 2: 509. 1879; FKH 261. 1912; S. Y. Hu, Genera Orchid. Hong Kong 72. 1977.

Epiphytic small herb, glabrous throughout; pseudobulbs crowded, compressed, bearing 4 cataphylls and 1 leaf. Leaf 1 to each pseudobulb, yellowish green to green, petiolate; petioles folded, articulate; leaf blades linear-lanceolate, 4.5–15 × 1.5–2.5 cm, slightly plicate, apex acute. Flowers 5–9, non-resupinate, in varying shades of green, turning to orange with age; the odd sepal linear-oblong, slightly recurved, 6–7 × 2 mm, obtuse at apex; lateral ones curving backward, lanceolate, 6 × 2 mm, obtuse; petals linear-filiform, 6 × 1 mm, obtuse; lip olive-green, tongue-like, curved downwards, apex truncate, slightly notched, with 2 distinct calli at the base, dark green; column snow-white, cylindrical, slightly compressed, base enlarged, apex arcuate, with a triangular wing on each side; anther cap ovoid, greenish, notched at the apex; pollinia 4 in 2 pairs; ovary strongly ridged and sulcate.

Locality: Violet Hill, Tai Mo Shan, Ma On Shan, Ng Tung Chai, Pak Tai To Yan, Lantau Island. *S. Y. Hu 12747, 12763* (CUHK); *P. S. Choi 487*.

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Hunan, Fujian, Taiwan; Sikkim, Bhutan, India, Myanmar, Vietnam, Thailand, Malaysia, Indonesia, Philippines, Japan.

Ecology: Rocks in shady ravines. Flowering: Oct.–Jan. of the following year.

5. Liparis ruybarrettoi S. Y. Hu & Barratto 包瑞羊耳蒜
Chung Chi Journal 13(2): 22. 1976; S. Y. Hu, Genera Orchid. Hong Kong 72. 1977; FRPS 18: 80. 1999; FOC 25: 211. 2009, pro syn. sub *L. bootanensis* Griff.

Epiphytic herb; pseudobulbs compressed-ovoid, the oldest the smallest, 5–6 close together forming an irregular curved line, with each succeeding pseudobulb emerging from the base of the previous one. Leaf 1 to each pseudobulb, linear-lanceolate, 11–17 × 1.4–2.5 cm, the basal half slightly plicate at anthesis, becoming plane and slightly folded near the base, apex acuminate and acute; midrib impressed above, elevated beneath, the 1 or 2 lateral parallel veins on each side rather obscure. Flowers non-resupinate, in various shades of green; sepals green, the odd one linear, farthest away from the rachis, 7 × 1 mm, apex slightly curved outwards; lateral sepals ovate-lanceolate, oriented below the lip and strongly curved outwards, 6 × 1.5–2 mm wide at middle; petals filiform, yellowish green, 7 × 0.25 mm, slightly curved forward; lip olive-green, tongue-like, curved downwards, apex truncate with a small obtuse middle projection, base furnished with 1 prominent shiny dark green glandular tubercle; column light yellow tinged green, curved forward; anther cap-like, ovate-lanceolate, acute; pollinia 4 in 2 pairs; ovary subtriangular-cylindrical, striate-sulcate.

Locality: Tai Mo Shan, Sunset Peak. *S. Y. Hu 11444A, 12569* (isotype), *12570* (holotype) (CUHK).

Distribution: Endemic to Hong Kong.

Ecology: Cliffs in shade and mossy rocks, alt. 500 m. Flowering: Oct.–Jan. of the following year.

Notes: The type specimen (*S. Y. Hu 12569*, K, holotype; A, CUHK, US, isotype) was collected from Tai Mo Shan in 1972.

6. Liparis stricklandiana Rchb. f.
扇唇羊耳蒜 **(Fig. 243; Photo 608)**

Gard. Chron. n. s. 13: 232. 1880; FRPS 18: 95, pl. 14: 5–6. 1999; FGD 7: 453. 2006; FOC 25: 225. 2009.

Liparis chloroxantha Hance, J. Bot. 21: 231. 1883; FKH 261. 1912; S. Y. Hu, Genera Orchid. Hong Kong 77, fig. 40. 1977.

Epiphytic herb; pseudobulbs oblique-ovoid to oblong-ovoid, slightly compressed, 2–4 cm long and 0.5–1.5 cm in diam., bearing 2 leaves at apex. Leaves petiolate; petioles articulate, 4–15 cm; leaf blades chartaceous, oblanceolate or linear-oblanceolate, 15–45 × 2–3 cm, base attenuate, apex acuminate. Flowers non-resupinate, greenish yellow; sepals narrowly obovate, 4–5 × 1.5–2 mm, lateral ones slightly wider; petals filiform, 5 × 1 mm; lip fan-shaped, 5 × 6 mm, apex truncate, mucronate, margin unevenly denticulate, base attenuate with an oblate callus; column slender, arcuate, slightly swollen at base; anther terminal, suborbicular; pollinia 4 in 2 pairs, faveolate.

Locality: Mount Parker, Kowloon Peak, Tai Mo Shan, Sha Tin, Ng Tung Chai. *S. Y. Hu 9484, 12757* (CUHK); *Y. S. Lau 1760.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan; Bhutan, Sikkim, India.

Ecology: Rocks along streams in shade. Flowering: Oct.–Jan. of the following year.

Figure 243. *Liparis stricklandiana* Rchb. f.
1. flowering plant; *2.* two-year old plant; *3.* abaxial view of flower; *4.* face view of flower; *5.* top view of flower; *6.* apical portion of column; *7.* two pairs of pollinia; *8.* side view of 1 pollinium. (drawn by Teresa F. Wong)

7. Liparis odorata (Willd.) Lindl.
香花羊耳蒜 **(Photos 609–610)**

Gen. Sp. Orch. Pl. 26. 1830; FHK 352. 1861; FKH 261. 1912; FFJ 6: 630. 1995; FRPS 18: 69, pl. 11: 6–8. 1999; FGD 7: 449. 2006; FOC 25: 218. 2009.

Malaxis odorata Willd., Sp. Pl. 4: 91. 1805.

Terrestrial herb; pseudobulbs subglobose, 1–2 cm long and 1–1.5 cm in diam., articulate, covered with membranous white sheaths. Leaves 2 or 3, ovate-oblong or linear-lanceolate, membranous, 6–15 × 2–5 cm, base attenuating gradually into a sheath-like petiole, apex acuminate; petiole non-articulate, 2–10. Flowers greenish yellow; odd sepal oblanceolate, strongly recurved along the margin, appearing linear, 7–10 × 1–1.5 mm, pointing backward, apex obtuse and thickened; lateral sepals ovate-oblong, reflexed, curved downwards, 5–7 × 3 mm, apex acute; petals filiform, 4–7 × 0.5 mm, wide spread and curved backward; lip green or tinged rose-pink, notched, with 2 triangular calli near the base, apex subtruncate; column arcuate, winged; anther greenish, apex mucronate; pollinia 4 in 2 pairs; ovary strongly ridged, the ridges winged and spiral.

Locality: Sunset Peak. *S. T. Dunn 192; Y. S. Lau 2743.*

Distribution: S, E & SW China; India, Myanmar, Laos, Thailand, Vietnam, Japan.

Ecology: Among short grasses in full sun at high elevations on exposed mountain tops. Flowering: Apr.–Jul.

8. Liparis ferruginea Lindl. 鏽色羊耳蒜 **(Photo 611)**

Gard. Chron. 1848: 55. 1848; FRPS 18: 75, pl. 11: 1–3. 1999; FGD 7: 449. 2006; FOC 25: 220. 2009.

Terrestrial herb; pseudobulbs narrowly ovoid, very small. Leaves 3–6, linear to lanceolate, (13–)20–33 × 0.8–1.2 cm, membranous or herbaceous, base slightly contracted and decurrent into amplexicaul sheath, not articulate, apex acute or shortly acuminate. Racemes several to 10-flowered; rachis 8–20 cm; pedicel 8–10 mm at fruiting time; floral bracts lanceolate, (2–)4–6 mm. Flowers yellow, lip pale yellowish brown slightly tinged with pale purple. Dorsal sepal linear, 6–7 × ca. 1.5 mm, 3-veined, margin revolute, apex obtuse; lateral sepals reflexed, obliquely ovate-oblong, ca. 6 × 2.5 mm, 5-veined. Petals nearly linear or narrowly oblanceolate-linear, ca. 6 × 1 mm, 1-veined, margin revolute; lip ± recurved, obovate-oblong, 4–5 × ca. 3 mm, with a pair of basal auricles backward spreading and 2 calli near base, apex broadly truncate, often emarginate and sinus apiculate. Column 3–4 mm, upper part with narrow wings on both sides. Capsule oblong or obovoid-oblong, ca. 1.5 cm × 6 mm.

Locality: Sai Kung. *P. S. Choi 504; Y. W. Lam 700.*

Distribution: Hainan, Fujian; Vietnam, Cambodia, Thailand, Malaysia, Indonesia.

Ecology: Streamsides, swamps. Flowering: Jul.

26. Malaxis Sol. ex Sw. 沼蘭屬

Terrestrial perennial herbs dormant during the cool dry season. Stems leafy, changing into elongate subconical or cylindrical pseudobulbs. Leaves large, plicate-venose, papery. Flowers very small and many, non-resupinate, in a terminal raceme; sepals free, spreading and often curved; petals filiform, curved forward; lip sessile, erect, spreading or the sides erect, auriculate at the base, with a depression near the column, the apex acute or bilobed; column very short, sunk in the sinus of the depression of the lip, terete, truncate at the apex; rostellum truncate; anther suborbicular, sessile, erect; pollinia 4 in 2 pairs, waxy, oblong-obovoid, without caudicle; viscidium a narrow mass lining the truncate rostellum; stigma concave; ovary obconical, striate-sulcate. Capsules ellipsoidal, the apex truncate, with the column surrounded by persistent remains of the sepals and petals.

About 300 species widely distributed in tropical and subtropical regions of the world, only a few species occur in N temperate zone; 21 species in China; two species in Hong Kong.

1a. Lip shield-like, without erect sides, the apex bilobed; column short, the length and the width subequal .....1. *M. acuminata*
1b. Lip erect on both sides, the apex triangular, entire and acute; column terete, the length twice as long as width.....2. *M. latifolia*

1. Malaxis acuminata D. Don

淺裂沼蘭(紫盾沼蘭) **(Fig. 244; Photos 612–613)**

Prodr. Fl. Nepal. 29. 1825; FRPS 18: 116, pl. 20: 5–6. 1999.

Crepidium acuminatum (D. Don) Szlach., Fragm. Florist. Geobot. Suppl. 3: 123. 1995; FOC 25: 233. 2009.

Malaxis allanii S. Y. Hu & Barretto, Chung Chi Journal 13(2): 18, fig. 9. 1976; S. Y. Hu, Genera Orchid. Hong Kong 79. 1977.

Terrestrial or half-epiphytic herb; pseudobulbs fleshy, cylindrical, 4–9 mm in diam., articulate, covered by ochreous dried leaf sheaths. Leaves 3–5, oblique-ovate or elliptic, 6–10 × 3–5 cm, base attenuating into a petiole, apex acuminate; petiole sheath-like, 2–4 cm, lower portion amplexicaul. Flowers purplish red, 1.5 cm in diam.; odd sepal linear, 8–10 × 2 mm, apex obtuse, margin recurved; lateral sepals oblong, 5–7 × 3–4 mm, apex obtuse, margin recurved; petals linear, 8–10 × 1 mm, margin recurved; lip ovate-oblong or obovate-oblong, 1 cm, the basal lobes pointing from the middle downwards, the apical lobe faintly cleft at the tip; column very short, 1–1.5 mm; anther suborbicular, wax-yellow and red at the base; pollinia 4 in 2 pairs, waxy; ovary 6-striate and sulcate, curved downwards.

Locality: Tai Tam, Repulse Bay, Tai Mo Shan, Sha Tin. *S. Y. Hu 1355* (holotype of *M. allanii* S. Y. Hu), *13010* (CUHK); *Y. S. Lau 2993*.

Distribution: Guangdong, Guizhou, Yunnan, Taiwan; Nepal, India, Myanmar, Vietnam, Laos, Indonesia, Java, Philippines, Australia.

Ecology: Forests and ravines. Flowering: Jun.

Notes: The type specimen of *M. allanii* (*S. Y. Hu 13551*, K, holotype; A, CUHK, isotype) was collected by W. L. Allen from Repulse Bay in 1969.

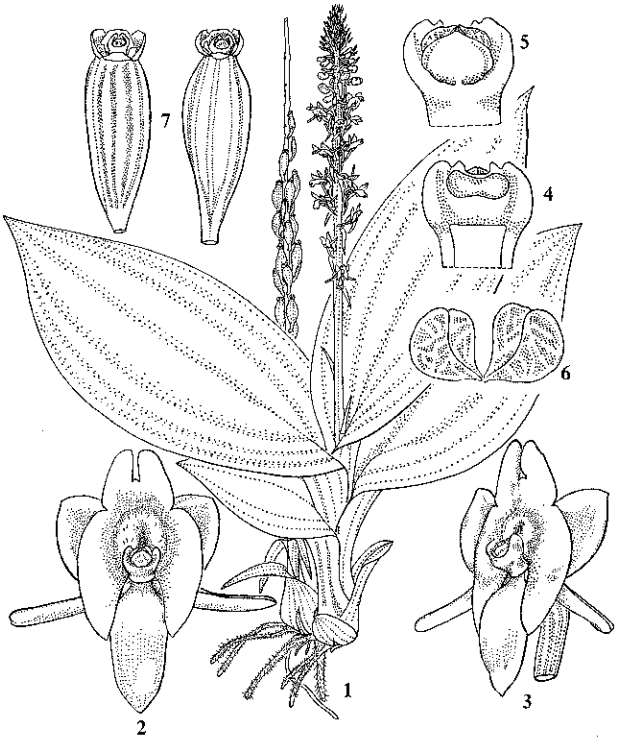

Figure 244. *Malaxis acuminata* D. Don
1. two-year old plant; *2*. front view of flower; *3*. lateral view of flower; *4*. front view of column; *5*. back view of column; *6*. four pollinia in 2 pairs, without viscidium; *7*. fruits. (drawn by Teresa F. Wong)

2. Malaxis latifolia Sm. 闊葉沼蘭 **(Photo 614)**

Rees Cyclop. 22. Malaxis n. 3. 1812; FHN 4: 207, fig. 1096. 1977; FRPS 18: 111. 1999; FTW ed. 2, 5: 964, pl. 409. 2000; FGD 7: 455, fig. 228. 2006.

Dienia congesta Lindl., Bot. Reg. 10: sub t. 825. 1824; FHK 352. 1861.

Dienia ophrydis (J. Koenig) Ormerod & Seidenf., Contr. Orchid. Fl. Thailand 13: 18. 1997; FOC 25: 235. 2009.

Microstylis congesta (L.) Rchb. F., Walp. Ann 6: 206. 1861; FKH 260. 1912.

Malaxis parvissima S. Y. Hu & Barretto, Chung Chi Journal 13(2): 22, fig. 10. 1976.

Terrestrial or half-epiphytic herb; pseudobulbs fleshy, cylindrical, 3–11 cm, articulate, covered by the sheathing base of degenerated leaves. Leaves 4–5, oblique ovate-elliptic or elliptic-lanceolate, 6–17 × 3–8 cm, base attenuating into a petiole, apex acuminate; petiole sheath-like, 3–5 cm, amplexicaul. Flowers purplish red or greenish yellow, non-resupinate; odd sepal narrowly oblong, 3–5 × 1–1.5 mm, apex obtuse; lateral sepals oblique-ovate, curved inward and forward, 2–3 × 1–2 mm, apex obtuse; petals linear, 3–4 × 1–1.5 mm, apex obtuse; lip dark purplish red, 2–3 × 2.5 mm, 3-lobed; midlobe narrowly ovate, 0.5–1 mm, apex obtuse; lateral lobes very short or not obvious, apex obtuse; column very short, 1.5 mm; anther 2-celled, sunk in the apical cavity of the column, attached at the back; pollinia 4, in 2 obovoid pairs, waxy; ovary very short, green with 6 purple cristate ridges, not twisted nor sulcate.

Locality: Tai Mo Shan, Wu Kau Tang, Sunset Peak. *Y. S. Lau 3305.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan; India, Indochina, Malesia, Australia.

Ecology: Along banks of streams in wooded areas. Flowering: May–Jul.

Notes: The type specimen of *M. parvissima* (*S. Y. Hu 12453,* K, holotype; A, CUHK, isotype) was collected by W. G. L. Allen from Tai Mo Shan in 1972.

27. Nephelaphyllum Blume 雲葉蘭屬

Terrestrial perennial herbs, with leaves remaining on the third year's growth. Roots few. Rhizomes fleshy, the internodes longer than thick. Leaves ovate, fleshy, produced 1 annually, disarticulation near the truncate base. Scapes emerging from the base of the last internode, with 1 basal and 1 submedian sheaths. Flowers few, non-resupinate, in a loose terminal raceme; sepals and petals subequal, spreading like a fan; lip uppermost, undivided, long and narrow, calcarate, the spur enlarged at the end, the lateral lobes obsolete, midlobe spreading, 2-lobed, erect, disk cristate-lamellate and papillose to the base; column long and stout, winged, the apex erose; clinandrium broad; rostellum fleshy, truncate, recurved; anther terminal, rectangular and 2-cornute; pollinia 8 in 2 groups, waxy, laterally compressed, 2-seriate, the upper ones smaller, loosely associated by granular basal membrane; stigma discoid; ovary subcylindrical-ovoid. Capsules oblong, reflexed, ridged.

About 18 species distributed in tropical Himalaya via S China to SE Asia; one species in China and Hong Kong.

1. Nephelaphyllum tenuiflorum Blume
雲葉蘭 **(Fig. 245; Photos 615–616)**

Bijdr. 8: 373. 1825; FRPS 18: 232, pl. 39: 7–12. 1999; FGD 7: 408, fig. 209. 2006; FOC 25: 281. 2009.

Nephelaphyllum cristatum Rolfe, Kew Bull. 194. 1896; J. Linn. Soc. Bot. 36: 19. 1903; FKH 263. 1912; S. Y. Hu, Quart. J. Taiwan Mus. 27: 442. 1974, et Genera Orchid. Hong Kong 64, fig. 31. 1977.

Terrestrial creeping herb; rhizomes fleshy, 2–5 mm in diam., with 1 cm long membranous sheaths; pseudobulbs petiole-like, fleshy, 1–2 cm long, 1–2 mm thick, unifoliate. Leaves ovate-cordate, slightly fleshy, 2–5 × 1–4 cm, base cordate, apex acute. Flowers non-resupinate; sepals and petals alike in colour, shiny light green, striped purplish red; sepals obovate-lanceolate, apex acuminate, 1 × 0.3 cm, lateral ones being narrower; petals spathulate, same length with sepals but being wider, apex acute; lip nearly elliptic, slightly notched, 1 × 0.5–0.7 cm, inobviously 3-lobed; lateral lobes growing downwards, midlobe curving upwards, apex slightly notched, margin crispate; column flat, veined along the sides; anther cornute, rectangular; pollinia 8 in 4 pairs, oblong, compressed; ovary obconical, green tinged purplish red.

Locality: Victoria Peak, Ma On Shan, Lantau Island. *Y. S. Lau 1891; Y. W. Lam 235, 1648.*

Distribution: Hainan, Guangdong.

Ecology: Forests. Flowering: Jun.–Jul.

Uses: Ornamental.

Notes: The type specimen of *N. cristatum* (*C. Ford 48, 254,* K) was collected by C. Ford from Victoria Peak before 1884. Listed in *Rare and Precious Plants of Hong Kong*.

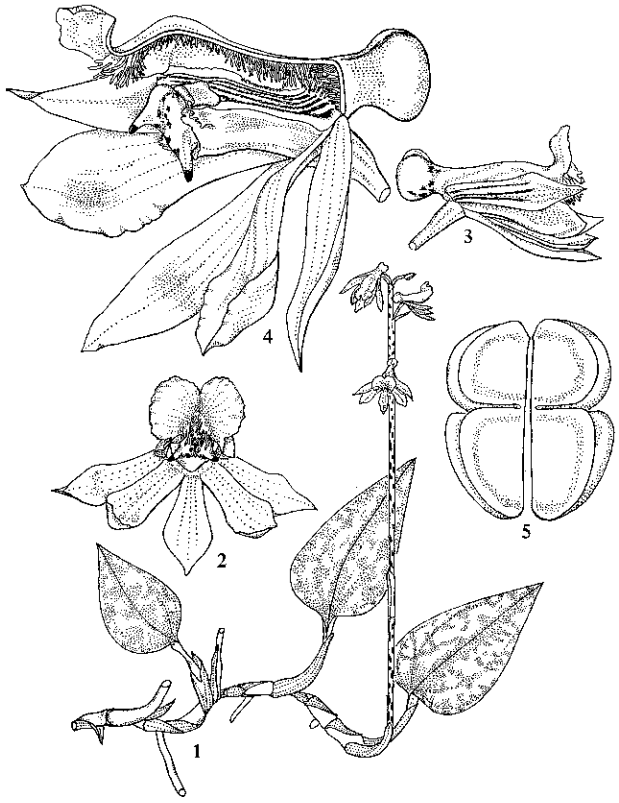

Figure 245. *Nephelaphyllum tenuiflorum* Blume
1. flowering plant; *2.* front view of flower; *3.* lateral view of flower; *4.* flower with half of lip removed; *5.* eight pollinia in 4 pairs. (drawn by Teresa F. Wong)

28. Mischobulbum Schltr. 球柄蘭屬

Terrestrial perennial herbs with the leaves remaining on the fifth year's growth. Rhizomes short and stout, the internodes thicker than long. Leaves ovate-cordate, produced 1 annually, petiolate, articulation near the cordate base of the leaf blade. Scapes emerging from one-year-old pseudobulbs, with 3 basal and a submedian sheaths. Flowers medium-sized, few in a short terminal raceme; sepals and petals subequal, the lateral sepals oblique, connate at the base and adnate to the column-foot forming a mentum; lip fleshy, undivided, subrhomboid, the sides erect, the apex triangular-acute, disk with 3 prominent keels; column long, erect, fleshy, slightly incurved, winged on both sides; rostellum deltoid; anther terminal, ovate, concave, bicornute; pollinia 8 in 2 groups, each group agglutinated at the base by a sticky mass; stigma transversely concave; ovary subcylindrical, striate.

About eight species distributed in S China, SE Asia and Pacific islands; one species in China and Hong Kong.

1. Mischobulbum cordifolium (Hook. f.) Schltr. 心葉球柄蘭 **(Fig. 246; Photo 617)**

Fedde Repert. Sp. Nov. Beih. 1: 98. 1911, et 4: 180. 1919; S. Y. Hu, Genera Orchid. Hong Kong 66, fig. 32. 1977; FRPS 18: 231. 1999; FTW ed. 2, 5: 971, pl. 413. 2000; FGD 7: 409, fig. 210. 2006.

Tainia cordifolia Hook. f., Hooker's Icon. Pl. 19(3): pl. 1861. 1889; FOC 25: 282. 2009.

Terrestrial herb; pseudobulbs petiole-like, 8 cm or longer, 3–4 mm thick, unifoliate. Leaves semi-succulent, ovate-cordate, 7–13 × 4–8 cm, base cordate, apex acute, dull green, with 6 arching primary veins in addition to the midrib and faintly reticulate veinlets. Flowers large, bracts small, lanceolate, 7 mm, apex acuminate; sepals and petals brown with purple-brown veins; sepals subequal, lanceolate; the odd one 2–2.5 × 0.3–0.5 cm, apex acuminate; lateral ones oblique, connate at the base forming the mentum of 12–14 mm; petals slightly larger than sepals, lanceolate, 2–2.2 × 0.5–0.7 cm, acute, oblique at the base, 5-veined and keeled along the midvein; lip fleshy, attached to the mentum, rhomboid, 2.4 × 1.4 cm, the apex triangular and acute, with 3 prominent ridges, purple; column erect, fleshy, slightly curved, winged along both sides; anther terminal, with 2 ear-like projections; pollinia 8 in 4 pairs; ovary subcylindrical, striate, glabrous.

Locality: Lantau Island. *HK sheet 34413*.

Distribution: Guangdong, Guangxi, Yunnan, Fujian, Taiwan; Vietnam.

Ecology: Shade and moist places in forests. Flowering: May–Jul.

Uses: Ornamental.

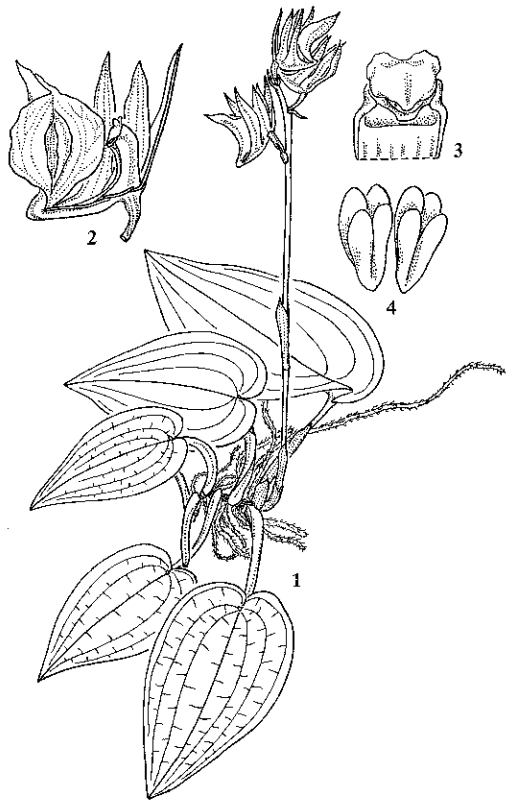

Figure 246. *Mischobulbum cordifolium* (Hook. f.) Schltr.

1. flowering plant; *2*. lateral view of faded flower with half of dorsal sepal, 1 lateral sepal and 1 petal removed; *3*. front view of apical portion of column; *4*. eight pollinia in 4 pairs. (drawn by Teresa F. Wong)

29. Cephalantheropsis Guillaumin 黃蘭屬

Subepiphytic perennial herbs. Stems bamboo-like, 2 or 3 together, leafy. Leaves all cauline, papery, plicate-venose, disarticulate below the leaf blade. Scapes emerging from the axils of cataphylls or lower leaves, with basal imbricate scale. Flowers medium-sized, showy, in lateral racemes; sepals and petals subsimilar, free, spreading; lip attached to the base of the column, 3-lobed, the lateral lobes erect and the apex recurved, midlobe transversely widened, 2-lobed, crisped; column suberect, short, stout, winged on the sides, slightly enlarged at the base, the apex truncate; clinandrium narrow; rostellum ovate, acute; anther ovoid, incumbent, hanging on the upper margin of the clinandrium; pollinia 8, obovoid-acuminate; viscidium small, discoid; stigma suborbicular; ovary cylindrical, striate-sulcate. Capsule oblong, rostrate.

