

## 42. HABENARIA Willdenow, Sp. Pl. 4: 5, 44. 1805.

玉凤花属 *yu feng hua shu*

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*Fimbrorchis* Szlachetko; *Habenaria* sect. *Kryptostoma* Summerhayes; *Habenorkis* Thouars; *Kryptostoma* (Summerhayes) Geerinck; *Medusorchis* Szlachetko; *Ochyrorchis* Szlachetko; *Senghasiella* Szlachetko; *Smithanthe* Szlachetko & Margońska.

Herbs, terrestrial. Tubers subglobose, ellipsoid, or oblong, fleshy, unlobed, neck with several slender roots. Stem erect, base often with tubular sheaths, above sheaths with leaves and sometimes several bractlike leaves above. Leaves 1 to several, loosely arranged or tufted, base contracted into amplexicaul sheaths. Inflorescence racemose, terminal, few to many flowered. Flowers resupinate. Sepals free; dorsal sepal connivent with petals forming a hood; lateral sepals spreading and reflexed. Petals simple or bilobed; lip often 3-lobed, base often spurred, sometimes saccate or spurless. Column short, both sides often with auricles (staminodes); anther erect, with distinct connective and 2 divergent locules, base of each often protruding and grooved; pollinia 2, granular-farinaceous, sectile, usually each by a long caudicle attached to a viscidium; viscidium naked, relatively small; stigmas 2, separate, convex or elongate, ± clavate, at base of column; rostellum usually stout and large, with arms parallel to basal grooves of anther, ± embracing caudicles.

About 600 species: worldwide, mainly in tropical and subtropical areas; 54 species (19 endemic) in China.

The recent fragmentation of *Habenaria* by Szlachetko and his co-workers (Szlachetko & Olszewski, Fl. Cameroun 34: 231. 1998; Olszewski & Szlachetko, Ann. Bot. Fenn. 37: 299. 2000; Szlachetko, Orchidee (Hamburg) 55: 489. 2004; Szlachetko, Richardiana 4: 55. 2004; Szlachetko & Margońska, Orchidee (Hamburg) 55: 174. 2004) has not been widely taken up. Although Szlachetko et al. retain many species in *Habenaria*, they also recognize the genera *Fimbrorchis*, *Kryptostoma*, *Medusorchis*, *Ochyrorchis*, *Senghasiella*, and *Smithanthe* as represented in China and have placed some Chinese *Habenaria* species in these genera. *Habenaria* is almost certainly polyphyletic and some reorganization of it is undoubtedly necessary. We await the results of molecular studies that are currently underway before adopting a different generic classification from that proposed here.

- 1a. Leaves basal, appressed to substrate, often 2, rarely 1 or more than 2, often cordate, orbicular, or ovate.
  - 2a. Petals simple.
    - 3a. Flowers white; sepals ciliate or not.
      - 4a. Leaves 3 or 4(–6), in a rosette; lip with a conic appendage at base; spur longer than pedicel and ovary ..... 1. *H. delavayi*
      - 4b. Leaves 2, subopposite; lip lacking an appendage; spur shorter than pedicel and ovary ..... 2. *H. siamensis*
    - 3b. Flowers green or greenish white; sepals not ciliate.
      - 5a. Spur 8–13 mm, ca. as long as or longer than ovary; leaves 2–3 × as long as wide ..... 5. *H. humidicola*
      - 5b. Spur indistinct or 1–7 mm, shorter than ovary; leaves slightly longer than wide.
        - 6a. Stem and ovary pubescent ..... 3. *H. diplonema*
        - 6b. Stem and ovary glabrous.
          - 7a. Leaves 2, subopposite; spur ca. 7 mm ..... 6. *H. diphylla*
          - 7b. Leaves 1 or 2, not as above; spur less than 2 mm.
            - 8a. Inflorescence 10–20-flowered; spur ca. 1.5 mm ..... 4. *H. acianthoides*
            - 8b. Inflorescence 4- or 5-flowered; spur indistinct or absent ..... 7. *H. reniformis*
  - 2b. Petals bilobed, anterior lobe sometimes small and obscure.
    - 9a. Leaves with yellowish white markings adaxially.
      - 10a. Leaves thinly textured; sepals ciliate; petals deeply 2-lobed, lower lobe linear, 9(–13) mm ..... 8. *H. fargesii*
      - 10b. Leaves relatively thickly textured; sepals not ciliate; petals shallowly 2-lobed, lower lobe ca. 0.5 mm ..... 9. *H. wolongensis*
    - 9b. Leaves lacking yellowish white markings adaxially.
      - 11a. Dorsal sepal 3–6(–7) mm; petals not ciliate.
        - 12a. Spur 6–9 mm, shorter than pedicel and ovary ..... 10. *H. aitchisonii*
        - 12b. Spur 11–13 mm, longer than pedicel and ovary ..... 11. *H. balfouriana*
      - 11b. Dorsal sepal 7–13 mm; petals ciliate.
        - 13a. Leaves glaucous adaxially; base of peduncle densely pubescent; dorsal sepal 10–13 mm; spur nearly as long as pedicel and ovary ..... 12. *H. glaucifolia*
        - 13b. Leaves green adaxially; base of peduncle sparsely pubescent or glabrous; dorsal sepal 7–9 mm; spur longer than pedicel and ovary.
          - 14a. Leaves with 5–7 white veins adaxially; lip lacking an appendage in mouth of spur ..... 13. *H. tibetica*
          - 14b. Leaves with 5–7 green veins adaxially; lip with a conic appendage in mouth of spur ..... 14. *H. szechuanica*

- 1b. Leaves cauline, well spaced or tufted, never appressed to substrate, various in shape but never cordate nor orbicular.
- 15a. Petals bilobed.
- 16a. Petals shallowly bilobed; lip  $\pm$  cross-shaped.
- 17a. Flowers small; petals ca. 4 mm; lateral lobes of lip obovate-oblongate, spreading at a right angle to mid-lobe; spur 1.4–1.5 cm, ca. as long as pedicel and ovary ..... 15. *H. schindleri*
- 17b. Flowers rather large, petals 5–5.5 mm; lateral lobes of lip linear, spreading at an acute angle to mid-lobe; spur 2.5–3.5 cm, longer than pedicel and ovary ..... 16. *H. linearifolia*
- 16b. Petals deeply bilobed; lip not cross-shaped.
- 18a. Petals usually with 6 or 7 filiform laciniae; lip with many filiform laciniae ..... 17. *H. polytricha*
- 18b. Petals and lip lacking filiform laciniae.
- 19a. Sepals long acuminate or caudate-aristate at apex.
- 20a. Petals with anterior (lower) lobe ca. 2.5 mm, shorter than posterior (upper) lobe ..... 18. *H. stenopetala*
- 20b. Petals with anterior (lower) lobe 18–25 mm, longer than posterior (upper) lobe ..... 19. *H. pantlingiana*
- 19b. Sepals neither long acuminate nor caudate-aristate at apex.
- 21a. Petals and lip not ciliate on margins of lobes; petal lobes of unequal size, with posterior lobe shorter and wider than anterior lobe ..... 20. *H. coulthousii*
- 21b. Petals and/or lip ciliate, or lip pubescent along apical margins of lobes; petal lobes of equal size.
- 22a. Petals and lip with ciliate lobes; spur not lobed ..... 21. *H. petelotii*
- 22b. Petals lacking ciliate lobes; spur deeply bilobed at apex ..... 22. *H. hosokawae*
- 15b. Petals simple.
- 23a. Lateral lobes of lip with many long laciniae along outside margins.
- 24a. Petals linear, ca. 0.5 mm wide; spur thickened and geniculate-curved near middle ..... 23. *H. medioflexa*
- 24b. Petals not linear, 3–8 mm wide; spur not as above.
- 25a. Petals falcate, subovate, ca. 8 mm wide.
- 26a. Sepals not ciliate; connective ca. 8 mm wide; staminodes spatulate, ca. 2 mm; spur shorter than ovary ..... 28. *H. yuana*
- 26b. Sepals ciliate; connective 2–4 mm wide; staminodes elliptic, ca. 1 mm; spur ca. as long as or longer than ovary.
- 27a. Inflorescence 1–4-flowered; spur 7–8.5 cm, much longer than ovary; connective ca. 2 mm wide ..... 29. *H. intermedia*
- 27b. Inflorescence 5- or more flowered; spur 3.5–4 cm, ca. as long as or slightly longer than ovary; connective 3–4 mm wide ..... 30. *H. arietina*
- 25b. Petals oblong or lanceolate, 4–5 mm wide.
- 28a. Spur 4.5–6.5 cm, much longer than pedicel and ovary ..... 26. *H. davidii*
- 28b. Spur 1.7–3.5 cm, shorter than or nearly as long as pedicel and ovary.
- 29a. Connective 10–12 mm wide ..... 24. *H. limprichtii*
- 29b. Connective 2–5 mm wide.
- 30a. Petals  $\pm$  hairy adaxially; spur 17–18 mm; connective ca. 2 mm wide ..... 25. *H. pectinata*
- 30b. Petals glabrous adaxially; spur 20–35 mm; connective ca. 5 mm wide ..... 27. *H. mairei*
- 23b. Lateral lobes of lip sometimes serrate but lacking long laciniae along outside margins.
- 31a. Lateral sepals strongly oblique.
- 32a. Lip with a ring-shaped or cupular structure, or sometimes a lamella near entrance of spur.
- 33a. Lateral lobes of lip much shorter than mid-lobe.
- 34a. Spur 10–17 mm, shorter than pedicel and ovary; petals oblong, 3–4 mm ..... 36. *H. acuífera*
- 34b. Spur 20–29 mm, longer than pedicel and ovary; petals narrowly ovate or narrowly elliptic, 4–5 mm ..... 37. *H. linguella*
- 33b. Lateral lobes of lip nearly as long as mid-lobe.
- 35a. Flowers white, with a brown vein on lateral sepals; spur 20–22 mm, slightly longer than pedicel and ovary ..... 38. *H. rostellifera*
- 35b. Flowers red-orange, with pale green sepals, without a brown vein on lateral sepals; spur 11–12 mm, shorter than pedicel and ovary ..... 39. *H. rostrata*
- 32b. Lip lacking a ring-shaped, cupular structure or lamella near entrance of spur.
- 36a. Dorsal sepal much smaller than lateral sepals.
- 37a. Lateral sepals obliquely axe-shaped, ca. 7  $\times$  13 mm; petals ca. 4 mm

- wide; spur 5–8 cm, pendulous, longer than pedicel and ovary; ovary glabrous ..... 31. *H. commelinifolia*
- 37b. Lateral sepals obliquely triangular, ca. 5 × 8 mm; petals ca. 1 mm wide; spur 2–2.2 cm, ca. as long as or shorter than pedicel and ovary; ovary pubescent ..... 32. *H. austrosinensis*
- 36b. Dorsal sepal not or slightly smaller than lateral sepals.
- 38a. Dorsal sepal with 3 serrulate keels on abaxial surface ..... 33. *H. ciliolaris*
- 38b. Dorsal sepal without keels on abaxial surface.
- 39a. Rachis villous on ridges; petals triangular-lanceolate, ca. 6 mm; lip with a conic callus at base; spur 1.6–2 cm, ca. as long as pedicel and ovary ..... 34. *H. hystrix*
- 39b. Rachis glabrous; petals linear-lanceolate, 13–15 mm; lip without callus at base; spur 3–6 cm, much longer than pedicel and ovary ..... 35. *H. fordii*
- 31b. Lateral sepals not or slightly oblique.
- 40a. Flowers orange to red; lip mid-lobe bilobed ..... 40. *H. rhodocheila*
- 40b. Flowers not orange to red; lip or its mid-lobe simple.
- 41a. Lip often unlobed; spur often absent ..... 41. *H. malintana*
- 41b. Lip deeply 3-lobed; spur present.
- 42a. Lateral lobes of lip broad, subrhombic or suborbicular, apical margin serrate.
- 43a. Plants 9–25 cm tall; leaves cordate or ovate; spur 17–20 mm, slightly shorter or nearly as long as pedicel and ovary ..... 42. *H. finetiana*
- 43b. Plants 35–87 cm tall; leaves oblong to narrowly elliptic; spur to 4 cm, longer than pedicel and ovary ..... 43. *H. dentata*
- 42b. Lateral lobes of lip narrow, not as above, margins never serrate.
- 44a. Mid-lobe of lip suberect or curved upward, apex adnate to tip of hood formed by dorsal sepal and petals.
- 45a. Floral bracts shorter than pedicel and ovary; lateral sepals reflexed; spur cylindrical, to 21 mm, much longer than pedicel and ovary ..... 44. *H. lucida*
- 45b. Floral bracts longer than flower; lateral sepals spreading, not reflexed; spur clavate, 3–6 mm, shorter than pedicel and ovary ..... 45. *H. shweliensis*
- 44b. Mid-lobe of lip never suberect or curved upward, apex never adnate to hood formed by dorsal sepal and petals.
- 46a. Leaves tufted at base of stem; spur longer than ovary.
- 47a. Leaves narrowly elliptic or broadly oblanceolate, 18–20 mm wide; flowers pale green ..... 46. *H. iyoensis*
- 47b. Leaves linear or linear-lanceolate, 4–15 mm wide; flowers yellowish green or white.
- 48a. Leaves 4 or 5, 4–6 mm wide; dorsal sepal ca. 2 mm; spur narrowly cylindrical ..... 47. *H. viridiflora*
- 48b. Leaves 6–13, 8–15 mm wide; dorsal sepal ca. 5 mm; spur narrowly cylindrical-clavate.
- 49a. Dorsal sepal broadly ovate; lateral sepals narrowly ovate; petals ovate-ligulate; lip with lateral lobes narrower than mid-lobe ..... 48. *H. plurifoliata*
- 49b. Dorsal sepal elliptic; lateral sepals elliptic; petals linear; lip with lateral lobes and mid-lobe equal in width ..... 49. *H. tonkinensis*
- 46b. Leaves not tufted at base of stem; spur longer or shorter than ovary.
- 50a. Dorsal sepal 7–8 mm.
- 51a. Spur narrowly cylindrical, 3–5 mm, shorter than pedicel and ovary; dorsal sepal narrowly ovate, ca. 4 mm wide; petals ca. 2.5 mm wide; flowers yellow .... 50. *H. fulva*
- 51b. Spur clavate, 8–13 mm, ca. as long as pedicel and ovary; dorsal sepal cordate or broadly ovate, 5–6 mm wide; petals obliquely ovate-triangular, 3–3.8 mm wide; flowers yellowish green ..... 51. *H. marginata*
- 50b. Dorsal sepal 3–4 mm.

