

## 91. CYMBIDIUM Swartz, Nova Acta Regiae Soc. Sci. Upsal., ser. 2, 6: 70. 1799.

兰属 lan shu

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*Cyperorchis* Blume; *Iridorchis* Blume (1859), not *Iridorkis* Thouars (1809); *Jensoa* Rafinesque; *Liuguishania* Z. J. Liu & J. N. Zhang; *Semiphajus* Gagnepain, p.p.; *Wutongshania* Z. J. Liu & J. N. Zhang.

Herbs, epiphytic, lithophytic, or terrestrial, autotrophic or rarely mycotrophic, usually with pseudobulbs. Pseudobulbs ovoid, ellipsoid, or spindle-shaped, rarely absent or stemlike, often enclosed in leaf bases. Leaves several to many, distichous, usually lorate or linear, rarely oblanceolate to narrowly elliptic, often articulate toward base. Inflorescence arising from base of pseudobulb or rarely from axils of leaves, erect to pendulous; rachis several to many flowered, rarely reduced to a solitary flower; floral bracts persistent. Flowers large or medium-sized. Sepals and petals free, subsimilar; lip free or basally fused for 3–6 mm to base of column, usually 3-lobed; lateral lobes erect, often clasping column; mid-lobe often recurved; disk usually with 2 longitudinal lamellae extending from base of lip to base of mid-lobe; lamellae sometimes inflated toward apex or broken in middle. Column rather long, often slightly arcuate, often narrowly winged; pollinia 2 and deeply cleft, or 4 and in 2 unequal pairs, waxy, commonly attached by a very short or indistinct caudicle to a usually broad viscidium.

About 55 species: tropical and subtropical Asia, south to Papua New Guinea and Australia; 49 species (19 endemic) in China.

In China, many species of *Cymbidium* have been cultivated as ornamentals for many centuries, and a number of cultivated species that have been selected from wild populations now exhibit extreme variation; this is particularly true of *C. ensifolium*, *C. goeringii*, *C. sinense*, and *C. tortisepalum*. Some of this variability may be the result of hybridization and introgression in the wild. The large number of recently described naturally occurring hybrids in *Cymbidium* can be explained by the rapid increase of disturbed habitats in China, which has allowed previously ecologically isolated but sympatric species to colonize disturbed areas, such as those left after logging or land-use change.

*Cymbidium gongshanense* H. Li & G. H. Feng (Acta Bot. Yunnan. 11: 39. 1989) may be a cultivated hybrid.

- 1a. Plants without green leaves at anthesis.
  - 2a. Typical roots absent, or if present less than 1 cm ..... 48. *C. macrorhizon*
  - 2b. Typical roots present, 8–12 cm.
    - 3a. Leaves apparently not produced; flowers not opening widely; sepals, petals, and lip purple-red to yellowish ..... 49. *C. multiradicatum*
    - 3b. Leaves emerging after anthesis; flowers opening widely; sepals, petals, and lip greenish to whitish with purplish red markings ..... 47. *C. rhizomatosum*
- 1b. Plants with green leaves at anthesis.
  - 4a. Leaves narrowly elliptic or narrowly elliptic-oblanceolate, contracted into a distinct petiole-like stalk at base.
    - 5a. Inflorescence 20–40-flowered; lip unlobed or obscurely 3-lobed, with 2 fleshy calli ..... 9. *C. devonianum*
    - 5b. Inflorescence 1–9-flowered; lip distinctly 3-lobed, with 2 lamellae or ridges.
      - 6a. Pseudobulbs nearly as long as or slightly longer than wide; lip fused at base to basal margins of column for 2–3 mm; pollinia 2 ..... 28. *C. tigrinum*
      - 6b. Pseudobulbs more than 2 × as long as wide; lip not fused at base to basal margins of column; pollinia 4.
        - 7a. Pseudobulbs bilaterally flattened, usually tapering toward apex; leaves basally contracted into a petiole-like stalk 3–18 cm; inflorescence usually 2–6-flowered; lateral lobes of lip white with purplish brown markings ..... 45. *C. lancifolium*
        - 7b. Pseudobulbs cylindrical, not flattened nor tapering toward apex; leaves basally contracted into a petiole-like stalk 1–2.5 cm; inflorescence usually 1-flowered; lateral lobes of lip purple ..... 46. *C. recurvatum*
  - 4b. Leaves lorate or nearly so, usually not contracted into a petiole-like stalk at base (except in *C. baoshanense*, *C. qiubeiense*, and *C. teretipetiolatum*).
    - 8a. Lip fused to basal margins of column for 2–10 mm.
      - 9a. Inflorescence pendulous, 13–35-flowered.
        - 10a. Flowers not pendulous, opening widely, not bell-shaped ..... 25. *C. concinnum*
        - 10b. Flowers pendulous, not opening widely, bell-shaped.
          - 11a. Flowers cream-yellow to pale yellow-green; leaves 1–1.7(–2) cm wide ..... 26. *C. elegans*
          - 11b. Flowers tawny-brown; leaves 0.8–1(–1.2) cm wide ..... 27. *C. cochleare*
      - 9b. Inflorescence erect or arching, 1–11(–15)-flowered.
        - 12a. Inflorescence arising from leaf axils; leaves usually 10–18, bilobed at apex.
          - 13a. Pseudobulb stemlike, continuously elongating, 10–30 cm ..... 24. *C. mastersii*
          - 13b. Pseudobulb not stemlike, generally less than 10 cm.