About six species distributed mainly in Japan, China and SE Asia; two species in China; one species in Hong Kong.

1. Cephalantheropsis obcordata (Lindl.) Ormerod
黃蘭(嶺南黃蘭) **(Fig. 247; Photos 618–619)**

Orchid Digest. 62: 157. 1998; FOC 25: 289. 2009.

Bletia obcordata Lindl., Gen. Sp. Orchid. Pl. 123. 1831.

Calanthe gracilis Lindl., Gen. Sp. Orchid. Pl. 251. 1833; FKH 254. 1912.

Cephalantheropsis gracilis (Lindl.) S. Y. Hu, Quart. J. Taiwan Mus. 25(3–4): 213. 1972, et Genera Orchid. Hong Kong 56, fig. 25. 1977; FRPS 18: 255, pl. 45: 7. 1999; FTW ed. 2, 5: 795. 2000; Check List HK Plants 372. 2002; 129. 2004.

Limatodes gracilis (Lindl.) Lindl., Fol. Orchid. Limatodis 1. 1855; FHK 359. 1861.

Perennial herb. Stems cane-like growing close together on a short creeping rhizome, to 1 m tall; internodes many, 5–10 cm. Leaves 5–8, papery, oblong-lanceolate, 30 × 5–8 cm; scapes 60 cm, rachis 5–20 cm; bracts membraneous. Flowers yellow; segments oblong, 9–11 × 4 mm, hairy outside; lip trilobed, lateral lobes erect; epichile 2-lobed, crisped; column fleshy; anther terminal; pollinia 8.

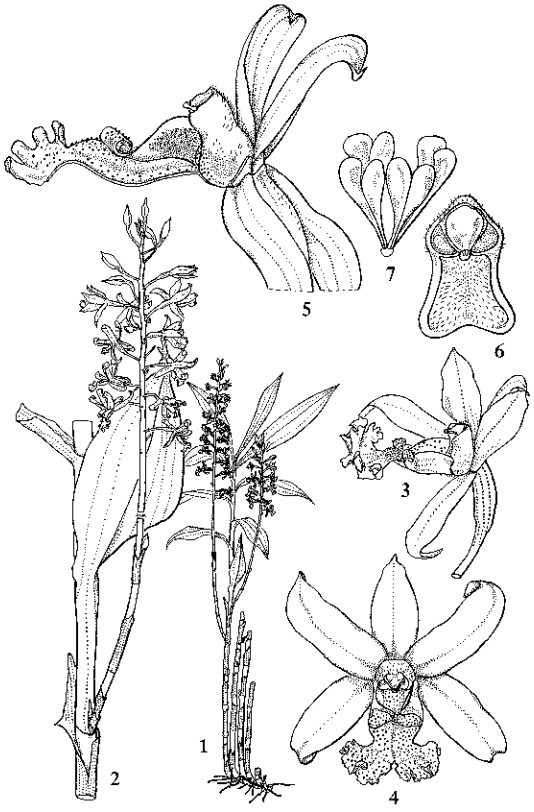

Figure 247. *Cephalantheropsis obcordata* (Lindl.) Ormerod

1. flowering plant; *2*. portion of flowering plant; *3*. lateral view of flower; *4*. front view of flower; *5*. lateral view of flower with 1 petal, lower portion of 2 sepals and half of lip removed; *6*. column; *7*. eight pollinia on short caudicles and viscidium. (drawn by Teresa F. Wong)

Locality: Victoria Peak, Shing Mun, Pat Sin Leng, Sheung Tsat Muk Kiu. *S. Y. Hu 10013, 10014* (CUHK); *Y. W. Lam 502.*
Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian, Taiwan; India, Myanmar, Laos, Thailand, Malaysia.
Ecology: Clinging to wet rocks in shade along streams. Flowering: Nov.–Mar. of the following year.

30. Arundina Blume 竹葉蘭屬

Terrestrial perennial herbs. Stems erect, leafy, slightly enlarged at the base. Leaves many, lanceolate, articulate with the sheaths. Inflorescences occasionally branched; bracts small, persistent. Flowers medium-sized, showy, opening one at a time, appearing as if in a terminal raceme; sepals free, subequal, spreading; petals slightly wider than the sepals; lip attached to the base of the column, trumpet-shaped, embracing the column, the apex deeply cleft, disk lamellate, with 5 longitudinal keels; column long, slender, slightly curved and enlarged at the apex; clinandrium elevated, rotundate and 2-dentate; rostellum curtain-like, pointed at the middle of the margin; anther terminal, incumbent, concave; pollinia 8 in 2 groups, discoid, laterally compressed, loosely connected by granular material; stigma semi-orbicular, below the rostellum; ovary cylindrical. Capsules cylindrical, strongly rostrate.

One or two species widely distributed in tropical Asia; one species in China and Hong Kong

1. Arundina graminifolia (D. Don) Hochr.
竹葉蘭 **(Fig. 248; Photos 620–621)**

Bull. New York Bot. Gard. 6: 270. 1910; FRPS 18: 334, pl. 56: 1–3. 1999; FTW ed. 2, 5: 755, pl. 321. 2000; FGD 7: 395, fig. 201. 2006; FOC 25: 315. 2009.

Bletia graminifolia D. Don, Prodr. Fl. Nepal. 29. 1825.

Arundina chinensis Blume, Bijdr. 8: 402. 1825; FHK 355. 1861; FKH 265. 1912; S. Y. Hu, Genera Orchid. Hong Kong 62, fig. 29. 1977.

Terrestrial herb; stems erect, grass-like and stiff, leafy, the basal portion swelling into a small ovoid pseudobulb covered by imbricate brown tough scales, the aerial portion cylindrical, covered by fresh or persistent sheaths. Leaves linear-lanceolate, thinly leathery or papery, 5–20 × 0.6 cm, base slightly narrowed and bearing cylindrical sheaths, apex acute; sheaths amplexicaul and overlapping, 2–4 cm, articulate at the apical end. Inflorescences terminal, racemose or paniculate; flowers resupinate, colourful and showy; sepals elliptic or elliptic-lanceolate, 2.5–4 × 0.7–0.9 cm, apex acute, pale rose-mauve; petals elliptic or ovate-elliptic, 2.5–3.5 × 1.3–1.8 cm, rose-mauve with darker median veins; lip trumpet-shaped, 3–4 cm, embracing the column, wavy at the margin, deeply cleft at the apex, pale magenta and deepening into bright rose-purple towards the margin and apex; column slender, curved and slightly winged at the apical end; anther terminal, 2-celled; pollinia 8, discoid; ovary slender, glabrous, striate.

Locality: Common in Hong Kong. *S. Y. Hu 9432, 12294A* (CUHK); *Y. S. Lau 3135; HK sheet 34780.*

Distribution: C, E, S & SW China; tropical Asia.

Ecology: Grassy slopes or along the banks of streams in exposed areas. Flowering: Jul.–Dec.

Uses: Medicinal (folklore), ornamental.

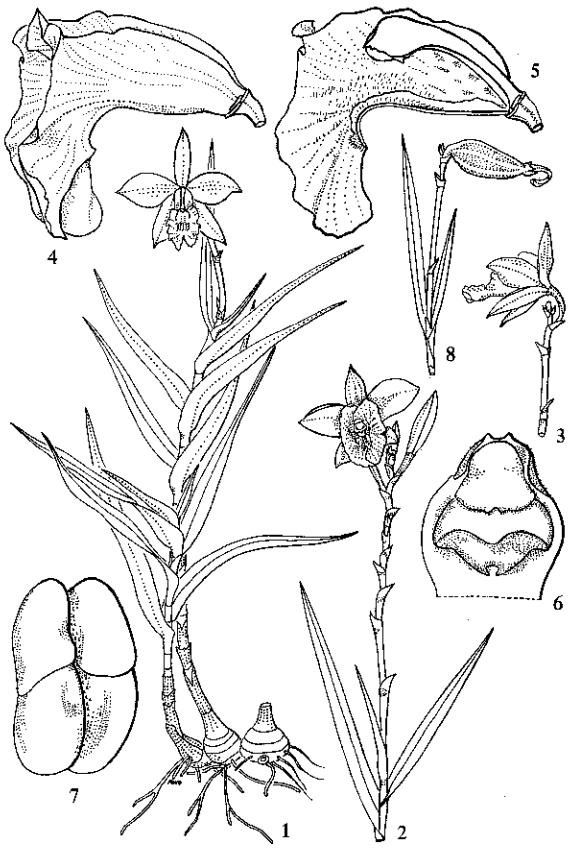

Figure 248. *Arundina graminifolia* (D. Don) Hochr.
1. flowering plant; *2.* portion of flowering plant; *3.* lateral view of flower; *4.* lateral view of flower with sepals and petals removed; *5.* laternal view of flower with half of lip removed; *6.* apex of column; *7.* two pairs of pollinia from half of an anther, the shorter ones being the front pair; *8.* portion of fruiting plant. (drawn by Teresa F. Wong)

31. Acanthephippium Blume 鐲花蘭屬

Terrestrial perennial herbs with large fleshy purplish brown conical erect pseudobulbs. Stem erect, changing into pseudobulb after anthesis. Cataphylls green at flowering time. New shoot emerging from the base of a mature pseudobulb, consisting of two elements, the flowering branch and the leafy shoot. Leaves 3 or 4, apical to a pseudobulb, chartaceous, arching, plicate-venose. Flowers medium-sized, hardly opening, in a loose raceme axillary to a cataphyll of a developing new shoot; sepals fleshy, coherent and forming an oblique ventricose-urceolate tube, the odd sepal linear, the lateral ones oblique, adnate to the column-foot forming a mentum, reflexed at the apex; petals largely concealed, narrower than the lateral sepals; lip short and broad, attached to the elongate and curved column-foot, movable, 3-lobed, the lateral lobes rectangular, erect, midlobe short, recurved, disk lamellate; column thick, winged, the base produced to an incurved foot; clinandrium short, membranous; rostellum truncate; anthers terminal, incumbent, cucullate; pollinia 8 in 2 groups, each group with a small front pair and a large hind pair, oblong-obovoid, connected by a granular mass at the apex; stigma triangular; ovary cylindrical. Capsules oblong-ellipsoidal, strongly ridged.

About ten species distributed in tropical Asia, New Guinea and Pacific islands; three species in China; one species in Hong Kong.

1. Acanthephippium striatum Lindl.
錐囊花蘭(中華囊花蘭) **(Fig. 249)**

Edwards's Bot. Reg. 24(Misc.): 41. 1838; FOC 25: 310. 2009.

Acanthephippium sinense Rolfe, Kew Bull. 142. 1913; S. Y. Hu, Quart. J. Taiwan Mus. 25: 11. 1972, et Genera Orchid. Hong Kong 90, fig. 50. 1977; FRPS 18: 323. 1999; FGD 7: 404, fig. 206. 2006; Check List HK Plants 369. 2002; 129. 2004.

Terrestrial perennial herb; pseudobulb ovoid-cylindrical, covered with several membranous sheaths. Leaves papery, obovate-elliptic, 20–25 cm, base attenuating into a petiole, apex acute or acuminate. Flowers medium-sized, the odd sepal elliptic-oblong, 1.8–2 × 0.8–1 cm, apex obtuse; lateral ones oblique ovate, slightly wider than the odd sepal, with a 1.3 cm long conical mentum at base; petals ovate-oblong, 2 × 0.7 cm, apex acuminate; lip 3-lobed, lateral lobes erect, apex rounded, curved forward; midlobe rhombic-triangular, 10 × 8 mm, lamellate, apex acute, disk becoming thick near the two lateral lobes, with 3 ridges; column 1.3 cm, with a 8–10 mm long column-foot; pollinia 8 in 2 groups; ovary cylindrical.

Locality: Tai Mo Shan. *S. Y. Hu 10166, 13699* (CUHK).

Distribution: Guangdong.

Ecology: Flowering: Apr.–May.

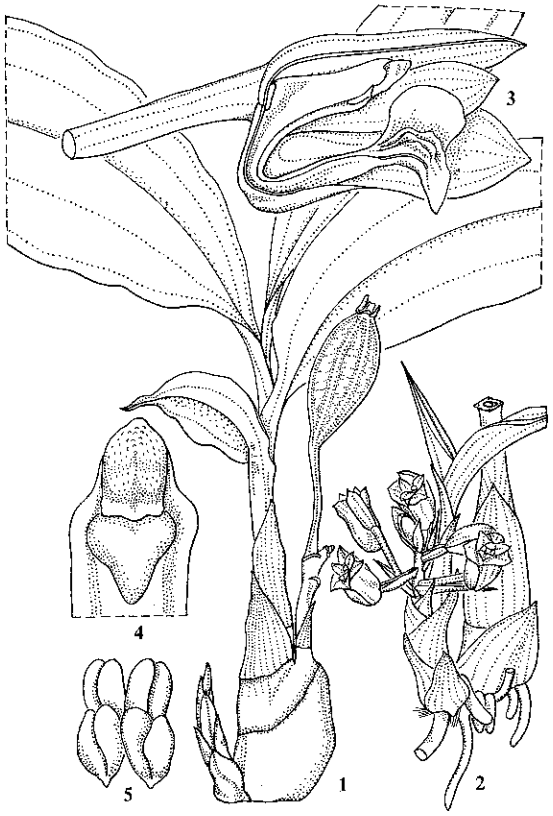

Figure 249. *Acanthephippium striatum* Lindl.

1. fruiting plant; *2.* plant at flowering stage with leafy portion of mother shoot removed; *3.* lateral view of flower with half of odd sepal, 1 lateral sepal, and 1 sidelobe of lip removed; *4.* apical portion of column; *5.* eight unequal pollinia in 2 groups of 2 pairs each. (drawn by Teresa F. Wong)

32. Phaius Lour. 鶴頂蘭屬

Terrestrial perennial herbs requiring dormancy in the dry cool season. Young shoot emerging from the base of a one-year-old pseudobulb and changing into a pseudobulb after anthesis. Leaves 5 or 6, plicate-venose. Scape axillary to the second leaf from the bottom. Flowers large, showy, in a terminal raceme; sepals and petals similar in size and colour, free, spreading; lip undivided, trumpet-shaped, embracing the column, calcarate, the spur short and pointed, the apical margin wavy; column long, slightly enlarged and winged at the apical portion, without foot; clinandrium short, oblique, sinuate at the margin; rostellum subtruncate; anther attached to the margin of the clinandrium, incumbent, convex; pollinia 8, waxy, unequal, obovoid, slightly compressed laterally; connected at the apex by granular mass; stigma suborbicular; ovary obovoid-cylindrical. Capsules ellipsoidal, pendulous, rostrate, ridged.

About 40 species distributed in tropical Africa, tropical and subtropical Asia and Oceania; eight species in China; one species in Hong Kong.

1. Phaius tankervilliae (L'Her.) Blume
鶴頂蘭 **(Fig. 250; Photos 622–623)**

Mus. Bot. 2: 177. 1856 ["*tankervillii*"]; S. Y. Hu, Quart. J. Taiwan Mus. 27(3–4): 464. 1974, et Genera Orchid. Hong Kong 92, fig. 51. 1977; FRPS 18: 265, pl. 45: 5. 1999; FTW ed. 2, 5: 1001, photo 131. 2000; Cribb, M. Sun & G. Barretto, Kew Bull. 59: 549, fig. 1–2. 2004; FGD 7: 421, fig. 214. 2006; FOC 25: 291. 2009; Check List HK Plants 382. 2002; 133. 2004.

Limodorum tankervilliae Banks ex L'Her., Sert. Angl. 28: 1788.

Phaius grandifolius Lour., Fl. Cochinch. 2: 529. 1790; FHK 355. 1861; FKH 263. 1912.

Phaius tankervilliae (L'Her.) Blume f. *veronicae* S. Y. Hu & Barretto, Chung Chi Journal 13(2): 25. 1976.

Terrestrial perennial herb; pseudobulbs large, oblique-ovoid or conical, 3–6 × 3–3.5 cm, often partially covered by degenerated

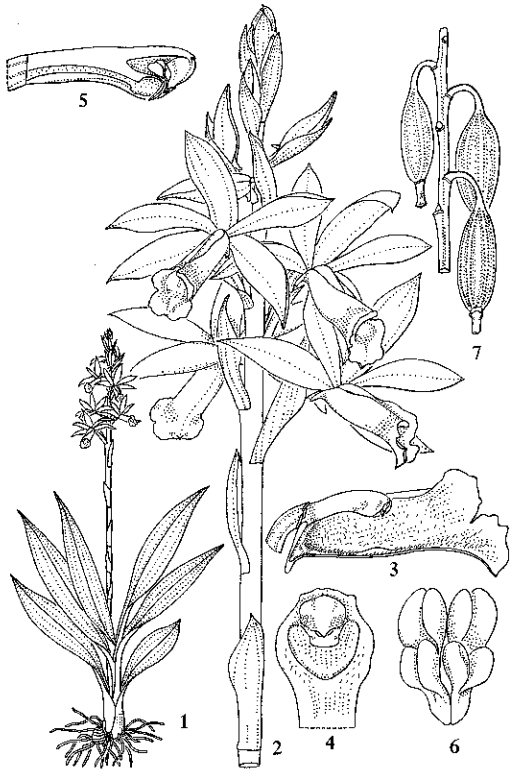

Figure 250. *Phaius tancervilleae* (L'Her.) Blume

1. flowering plant; *2.* upper portion of scape; *3.* flower with sepals, petals, and half of the lip removed; *4.* front view of apical portion of column; *5.* longitudinal section of column with portion of ovary attached; *6.* eight unequal pollinia in 4 pairs with the front ones smaller than the hind ones; *7.* fruiting branch. (drawn by Teresa F. Wong)

leaf-bases; cataphylls green, sheathing. Leaves 2–6, elliptic or oblong-lanceolate, plicate, glabrous, 20–60 × 3–10 cm, base attenuating into a petiole, apex acuminate; petiole 9–20 cm. Inflorescence a raceme, bracts membraneous, caducous, cymbiform; flowers large, resupinate, uniform in colour and shape, white outside, brown inside; sepals subequal, ovate-elliptic or oblong-lanceolate, 4–6 × 1–1.5 cm, base subcordate, apex acute and apiculate; petals elliptic or oblong, same length with sepals but slightly narrower, base cuneate and slightly reflexed, apex acuminate and slightly recurved; lip trumpet-like, embracing the column, base slightly adnate to the column-foot, the basal two-thirds of the outside whitish purple, the apical one-third dull purple, lighter along the margin, the basal portion of the inside dull purple maculated with darker lines towards the base, slightly villose with 2 calli at the middle; column white, apical end winged; anther white, protected by wings of the column; pollinia 8 in 4 pairs; ovary glabrous, whitish green.

Locality: Mount Parker, Sham Chung, Tai Mo Shan, Sai Kung. *S. Y. Hu 9926, 11844* (CUHK); *P. S. Choi 251.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Xizang, Fujian, Taiwan; tropical and subtropical Asia, Australia.

Ecology: Shade banks of streams in forests. Flowering: Mar.–Apr.

Uses: Ornamental.

Notes: The type specimen of *Phaius tankervilliae* (L'Her.) Blume f. *veronicae* S. Y. Hu & Barretto (*S. Y. Hu 13145A*, K, holotype; CUHK, isotype) was collected from Mount Parker in 1975. This coloured form is distinguished by the lemon-yellow sepal and petals, the lip being more tubular with a smaller ruffled yellow apical portion, and the anther being densely pilose on the sides. Moreover, a distinct species *P. wallichii* Lindl. has been reported recently by Cribb et al. (Kew Bull. 59: 547–554, fig. 3–4. 2004; voucher specimen: *Barretto 146,* K). Locally known from the estate of the Kadoorie Farm and Botanic Garden (KFBG) and thus being referred as the "Kadoorie Phaius" (Barretto, Check List of Plants at KFBG: 57. 2004), *P. wallichii* could be distinguished by these features: flowering spreading; tepals ochre-coloured, acuminate; lip with a yellow and purple-marked throat and a large, white, cuspidate, deflexed midlobe; spur slender, 11–20 mm long, distinctly bifid at the tip.

33. Calanthe R. Br. 蝦脊蘭屬

Terrestrial perennial herbs, caespitose. Leaves large, plicate-venose, papery. Scape axillary to the second or the fourth leaf of the current year's growth. Flowers medium-sized, in a terminal raceme; sepals equal, free, spreading; petals almost similar as or slightly narrower than the sepals, spreading; lip adnate to the sides of the column, calcarate, 3-lobed, the spur slender, usually longer than the ovary, lateral lobes erect or spreading, midlobe truncate or bilobed, disk with cristate or lobed calli; column short, without foot; clinandrium membranous; rostellum triangular, acuminate, bifid; anther subterminal, incumbent, acuminate; pollinia 8, waxy, lanceolate, attenuate at the apex; viscidium linear or obovate; stigma transversely dumb-bell-shaped, visible from the sides of the rostellum, or U-shaped below the rostellum; ovary subcylindrical. Capsules oblong-ellipsoidal.

About 150 species distributed in tropical Asia, Papua New Guinea, Australia, tropical Africa and C America; 49 species and five varieties in China; four species in Hong Kong.

1a. Flowers yellow, appearing with the young shoot in early spring; spur short; lateral lobes of the lip broad, suborbicular; midlobe truncate or shallowly bilobed.
  2a. Flowering bracts deciduous; sepals yellow on both surfaces; spur clavate; midlobe of lip 2-lobed, with the base narrower than the apex ..... 1. *C. speciosa*
  2b. Flowering bracts persistent; sepals tinged brown on the outside; spur curved, acute; midlobe of lip truncate, the base and the apex similar in width ..... 2. *C. graciliflora*
1b. Flowers white or purple-red, appearing in the autumn on shoots with mature leaves; spur slender, equal to or longer than the ovary and the pedicel together; lateral lobes of the lip ovate or obovate-oblanceolate; midlobe of the lip obcordate or with narrow divergent lobes.
  3a. Flowers white, in a crowded corymb-like raceme; spurs pointing downward; midlobe of the lip with divergent narrow lobes ..... 3. *C. triplicata*
  3b. Flowers purple-pink, in a loose raceme; spurs very long, pointing backward; midlobe of the lip obcordate.... 4. *C. sylvatica*

1. Calanthe speciosa (Blume) Lindl. 二列葉蝦脊蘭 (Photo 624)

Gen. Sp. Orch. 250. 1833; Su, Quart. J. Expt. Forest. Natl. Taiwan Univ. 4(3): 87, pl. 3. 1990; FTW ed. 2, 5: 789. 2000; FOC 25: 296. 2009.

Amblyglottis speciosa Blume, Bijdr. Fl. Ned. Ind. 371. 1925.

Calanthe formosana Rolfe, Ann. Bot. 9: 157. 1895; FRPS 18: 278, pl. 48: 5. 1999; FGD 7: 415. 2006; Check List HK Plants 372. 2002; 129. 2004.

Calanthe curculigoides auct. non Lindl.: FKH 264. 1912.

Calanthe patsinensis S. Y. Hu, Chung Chi Journal 11: 13, fig. 1. 1972, et Quart. J. Taiwan Mus. 25(3–4): 202. 1972, et Genera Orchid. Hong Kong 93. 1977.

Terrestrial herb, up to 120 cm tall, completely glabrous; pseudobulbs cylindrical, sheathing. Leaves distichous, oblong-elliptic or elliptic-lanceolate, 20–60(–95) × 4–6 cm, base attenuating into a long petiole, apex acuminate; petiole stout, 6–10(–20) cm, base enlarging into sheaths. Flowers yellow or yellow-orange, in a terminal raceme; sepals subequal, elliptic or ovate-lanceolate, 10–15 × 4–5 mm, apex acuminate; petals ovate-elliptic or oblong-elliptic, 10–13 × 5–6 mm, apex acute; lip adnate to the sides of the column, 3-lobed; lateral lobes ovate-triangular, 5 mm apart from each other; apical lobe fan-shaped, 5 × 5 mm, truncate, apiculate at the apex, gradually narrowed towards the base; column 3–5 mm, winged at the apex; anther elongate-conical; pollinia 8, strongly attenuate; ovary subcylindrical, subtrigonous, glabrous.

Locality: Tai Po Kau, Pat Sin Leng, Sha Tau Kok. *K. K. Mark 2* (CUHK); *L. T. Lo 570; Y. W. Lam 179.*

Distribution: Hainan, Taiwan.

Ecology: Shade and moist places in forests. Flowering: Oct.–Nov.

Notes: The type specimen of *C. patsinensis* (*S. Y. Hu 10013,* A, holotype) was collected from Pat Sin Leng in 1970.

2. Calanthe graciliflora Hayata 鈎距蝦脊蘭

J. Coll. Sci. Univ. Tokyo 30: 329. 1911, et Icon. Pl. Formos. 4: 68, t. 31. 1914; S. Y. Hu, Quart. J. Taiwan Mus. 25(3–4): 202. 1972; FRPS 18: 316. 1999; FTW ed. 2, 5: 786. 2000; FGD 7: 418. 2006; FOC 25: 307. 2009.

Calanthe striata auct. non (Sw.) R. Br.: S. Y. Hu, Genera Orchid. Hong Kong 93. 1977.

Terrestrial herb, rhizomes inconspicuous; pseudobulbs short, subovoid, covered by cataphylls and leaf sheaths. Leaves basal, elliptic or ovate-elliptic, 15–23(–33) × 6–8 cm, conspicuously plicate, base gradually attenuating into sheathing petioles, apex acuminate, glabrous at two sides. Flowers resupinate, fragrant, pale lemon-yellow, deeper towards the margin, with sepals and petals washed brownish outside; sepal similar in shape and colour, equally spaced, elliptic, 10–15 ×, 5–6 mm, apex acute; petals obovate or obovate-lanceolate, 10–13 × 3–4 mm, apex acute; lip 3-lobed, white with purplish marks on lateral and midlobes; lateral lobes obovate-triangular, 3–4 mm; midlobe obovate, straight, truncate and apiculate at the middle, column 4 mm, glabrous, rounded at the apex, broadly winged on each side; anther white, ovate; pollinia 8 in 4 pairs.

Locality: Sunset Peak. *S. Y. Hu 11552A* (CUHK); *HK sheet 32508, 34043.*

Distribution: Guangdong, Hunan, Sichuan, Hubei, Jiangxi, Anhui, Zhejiang, Taiwan.

Ecology: Forests. Flowering: Mar.–May.

3. Calanthe triplicata (Willemet) Ames 三褶蝦脊蘭(白花蝦脊蘭) **(Photo 625)**

Philipp. J. Sci. Bot. 2(4): 326. 1907; S. Y. Hu, Quart. J. Taiwan Mus. 25(3–4): 207. 1972, et Genera Orchid. Hong Kong 93. 1977; FRPS 18: 308, pl. 53: 3. 1999; FTW ed. 2, 5: 791. 2000; FGD 7: 417. 2006; FOC 25: 302. 2009.

Orchis triplicata Willemet, Usteri Ann. Bot. 18: 52. 1796.

Calanthe veratrifolia R. Br., Bot. Reg. 9: ad t. 720. 1823; FKH 265. 1912.