- 52a. Floral bracts longer than ovary; flowers pale yellowish green ..... 52. *H. leptoloba*
- 52b. Floral bracts shorter or nearly as long as ovary; flowers pinkish white or pale green.
- 53a. Floral bracts much shorter than pedicel and ovary; flowers pinkish white; lateral sepals 2-veined; petals obliquely oblong-ovate; spur ca. 21 mm ..... 53. *H. nematocera*
- 53b. Floral bracts nearly as long as pedicel and ovary; flowers pale green; lateral sepals 3-veined; petals lanceolate; spur ca. 17 mm ..... 54. *H. furcifera*

**1. *Habenaria delavayi*** Finet, Rev. Gén. Bot. 13: 527. 1901.

厚瓣玉凤花 *hou ban yu feng hua*

*Habenaria yunnanensis* Rolfe.

Plants 9–35 cm tall. Tubers oblong or ovoid, 1–2 × 1–1.5 cm, fleshy. Stem erect, terete, 3–5 mm in diam., glabrous, base with 1 or 2 tubular sheaths, with 3 or rarely 4(–6) leaves in a dense basal rosette, and with 1–5 bractlike leaves above. Leaf blade orbicular or ovate, 1.5–5 × 1.5–4 cm, slightly fleshy, base obtuse-rounded, abruptly narrowed and amplexicaul, apex obtuse or acute. Raceme 6–15 cm, loosely 7–20-flowered; floral bracts lanceolate, ca. 1/2 length of ovary, apex aristate; ovary twisted, slightly arching, fusiform, glabrous, including pedicel 1.3–1.8 cm. Flowers white. Dorsal sepal erect, broadly elliptic, ca. 4 × 4 mm, concave, abaxially keeled and toward apex pubescent, 3-veined; lateral sepals reflexed, lanceolate, 4–5 × ca. 2.5 mm, 3-veined, apex acute, abaxially and along margin pubescent. Petals linear, ca. 6 × 0.8 mm, base twisted, 1-veined, apex acute; lip spurred, deeply 3-lobed above base; lobes narrow, equal in width, stout; lateral lobes linear-cuneate, 8–9 × 0.8–1 mm; mid-lobe linear, ± subcylindric, ca. 7 × 0.7 mm, adaxially channeled; spur pendulous, slightly curved, clavate, 1.2–1.4 cm, longer than ovary, with 1 slightly incurved, subulate appendage at front margin of mouth; pollinia obovoid; caudicles nearly oblong, slender; viscidium ovate; stigmas clavate, apex papillate. Fl. Jun–Aug.

- Forests, grassy places in forests, shrubby grasslands; 1500–3000 m. Guizhou, W Sichuan, NW to SE Yunnan.

**2. *Habenaria siamensis*** Schlechter, Repert. Spec. Nov. Regni Veg. 2: 82. 1906.

中泰玉凤花 *zhong tai yu feng hua*

Plants 14–16 cm tall. Tubers oblong, 2–3 cm × 8–10 mm, fleshy. Stem erect, terete, 2–3 mm in diam., glabrous, often with 2 spreading basal leaves, with 3–5 bractlike leaves above. Leaf blade ovate or ovate-oblong, 4–4.5 × 2.5–3.5 cm, base amplexicaul-sheathing, apex acute or acuminate. Raceme several to more than 10-flowered, erect or arching, 4–6 cm; floral bracts lanceolate, ca. 13 mm, shorter than ovary, margin finely ciliate, apex acuminate; ovary twisted, slightly arching, cylindric, including pedicel to 15 mm, glabrous. Flowers white. Sepals 3-veined, margin finely ciliate; dorsal sepal forming a hood with petals, erect, ovate, concave, ca. 8 × 4 mm; lateral sepals reflexed, obliquely ovate-lanceolate, ca. 9 × 4 mm. Petals obliquely falcate-lanceolate, ca. 8 × 2.5 mm, 2-veined; lip

spurred at base, deeply 3-lobed above base; lateral lobes linear-filiform, ± curved, 17–21 × ca. 0.5 mm, attenuate toward apex; mid-lobe straight, linear, 6–9 × 0.8–1.5 mm; spur pendulous, cylindric-clavate, 9–10 mm, conspicuously shorter than ovary, dilated from middle to end, near end ca. 2.2 mm in diam., apex obtuse; connective narrow, ca. 1 mm wide; rostellum short; stigmas oblong-clavate, ca. 4 mm. Fl. Aug.

- Grassy slopes; ca. 600 m. SE Guizhou [Thailand].

**3. *Habenaria diplonema*** Schlechter, Notes Roy. Bot. Gard. Edinburgh 5: 100. 1912.

小巧玉凤花 *xiao qiao yu feng hua*

Plants 8–13 cm tall. Tubers oblong, ca. 1 cm × 5 mm, fleshy. Stem erect or ascending, slender, pubescent, with 2 nearly opposite leaves near middle. Leaf blade orbicular, 1.5–2 × 1.4–1.7 cm, adaxially with yellowish white venation, densely finely papillate, base narrowed and amplexicaul-sheathing, margin white ciliate, apex acute. Raceme 4–14-flowered; rachis pubescent; floral bracts lanceolate, much shorter than ovary, apex acuminate; ovary twisted, terete, pubescent, including pedicel ca. 7 mm. Flowers green, small. Dorsal sepal erect, broadly ovate, ca. 3.5 × 3 mm, glabrous, 1-veined, apex obtuse-rounded; lateral sepals reflexed, obliquely ovate-elliptic, ca. 4 × 2.5 mm, glabrous, 1-veined, apex subobtuse. Petals erect, obliquely falcate-ovate, ca. 3.5 × 2.3 mm, glabrous, 1-veined, unlobed; lip spurred at base, above base 3-lobed; lateral lobes filiform, 6–7 mm, much longer than mid-lobe; mid-lobe linear-ligulate, ca. 2 mm, apex subacute; spur pendulous, clavate, ca. 4 mm. Fl. Aug.

- Forests, soil-covered rocks; 2800–4200 m. N Fujian, SW Sichuan, NW Yunnan.

**4. *Habenaria acianthoides*** Schlechter, Acta Horti Gothob. 1: 138. 1924.

小花玉凤花 *xiao hua yu feng hua*

Plants 18–20 cm tall. Tubers ovoid, ca. 1.5 cm, fleshy. Stem erect or ascending, slender, glabrous, with 1 leaf at base and 2 or 3 bractlike leaves above. Leaf blade green or purplish red, ovate-orbicular, 1.5–3 × 2.2–2.8 cm, slightly fleshy, base subcordate, apex mucronate. Raceme with 10–20 secund flowers, 8–12 cm; floral bracts ovate-lanceolate, much shorter than ovary, apex acuminate; ovary twisted, fusiform, including pedicel ca. 4.5 mm, glabrous. Flowers green, very small. Dorsal sepal forming a hood with petals, erect, ovate, ca. 1.5 × 1.2 mm, 1-veined, apex obtuse; lateral sepals reflexed, obliquely ovate,

ca. 1.75 × 1 mm, 1-veined, apex obtuse. Petals obliquely ovate, ca. 1.5 × 1.5 mm, 1-veined; lip spurred at base, 3-veined, deeply 3-lobed below middle; lateral lobes divaricate, ± curved, filiform, ca. 3.5 mm; mid-lobe straight, linear, ca. 2 mm; spur pendulous, oblong-cylindric, ca. 1.5 mm, apex obtuse. Fl. Jul.

- Forests, thickets; 900–1900 m. S Gansu, E Qinghai, W Sichuan.

**5. *Habenaria humidicola*** Rolfe, Bull. Misc. Inform. Kew 1896: 202. 1896.

湿地玉凤花 shi di yu feng hua

Plants 15–20 cm tall. Tubers cylindric, 1–4 cm × 5–15 mm, fleshy. Stem erect, terete, glabrous, with 3 or 4 rosette leaves at base and with a few bractlike leaves above. Leaf blade lanceolate-oblong, 4–6 × 1–1.5 cm, base amplexicaul, apex subacute or acuminate. Raceme laxly few to many flowered, 5–20 cm; floral bracts ovate-lanceolate, 5–14 mm, shorter to longer than ovary, apex acuminate; ovary twisted, cylindric-fusiform, including pedicel 8–10 mm, glabrous. Flowers green, small. Dorsal sepal forming a hood with petals, erect, ovate-oblong, concave, 3.2–4 × 2–2.8 mm, 3-veined, apex obtuse; lateral sepals reflexed, obliquely ovate-oblong, 3.5–4.5 × 1.8–2 mm, 3-veined, apex obtuse. Petals straight, linear-oblong, 3.2–4 × ca. 1 mm, 1-veined, apex obtuse; lip 5–9 mm, spurred at base, deeply 3-lobed above base; lateral lobes linear-lanceolate, attenuate and filiform above middle, 4.5–9 mm; mid-lobe linear, 3.2–6 mm, apex obtuse; spur pendulous, cylindric, 8–15 mm, ca. as long as or longer than ovary, slender, apical half slightly dilated; stigmas oblong-clavate, ca. 1.5 mm. Fl. Sep.

Forests, damp places on shaded rocks; 600–1500 m. SW Guizhou, S Yunnan, E Zhejiang [Myanmar].

**6. *Habenaria diphylla*** Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 262. 1850.

二叶玉凤花 er ye yu feng hua

*Habenaria humistrata* Rolfe ex Downie; *Liparis diphyllus* Nimmo.

Plants 7–25 cm tall. Tubers ovoid or ellipsoid, 0.5–1.5 cm, fleshy. Stem erect or ascending, terete, glabrous, with 2 nearly opposite leaves at base and 2–5 bractlike leaves above. Leaf blade cordate or nearly reniform, 1.2–3.5 × 1–5 cm, base contracted into amplexicaul sheath, apex acute. Raceme loosely 1- to several flowered; rachis glabrous; floral bracts ovate-lanceolate, 4–7 mm, shorter than ovary, apex acuminate; ovary twisted, terete, including pedicel 10–11 mm, glabrous. Flowers greenish white, small. Dorsal sepal forming a hood with petals, erect, ovate, concave, ca. 5 × 4 mm, 1-veined, apex obtuse-rounded; lateral sepals reflexed, oblong, ca. 6 × 3 mm, 3-veined, apex acute. Petals straight, linear-lanceolate, ca. 5 × 1 mm, 1-veined, apex acute; lip 13–15 mm, from base deeply 3-lobed, lobes filiform; lateral lobes longer than mid-lobe, 13–15 mm, often curled upward toward apex; spur pendulous, subclavate, 5.5–9 mm, shorter than ovary, apex subacute; stigmas narrowly clavate. Fl. Jun.  $2n = 42, 42 + 2B, 108$ .

Damp places and on rocks in forests along valleys; 1000–1400 m. S Yunnan [N India, Thailand].

**7. *Habenaria reniformis*** (D. Don) J. D. Hooker, Fl. Brit. India

6: 152. 1890.

肾叶玉凤花 shen ye yu feng hua

*Listera reniformis* D. Don, Prodr. Fl. Nepal. 28. 1825; *Aopla reniformis* Lindley; *Herminium reniforme* (D. Don) Lindley; *Neottia reniformis* (D. Don) Sprengel.

Plants 18–20 cm tall. Tubers globose, ca. 1 cm in diam., fleshy. Stem rather slender, with 1 or 2 leaves at base and 3 or 4 bractlike leaves above. Leaf blade almost spreading horizontally, orbicular, ovate-cordate, or broadly ovate-orbicular, 1.8–2.5 × 1.5–2.7 cm, fleshy, base often cordate, amplexicaul, apex obtuse. Raceme sparsely 4- or 5-flowered, 7–8 cm, glabrous; floral bracts lanceolate, small, 6–8 mm, much shorter than ovary; ovary twisted, cylindric-fusiform, including pedicel 13–16 mm, glabrous. Flowers green, small. Dorsal sepal erect, concave, narrowly ovate-oblong, ca. 5 × 1.7 mm, 3-veined, apex obtuse; lateral sepals spreading or reflexed, obliquely ovate-lanceolate, ca. 6 × 1.5 mm, 3-veined, apex acuminate. Petals oblique, narrowly lanceolate, falcate, ca. 4.5 × 1 mm, 1-veined, apex subobtuse; lip linear, slightly longer than or ca. as long as sepals, usually with 1 tooth on either side below middle; spur often absent; stigmas subcylindric or clavate, ca. 1.5 mm. Fl. Oct.

Grassy places in forests. Guangdong, S Hainan [Cambodia, India, Nepal, Thailand, Vietnam].

**8. *Habenaria fargesii*** Finet, Rev. Gén. Bot. 13: 528. 1901.

雅致玉凤花 ya zhi yu feng hua

Plants 13–24 cm tall. Tubers ovoid or oblong, 1.5–3 × 1–1.5 cm, fleshy. Stem erect or ascending, terete, slender, 1–2 mm in diam., finely papillate-pubescent, with 2 nearly opposite leaves at base, and 1–3 bractlike leaflets above leaves. Leaf blade spreading horizontally, adaxially with yellowish white markings, ovate-orbicular or orbicular, 4–4.5 × 4–5 cm, slightly fleshy, base abruptly narrowed and amplexicaul, apex acute. Raceme 4–9-flowered, 5–15 cm; rachis finely papillate-pubescent; floral bracts lanceolate, much shorter than ovary, apex acuminate; ovary twisted, cylindric, including pedicel 7–8 mm, papillate-pubescent. Flowers yellowish green. Dorsal sepal ovate, concave, 3–3.5 × ca. 2.5 mm, 3-veined, ciliate, apex acute; lateral sepals strongly reflexed, obliquely ovate, 5–5.5 × ca. 4 mm, 4-veined, ciliate, apex acute. Petals connivent with dorsal sepal, deeply 2-lobed; upper lobe falcate-oblong, ca. 4 mm; lower lobe linear, ca. 8 mm; lip spurred at base, deeply 3-lobed above base; lateral lobes divaricate, filiform, ca. 1.5 cm, apex curled; mid-lobe linear, much shorter than lateral lobes; spur pendulous, cylindric, clavate below middle, longer than ovary; connective broad; pollinia obcuneate; caudicles curved, linear, slender; viscidia subglobose; rostellum with slender lateral lobes. Fl. Aug.

• Forests, along valleys; 1400–3000 m. N Chongqing, SE Gansu, Sichuan.