- 14a. Lip with a purple-red V-shaped patch on mid-lobe ..... 23. *C. changningense*
- 14b. Lip without a V-shaped patch on mid-lobe.
  - 15a. Inflorescence 1- or rarely 2(or 3)-flowered; petals 55–70 × 13–18 mm ..... 21. *C. eburneum*
  - 15b. Inflorescence 2–11(–15)-flowered; petals 46–52 × 8–12 mm ..... 22. *C. maguanense*
- 12b. Inflorescence arising from base of pseudobulb; leaves usually 3–9, unlobed at apex.
  - 16a. Sepals and petals white or pinkish, sometimes tinged pale red-brown or cream-yellow.
    - 17a. Inflorescence suberect, longer than or nearly as long as leaves; lateral sepals spreading horizontally or nearly so; petals spreading, never clasping column; lip mid-lobe ovate, apex acute ..... 19. *C. insigne*
    - 17b. Inflorescence arching to pendulous, usually shorter than leaves; lateral sepals pendulous or downcurved; petals clasping column; lip mid-lobe obovate to nearly oblate, apex obtuse to slightly emarginate ..... 20. *C. wenshanense*
  - 16b. Sepals and petals green, olive-green, apple-green, yellowish green, or brown-yellow.
    - 18a. Mid-lobe of lip with a large, red to chestnut V-shaped patch; patch densely velvety hairy ..... 17. *C. lowianum*
    - 18b. Mid-lobe of lip with or without a V-shaped patch but patch never velvety hairy.
      - 19a. Mid-lobe of lip with 2 or 3 rows of long hairs running from middle of mid-lobe to apices of lamellae.
        - 20a. Lip without a row of long hairs between 2 lamellae on disk ..... 12. *C. iridioides*
        - 20b. Lip with a row of long hairs between 2 lamellae on disk.
          - 21a. Flowers 13–14 cm in diam.; sepals and petals with distinct dark red-brown venation and spots; lip 45–60 mm, with dark red-brown marks and 3 rows of suberect hairs 5–6 mm on mid-lobe ..... 10. *C. tracyanum*
          - 21b. Flowers 7–8 cm in diam.; sepals and petals usually without red-brown venation, or, if present, indistinct and pale; lip 30–32 mm, without dark red-brown markings, with 3 rows of soft hairs 1–3 mm on mid-lobe ..... 11. *C. gaoligongense*
      - 19b. Mid-lobe of lip without rows of long hairs.
        - 22a. Column purple-red at apex, with purple-red spots below; mid-lobe of lip yellow with many purple-red striations and irregular dashes ... 13. *C. sichuanicum*
        - 22b. Column not tinged purple-red at apex; mid-lobe of lip without markings as above.
          - 23a. Sepals and petals green with heavy reddish brown longitudinal stripes and irregular spots ..... 14. *C. erythraeum*
          - 23b. Sepals and petals usually without striations and spots, or, if present, inconspicuous and pale red-brown.
            - 24a. Leaves somewhat oblanceolate, base contracted into a distinct petiole-like stalk ..... 29. *C. baoshanense*
            - 24b. Leaves lorate, not or indistinctly contracted at base.
              - 25a. Mid-lobe of lip with a large, V-shaped, chestnut patch not composed of spots or blotches ..... 18. *C. schroederi*
              - 25b. Mid-lobe of lip without or with a V-shaped patch composed of spots and blotches.
                - 26a. Sepals and petals green, without longitudinal reddish brown veins; mid-lobe of lip with chestnut spots and striations; lateral lobes with chestnut stripes composed of small spots ..... 15. *C. hookerianum*
                - 26b. Sepals and petals yellowish green, indistinctly with a few longitudinal reddish brown veins; mid-lobe of lip with a submarginal V-shaped reddish brown patch composed of dense spots and blotches along apical margin; lateral lobes with brown striations ..... 16. *C. wilsonii*
    - 8b. Lip not fused to basal margins of column.
      - 27a. Pollinia 2, each cleft.

- 28a. Inflorescence erect to suberect, densely 15–50-flowered.
  - 29a. Leaves 0.8–1.8 cm wide, midvein usually raised more than 2 lateral veins on abaxial surface; column not auriculate at base ..... 7. *C. floribundum*
  - 29b. Leaves 2–3.5 cm wide, midvein not usually raised; column auriculate at base ..... 8. *C. suavisimum*
- 28b. Inflorescence usually arcuate to pendulous, laxly 5–35-flowered.
  - 30a. Apices of sepals acute or acuminate, porrect.
    - 31a. Dorsal sepal 42–48 mm, whitish or yellowish brownish with purple-brown veins ..... 6. *C. aestivum*
    - 31b. Dorsal sepal 14–33 mm, white with a central purple stripe ..... 5. *C. dayanum*
  - 30b. Apices of sepals usually obtuse, spreading or pendulous.
    - 32a. Sepals 28–33 mm; lip white with 4 purple spots or short streaks on mid-lobe ..... 4. *C. atropurpureum*
    - 32b. Sepals and petals 14–23 mm; lip mid-lobe with longitudinal purple stripes, dense spots, or flushed purple.
      - 33a. Lip with longitudinal purple stripes on mid-lobe, lateral lobes acute, callus interrupted ..... 1. *C. aloifolium*
      - 33b. Lip densely spotted or flushed with purple, lateral lobes obtuse or rounded, callus ridges entire.
        - 34a. Leaves 2–4; sepals and petals dark purplish red or blackish purple, with yellow margins ca. 0.8 mm wide; fl. Oct–Nov ..... 3. *C. paucifolium*
        - 34b. Leaves 4–6; sepals and petals yellowish to whitish, with a central purplish red or maroon-brown longitudinal stripe 3–4 mm wide; fl. Mar–Apr ..... 2. *C. manni*
- 27b. Pollinia 4, in 2 pairs.
  - 35a. Leaves not articulate toward base.
    - 36a. Lip unlobed or obscurely 3-lobed, disk without keels or lamellae ..... 44. *C. teretipetiolatum*
    - 36b. Lip distinctly 3-lobed, disk with keels or lamellae.
      - 37a. Plants with a many-noded, cylindric, usually shortly branched, subterranean rhizome usually more than ca. 1 cm in diam.; column 6–7 mm ..... 43. *C. nanulum*
      - 37b. Plants without a rhizome as above; column more than 10 mm.
        - 38a. Pseudobulbs inconspicuous; leaves with translucent veins; floral bracts ca. 1/2 as long as ovary ..... 42. *C. faberi*
        - 38b. Pseudobulbs conspicuous, 0.8–2 cm; leaves without translucent veins; floral bracts exceeding ovary.
          - 39a. Leaves 3–5, usually 23–38 cm; inflorescence usually 1-flowered; flower thickly textured; sepals 11–13 mm wide ..... 40. *C. serratum*
          - 39b. Leaves 5–7(–10), usually 40–65 cm; inflorescence 2–7-flowered; flowers thinly textured; sepals 8–9 mm wide ..... 41. *C. tortisepalum*
    - 35b. Leaves articulate toward base.
      - 40a. Only terminal pseudobulb with leaves; leaves deciduous in winter ..... 34. *C. defoliatum*
      - 40b. Most of pseudobulbs with leaves; leaves persistent in winter.
        - 41a. Flowers 2–3 cm in diam.; sepals and petals to 17 mm; lip obscurely 3-lobed ... 35. *C. micranthum*
        - 41b. Flowers 4–7 cm in diam.; sepals and petals 17 mm or longer; lip distinctly 3-lobed.
          - 42a. Leaves 9–13 or more, strongly distichous-equant and with broad membranous margins 1–3 mm wide at base ..... 30. *C. cyperifolium*
          - 42b. Leaves 2–7(–10), base not strongly distichous-equant, lacking broad membranous margins at base.
            - 43a. Inflorescence 1- or very rarely 2-flowered; floral bract exceeding ovary ..... 39. *C. goeringii*
            - 43b. Inflorescence 3- to many flowered; floral bracts shorter than or nearly as long as ovary.
              - 44a. Pseudobulbs inconspicuous; floral bracts nearly as long as ovary; plant flowering twice per year ..... 38. *C. omeiense*
              - 44b. Pseudobulbs conspicuous; floral bracts shorter than ovary; plant flowering once per year.
                - 45a. Floral bracts at middle part of inflorescence ca. as long as or more than 1/2 length of pedicel and ovary.
                - 46a. Leaves usually slightly tinged purplish, base