Perennial herb, bearing no leaf at anthesis; stems short, fleshy, consisting of 1–3 green fleshy stems; stems with 2 or 3 oblong joints, each joint 1.3–4 cm long, 1.2–3.5 cm in diam., slightly compressed, partially covered by remnants of sheaths. Leaves emerging after anthesis. Flowers white, 2–few, in a terminal raceme; stipe 35–40 cm, bracts 3 or 4, greenish, the upper ones 1.5 cm; pedicels 2–3 cm, hairy; flowers 4 cm across; dorsal sepal ovate-lanceolate, 25 × 6 mm, acute, lateral sepals similar in size and shape, turning upwards against the dorsal one; petals elliptic-oblong, 2.5 cm, apex obtuse; lip conspicuous, the lateral lobes connate to the column forming a funnel; the front lobe turning 90° upward, enlarged into a trilobed suborbicular epichile, biparted at apex.

Locality: Deep Water Bay, Sha Tin, Sha Tau Kok, Lantau Island. *S. Y. Hu 10701, 13822* (CUHK); *HK sheet 7097, 27424.*

Distribution: Guangdong, Guangxi, Yunnan, Fujian, Taiwan; tropical Asia, Australia, Madagascar.

Ecology: Forests. Flowering: Mar.–Jul.

Uses: Ornamental.

4. Calanthe sylvatica (Thouars) Lindl.

長距蝦脊蘭(粉紅蝦脊蘭) **(Fig. 251; Photo 626)**

Gen. Sp. Orchid. Pl. 250. 1833; FRPS 18: 301. 1999; FTW ed. 2, 5: 789. 2000; FGD 7: 416. 2006; FOC 25: 300. 2009.

Centrosis sylvatica Thouars, Hist. Orchid. pl. 35 & 36. 1822.

Bletia masuca D. Don, Prodr. Fl. Nepal 30. 1825.

Calanthe masuca (D. Don) Lindl., Gen. Sp. Orch. Pl. 249. 1833; FKH 265. 1912.

Calanthe masuca Lindl. var. *sinensis* Rendle, J. Bot. Brit. For. 40: 310. 1902; S. Y. Hu, Genera Orchid. Hong Kong 93, fig. 52. 1977.

Terrestrial herb up to 80 cm, rhizomes inconspicuous; pseudobulbs narrow conical, 1–2 cm long, 1 cm across at base. Leaves all basal, elliptic to ovate, 15–40 × 7–11 cm, base attenuate into petioles, apex acute or acuminate, margin wavy. Flowers rather large, sepals all alike in colour, delightfully bright lavender, darker on the outside; odd sepal elliptic, 18–20 × 6–10 mm, apex acute; lateral sepals oblique-elliptic or oblong, apex acute; petals obovate

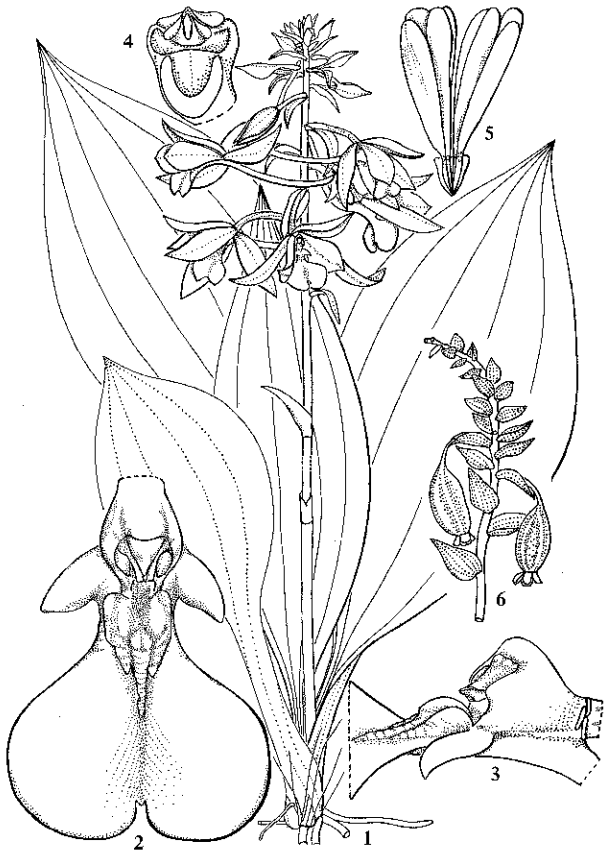

Figure 251. *Calanthe sylvatica* (Thouars) Lindl.

1. flowering plant with portion of scape shortened; *2.* front view of flower with sepals and petals removed; *3.* lateral view of column and portion of lip; *4.* front view of column with lip removed; *5.* eight slender subequal pollinia in 4 pairs on broad viscidium; *6.* fruiting branch. (drawn by Teresa F. Wong)

or oblong, lavender shading to white inside along the centre, 1.5–2.5 × 1–1.3 cm, apex obtuse or acute; lip adnate to the sides of the column, 3-lobed; lateral lobes deep purple, oblique, falcate-lanceolate, 3–5 × 1.5–2 mm; midlobe light purple, fan-shaped, 1–1.5 × 1.5–1.8 cm, the apex bilobed with an acute recurved point between the lobes; column white, waxy; anther white, ovate; pollinia 8 in 4 pairs, all white; ovary hairy, with pink ridges and green depressions.

Locality: Victoria Peak, Ma On Shan, Lantau Island. *S. Y. Hu 12676* (CUHK); *Y. S. Lau 1639; HK sheet 34679.*

Distribution: Guangdong, Guangxi, Yunnan, Xizang, Hunan, Taiwan; Nepal, India, Thailand, Malaysia, Indonesia, Japan.

Ecology: Shade and moist places in forest. Flowering: Apr.–Sep.

Uses: Ornamental.

34. **Pachystoma** Blume 粉口蘭屬

Terrestrial perennial herbs, dormant in winter. Rhizomes flesh, cylindrical or yoke-shaped, with 2 buds developing into a leafless scape and a vegetative shoot separately. Leaves linear, papery, plicate-venose. Scape aphyllous, with many brownish cataphylls. Flowers medium-sized, resupinate, hairy, in a terminal raceme; sepals subequal, the odd one free, the lateral ones oblique at the base, adnate to the short column-foot forming a mentum; petals slightly narrower than the sepals; lip attached to the column-foot, subgibbous at the base, 3-lobed, lateral lobes erect, rounded, midlobe slightly recurved, retuse, disk fleshy, papillose; column long, arcuate, semiterete and plane in front, enlarged at the apex, forming 2 lateral pouches; clinandrium membranous; rostellum obtuse; anther terminal, pilose, 2-lobed; pollinia 8, waxy, obovoid-cuneate, subcoherent at the apex of the slender caudicles; ovary cylindrical, hairy. Capsules oblong, ridged and rostrate.

About five species distributed in tropical Asia, Papua New Guinea and Pacific islands; one species in China and Hong Kong.

1. **Pachystoma pubescens** Blume

粉口蘭 **(Fig. 252; Photos 627–628)**

Bijdr. 376. t. 29. 1825; FRPS 18: 249, pl. 42: 7–8. 1999; FTW ed. 2, 5: 993. 2000; FGD 7: 405, fig. 207. 2006; FOC 25: 286. 2009.

Pachystoma chinense (Lindl.) Rchb. f., Bonplandia 3: 251. 1855; FHK 356. 1861; FKH 263. 1912; S. Y. Hu, Genera Orchid. Hong Kong 70, fig. 35. 1977.

Terrestrial herb; rhizome fibrous or yoke-shaped. Leaves 1–2, produced after anthesis, papery, linear-lanceolate, 7–40 × 0.5–1.2 cm, cuneate at base, acute at apex. Flowers 5–13, purple, hanging; pedicels 4–5 mm, hirsute; dorsal sepal elliptic or oblong-lanceolate, 11–15 × 4–6 mm, truncate at base, obtuse at apex, with 5 pink veins, glabrous above, sparsely pubescent towards the base beneath; lateral sepals oblique, slightly narrower, pubescent on both surfaces; petal linear-oblong or oblanceolate, 12–13 × 1.5–3 mm, apex acute or acuminate, ciliate along margin; lip 3-lobed, fleshy, pubescent at base, connate to the column foot; lateral lobes erect, rounded, purplish red on both surfaces; midlobe ovate-oblong, recurved at apex, bright purplish red with 3–5 papillose, rough, bright yellow-green ridges; column uniformly dark purple, arcuate, hirsute; anther sparsely pubescent, dark purple; pollinia 8 in 2 groups of 4 pairs.

Locality: Mount Kellet, Ma On Shan, Fanling, Luk Keng, Sai Kung, Nai Chung, Lantau Island. *S. Y. Hu 7322, 11849* (CUHK); *L. T. Lo 607.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Taiwan; tropical Asia.

Ecology: Grassy mountain slopes. Flowering: Mar.–May.

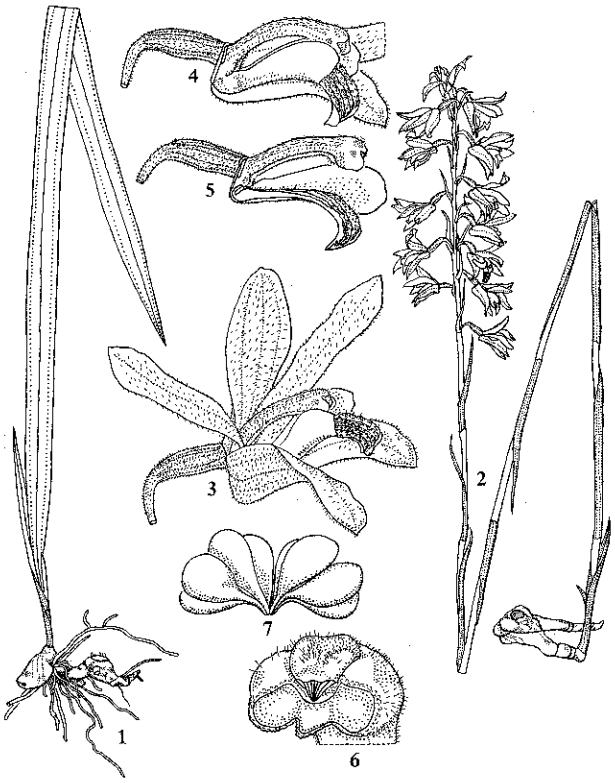

Figure 252. *Pachystoma pubescens* Blume

1. young plant before anthesis; *2.* flowering plant; *3.* lateral view of flower; *4.* lateral view of flower with sepals and petals partially removed; *5.* lateral view of flower with sepals, petals partially and half of lip removed; *6.* front view of apical portion of column; *7.* eight pollinia with short caudicles. (drawn by Teresa F. Wong)

35. **Bletilla** Rchb. f., *nom. cons.* 白芨屬

Terrestrial perennial herbs with irregularly lobed lumpy rhizomes. Stems of the flowering plants short, leafy, with some cataphylls at the base, gradually changing into leaves, the basal section developing into a rhizome after anthesis. Leaves 2 or 4, appearing with the scape, plicate-venose. Flowers purplish red, white-flowered cultivar rare. Flowers medium-sized, showy, in a loose terminal raceme, with deciduous bracts; sepals free, subequal; petals slightly larger, spreading; lip attached to the base of the column, trilobed, lateral lobes erect, slightly embracing the column, midlobe strongly lamellate; column long, without a foot, winged at the apex; clinandrium with broad lateral lobes; rostellum projecting forward forming a roof over the stigma; anther attached to a tooth of the clinandrium, incumbent, ovate; pollinia 8, unequal, in 2 groups of 4 pairs, waxy, oblong and laterally compressed, the base loosely connected by a

granular laminiform appendage; viscidium obscure; stigma suborbicular; ovary cylindrical, striate-sulcate. Capsules oblong-fusiform, erect, rostrate.

About six species distributed from N Myanmar via China to Japan; four species in China; one species in Hong Kong.

1. Bletilla striata (Thunb. ex Murray) Rchb. f.
白芨 **(Fig. 253; Photo 629)**

Bot. Zeit. 36: 75. 1878; S. Y. Hu, Genera Orchid. Hong Kong 74, fig. 37. 1977; FRPS 18: 50, pl. 6: 1–3. 1999; FGD 7: 340, fig. 169. 2006; FOC 25: 210. 2009.

Limodorum striatum Thunb. ex Murray, Syst. Veg. ed. 14, 816. 1784.

Bletia hyacinthina (Sm.) R. Br., Hort. Kew ed. 2, 5: 206. 1813; FKH 263. 1912.

Cymbidium hyacinthinum Sm., Exot. Bot. 1: 117, t. 60. 1804.

Terrestrial perennial herb; rhizomes compressed, ginger-like. Leaves petiolate, petioles sheathing with conspicuous joint; leaf blades elliptic or lanceolate, 10–15(–30) × 2–4 cm. Flowers resupinate, bright purple, wide open; sepals and petals similar in length and width, 2.5–3 × 0.5–0.7 cm; dorsal sepal linear-oblong, obtuse at apex; lateral ones oblique-falcate; petals almost horizontal, oblong-oblanceolate-oblique, slightly twisted; lip horizontal, tubular and covering the column, slightly enlarged towards the apex, 3-lobed, 2 × 0.7–0.8 cm, light purple, darker towards apex and margin, lateral lobes erect, midlobe tongue-like, with 5 longitudinal wavy crests running all the way, 2 additional ridges near to the base, the margin ruffled and wavy; column long, slender, slightly arcuate; anther oblong, white; pollinia 8 in 4 pairs, ovary slender, slightly curved.

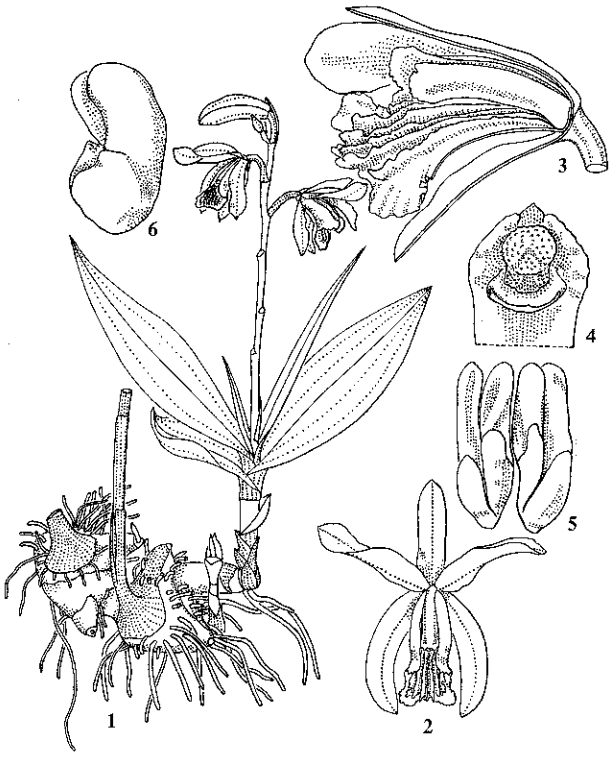

Figure 253. *Bletilla striata* (Thunb. ex Murray) Rchb. f.
1. flowering plant; *2.* front view of flower; *3.* lateral view of flower with half of dorsal sepal, 1 petal, lateral sepals and 1 lateral lobe of lip removed; *4.* apical portion of column; *5.* dorsal view of 8 unequal pollinia in 2 groups of 2 pairs; *6.* lateral view of 1 group of pollinia. (drawn by Teresa F. Wong)

Locality: Cultivated in Hong Kong; *Y. K. Leung 26* (CUHK); *S. Y. Hu 11699* (CUHK); *HK sheet 35812*.
Distribution: Shaanxi, Gansu, areas S of Changjiang; Korea, Japan.
Ecology: Forests. Flowering: Feb.–Apr.
Uses: Medicinal (folklore), ornamental.

36. Spathoglottis Blume 苞舌蘭屬

Terrestrial perennial herbs, dormant in winter. Rhizomes compressed globose. Leaves linear, plicate-venose, appearing before the flowers. Scape emerging from a lateral bud of the rhizome, with basal scales; flowers bright yellow or purple; variations evident with the lip and column. Flowers medium-sized, in a loose terminal raceme; sepals and petals subequal, free, spreading; lip 3-lobed, attached to the base of the column, slightly saccate at the base, lateral lobes erect, rotundate at the apex, midlobe panduriform, with or without a tooth on each side at the base, the disk with 2 tuberculate-ridged calli near the sinus and a keel running from the calli toward the apex; column long, arcuate, winged near the apex and with or without horn-like appendages; clinandrium short, incurved; rostellum truncate; anthers terminal, incumbent, convex; pollinia 8, subequal, in 2 groups of 4 pairs, waxy, obovoid; viscidium triangular; ovary pubescent. Capsules oblong, with persistent perianth, prominently ridged.

About 46 species distributed in tropical Asia, Pacific islands and Australia; three species in China; one species in Hong Kong.

1. Spathoglottis pubescens Lindl. 苞舌蘭 **(Fig. 254; Photos 630–631)**

Gen. Sp. Orch. Pl. 120. 1831, et Bot. Reg. 8(n. s.): sub. t. 19. 1845; FKH 263. 1912; S. Y. Hu, Genera Orchid. Hong Kong 75, fig. 38. 1977; FRPS 18: 252, pl. 44: 3–4. 1999; FGD 7: 411, fig. 211. 2006; FOC 25: 288. 2009.

Spathoglottis fortunei Lindl., Bot. Reg. 31: pl. 19. 1845; FHK 355. 1861; S. Y. Hu, Genera Orchid. Hong Kong 71. 1977.

Terrestrial herb, requiring a dormant period over dry season; roots profuse, fibrous, originating from a basal point of the pseudobulb; pseudobulbs irregularly tuberous, compressed, often angular or irregularly humped. Leaves 2–4, all basal, emerging from the base of the pseudobulb; petioles sheathing, purplish; cataphylls membraneous, purplish and soon disintegrating; leaf blades linear-lanceolate, plicate, 12–35(–43) × 1–3(–4.5) cm, base cuneate, apex acute or acuminate. Flowers bright yellow, resupinate; sepals similar in length and width, 1.2–1.6 × 0.5–0.7 cm; the odd one ovate-elliptic, concave, apex acute; lateral ones oblique ovate-oblong, apex acute; petals ovate, similar length with sepals but slightly wider, conspicuously veined; lip strongly 3-lobed, the base bluntly saccate, the interior of the sac with 2 barbate ridges along the disk; lateral lobes oblong, extending forward, the inner surface flecked, speckled or wholly bright brownish red; the midlobe panduriform, with 2 waxy, fleshy, orange calli at the base, with a ridge between the calli extending forward to apex, column long, arching, yellow, winged along the side with a basal annulus; anther pointing downward, ovate, yellow; pollinia 8

in 2 groups of 4, waxy; ovary inconspicuously sulcate, very hairy.

Locality: Common in Hong Kong. *S. Y. Hu 10780, 10862* (CUHK); *Y. S. Lau 3173*.

Distribution: Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Jiangxi, Zhejiang; India, Myanmar, Thailand, Indochina.

Ecology: Open grassy slopes, fire-resistant. Flowering: Jul.–Sep.

Uses: Ornamental.

37. Tainia Blume 帶唇蘭屬

Terrestrial perennial herbs with slender erect pseudobulbs. Rhizomes short and stout, the internodes thicker than long. Leaves solitary, 1 terminal to each pseudobulb, petiolate, linear-lanceolate. Scape emerging from the side of a pseudobulb, aphyllous, slender and long, with several sheaths at the base. Flowers medium-sized, resupinate, in a well-spaced raceme; sepals subequal, spreading, the odd one free, the lateral ones adnate to the short foot of the column forming a mentum; petals narrower than the sepals; lip attached to the apex of the column foot, slightly gibbous at the base, 3-lobed, the lateral lobes erect, parallel to the column, the apex obtuse, the midlobe suborbicular, entire, disk lamellate; column slender, slightly oblique, dentate; rostellum truncate; anther terminal incumbent, convex, bicornute; pollinia 8 in 2 groups, 2-seriate, waxy, laterally compressed; stigma suborbicular, concave; ovary oblong-obovoid, striate-sulcate. Capsules ellipsoidal, rostrate.

About 13 species distributed from E Himalaya, China, Japan, Indochina and adjacent islands; 11 species in China; one species in Hong Kong.

1. Tainia dunnii Rolfe 帶唇蘭 (Fig. 255)

J. Linn. Soc., Bot. 38: 368. 1908; S. Y. Hu, Genera Orchid. Hong Kong 67, fig. 33. 1977; FRPS 18: 237, pl. 40: 1–5. 1999; FTW ed. 2, 5: 1043, pl. 447. 2000; FGD 7: 407, fig. 208. 2006; FOC 25: 284. 2009.

Terrestrial perennial herb; rhizome short and thick, consisting of 4 joints; pseudobulbs dull dark green or dull purple, ovate-lanceolate, 1.5–3(–7) cm long, 5–12 mm in diam. Leaf solitary, terminal to the pseudobulb; petiole short, 3–5 cm; leaf blade lanceolate or elliptic-lanceolate, 20–30 × 2–4 cm, attenuate at both ends, with 3 prominent veins running from base to apex. Flowers resupinate, up to 21 in a well-spaced raceme; sepals and petals dull purple, tinged yellow, similar in length and width, 10–15 × 2–3 mm; odd sepal linear, apex obtuse; lateral ones falcate-linear, base joined to the column foot forming a short mentum, apex obtuse; petals falcate-linear, apex obtuse or acute; lip attached to a short mentum, 1 cm, narrowed at the base, widening to a 3-lobed blade; lateral lobes erect, light yellow densely speckled with purple inside, flushed dull purple outside, triangular-ovate, 2 mm, obtuse; midlobe panduriform, bright yellow, 6 mm across, truncate, lightly produced and obtuse at middle, with 3 longitudinal creamy yellow ridges, 2 lateral ones higher and more fleshy; column arcuate, winged at both sides; anther resembling the head of a cat, bright reddish purple; pollinia 8 in 4 pairs, ovary oblanceolate, glabrous.

Locality: Sunset Peak, Lantau Peak. *Y. S. Lau 2988, 3097; HK sheet 34321*.

Distribution: Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Zhejiang, Fujian, Taiwan.

Ecology: Forests and ravines. Flowering: Mar.–Apr.

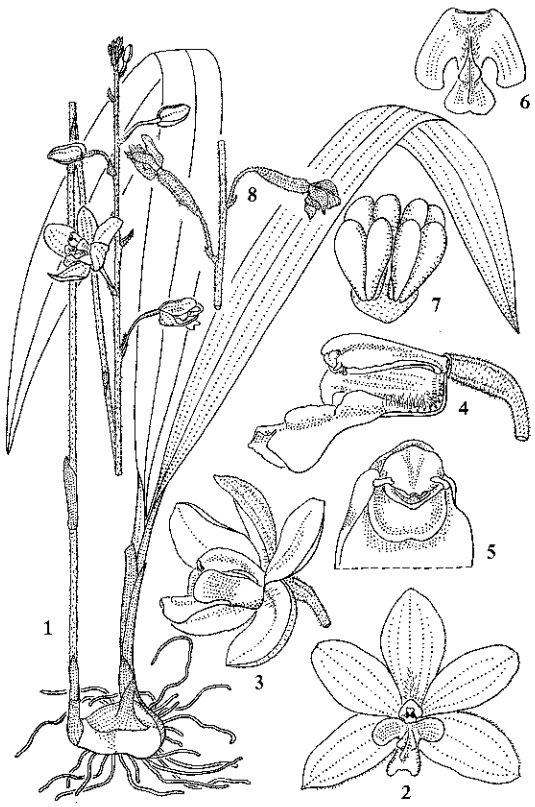

Figure 254. *Spathoglottis pubescens* Lindl.

1. flowering plant; *2*. front view of flower; *3*. lateral view of flower; *4*. lateral view of flower with sepals, petals, and 1 lateral lobe of lip removed; *5*. front view of apical portion of column; *6*. top view of lip; *7*. eight pollinia in 4 pairs loosely associated by granular membrane at the end; *8*. fruiting branch. (drawn by Teresa F. Wong)

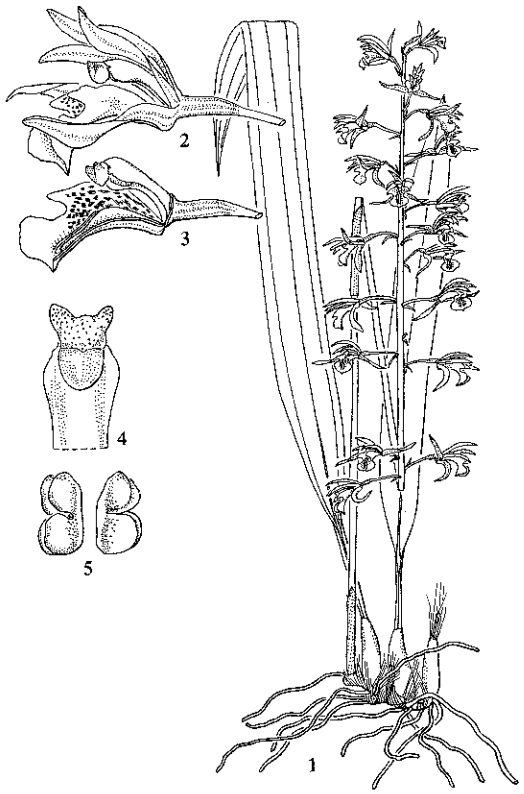

Figure 255. *Tainia dunnii* Rolfe

1. flowering plant; *2*. lateral view of flower; *3*. lateral view of flower with sepals, petals, and half of lip removed; *4*. apical portion of column; *5*. eight discoid pollinia in 4 pairs. (drawn by Teresa F. Wong)

38. Ania Lindl. 安蘭屬

Terrestrial perennial herbs. Roots many and long. Rhizomes slender; pseudobulbs ovoid, above the ground. Leaves solitary, 1 on the apex to each pseudobulb, petiolate. Scape emerging from the base of a mature pseudobulb before the leaf. Flowers medium-sized, in a loose raceme; sepals and petals subequal, spreading; lip 3-lobed, calcarate, attached to the base of the column, lateral lobes erect, obtuse at the apex or triangular-ovate and acute, midlobe ovate or subrotundate, acute; column long, the apical portion winged; clinandrium dentate; rostellum truncate; anther oblong or obovate, convex; pollinia 8 in 2 groups, 2-seriate, the top 2 of each group smaller; stigma suborbicular; ovary cylindrical, striate-sulcate. Capsules cylindrical.

Two species in China and Hong Kong.

1a. Flowers yellow; side-lobes of lip obtuse; anther obovoid, truncate at the base ..... 1. *A. hongkongensis*

1b. Flowers purplish yellow with 3–5 purple lines, with lavender lip dotted purple; side-lobes triangular-ovate and acute; anther oblong, the base obtuse ..... 2. *A. ruybarrettoi*

1. Ania hongkongensis (Rolfe) T. Tang & F. T. Wang
香港安蘭(香港帶唇蘭) **(Fig. 256; Photo 632)**

Acta Phytotax. 1: 46. 88. 1951; S. Y. Hu, Quart. J. Taiwan Mus. 25: 48. 1972, et Genera Orchid. Hong Kong 68, fig. 34. 1977.