**9. *Habenaria wolongensis*** K. Y. Lang, Acta Phytotax. Sin. 22: 314. 1984.

卧龙玉凤花 wo long yu feng hua

Plants 21–30 cm tall. Tubers oblong, 1.5–2.5 × 1–1.5 cm, fleshy. Stem erect, pubescent, with 2 nearly opposite leaves at base, and sometimes 1–6 bractlike leaflets above leaves. Leaf blade spreading horizontally, adaxially with yellowish white markings, cordate or ovate, 4–8.5 × 3.5–9 cm, slightly fleshy, base abruptly narrowed and amplexicaul, apex acute. Raceme many flowered, 7–10 cm; rachis pubescent; floral bracts lanceolate, shorter than ovary, ciliate, apex acuminate; ovary twisted, cylindrical-fusiform, including pedicel 8–10 mm. Flowers yellowish green. Dorsal sepal erect, broadly ovate, concave, ca. 5 × 3.5 mm, 3-veined, apex obtuse; lateral sepals reflexed, obliquely ovate, ca. 6 × 3 mm, 3-veined, apex obtuse. Petals basally 2-lobed; upper lobe falcate-lanceolate, ca. 6 mm; lower lobe a tooth at base of upper lobe, ca. 0.5 mm; lip spurred at base, near base deeply 3-lobed, lobes linear, ca. 6.5 mm; lateral lobes lanceolate-filiform, slightly narrower than linear mid-lobe; spur pendulous, subclavate, ca. as long as ovary, apex obtuse; pollinia ovoid; viscidia elliptic; stigmas clavate. Fl. Aug.

- Forests; ca. 2200 m. W Sichuan.

**10. *Habenaria aitchisonii*** H. G. Reichenbach, Trans. Linn. Soc. London, Bot. 3: 113. 1886.

落地金钱 *luo di jin qian*

*Habenaria bihamata* Kraenzlin; *H. diceras* Schlechter; *H. diceras* var. *pubicaulis* (Schlechter) Soó; *H. pubicaulis* Schlechter.

Plants 12–33 cm tall. Tubers oblong or ellipsoid, 1–2.5 × 0.8–1.5 cm, fleshy. Stem erect, terete, papillate-pubescent, with 2 nearly opposite leaves at base. Leaf blade spreading horizontally, ovate or ovate-orbicular, 2–5 × 1.5–4 cm, adaxially sometimes with 5 yellowish white veins, base narrowed and amplexicaul, apex acute. Raceme several to many flowered, 5–15 cm; rachis papillate; floral bracts ovate-lanceolate, ca. as long as or shorter than ovary, apex acuminate; ovary twisted, terete, including pedicel 7–10 mm, papillate-hairy. Flowers yellowish green or green, small. Dorsal sepal forming a hood with petals, erect, ovate, concave, 3–5 × 2.5–3.5 mm, 3-veined, apex obtuse or acute; lateral sepals reflexed, obliquely ovate-oblong, 3.5–5.5 × 2–3 mm, 3-veined, apex obtuse or acute. Petals indistinctly 2-lobed; upper lobe obliquely falcate-lanceolate, 3–5 × 1.5–2 mm; lower lobe a tooth at base of upper lobe; lip longer than sepals, above base deeply 3-lobed; lateral lobes retrorse, almost embracing erect sepals, subulate, 6–12 mm, apex slightly hooked; mid-lobe reflexed, straight, linear, 5–9 × 1–1.2 mm; spur pendulous, cylindrical-clavate, 6–9 mm, shorter than ovary; connective relatively narrow; stigmas subclavate. Fl. Jul–Sep.  $2n = 42$ .

Forests, thickets, grasslands; 2100–4300 m. Guizhou, S Qinghai, W Sichuan, S and SE Xizang, C and NW Yunnan [Afghanistan, Bhutan, India, Kashmir].

**11. *Habenaria balfouriana*** Schlechter, Repert. Spec. Nov. Regni Veg. 20: 381. 1924.

滇蜀玉凤花 *dian shu yu feng hua*

Plants 15–20 cm tall. Tubers oblong, 1–1.5 × 0.7–1 cm, fleshy. Stem erect, terete, 2–2.5 mm in diam., densely papillate-

hairy, with 2 nearly opposite leaves at base. Leaf blade spreading horizontally, sometimes slightly tinged with yellowish white, ovate or broadly elliptic, 3–4 × ca. 3 cm, slightly fleshy, with 5 main veins, base obtuse-rounded, apex acuminate or acute. Raceme 3–7-flowered, erect, ca. 7 cm; rachis papillate; floral bracts lanceolate, apex acuminate; ovary twisted, fusiform, including pedicel 11–12 mm, finely papillate-hairy. Flowers yellowish green. Dorsal sepal forming a hood with petals, erect, ovate, concave, 5–6 × 3.5–4 mm, 3-veined, margin ciliate-denticulate, apex obtuse; lateral sepals reflexed, obliquely ovate-oblong, 6–7 × 3.5–4 mm, 3-veined, apex subacute. Petals 2-lobed; upper lobe obliquely ovate-lanceolate, 5–6 × 2–2.2 mm; lower lobe a tooth at base of upper lobe; lip longer than sepals, deeply 3-lobed above base; lateral lobes retrorse, almost embracing ovary, subulate, 1–1.2 cm; mid-lobe linear, ca. 1 cm; spur pendulous, slightly curved, cylindrical-clavate, ca. 1.3 cm, longer than ovary, apex subobtuse; connective relatively narrow; stigmas suboblong. Fl. Jul–Aug.

- Forests or shrubby grasslands; 2200–3600 m. SW Sichuan, NW Yunnan.

**12. *Habenaria glaucifolia*** Bureau & Franchet, J. Bot. (Morot) 5: 152. 1891.

粉叶玉凤花 *fen ye yu feng hua*

*Habenaria alexandrae* Schlechter; *H. gnomifera* Schlechter; *Senghasiella glaucifolia* (Bureau & Franchet) Szlachetko.

Plants 15–50 cm tall. Tubers oblong or ovoid, 1.5–3 × 1–1.5 cm, fleshy. Stem erect, terete, 3–5 mm in diam., pubescent, with 2 nearly opposite leaves at base. Leaf blade spreading horizontally, abaxially slightly tinged with grayish white, adaxially purplish green, suborbicular or ovate-orbicular, 3.5–4.6 × 3–4.7 cm, rather stout, base obtuse-rounded and amplexicaul, apex acute or subacuminate. Raceme 5–20 cm, 3–10-flowered; peduncle densely pubescent at base; rachis pubescent; floral bracts lanceolate or ovate, shorter than ovary, apex acuminate; ovary twisted, terete, including pedicel 2.5–3 cm, pubescent. Flowers white or whitish green. Dorsal sepal forming a hood with petals, erect, ovate or oblong, concave, 10–13 × 6–7 mm, 5-veined, apex obtuse; lateral sepals reflexed, obliquely ovate or oblong, 11–14 × 7–7.5 mm, 5-veined, apex acute. Petals deeply 2-lobed; upper lobe spatulate-oblong, ca. 12 × 6 mm, margin ciliate, apex obtuse; lower lobe much smaller, linear-lanceolate, 3–5 × 1–1.5 mm, apex acute or subobtuse; lip reflexed, much longer than sepals, base with a short claw, above base deeply 3-lobed; lateral lobes divaricate, linear-lanceolate, ca. 2.5 cm, circinate toward apex; mid-lobe straight, linear, ca. 1.2 cm, slightly wider than lateral lobes; spur pendulous, cylindrical-subclavate, 2.5–3 cm, nearly as long as ovary, apex slightly obtuse; connective extremely wide; stigmas lanceolate. Fl. Jul–Aug.

- Forests, thickets, grasslands; 2000–4300 m. S Gansu, Guizhou, S Shaanxi, W Sichuan, SE Xizang, NW to SE Yunnan.

**13. *Habenaria tibetica*** Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 12: 338. 1922.

西藏玉凤花 *xi zang yu feng hua*

Plants 18–35 cm tall. Tubers subglobose, oblong, or ellipsoid, 2–3 × 2–2.5 cm, fleshy. Stem erect, terete, papillate-hairy, with 2 nearly opposite leaves at base. Leaf blade spreading horizontally, ovate or orbicular, 3–6.5 × 2.5–7 cm, adaxially with 5–7 white veins, base obtuse-rounded, abruptly narrowed and amplexicaul, apex acute to obtuse. Raceme 4–10 cm, loosely 3–8-flowered; rachis papillate-hairy; floral bracts lanceolate or linear-lanceolate, apex acuminate; ovary twisted, narrowly fusiform, including pedicel 1.5–2 cm, finely papillate-hairy. Flowers yellowish green to whitish. Dorsal sepal forming a hood with petals, erect, ovate, concave, 7–9 × 4.5–5 mm, 3(–5)-veined, apex subobtuse; lateral sepals reflexed, obliquely ovate, 9–11 × 4–5 mm, 3(–5)-veined, apex subacute. Petals shallowly 2-lobed; upper lobe oblique, oblong-lanceolate to ovate-lanceolate, 8–10 × 3–3.5 mm, 2-veined, margin papillate-ciliate, apex subacute; lower lobe a tooth at base of upper lobe, 1.5–2 mm; lip longer than sepals, near base deeply 3-lobed, lobes reflexed; lateral lobes divergent, linear-filiform, 25–40 mm, apically often curled; mid-lobe straight, linear, 10–19 mm, apex obtuse; spur often spreading horizontally, cylindrical-clavate, 2–2.5 cm, much longer than ovary, apex obtuse; connective rather wide; stigmas ligulate. Fl. Jul–Aug.

• Forests, thickets, grasslands; 2300–4300 m. S Gansu, NE Qinghai, W Sichuan, SE Xizang, NW Yunnan.

**14. *Habenaria szechuanica*** Schlechter, Acta Horti Gothob. 1: 140. 1924.

四川玉凤花 *si chuan yu feng hua*

Plants 20–30 cm tall. Tubers subglobose or ellipsoid, 1–2 × 1–1.5 cm. Stem erect or ascending, terete, 3–5 mm in diam., finely papillate-hairy, with 2 nearly opposite leaves at base. Leaf blade spreading horizontally, broadly ovate or orbicular, 3–4.5 × 3–5 cm, slightly fleshy, with 5(–7) green veins, base obtuse-rounded, abruptly narrowed and amplexicaul, apex shortly acuminate or acute. Raceme erect, with 3–7 often secund flowers, 4–12 cm; rachis finely papillate-hairy; floral bracts linear or lanceolate, apex acuminate; ovary twisted, arching, fusiform, including pedicel 1–1.5 cm, papillate-hairy. Flowers yellowish green. Dorsal sepal forming a hood with petals, erect, ovate, concave, 7–8 × ca. 3.5 mm, 3-veined, apex obtuse; lateral sepals reflexed, obliquely ovate, 8–9 × 3.5–4 mm, 3-veined, apex subobtuse. Petals shallowly 2-lobed; upper lobe obliquely oblong-lanceolate, 8–9 × 2–2.5 mm, 2-veined, margin papillate-ciliate, apex obtuse; lower lobe a tooth at base of upper lobe, 1.5–2 mm; lip reflexed, longer than sepals, spurred at base, adaxially with an appendage 5–7 mm, above base deeply 3-lobed; lateral lobes linear-filiform, 2.5–2.8(–4) cm, apex often curled; mid-lobe linear, 1.3–1.9 cm; spur cylindrical-clavate, 2–2.5 cm, longer than ovary, apex obtuse; connective rather wide; stigmas narrowly clavate. Fl. Jul–Aug.

• Forests of *Pinus yunnanensis* or *Picea*; 2900–3200 m. S Shaanxi (Taibai Shan), NW Sichuan, NW Yunnan.

**15. *Habenaria schindleri*** Schlechter, Repert. Spec. Nov. Regni Veg. 16: 354. 1920.

十字兰 *shi zi lan*

*Fimbrorchis linearifolia* (Maximowicz) Szlachetko subsp. *schindleri* (Schlechter) Szlachetko; *Habenaria sagittifera* H. G. Reichenbach f. *lacerata* Matsuda.

Plants 25–70 cm tall. Tubers oblong or ovoid, 5–15 mm in diam., fleshy. Stem erect, terete, with 4–7 leaves below middle. Leaf blade linear, 5–23 × 0.3–0.9 cm, base amplexicaul-sheathing, apex acuminate. Raceme 5.5–18 cm, 6–25-flowered; rachis glabrous; floral bracts linear-lanceolate to ovate-lanceolate, basal ones 15–20 mm, longer than ovary, glabrous; ovary twisted, slightly arching, terete, including pedicel 1.4–1.5 cm. Flowers white, glabrous. Dorsal sepal forming a hood with petals, erect, ovate-orbicular, concave, 4.5–5 × 4–4.5 mm, 5-veined, apex obtuse; lateral sepals strongly reflexed, obliquely oblong-ovate, 6–7 × 4–5 mm, 4(or 5)-veined, apex subacute. Petals 2-lobed; upper lobe ovate-triangular, ca. 4 × 2 mm, 2-veined; lower lobe triangular-lanceolate, 1.5–1.8 mm, apex shallowly bilobed; lip spreading, (11–)13–15 mm, below middle deeply 3-lobed and ± cross-shaped; lobes 7–9 mm; lateral lobes spreading at right angles to mid-lobe, obovate-oblancoate, 1–1.5 mm wide, apex fimbriate; mid-lobe linear, ca. 0.8 mm wide, toward apex contracted; spur pendulous, 1.4–1.5 cm, nearly as long as ovary, abruptly dilated near apex; stigmas oblong. Fl. Jul–Oct.  $2n = 28$ .

Forests or grasslands along valleys; 200–1700 m. Anhui, Fujian, Guangdong, Hebei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Zhejiang [Japan, Korea].

**16. *Habenaria linearifolia*** Maximowicz, Mém. Acad. Imp. Sci. St. Pétersbourg Divers Savans 9 [Prim. Fl. Amur.]: 269. 1859.

线叶十字兰 *xian ye shi zi lan*

*Fimbrorchis linearifolia* (Maximowicz) Szlachetko.