- contracted into a long, filiform petiole-like stalk ..... 37. *C. qiubeiense*
- 46b. Leaves not tinged purplish, not contracted at base into a petiole-like stalk ..... 36. *C. kanran*
- 45b. Floral bracts at middle part of inflorescence shorter than 1/2 length of ovary.
- 47a. Leaves dark glossy green, (1.5–)2–3 cm wide, articulate 3.5–7 cm from base; inflorescence 10–20-flowered ..... 32. *C. sinense*
- 47b. Leaves green, 1–1.5(–2.5) cm wide, articulate 2–4 cm from base; inflorescence 3–9(–13)-flowered.
- 48a. Leaves 30–60 cm, margin sometimes serrate toward apex; lip mid-lobe ovate, with a few red spots, margin kinked ..... 31. *C. ensifolium*
- 48b. Leaves 50–200 cm, usually lacking serrations along margin; lip mid-lobe triangular-elliptic, with transverse fine red spots, margin undulate, not kinked ..... 33. *C. haematodes*

**1. *Cymbidium aloifolium*** (Linnaeus) Swartz, Nova Acta Regiae Soc. Sci. Upsal., ser. 2, 6: 73. 1799.

纹瓣兰 wen ban lan

*Epidendrum aloifolium* Linnaeus, Sp. Pl. 2: 953. 1753; *Cymbidium pendulum* (Roxburgh) Swartz; *C. simulans* Rolfe; *E. pendulum* Roxburgh.

Plants epiphytic, autotrophic. Pseudobulbs ovoid, bilaterally flattened, 3–6(–10) × 2.5–4 cm, usually enclosed in leaf bases. Leaves 4 or 5, lorate, 40–90 × 1.5–4(–6) cm, thickly leathery, articulate 8–16 cm from base, apex obtuse and unequally 2-lobed. Inflorescence arising from within sheaths at base of pseudobulb, pendulous, 20–60 cm; rachis (20–)25–35-flowered; floral bracts 2–5 mm. Flowers slightly fragrant, medium-sized; pedicel and ovary 12–20 mm; sepals and petals pale yellow to cream-yellow, with a broad, central maroon-brown stripe; lip white or cream-colored, with dense, maroon venation on lateral lobes and longitudinal maroon stripes on mid-lobe. Sepals spreading, narrowly oblong to narrowly elliptic, 15–20 × 4–6 mm, apex obtuse. Petals narrowly elliptic, 14–18 × 4–6 mm, apex obtuse to acute; lip subovate, 13–20 mm, not fused to basal margins of column, base slightly saccate, 3-lobed; lateral lobes acute, loosely clasping column and exceeding column and anther; mid-lobe recurved; disk minutely papillate or puberulent, with 2 sigmoid lamellae; lamellae usually broken in middle and inflated toward base and apex. Column slightly arcuate, 10–12 mm; pollinia 2. Capsule oblong-ellipsoid, 35–65 × 20–30 mm. Fl. Apr–May, fr. Aug.  $2n = 40^*$ .

Large branches or tree trunks in open forests and thickets, cliffs along streamsides and valleys, rocks in monsoon forests; 100–1100 m. Guangdong, Guangxi, Guizhou, S and SE Yunnan [Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam].

**2. *Cymbidium mannii*** H. G. Reichenbach, Flora 55: 274. 1872.

硬叶兰 ying ye lan

*Cymbidium bicolor* Lindley subsp. *obtusum* Du Puy & P. J. Cribb; *C. flaccidum* Schlechter.

Plants epiphytic, autotrophic. Pseudobulbs narrowly ovoid, slightly bilaterally flattened, 2.5–5 × 2–3 cm, enclosed in leaf bases. Leaves (4 or)5–7, lorate, 22–80 × 1–1.8 cm, thickly leathery, apex acute and unequally 2-lobed, sometimes emarginate; basal sheaths with black membranous margins 1–1.5 mm wide. Inflorescence arising from within sheaths at base of pseudobulb, pendulous or arching, 17–28 cm; rachis usually 10–20-flowered; floral bracts subtriangular, 1.5–4.5 mm. Flowers medium-sized, 3–4 cm in diam.; pedicel and ovary 10–15 mm; sepals and petals yellowish to whitish, with a central purplish red or maroon-brown longitudinal stripe 3–4 mm wide; lip white or cream-yellow, spotted, striped, or sometimes heavily tinged purple-red or purple-brown except at base and margins. Sepals spreading, narrowly oblong, 14–20 × 3–5 mm, apex obtuse to acute. Petals narrowly subelliptic, 12–17 × 3–4 mm, apex obtuse to subacute; lip subovate, 12–14 mm, not fused to basal margins of column, base slightly saccate, 3-lobed; lateral lobes shorter than or ca. as long as column and anther; mid-lobe recurved; disk minutely papillate or puberulent, with 2 longitudinal lamellae slightly inflated toward base and apex. Column slightly arcuate, 8–12 mm, base with a very short foot; pollinia 2. Capsule subellipsoid, 35–50 × 25–30 mm. Fl. Mar–Apr, fr. Jul–Aug.

Trees in forests and thickets; 100–1600 m. Guangdong, Guangxi, Guizhou, Hainan, SE and SW Yunnan [Bangladesh, Bhutan, Cambodia, India, Laos, Malaysia, Myanmar, Nepal, Thailand, Vietnam].

**3. *Cymbidium paucifolium*** Z. J. Liu & S. C. Chen, J. Wuhan Bot. Res. 20: 350. 2002.

少叶硬叶兰 shao ye ying ye lan

Plants epiphytic, autotrophic. Pseudobulbs narrowly ovoid, slightly bilaterally flattened, 7–8 × 4–5 cm, enclosed in leaf bases when young. Leaves 2–4, deep green, lorate, 33–64 × 3–4.7 cm, rigid, thickly leathery, articulate 7–8 cm from base, apex obtuse and unequally 2-lobed. Inflorescence arising from within sheaths at base of pseudobulb, arching or pendulous, 25–40 cm; rachis 14.5–23 cm, 6–11-flowered; floral bracts triangular, ca. 3 mm. Flowers slightly scented, ca. 4 cm in diam.; pedicel and ovary 22–25 mm; sepals and petals dark purplish

red or blackish purple with yellow margins ca. 0.8 mm wide; lip purple-red, with yellowish spots near base, white speckles on lateral lobes and yellow margins on mid-lobe. Sepals spreading, narrowly oblong or narrowly ligulate-elliptic, 20–23 × 5.5–6.5 mm, apex obtuse. Petals narrowly oblong, 18–20 × 4.5–5.5 mm, apex obtuse; lip subovate in outline, 17–20 × 14–15 mm, not fused to basal margins of column, base saccate, 3-lobed; lateral lobes erect, subovate, weakly clasping and exceeding column and anther; mid-lobe recurved, broadly oblong-elliptic, 8–9 × 8–9 mm; disk with 2 cream-white or yellow lamellae. Column slightly arcuate, ca. 12 mm, base with a very short foot; pollinia 2. Fl. Oct–Nov.

- Trees. S Yunnan.

This species is very close to *Cymbidium mannii* in its floral morphology. It has fewer, broader leaves, similar to those of *C. aloifolium*, and is said to flower at a different time. The possibility of a hybrid origin between these species cannot be dismissed.