Tainia hongkongensis Rolfe, Bull. Misc. Inform. Kew 195. 1896; FKH 264. 1912; FRPS 18: 240. 1999; FGD 7: 406. 2006; FOC 25: 282. 2009; Check List HK Plants 383. 2002; 133. 2004.

Ania angustifolia auct. non Lindl.: FHK 356. 1861.

Terrestrial herb, pseudobulbs ovoid, sheathing when young, bearing a terminal leaf. Leaves petiolate; petioles slender, 13–16 × 0.2–0.3 cm, base covered with a 6 cm tube-like sheath; leaf blades oblong-elliptic, 26 × 3–4 cm, base attenuate into petioles, apex acuminate. Flowers yellowish green with purplish brown spots or veins; sepals subequal, oblong-lanceolate, 20 × 2.2–3.5 mm, apex acuminate; lateral sepals connate to the column base; petals obovate-lanceolate, similar size with sepals, apex acuminate, base attenuate; lip white with yellowish green veins, obovate, apiculate at apex, base spurred, the two sides near base ± covering the column, disk with 3 narrow ridges; column white with light purple, slightly enlarged at apex; anther obovoid, truncate at the base; pollinia 8 in 2 groups.

Locality: Stubb Rd., Repulse Bay, Sha Tin, Ma On Shan, Castle Peak, Wong Lung Hang. *S. Y. Hu 9853, 13219* (CUHK); *Y. S. Lau 2129*.

Distribution: Guangdong, Fujian.

Ecology: Among loose rocks or under trees from hillsides. Flowering: Mar.–Apr.

Notes: The type specimen was collected by C. Wilford from Mount Parker in 1858.

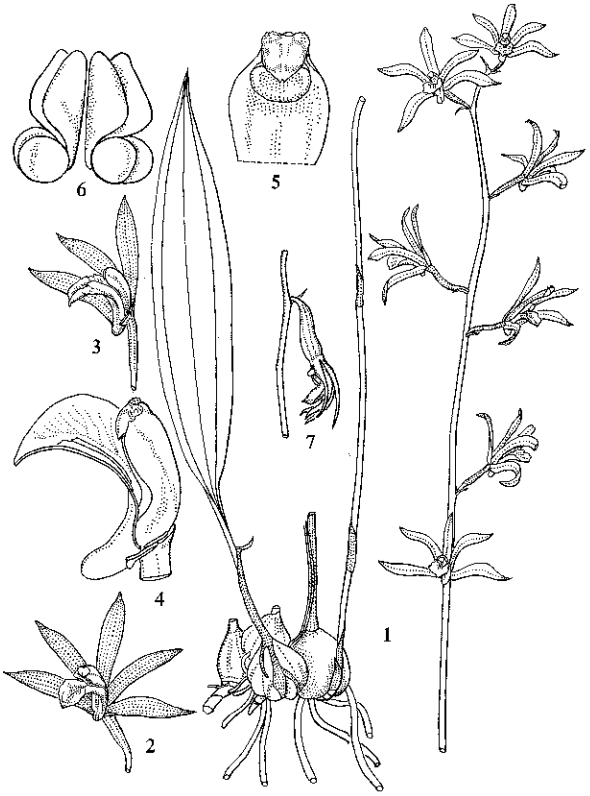

Figure 256. *Ania hongkongensis* (Rolfe) T. Tang & F. T. Wang
1. flowering plant; *2.* front view of flower; *3.* lateral view of flower with 1 sepal and 1 petal removed; *4.* lateral view of flower with all sepals, petals and half of lip removed; *5.* front view of apical portion of column; *6.* eight unequal pollinia in 4 pairs; *7.* young pendulous fruit. (drawn by Teresa F. Wong)

2. Ania ruybarrettoi S. Y. Hu & Barretto 南方安蘭(南方帶唇蘭) **(Photo 633)**

Chung Chi Journal 13(2): 25 fig. 12. 1976.

Tainia ruybarrettoi (S. Y. Hu & Barretto) Aver., Opred. Orkhid. V'etnama. 403. 1994; FOC 25: 283. 2009.

Tainia ruybarrettoi (S. Y. Hu & Barretto) Z. H. Tsi, FRPS 18: 243. 1999; FGD 7: 406. 2006; Check List HK Plants 383. 2002; 133. 2004.

Terrestrial herb; rhizome horizontal, the terminal internode enlarging into a pseudobulb; pseudobulbs crowded together or very closely spaced, ovoid and smooth when young, grooved and winkled when old, dull green or purple in colour at anthesis bearing 2 cataphylls and a terminal leaf. Leaves solitary, dark green, slightly grooved at apex, petiolate; petioles 15–25 cm, oriented at the apex of the pseudobulb; leaf blades lanceolate, 30–45 × 4.5–5.3 cm, conspicuously veined with 9 longitudinal veins, prominently elevated beneath. Flowers 5–28, well-spaced; sepals and petals similar in size and colour, palmately arranged in one plane, 2.7–3.5 × 0.4–0.5 cm, purplish yellow with 3–5 purple longitudinal veins running from the base to apex, margin yellow; odd sepal dorsal, linear-lanceolate, lateral ones slightly falcate; petals oblique-oblanceolate; lip 3-lobed, spurred, bent, crescent-shaped, the sides erect, covering almost the entire column, extending forward into a distinct rounded lobe at the apex, streaked and dotted bright purple, the inner surface marked with lines of bright purple hairs, the midlobe ovate, slightly curved downwards, margin wavy, apex acute, pale lavender flushed yellow, darker purple beneath, disk longitudinally 5-ridged, becoming 5-crested at the throat; spur orange-yellow, rounded and smooth at apex; column back white, the front streaked purple, truncate, slightly arcuate; anther hanging, ovoid, creamy yellow; pollina 8 in 4 pairs.

Locality: Sai Kung, Pat Sin Leng, Sha Tau Kok. *S. Y. Hu 13098* (CUHK); *HK sheet 30331, 30431*.

Distribution: Guangxi.

Ecology: Bamboo forests. Flowering: Mar.

Notes: The type specimen (*S. Y. Hu 13098A*, K, holotype; PE, isotype) was collected by Ruy Barretto from Pat Sin Leng in 1968. Listed in *Rare and Precious Plants of Hong Kong*.

39. Eria Lindl., *nom. cons.* 毛蘭屬

Epiphytic herbs. Roots many and long. Pseudobulbs crowded. Leaves 1–4 to each pseudobulb, coriaceous or chartaceous. Flowers medium-sized or small, non-resupinate, in a terminal raceme, rarely solitary (due to reduction); sepals subequal in length, the odd one symmetrical, concave, the lateral sepals oblique, adnate to the foot of the column forming a mentum; petals similar to or narrower than the sepals; lip 3-lobed, attached to the end of the column foot, recurved, the sides erect, the midlobe lamellate; column short, broad, winged, the base produced into a straight or curved foot; clinandrium truncate or sinuate; rostellum obtuse; anther terminal, incumbent, concave; pollinia 8 in 2 groups, waxy, obovoid, pyriform, the apex coherent slightly by a viscid mass; stigma suborbicular, or the lower margin 3-lobed; ovary subcylindrical or obovoid. Capsules oblong, ridged.

About 370 species distributed in tropical Asia and Oceania; 43 species in China; five species in Hong Kong.

1a. Plants very small, less than 1 cm tall; pseudobulbs compressed-globular, 3–6 mm in diam., always appearing in pairs; flowers solitary; scape filiform; perianth (4–)5 mm long ..... 1. *E. sinica*

1b. Plants 10–20 cm high; pseudobulbs oblong-ovoid, 0.2–3.5 cm in diam.; flowers several to many, in loose racemes; scape terete; perianth 10 mm or more long.

2a. Plants growing on soil along damp banks of streams under trees; leaves chartaceous, with several prominent veins; flowers many, 6 or more to each raceme; bracts deciduous ..... 2. *E. corneri*

2b. Plants growing on the surface of exposed boulders in arid places; leaves leathery and fleshy, with visible midrib only; flowers 2–12 in a raceme; flowering bracts persistent.

3a. Leaf solitary, 1 to each pseudobulb ..... 3. *E. rosea*

3b. Leaves 2–5 to each pseudobulb.

4a. Inflorescence white or grey yellowish woolly ..... 4. *E. lasiopetala*

4b. Inflorescence glabrous or nearly so ..... 5. *E. gagnepainii*

1. Eria sinica (Lindl.) Lindl.

小毛蘭 **(Fig. 257; Photos 634–635)**

J. Linn. Soc., Bot. 3: 48. 1859; FKH 263. 1912; S. Y. Hu, Genera Orchid. Hong Kong 88, fig. 48. 1977; FRPS. 19: 12, pl. 1: 6–8. 1999; FGD 7: 398. 2006.

Conchidium sinicum Lindl., J. Bot. Kew (Misc.) 7: 34. 1855.

Eria pusilla (Griff.) Lindl., J. Linn. Soc. 3: 48. 1859; FHK 353. 1861; FRPS 19: 11. 1999; FGD 7: 398. 2006.

Conchidium pusillum Griff., Pl. Asiat. 3: 321, pl. 310. 1851; FOC 25: 347. 2009.

Rhizomes thread-like, originating from the lower side of a pseudobulb, scales inconspicuous; pseudobulbs dorsiventrally compressed-globose, often formed in pairs, generally crowded together in colonies, 3–6 mm in diam. Leaves entire, ovate, lanceolate, obovate or oblanceolate, 7–10 × 2–4 mm, base obtuse or cuneate, apex acute and apiculate, the midrib evident. Inflorescence a scape, slender, 3–4 mm, the flower bract terminal, 1–5 mm, sheathing below and cymbiform above. Flower solitary, greenish-yellow, pedicel and ovary together 1.5 mm; perianth (4–)5 mm, segments lanceolate, 1–2 mm at the base; lateral sepals fusing at their lower portion forming a prominent, swollen irregularly shaped sac; lip tongue-like, movable, shorter than the lateral sepals and the petals, the margin minutely denticulate; column minute, 0.5 mm long and wide; anther cap rugose; pollinia partially exposed, the base viscid, 8 in 4 pairs.

Locality: Victoria Peak, Tai Mo Shan, Tung Chung, Lantau Peak. *S. Y. Hu 9104, 9207, 12874* (CUHK).

Distribution: Hainan.

Ecology: Growing with mosses and ferns over surface of exposed rocks, on top of mountain. Flowering: Oct.–Nov.

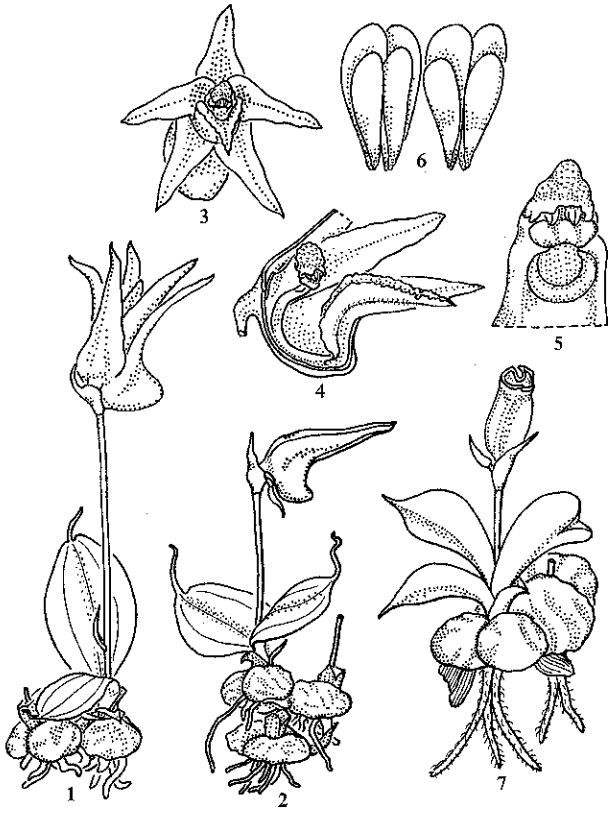

Figure 257. *Eria sinica* (Lindl.) Lindl.
1–2. flowering plants; *3.* front view of flower; *4.* lateral view of flower with half of dorsal sepal, 1 lateral sepal, and 1 petal removed; *5.* front view of column; *6.* eight pollinia in 2 groups; *7.* colony with fruit, showing the paired pseudobulbs formed at base of leafy shoot. (drawn by Teresa F. Wong)

2. Eria corneri Rchb. f. 半柱毛蘭 **(Photos 636–637)**

Gard. Chron. n. s. 2: 106. 1878; FKH 263. 1912; FRPS 19: 15. 1999; FTW ed. 2, 5: 864, photo 109. 2000; FGD 7: 400. 2006; FOC 25: 345. 2009.

Roots wire-like, young portion densely hairy, older ones branched; stems very short, obscured by the aggregated pseudobulbs; pseudobulbs subtetragonous, compressed-ovoid. Leaves 2, persistent on 2-year-old pseudobulb; petioles 1.5–2 × 0.8 cm, slightly folded; leaf blades linear-lanceolate, 15–25 × 2.7–5.5 cm, attenuate at both ends, apex acuminate, cuspidate at the tip; midrib plane above, elevated beneath, with 2 major veins parallel on each side. Inflorescence a scape, 10–15 cm, furnished with 3 imbricate scales at the base, a sterile bract at the middle and a terminal raceme of 6–50 flowers; bracts caducous; flowers cream-white, tinged yellow at the apices of the sepals, petals and the mentum; odd sepal dorsal, linear-lanceolate, 13–14 × 2.5 mm, apex obtuse; lateral sepals oblique-ovate, united with the column foot forming the mentum, the lower margin shorter and strongly curved; petals linear-falcate, 10–11 × 2 mm, apex round; lip movable, 3-lobed, cream-white, speckled reddish purple, curved, the lateral lobes erect, short and broad, midlobe ovate-subrotundate, lamellate, margin erose; column subcylindrical, 3 × 1.5 mm, the foot 5 mm; anther oblong, 1.5 mm; pollinia 8 in 4 pairs; ovary obconical-subcylindrical, glabrous.

Locality: Mount Parker, Tai Mo Shan, Ng Tung Chai. *S. Y. Hu 9748, 12758* (CUHK); *Y. S. Lau 1757.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Fujian, Taiwan; Vietnam, Japan.

Ecology: Shade and wet rocks along bank of streams. Flowering: Aug.–Sep.; fruiting: Oct.–Dec.

3. Eria rosea Lindl. 玫瑰毛蘭 **(Photos 638–639)**

Bot. Reg. 12: t. 978. 1826; FHK 353. 1861; FKH 263. 1912; FRPS 19: 13, pl. 2: 1–4. 1999; FGD 7: 399. 2006.

Cryptochilus roseus (Lindl.) S. C. Chen & J. J. Wood, FOC 25: 362. 2009.

Rhizome horizontal, with short internodes; pseudobulbs large, slightly compressed, ovoid, 2–3 cm long, 2–3.5 cm across, growing close to each other. Leaf solitary; new growth with scale leaves 1–8 cm, sheath-like, green and rather fleshy at anthesis, apex mucronate, turning brown and parchment-like and completely disintegrating by the second year; foliaceous leaf leathery, fleshy and firm, base elongate into a cylindrical petiole after anthesis; leaf blade oblong-elliptic, 5–23 × 1.5–4.5 cm, about 2–3 mm thick, base cuneate and gradually attenuate into the petiole, apex obtuse and apiculate. Inflorescence a scape, bearing 3 or 4 flowers; flowers incompletely resupinate, projecting the column and the lip in a horizontal position; sepals greenish white; the odd one ovate, slightly arcuate, 12–13 × 6 mm; lateral sepals tinged pink at base, triangular-ovate, obliquely ridged along the middle, base connate and adnate to the foot forming a double-headed sac; petals white with pink lines at base, ovate, 11–12 × 8–9 mm; lip 3-lobed, pink marked with purplish red veins especially on lateral lobes, distinctly golden on the ridges of the front lobe, base saccate and adnate to the foot, front lobe slightly recurved; column slightly enlarged at apex and extending into 2 foliaceous lateral lobes; anther red, subglobose; pollinia 8 in 4 pairs; ovary subsessile, striate-sulcate.

Locality: Ma On Shan, Wu Kau Tang, Lantau Island. *S. Y. Hu 11457* (CUHK); *Y. S. Lau 1761; S. P. Lau 87.*

Distribution: Hainan, Guangdong.

Ecology: Shade and damp rocks in forests. Flowering & fruiting: Jan.–May.

4. Eria lasiopetala (Willd.) Ormerod 白綿毛蘭 **(Photos 640–641)**

Opera Bot. 124: 22. 1995; FRPS 19: 26. 1999; FGD 7: 402. 2006.

Aerides lasiopetala Willd., Sp. Pl. 4: 130. 1805.

Eria flava Lindl., Gen. Sp. Orch. Pl. 65. 1830; FKH 263. 1912; S. Y. Hu, Genera Orchid. Hong Kong 89. 1977.

Dendrolirium lasiopetalum (Willd.) S. C. Chen & J. J. Wood, FOC 25: 351. 2009.

Epiphytic herb; roots brownish, purplish red when young; rhizome slender, creeping, consisting of 3–5 internodes and terminated by an erect oblong-ovoid pseudobulb bearing leaves at apex. Leaves 3–4, petioles 1.5–2.5 cm, folded; leaf blades thick, leathery, lanceolate-linear, 9–18 × 1.2–3 cm, attenuate at both ends, apex acute. Flowers 2–5, bracts lanceolate, caducous; sepals yellowish green, densely woolly outside, lime-green and tinged yellow inside; the odd one dorsal, oblong-ovate, 16 × 5 mm, apex obtuse; lateral sepals oblique-ovate, 2.5–3 cm between apices, connate and forming a mentum at base, 2 cm from apex of mentum to the acute tip; petals lime-green, oblong-oblanceolate, 12 × 2 mm, apex obtuse; lip greenish yellow, movable, 3-lobed, lateral lobe erect, triangular, obtuse, 2–3 mm long; midlobe spathulate-obcordate, 11–12 × 7 mm, slightly recurved, margin slightly wavy, dull violet, middle thickened and slightly crested; column light green, apex shortly produced, rounded; anther yellow, oblong-subglobose; pollinia 8 in 2 groups of 4, each group with 2 larger ones and 2 smaller ones; ovary obconical, woolly.

Locality: Fo Tan Valley, Tai Po. *S. Y. Hu 13146* (CUHK); *Y. S. Lau 3071, 3268.*

Distribution: Hainan; Indochina, Myanmar, Thailand, Nepal, India.

Ecology: Forests. Flowering: Nov.–Apr. of the following year.

5. Eria gagnepainii A. D. Hawkes & A. H. Heller 香港毛蘭

Lloydia 20: 130. 1957 ["*gagnepaini*"]; FRPS 19: 17, pl. 3: 5–6. 1999; FGD 7: 400. 2006; FOC 25: 345. 2009.

Eria coronaria auct. non Rchb. f.: Herklots, Hongkong Naturalist 6: 24, fig. 3. 1935.

Eria herklotsii P. J. Cribb, Orch. Rev. 84: 130, fig. 76, 77. 1976.

Epiphytic herb, glabrous throughout; rhizome creeping, 4–5 mm in diam., with funnel-shaped sheaths 0.7–1.5 cm. Pseudobulb cylindrical, 5–20 cm × 3–6 mm with a long, lacerate sheath at base. Leaves 2, subterminal, sessile, narrowly elliptic, obovate-elliptic or elliptic-lanceolate, 10–25 × 2.5–6 cm, apex acuminate, with 5–9 main veins. Flowers 5–12, bracts ovate-lanceolate to linear, 6–11 × 1.5–2 mm; pedicel including ovary 1–1.5 mm; dorsal sepals narrowly elliptic or oblong-elliptic, 14–16 × 3–5 mm, apex acute or obtuse; lateral sepals falcate-lanceolate, 12–16 × 5–8 mm, obtuse or acuminate, connate and forming a mentum (ca. 5 mm) at base; petals initially white, gradually turning cream-yellow, oblong-oblanceolate, 11–13 × 1.5–3 mm, acute or obtuse; lip ca. 9 × 8 mm, 3-lobed, lateral lobes parallel to midlobe, suboblong to ovate-triangular, obtuse; midlobe subtriangular or ovate-triangular, 2–3 × 2 mm. Column light green, ca. 5 mm.

Locality: Sha Tin (Siu 2000).

Distribution: Hainan, SE Xizang.

Ecology: Rocks in forests. Flowering: Feb.–Apr.

Notes: The type specimen of *E. herklotsii* was collected by G. A. C. Herklots from Tai Mo Shan before 1935.

40. Appendicula Blume 牛齒蘭屬

Epiphytic caespitose perennial herbs. Stems erect. Leaves many, distichous. Spikes several on the same shoot, axillary, with imbricate scales. Flowers very small, non-resupinate, in axillary spikes; sepals subequal, the odd one ovate, concave, the lateral ones adnate to the column-foot forming a mentum; petals ovate, obtuse; lip fleshy, undivided, attached to the column foot and produced into a conical spur filled with a pendulous appendage, the apex reflexed, disk with an unicorn-like callus; column short, stout, 2-cuspidate at the apex; clinandrium small; rostellum triangular, long acuminate, 2-lobed; anther sessile, acuminate; pollinia 6, in 2 groups of 3, attached to a slender caudicle; viscidium discoid; stigma suborbicular; ovary cylindrical, subsessile. Capsules oblong-ellipsoidal, with persistent perianth at the apex.

About 150 species distributed from tropical Asia to Oceania, but mainly in Indonesia and Papua New Guinea; four species in China; one species in Hong Kong.

1. Appendicula cornuta Blume

牛齒蘭 **(Fig. 258; Photos 642–643)**

Bijdr. 6: fig. 12, et 7: 302. 1825; FRPS 19: 58, pl. 9: 7–9. 1999; FGD 7: 445, fig. 224. 2006; FOC 25: 364. 2009.

Appendicula bifaria Lindl. ex Benth., Hook. J. Bot. Kew Misc. 7: 35. 1855; FHK 358. 1861; FKH 266. 1912; S. Y. Hu, Genera Orchid. Hong Kong 57, fig. 26. 1977.

Epiphytic caespitose perennial herb; stems erect or hanging, subcylindrical. Leaves distichous, ovate-elliptic or oblong, 2–4 × 0.5–1.2 cm, base sheathing, apex obtuse, notched, apiculate. Flowers white, very small, non-resupinate, 2–6 in axillary spikes; sepals subequal, the odd one ovate or elliptic, 3–4 mm, concave, apex acuminate; the lateral ones oblique-triangular, slightly longer than the odd sepal, adnate to the column foot forming a mentum; petals ovate or ovate-oblong, 2–3 × 1.5 mm, obtuse; lip fleshy, undivided, attached to the column foot, produced into a conical spur filled with a fleshy appendage at the apical portion and a membranous appendage near the base, apex obtuse and reflexed, margin wavy, disk with an unicorn-like callus; column short, stout; pollinia 6, in 2 groups of 3; ovary cylindrical, subsessile.

Locality: Mount Parker, Tai Mo Shan, Ma On Shan, Tai Po Kau, Wong Lung Hang. *S. Y. Hu 8990, 10863* (CUHK); *Y. W. Lam 178*.

Distribution: Hainan, Guangdong, Guangxi, Yunnan; S to SE Asia.

Ecology: Forests, streamsides. Flowering: Jul.–Aug.; fruiting: Sep.–Nov.

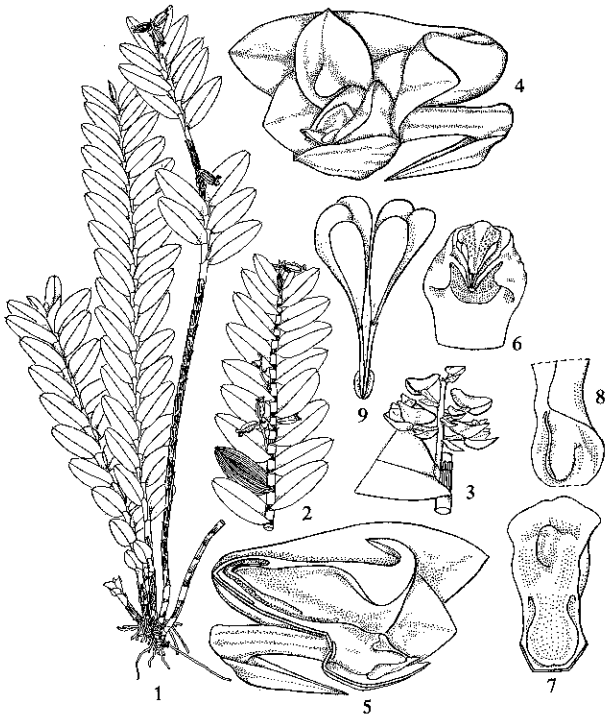

Figure 258. *Appendicula cornuta* Blume

1–2. fruiting plants; *3.* inflorescence; *4.* flower; *5.* lateral view of flower with half of odd sepal, 1 petal, 1 lateral sepal and half of lip removed; *6.* front view of column; *7.* top view of lip; *8.* lateral view of basal portion of lip; *9.* six pollinia in 2 groups on forked stipe. (drawn by Teresa F. Wong)

41. Thelasis Blume 矮柱蘭屬

Epiphytic small perennial herbs. Stems short, changing into globose pseudobulbs with 1 or 2 leaves. Scapes aphyllous, with sheathing bracts at the base. Flowers small, hardly opening, closely arranged in a spike; sepals equal, connivent; petals smaller than the odd sepal; lip undivided, attached to the base of the column, concave; column very short, conical, without wings or foot; rostellum terminal, acuminate; anther subsessile, ovate-acuminate; pollinia 8, in 2 groups of 4, obovoid-globose, attached to an elongate stipe with widened apex and an elliptic viscidium; stigma large, ovate; ovary obconical, very short. Capsules small, oblong.

About 20 species distributed in tropical Asia, especially in SE Asia; two species in China; one species in Hong Kong.

1. Thelasis pygmaea (Griff.) Blume 矮柱蘭 **(Fig. 259)**

Fl. Jav. Orch. 23. 1858; FRPS 19: 62. 1999; FTW ed. 2, 5: 1046, pl. 448. 2000; FOC 25: 366. 2009.

Euproboscis pygmaea Griff., Calc. J. Nat. Hist. 5: 731, t. 26. 1845.

Thelasis hongkongensis Rolfe, Kew Bull. 199. 1896, et J. Linn. Soc. Bot. 36: 39. 1903; FKH 267. 1912; S. Y. Hu, Genera Orchid. Hong Kong 76, fig. 39. 1977.