Plants 25–80 cm tall. Tubers ovoid or globose, fleshy. Stem erect, terete, with 5–7 leaves below middle. Leaf blade linear, 9–20 × 3–7 cm, base amplexicaul-sheathing, apex acuminate. Raceme 8–20-flowered, 5–16 cm; rachis glabrous; floral bracts lanceolate to ovate-lanceolate, basal ones ca. 1.5 cm, shorter than ovary, apex long acuminate; ovary twisted, slightly arching, cylindrical, including pedicel 1.8–2 cm, glabrous. Flowers white or greenish white, glabrous. Dorsal sepal forming a hood with petals, erect, ovate or broadly ovate, concave, 5.5–6 × 3.5–4 mm, 5-veined; lateral sepals reflexed, obliquely ovate, 6–7 × 4–5 mm, 4- or 5-veined, apex subacute. Petals 2-lobed; upper lobe 5–5.5 × 3.5–4 mm; lower lobe a short tooth, apex shallowly 2-lobed; lip spreading, ca. 15 mm, deeply 3-lobed near middle and ± cross-shaped; lobes linear, 8–9 × 0.5–0.6 mm; lateral lobes spreading at acute angles to mid-lobe, apex fimbriate; mid-lobe entire; spur pendulous, 2.5–3.5 cm, longer than ovary, slightly thickened toward end, apex obtuse; stigmas oblong. Fl. Jul–Sep.  $2n = 28$ .

Forests or grasslands along valleys; 200–1500 m. Anhui, N Fujian, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shandong, Zhejiang [Japan, Korea, Russia (Far East)].

**17. *Habenaria polytricha*** Rolfe, Hooker's Icon. Pl. 25: ad t. 2496. 1896.

丝裂玉凤花 *si lie yu feng hua*

*Medusororchis polytricha* (Rolfe) Szlachetko.

Plants 40–80 cm tall. Tubers oblong, 3–5 × 1–2.5 cm, fleshy. Stem erect, terete, stout, with 7 or 8(–10) leaves near middle and 3 to many bractlike leaflets above leaves. Leaf blade narrowly elliptic to oblong-lanceolate, 4–20 × 2–6 cm, base contracted into amplexicaul sheath, apex acuminate. Raceme 6–15(–40)-flowered, 15–30 cm; floral bracts lanceolate, 10–12 mm, apex long acuminate; ovary twisted, terete, including pedicel 14–15 mm, glabrous. Flowers greenish white; sepals green. Dorsal sepal elliptic-lanceolate, concave, 8–9 × 3–4 mm, 3-veined, apex aristate; lateral sepals reflexed, obliquely ovate, 9–12 × 5–6 mm, 3-veined, apex aristate. Petals pale green or white, deeply 2-lobed; upper lobe 2-lobed and lower lobe 3–5-lobed once again, lobules all filiform, 14–17 mm; lip pale green or white, above base 3-lobed, each lobe divided once more into more than 20 lobules; lobules filiform, 14–18 mm; spur pendulous, white, cylindrical-clavate, 12–14 mm, shorter than ovary, slightly dilated toward end, apex obtuse; stigmas oblong. Fl. Aug–Oct.

Forests; 300–1100 m. Guangxi, Jiangsu, SW Sichuan, Taiwan, Zhejiang [Japan (Ryukyu Islands), Philippines].

**18. *Habenaria stenopetala*** Lindley, Gen. Sp. Orchid. Pl. 319. 1835.

狭瓣玉凤花 *xia ban yu feng hua*

*Habenaria amanoana* Ohwi; *H. delessertiana* Kraenzlin; *H. linearipetala* Hayata; *H. rhynchocarpa* (Thwaites) J. D. Hooker; *H. sutepensis* Rolfe ex Downie; *Platanthera rhynchocarpa* Thwaites.

Plants 40–89 cm tall. Tubers oblong or narrowly ellipsoid, 2–5 × 1–2 cm, fleshy. Stem erect, terete, stout, with 5–8 leaves near middle and many bractlike leaves above. Leaf blade elliptic or oblong to oblong-lanceolate, 8–16 × 3–5.5 cm, base contracted into amplexicaul sheath, apex acute or acuminate. Raceme densely many flowered, 10–20 cm; floral bracts lanceolate or ovate-lanceolate, 1.5–2.8 × 0.4–0.6 cm, often longer than flowers, apex aristate; ovary twisted, cylindrical-fusiform, including pedicel 1.5–2.2 cm, glabrous. Flowers green or greenish white. Dorsal sepal erect, ovate-elliptic, concave, 1.4–1.6 × 0.4–0.5 cm, 3-veined, apex long acuminate or caudate-aristate; lateral sepals reflexed, obliquely ovate, 1.6–1.8 × 0.5–0.6 cm, 3-veined, apex long acuminate or caudate-aristate. Petals slightly shorter and narrower than dorsal sepal, 2-lobed; upper lobe linear, 10–13 × 1–1.8 mm, 1-veined, apex acuminate; lower lobe narrowly falcate, small, ca. 2.5 mm; lip brownish, 10–15 mm, deeply 3-lobed from base; lateral lobes linear or subulate, shorter than mid-lobe; mid-lobe linear or ligulate, wider than lateral lobes; spur pendulous, cylindrical, 15–26 mm, ca. as long as or longer than ovary, apex obtuse; stigmas oblong-clavate. Fl. Aug–Oct.  $2n = 40, 42$ .

Broad-leaved forests or forest margins; 300–1800 m. Guizhou, Taiwan, SE Xizang [India, Japan (Ryukyu Islands), Kashmir, Nepal, Philippines, Thailand, Vietnam].

**19. *Habenaria pantlingiana*** Kraenzlin, Orchid. Gen. Sp. 1:

892. 1900.

丝瓣玉凤花 *si ban yu feng hua*

*Habenaria cirrhifera* Ohwi; *H. longitentaculata* Hayata; *H. polytricha* (J. D. Hooker) Pradhan (1979), not Rolfe (1896); *H. stenopetala* Lindley var. *polytricha* J. D. Hooker.

Plants 40–70 cm tall. Tubers oblong, 3–5 × 1–2.5 cm, fleshy. Stem erect, terete, stout, with 6 or 7 leaves near middle and 2–7 bractlike leaves above. Leaf blade oblong-lanceolate or obovate-lanceolate, 13–15 × 3.5–4.5 cm, base contracted into amplexicaul sheath, apex acute or acuminate. Raceme densely many flowered, 8–20 cm; floral bracts lanceolate, 18–24 × 2.5–4 mm, ca. as long as or longer than ovary, apex long acuminate; ovary twisted, cylindrical, including pedicel 1.8–2.2 cm, glabrous. Flowers green. Dorsal sepal erect, ovate-lanceolate, concave, 1.2–1.5 × 0.4–0.6 cm, 3-veined, apex long acuminate-caudate; lateral sepals reflexed, slightly oblique, ovate-lanceolate, 1.4–1.5 × 0.4–0.6 cm, 3-veined, apex long acuminate-caudate. Petals deeply 2-lobed from base; lobes divaricate, filiform; upper lobe 1.1–1.4 cm; lower lobe 1.8–2 cm; lip deeply 3-lobed from base; lobes filiform, 1.8–2.5 cm × ca. 0.8 mm, sometimes mid-lobe shorter than lateral lobes; spur pendulous, cylindrical, 1.8–2.3 cm, ca. as long as or longer than ovary, slightly thickened toward end; pollinia oblong; viscidia orbicular, small; stigmas clavate. Fl. Aug–Oct.  $2n = 42, 42 + 2B$ .

Broad-leaved forests; 400–700 m. SW Guangxi, SE Hainan, N Taiwan [India (Sikkim), Japan (Ryukyu Islands), Nepal, Vietnam].

**20. *Habenaria coulousii*** Barretto, Orchadian 7: 10. 1981.

香港玉凤花 *xiang gang yu feng hua*

Plants 15–45 cm tall. Tubers oblong, to 3.5 × ca. 1.5 cm, fleshy. Stem erect, terete, slender, with 3 or 4 leaves near middle and 2 or 3 bractlike leaves above. Leaf blade lanceolate or ovate-lanceolate, 2.5–5.2 × 0.8–1.2 cm, base contracted into amplexicaul sheath, margin very narrow and membranous, apex acuminate. Raceme 2–9-flowered; floral bracts ovate-lanceolate, concave, ca. 2.4 cm, often longer than ovary, apex long acuminate; ovary twisted, cylindrical-fusiform, including pedicel 18–20 mm, glabrous. Flowers whitish green. Sepals abaxially green, adaxially white, 8–9 × 3.5–4.5 mm, 3-veined, apex acute; dorsal sepal concave-hooded, erect, narrowly ovate; lateral sepals reflexed, obliquely ovate, concave. Petals white, obliquely ovate, 9–11 × ca. 2 mm, deeply 2-lobed from base; upper lobe shorter and broader than lower lobe, basal half connivent with dorsal sepal, apical half spreading, knife-shaped; lower lobe filiform, apex often curved; lip pale green, 9–12 mm, deeply 3-lobed from base; lobes linear-filiform; lateral lobes ca. as long as but narrower than mid-lobe; spur pendulous, yellowish green, base narrow and whitish, 22–24 mm, longer than ovary, slender, with widest part near middle, becoming narrower toward both ends; pollinia subglobose; caudicles 3.5–4 mm; viscidia narrowly elliptic, ca. 0.5 mm; stigmas yellowish white, broadly bean-shaped. Fl. Oct.

• Forests, along valleys; ca. 300 m. Hong Kong.

**21. *Habenaria petelotii*** Gagnepain, Bull. Soc. Bot. France 78: 73. 1931.

裂瓣玉凤花 lie ban yu feng hua

*Habenaria pseudodenticulata* Handel-Mazzetti.

Plants 35–60 cm tall. Tubers oblong, 3–4 × 1–2 cm, fleshy. Stem erect, terete, stout, with 5 or 6 leaves near middle and many bractlike leaves above. Leaf blade elliptic or elliptic-lanceolate, 3–15 × 2–4 cm, base contracted into amplexicaul sheath, apex acuminate. Raceme loosely 3–12-flowered, 4–12 cm; floral bracts narrowly lanceolate, ca. 15 × 3–4 mm, apex acuminate; ovary twisted, slightly arching, cylindrical-fusiform, including pedicel 1.5–3 cm, glabrous. Flowers greenish or white. Dorsal sepal concave-hooded, ovate, 10–12 × ca. 6 mm, 3-veined, apex acuminate; lateral sepals spreading, oblong-ovate, 11–13 × ca. 6 mm, 3-veined, apex acuminate. Petals deeply 2-lobed from base; lobes divergent, linear, 1.5–2 mm wide, margin ciliate; upper lobe erect, 14–16 mm; lower lobe ca. 20 mm; lip deeply 3-lobed above base; lobes linear, nearly equal in length and width, 15–20 × 1.5–2 mm, margin ciliate; spur pendulous, slightly bent forward, cylindrical-clavate, 1.3–2.5 cm, thickened from middle to end, apex obtuse; stigmas oblong, ca. 2 mm. Fl. Jul–Sep.

Forests, along valleys; 300–1600 m. Anhui, N Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, SE Yunnan, Zhejiang [Vietnam].

**22. *Habenaria hosokawae*** Fukuyama, Bot. Mag. (Tokyo) 48: 297. 1934.

毛唇玉凤花 mao chun yu feng hua

Plants 35–40 cm tall. Stem with 5 or 6 leaves near middle and 3 or 4 bractlike leaves above. Leaf blade oblanceolate or oblong, 5–8 × ca. 2 cm, apex acute. Raceme loosely 6-flowered, ca. 5 cm; floral bracts ovate-lanceolate, 5–8 × ca. 2 mm; ovary ca. 3 cm. Flowers nodding, greenish white. Dorsal sepal concave, lanceolate or oblanceolate, ca. 13 × 3.5–4 mm, 3-veined; lateral sepals similar to dorsal sepal, but wider. Petals deeply 2-lobed, ca. 14 × 1.5 mm; lip deeply 3-lobed; mid-lobe linear, ca. 12 × 2 mm; lateral lobes longer than mid-lobe, apical margin densely pubescent; spur ca. 1.4 cm, apex dilated and deeply 2-lobed. Fl. Jul–Aug.

• 1000–1500 m. C and S Taiwan.

**23. *Habenaria medioflexa*** Turrill, Bull. Misc. Inform. Kew 1923: 118. 1923.

版纳玉凤花 ban na yu feng hua

*Habenaria trichochila* Rolfe ex Downie.

Plants 30–48 cm tall. Tubers oblong, 2.5–3 × 1.5–2 cm, fleshy. Stem erect, terete, stout, with 4 or 5 leaves and 3–7 bractlike leaves above. Leaf blade narrowly elliptic, oblong, or lanceolate, 5–15 × 1.7–5 cm, base contracted into amplexicaul sheath, apex acuminate or acute. Raceme 9–18-flowered, 9–15 cm; floral bracts lanceolate to linear-lanceolate, 2–3 cm, apex acuminate; ovary twisted, arching, cylindrical-fusiform, including pedicel 2.2–2.5 cm. Flowers with yellowish green sepals and white petals and lip. Dorsal sepal concave-hooded, ovate, ca. 6 × 4 mm, 3-veined, apex obtuse; lateral sepals spreading, obliquely ovate, ca. 7 × 5 mm, 3-veined, apex acute. Petals

forming a hood with dorsal sepal, linear, ca. 5 × 0.5 mm, 1-veined, apex acuminate; lip spurred at base, 3-lobed above base; lateral lobes ca. 1.4 cm, divided into many filiform lobules; mid-lobe linear, ca. 1 cm, unlobed; spur pendulous, yellowish green, cylindrical, to 3.5 cm, much longer than ovary, thickened and geniculate-curved near middle; stigmas globose. Fl. Sep.

Forests; 700–800 m. S Yunnan [Thailand, Vietnam].

**24. *Habenaria limprichtii*** Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 4: 50. 1919.

宽药隔玉凤花 kuan yao ge yu feng hua

*Habenaria oligoschista* Schlechter; *H. pectinata* D. Don var. *limprichtii* (Schlechter) Pradhan; *Kryptostoma limprichtii* (Schlechter) Szlachetko & Olszewski; *K. oligoschistum* (Schlechter) Szlachetko & Olszewski; *Ochyrorchis limprichtii* (Schlechter) Szlachetko; *O. oligoschista* (Schlechter) Szlachetko.