**4. *Cymbidium atropurpureum*** (Lindley) Rolfe, *Orchid Rev.* 11: 190. 1903.

椰香兰 *ye xiang lan*

*Cymbidium pendulum* (Roxburgh) Swartz var. *atropurpureum* Lindley, *Gard. Chron.* 1854: 287. 1854; *C. atropurpureum* var. *olivaceum* J. J. Smith; *C. finlaysonianum* Wallich ex Lindley var. *atropurpureum* (Lindley) Veitch; *C. pendulum* var. *purpureum* W. Watson.

Plants epiphytic or rarely lithophytic, autotrophic. Pseudobulb ovoid, often weakly inflated, bilaterally flattened, to 10 × 6 cm, enclosed in persistent leaf bases and ca. 4 scarious cataphylls. Leaves usually 7–9, arching, ligulate, to 50–90(–125) × 1.5–4 cm, leathery, rigid, articulate to a broadly sheathing base to 15–20 cm, apex obtuse and unequally bilobed; shortest leaves reduced to cataphylls with an abscission zone near apex and a short blade. Inflorescence arising from within cataphylls, arching or pendulous, 28–75 cm; peduncle 5–16 cm, covered basally by 6–8 overlapping, cymbiform, acute, spreading sheaths to 7 cm; rachis pendulous, pale green, often flushed with purple, 20–55 cm, (7–)10–33-flowered; floral bracts triangular, 1–4 mm. Flowers usually coconut-scented, 3.5–4.5 cm in diam.; pedicel and ovary 15–26 mm, pale green, often flushed with purple; sepals deep maroon to dull yellow-green, strongly stained maroon; lip white, becoming yellow with age, lateral lobes stained maroon-purple, mid-lobe yellow in front of callus ridges and with maroon blotches; callus ridges bright yellow toward apex, stained maroon below; column deep maroon, sometimes paler at apex, anther cap white or pale yellow. Dorsal sepal spreading, suberect, narrowly ligulate-elliptic, 28–33 × 7–10 mm, margin revolute, apex obtuse; lateral sepals pendulous, similar, falcate, oblique. Petals weakly porrect, narrowly elliptic, 25–30 × 7.5–11 mm, margins sometimes revolute, apex obtuse or subacute; lip 21–25 × 13–15 mm when flattened, not fused to basal margins of column, 3-lobed, usually broadest across mid-lobe; lateral lobes erect, much shorter than column, apices obtuse and appearing truncate; mid-lobe weakly recurved, broadly ovate to rhombic, 11–13 × 13–14 mm, margin entire, apex obtuse to emarginate; disk minutely papillose to minutely pubescent (hairs longest on tips of lateral lobes), with

a callus of 2 sigmoid raised ridges rounded and confluent at their apices and merging gradually with base of mid-lobe. Column arcuate, 16–18 × ca. 3.5 mm, winged; pollinia 2, triangular, 2–2.5 mm, deeply cleft, borne on a broadly triangular viscidium, tapering to acuminate apices. Fl. Mar–May.

Forks of forest trees, occasionally on rocks, evergreen and riverine forests; sea level to 1200 m. Hainan [Indonesia (Borneo, Java, Sumatra), Malaysia, Philippines, S Thailand, S Vietnam].

*Cymbidium atropurpureum* may be a naturalized species in China. The present authors have seen no Chinese specimens in any herbarium; nor have they seen any living plants in the wild, although one of us (Cribb) has seen a photograph by Gloria Siu of a wild plant of *C. atropurpureum* in Hainan. The species was misidentified as *C. bicolor* subsp. *obtusum* (a synonym of *C. mannii* in the present treatment) in S. Y. Ding and J. M. Yin (Ill. Wild Orchids Hainan Island, 36. 2005).

**5. *Cymbidium dayanum*** H. G. Reichenbach, *Gard. Chron.* 1869: 710. 1869.

冬凤兰 *dong feng lan*

*Cymbidium alborubens* Makino; *C. dayanum* var. *albiflorum* S. S. Ying; *C. dayanum* var. *austrojaponicum* Tuyama; *C. dayanum* subsp. *leachianum* (H. G. Reichenbach) S. S. Ying; *C. dayanum* var. *leachianum* (H. G. Reichenbach) S. S. Ying; *C. eburneum* Lindley var. *austrojaponicum* (Tuyama) Hiroe; *C. leachianum* H. G. Reichenbach; *C. poilanei* Gagnepain; *C. simonsianum* King & Pantling; *C. sutepense* Rolfe ex Downie.

Plants epiphytic, autotrophic. Pseudobulbs nearly fusiform, ± bilaterally flattened, 2–5 × 1.5–2.5 cm, enclosed in leaf bases. Leaves 4–9, deep green, lorate, 32–60(–110) × 0.7–1.3 cm, papery, usually with 2 lateral veins raised more than mid-vein abaxially (especially toward base), articulate 7–12 cm from base, apex acuminate. Inflorescence arising from within sheaths at base of pseudobulb, arching or pendulous, 18–35 cm; rachis laxly 5–9-flowered; floral bracts subtriangular, 4–5 mm. Flowers usually not fragrant, 4–5 cm in diam.; pedicel and ovary 10–20 mm, elongating in fruit; sepals and petals white or cream-yellow, with a central maroon stripe extending from base to slightly above middle or occasionally wholly tinged pale purplish red; lip maroon, tinged white at its base and at center of mid-lobe, lateral lobes with dense white stripes. Sepals porrect, narrowly oblong-elliptic, 22–27 × 5–7 mm, apex acute or acuminate. Petals narrowly ovate-oblong, 17–23 × 4–6 mm, apex acute; lip subovate, 15–19 mm, not fused to basal margins of column, 3-lobed; lateral lobes nearly as long as column; mid-lobe recurved, 7–9 mm; disk densely glandular-papillose, with 2 longitudinal lamellae extending from base of lip to base of mid-lobe; lamellae continuous with 2 glandular-hairy lines that extend from apices of lamellae to middle of mid-lobe. Column slightly arcuate, 9–10 mm; pollinia 2. Capsule ellipsoid, 40–50 × 20–28 mm. Fl. Aug–Dec, fr. Feb–Apr.  $2n = 40^*$ .

Trees in open forests, cliffs along streamsides; 300–1600 m. S Fujian, Guangdong, Guangxi, Hainan, Taiwan, S Yunnan [Bhutan, Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

**6. *Cymbidium aestivum*** Z. J. Liu & S. C. Chen, *J. Wuhan Bot. Res.* 22: 323. 2004.

夏凤兰 *xia feng lan*

Plants lithophytic, autotrophic. Pseudobulbs subfusiform, slightly bilaterally flattened, 1.5–2.5 × 1.5–2 cm, enclosed in leaf bases. Leaves 4–8, lorate, 32–36 × 0.8–1.6 cm, papery, with midvein raised abaxially, articulate 3–6 cm from base, apex acuminate. Inflorescence lateral, spreading horizontally or arching; rachis laxly 10–13-flowered; floral bracts lanceolate, 10–15 mm. Flowers not scented, 4–6 cm in diam.; pedicel and ovary 25–35 mm; pedicel elongating in fruit; sepals and petals whitish or yellowish heavily tinged pale purple-brown, dorsal sepal with purple-brown veins; lip dark purple with a yellow-green, triangular-lanceolate patch at center. Dorsal sepal porrect, lanceolate or linear-lanceolate, 42–48 × 8–9 mm, apex acuminate or sharply acute; lateral sepals porrect, slightly narrower and oblique. Petals narrowly oblong-lanceolate, 28–32 × 7–8 mm, apex sharply acute; lip ovate-oblong, 27–30 × 10–12 mm, not fused to basal margins of column, 3-lobed below middle; lateral lobes erect, suborbicular, slightly clasping column; mid-lobe recurved, ovate-oblong, 16–18 × 8–11 mm; disk with 2 glandular-pubescent lamellae extending from base of lip to near base of mid-lobe. Column 13–14 mm; pollinia 2. Fl. Jun–Aug.