Saxicolous herb; pseudobulbs compressed, globose, growing close together, 7–11 mm in diam. Leaves terminal, solitary, leathery, oblong or oblanceolate, 1–4.5 × 0.7–1 cm, base cuneate, apex rotundate or obtuse, midrib impressed above, slightly elevated beneath. Flowers non-resupinate, creamy white with a greenish tinge; odd sepal ovate-lanceolate, 2 × 1 mm; lateral sepals folded, 2.5 × 1 mm, apex rotundate, back with a keel running down to the base of the ovary; petals shorter than the sepals, oblong-linear, transparent with 1 medium-longitudinal vein, apex obtuse; lip simple, undivided, ovate-lanceolate and triangular, 2 mm, the base shortly stiped, apex obtuse, margins slightly curved upwards near the base; column very short, horizontal, dorso-ventrally compressed, ovoid, beak-like at the apex, the dorsal side concave, containing an ovoid beak-like 2-chambered anther; pollinia 8 in 2 groups; ovary obconical, winged.

Locality: Aberdeen, Cape D'Aguilar. *HK sheet 7120.*

Distribution: Hainan, Guangdong, Yunnan, Taiwan; Nepal, Sikkim, India, Myanmar, Thailand, Vietnam, Malaysia, Indonesia, Philippines.

Ecology: Trunks or rocks by streams. Flowering: Apr.–Oct.

Notes: The type specimens of *T. hongkongensis* (*H. F. Hance 1287,* BM; *C. Ford 13*, K) were collected from Hong Kong Island around 1880.

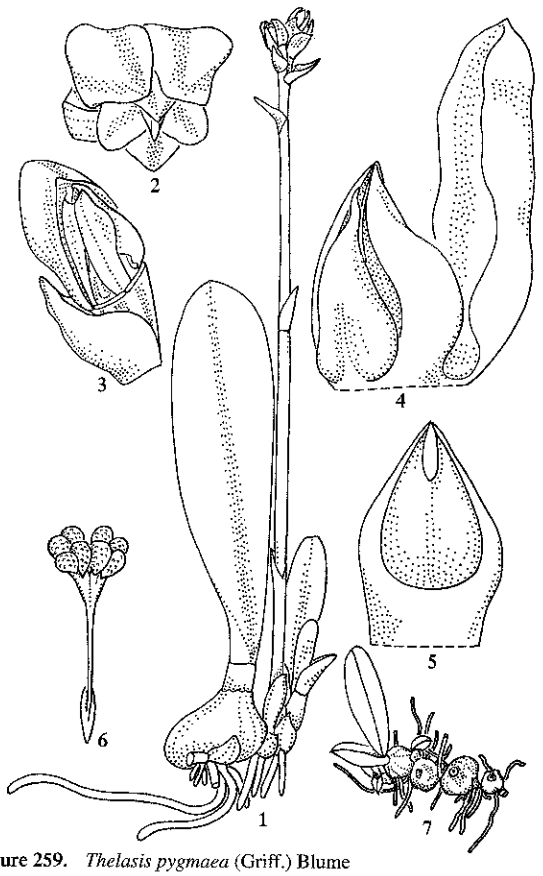

Figure 259. *Thelasis pygmaea* (Griff.) Blume

1. flowering plant; *2.* front view of non-resupinate flower; *3.* lateral view of flower with odd sepal and 1 lateral sepal removed; *4.* laternal viewing short column; *5.* apical view of column; *6.* eight pollinia in 4 pairs on elongated stipe with viscidium; *7.* vegetative shoot. (drawn by Teresa F. Wong)

42. Dendrobium Sw., *nom. cons.* 石斛屬

Epiphytic and lithophytic herbs; stems erect or rhizomatous, usually without pseudobulbs. Leaves usually many, various, articulate or not. Flowers showy, 1 or several, on leafy or leafless stems, in cymose or racemose clusters; petals generally narrower than sepals; lip entire or trilobed, joined to column foot at base, with a spur or spur-like mentum with lateral sepals. Pollinia 4 in 2 pairs, naked, without caudicles or viscidia.

About 1000 species widely distributed in Old World tropics; 74 species and two varieties in China; three species in Hong Kong.

1a. Leaves bilaterally compressed, without obvious upper and lower surfaces; flowers less than 1 cm across ..... 1. *D. spatella*

1b. Leaves flat, with obvious upper and lower surfaces; flowers 2–6 cm across.

2a. Apical margin of the lip fringed; leaves 1.5–3.5 cm long ..... 2. *D. loddigesii*

2b. Apical margin of the lip not fringed; leaves 7–9 cm long ..... 3. *D. aduncum*

1. Dendrobium spatella Rchb. f. 劍葉石斛

Hamburger Garten-Blumenzeitung 21: 298. 1865; FOC 25: 396. 2009.

Dendrobium acinaciforme auct. non Roxb.: FRPS 19: 142, pl. 21: 1–2. 1999; FGD 7: 439. 2006; Check List HK Plants 374. 2002; 130. 2004.

Small tufted saxicolous herb; roots fibrous, stringy and strong; rhizomes horizontal, closely knotted; stem upright, 5–7 cm tall, with up to 20 joints. Leaves closely arranged in 2 ranks, fleshy, scimitar-like, articulate at base, 25–40 × 4–6 mm, apex acute, green, turning dull purple with exposure to strong sunshine and cold dry weather. Flowers solitary, about 2 occurring on small lateral branchlets on the subapical leafless nodes of a mature leafy shoot; sepals pale rosy mauve, the odd one ovate, oblique, broad triangular-ovate, 3 mm across the middle, the basal fused portion extended downwards into a curved mentum 6–7 mm; petals ivory-white, oblique-ovate, 2 mm, acute, inconspicuously 3-veined; lip free from the apex of the mentum, deltoid, cuneate, 9–10 mm, the margin of the basal one-third involute, rosy purple, the enlarged apical portion wavy, 6–8 mm wide, white, tinged pale mauve and dusted with rosy mauve dots, notched, and with yellow crest at the centre, overlaid with many rosy mauve specks; column white, short and stout, 2 mm long including the foot; anthers subglobose, 2-lobed, papillose; pollinia 4 in 2 oblong pairs; ovary small, obconical, inconspicuously 6-striate.

Locality: Lantau Island. *S. Y. Hu & K. H. Yung 233.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian; Myanmar, Laos, Vietnam, Cambodia, Thailand, India.

Ecology: Trunks or rocks in forests. Flowering: May–Jun.

Uses: Ornamental.

2. Dendrobium loddigesii Rolfe

美花石斛 **(Fig. 260; Photo 644)**

Gard. Chron. ser. 3. 2: 155. 786. 1887, et J. Linn. Soc. Bot. 36: 12. 1903; FKH 261. 1912; S. Y. Hu, Genera Orchid. Hong Kong 60, fig. 28. 1977; FRPS 19: 104, pl. 15: 2. 1999; FGD 7: 443. 2006; FOC 25: 379. 2009.

Roots slender, 6–12 originated from a node; stem slender, annual growth 3–25 cm long, the longer ones with 20 nodes, each 8–17 mm long. Leaves fleshy, alternate, ovate-oblong or elliptic, 15–35 × 5–11 mm, base obtuse, shortly pedicellate or subsessile, apex acute, leaf sheath 3–4 mm, midrib impressed above, plane beneath, lateral veins inconspicuous. Flower solitary, occurring on a very short, slender lateral branchlet; sepals lavender-pink, lighter at base, darker at apex; odd sepal dorsal, ovate-lanceolate, 2 × 0.6 cm, slightly reflexed along the margins, base truncate, apex acute; lateral ones triangular-lanceolate, 2.5 × 0.9 cm, adnate to the column foot forming a mentum with the lower margins forming a horizontal line; petals oblong-obovate, 23 × 12 mm, colour same as sepals; lip shell-like, with a saccate base attached to the foot, completely covering the column, apex enlarging, apron-like, margin heavily fringed, central portion deep orange-yellow, bordered by a white halo, turning to deep lavender-pink along the fringed margin; column superior, subconical, jade-white, apex truncate with a triangular lobe on each side, base brilliantly purple with a white median longitudinal line in front; anther creamy white, compressed, globose, with filament, papillose throughout; pollinia 4 in 2 pairs, waxy, golden.

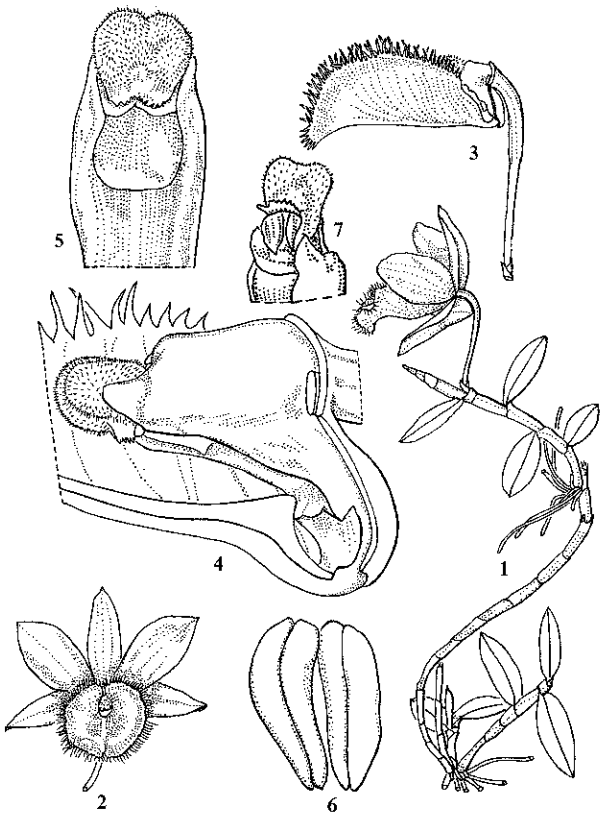

Figure 260. *Dendrobium loddigesii* Rolfe

1. flowering plant; *2.* front view of flower; *3.* lateral view of flower with sepals and petals removed; *4.* lateral view of flower with sepals, petals, and half of lip removed; *5.* front view of apical portion of column; *6.* four pollinia in 2 pairs, without caudicle and viscidium; *7.* front-lateral view of apical poriton of column with anther cap pushed up. (drawn by Teresa F. Wong)

Locality: Hong Kong Island, Lantau Island. *S. Y. Hu 13273; HK sheet 37603.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan; Laos, Vietnam.

Ecology: Trunks or rocks in forests. Flowering: Mar.–May.

Uses: Ornamental, medicinal (folklore).

Notes: Listed in *Rare and Precious Plants of Hong Kong.*

3. Dendrobium aduncum Wall. ex Lindl. 鉤狀石斛

Bot. Reg. 28(Misc): 58. 1842; FKH 261. 1912; FRPS 19: 123, pl. 15: 3–4. 1999; FGD 7: 411. 2006; FOC 25: 389. 2009.

Dendrobium hercoglossum auct. non Rchb. f.: S. Y. Hu, Genera Orchid. Hong Kong 59, et 122, fig. 73-B. 1977.

Root fibrous, many- and much branched; stem cylindrical, hanging, up to 70 cm or longer, consisting of 35 or more joints, bearing 2–10 leaves at apex. Leaves distichous, petiolate; petioles sheathed, 15–30 mm; leaf blades oblong-lanceolate, conduplicate in bud, 7–9 × 1.7–2.7 cm, base convex, apex acute or short-acuminate, midrib impressed above, elevated beneath, secondary veins many, parallel from base to apex. Inflorescence a short 2–5-flowered raceme; flowers rosy-lavender, darker along the margin; the odd sepal ovate-lanceolate, 2 × 0.8 cm, apex acute; lateral ones widely separate, 3.3 cm between apices, oblique-ovate, base connate and adnate to the column foot forming an inflated sac-like mentum; petals elliptic, 18 × 8 mm, apex acuminate, base cuneate; lip semi-urceolate, unguiculate, jade-white, ciliate both along the front and back margins; column short, thick, subconical, extending into a curved foot, apex truncate and slightly winged, base of the front with brilliant dark violet papillose; anther globose, bilobate, deep violet, densely papillose; pollinia 4 in 2 pairs; ovary striate, curved.

Locality: Sha Tin. *S. Y. Hu 13824; HK sheet 27202, 34336.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Guizhou, Hunan; Vietnam, Thailand, Myanmar, India.

Ecology: Trunks in forests. Flowering: Jun.–Aug.

Uses: Ornamental, medicinal (folklore).

43. Bulbophyllum Thouars 石豆蘭屬

Epiphytic perennial herbs. Rhizomes slender, with 3–4 internodes, rooted below the pesudobulb. Pseudobulbs cylindrical, oblong or ovoid, often compressed or slightly flattened on one side near the base. Leaves solitary, apical to a pseudobulb, leathery, oblong,

rarely ovate-oblong, rounded or retuse at the apex. Scape filiform, emerging from the base at the flat side of the pseudobulb, with 2–4 basal bracts and some median and supermedian bracts; pedicels filiform. Flowers small, in a subumbelliform raceme, or medium-sized and solitary; sepals subequal, spreading, the odd one free, the lateral ones obliquely dilated at the base and adnate to the column foot forming a mentum; petals smaller than the sepals; lip attached to the column foot, incumbent, mobile, fleshy, tongue-like, recurved, 2-lamellate, often warty; column short, stout, produced into a foot at the base, winged at the apical portion and extended into 2 arms; clinandrium short, 2 dentate; rostellum truncate; anther terminal, incumbent, depressed, hemispherical or obtuse-conical, deciduous; pollinia 4 in 2 pairs, unequal, the inner one of each pair smaller, waxy, without caudicles or viscidium; stigma concave, occupying the entire front of the column; ovary obconical. Capsules oblong.

About 1000 species widely distributed in tropical and subtropical regions of the world; 98 species and three varieties in China; six species in Hong Kong.

1a. Flowers solitary, rarely 2; pseudobulbs cylindrical; odd sepals broad-ovate or lanceolate, apex acute; lip strongly or slightly recurved.
  2a. Pseudobulbs erect or slightly curved upward, 2–5 cm long, 3–6 mm in diam.; leaves 3.5–12 × 1–2.5 cm; flowers light purplish yellow ..... 1. *B. ambrosia*
  2b. Pseudobulbs erect, 3–4 cm long, 5–8 mm in diam.; leaves 5–25 × 1–5 cm; flowers light yellow with purple veins ..... 2. *B. affine*
1b. Flowers in subumbelliform clusters; pseudobulbs ovoid or oblong; odd sepals lanceolate or ovate and caudate; lip tongue-like, moderately recurved.
  3a. Pseudobulbs crowded together; sepals broadly ovate and caudate; petals dentate along the margin; anther conical, ridged ..... 3. *B. levinei*
  3b. Pseudobulbs separated by slender rhizomes; sepals lanceolate; petals entire; anther ovoid.
    4a. Umbel large, containing 4–15 flowers; pseudobulbs oblong; lip papillose ..... 4. *B. odoratissimum*
    4b. Umbel small, with 2–4 flowers; pseudobulbs ovoid; lip not papillose.
      5a. Petals linear; flowers loosely arranged on a raceme with distinctive rachis; flowering bracts over half of the length of the pedicel ..... 5. *B. stenobulbon*
      5b. Petals ovate; flowers in an umbelliform cluster; flowering bracts one-third or less as long as the pedicel ..... 6. *B. kwangtungense*

1. Bulbophyllum ambrosia (Hance) Schltr. 芳香石豆蘭(馥石蘭) **(Photo 645)**

Fedde Repert. Sp. Nov. Beih. 4: 247. 1919; S. Y. Hu, Genera Orchid. Hong Kong 86. 1977; FRPS 19: 174, pl. 25: 7. 1999; FGD 7: 425. 2006; FOC 25: 407. 2009.

Eria ambrosia Hance, J. Bot. 21(8): 232. 1883.

Bulbophyllum watsonianum Rchb. f., Flora 71: 155. 1888; FKH 262. 1912.

Rhizomes 2–4 mm in diam., with imbricate scale-like sheaths. Pseudobulbs erect or slightly curved upward, cylindrical, 2–5 cm long, 3–6 mm in diam., terminated with 1 leaf. Leaves leathery, oblong, 3.5–12 × 1–2.5 cm, base attenuate into a petiole 3–6 mm, apex obtuse and slightly notched. Flowers light purplish yellow; odd sepal broad-ovate or oblong, 1 × 0.5 cm, apex acute, glabrous, margin entire; lateral sepals oblique ovate-triangular, same length with the odd one but slightly wider, the upper portion oblique and twisted to become beak-like, apex obtuse, base adnate to the column foot forming a mentum; petals triangular, 5–6 × 0.3 cm, margin entire; lip subovate, thicker at apex, winged in the middle, grooved at base, margin slightly wavy, strongly recurved; column short and thick.

Locality: Victoria Peak, Lantau Island. *K. K. Mark 5(2144)* (CUHK); *Y. S. Lau 1763; HK sheet 7064.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian.

Ecology: Forests. Flowering: Mar.–May.

Notes: The type specimen (*Hance Herb. No. 22156*, BM) was collected by C. Ford from Victoria Peak in Mar. 1875.

2. Bulbophyllum affine Lindl. 赤唇石豆蘭

Gen. Sp. Orch. Pl. 48. 1830; FRPS 19: 173, pl. 25: 1–3. 1999; FTW ed. 2, 5: 763. 2000; FGD 7: 424, fig. 215. 2006; FOC 25: 410. 2009.

Rhizomes stout and thick, 4–5 mm in diam., with imbricate scale-like sheaths. Pseudobulb erect, subcylindrical, 3–4 cm long, 5–8 mm in diam., terminated with 1 leaf. Leaves thickly coriaceous or fleshy, upright, oblong, 5–25 × 1–5 cm, apex obtuse and notched, midrib impressed above, elevated beneath. Flowers light yellow with purple veins, thick; odd sepal lanceolate, 1.5–2 × 0.4–0.5 cm, apex acute; lateral sepals falcate-lanceolate, same length with the odd one, apex acute, base oblique and slightly wider, adnate to the column foot forming a mentum; petals lanceolate, 1–1.5 cm, apex acute, margin entire; lip fleshy, lanceolate, shorter than the petals, apex acuminate, slightly curved downward, grooved at base, lateral margins dark purple; column short and thick, 5 mm.

Locality: Lantau Island.

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Sichuan, Taiwan; Vietnam, Laos, Thailand, India, Japan.

Ecology: Rocks along streams in forests. Flowering: May–Jul.

3. Bulbophyllum levinei Schltr. 齒瓣石豆蘭 **(Fig. 261; Photos 646–647)**

Fedde Repert. Sp. Nov. 19: 389. 1924; S. Y. Hu, Quart. J. Taiwan Mus. 25(1–2): 62. 1972, et Genera Orchid. Hong Kong 87, fig. 47. 1977; FRPS 19: 191, pl. 29: 7–9. 1999; FGD 7: 425. 2006; FOC 25: 417. 2009.

Rhizomes slender, prostrate; pseudobulbs aggregated at rhizomes, subcylindrical, 5–10 mm long, 2–4 mm in diam. Leaves thinly coriaceous, oblong or obovate-lanceolate, 3–4 × 0.5–0.7 cm, base attenuate into a petiole 4–10 mm, apex acute, margin slightly wavy, midrib usually impressed above. Flowers membraneous, purplish white; odd sepal ovate-lanceolate, notched, 4–5 × 1.5–2 mm, upper portion narrower and thicker, apex acute, margin denticulate; lateral sepals oblique ovate-lanceolate, 5–6 mm, same width with the odd one, upper portion thicker, base adnate to the column forming a mentum, margin entire; petals ovate-lanceolate, 3.5 × 1.5 mm, margin denticulate, apex acute; lip fleshy, grooved below the middle, curved outside and downwards, apex acute, base truncate; column 1.2 mm.

Locality: Tai Mo Shan. *N. H. Li 96* (CUHK); *P. S. Choi 406*.

Distribution: Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang, Fujian.

Ecology: Trunks along streams in forests. Flowering: May–Aug.

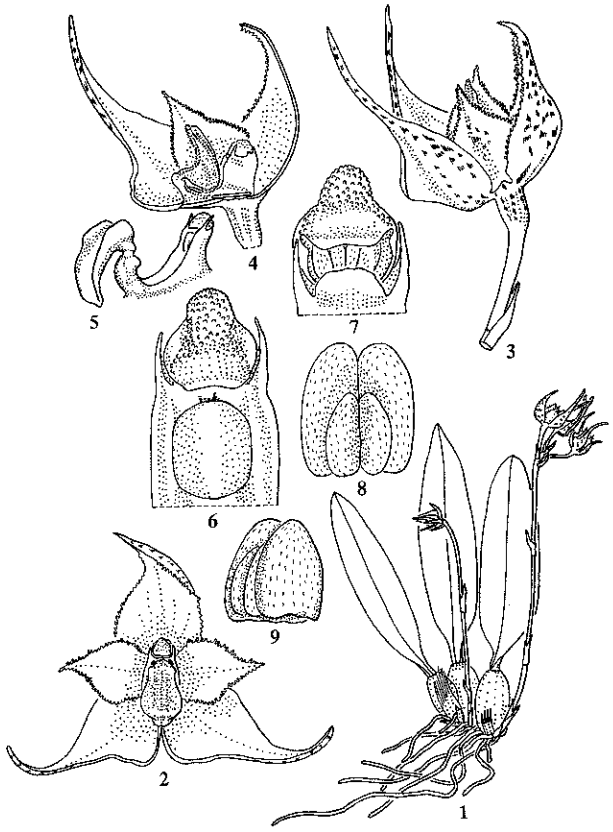

Figure 261. *Bulbophyllum levinei* Schltr.
1. flowering plant; *2.* front view of flower; *3.* lateral view of flower; *4.* lateral view of flower with half of dorsal sepal, 1 lateral sepal, and 1 petal removed; *5.* front-lateral view of column; *6.* front view of column; *7.* apex of column with anther cap slightly pushed up; *8.* four unequal pollinia in 2 pairs; *9.* pollinia in lateral view. (drawn by Teresa F. Wong)

4. Bulbophyllum odoratissimum (Sm.) Lindl.
密花石豆蘭(香石豆蘭) **(Photos 648–649)**

Gen. Sp. Orch. Pl. 55. 1830; FKH 262. 1912; S. Y. Hu, Quart. J. Taiwan Mus. 25(1–2): 62. 1972; FRPS 19: 195, pl. 28: 8–9. 1999; FGD 7: 426, fig. 206. 2006; FOC 25: 414. 2009.

Stelis odoratissima Sm., Ress Cyclop. 34: 12. 1814.

Rhizomes 2–4 mm in diam., branched; pseudobulbs subcylindrical, erect, 2.5–5 cm long, 3–6 mm in diam., terminated with 1 leaf. Leaves coriaceous, oblong, 4–13.5 × 1–2.5 cm, base attenuate, apex obtuse and notched. Flowers fragrant, white at the beginning and turning orange-yellow in the upper portion of both sepals and petals; sepals separate, lanceolate, apex obtuse or acute, margin curved inward, appearing like a narrow tube; odd sepal notched, ovate or ovate-lanceolate, 3–7 × 1.5 mm, lateral sepals 4–14 × 2 mm; petals thinner than sepals, subovate or elliptic, 1–2 × 1–1.5 mm, apex obtuse; lip orange-red, fleshy, tongue-shaped, slightly curved outward and downward, with 2 papillose keels, apex obtuse, adnate to the column foot at base, margin with tiny papillae or white hairs; column short and thick, 1 mm; column foot orange-red, 1 mm.

Locality: Tai Mo Shan, Nai Chung. *S. Y. Hu 7321A* (CUHK); *HK sheet 27291, 32981*.

Distribution: Guangdong, Guangxi, Fujian, Sichuan, Yunnan, Xizang; Nepal, Sikkim, Bhutan, India, Myanmar, Thailand, Laos, Vietnam.

Ecology: Bare rocks or rocks in shade in forests. Flowering: Feb.–Jun.

5. Bulbophyllum stenobulbon Parish & Rchb. f. 短足石豆蘭 **(Photos 650–651)**

Trans. Linn. Soc. 30: 153. 1874; FRPS 19: 194. 1999; FOC 25: 413. 2009.

Bulbophyllum youngsayeanum S. Y. Hu & Barretto, Chung Chi Journal 13(2): 29. 1976.

Rhizomes 1–1.5 mm in diam., branched, bearing a pseudobulb between 1.5–3 cm. Roots growing at the node bearing the pseudobulb. Pseudobulb erect, ovoid-cylindrical or cylindrical, 1–1.5 cm long, changeable in sizes, 3–6 mm across middle, bearing 1 leaf at the apex. Leaves leathery, oblong, 1.5–3.3 × 1 cm; base narrowed into petioles 2–3 mm; apex round-obtuse and emarginate; midrib depressed above. Scapes 1 or 2, emerged from base of pseudobulb, slender as hairs, longer than pseudobulb; racemes shortened into umbel-form, bearing 2–4 flowers; peduncle bearing 3–4 membranous-tubular sheaths; bracts 2–3 mm, ovate-lanceolate, emarginate, longer or shorter than the pedicel and ovary together, apex acute; sepals and petals pale yellow; sepals distinct, thin; the dorsal one lanceolate, 4.5–5 × 1.3–1.5 mm, ± uncurved above middle, acuminate at apex with 3 veins; petals thin, ovate, 2–2.4 × 0.8–1 mm across middle, apex obtuse, entire with 3 veins, only the middle one reaching the apex; lip orange, fleshy, tongue-like or ovate-lanceolate, flat, 2 × 0.5–0.7 mm, rounded or truncate at apex, slightly recurved, grooved at base, densely fine papillose on the back, often with 3 vertical ribs above, the sides thickened and swell up; column 1 mm, the apical teeth same height with anther, awl-like, 0.5 mm; foot very short, turning upward slightly, 1–1.3 mm, the free portion 0.3 mm; anther hemispherical, short in front.

Locality: Tai Mo Shan, Sha Tin. *S. Y. Hu 10136, 12052* (CUHK); *Y. S. Lau 1749*.

Distribution: Guangdong, Yunnan; Sikkim, Bhutan, Myanmar, Thailand, Laos, Vietnam.

Ecology: Trunks or rocks in forests. Flowering: May–Jun.

Notes: The holotype specimen of *B. youngsayeanum* (*S. Y. Hu 12052,* K) was collected from Tai Mo Shan in 1969.

6. Bulbophyllum kwangtungense Schltr. 廣東石豆蘭 **(Photos 652–653)**

Fedde Repert. Sp. Nov. 19: 381. 1924; S. Y. Hu, Quart. J. Taiwan Mus. 25(1–2): 62. 1972; FRPS 19: 196, pl. 28: 7. 1999; FGD 7: 427, fig. 217. 2006; FOC 25: 414. 2009.

Bulbophyllum radiatum auct. non Lindl.: Rolfe, J. Linn. Soc. Bot. 36: 13. 1903; FHK 353. 1861; FKH 262. 1912; S. Y. Hu, Genera Orchid. Hong Kong 86. 1977.