Plants turning black when dried, 18–60 cm tall. Tubers ovoid-ellipsoid or oblong, 1.5–3 × 1–1.5 cm, fleshy. Stem erect, terete, stout, with 4–7 leaves. Leaf blade ovate to oblong-lanceolate, 4–10 × 1.5–3 cm, base amplexicaul, apex acuminate or acute. Raceme loosely 3–20-flowered, 5–20 cm; floral bracts ovate-lanceolate, 3–4 × ca. 1 cm, apex acuminate, basal ones ca. as long as ovary; ovary twisted, terete, including pedicel 2–2.5 cm. Sepals green or whitish green, apical margin ciliate; dorsal sepal forming a hood with petals, erect, concave, ovate-elliptic, 18–20 × 9–10 mm, 5-veined, apex obtuse; lateral sepals reflexed, obliquely ovate, 19–21 × 9–10 mm, 5- or 6-veined, apex acute. Petals erect, white, obliquely oblong, falcate, 18–20 × 5–7 mm, 3-veined, unlobed, margin ciliate; lip white, slightly longer than sepal, spurred at base, deeply 3-lobed above base; lobes nearly equal in length, hairy; lateral lobes linear, outer margins with 8–10 filiform lobules; mid-lobe linear, ca. 15 × 1 mm, apex obtuse; spur pendulous, cylindrical, 2–3 cm, ca. as long as or shorter than ovary, apex obtuse; connective very broad, 10–12 mm wide; pollinia ovoid; caudicles linear, slender; viscidia orbicular, small, rostellum with elongate arms; stigmas clavate. Fl. Jun–Aug.

Forests, thickets, grasslands; 1900–3500 m. W Hubei, Sichuan, NW to S Yunnan [Vietnam].

**25. *Habenaria pectinata*** D. Don, Prodr. Fl. Nepal. 24. 1825.

剑叶玉凤花 jian ye yu feng hua

*Orchis pectinata* Smith, Exot. Bot. 2: 77. 1806, not Thunberg (1794); *Habenaria ensifolia* Lindley; *Kryptostoma pectinatum* (D. Don) Szlachetko & Olszewski; *Ochyrorchis ensifolia* (Lindley) Szlachetko; *O. pectinata* (D. Don) Szlachetko.

Plants turning black when dried, 55–70 cm tall. Tubers oblong, 2–3 × 1–1.5 cm, fleshy. Stem erect, terete, stout, glabrous, with several tubular sheaths and many leaves. Leaf blade oblong to linear-lanceolate, 6–15 × 1.5–2 cm, base amplexicaul, apex acuminate. Raceme 6–13-flowered, 10–20 cm; floral bracts lanceolate to linear-lanceolate, 2.5–3.2 cm, much longer than ovary, apex acuminate; ovary twisted, slightly arching, terete, including pedicel 1.8–2 cm. Sepals greenish, 5-veined,

apical margin ciliate, apex often recurved; dorsal sepal erect, concave, lanceolate, ca.  $17 \times 5$  mm, apex subacute; lateral sepals spreading, obliquely oblong, subfalcate, ca.  $19 \times 5$  mm, apex acute. Petals forming a hood with dorsal sepal, greenish or white, obliquely falcate, ca.  $17 \times 3$  mm, adaxially  $\pm$  hairy, margin ciliate, unlobed, apex acute; lip white, slightly longer than sepal, spurred at base, deeply 3-lobed; lateral lobes linear, ca. 2 cm, outer margin with 6 or 7 filiform lobules; mid-lobe linear, ca. 1.8 cm; spur pendulous, cylindric-clavate, 17–18 mm, slightly dilated toward apex; connective ca. 2 mm wide; pollinia narrowly ellipsoid; caudicles curved, slender; viscidia discoid; stigma thin clavate. Fl. Aug.  $2n = 42, 42 + 2B$ .

Forests; ca. 1800 m. S Yunnan [India, Nepal].

**26. *Habenaria davidii*** Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 10: 86. 1888 [“*davidii*”].

长距玉凤花 chang ju yu feng hua

*Habenaria chloropecten* Schlechter; *H. leucopecten* Schlechter; *H. pectinata* D. Don var. *davidii* (Franchet) Finet; *Kryptostoma davidii* (Franchet) Szlachetko & Olszewski; *Ochrorchis davidii* (Franchet) Szlachetko.

Plants turning black when dried, 65–75 cm tall. Tubers oblong,  $2-5 \times 0.8-1.5$  cm, fleshy. Stem erect, terete, stout, 4–6 mm in diam., with 5–7 leaves. Leaf blade ovate, ovate-oblong, or oblong-lanceolate,  $5-12 \times 1.5-4.5$  cm, base amplexicaul, apex acuminate. Raceme 4–15-flowered, 4–21 cm; floral bracts lanceolate, ca. 4.5 cm, apex acuminate, basal ones longer than ovary; ovary twisted, terete, including pedicel 2.5–3.5 cm. Sepals greenish or white, margin ciliate; dorsal sepal erect, oblong, concave,  $15-18 \times 6-7$  mm, 5-veined, apex obtuse; lateral sepals reflexed, obliquely ovate-lanceolate,  $17-20 \times 6-8$  mm, 5–7-veined, apex acuminate. Petals forming a hood with dorsal sepal, erect, white, obliquely lanceolate, subfalcate,  $14-17 \times 3-4$  mm, 3–5-veined, margin ciliate, unlobed, apex subacute; lip white or yellowish, 2.5–3 cm, spurred at base, deeply 3-lobed above base; lobes linear, margin ciliate; lateral lobes 2–2.5 cm, outer margin with 7–10 filiform lobules, lobules usually branching; mid-lobe nearly as long as lateral lobe, apex acute; spur pendulous, curved inward, cylindric, 4.5–6.5 cm, longer than ovary, slightly dilated toward apex; connective ca. 4 mm wide; pollinia narrowly ellipsoid, ca. 4 mm; caudicles linear, ca. 5 mm; viscidia suborbicular, small; stigmas clavate, ca. 5 mm. Fl. Jun–Aug.

• Forests, thickets, grasslands; 600–3200 m. Guizhou, Hubei, Hunan, Sichuan, E and S Xizang, C and NW Yunnan.

**27. *Habenaria mairei*** Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 4: 50. 1919.

棒距玉凤花 bang ju yu feng hua

*Ochrorchis mairei* (Schlechter) Szlachetko.

Plants turning black when dried, 18–65 cm tall. Tubers oblong or ovoid,  $1.5-2.5 \times 1-1.5$  cm, fleshy. Stem erect, terete, robust, with 2 or 3 tubular sheaths and 5 or 6 leaves. Leaf blade elliptic-ligulate or oblong-lanceolate,  $2.5-12 \times 1.5-4$  cm, base amplexicaul, apex acuminate. Raceme 4–19-flowered, 6–18 cm;

floral bracts elliptic-lanceolate, margin ciliate, apex acuminate; ovary twisted, terete, including pedicel 2–3 cm. Sepals yellowish green, margin ciliate; dorsal sepal erect, narrowly ovate, concave,  $1.3-1.5 \times 0.6-0.7$  cm, 5-veined, apex obtuse; lateral sepals spreading, slightly oblique, ovate-lanceolate,  $1.4-1.7 \times 0.5-0.6$  cm, 5-veined, apex acute. Petals forming a hood with dorsal sepal, erect, white, obliquely oblong,  $1.3-1.5 \times$  ca. 0.4 cm, 3-veined, margin ciliate, unlobed, apex obtuse; lip white or yellowish white, 20–25 mm, base spurred, deeply 3-lobed above base, lobes ciliate; lateral lobes linear, 19–22 mm, outer margin comblike, with 8–10 filiform lobules; mid-lobe linear, 18–20 mm; spur pendulous, cylindric-clavate, 20–35 mm, ca. as long as or slightly shorter than ovary, thickened toward end; connective 4–5 mm wide; pollinia narrowly ellipsoid, ca. 4 mm; caudicles linear, ca. 4 mm; viscidia ovate, small; stigmas clavate. Fl. Jul–Aug.

• Forests, shrubby grasslands; 2400–3500 m. W Sichuan, SE Xizang, N Yunnan.

**28. *Habenaria yuana*** Tang & F. T. Wang, Bull. Fan Mem. Inst. Biol. Bot. 7: 135. 1936.

川滇玉凤花 chuan dian yu feng hua

Plants turning black when dried, 40–57 cm tall. Tubers oblong, ca.  $2 \times 1$  cm, fleshy. Stem erect, terete, stout, with 5 or 6 laxly arranged leaves. Leaf blade ovate or ovate-elliptic,  $2.5-9 \times 2-4$  cm, base amplexicaul, apex acute. Raceme 7–9-flowered, 10–12 cm; floral bracts elliptic-ovate,  $2.5-3.5 \times 0.7-1.2$  cm, longer than ovary, apex acuminate; ovary twisted, cylindric-fusiform, including pedicel 2–2.5 cm. Flowers greenish, large. Dorsal sepal erect, oblong-elliptic, concave,  $2-2.1 \times 1-1.1$  cm, 5-veined, apex obtuse; lateral sepals spreading, obliquely oblong,  $2.1-2.2 \times$  ca. 0.8 cm, 5-veined, apex acute. Petals forming a hood with dorsal sepal, obliquely subovate-falcate,  $2-2.1 \times$  ca. 0.8 cm, 5- or 6-veined, margin slightly ciliate, unlobed, apex obtuse; lip ca. 2.5 cm, base spurred, deeply 3-lobed above base, lobes ciliate; lateral lobes linear, 1.8–2 cm, outer margin with more than 10 filiform lobules; mid-lobe linear, 1.5–1.7 cm; spur pendulous, cylindric-clavate, 1.4–2.5 cm, slightly dilated toward end, shorter than ovary; connective 12–15 mm wide; pollinia narrowly ellipsoid, ca. 3 mm; caudicles linear, ca. 5 mm; viscidia subglobose, small; stigmas clavate. Fl. Aug.

• Forests; 1800–2600 m. W Sichuan, S Yunnan.

**29. *Habenaria intermedia*** D. Don, Prodr. Fl. Nepal. 24. 1825.

大花玉凤花 da hua yu feng hua

*Kryptostoma intermedium* (D. Don) Olszewski & Szlachetko; *Ochrorchis intermedia* (D. Don) Szlachetko.

Plants turning black when dried, 23–30 cm tall. Tubers ellipsoid,  $1.5-3 \times 1-2$  cm, fleshy. Stem erect, terete, stout, with 3–5 laxly arranged leaves. Leaf blade ovate-lanceolate,  $3.5-8 \times 2-4$  cm, base amplexicaul, apex acute. Raceme 1–4-flowered, 6–15 cm; floral bracts ovate, 4–5 cm, nearly as long as ovary, apex acuminate; ovary twisted, terete, including pedicel 3.8–4.5 cm. Flowers white or greenish. Sepals ciliate; dorsal sepal erect, ovate-oblong, concave, ca.  $2.2 \times 1.2$  cm, 7-veined, apex acute; lateral sepals reflexed, obliquely falcate-lanceolate, ca.  $3 \times 0.6$

cm, 7-veined, apex acute. Petals forming a hood with dorsal sepal, erect, white, obliquely subovate-falcate, ca.  $2.2 \times 0.8$  cm, 5-veined, margin ciliate, unlobed, apex acute; lip 2.8–3 cm, base spurred, deeply 3-lobed above base, lobes ciliate; lateral lobes linear, outer margin with 10 filiform lobules; mid-lobe linear, 18–20 mm, slightly shorter than lateral lobes, apex acute; spur pendulous, cylindrical, 7–8.5 cm, much longer than ovary, slightly dilated near end, apex obtuse; connective ca. 2 mm wide; pollinia ovoid; caudicles linear; viscidia orbicular, small; rostellum with elongate arms; stigmas clavate. Fl. Jul.  $2n = 42$ .

Forests; 2600–3000 m. S Xizang [India, Kashmir, Nepal].

**30. *Habenaria arietina*** J. D. Hooker, Fl. Brit. India 6: 138. 1890.

毛瓣玉凤花 mao ban yu feng hua

*Habenaria intermedia* D. Don var. *arietina* (J. D. Hooker) Finet; *H. pectinata* D. Don var. *arietina* (J. D. Hooker) Kraenzlin; *Ochyrorchis arietina* (J. D. Hooker) Szlachetko.

Plants turning black when dried, 57–65 cm tall. Tubers oblong,  $3-5 \times 1-2$  cm, fleshy. Stem erect, terete, robust, with 5–7 laxly arranged leaves. Leaf blade ovate-lanceolate or oblong-lanceolate,  $5.5-10 \times 2-3$  cm, base amplexicaul, apex acuminate. Raceme densely many (more than 5-) flowered, to 30 cm; floral bracts ovate-lanceolate, 1.8–2 cm, nearly as long as ovary, apex acuminate; ovary twisted, terete, including pedicel 3–3.5 cm. Flowers white or greenish white. Sepals 5-veined, ciliate; dorsal sepal erect, oblong, concave, ca.  $19 \times 6$  mm, apex acute; lateral sepals reflexed, obliquely falcate-lanceolate, ca.  $20 \times 6$  mm, apex acute. Petals forming a hood with dorsal sepal, obliquely subovate-falcate, ca.  $19 \times 8$  mm, 5-veined, adaxially pubescent, margin ciliate, unlobed; lip ca. 3 cm, base spurred, deeply 3-lobed above base; lobes linear, nearly equal in length, ciliate; lateral lobes ca. 2.2 cm, outer margin with 10 filiform lobules; mid-lobe ca. 2 mm wide; spur pendulous, cylindrical-clavate, 3.5–4 cm, ca. as long as or slightly longer than ovary, slightly dilated below middle, apex obtuse; connective 3.5–4 mm wide; pollinia ovoid; caudicles linear; viscidia orbicular, small; rostellum with elongate arms; stigmas clavate. Fl. Aug.  $2n = 21, 42, 46, 48, 56$ .

Grassy slopes; 2300–2400 m. SE Xizang [Bhutan, India, Nepal].

**31. *Habenaria commelinifolia*** (Roxburgh) Wallich ex Lindley, Gen. Sp. Orchid. Pl. 325. 1835.

斧萼玉凤花 fu e yu feng hua

*Orchis commelinifolia* Roxburgh, Fl. Ind., ed. 1832, 3: 451. 1832 [*“commelinaefolia”*].