• Mossy rocks in forests along valleys; 1500–1600 m. S Yunnan (Mengla).

This species is morphologically similar to *Cymbidium dayanum*, differing in its larger flowers more heavily tinged with purple. *Cymbidium dayanum* in Borneo has dark purple flowers. The possibility that it is a polyploid of *C. dayanum*, or a hybrid of it, should be investigated.

**7. *Cymbidium floribundum*** Lindley, Gen. Sp. Orchid. Pl. 162. 1833.

多花兰 *duo hua lan*

*Cymbidium chawalongense* C. L. Long, H. Li & Z. L. Dao; *C. floribundum* var. *pumilum* (Rolfe) Y. S. Wu & S. C. Chen; *C. illiberale* Hayata; *C. pumilum* Rolfe.

Plants epiphytic, autotrophic. Pseudobulbs subovoid, slightly bilaterally flattened, 2.5–3.5 × 2–3 cm, enclosed in leaf bases and surrounded by several green sheaths. Leaves usually 5 or 6, lorate, 22–50 × 0.8–1.8 cm, papery, with midvein usually raised more than 2 lateral veins abaxially (especially toward base), articulate 2–6 cm from base, apex obtuse or acute. Inflorescence arising from within sheaths at base of pseudobulb, suberect, 16–28(–35) cm; rachis usually densely 10–40-flowered; floral bracts 2–10 mm. Flowers usually not scented, 3–4 cm in diam.; pedicel and ovary 15–30 mm; sepals and petals reddish brown or occasionally greenish yellow, very rarely grayish brown; lip white, mottled purplish red on lateral lobes and mid-lobe. Sepals narrowly oblong, 16–18 × 4–7 mm, apex obtuse. Petals narrowly elliptic, 14–16 × 4–7 mm, apex obtuse; lip subovate in outline, 16–18 mm, not fused to basal margins of column, 3-lobed; lateral lobes erect; mid-lobe slightly recurved; disk minutely papillate, with 2 longitudinal lamellae nearly convergent at their apices. Column slightly arcuate, 11–14 mm; pollinia 2, deltoid. Capsule suboblong, 3–4 × 1.3–2 cm. Fl. Apr–Aug, fr. Oct–Dec.  $2n = 40^*$ .

Trees in forests or at forest margins, rocks and cliffs along stream-

sides or valleys; 100–3300 m. N Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, E Sichuan, Taiwan, Xizang, NW and SE Yunnan, Zhejiang [Vietnam].

**8. *Cymbidium suavissimum*** Sander ex C. H. Curtis, Gard. Chron., ser. 3, 84: 137. 1928.

果香兰 *guo xiang lan*

Plants lithophytic or terrestrial, autotrophic. Pseudobulbs subovoid, slightly bilaterally flattened, 5–6 × 2–3 cm, enclosed in leaf bases, surrounded by several purple sheaths when young. Leaves 5–7, arching, lorate, 40–70 × 2–3.5 cm, papery, rather soft, articulate 3–6 cm from base, apex acute. Inflorescence arising from base of pseudobulb, usually suberect, 40–50 cm; rachis densely 20–50-flowered; floral bracts small. Flowers sweetly fruit-scented, 3–4 cm in diam.; pedicel and ovary 25–40 mm; sepals and petals usually dull yellowish, flushed reddish brown; lip white with purple-red markings. Sepals similar, subelliptic, 20–25 × 6–8 mm, apex obtuse. Petals oblong-elliptic, ca. 20 × 6 mm, apex obtuse; lip subovate, 16–17 × 10–12 mm, not fused to basal margins of column, 3-lobed; lateral lobes erect; mid-lobe recurved, broadly ovate; disk minutely papillate, with 2 lamellae slightly convergent at their apices. Column slightly arcuate, ca. 14 mm, with 2 small auricles placed laterally at base; pollinia 2. Fl. Jul–Aug.

Open forests; 700–1100 m. SW Guizhou, W Yunnan [Myanmar, N Vietnam].

**9. *Cymbidium devonianum*** Paxton, Paxton's Mag. Bot. 10: 97. 1843.

福兰 *fu lan*

*Cymbidium rigidum* Z. J. Liu & S. C. Chen.

Plants terrestrial or lithophytic, autotrophic. Pseudobulbs subcylindric, 1.5–2.5 × ca. 1 cm, enclosed in leaf bases. Leaves 2–4, suberect, oblong-oblancoate, 22–27 × 3.5–4.7 cm, leathery, with a prominent midvein, tapering into a petiole-like stalk at base, apex acute or obtuse; petiole-like stalk slender, 15–23 × 0.4–0.5 cm, channeled, articulate near middle. Inflorescence arising from base of pseudobulb, suberect or slightly arching, 36–50 cm, with several sheaths toward base; rachis 20–30 cm, 20–40-flowered; floral bracts ovate-lanceolate, 4–5 mm. Flowers purplish brown, ca. 3.5 cm in diam.; pedicel and ovary 15–20 mm. Sepals narrowly elliptic to ovate-lanceolate, 20–22 × 6–7 mm, apex acuminate. Petals narrowly elliptic-lanceolate, 16–19 × 5.5–6 mm, apex acuminate; lip slightly recurved, subrhombic or obovate-rhombic, 13–15 × ca. 10 mm, not fused to basal margins of column, unlobed or sometimes obscurely 3-lobed, apical margins slightly crisped; disk with 2 fleshy calli centrally. Column slightly arcuate, 10–12 mm. Fl. Mar–Apr.  $2n = 40$ .

In shade on rocks and trees. SE Yunnan (Pingbian) [Bhutan, India, Nepal, NE Thailand, N Vietnam].

**10. *Cymbidium tracyanum*** L. Castle, J. Hort. Cottage Gard., ser. 3, 21: 513. 1890.

西藏虎头兰 *xi zang hu tou lan*

*Cyperorchis tracyana* (L. Castle) Schlechter.