Rhizomes 2 mm in diam.; pseudobulbs erect, cylindrical, 1–2.5 cm long, 2–5 mm in diam., terminated with 1 leaf. Leaves coriaceous, oblong, 2.5–3 × 0.5–1.5 cm, apex obtuse and slightly notched. Flowers light yellow; sepals separate, lanceolate, 8–10 × 1–1.5 mm, apex acuminate, margin from the middle to apex curved inward; lateral sepals slightly longer than the odd one, adnate to the column foot at base, mentum not obvious; petals ovate-lanceolate, 4–5 × 0.5 mm, apex acuminate, margin entire; lip fleshy, lanceolate, curved outward, 1.5 × 0.5 mm, apex obtuse, grooved below the middle, with 2–3 small keels becoming a thick one from the middle to apex; column 0.5 mm.

Locality: Hong Kong Island, Tsuen Wan, Tai Mo Shan, Sha Tin, Tai Po, Castle Peak, Lantau Island. *K. K. Mark 1, 4* (CUHK); *HK sheet 27295, 34409.*

Distribution: Guangdong, Guangxi, Yunnan, Guizhou, Hunan, Jiangxi, Zhejiang, Fujian.

Ecology: Rocks in forests and ravines. Flowering: May–Aug.

44. Cirrhopetalum Lindl., *nom. cons.* 卷瓣蘭屬

Epiphytic perennial herbs. Rhizomes slender. Pseudobulbs ovoid, slightly flattened on one side. Leaves solitary, terminal to the pseudobulb, fleshy, lasting for 3 years. Scape emerging from the base of the flattened side of a pseudobulb, with basal and submedian scales. Flowers resupinate, of moderate size, graceful and attractive, in a simple umbel arranged in form of a fan; sepals unequal, the odd one free, ovate or ovate-oblong, fornicate, the lateral ones 2–6 times longer than the odd one, adnate to the column foot and forming a mentum at the base, then twisted, with the upper margins meeting before the lip, forming a coherent platform; petals similar to and smaller than the odd sepal, lip tongue-like, fleshy, mobile, contracted at the base and hinged to the end of the column foot, incumbent, recurved; column short, stout, the base produced into an elongate and curved foot, the sides winged, and the wings extended into 2 prominent arms at the apex; clinandrium truncate or dentate; rostellum truncate; anther depressed, hemispherical, deciduous; pollinia 4 in 2 pairs, waxy, the inner one of each pair smaller, without caudicles or viscidium; stigma strongly concave, with a large glossy sticky gland on the upper margin below the rostellum and two small ones on the opposite margin; ovary obovoid-cylindrical. Capsules oblong-ellipsoidal, rostrate, ridged.

About 130 species distributed in E Africa, tropical and subtropical Asia and Australia; 25 species in China; five species in Hong Kong.

1a. Lateral sepals less than 3 times the length of the odd one; petals without cilia or seta.
  2a. Flowering scape emerging from one-year-old pseudobulb with all the cataphylls deteriorated and disappeared; sepals, petals, and lip with red longitudinal stripes on yellow background; anther cap smooth ..... 1. *C. tigridum*
  2b. Flowering scape emerging from the base of newly formed pseudobulb covered by imbricate cataphylls; sepals, petals, and lip uniform in colour ..... 2. *C. bicolor*
1b. Lateral sepals 5–6 times longer than the odd sepal; petals ciliate or each with a seta at the apex.
  3a. Leaves 4 cm, or more wide; scape emerging from the base of newly formed pseudobulb covered by cataphylls ..... 3. *C. delitescens*
  3b. Leaves 3 cm, or less wide; scape emerging from the base of pseudobulb with cataphylls all deteriorated and disappeared.
    4a. Flowers salmon pink; lateral sepals 5 cm long, with both the upper and the lower margins coherent beyond the mentum, forming a tube about 1.5 cm long; cilia of the odd sepal and petals clavate ..... 4. *C. miniatum*
    4b. Flowers yellow maculate purplish red; lateral sepals 2 cm long, with the lower margin free beyond the mentum, the upper margin coherent forming a platform; cilia of the odd sepal and petals long and wavy, setaceous ... 5. *C. tseanum*

1. Cirrhopetalum tigridum (Hance) Rolfe 虎斑卷瓣蘭

J. Linn. Soc., Bot. 36(249): 15. 1903; FKH 262. 1912.

Bulbophyllum tigridum Hance, J. Bot. 21(8): 232. 1883; FGD 7: 428. 2006; FOC 25: 427. 2009.

Bulbophyllum retusiusculum Rchb. f. var. *tigridum* (Hance) Z. H. Tsi, Guihaia 15(2): 108. 1995; FRPS 19: 222. 1999; Check List HK Plants 371. 2002; 129. 2004.

Rhizomes prostrate, 2 mm in diam.; pseudobulbs ovoid-conical, 5–25 mm long, 4–13 mm in diam., terminated with 1 leaf. Leaves leathery, oblong or ovate-lanceolate, 1.5–8 × 0.5–2 cm, base attenuate into a short petiole, apex obtuse and slightly notched. Flowers small, dull red with purplish red veins; odd sepal oblong-ovate or subrectangular, apex subtruncate; lateral sepals lanceolate or linear, 5–7 mm, apex acuminate, adnate to the column foot at base; petals subequal to the odd sepal, apex obtuse, adnate to the column foot at base; lip fleshy, tongue-like, curved outwards and downwards, apex obtuse, grooved near base; column winged, wider near base; column foot curved upwards.

Locality: Tai Mo Shan. *G. Barretto 137; HK sheet 27310.*

Distribution: Guangdong.

Ecology: Rocks or trunks in forests. Flowering: Sep.–Nov.

2. Cirrhopetalum bicolor (Lindl.) Rolfe 二色卷瓣蘭(二色石豆蘭) **(Photo 654)**

J. Linn. Soc. Bot. 36(249): 14. 1903; FKH 262. 1912; S. Y. Hu, Genera Orchid. Hong Kong 86. 1977.

Bulbophyllum bicolor Lindl., Gen. Sp. Orchid. Pl. 49. 1830; FRPS 19: 227. 1999; FGD 7: 430. 2006; FOC 25: 428. 2009; Check List HK Plants 370. 2002; 129. 2004.

Rhizome stout, 3–4 mm in diam.; pseudobulbs ovoid-spherical, 1.5–2 cm long, 8–13 mm in diam., terminated with 1 leaf. Leaves leathery, oblong, 10–15 × 2–2.5 cm, base attenuate into a petiole 1.5 cm, apex obtuse and slightly notched. Flowers light yellow, inside base with purple dots, purplish red at tips of both sepals and petals; odd sepal oblong, 15 × 10 mm, apex acuminate, margin with thick red cilia; lateral sepals oblique ovate-lanceolate, 20 × 7.5 mm, apex obtuse, twisted above the base; petals oblong, 10 × 6 mm, apex apiculate, margin entire; lip olive green, turning orange-red in later time, ovate, curved downwards, adnate to the column foot, apex obtuse.

Locality: Tai Mo Shan, Sha Tin. *S. Y. Hu 10162* (CUHK); *Y. S. Lau 1805; HK sheet 30760.*

Distribution: Endemic to Hong Kong.

Ecology: Forests. Flowering: May.

Notes: Listed in *Rare and Precious Plants of Hong Kong*.

3. Cirrhopetalum delitescens (Hance) Rolfe 直唇卷瓣蘭 **(Photo 655)**

Gard. Chron. n. s. 18: 461. 1882; FKH 262. 1912.

Bulbophyllum delitescens Hance, J. Bot. 14(2): 44. 1876; FRPS 19: 209, pl. 32: 1. 1999; FGD 7: 429. 2006; FOC 25: 423. 2009; Check List HK Plants 371. 2002; 129. 2004.

Rhizomes stout, prostrate, 4 mm in diam.; pseudobulb ovoid or subglobose, 1.7–3.5 cm long, 5–10 mm in diam., terminated with 1 leaf. Leaves thin-leathery, oblong or elliptic, sometimes obovate-oblong, 16–25 × 3.5–6 cm, base cuneat, apex obtuse or acute. Flowers purple, odd sepal ovate, depressed to become boat-shaped, 1 × 3 mm, apex truncate and notched, with an awn to 7 mm in the middle of the notch, margin entire; lateral sepals narrowly lanceolate, 6 × 0.2 cm, apex acuminate, adnate to the column foot, twisted above the base, upper and lower margins connate; petals falcate-lanceolate, 5–7 × 1.5–2 mm, apex truncate and notched, with an awn in the middle of the notch, margin entire; lip fleshy, tongue-like, recurved, 5 mm, apex obtuse, base grooved and adnate to the column foot, glabrous; column 3 mm, winged.

Locality: Victoria Peak, Cape D'Aguilar, Tai Mo Shan. *HK sheet 7065, 27305, 34047.*

Distribution: Hainan, Guangdong, Yunnan, Xizang, Fujian; India, Vietnam.

Ecology: Trunks and rocks in forests. Flowering: Feb.–Jul.

Notes: The type specimens were collected by J. Lamont and C. Ford from Victoria Peak before 1876.

4. Cirrhopetalum miniatum Rolfe 斑唇卷瓣蘭

Bull. Misc. Inform. Kew. 1913(1): 28. 1913; S. Y. Hu, Genera Orchid. Hong Kong 186. 1977.

Bulbophyllum pecten-veneris (Gagnep.) Seidenf., Dansk Bot. Ark. 29(1): 37. 1973, et Opera Bot. 114: 278, fig. 182. 1992; FRPS 19: 233. 1999; FTW ed. 2, 5: 771. 2000; FGD 7: 430. 2006; FOC 25: 433. 2009; Check List HK Plants 371. 2002; 129. 2004.

Rhizomes 1–2 mm in diam., prostrate; pseudobulbs ovoid-spherical, 5–12 mm long, 5–10 mm in diam., terminated with 1 leaf. Leaves thickly leathery, elliptic, oblong-lanceolate or ovate, 1–6 × 0.7–1.8 cm, apex obtuse or sometimes slightly retuse. Flowers yellowish green or yellow with some brown colour; odd sepal ovate, notched, 5 × 2.5 mm, apex acute, margin above base with fimbriate hairs; lateral sepals narrowly lanceolate, 3.5–5 × 0.25 cm, apex long and caudate, base adnate to the column foot, twisted above the base, upper and lower margins connate to each other, margins curved inwards, attenuate to apex forming a long tail-like tube; petals oblique ovate, 2.5–3 × 1.5 mm, apex acute, margins above middle with fimbriate hairs; lip fleshy, tongue-like, curved outwards and downwards, 2.5 mm, apex acute, glabrous; column 2 mm.

Locality: Sha Tin (Siu 2000).

Distribution: Hainan, Guangxi, Hubei, Anhui, Fujian, Taiwan; Vietnam, Laos.

Ecology: Trunks and rocks in forests. Flowering: Apr.–Sep.

5. Cirrhopetalum tseanum S. Y. Hu & Barretto 香港卷瓣蘭 **(Fig. 262)**

Chung Chi Journal 13(2): 30, fig. 14. 1976; S. Y. Hu, Genera Orchid. Hong Kong 84. 1977.

Bulbophyllum tseanum (S. Y. Hu & Barretto) Z. H. Tsi, FRPS 19: 239. 1999; FGD 7: 432. 2006; FOC 25: 434. 2009; Check List HK Plants 371. 2002; 129. 2004.

Saxicolous orchid; root fibrous, many; rhizomes creeping, 3 mm in diam., covered by straw-like scales; pseudobulbs oblique-ovoid, 1–1.5 cm long, 6–8 mm across the base. Leaves solitary, petiolate, petioles 3–7 mm, folded, articulate at base; leaf blades thick, leathery, oblong, 4–7 × 1.7–2.5 cm, base obtuse, apex rotundate and retuse, midrib impressed above, hardly visible beneath. Flowers 4 or 5 in a subumbelliform raceme terminal to the scape, bracts subulate, 3 mm, acuminate and apiculate; odd sepal cucullate, 5 × 4 mm, light yellow and uniformly crimson-lake along the margin, ciliate, hairs dark red, apex extending forward to a caudate filiform process, 4 mm; lateral sepals oblique, twisted, turning upwards with the upper margins meeting in front of the lip, to form a tongue-like elliptic blade, 1.8–2 × 0.7–0.8 cm, densely mottled dull purplish red and light yellow, margin yellow, recurved, apex retuse; petals oblique-ovate, 4 × 2.5 mm, light yellow, dark red along the margin, ciliate and acuminate, apex filiform, 4 mm; lip attached to the apex of the long mentum, movable, glossy orange, fleshy, tongue-like, recurved, with a median longitudinal ridge and a groove along each side;

column 3 mm, stout and winged on each side; pollinia 4 in 2 pairs; ovary obconical, 2 mm.

Locality: Sha Tin, Sha Tau Kok (Siu 2000).

Distribution: Endemic to Hong Kong.

Ecology: Rocks in forests. Flowering: Mar.–Apr.

Notes: The holotype specimen (*S. Y. Hu 13586*, K) was collected by S. C. Tse from Pat Sin Leng in 1974.

45. Thrixspermum Lour. 白點蘭屬

Epiphytic herbs. Aerial roots long and branched. Leaves oblong-elliptic, distichous. Scapes short, subsessile, many on a shoot, with imbricate persistent scales. Flowers showy, ephemeral, in a short axillary raceme; sepals equal, free, spreading; petals slightly smaller; lip 3-lobed, saccate, adnate to the base of the column, spur conical, lateral lobes erect, obtuse, midlobe triangular-ovate, obtuse, disk with a callus; column short, semiterete, with fleshy arms; clinandrium oblique; rostellum fleshy, horse-shoe-shaped; anther terminal, incumbent, convex; pollinia 4 in 2 pairs, unequal, the front one of each pair smaller, obovoid-oblong, on a white viscidium with a recurved ovate membrane resting over the horse-shoe-shaped rostellum; stigma suborbicular; ovary obovoid-cylindrical. Capsules oblong.

About 120 species distributed from tropical Asia to Oceania; 12 species in China; one species in Hong Kong.

1. Thrixspermum centipeda Lour.

白點蘭 **(Fig. 263; Photo 656)**

Fl. Cochinch. 520. 1790; S. Y. Hu, Quart. J. Taiwan Mus. 28(1–2): 171. 1975, et Genera Orchid. Hong Kong 105, fig. 59. 1977, et Enum. Sperm. Hong Kong 109. 2002; FRPS 19: 345, pl. 50: 3. 1999; FGD 7: 486, fig. 249. 2006; FOC 25: 470. 2009.

Epiphytic herb; roots cord-like, shiny grey; stems monopodial, slightly compressed. Leaves distichous, thick, smooth, appearing sessile, leaf blades oblong-linear, 3.5–7 × 0.8–1.6 cm, base obtuse, apex rotundate, obliquely retuse and apiculate, midrib slightly impressed above. Flowers resupinate, pale yellow, two-ranked, ephemeral; sepals and petals linear-lanceolate, evenly spaced, forming a semicircle; odd sepal dorsal, 2.6 × 0.3 cm; lateral sepals widespread, oblique, 3 mm wide at base; petals slanting upwards, 2.2 × 0.2 cm; lip 3-lobed, white, fleshy, saccate; lateral lobes very short, 2 mm, arching over the column with downy hair along the margin; midlobe triangular, 6 mm, curved, base with a white callus 2.5 mm; disk speckled red both inside and outside; spur stout and rounded at base, papillose inside and at tip, lemon-yellow and fainly dotted pink; column white, very short, fleshy, triangular at the sides; pollinia 4 in 2 pairs, unequal; ovary shiny, smooth, light green.

Locality: Castle Peak, Sai Kung. *HK sheet 27536, 33094.*

Distribution: Hainan, Guangdong, Yunnan; Sikkim, India, Myanmar, Indochina, Indonesia.

Ecology: Trunks in forests. Flowering: Aug.–Sep.

46. Diploprora Hook. f. 蛇舌蘭屬

Epiphytic monopodial herbs; roots string-like, branched. Leaves leathery, distichous. Scapes several, axillary, short, with basal scales; flowering bracts persistent. Flowers small, in a short axillary spike, opening 1 at a time; sepals subequal, free, spreading; petals slightly narrower than the sepals, spreading; lip 3-lobed, attached to the base of the column, concave, without a foot or spur,

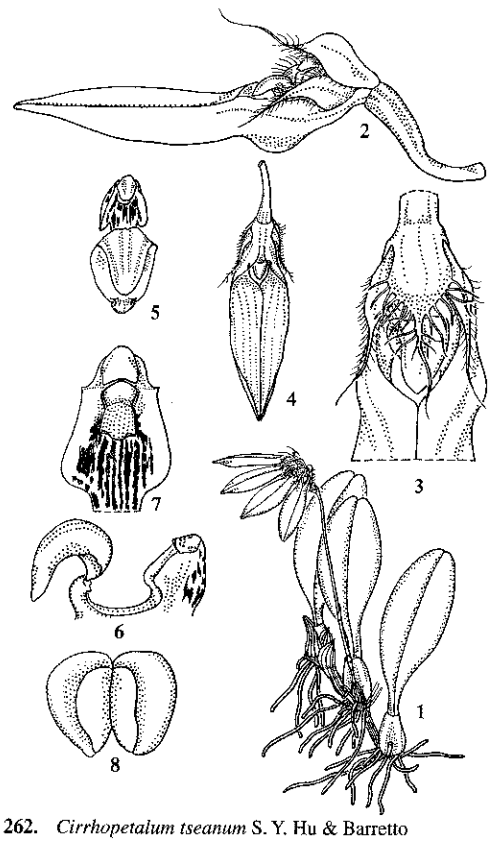

Figure 262. *Cirrhopetalum tseanum* S. Y. Hu & Barretto

1. flowering plant; *2.* lateral view of flower; *3.* top view of portion of flower; *4.* ventral view of flower; *5.* front view of column and lip; *6.* lateral view of column and lip; *7.* front view of apical portion of column; *8.* four pollinia in 2 pairs. (drawn by Teresa F. Wong)

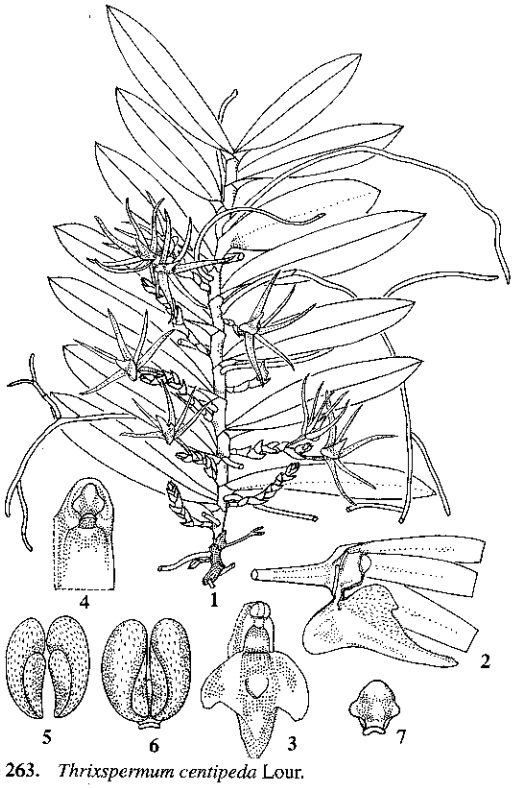

Figure 263. *Thrixspermum centipeda* Lour.

1. flowering plant; *2.* lateral view of flower with 1 sepal and 1 petal removed; *3.* front view of flower with all sepals and petals removed; *4.* apical portion of column with anther removed; *5.* back view of four unequal pollinia in 2 pairs; *6.* front view of 4 unequal pollinia on narrow viscidium with recurved ovate membrane; *7.* back view of viscidium and ovate hyaline membrane. (drawn by Teresa F. Wong)

lateral lobes erect, obtuse, midlobe narrow, the apex extending into 2 filiform lobes, disk flat, fleshy; column short, oblong, clinandrium truncate; rostellum ovate, obtuse; anther semiglobose; pollinia 4 in 2 pairs, unequal, the front ones larger, obovoid, attached to a stipe with an ovate viscidium; stigma large covering the entire front of the column; ovary cylindrical. Capsules oblong, the apex crowned with persistent sepals.

Two species distributed in tropical areas of S Asia; one species in S China and Hong Kong.

1. Diploprora championii (Lindl.) Hook. f. **(Fig. 264; Photos 657–658)**

蛇舌蘭

Fl. Brit. Ind. 6: 26. 1890, et Hook., Icon. Pl. 2: t. 2120. 1892; FHK 357. 1861; FKH 266. 1912; S. Y. Hu, Quart. J. Taiwan Mus. 26(3–4): 375. 1973, et Genera Orchid. Hong Kong 108, fig. 62. 1977; FRPS 19: 282, pl. 43: 3–4. 1999; FTW ed. 2, 5: 854, pl. 362. 2000; FGD 7: 489, fig. 252. 2006; FOC 25: 448. 2009.

Cottonia championii Lindl., J. Bot. Kew (Misc.) 7: 35. 1855; FHK 357. 1861.

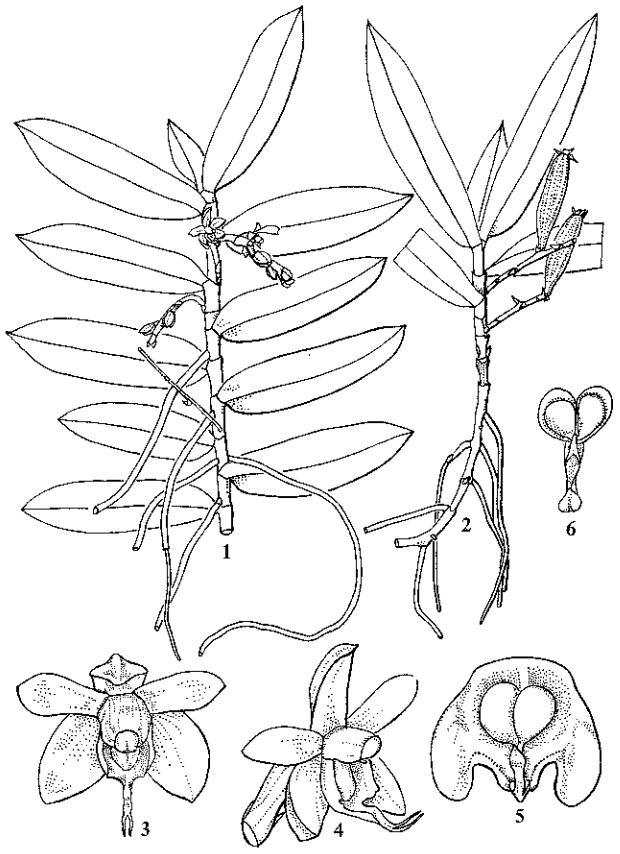

Figure 264. *Diploprora championii* (Lindl.) Hook. f.
1. flowering plant; *2.* fruiting plant; *3.* front view of flower; *4.* lateral view of flower; *5.* apex of column with anther cap removed; *6.* back view of 4 unequal pollinia in 2 pairs. (drawn by Teresa F. Wong)

Monopodial herb; roots cord-like, grooved, 15 cm or longer, 2 mm in diam.; stem leafy, green, slightly compressed and zig-zag. Leaves sessile, fleshy, evergreen, distichous, oblong or oblong-lanceolate, 4–8 × 1.2–2.2 cm, base oblique or slightly twisted, apex acute, slightly recurved, midrib impressed above, elevated beneath. Inflorescence a hanging raceme; flowers 3–8 on a rachis; sepals and petals pale cream to yellow, deepening with age, wide spread, apex obtuse; odd sepal dorsal, plane, oblong-ovate, 9–10 × 5 mm, truncate at base; lateral sepals ovate-elliptic, 8 × 5 mm, apex tinged pink; petals oblique-oblong, 8 × 3.5 mm; lip suborbicular, with the margin raised forming a shallow saucer, base uneven with a flat floor, elevated in middle with lower lateral and apical sides depressed, delicately lavender-pink with bright yellow patches within, the front extending into a filiform process, triangular at base, forked at apex; column lilac, short, thick and smooth, rounded at the back and apex; anther globose, lavender, apex pointed; pollinia 4 in 2 pairs, globose, waxy.

Locality: Violet Hill, The Peak, Wong Nai Chung, Mount Kellett, Pok Fu Lam Country Park. *S. Y. Hu 9349, 11663A* (CUHK); *Y. S. Lau 1766; P. S. Choi 222.*

Distribution: Hainan, Guangxi, Yunnan, Fujian, Taiwan; Sikkim, India, Myanmar, Thailand, Vietnam.

Ecology: Trees or rocks in shade areas in forests. Flowering: Feb.–Aug.; fruiting: Mar.–Sep.

Notes: The type specimen was collected by J. G. Champion from Victoria Peak between 1847 and 1850.

47. Acampe Lindl., *nom. cons.* 脆蘭屬

Large fleshy epiphytic herbs with monopodial growth. Roots stout, long, branched. Leaves band-like, 20 × 5 cm. Scape shortly pedunculate. Flowers rather small, in axillary small panicles; sepals and petals similar in colour and size, free, spreading, with transverse bars; lip 3-lobed, attached to the base of the column, slightly saccate at the base, papillose-velvety, fleshy; column short, stout, without wing or foot, with a tooth on each side of the apex; clinandrium truncate; rostellum obtuse; anther semiglobose; pollinia 4 in 2 globose pairs, waxy, on a slender stipe; viscidium ovate; stigma large, suborbicular; ovary cylindrical. Capsules cylindrical, erect, erostrate.

About five species distributed in S and SE Asia; three species in China; one species in Hong Kong.

1. Acampe rigida (Buch.-Ham. ex Sm.) P. F. Hunt 多花脆蘭 **(Fig. 265; Photos 659–660)**

Kew Bull. 24: 98. 1970; FRPS 19: 286, pl. 43: 1–2. 1999; FTW ed. 2, 5: 735, pl. 310. 2000; FGD 7: 496, fig. 256. 2006; FOC 25: 449. 2009.

Aerides rigida Buch.-Ham. ex Sm., Rees Cyclopedia 39. 1819.

Acampe multiflora (Lindl.) Lindl., Fol. Orch. Acampe 1. 1853; FHK 358. 1861; FKH 266. 1912; S. Y. Hu, Quart. J. Taiwan Mus. 25(1–2): 41. 1972, et Genera Orchid. Hong Kong 112. 1977.

Roots thick and strong, many, branching profusely, up to 50 cm long, 3–10 mm in diam.; stem upright, monopodial, leafy, stout, covered by overlapping leaf sheaths. Leaves distichous, dull green, thick coriaceous, linear, 20–35 × 4–4.5 cm, base folded, apex obtuse or oblique-retuse, midrib inconspicuous above, elevated beneath. Inflorescence an axillary panicle; flowers non-resupinate, very fleshy, creamy white, turning yellow when old, speckled with bright reddish purple on the outside and streaked horizontally on the inside; sepals all alike in size, shape and colour, oblong, slightly incurved, apex rounded or obtuse, 11 × 6–7 mm; petals narrower than the sepals, spathulate, 12 × 4.5 mm, apex rounded; lip very fleshy, non-movable, midlobe tongue-like, ovate, creamy yellow tinged lavender with irregular red specks above

and below, margin erose, apex curved downwards, lateral lobes wall-like, velvety inside; disk with a yellow median ridge; column fleshy, very short, 2 mm high, bright purplish red; anther yellow, apical to the column; pollinia fixed at the end of a narrow caudicle; ovary smooth, with inconspicuous lines.