Plants 60–75 cm tall. Tubers ellipsoid,  $5-8 \times 3-5$  cm, fleshy. Stem erect, stout, with 4–6 well-spaced leaves and several bractlike leaves above. Leaf blade narrowly oblong-lanceolate to linear-lanceolate,  $7-15 \times 1.5-2.5$  cm, base contracted into amplexicaul sheath, apex acuminate. Raceme many flowered, 9–11 cm; floral bracts linear-lanceolate, ca. as long as or longer than flowers, margin ciliate, apex acuminate; ovary twisted, slender, including pedicel 3–4 cm. Flowers white. Dorsal sepal concave-hooded, broadly obovate, ca.  $7 \times 9$  mm, 5-veined, apex acute; lateral sepals reflexed, strongly oblique,

axe-shaped, ca. 7 mm, strongly dilated toward apex and ca. 13 mm wide, with 3 strongly curved veins. Petals connivent with dorsal sepal, obliquely oblong, subfalcate, ca.  $6.5 \times 4$  mm, 2-veined, apex acute or obtuse; lip ca. 4 cm, with linear base 4–6 mm, then deeply 3-lobed, lobes filiform-linear; lateral lobes 2.5–3.2 cm; mid-lobe pendulous, 1.8–2.2 cm, slightly wider than lateral lobes; spur pendulous, cylindrical-clavate, 5–8 cm, slender, near apex dilated, with a bristle projection on front margin of mouth; pollinia ellipsoid; caudicles linear; viscidia orbicular; stigmas clavate. Fl. Aug.  $2n = 42$ .

Forests; 900–1200 m. SW Yunnan [India, Myanmar, Nepal, Thailand, Vietnam].

**32. *Habenaria austrosinensis*** Tang & F. T. Wang, Bull. Fan Mem. Inst. Biol. Bot. 7: 134. 1936.

薄叶玉凤花 bao ye yu feng hua

Plants 30–60 cm tall. Tubers narrowly ellipsoid,  $3-5 \times 1-3$  cm, fleshy. Stem erect, terete, stout, pubescent, with 3–5 leaves below middle and 9–13 bractlike leaves above. Leaf blade narrowly elliptic to oblong-oblong-lanceolate,  $13-25 \times 2.5-6$  cm, relatively thin, base contracted into amplexicaul sheath, apex acuminate. Raceme many flowered, 9–14 cm; rachis pubescent; floral bracts lanceolate, ca. 15 mm, shorter than ovary, ciliate, apex acuminate; ovary twisted, cylindrical-fusiform, pubescent, including pedicel 15–27 mm. Flowers white. Dorsal sepal concave-hooded, broadly ovate, ca.  $3.5 \times 5$  mm, abaxially pubescent, 3-veined, apex acute; lateral sepals reflexed, strongly obliquely triangular, ca. 5 mm, toward apex strongly dilated and ca. 8 mm wide, with 3 strongly curved veins. Petals forming a hood with dorsal sepal, obliquely linear, ca.  $4 \times 1$  mm, 1-veined, apex obtuse; lip longer than sepals, above base deeply 3-lobed; lobes similar, linear, ca. 8 mm; spur curving upward above ovary, cylindrical-clavate, 20–22 mm, ca. as long as or slightly shorter than ovary, apex dilated; connective narrow; stigmas elliptic, ca. 1 mm. Fl. Jul–Aug.

Damp places in forests along valleys; 700–1400 m. S Yunnan [Thailand].

**33. *Habenaria ciliolaris*** Kraenzlin, Bot. Jahrb. Syst. 16: 169. 1892.

毛萼玉凤花 mao ting yu feng hua

*Habenaria kweitschuensis* Schlechter.

Plants 25–60 cm tall. Tubers narrowly ellipsoid or oblong,  $3-5 \times 1.5-2.5$  cm, fleshy. Stem erect, terete, stout, with 5 or 6 leaves near middle and 5–10 bractlike leaves above. Leaf blade elliptic-lanceolate, obovate-spatulate, or narrowly elliptic,  $5-16 \times 2-5$  cm, base contracted and amplexicaul, apex acuminate or acute. Raceme 6–30-flowered, 9–23 cm; peduncle and rachis ridged, ridges villous; floral bracts ovate, 13–15 mm, shorter than ovary, ciliate, apex acuminate; ovary twisted, cylindrical-fusiform, denticulate-ridged, including pedicel 23–25 mm. Flowers white or greenish white, rarely tinged with pink. Dorsal sepal forming a concave hood with petals, saccate, broadly ovate,  $6-9 \times 5.5-8$  mm, abaxially 3-keeled, 5-veined, toward apical margin ciliate; lateral sepals reflexed, strongly oblique, ovate,  $6.5-10 \times 4-7$  mm, 3- or 4-veined, apex acute. Petals obliquely lanceolate,  $6-7 \times 2-3$  mm, unlobed, 1-veined, apex

acuminate; lip longer than sepals, deeply 3-lobed from base; lobes parallel, filiform; lateral lobes 20–22 mm; mid-lobe pendulous, 16–18 mm; spur pendulous, curved, cylindrical-clavate, 21–27 mm, slightly longer or shorter than ovary, dilated toward end, apex obtuse; stigmas oblong, ca. 1.5 mm. Fl. Jul–Sep.

Shaded places in forests or along valleys; 100–1800 m. N Fujian, SE Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, S Yunnan, Zhejiang [Vietnam].

**34. *Habenaria hystrix*** Ames, *Orchidaceae* 2: 35. 1908.

粤琼玉凤花 yue qiong yu feng hua

Plants 28–45 cm tall. Tubers oblong, ca. 3 × 1 cm, fleshy. Stem erect, terete, stout, with 5 or 6 leaves below middle and 5–8 bractlike leaves above. Leaf blade narrowly elliptic or oblong, 9–16 × 3–5 cm, base contracted and amplexicaul, apex acuminate or acute. Raceme 6–10-flowered, 8–11 cm; peduncle and rachis ridged, ridges villous; floral bracts ovate, ca. 1.5 cm, shorter than ovary, ciliate, apex acuminate; ovary twisted, cylindrical-fusiform, slightly ridged, including pedicel ca. 18 mm. Flowers white or greenish white. Dorsal sepal forming a concave hood with petals, broadly ovate, ca. 6 × 6–6.5 mm, 3-veined; lateral sepals reflexed, strongly oblique, ovate, ca. 7 × 6 mm, 3-veined, apex acute. Petals obliquely triangular-lanceolate, ca. 6 × 2 mm, simple, 1-veined, apex long acuminate; lip longer than sepals, deeply 3-lobed from base; lobes parallel, filiform; lateral lobes 20–22 mm; mid-lobe 20–24 mm, base with 1 obtusely conic callus; spur spreading horizontally, cylindrical-clavate, 16–20 mm, ca. as long as ovary, slightly dilated toward apex; stigmas narrowly elliptic, ca. 1.5 mm. Fl. Aug–Sep.  $2n = 42$ .

Forests, along valleys; 300–400 m. Guangdong, W Hainan [Indonesia (Kalimantan), Philippines].

**35. *Habenaria fordii*** Rolfe, *Bull. Misc. Inform. Kew* 1896: 202. 1896.

线瓣玉凤花 xian ban yu feng hua

Plants 30–60 cm tall. Tubers narrowly elliptic, 3–4 × 2–3 cm, fleshy. Stem erect, stout, base with 4 or 5 ± tufted leaves and above leaves several bractlike leaflets. Leaf blade oblong-lanceolate or narrowly elliptic, 14–25 × 3–6 cm, base contracted and amplexicaul, apex acute. Raceme many flowered, 8–16 cm; floral bracts ovate-lanceolate, 2–4 cm, apex acute or acuminate; ovary twisted, cylindrical-fusiform, including pedicel 1.5–2 cm. Flowers white. Dorsal sepal forming a hood with petals, broadly ovate, concave, 1.3–1.5 cm; lateral sepals spreading or reflexed, obliquely subovate, 14–16 × 6–7 mm. Petals linear-lanceolate, 1.3–1.5 cm, apex acute; lip 2.3–2.5 cm, narrow, below middle deeply 3-lobed; lobes linear, 1.5–1.7 cm; lateral lobes filiform, narrower and slightly longer than linear mid-lobe; spur pendulous, cylindrical-clavate, slightly thickened toward end, 3–6 cm. Fl. Jul–Aug.

• Damp places or soil-covered rocks in forests or along valleys; 600–2200 m. Guangdong, Guangxi, S Yunnan.

**36. *Habenaria acuifera*** Wallich ex Lindley, *Gen. Sp. Orchid. Pl.* 325. 1835.

凸孔坡参 tu kong po shen

*Habenaria lolorum* Schlechter.

Plants 14–38 cm tall. Tubers oblong or narrowly ellipsoid, 2.5–4 × 1–2.5 cm, fleshy. Stem erect, terete, glabrous, with 3 or 4 leaves and many bractlike leaflets. Leaf blade oblong or oblong-lanceolate, 4–12 × 1–1.5 cm, base amplexicaul, apex acuminate or acute. Raceme 8–20-flowered, 3–8 cm; floral bracts lanceolate, basal ones 1.5–1.7 cm, longer than ovary, ciliate; ovary twisted, cylindrical-fusiform, including pedicel 15–18 mm. Flowers yellow, small. Dorsal sepal forming a hood with petals, erect, broadly ovate, concave, 3–4.5 × 3–3.5 mm, 3-veined, apex obtuse; lateral sepals reflexed, obliquely ovate-elliptic, 5–6 × 3.5–4 mm, 3-veined, apex obtuse. Petals obliquely oblong, 3–4 × 1.8–2 mm, 1-veined, unlobed; lip 9–10 mm, spurred at base, with a cupular structure near mouth of spur, spreading, 3-lobed from base; lateral lobes subulate, 1.5–3.5 mm; mid-lobe straight, linear, 7–8 × ca. 1 mm, apex obtuse; spur pendulous, cylindrical-clavate, 10–17 mm, shorter than ovary, near middle geniculate-curved, slightly thickened from middle to apex; connective narrow; pollinia narrowly ellipsoid; caudicles linear, longer than pollinia; viscidia orbicular, small; stigmas suberect, exerted along both sides of spur mouth, oblong, 2–2.5 mm. Fl. Jun–Aug.  $2n = 42 + 0-2B$ .

Forests, thickets, grasslands; 200–2000 m. Guangxi, SW and W Sichuan, Yunnan [NE India, Laos, Malaysia (Peninsular), Myanmar, Thailand, Vietnam].

**37. *Habenaria linguella*** Lindley, *Gen. Sp. Orchid. Pl.* 325. 1835.

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*Centrochilus gracilis* Schauer; *Habenaria acuifera* Lindley var. *linguella* (Lindley) Finet; *H. chrysantha* Schlechter; *H. endothrix* Miquel; *H. simeonis* Kraenzlin.

Plants 20–50(–75) cm tall. Tubers 3–5 × 1–2 cm, fleshy. Stem erect, terete, glabrous, with 3 or 4 leaves and 3–9 bractlike leaflets. Leaf blade narrowly oblong to narrowly oblong-lanceolate, 5–12(–27) × 1.2–2 cm, base amplexicaul, apex acuminate. Raceme densely 9–20-flowered, 2.5–6 cm; floral bracts linear-lanceolate, 1.2–2.5 cm, ciliate; ovary twisted, cylindrical-fusiform, including pedicel 1.8–2.3 cm. Flowers yellow or brownish yellow. Dorsal sepal forming a hood with petals, erect, broadly elliptic, concave, 4–5 × 3–3.5 mm, 3-veined, apex obtuse; lateral sepals reflexed, oblique, broadly obovate, 6–7 × 4–4.5 mm, 3- or 4-veined, apex obtuse or subacute. Petals oblique, narrowly ovate or obliquely narrowly elliptic, 4–5 × 2–2.5 mm, 1-veined, apex obtuse; lip 9–10 mm, spurred at base, with a ring-shaped rim at mouth of spur, 3-lobed from base; lateral lobes subulate, 1.5–2.75 mm, apex acuminate; mid-lobe linear, 8–9 mm, apex obtuse; spur pendulous, cylindrical, 2–2.9 cm, longer than ovary, slender, slightly thickened toward end, 1–1.5 mm in diam., apex obtuse; connective narrow; pollinia narrowly obovoid; caudicles linear, longer than pollinia; viscidia ovate; stigmas oblong, ca. 1.5 mm. Fl. Jun–Aug.

Forests, grasslands; 500–2500 m. Guangdong, Guangxi, Guizhou, Hainan, Yunnan [Vietnam].

**38. *Habenaria rostellifera*** H. G. Reichenbach, *Otia Bot. Hamburg*. 2: 34. 1878.

齿片坡参 chi pian po shen

*Habenaria hancockii* Rolfe.

Plants 17–40 cm tall. Tubers oblong, 2–5 × 1–2 cm, fleshy. Stem erect, terete, stout, glabrous, with 4 or 5 leaves and 5–9 bractlike leaflets. Leaf blade narrowly elliptic or oblong to oblong-lanceolate, 5–10 × 1–2 cm, base amplexicaul, apex acuminate. Raceme densely many flowered, 3.5–6 cm; floral bracts lanceolate, 2–2.5 cm, ciliate, apex acuminate; ovary twisted, cylindric-fusiform, including pedicel 1.8–1.9 cm. Flowers white, lateral sepals with brown markings. Dorsal sepal forming a hood with petals, erect, broadly elliptic, concave, ca. 6 × 4 mm, 3-veined, apex obtuse; lateral sepals reflexed, obliquely elliptic, ca. 9 × 4.5 mm, 4-veined. Petals oblique, narrowly ovate or narrowly elliptic, ca. 6 × 3 mm, 3-veined, unlobed, apical margin ciliate; lip spurred at base, with a 3-toothed, subcylindric lamella near mouth of spur, deeply 3-lobed from base, lobes linear; lateral lobes divaricate, 6–8 × ca. 1 mm, attenuate toward apex; mid-lobe ca. 10 × 2 mm, apex obtuse; spur pendulous, cylindric-clavate, 2–2.2 cm, slightly longer than ovary, apical half slightly dilated, apex obtuse; connective relatively narrow; pollinia narrowly ellipsoid; caudicles linear, longer than pollinia; viscidium elliptic, small; stigmas oblong, ca. 2.5 mm. Fl. Jul–Aug.

Grassy slopes; 1000–2200 m. C Guizhou, C, NW, and SE Yunnan [Cambodia, Malaysia (Peninsular), Thailand, Vietnam].

**39. *Habenaria rostrata*** Lindley, *Gen. Sp. Orchid. Pl.* 325. 1835.

喙房坡参 hui fang po shen

*Habenaria acuifera* Lindley var. *rostrata* (Lindley) Finet.