Plants epiphytic, autotrophic. Pseudobulbs ellipsoid-ovoid or oblong-ovoid, 5–11 × 2–5 cm, mostly enclosed in leaf bases. Leaves 5–8 or more, lorate, 55–80 × (1.5–)2–3.4 cm, articulate 7–14 cm from base, apex acute. Inflorescence arising from within sheaths at base of pseudobulb, arching or suberect, 65–100 cm or longer; rachis usually more than 10-flowered; floral bracts ovate-triangular, 3–5 mm. Flowers fragrant, 13–14 cm in diam.; pedicel and ovary 30–55 mm; sepals and petals yellowish green to olive-green, with irregular dark red-brown venation and spots; lip pale yellow to cream-yellow with dark red-brown venation on lateral lobes and with vertical dashes and scattered spots of same color on mid-lobe, lamellae cream and red spotted. Sepals narrowly elliptic, (45–)55–70 × 17–20 mm, apex acute; lateral sepals slightly oblique and twisted. Petals falcate, slightly twisted, 45–65 × 7–12 mm, apex acute; lip ovate-elliptic, 45–60 mm, base fused to basal margins of column for 4–5 mm, 3-lobed; lateral lobes erect; mid-lobe recurved, elliptic; disk long ciliate and with reddish brown hairs on veins of lateral lobes, sparsely ciliate on mid-lobe, with 2 central lamellae and with a row of long hairs 5–6 mm between lamellae; lamellae each with a row of long hairs 5–6 mm which extend to middle of mid-lobe. Column arcuate, 35–43 mm, winged, shortly hairy below middle on ventral surface; pollinia 2, deltoid, 3–4 mm. Capsule ellipsoid, 80–90 × 45–50 mm. Fl. Sep–Dec, fr. Feb–Mar.  $2n = 40$ .

Tree trunks and branches in forests, rocks by streambanks; 1200–1900 m. SW Guizhou, SE Xizang, SE and SW Yunnan [Myanmar, N Thailand, N Vietnam].

**11. *Cymbidium gaoligongense*** Z. J. Liu & J. Yong Zhang, J. Wuhan Bot. Res. 21: 316. 2003.

金蝉兰 jin chan lan

Plants epiphytic, autotrophic. Pseudobulbs ellipsoid-ovoid or narrowly ovoid, 5–10 × 3–5 cm, enclosed in leaf bases. Leaves distinctly distichous at base, 6–11, lorate, 70–90 × 2–3 cm, leathery, articulate 8–11 cm from base, apex acuminate. Inflorescence arising from within sheaths at base of pseudobulb, suberect or arching, 65–100 cm, rather slender, with 8–10 sheaths below middle; sheaths to 15 cm; rachis 30–40 cm, usually 8–10-flowered; floral bracts ovate-triangular, 3–5 mm. Flowers 7–8 cm in diam.; pedicel and ovary green, 15–38 mm; sepals and petals yellow-green or olive-green, sometimes with indistinct pale red-brown venation; lip yellow or sometimes cream-white with irregular yellow dashes and spots. Dorsal sepal narrowly obovate-oblong, 40–60 × 13–16 mm, apex acute; lateral sepals narrowly oblong, oblique, 34–50 × 12–15 mm, apex acute. Petals narrowly oblong, falcate, 37–56 × 6–9 mm, apex acute; lip subelliptic, 30–32 × 17–18 mm, base fused to basal margins of column for ca. 3 mm, 3-lobed; lateral lobes erect, subovate, minutely hairy on veins, margins strongly crisped and golden ciliate; mid-lobe recurved, broadly ovate, 8–10 × 8–10 mm, margin strongly crisped; disk sparsely hairy toward base, with 2 central lamellae bearing long hairs 1–3 mm and with a third, shorter row of hairs 1–3 mm between lamellae which merges with 2 other rows on mid-lobe. Column 30–38 mm, wings ca. 1.5 mm wide. Fl. Sep–Dec.

• Trees in forests; ca. 1500 m. W Yunnan (Baoshan: Gaoligong Shan).

This taxon is an albinistic form. It may be of hybrid origin or is possibly a form of *Cymbidium tracyanum*. It is somewhat intermediate in its floral and vegetative morphology between *C. tracyanum* and *C. erythraeum*, having the lip shape and callus type of the former and the leaf type, flower size, and petal shape of the latter. The latter is often found as an albinistic form in Gaoligong Shan. Further study is needed to establish the nature of *C. gaoligongense*.

**12. *Cymbidium iridioides*** D. Don, Prodr. Fl. Nepal. 36. 1825.

黄蝉兰 huang chan lan

*Cymbidium giganteum* Wallich ex Lindley, nom. illeg.; *Cyperorchis gigantea* Schlechter, nom. illeg.; *Iridorchis gigantea* Blume, nom. illeg.

Plants epiphytic, autotrophic. Pseudobulbs ellipsoid-ovoid to narrowly ovoid, bilaterally flattened, 4–11 × 2–5 cm, partially enclosed in leaf bases. Leaves 6–10, lorate, 45–70(–90) × (1.6–)2–4 cm, articulate 6–15 cm from base, apex acute. Inflorescence arising from within sheaths at base of pseudobulb, suberect or spreading horizontally, 40–70 cm or longer; rachis 3–17-flowered; floral bracts subtriangular, 2–3 mm. Flowers fragrant, 9–10 cm in diam.; pedicel and ovary 40–45 mm; sepals and petals yellowish green, with 7–9 brownish or reddish brown longitudinal stripes; lip yellowish, with reddish brown stripes on lateral lobes and similarly colored mottling on mid-lobe. Sepals narrowly obovate-oblong, 37–45 × 12–15 mm, apex acute. Petals slightly falcate, narrowly ovate-oblong, 35–46 × 7–9 mm, not twisted, apex acute; lip ovate-triangular, slightly shorter than petals, base fused to basal margins of column for 4–5 mm, 3-lobed; lateral lobes shortly ciliate; mid-lobe strongly recurved, margin erose and undulate; disk sparsely hairy, with 2 central lamellae extending to base of mid-lobe, lamellae thickened and with long hairs from midway along their length to their apices. Column arcuate, 25–29 mm, shortly hairy at base on ventral surface; pollinia 2, subtriangular. Capsule subellipsoid, 60–110 × 30–45 mm. Fl. Aug–Dec, fr. Feb–Apr.  $2n = 40, 80$ .

Trees or rocks in forests or thickets, shaded cliffs; 900–2800 m. SW Guizhou, SW Sichuan, SE Xizang, NW to SE Yunnan [Bhutan, India, Myanmar, Nepal, N Vietnam].

**13. *Cymbidium sichuanicum*** Z. J. Liu & S. C. Chen, Gen. Cymbidium China, 82. 2006.

川西兰 chuan xi lan

Plants epiphytic, autotrophic. Pseudobulbs subellipsoid, 6–10 × 2.8–3.3 cm, enclosed in leaf bases. Leaves 5–8, lorate, (30–)60–110 × 2–2.5 cm, leathery, articulate 10–15 cm from base, apex subacuminate. Inflorescence arising from base of pseudobulb, suberect, 50–70 cm, with 7–9 sheaths toward base; sheaths 2.5–12.5 cm; rachis 10–15-flowered; floral bracts lanceolate, 6–20 mm. Flowers slightly scented, 6–7 cm in diam.; pedicel and ovary 40–55 mm, red-brown; sepals and petals yellow-green, tinged pale purple-red, with 9–11 purple-red longitudinal stripes (stripes on petals usually composed of small spots toward base); lip yellow, tinged red-brown along margins, with purple-red striations and irregular dashes on both lateral lobes and mid-lobe; column purple-red at apex, with purple-red

spots below. Sepals narrowly elliptic, 55–59 × 18–20 mm, apex acute; lateral sepals slightly oblique, carinate on outer surface. Petals obovate-oblong, slightly falcate, 52–55 × 17–19 mm, apex acute; lip ovate-orbicular in outline, 43–46 mm, base fused to basal margins of column for 3–4 mm, 3-lobed; lateral lobes white ciliate; mid-lobe recurved, ovate, 17–19 × 21–23 mm, margin undulate; disk sparsely hairy along striations on lateral lobes, white pubescent on mid-lobe, with 2 lamellae extending from near base of lip almost to base of mid-lobe; lamellae white hairy. Column arcuate, 36–39 mm, hairy on ventral surface, narrowly winged. Fl. Feb–Mar.