Locality: Shek O, Kowloon Peak, Fo Tan Valley, Ma On Shan, Lantau Island. *K. Y. Chan 1374* (CUHK); *S. Y. Hu 7352* (CUHK); *Y. S. Lau 2024, 2364.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan; S and SE Asia.

Ecology: Damp rocks under trees along streams. Flowering: May–Sep.; fruiting: Oct.–Dec.

48. Gastrochilus D. Don 盆距蘭屬

Epiphytic herbs with monopodial growth. Roots many, thick and long. Stems rather short, covered by roots and remains of degenerated leaves. Leaves rather small, linear-lanceolate, wavy, acute. Scapes short, with 2–3 flowers. Flowers rather small, non-resupinate, few on an axillary raceme; sepals and petals subequal, free, spreading in form of a fan; lip undivided, attached to base of the column, broadly saccate, apex transversely dilated and bilobed, the sac smooth inside, without callus or keel; column short, stout, winged; clinandrium truncate; rostellum subulate, bifid; anther terminal, incumbent, convex, acuminate at the apex; pollinia 2, subglobose in appearance from the front, flattened and with a central depression on the back; stipe slender; viscidium bifid; stigma suborbicular; ovary cylindrical. Capsules oblong.

About 47 species distributed in tropical and subtropical Asia; 28 species in China; one species in Hong Kong.

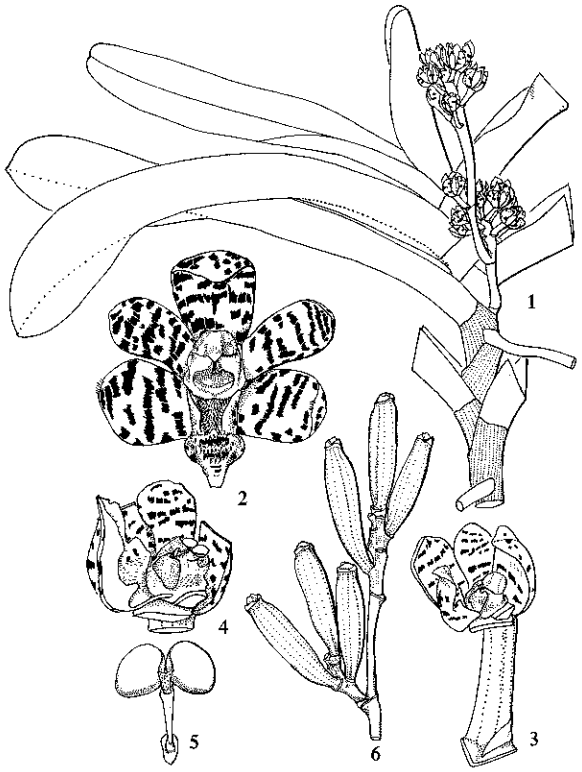

Figure 265. *Acampe rigida* (Buch.-Ham. ex Sm.) P. F. Hunt

1. flowering shoot; *2.* front view of flower; *3.* lateral view of flower with 1 petal and 1 lateral sepal removed; *4.* lateral view of flower with anther cap and portion of lip removed; *5.* front view of 4 pollinia in 2 globose pairs attached to stipe and viscidium; *6.* fruiting branch. (drawn by Teresa F. Wong)

1. Gastrochilus japonicus (Makino) Schltr.
黃松盆距蘭(港盆距蘭) **(Fig. 266)**

Fedde Repert. Sp. Nov. Beih. 12: 315. 1913, et l. c. 4: 288. 1919; FRPS 19: 407, pl. 60: 7. 1999; FTW ed. 2, 5: 887, pl. 378. 2000; FGD 7: 475. 2006; FOC 25: 494. 2009.

Gastrochilus holttumianus S. Y. Hu & Barretto, Chung Chi Journal 13(2): 32. 1976; S. Y. Hu, Genera Orchid. Hong Kong 114. 1977.

Epiphytic monopodial herb; roots many, greyish green, 2 mm in diam.; stems very short. Leaves dull green, conduplicate in bud, articulate at base and slightly papillose at the joint; leaf blades elliptic, 4–6 × 1–1.2 cm, base oblique and twisted, apex acute, midrib canaliculate above, elevated beneath, margin strongly wavy. Flowers yellowish green; sepals and petals almost similar in colour, shape and size, equally spaced, forming a semicircle behind the column, the segments fleshy, rounded at apex, cuneate at base, 5 × 2–3 mm, petals slightly narrower; lip saccate, yellowish to white, very smooth inside, red at base and dotted red here and there along the margin, the front lobe rounded, 3 × 7 mm, notched at apex, margin slightly recurved, greenish white, the middle portion yellow with red dots; column very short, red, 1.5 × 5 mm, adnate to the lip by a short foot; anther dorso-ventrally compressed, the back globular, gradually attenuate at apex, yellow; pollinia 2, front view spherical, back view slightly flat with a depression at centre, supported by a slender transparent stipe; ovary and pedicel indistinct, glabrous, shallowly grooved.

Locality: Victoria Peak. *S. Y. Hu 12349B* (CUHK).

Distribution: Taiwan; Japan (Ryukyu).

Ecology: Trunks in forests.

Notes: The holotype specimen of *G. holttumianus* (*S. Y. Hu 12349B,* K) was collected by H. Tai from Victoria Peak in 1962.

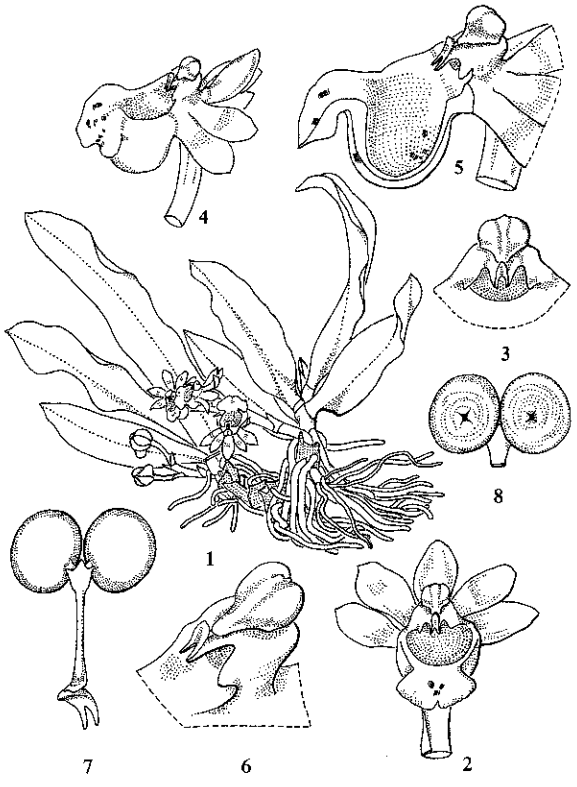

Figure 266. *Gastrochilus japonicus* (Makino) Schltr.

1. flowering plants; *2.* front view of flower; *3.* front view of column; *4.* lateral view of flower; *5.* lateral view of flower with portion of sepals and petals and half of lip removed; *6.* lateral view of portion of column; *7.* front view of pollinia; *8.* back view of pollinia. (drawn by Teresa F. Wong)

49. **Robiquetia** Gaudich. 寄樹蘭屬

Epiphytic herbs with monopodial growth. Roots long, strong and branched. Stems slender. Leaves distichous, oblong, erose at the apex. Peduncles as long as the leaves, with basal and median sterile bracts. Flowers rather small, in an axillary panicle; sepals free, spreading, the odd one concave; petals slightly smaller than the sepals; lip 3-lobed, calcarate, attached to the base of the column; spur enlarged and rotundate at the apex, with a horizontal flap in the back wall near the entrance and a keel on the front wall, lateral lobes erect and truncate, midlobe fleshy, ovate; column short and broad, produced into 2 arms at the apex; clinandrium elongate; rostellum produced below the tip of the anther; anther terminal, ovate, the apex beaked; pollinia 4 in 2 pairs, on a short stipe attached to a slender caudicle enlarged, curved, and grooved at the pollinian end and with a small viscidium at the rostellum end; stigma suborbicular; ovary cylindrical. Capsules fusiform.

About 40 species distributed in SE Asia, Pacific islands and Australia; two species in China; one species in Hong Kong.

1. Robiquetia succisa (Lindl.) Seidenf. & Garay
寄樹蘭(小葉寄樹蘭) **(Fig. 267; Photo 661)**

Bot. Tisskr. 67: 119. 1972; S. Y. Hu, Genera Orchid. Hong Kong 116, fig. 68. 1977; FRPS 19: 368, pl. 55: 1–2. 1999; FGD 7: 484. 2006; FOC 25: 476. 2009.

Sarcanthus succisus Lindl., Bot. Reg. 12: t. 1014. 1826.

Epiphytic herb; roots cord-like, shiny grey, turning to olive green when old; stems monopodial. Leaves distichous, petiolate; petioles sheathing, green; leaf blades leathery, linear-oblong, 5–10 × 1.5–2.3 cm, midrib shallowly impressed above, evident beneath, base truncate, apex erose, emarginate, truncate and apiculate. Flowers non-resupinate; pale greenish yellow to lemon-yellow, in places washed and streaked red; sepals orbicular, fleshy, odd sepal concave, 4 mm in diam., apex rounded, greenish yellow washed red in the centre; lateral sepals plane, 5 mm in diam.; petals orbicular, the inner margin fitting into the concave depression of the odd sepal, waxy yellow, flushed red throughout; lip calcarate, disk funnel-shaped, the anterior side extended into a tongue-like lobe with 2 longitudinal ridges in the centre, lateral lobes thickened below, wing-like, erect above with a well-marked deep purple vertical line on each side; column white, short, thick, apex truncate, concave, the anterior portion extended upwards into 2 stout arms, the foot thick and united with the posterior wall of the funnel-shaped portion of the lip, extending into a screen-like callus partially covering the throat of the spur; anther white, suborbicular, concave; pollinia 4 in 2 pairs, waxy, attached by a short filament onto the stipe; ovary short, ridged and canaliculate.

Locality: New Territories. *S. Y. Hu 10815A* (CUHK); *HK sheet 7117*.

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Fujian; Indochina, Myanmar, Thailand, N India, Sikkim, Bhutan.

Ecology: Shade cliffs along streams. Flowering: Jun.–Sep.

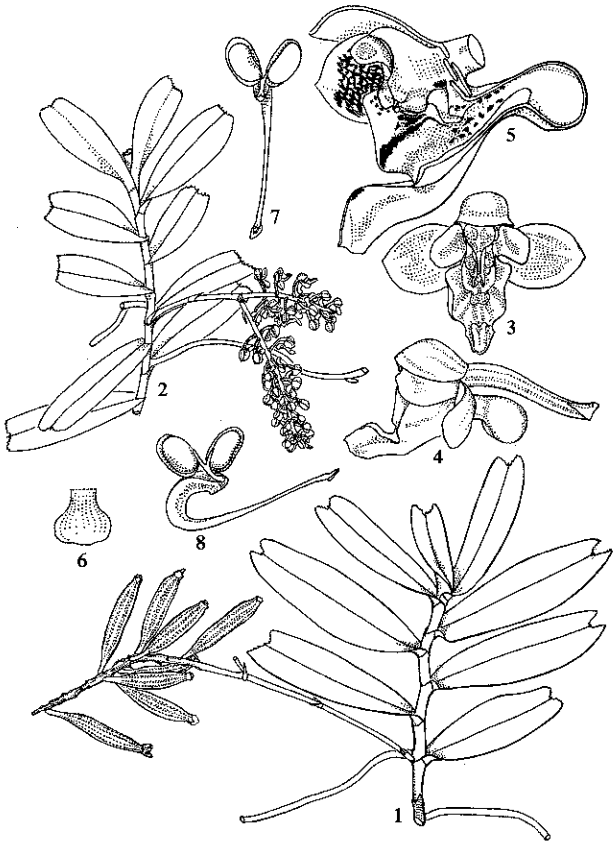

Figure 267. *Robiquetia succisa* (Lindl.) Seidenf. & Garay
1. fruiting branch; *2.* flowering branch; *3.* front view of flower; *4.* lateral view of flower; *5.* lateral view of flower with half of odd sepal, 1 lateral sepal, 1 petal, and portion of lip removed; *6.* front view of spur; *7.* front view of pollinia on short stipe, and curved caudicle attached to viscidium at apex; *8.* lateral view of pollinia. (drawn by Teresa F. Wong)

50. **Cleisostoma** Blume 隔距蘭屬

Epiphytic monopodial herbs. Roots wire-like, branched. Stems slender, terete. Leaves terete, lanceolate, or band-like. Flowers rather small, in an axillary raceme or panicle; sepals subequal, free, spreading, the lateral ones attached to the column foot; petals slightly smaller, spreading; lip 3-lobed, calcarate, attached to the base of the column, spur large, irregular-cylindrical, obtuse, with a callus on the back wall at the entrance and a longitudinal keel on the front wall running down from the base of the midlobe, lateral lobes erect, over the sides of the sac, triangular, acute, midlobe fleshy, straight and triangular, or curved upward and with a callus at its base; column stout, semiterete, with a stout foot; clinandrium truncate, the apex 2-toothed; rostellum concave and U-shaped or subulate; anther terminal, incumbent, the apex truncate or acuminate; pollinia 4 in 2 pairs, waxy; stipe short, compressed and enlarged to a horse-shoe-shaped base and viscidium, or slender and with a small viscidium; stigma orbicular; ovary obovate-cylindrical. Capsules cylindrical, with persistent column.

About 100 species distributed in tropical Asia and Oceania; 17 species and one varieties in China; four species in Hong Kong.

1a. Leaves terete.
2a. Flowers lilac; sepal ca. 2.2 mm; the side-lobes of the lip, and the base of the front lobes bright purple ..... 1. *C. williamsonii*
2b. Flowers pale green or yellowish with purple strips; sepal 5–6 mm; lip white to yellowish ..... 2. *C. simondii* var. *guangdongense*
1b. Leaves flat, linear-lanceolate or band-like.
3a. Inflorescences paniculate, the peduncles similar to the leaves in length; leaves band-like, the apex retuse or bilobed; anther truncate-serrate at the apex; back callus of spur not meeting the front keel; stipe of pollinia short and broad, horse-shoe-shaped at the base ..... 3. *C. paniculatum*
3b. Inflorescences racemose, the peduncles many times shorter than the leaves; leaves lanceolate, the apex acuminate; anther acuminate at the apex; back callus of spur connivent with the front keel; stipe of pollinia slender, obtuse at the base ..... 4. *C. rostratum*

1. Cleisostoma williamsonii (Rchb. f.) Garay 紅花隔距蘭
Bot. Mus. Leafl. 23: 176. 1972; FRPS 19: 324. 1999; FGD 7: 491. 2006; FOC 25: 462. 2009.
Sarcanthus williamsonii Rchb. f., Gard. Chron. 674. 1865.
Cleisostoma hongkongense (Rolfe) Garay, Bot. Mus. Leafl. 23(4): 172. 1972.
Sarcanthus hongkongensis Rolfe, Kew Bull. 1898: 198. 1898; J. Linn. Soc. Bot. 36: 37. 1903; FKH 266. 1912; FHN 4: 262. 1977.

Epiphytic herb, to 70 cm tall; stems 3–4 mm in diam., branched or unbranched, internodes 1–2.5 cm. Leaves terete, 6–10 cm × 2–3 mm, apex obtuse. Racemes or panicles lateral; bracts ovate-lanceolate, ca. 2 mm. Flowers pale lilac, opening widely, dorsal sepal ovate-elliptic, cymbiform, ca. 2.2 × 1.5 mm, rounded; lateral sepals ovate-elliptic, ca. 2.5 × 1.5 mm, apex obtuse. Petals oblong, ca. 2.2 × 1 mm; lip saccate, lateral lobes erect, ligulate-oblong; midlobe narrowly ovate-triangular, fleshy, adaxially with a ridge raised and triangular near spur entrance; spur globose, ca. 2 mm in diam. Column ca. 2 mm.

Locality: Hong Kong Island, Ma On Shan. *C. Ford s.n.* (K); *HK sheet 34049.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan; NE India to Indochina and Indonesia.

Ecology: Trunks in forests. Flowering: Apr.–Jun.

Notes: The type specimen of *Sarcanthus hongkongensis* (*C. Ford. s.n.*) was collected from Hong Kong before 1893. Rolfe (1903) noted that "the flowers are pale lilac, with the column, the side-lobes of the lip, and the base of the front lobes bright purple".

2. Cleisostoma simondii (Gagnep.) Seidenf. var. **guangdongense** Z. H. Tsi 廣東隔距蘭(柱葉隔距蘭) **(Photo 662)**
Bull. Bot. Res. 3(4): 84, fig. 1. 1983; FRPS 19: 330. 1999; FGD 7: 492. 2006; FOC 25: 463. 2009.
Sarcanthus teretifolius auct. non (Lindl.) Lindl.: FKH 266. 1912; S. Y. Hu, Quart. J. Taiwan Mus. 28 (1, 2): 156. 1975.

Epiphytic herb, to 50 cm tall; stems 4 mm in diam., branched. Leaves terete, 7–11 cm, 3 mm in diam., apex obtuse. Flowers having the size and shape of a bee, in axillary racemes; dorsal sepal rounded; lateral sepals and petals oblong, all greenish marked with red longitudinal lines, apex rounded; lip saccate, lateral lobes erect, midlobe oblong; apex triangular-acute, white with pink veins. Column 3 mm. Capsules cylindrical, 3.5 × 0.6 cm.

Locality: Common in Hong Kong. *S. Y. Hu 9754, 12294B* (CUHK); *K. L. Yip 4518.*

Distribution: Hainan, Guangdong, Fujian.

Ecology: Trunks in forests. Flowering: May–Nov.

3. Cleisostoma paniculatum (Ker Gawl.) Garay 大序隔距蘭
Bot. Mus. Leafl. Harvard Univ. 23(4): 173. 1972; S. Y. Hu, Genera Orchid. Hong Kong 115. 1977; FRPS 19: 323, pl. 47: 11–14. 1999; FTW ed. 2, 5: 808, pl. 341. 2000; FGD 7: 493, fig. 254. 2006; FOC 25: 461. 2009.
Aerides paniculata Ker Gawl., Bot. Reg. 3: t. 220. 1817.
Sarcanthus cerinus (Hance) Rolfe, J. Linn. Soc. Bot. 36: 36. 1903; FKH 266. 1912.
Cleisostoma cerinum Hance, J. Bot. 20: 359. 1882.

Monopodial herb; stems erect, compressed cylindrical, 18–25 cm tall. Leaves band-like, apex retuse or bilobed, the longest 14 cm. Inflorescence a panicle with many small flowers; flowers yellow, with 2 fairly broad bands of lilac-mauve on sepals and petals; odd sepal dorsal, oblong, 6 × 3.5 mm, apex obtuse; lateral ones oblique-oblong, 4.5 × 3 mm, apex acute, pointing upwards; petals linear-oblong, 4 × 1.7 mm, apex obtuse; lip 5 mm, with a unicorn-like callus at the entrance and continued downwards to the spur, as a membrane-like partition; column 3 mm; anther cap 2-lobed; pollinia 4 in 2 pairs, attached to a horse-shoe-like viscid disk by a wide stipe; stigma pear-shaped, situated beneath the rostellum; ovary and pedicel 6 mm.

Locality: Lantau Island. *HK sheet 27571, 34211.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Xizang, Jiangxi, Fujian, Taiwan; Thailand, Vietnam, NE India.

Ecology: Trunks or rocks in forests. Flowering: May–Sep.

4. Cleisostoma rostratum (Lodd. ex Lindl.) Garay
尖喙隔距蘭(福氏隔距蘭) **(Fig. 268; Photo 663)**

Bot. Mus. Leafl. 23: 174. 1972; FOC 25: 460. 2009.

Sarcanthus rostratus Lodd. ex Lindl., Coll. Bot. ad pl. 39B. 1826.

Cleisostoma fordii Hance, J. Bot. Brit. For. 14: 45. 1875; S. Y. Hu, Genera Orchid. Hong Kong 115, fig. 69. 1977; Check List HK Plants 373. 2002; 130. 2004.

Cleisostoma rostratum (Lodd. ex Lindl.) Seidef. ex Averyanov, Vasc. Pl. Syn. Vietnam. Fl. 1: 53. 1990, et Iden. Guide Vietnam. Orch. 376. 1994; FRPS 19: 319. 1999; FGD 7: 492. 2006, *nom. illeg. prior.*

Sarcanthus fordii (Hance) Rolfe, J. Linn. Soc. Bot. 36: 37. 1903; FKH 266. 1912.

Epiphytic or saxicolous; roots wire-like, light grey, greyish green when mature, slightly compressed; stems subterete, dark green, longitudinally striate below the insertion of the leaf blades and horizontally wrinkled elsewhere. Leaves distichous, dark green, rather fleshy, stiff, linear-lanceolate, 8–14 × 1–1.6 cm, midrib narrowly compressed above, distinctly elevated below, base cuneate and distinctly articulate, apex suddenly constricted and long acuminate. Flowers resupinate, erect; sepals and petals similar in colour and design, apex acute, yellowish green with 2 carmine-red bands on each side; odd sepal dorsal, elliptic, 7 × 3 mm, concave and arcuate; lateral ones rather low, in line with the lip, oblique obovate-elliptic, 6 × 3 mm, reflexed; petals laterally partitioned, pointing slightly forward, oblong, 6 × 2.5 mm; lip calcarate, 3-lobed, lilac-mauve, white at base, lateral lobes erect, cuspidate at apex, midlobe folded along the sides and curved upwards forming a beak-like structure, with a fleshy tongue-like callus; column white, fleshy, apex truncate, slightly narrowed at the centre; anther cordate and beak-like at apex; pollinia 4 in 2 pairs; ovary very small, 2–3 mm.

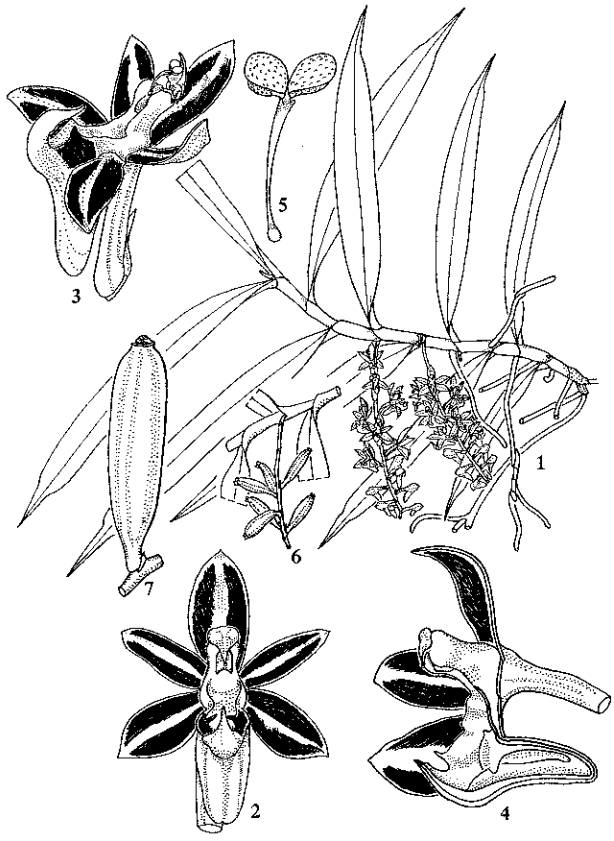

Figure 268. *Cleisostoma rostratum* (Lodd. ex Lindl.) Garay
1. flowering plant; *2.* front view of flower; *3.* lateral view of flower; *4.* lateral view of flower with half of odd sepal, 1 lateral sepal, 1 petal, and half of lip removed; *5.* four pollinia in 2 pairs on elongated stipe; *6.* fruiting branch; *7.* capsule with persistent column. (drawn by Teresa F. Wong)

Locality: Fo Tan Valley, Tai Mo Shan, Nam Chung, Yi O. *K. Y. Chan 1373* (CUHK); *Y. S. Lau 1765; Y. W. Lam 944.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan; Thailand, Laos, Vietnam.

Ecology: Trunks and rocks in forests. Flowering: Jul.–Aug.

51. Geodorum Jacks. 地寶蘭屬

Terrestrial perennial orchids. Rhizomes tuberous, ovoid or compressed spherical, with concentric rings. New shoots emerging from the base of the pseudobulb. Leaves 3 or 4, oblong-linear, plicate-venose, deciduous. Scape emerging from a one-year-old rhizome simultaneously with the leafy shoot, the apex bending at anthesis, becoming erect afterward. Flowers rather small, crowded in a nutant raceme; sepals and petals subequal, free, ovate, spreading; lip undivided, attached to the foot of the column, concave, the base ventricose-subsaccate, not spurred, with a thick papillose curved callus above the sac, disk keeled; column short, broad, subterete, with a short foot fused with the lip; clinandrium broadly ovate, apiculate; rostellum truncate, fleshy; anther subglobose, incumbent, with 2 basal flaps; pollinia 2, waxy, globose and profoundly saccate on the back, attached to a slender hyaline stipe with a small viscidium; stigma obovate-suborbicular; ovary oblong. Capsules oblong-ellipsoidal, nutant, strongly rostrate.

About ten species distributed in tropical Asia, Pacific islands and Australia; five species in China; one species in Hong Kong.

1. Geodorum densiflorum (Lam.) Schltr. 地寶蘭 **(Fig. 269; Photo 664)**

Fedde Repert. Sp. Nor. Beih. 4: 259. 1919; S. Y. Hu, Genera Orchid. Hong Kong 96, fig. 54. 1977; FRPS 18: 187, pl. 31: 4–5. 1999; FTW ed. 2, 5: 896, pl. 381. 2000; FGD 7: 390, fig. 197. 2006; FOC 25: 259. 2009.

Limodorum densiflorum Lam., Encycl. 3: 516. 1789.

Geodorum semicristatum Lindl., Fol. Orch. Geodorum 2. 1854; FKH 265. 1912.

Geodorum dilatatum auct. non (Roxb.) Aiton: FKH 265. 1912.

Terrestrial herb; roots cord-like, 3–4 mm in diam.; pseudobulbs subglobose and dorso-ventrally compressed-globose. Leaves 2–4, all basal; petioles sheathing, the sheaths closed; leaf blades plicate-venose, chartaceous, delicate green, elliptic or lanceolate, 20–30 × 4.5–7.5 cm, slightly wavy along the lower margin, base cuneate, apex acute or acuminate. Flowers white, or light purplish pink, crowded, non-resupinate; sepals uniform in colour and similar in size and shape; the odd one oblong-elliptic, 10 × 3 mm, apex obtuse and mucronate; lateral sepals widespread, 18 mm between apices, oblong-elliptic, 12 × 3 mm; petals oblong, 10 mm between apices, 11–12 × 5 mm,

apex obtuse; lip trowel-shaped, base saccate, adnate to the broad column foot, delicately fleshy, white within, margin slightly wavy or crisped, apex rounded or notched, disk papillose, yellow or orange along the upper middle portion, rugosely keeled; column white, short and very broad, 4 mm broad, 3 mm wide, extending to a broad triangular foot white or maculated maroon; anther semispherical; pollinia 2, waxy, globes in front and strongly sulcate at the back; ovary shiny green, glabrous, striate and sulcate.