Plants 20–30 cm tall. Tubers oblong, 2–3 × 0.8–1 cm, fleshy. Stem erect, terete, glabrous, with 4 or 5 leaves and 4–8 bractlike leaflets. Leaf blade oblong or oblong-lanceolate, 5–10 × 0.7–1 cm, base amplexicaul, apex acute. Raceme many flowered, sometimes nearly corymbiform, 4–6 cm; floral bracts lanceolate, shorter than ovary, ciliate, apex aristate; ovary twisted, arching, cylindric-fusiform, including pedicel 15–16 mm. Flowers reddish orange, with greenish sepals. Dorsal sepal forming a hood with petals, erect, broadly elliptic, concave, ca. 4.5 × 3 mm, 3-veined, apex obtuse; lateral sepals reflexed, obliquely ovate-elliptic, ca. 6.5 × 4 mm, 3-veined, apex obtuse. Petals obliquely broadly oblong, falcate, ca. 4.5 × 2 mm, 1-veined, margin ciliate, apex obtuse; lip ca. 10 mm, spurred at base, with a 3-lobed, ring-shaped structure near mouth of spur, shortly 3-lobed, lobes linear; lateral lobes extremely bifid, ca. 7 × 0.6 mm, apex acuminate; mid-lobe ca. 8 × 1 mm, apex obtuse; spur pendulous, cylindric-clavate, 11–12 mm, slightly shorter than ovary, slightly dilated toward apex; connective narrow; pollinia ellipsoid; caudicles linear, slender; viscidia linear; stigmas oblong, ca. 2 mm. Fl. Jul–Aug.

Forests, forest margins, thickets; 900–2000 m. S Sichuan, C and S Yunnan [Laos, Myanmar, Thailand, Vietnam].

**40. *Habenaria rhodocheila*** Hance, *Ann. Sci. Nat., Bot., sér.* 5, 5: 243. 1866.

橙黄玉凤花 cheng huang yu feng hua

*Smithanthe rhodocheila* (Hance) Szlachetko & Margońska.

Plants 8–35 cm tall. Tubers oblong-cylindric, 2–4 × 1–2 cm, fleshy. Stem erect, terete, stout, with 4–6 leaves below middle and 1–3 bractlike leaflets above leaves. Leaf blade linear-lanceolate to suboblong, 10–15 × 1.5–2 cm, base amplexicaul, apex acuminate. Raceme loosely 2–10-flowered, 3–8 cm; floral bracts ovate-lanceolate, 1.5–1.7 cm, shorter than ovary, apex acuminate; ovary twisted, terete, including pedicel 2–3 cm. Flowers with green sepals and petals and orange-yellow to red lip. Dorsal sepal forming a hood with petals, erect, suborbicular, concave, ca. 9 × 8 mm, 3-veined, apex obtuse; lateral sepals reflexed, oblong, 9–10 × ca. 5 mm, 5-veined, apex obtuse. Petals spatulate-linear, ca. 8 × 2 mm, 1-veined, apex obtuse; lip spreading, ovate in outline, 1.8–2 × ca. 1.5 cm, 4-lobed, with short claw at base, spurred; lateral lobes spreading, oblong, ca. 7 × 5 mm, apex obtuse; mid-lobe bilobed, lobules nearly subovate, ca. 4 × 3 mm, apex obliquely truncate; spur pendulous, dull yellow, cylindric, 2–3 cm × ca. 1 mm, apex often upcurved; rostellum deltoid, large, with elongated arms; stigmas clavate. Capsule fusiform, ca. 1.5 cm, apex beaked. Fl. Jul–Aug, fr. Oct–Nov. *2n* = 38, 42.

Shaded places or soil-covered rocks in forests or along valleys; 300–1500 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi [Cambodia, Laos, Malaysia, Philippines, Thailand, Vietnam].

**41. *Habenaria malintana*** (Blanco) Merrill, *Sp. Blancoan*. 112. 1918.

南方玉凤花 nan fang yu feng hua

*Thelymitra malintana* Blanco, *Fl. Filip.* 642. 1837; *Habenaria dentata* (Swartz) Schlechter f. *ecalcarata* (King & Pantling) Tuyama; *H. dentata* subsp. *ecalcarata* (King & Pantling) Panigrahi & Murti; *H. dentata* var. *ecalcarata* (King & Pantling) Handel-Mazzetti; *H. geniculata* D. Don var. *ecalcarata* King & Pantling; *Kraenzlinorchis malintana* (Blanco) Szlachetko.

Plants 40–55 cm tall. Tubers ellipsoid, 2–4 × 1.5–2.5 cm, fleshy. Stem erect, terete, stout, with 3 or 4 leaves and 5 or 6 bractlike leaflets. Leaf blade oblong or oblong-lanceolate, 6–13 × 1.5–4.5 cm, base amplexicaul, apex acute or acuminate. Raceme densely more than 10-flowered; floral bracts narrowly lanceolate, ca. 2 cm, margin ciliate; ovary twisted, cylindric-fusiform, including pedicel 2–2.5 cm. Flowers white, ca. 1.5 cm in diam. Sepals subsimilar, oblong-lanceolate to ovate-lanceolate, 11–13 × 3–5 mm, 3-veined, margin finely ciliate, apex acute; lateral sepals spreading, slightly oblique. Petals narrowly oblong-lanceolate, 7–8 × ca. 2 mm, 1- or rarely 3-veined, unlobed, margin finely ciliate, apex acuminate; lip ligulate-lanceolate, 11–12 mm, margin finely ciliate, usually unlobed, with very small lateral lobes on both basal sides, spurless or rarely with a short spur 2–8 mm. Fl. Oct–Nov. *2n* = 42, 84, 168.

Forests, grasslands; 500–1300 m. S Guangxi, Hainan, SW Si-

chuan, W to SE Yunnan, N Zhejiang [India, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam].

**42. *Habenaria finetiana*** Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 4: 126. 1919.

齿片玉凤花 *chi pian yu feng hua*

*Habenaria geniculata* D. Don var. *yunnanensis* (Finet) Finet; *H. miersiana* Champion ex Benth. var. *yunnanensis* Finet; *H. peyentsinensis* Kraenzlin; *H. tienensis* Tang & F. T. Wang; *Plantaginorchis finetiana* (Schlechter) Szlachetko.

Plants 9–25 cm tall. Tubers oblong, 1.5–2 cm × 8–10 mm, fleshy. Stem erect, glabrous, below middle with 2 or 3 leaves, with 1–4 bractlike leaves above. Leaf blade cordate or ovate, 2.5–5 × 1.8–3.5 cm, with white margin when dried, apex acute. Raceme 2–8-flowered, 3–5 cm; floral bracts lanceolate, ca. 2 cm, nearly as long as ovary, apex acuminate; ovary twisted, terete, including pedicel 1.8–2 cm. Flowers white, sometimes secund. Sepal and petal margins ciliate; dorsal sepal forming a hood with petals, erect, ovate or elliptic, concave, ca. 8 × 5 mm, 5-veined, apex acute; lateral sepals reflexed, obliquely ovate, 9–10 × ca. 5 mm, 5-veined, apex acute. Petals linear, subfalcate, ca. 6 × 2 mm, 1-veined, unlobed, apex obtuse; lip broadly obovate, ca. 12 × 10 mm, 3-lobed; lateral lobes rhombic, ca. 4 mm wide, margins serrate; mid-lobe ligulate, ca. 4 × 2 mm, slightly longer than lateral lobes, apex subobtusely; spur pendulous, cylindrical, 17–20 mm, slightly shorter than or nearly as long as ovary, apex slightly dilated, obtuse, slightly curved; stigmas oblong. Fl. Aug–Oct.  $2n = 64^*$ .

• Forests, grasslands; 2000–3500 m. W Sichuan, C and NW Yunnan.

**43. *Habenaria dentata*** (Swartz) Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 4: 125. 1919.

鹅毛玉凤花 *e mao yu feng hua*

*Orchis dentata* Swartz, Kongl. Vetensk. Acad. Nya Handl. 21: 207. 1800; *Habenaria dentata* var. *tohoensis* (Hayata) S. S. Ying; *H. geniculata* D. Don; *H. miersiana* Champion ex Benth.; *H. tohoensis* Hayata; *Plantaginorchis dentata* (Swartz) Szlachetko; *Platanthera dentata* (Swartz) Lindley; *P. geniculata* (D. Don) Lindley.

Plants 35–87 cm tall. Tubers oblong-ovoid to oblong, 2–5 × 1–3 cm, fleshy. Stem erect, terete, stout, loosely with 3–5 leaves and several bractlike leaflets. Leaf blade oblong to narrowly elliptic, 5–15 × 1.5–4 cm, base amplexicaul, margin white when dried, apex acute or acuminate. Raceme often many flowered, 5–12 cm; floral bracts lanceolate, 2–3 cm, basal ones ca. as long as ovary, apex acuminate; ovary twisted, terete, including pedicel 2–3 cm. Flowers white. Sepals and petals ciliate; dorsal sepal forming a hood with petals, erect, broadly ovate, concave, 10–13 × 7–8 mm, 5-veined, apex acute; lateral sepals spreading or reflexed, obliquely ovate, 14–16 mm, 5-veined, apex acute. Petals falcate-lanceolate, 8–9 × 2–2.5 mm, 2-veined, unlobed; lip broadly obovate, 15–18 × 12–16 mm, 3-lobed; lateral lobes subrhombic or flabellate, 7–8 mm wide, apical margin serrate; mid-lobe linear-lanceolate or ligulate-lanceolate, 5–7 × 1.5–3 mm, 3-veined, apex obtuse; spur pendu-

lous, green below middle, cylindric-clavate, 3.5–4 cm, longer than ovary, somewhat geniculate in basal half, slightly curved, gradually dilated toward end, apex obtuse, with conspicuously raised structure surrounding mouth; stigmas oblong. Fl. Aug–Oct.  $2n = 64$ .

Forests on slopes or along valleys; 200–2300 m. Anhui, N Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Cambodia, India, Japan, Laos, Myanmar, Nepal, Thailand, Vietnam].

**44. *Habenaria lucida*** Wallich ex Lindley, Gen. Sp. Orchid. Pl. 319. 1835.

细花玉凤花 *xi hua yu feng hua*

*Habenaria dilatata* (Pursh) Hooker subsp. *lucida* (Wallich ex Lindley) S. S. Ying; *H. longiracema* Fukuyama; *H. recurva* Rolfe ex Downie var. *erectiflora* Tang & F. T. Wang; *Habenella lucida* (Wallich ex Lindley) Szlachetko & Kras-Lapinska; *Hetaeria taiwaniana* S. S. Ying; *Peristylus longiracemus* (Fukuyama) K. Y. Lang; *Platantheroides lucida* (Wallich ex Lindley) Szlachetko; *Rhomboda taiwaniana* (S. S. Ying) Ormerod.

Plants 40–61 cm tall. Tubers oblong or ellipsoid, 3–5 × 1–3 cm, fleshy. Stem erect, terete, slender, with 4–6 ± clustered leaves and 3–6 bractlike leaflets. Leaf blade oblanceolate, subspatulate, or oblong-lanceolate, 8–18 × 2.5–4.5 cm, base contracted into amplexicaul sheath, apex acute or acuminate. Raceme 25–43-flowered, 15–23 cm; floral bracts lanceolate to ovate-lanceolate, 8–10 × 3–4 mm, shorter than ovary, apex acuminate; ovary twisted, cylindrical, including pedicel 16–18 mm. Sepals green, 3-veined; dorsal sepal forming a hood with petals, ovate, concave, 3.5–4 × 2.5–3 mm, apex obtuse; lateral sepals reflexed, obliquely ovate or ovate-oblong, 4–4.5 × ca. 2.5 mm, apex obtuse. Petals yellow, narrowly ovate-oblong, 3–3.5 × ca. 1.5 mm, 2-veined, apex obtuse; lip yellow, ca. 5 mm, thickly textured, 3-lobed from base; lobes narrowly oblong; lateral lobes reflexed, 3–4.5 × 1–1.5 mm, apex obtuse; mid-lobe suberect, 3.5–4.5 × 1–1.5 mm, apex adnate to tip of hood formed by dorsal sepal and petals; spur cylindrical, ca. 21 × 1 mm, slender; connective narrow; pollinia ovoid; viscidia lanceolate, ca. 1.2 mm. Fl. Jul–Sep.  $2n = 42$ .

Forests; 400–1200 m. Guangdong, Hainan, Taiwan, S Yunnan [Cambodia, E India, Laos, Myanmar, Thailand, Vietnam].

**45. *Habenaria shweliensis*** W. W. Smith & Banerji, Rec. Bot. Surv. India 6: 33. 1913.

中緬玉凤花 *zhong mian yu feng hua*

*Habenaria crassilabia* Kraenzlin.

Plants 35–50 cm tall. Tubers ellipsoid, 2.5–3 × 1.2–2 cm, fleshy. Stem erect, terete, with 4 or 5(–7) somewhat clustered leaves below and 3 to many bractlike leaves above. Leaf blade elliptic, elliptic-lanceolate, lanceolate, or oblong, 5–10 × 1.8–4 cm, thinly textured, base contracted into amplexicaul sheath, apex acute. Raceme loosely 14–30-flowered, 10–15 cm; floral bracts ovate-lanceolate, 1.5–2 × 0.3–0.4 cm, longer than flowers, apex acuminate; ovary twisted, slightly arching, cylindrical, 1–1.2 cm. Flowers spreading horizontally, yellowish green. Sepals green, 3-veined; dorsal sepal broadly ovate, concave, 3–4 ×

2.8–3 mm, apex obtuse; lateral sepals spreading, obliquely ovate, concave, 3–4 × 2.5–2.8 mm, apex obtuse. Petals forming a hood with dorsal sepal, erect, yellow, obliquely ovate, 2.8–3.5 × ca. 2 mm, 3-veined, apex obtuse or emarginate; lip yellowish green, thickly textured, ca. 4 mm, 3-lobed from base; lateral lobes pendulous, narrowly oblong, ca. 3 × 1 mm, apex obtuse, reflexed; mid-lobe suberect, narrowly ovate-lanceolate, ca. 3 × 2 mm, apex adnate to tip of hood formed by dorsal sepal and petals; spur pendulous, slightly curved, cylindrical-clavate, 3–6 mm, shorter than ovary, conspicuously dilated toward apex; connective narrow; pollinia ovoid; viscidia linear-oblong, ca. 0.8 mm. Fl. Jul–Sep.

Grassy slopes; 1300–2000 m. SW Guizhou, N Yunnan [Myanmar].

**46. *Habenaria iyoensis*** Ohwi, J. Jap. Bot. 12: 382. 1936.

岩坡玉凤花 yan po yu feng hua

*Habenaria minor* Fukuyama & Masamune; *H. rupestris* T. P. Lin & T. W. Hu.