• Trees in forests or rocks at forest margins; 1200–1600 m. NC Sichuan (Maoxian, Wenchuan).

**14. *Cymbidium erythraeum*** Lindley, J. Proc. Linn. Soc., Bot. 3: 30. 1858.

长叶兰 chang ye lan

Plants epiphytic or lithophytic, autotrophic. Pseudobulbs ovoid, bilaterally flattened, 2–6 × 1.5–3 cm, enclosed in leaf bases. Leaves distichous, 5–12, deep green tinged purple at base, lorate, 35–90 × 0.7–1.5 cm, articulate 2.5–6.5 cm from base. Inflorescence arising from within sheaths at base of pseudobulb, suberect or arching, 40–75 cm, slender; rachis 23–29 cm, 3–8-flowered; floral bracts subtriangular, 2–4 mm. Flowers fragrant, 6.5–8 cm in diam.; pedicel and ovary 25–43 mm; sepals and petals green with heavy reddish brown longitudinal stripes and irregular spots of same color, or uniformly greenish yellow; lip pale yellow or white with red-brown venation on lateral lobes and a few red-brown spots and a central longitudinal dash on mid-lobe, or white with yellow venation on lateral lobes and scattered yellow spots on mid-lobe. Sepals narrowly oblong-oblong to narrowly obovate-oblong, 34–52 × 7–14 mm, apex acute to obtuse. Petals falcate, ligulate, 33–53 × 4–7 mm, apex acute; lip elliptic-ovate, 24–43 mm, base fused to basal margins of column for 2–3 mm, 3-lobed; lateral lobes erect, subovate, sometimes shortly ciliate; mid-lobe slightly recurved, cordate to ensiform, 8–9 × 10–11 mm, sometimes sparsely shortly hairy; disk densely hairy at apices of lateral lobes, papillate near base and on mid-lobe, with 2 puberulent lamellae extending to base of mid-lobe; lamellae slightly swollen toward apices. Column 23–32 mm, narrowly winged, sparsely hairy toward base; pollinia 2, subtriangular. Capsule fusiform-ellipsoid, 40–50 × 20–30 mm. Fl. Oct–Jan, fr. Mar–May. *2n* = 40, 42.

Trees and rocks at forest margins and in forests; 1400–2800 m. C and SW Guizhou, SW Sichuan, SE Xizang, NW, SE, and W Yunnan [Bhutan, India, Myanmar, Nepal, Vietnam].

- 1a. Sepals and petals green, heavily flushed red-brown; lip pale yellow or white with red-brown venation on lateral lobes and red-brown spots on mid-lobe ..... 14a. var. *erythraeum*  
 1b. Sepals and petals uniformly greenish yellow; lip white with yellow venation on lateral lobes and yellow spots on mid-lobe ..... 14b. var. *flavum*

**14a. *Cymbidium erythraeum* var. *erythraeum***

长叶兰(原变种) chang ye lan (yuan bian zhong)

*Cyperorchis longifolia* (D. Don) Schlechter.

Sepals and petals green, heavily flushed red-brown; lip pale yellow or white with red-brown venation on lateral lobes and red-brown spots on mid-lobe, 30–43 cm.

Trees and rocks at forest margins and in forests; 1400–2800 m. C and SW Guizhou, SW Sichuan, SE Xizang, NW and SE Yunnan [Bhutan, India, Myanmar, Nepal].

**14b. *Cymbidium erythraeum* var. *flavum*** (Z. J. Liu & J. Yong Zhang) Z. J. Liu, S. C. Chen & P. J. Cribb, **comb. et stat. nov.**

黄花长叶兰 huang hua chang ye lan

Basionym: *Cymbidium flavum* Z. J. Liu & J. Yong Zhang, Orchidee (Hamburg) 53: 94. 2002.

Sepals and petals uniformly greenish yellow; lip white with yellow venation on lateral lobes and yellow spots on mid-lobe, 24–27 mm.

• Trees in evergreen broad-leaved Fagaceae forests; 2400–2800 m. SE and W Yunnan (Gaoligong Shan, Wenshan).

**15. *Cymbidium hookerianum*** H. G. Reichenbach, Gard. Chron. 1866: 7. 1866.

虎头兰 hu tou lan

*Cymbidium giganteum* Wallich ex Lindley var. *hookerianum* (H. G. Reichenbach) Bois; *C. grandiflorum* Griffith; *Cyperorchis grandiflora* (Griffith) Schlechter.

Plants epiphytic or lithophytic, autotrophic. Pseudobulbs narrowly ellipsoid to narrowly ovoid, bilaterally flattened, 3–8 × 1.5–3 cm, partially enclosed in leaf bases. Leaves 4–6(–8), lorate, 35–60(–80) × 1.4–2.3 cm, articulate (4)–6–10 cm from base, apex acute. Inflorescence arising from near base of pseudobulb, arching or suberect, 45–60(–70) cm; rachis 7–14-flowered; floral bracts ovate-triangular, 3–4 mm. Flowers slightly fragrant, 11–12 cm in diam.; pedicel and ovary 30–50 mm; sepals and petals apple-green or yellowish green with a few deep red spots or occasionally tinged pale reddish brown at base; lip white or cream-yellow with chestnut spots and striations on lateral lobes and mid-lobe, becoming purplish red following pollination. Sepals suboblong, 50–55 × 15–17 mm, apex acute. Petals narrowly oblong-oblong, 50–55 × 10–13 mm, apex acute; lip subelliptic, 45–50 mm, base fused to basal margins of column for 4–4.5 mm, 3-lobed; lateral lobes erect, ciliate; mid-lobe recurved, margin erose and undulate; disk sparsely minutely papillate or puberulent and densely so toward apices of lateral lobes, with 2 shortly hairy lamellae extending from base of lip to base of mid-lobe. Column arcuate, 33–40 mm, papillate or puberulent near base on ventral surface; pollinia 2, subtriangular. Capsule narrowly ellipsoid, 90–110 × ca. 40 mm. Fl. Jan–Apr, fr. Jun–Aug. *2n* = 38\*, 40\*.

Trees in forests, rocks along valleys; 1100–2700 m. S Guangxi, SW Guizhou, SW Sichuan, SE Xizang, Yunnan [Bhutan, NE India,



Nepal, N Vietnam].