Locality: Wong Nai Chung, Aberdeen, Sai Kung. *H. C. Tang 1026; Y. W. Lam 35; HK sheet 34724.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Guizhou, Taiwan; Philippines, tropical Asia.

Ecology: Forests, streamsides and grassy slopes. Flowering: Jun.–Jul.

52. Cymbidium Sw. 蘭屬

Perennial caespitose herbs, terrestrial or epiphytic. Roots wire-like. Rhizomes short and thick, covered by cataphylls and enlarged into conical pseudobulbs. Leaves 3–5, persistent, petiolate, linear or lanceolate. Scape emerging from the axil of a cataphyll or rarely of a leaf, with imbricate basal scales and cauline sheaths. Flowers moderately large, in a loose raceme; sepals equal, free, spreading; petals similar to or slightly smaller than the sepals, spreading or proximate and over the column; lip attached to the base of the column, 3-lobed, the base fleshy, concave, lateral lobes erect, partially covering the column, midlobe strongly recurved, disk 2-keeled and deeply canaliculate, rarely tubercular; column long, curved, without foot; clinandrium oblique-truncate; anther terminal, incumbent, convex or subglobose; pollinia 2, folded, waxy, in several species separated into 4 readily, on a broad stipe widened to a viscid base; stigma suborbicular; ovary cylindrical, striate-sulcate. Capsules fusiform or oblong-ellipsoidal, strongly rostrate.

About 48 species distributed in tropical and subtropical Asia and extends southwards to Papua New Guinea and Australia; 29 speeies in China; five species in Hong Kong. For it is a very favourite genus for Chinese orchidophiles, many cultivars were cultivated in private gardens of Hong Kong.

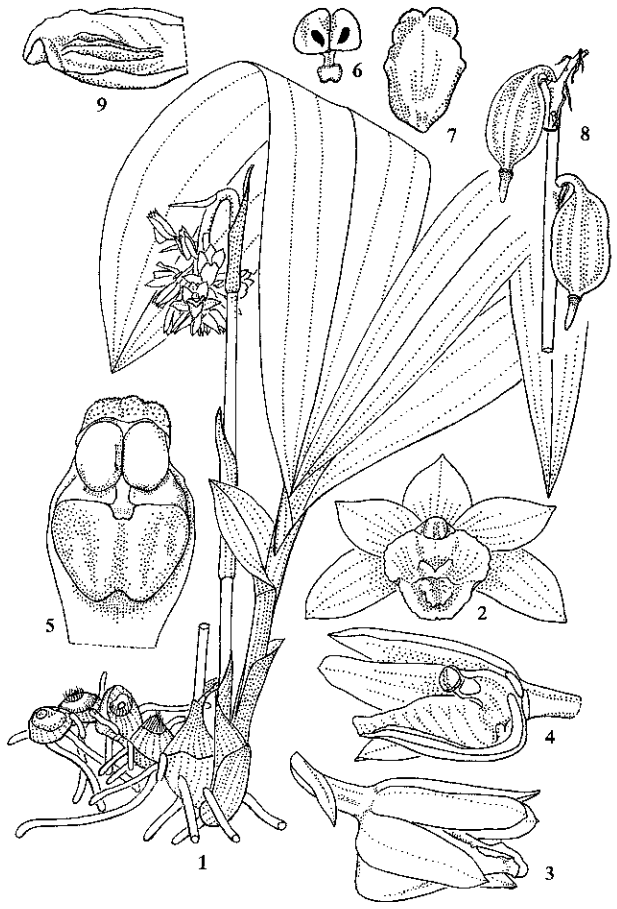

Figure 269. *Geodorum densiflorum* (Lam.) Schltr.
1. scape and vegetative shoot; *2.* front view of flower; *3.* lateral view of flower; *4.* lateral view of flower with half of dorsal sepal, 1 lateral sepal, 1 petal, and half of lip removed; *5.* apical portion of column with anther cap pushed back slightly; *6.* back view of 2 cleft pollinia on stipe; *7.* abaxial view of lip; *8.* fruiting branch; *9.* lateral view of undivided lip with keeled disc. (drawn by Teresa F. Wong)

1a. Leaves lanceolate; cataphylls many, imbricate.
- 2a. Petals spreading; short-day flowers, appearing in December and January; capsules parallel to the rachis.....1. *C. maclehoseae*
- 2b. Petals proximate, forming a roof over the column; long-day flowers, appearing in April to June; capsules reclining at an angle of 45° to the rachis .....2. *C. lancifolium*

1b. Leaves linear; cataphylls few, almost parallel.
- 3a. Scapes 1 m or more high; leaves 3 cm or more wide; short-day flowers, appearing in January to February, faintly fragrant .....3. *C. sinense*
- 3b. Scapes 20–60 cm long; leaves 8–17 mm wide; long-day flowers, appearing in June to December, strongly fragrant.
  - 4a. Flora bracts at middle part of inflorescence shorter than 1/2 length of ovary; sepal 23–28 × 5–8 mm .....4. *C. ensifolium*
  - 4b. Flora bracts at middle part of inflorescence almost as long as ovary; sepal 30–50 × 3.5–5 mm .....5. *C. kanran*

1. Cymbidium maclehoseae S. Y. Hu 冬月蘭

Chung Chi Journal 11: 15, fig. 2. 1972; FRPS 18: 225. 1999; FGD 7: 384, fig. 194. 2006; FOC 25: 278. 2009, pro syn. sub *C. lancifolium.*

Large terrestrial herb; pseudobulbs elongate-ellipsoidal, 8–10 cm long, 1.5–1.7 cm in diam. Leaves petiolate, petioles equitant, lower portion sheathing, upper part subcylindrical-canaliculate; leaf blades elliptic, 13–21 × 3.5–5.5 cm, base cuneate, apex acute, midrib impressed above and elevated beneath. Inflorescences racemose, lateral to the pseudobulb; flowers greenish cream-white; sepals lanceolate, 2.5 × 0.4 cm, basal one-third recurved; petals lanceolate, 2.2 × 0.45 cm, slightly oblique and falcate at base, basal one-fourth faintly purple-lined on the inside; lip irregularly purple maculate; lateral lobes erect, narrow, fleshy; midlobe tongue-like, recurved and rolling backward, trough deeply grooved along the median longitudinal line, fleshy; column slightly arcuate, cream-white, maculate purple on the flat front surface; anther subglobose; pollinia 4 in 2 pairs.

Locality: New Territories. *S. Y. Hu 9369* (A).

Distribution: Known only from Hong Kong.

Ecology: Forests. Flowering: Dec. (fide Hu, 1972)

Uses: Ornamental.

Notes: The holotype specimen (*S. Y. Hu 9369*, A) was collected by S. Y. Hu from New Territories in 1969. The species has been synonymised under *Cymbidium lancifolium* Hook. *s.l.* by some authors (e.g. FOC 25: 278. 2009).

2. Cymbidium lancifolium Hook. 兔耳蘭 **(Photos 665–666)**

Exot. Bot. 1: t. 51. 1823; FRPS 18: 225, pl. 36: 3. 1999; FTW ed. 2, 5: 829. 2000; FGD 7: 384, fig. 194. 2006; FOC 25: 278. 2009.

Terrestrial herb; pseudobulbs ellipsoidal, slightly compressed, 4–5 cm long, 10 cm across one way, 6 cm across the other. Leaves petiolate, 2–4 terminal to pseudobulbs; petioles slender, folded, faintly articulate; leaf blades dark green, elliptic, 10–19 × 3.5–4.5 cm, base gradually attenuate to the folded petiole, apex shortly acuminate or acute, midrib impressed above and elevated beneath, lateral veins obscure above, evident beneath. Inflorescences racemose, light green; flowers pale green, creamy white, with red and purple blotches and streaks; sepals uniformly pale green with a satin sheen, linear-lanceolate, 3.5 × 0.5 cm, slightly recurved; petals oblique-lanceolate, 2.5 × 0.7 cm, inner margin slightly overlapping, creamy white with a conspicuous purplish red longitudinal median line within; lip fleshy, delicately creamy white; lateral lobes erect, brilliant purplish red suffused with creamy white on inner sides; midlobe oblong-ovate, apex obtuse and strongly recurved, irregularly and sparsely marked with red patches; column arching, creamy white, inconspicuously diffused pink at the back, with red lines and streaks at the front; anther subglobose, yellowish, papillose; pollinia 4 in 2 pairs.

Locality: Tai Mo Shan. *HK sheet 34239, 35993.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Xizang, Sichuan, Hunan, Zhejiang, Fujian, Taiwan; Japan, India, Indonesia.

Ecology: Forests. Flowering: Apr.–Jun.

Uses: Ornamental.

3. Cymbidium sinense (Jacks. ex Andrews) Willd. 墨蘭(報歲蘭) **(Photos 667–668)**

Sp. Pl. ed. 4. 111. 1805; FHN 4: 246. 1977; FRPS 18: 215. 1999; FTW ed. 2, 5: 831. 2000; FGD 7: 386. 2006; FOC 25: 274. 2009.

Terrestrial herb; pseudobulbs ovoid, 3 cm long, 2 cm in diam. Leaves narrow-linear, shorter than the scape. Flowers 5 cm in diam., in racemes above the foliage, on greenish-brown rachis; sepals and petals lanceolate, pale-yellow, faintly red-lined, red toward base; lip red, narrowly yellow along the margin, yellow patched with white-centre at base, without distinct lateral lobes; column short, white.

Locality: Tai Mo Shan, Sunset Peak. *S. Y. Hu 9492, 11504* (CUHK); *HK sheet 34337.*

Distribution: Hainan, Guangdong, Guangxi, Yunnan, Guizhou, Hunan, Jiangxi, Anhui, Fujian, Taiwan; India, Burma, Myanmar, Laos, Vietnam, Cambodia, Thailand, Japan (Ryukyu).

Ecology: Forests. Flowering: Jan.–Feb.

Uses: Ornamental.

4. Cymbidium ensifolium (L.) Sw. 建蘭 **(Fig. 270; Photo 669)**

Nov. Acta Soc. Sci. Upsal. 6: 77. 1799; FHK 357. 1861; FKH 265. 1912; S. Y. Hu, Genera Orchid. Hong Kong 98, fig. 55. 1977; [illegible]J 6: 616. 1995; FRPS 18: 213. 1999; FTW ed. 2, 5: 823. 2000; FGD 7: 395, fig. 195. 2006; FOC 25: 274. 2009.

Epidendrum ensifolium L., Sp. Pl. 2: 954. 1753.

Cymbidium xiphiifolium Lindl., Bot. Reg. 7: t. 529. 1821; S. Y. Hu, Genera Orchid. Hong Kong 96. 1977.

Terrestrial herb; pseudobulbs very small, ovoid, subterranean. Leaves grass-like, tufted, linear, 50–70 cm. Flowers fragrant, 3–5 cm across, racemose, on scapes as long as leaves; sepals spreading, white tinged green, occasionally lined red near base; petals white, shorter and wider than sepals, forming a roof over the column; lip pale yellow or white with irregular red blotches, the midlobe papillose, recurved. Column short, hidden by the petals.

Locality: Hong Kong Island, Tai Mo Shan, Ma On Shan, Fo Tan Valley, High Island Reservoir, Tung Chung. *K. K. Mark 13(2404)* (CUHK); *S. Y. Hu 8212* (CUHK); *Y. W. Lam 126.*

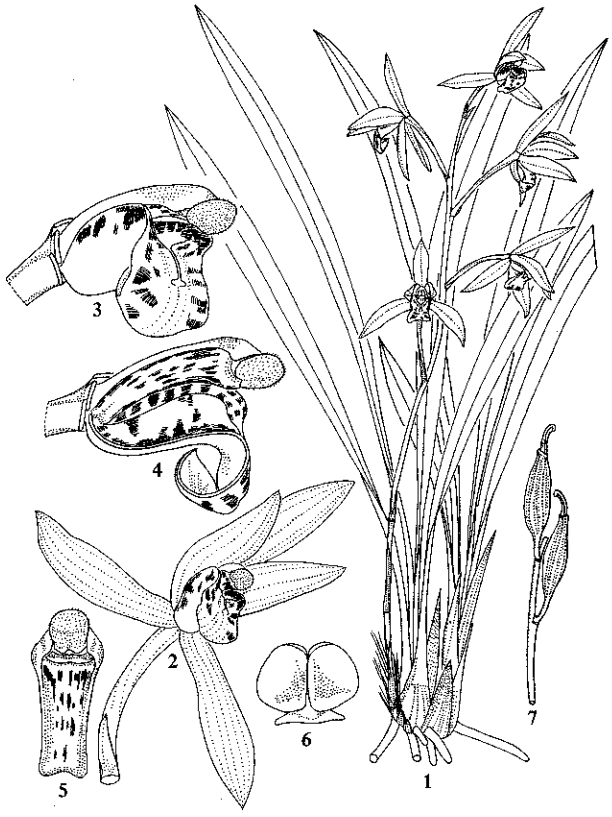

Figure 270. *Cymbidium ensifolium* (L.) Sw.

1. flowering plant; *2.* front view of flower; *3.* front view of flower with all sepals and petals removed; *4.* front view of flower with half of lip removed; *5.* front view of column; *6.* two pairs of compressed pollinia on stipe attached to broad viscidium; *7.* fruiting branch. (drawn by Teresa F. Wong)

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Sichuan, Hunan, Jiangxi, Anhui, Zhejiang, Fujian; widely distributed in SE and S Asia.

Ecology: Forests. Flowering: Jun.–Dec.

Uses: Ornamental.

5. Cymbidium kanran Makino 寒蘭 **(Photo 670)**

Bot. Mag. (Tokyo) 16: 10. 1902; FRPS 18: 217. 1999; FTW ed. 2, 5: 828. 2000; FGD 7: 386. 2006; FOC 25: 275. 2009.

Terrestrial herb; pseudobulbs narrowly ovoid, ± compressed. Leaves usually 4–5 on pseudobulb, linear, 40–70 × 0.9–1.7 cm, dark green, thinly leathery. Scape arising from base of pseudobulb, 25–60–(80) cm. Racemes 10- or more-flowered; bracts linear-lanceolate, 2.5–3 × 0.3–0.4 cm; pedicel and ovary 20–25(–30) mm. Flowers fragrant, 3–5 cm across, variable in colour; sepals and petals pale yellowish green with purplish red striations; lip yellowish, mottled purplish red; petals narrowly ovate or ovate-lanceolate, 20–30 × 5–10 mm; lip obovate obscurely 3-lobed. Column whitish, 10–17 mm, with reddish spots on ventral side.

Locality: Ma On Shan. *Y. W. Lam 1189.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, SE Xizang, Sichuan, Hunan, Jiangxi, Anhui, Zhejiang, Fujian, Taiwan; Japan, Korea.

Ecology: Forests, streamsides. Flowering: Aug.–Dec.

Uses: Ornamental.

53. Eulophia R. Br. ex Lindl., *nom. cons.* 美冠蘭屬

Terrestrial or saprophytic herbs. Rhizomes lumpy, large, with concentric rings. Scapes aphyllous, appearing before the leaves, 50–150 cm tall, with many scales. Flowers large or medium-sized, in terminal loose racemes; sepals equal, spreading, the odd one free, the lateral ones attached to the side of the column foot; petals shorter and broader or narrower than the sepals, spreading; lip 3-lobed, attached to the column, slightly contracted at the base and produced into a spur, lateral lobes erect, midlobe broad, almost entire, disk cristate or lamellate; column rather long, with a foot; clinandrium strongly oblique; rostellum subtruncate; anther terminal, incumbent, semi-globose, produced into an obtuse-conical or bilobed appendage; pollinia 2 pairs, waxy, on a short stipe with viscidium at the base; stigma suborbicular or transversely broad; ovary cylindrical. Capsules oblong, pendulous, ridged.

About 200 species distributed in Africa, tropical and subtropical Asia, America and Australia, but mainly in Africa; 14 species in China; three species in Hong Kong.

1a. Saprophytic plants consisting of large subterranean rhizome with concentric black rings and stout flowering scapes; flowers brown-yellow ..... 1. *E. zollingeri*

1b. Normal leafy plants; flowers bright yellow or green.

2a. Flowers yellow; rhizomes subterranean; leaves elliptic, (25–)45–50 × (4.5–)10 cm ..... 2. *E. flava*

2b. Flowers green; rhizomes partially exposed; leaves linear, 4–12(–35) × (0.7–)1–1.5 cm ..... 3. *E. graminea*

1. Eulophia zollingeri (Rchb. f.) J. J. Sm. 無葉美冠蘭 **(Photo 671)**

Fl. Buitenz. 6: 228. 1905; FFJ 6: 600, fig. 521. 1995; FRPS 18: 185. 1999; FTW ed. 2, 5: 878, pl. 373. 2000; FOC 25: 254. 2009.

Cyrtopera zollingeri Rchb. f., Bonplandia 5: 38. 1857.

Eulophia yushuiana S. Y. Hu, Chung Chi Journal 11: 19, fig. 3(d–h). 1972.

Terrestrial herb appearing as scapes bearing brownish yellow-red flowers; roots many, fleshy, brittle; rhizomes irregularly cylindrical, ginger-like, those of the flowering plants 6–13 cm long, 2.3 cm in diam. Scape 30–50 cm long, 4–8 mm in diam., with 3–5 brownish-green cataphylls at the base, the internodes 6–7 cm, olive-green, the flowering axis 10–20 cm, with 15–30 flowers well spaced; pedicels 7 mm. Flowers brownish red-green, the odd sepal ovate-oblong, 20 × 8 mm, base truncate, apex acuminate; lateral sepals spreading, oblique ovate-elliptic, 25 × 8–9 mm; petals obovate, shiny brownish red, 1.7 cm; lip shortly spurred, saccate at the base, 3-lobed, 2-ridged at the throat, purplish beige outside, purplish red and sparsely hairy inside, the front lobe ovate, slightly recurved, 7 × 5 mm, hairy, margin purplish red, centre yellow; column 10 mm, light green; anther yellow-red and trimmed with maroon at the basal end; pollinia 2; rostellum fleshy; ovary beige-brown, 13 mm long, 2.5 mm in diam., striate-sulcate.

Locality: Clear Water Bay, New Territories. *S. Y. Hu 10274* (CUHK); *L. T. Lo 406, 453.*

Distribution: Yunnan, Guangxi, Guangdong, Jiangxi, Taiwan; India, Sri Lanka, Malaysia, Indonesia, Ryukyu.

Ecology: Margins of swamps. Flowering: May–Jun.

Notes: The type specimen of *Eulophia yushuiana* (*S. Y. Hu 10274*, A, holotype; CUHK, isotype) was collected from Clear Water Bay on 29 May 1970.

2. Eulophia flava (Lindl.) Hook. f. 黃花美冠蘭 **(Photo 672)**

Fl. Brit. Ind. 6: 7. 1890; FKH 265. 1912; FRPS 18: 177. 1999; FGD 7: 389. 2006; FOC 25: 256. 2009.

Cyrtopera flava Lindl., Gen. Sp. Orch. Pl. 189. 1833; FHK 357. 1861.

Terrestrial herb; roots wire-like, 4–5 mm in diam.; rhizomes tuber-like, white, irregularly ovoid, 6–8 cm long, 3–5 cm in diam., with distinct oblique, black concentric joints. Leaves 2–4, pedicellate, the pedicels sheathing, 25 cm or longer, covered by cataphylls

12–30 cm; leaf blades plicate, oblong-elliptic, (25–)45–50 × (4.5–)10 cm. Inflorescence a raceme; flowers bright canary-yellow and creamy yellow; dorsal sepal elliptic, 3 × 1 cm, apex acuminate, with 7 longitudinal veins slightly elevated above; lateral sepals wide-spreading, subfalcate-oblong, with 1 median longitudinal ridge, 2.5–3 × 0.8–1 cm, base oblique, truncate, apex acuminate and slightly keeled; petals situated below the dorsal sepal, broad-elliptic, 2.6 × 1.5 cm, with the inner edge overlapping above the column; lip 3-lobed, subconical, saccate at base; lateral lobes creamy yellow, slightly reflexed; front lobe yellow, rounded, margin wavy and curved upwards; column arching, white or very light yellow, tinged greenish at apex, apex enlarged, apiculate at the back; anther conical, honey-yellow; pollinia 2, orange, roundish and compressed; ovary smooth, shallowly grooved.

Locality: Tai Tam, Cape D'Aguilar, Lantau Island, Lamma Island. *S. Y. Hu 10164* (CUHK); *Y. S. Lau 2637; HK sheet 33096.*

Distribution: Hainan, Guangxi; Nepal, India, Myanmar, Vietnam, Thailand.

Ecology: Crevices of rocks along streams, open grassy slopes. Flowering: Mar.–Oct.

Uses: Ornamental.

3. Eulophia graminea Lindl. 美冠蘭 **(Fig. 271; Photo 673)**

Gen. Sp. Orch. Pl. 182. 1833; FRPS 18: 182, pl. 32: 4–5. 1999; FTW ed. 2, 5: 874. 2000; FGD 7: 388, fig. 196. 2006; FOC 25: 255. 2009.

Eulophia sinensis Miq., J. Bot. Neerl. 1: 91. 1861; FKH 265. 1912; S. Y. Hu, Genera Orchid. Hong Kong 72, fig. 36. 1977.

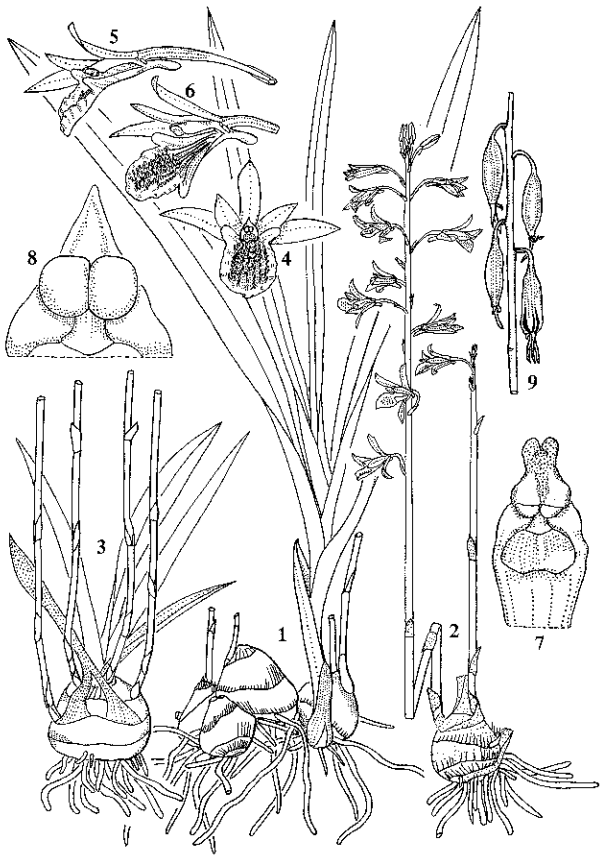

Figure 271. *Eulophia graminea* Lindl.

1. vegetative growth; *2.* flowering plant which has no leaves during anthesis; *3.* large pseudobulb after anthesis; *4.* front view of flower with anther cap removed; *5.* lateral view of flower with 1 sepal and 1 petal removed; *6.* lateral view of flower with 1 sepal and 1 petal removed and lip spread out; *7.* apical portion of column; *8.* apical portion of column with anther cap removed; *9.* fruiting branch. (drawn by Teresa F. Wong)

Terrestrial herb; roots many, 2 mm in diam.; at anthesis rhizomes partially exposed, globular-conical, green at the basal half, covered by fibrous, stiff, dead leaf scales. Leaves 7–8 developed at post-anthesis, equitant, bluish green, 4–12(–35) × (0.7–)1–1.5 cm, deeply furrowed along the midrib, apex acuminate and acute. Flowers 9–20, rather small; sepals similar in colour and size, the dorsal one oblong, 12 × 2 mm, apex acute, slightly recurved; lateral sepals widespread, olive-green with a satin-like sheen, faintly tinged with purplish red stripes; petals oblong, slightly shorter than the sepals, 8–9 × 2 mm, apex acute, recurved with a rather broad, faint purplish red mid-longitudinal vein and 2 narrower ones; lip distinctly spurred and trilobed, midlobe obovate, margins crisped, apex acute, white, lateral lobes running upward and forward, greenish outside with 4–5 palmate, oblique, purplish red ridges inside; column 3.5 mm, smooth, green tinged pink, apex produced into a sharp point and enlarged into a scalloped crest; anther yellow, with 2 rounded, apical, ear-like papillose lobes; pollinia 2, subglobose; ovary 4–5 mm, glossy greenish maroon.

Locality: Ho Chung, Sha Tin, Lam Tsuen, Pillar Point. *K. Y. Chan 1472* (CUHK); *S. Y. Hu 13781A* (CUHK); *K. L. Yip 4064; HK sheet 40320.*

Distribution: Hainan, Guangdong, Guangxi, Guizhou, Yunnan, Anhui, Taiwan; tropical Asia.

Ecology: Thin forests, grassy slopes, open fields. Flowering: Apr.–Aug.

Uses: Ornamental.

Notes: Recent studies of reproductive biology and genetics show that this species is a self-compatible but pollinator-dependent outcrossing colonizer (Sun, Am. J. Bot. 84: 224–232. 1997; Sun & Wong, Am. J. Bot. 88: 2180–2188. 2001).

LIST OF CONTRIBUTORS (VOLUME 4) *(in alphabetical order)*

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HU Qi-ming 胡啟明[1]	:	Acoraceae, Commelinaceae, Eriocaulaceae, Lemnaceae, Liliaceae, Pontederiaceae, Strelitziaceae, Typhaceae, Xyridaceae
HU Shiu-ying 胡秀英[2]	:	Orchidaceae
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Richard M. K. SAUNDERS[6]	:	Burmanniaceae, Philydraceae
WANG Fa-guo 王發國[1]	:	Dioscoreaceae
WU De-lin 吳德鄰[1]	:	Alismataceae, Aponogetonaceae, Bromeliaceae, Cannaceae, Costaceae, Juncaceae, Marantaceae, Musaceae, Pandanaceae, Potamogetonaceae, Ruppiaceae, Triuridaceae, Zingiberaceae, Zosteraceae
XIA Nian-he 夏念和[1]	:	Agavaceae, Aloeaceae, Iridaceae, Poaceae, Smilacaceae, Stemonaceae, Taccaceae
XING Fu-wu 邢福武[1]	:	Dioscoreaceae
YIP Kwok-leung 葉國樑[3]	:	Hydrocharitaceae, Limnocharitaceae, Najadaceae
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