Plants 15–40 cm tall. Tubers oblong, 2–4 × 1–1.5 cm, fleshy. Stem erect, terete, with 5–7 tufted leaves at base and 2 bractlike leaves above. Leaf blade narrowly elliptic or broadly oblanceolate, 8–10 × 1.8–2 cm, base contracted into amplexicaul sheath, apex acute. Raceme densely many flowered, 8–10 cm; floral bracts ovate-lanceolate, 8–12 × ca. 3 mm, basal ones nearly as long as ovary; ovary twisted, cylindrical-fusiform, including pedicel 8–12 mm. Flowers greenish. Dorsal sepal forming a hood with petals, erect, broadly ovate, concave, 5–6 × 3.8–4 mm, 3-veined, apex obtuse; lateral sepals reflexed, obliquely ovate, 5–6 × 2.2–3 mm, 3-veined, apex acute. Petals narrowly falcate-lanceolate, 5–6 × ca. 2 mm, 1-veined, apex obtuse; lip spurred, deeply 3-lobed above base; lateral lobes spreading, almost at right angles to mid-lobe, filiform, 7–15 mm; mid-lobe linear, 7–9 mm, apex obtuse; spur pendulous, slightly curved, cylindrical, 11–20 mm, longer than ovary, apex obtuse; connective rather broad; stigmas oblong. Fl. Sep–Oct.  $2n = 42$ .

Rocky slopes, sparse forests; below 700 m. C and S Taiwan [S Japan].

**47. *Habenaria viridiflora*** (Rottler ex Swartz) R. Brown, Prodr. 312. 1810.

绿花玉凤花 lü hua yu feng hua

*Orchis viridiflora* Rottler ex Swartz, Kongl. Vetensk. Acad. Nya Handl. 21: 206. 1800.

Plants 13–20 cm tall. Tubers oblong, 1.5–2 × 0.8–1 cm, fleshy. Stem erect, slender, rigid, glabrous, base with 4 or 5 leaves, with 4 or 5 bractlike leaves above. Leaf blade linear, 5–10 × 0.4–0.6 cm, base amplexicaul, apex acuminate or acute. Raceme several to more than 10-flowered, 2–4 cm, glabrous; floral bracts ovate-lanceolate, ca. 4 mm, much shorter than ovary, apex long acuminate; ovary twisted, terete, slender, including pedicel ca. 1 cm. Flowers yellowish green, small, glabrous. Dorsal sepal forming a hood with petals, ovate, concave, ca. 2 × 1.3 mm, 3-veined, apex obtuse; lateral sepals reflexed, obliquely ovate-oblong, ca. 2.8 × 1.3 mm, 3-veined, apex ob-

tuse. Petals obliquely ovate, ca. 2 × 1.1 mm, 1-veined, apex acute; lip ca. 3.2 mm, fleshy, near base deeply 3-lobed; lobes linear, apex obtuse; lateral lobes perpendicular to mid-lobe, often ca. 2 mm; mid-lobe ca. 3 mm; spur pendulous, cylindrical, to 1.6 cm, much longer than ovary, slender; pollinia obovoid; caudicles short; stigmas clavate. Fl. Jun.  $2n = 42, 44, 84$ .

Forests. N Guangxi [Cambodia, India, Laos, Sri Lanka, Thailand, Vietnam].

**48. *Habenaria plurifoliata*** Tang & F. T. Wang, Bull. Fan Mem. Inst. Biol. Bot. 10: 40. 1940.

莲座玉凤花 lian zuo yu feng hua

Plants 28–33 cm tall. Tubers cylindrical-oblong, ca. 2.5 cm × 8 mm, fleshy. Stem erect, terete, stout, ca. 3 mm in diam., with 1 or 2 tubular sheaths at base, with (4–)6–10 leaves ± in a rosette and many bractlike leaves above. Leaf blade linear-lanceolate, 7–9 × 0.8–1.1 cm, base contracted into amplexicaul sheath, apex acute or acuminate. Raceme 10–25-flowered, 6–17 cm; floral bracts lanceolate, basal ones nearly as long as ovary, apex acuminate; ovary twisted, terete, including pedicel 8–12 mm. Flowers yellowish green or white. Dorsal sepal forming a hood with petals, erect, broadly ovate, concave, ca. 5 × 2.9 mm, 3-veined, apex obtuse; lateral sepals reflexed, narrowly ovate, ca. 6 × 2.4 mm, 2-veined, apex subobtuse. Petals obliquely ovate-ligulate, falcate, ca. 4.5 × 1.2 mm, 1-veined, apex acute; lip deeply 3-lobed from base; lateral lobes spreading at right angles to mid-lobe, filiform, ca. 14 mm; mid-lobe linear, ca. 7 mm, wider than lateral lobes; spur pendulous, cylindrical-clavate, ca. 14 mm, longer than ovary, slender, apical half ca. 1.4 mm in diam., slightly thickened toward end, apex acute or obtuse; connective wide; stigmas clavate. Fl. Oct.

• Forests, along rivers; 700–1600 m. S Guangxi, S Yunnan.

**49. *Habenaria tonkinensis*** Seidenfaden, Dansk Bot. Ark. 31(3): 114. 1977.

丛叶玉凤花 cong ye yu feng hua

Plants 24–40 cm tall. Tubers oblong, 3–4 × 1–1.5 cm, fleshy. Stem erect, terete, stout, glabrous, with 10–13 ± clustered leaves at base and 5–13 bractlike leaves above. Leaf blade linear to linear-lanceolate, 7–13 × 0.8–1.5 cm, base contracted, apex acuminate or acute. Raceme many flowered, 11–21 cm; floral bracts lanceolate to ovate-lanceolate, 13–17 mm, apex long acuminate; ovary twisted, cylindrical-fusiform, including pedicel 13–15 mm. Flowers fragrant, white. Dorsal sepal forming a hood with petals, erect, elliptic, concave, ca. 5 × 3–3.5 mm, 3-veined, apex obtuse; lateral sepals reflexed, obliquely elliptic, ca. 6 × 2.5–3 mm, 3-veined, apex obtuse. Petals linear, slightly oblique, ca. 5 × 1 mm, 1-veined, apex acute; lip deeply 3-lobed from base; lobes linear, base ca. 0.5 mm wide; lateral lobes spreading nearly at right angles to mid-lobe, 10–11 mm; mid-lobe 7–8 mm, apex obtuse; spur pendulous, slightly curved, cylindrical-clavate, ca. 17 mm, longer than ovary, thickened toward end; pollinia obovoid; caudicles slender; viscidia orbicular, small; stigmas clavate. Fl. Sep–Oct.

Broad-leaved forests; 600–1200 m. S Guangxi (Dongxing), S Yunnan [Cambodia, Laos, N Vietnam].

**50. *Habenaria fulva*** Tang & F. T. Wang, Bull. Fan Mem. Inst. Biol. Bot. 7: 138. 1936.

褐黄玉凤花 he huang yu feng hua

Plants 21–40 cm tall. Tubers oblong, 1–2 cm × 5–10 mm, fleshy. Stem erect, terete, glabrous, with 3–5 leaves below middle, with 3–10 bractlike leaves above. Leaf blade oblong-lanceolate, 4–8 × 0.6–1.8 cm, base amplexicaul, apex acute. Raceme densely many flowered, ca. 6 cm; floral bracts lanceolate, ca. as long as or longer than flower, apex acuminate; ovary twisted, cylindrical-fusiform, including pedicel 8–10 mm. Flowers yellow or yellowish brown. Dorsal sepal erect, narrowly ovate, concave, 6.5–8 × 3.5–4 mm, 3-veined, apex obtuse; lateral sepals obliquely oblong-lanceolate, ca. 9 × 3 mm, 3-veined, apex obtuse. Petals forming a hood with dorsal sepal, falcate-lanceolate, ca. 8 × 2.5 mm, oblique, 2-veined, apex acuminate; lip ca. 1 cm, deeply 3-lobed from base; lobes similar, linear; mid-lobe slightly longer and wider than lateral lobes; spur pendulous, straight, cylindrical, 3–5 mm, apex obtuse; stigmas arching, cylindrical. Fl. Aug–Sep.

Forests; 900–1000 m. SW Guangxi, S Yunnan [Myanmar].

**51. *Habenaria marginata*** Colebrooke in Hooker, Exot. Fl. 2: ad t. 136. 1824.

滇南玉凤花 dian nan yu feng hua

*Platanthera marginata* (Colebrooke) Lindley.

Plants 8–37 cm tall. Tubers ellipsoid or narrowly ellipsoid, 2–4 × 1–2.5 cm, fleshy. Stem erect, terete, glabrous, with 1 or 2 tubular sheaths at base, 3–5 leaves below middle, and 3–5 bractlike leaves above. Leaf blade narrowly oblong or oblong-lanceolate, 4–9 × 1–2 cm, base contracted into amplexicaul sheath, margin yellow when dried, apex acuminate or subobtuse. Raceme 3–15-flowered, 2.5–10 cm; floral bracts lanceolate, apex long acuminate; ovary twisted, arching, cylindrical-fusiform, including pedicel 8–13 mm. Sepals green, petals and lip yellow. Dorsal sepal forming a hood with petals, erect, cordate or broadly ovate, concave, 7–7.5 × 5–6 mm, 3-veined, apex acute; lateral sepals reflexed, obliquely ovate or narrowly ovate-oblong, 7.5–8.5 × 2.5–3.5 mm, 3-veined, apex acute. Petals obliquely ovate-triangular, 6.5–7.3 × 3–3.8 mm, 2-veined, apex acute; lip spreading, 11–13 mm, deeply 3-lobed above base; lateral lobes spreading at acute angles to mid-lobe, linear or linear-lanceolate, 7–8 × 1–1.4 mm; mid-lobe ligulate, 8–9 × 2–2.3 mm; spur pendulous, clavate, 8–13 mm, apical half dilated and 1.5–2 mm in diam.; stigmas falcate, long. Fl. Oct–Nov.  $2n = 42$ .

Forests, grasslands at forest margins; 500–1200 m. S Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal, Thailand].

**52. *Habenaria leptoloba*** Benth, Fl. Hongk. 362. 1861.

细裂玉凤花 xi lie yu feng hua

Plants 15–31 cm tall. Tubers oblong, ca. 2 cm × 8 mm, fleshy. Stem erect, terete, slender, near base with 3–6 leaves, with 2–5 bractlike leaves above. Leaf blade lanceolate or linear, 6–15 × 1–1.8 cm, base contracted into amplexicaul sheath, apex

acuminate or acute. Raceme 8–19-flowered, 8–14 cm; floral bracts lanceolate, 4–12 mm, longer than ovary, apex acuminate; ovary twisted, cylindrical-fusiform, glabrous, including pedicel 7–8 mm. Flowers yellowish greenish; sepals greenish. Dorsal sepal forming a hood with petals, broadly ovate, concave, ca. 3 × 2.8 mm, 1-veined, apex obtuse; lateral sepals spreading or reflexed, obliquely ovate-lanceolate, ca. 4.5 × 2 mm, 1-veined, apex obtuse. Petals erect, whitish green, obliquely ovate, concave, ca. 3.8 × 2 mm, 1-veined, apex obtuse; lip yellow, relatively long, deeply 3-lobed from base, lobes linear; lateral lobes divergent, ca. 6 mm, narrowed toward apex, apex obtuse; mid-lobe ca. 4 mm, apex obtuse; spur pendulous or slightly curved, cylindrical, 8–11 mm, longer than ovary, slender, slightly thickened near end, apex obtuse. Fl. Aug–Sep.

• Humid places in forests or grasslands. Hong Kong.

**53. *Habenaria nematocera*** Tang & F. T. Wang, Bull. Fan Mem. Inst. Biol. Bot. 10: 39. 1940.

细距玉凤花 xi ju yu feng hua

Plants 40–45 cm tall. Stem terete, with 3 tubular sheaths at base, 3 or 4 leaves near base, and 6–8 bractlike leaves above. Leaf blade narrowly oblong, narrowly elliptic, or narrowly spatulate, 9–15 × 2–2.5 cm, papery, base attenuate into amplexicaul sheath, apex acuminate or acute. Raceme loosely 15–30-flowered, 10–18 cm; floral bracts lanceolate, much shorter than ovary, apex aristate; ovary twisted, cylindrical-fusiform, glabrous, including pedicel ca. 15 mm. Flowers pinkish white. Dorsal sepal forming a hood with petals, erect, oblong-ovate, concave, ca. 4 × 2.5 mm, 3-veined, apex obtuse; lateral sepals reflexed,

oblique, narrowly ovate, ca.  $4.5 \times 2$  mm, 2-veined, apex obtuse. Petals obliquely oblong-ovate, ca.  $4 \times 1.7$  mm, with 1 vein, apex obtuse; lip deeply 3-lobed above base; lateral lobes divergent, pendulous, filiform, 9–10 mm; mid-lobe narrowly ligulate,  $4-5 \times$  ca. 1 mm; spur pendulous, curved, ca. 21 mm, much longer than ovary, slender, slightly dilated toward end; connective very narrow; pollinia inversely pear-shaped; caudicles long; viscidia ovate-elliptic. Fl. Oct.

- Forests; ca. 1200 m. SW Yunnan.

**54. *Habenaria furcifera*** Lindley, Gen. Sp. Orchid. Pl. 319. 1835.

密花玉凤花 mi hua yu feng hua

Plants to 50 cm tall. Tubers oblong,  $4-5 \times 2-2.5$  cm, fleshy. Stem erect, terete, slender, glabrous, with 6 leaves below middle and 11 sparse bractlike leaves above. Leaf blade elliptic to narrowly elliptic,  $8-18 \times 3-6.5$  cm, base contracted into amplexicaul sheath, apex acuminate or acute. Raceme densely many flowered, 9.5–13 cm, glabrous; floral bracts lanceolate, 7–15 mm, slightly shorter than or nearly as long as ovary, apex long acuminate. Flowers greenish, small, glabrous. Dorsal sepal forming a concave hood with petals, ovate, ca.  $4 \times 3$  mm, 3-veined, apex acute; lateral sepals reflexed, obliquely oblong-lanceolate, ca.  $4.5 \times 2$  mm, 3-veined, apex subobtuse. Petals lanceolate, concave, ca.  $4 \times 1.7$  mm, with 1 vein, attenuate toward apex, apex subobtuse; lip 3-lobed from base; lobes linear; lateral lobes slightly curved, ca. 7 mm; mid-lobe erect, ca. 5 mm; spur pendulous, curved, ca. 17 mm, much longer than ovary, slender; stigmas suboblong, small. Fl. Sep.  $2n = 42$ .

Forest margins, forests; 1100–1200 m. S Yunnan [Bhutan, India, Myanmar, Nepal, Thailand].