**16. *Cymbidium wilsonii*** (Rolfe ex E. T. Cook) Rolfe, *Orchid Rev.* 12: 79. Mar 1904 [“*wilsonii*”].

滇南虎头兰 dian nan hu tou lan

*Cymbidium giganteum* Wallich ex Lindley var. *wilsonii* Rolfe ex E. T. Cook, *Garden* (London, 1871–1927) 65: 158. 27 Feb 1904 [“*wilsonii*”]; *Cyperorchis wilsonii* (Rolfe ex E. T. Cook) Schlechter.

Plants epiphytic, autotrophic. Pseudobulbs narrowly ovoid, bilaterally flattened, ca. 6 × 3 cm. Leaves 7, lorate, ca. 90 × 2.5 cm, articulate 6–11 cm from base, apex acute. Inflorescence suberect or arching, 25–70 cm; rachis 5–15-flowered; floral bracts triangular, very small. Flowers slightly fragrant, 9–10 cm in diam.; pedicel and ovary 22–42 mm; sepals and petals green or yellowish green with inconspicuous reddish brown longitudinal venation and more distinct reddish brown speckles along veins; lip cream-yellow with dark reddish brown striations on lateral lobes and with a submarginal V-shaped reddish brown patch composed of dense spots and blotches along apical margin of mid-lobe, becoming purplish red following pollination. Sepals narrowly obovate, 44–57 × 12–19 mm, apex acuminate. Petals narrowly obovate, 40–53 × 7–13 mm, apex acuminate; lip broadly ovate-elliptic, base fused to basal margins of column for 3.5–5 mm, 3-lobed; lateral lobes erect, ciliate; mid-lobe 15–18 mm, margin undulate; disk papillate or puberulent. Column 27–32 mm, broadly winged at apex, sparsely puberulent and papillate near base on ventral surface; pollinia 2, deltoid. Fl. Feb–Apr.

Trees in forests; ca. 2000 m. S Yunnan (Mengzi) [Vietnam].

**17. *Cymbidium lowianum*** (H. G. Reichenbach) H. G. Reichenbach, *Gard. Chron.*, n.s., 11: 332. 1879.

碧玉兰 bi yu lan

Plants epiphytic or lithophytic, autotrophic. Pseudobulbs narrowly ellipsoid, slightly bilaterally flattened, 6–13 × 2–6 cm, enclosed in leaf bases. Leaves 5–7, lorate, 65–80 × 2–3.6 cm, articulate 6–9 cm from base, apex shortly acuminate or subacute. Inflorescence arising from within sheaths at base of pseudobulb, suberect or arching, 60–80 cm; rachis 10–20- or more flowered; floral bracts ovate-triangular, ca. 3 mm. Flowers not scented, 7–11.5 cm in diam.; pedicel and ovary 30–40 mm; sepals and petals apple-green or yellowish green with reddish brown longitudinal venation; lip pale yellow to whitish, mid-lobe with a large V-shaped red to pale chestnut or pale brown patch at apex. Sepals narrowly obovate-oblong, 40–50 × 14–16 mm, apex acute. Petals narrowly obovate-oblong, 40–50 × 8–10 mm, apex acute; lip broadly ovate, 35–40 mm, base fused to basal margins of column for 3–4 mm, 3-lobed; lateral lobes erect, triangular; mid-lobe cordate, ca. 16 × 18 mm, margin erose and slightly undulate; disk velvety hairy toward apices of lateral lobes and at center and base of mid-lobe, V-shaped patch at apex of mid-lobe also composed of dense velvety hairs, with 2 short lamellae near base of lip; lamellae minutely hairy, not extending onto mid-lobe. Column arcuate, 27–30 mm, winged, papillate or puberulent near base; pollinia 2, deltoid.

Trees in forests, cliffs along valleys; 1300–1900 m. SE and SW Yunnan [Myanmar, Thailand, Vietnam].

*Cymbidium lowianum* var. *ailaoense* X. M. Xu (J. S. China Agric. Univ. 26(4): 121. 2005) was described from Yunnan but could not be treated here because no specimens were seen by the present authors.

- 1a. V-shaped blotch on mid-lobe of lip red to pale chestnut ..... 17a. var. *lowianum*
- 1b. V-shaped blotch on mid-lobe of lip pale brown ..... 17b. var. *iansonii*

**17a. *Cymbidium lowianum* var. *lowianum***

碧玉兰(原变种) bi yu lan (yuan bian zhong)

*Cymbidium giganteum* Wallich ex Lindley var. *lowianum* H. G. Reichenbach, *Gard. Chron.*, n.s., 7: 685. 1877; *C. hookerianum* H. G. Reichenbach var. *lowianum* (H. G. Reichenbach) Y. S. Wu & S. C. Chen; *Cyperorchis lowiana* (H. G. Reichenbach) Schlechter.

Flowers 7–9 cm in diam.; lip pale yellow, mid-lobe with a large V-shaped red to pale chestnut blotch at apex. Fl. Apr–May.  $2n = 38, 40, 44$ .

Trees in forests, cliffs along valleys; 1300–1900 m. SE and SW Yunnan [Myanmar, Thailand].

**17b. *Cymbidium lowianum* var. *iansonii*** (Rolfe) P. J. Cribb & Du Puy, *Kew Bull.* 40: 432. 1985 [“*i’ansonii*”].

浅斑碧玉兰 qian ban bi yu lan

*Cymbidium ×iansonii* Rolfe, *Orchid Rev.* 8: 191. 1900; *C. grandiflorum* Griffith var. *kalawense* Colyear; *C. lowianum* var. *kalawense* (Colyear) Govaerts; *C. mandaiantum* Gower.

Flowers 10–11.5 cm in diam.; lip yellowish to whitish, mid-lobe with a large V-shaped pale brown blotch at apex.

Trees in forests; ca. 1900 m. SW Yunnan [Myanmar].

**18. *Cymbidium schroederi*** Rolfe, *Gard. Chron.*, ser. 3, 37: 243. 1905.

薛氏兰 xue shi lan

*Cyperorchis schroederi* (Rolfe) Schlechter.

Plants epiphytic, autotrophic. Pseudobulbs subellipsoid, bilaterally flattened, 13–16 × 4–5 cm. Leaves 6–8, lorate, 55–70 × 2.5–3 cm, articulate 8–9 cm from base, apex acute. Inflorescence arising from base of pseudobulb, suberect or arching, 45–70 cm; rachis 14–25-flowered; floral bracts triangular, 1–3 mm. Flowers not scented, 7–9.5 cm in diam.; pedicel and ovary 25–48 mm; sepals and petals greenish or pale yellow-green with irregular brown striations and spots; lip yellowish to whitish with red-brown striations on lateral lobes and a red-brown, V-shaped patch and a longitudinal line of same color on mid-lobe; column longitudinally striped red-brown on ventral surface. Dorsal sepal narrowly obovate, 45–50 × 13–16 mm, apex acuminate; lateral sepals falcate, oblong, slightly narrower than dorsal sepal. Petals narrowly obovate, 42–46 × 9–12 mm, apex acuminate; lip subovate, 25–28 mm, base fused to basal

margins of column for 2–3 mm, 3-lobed; lateral lobes triangular, ciliate; mid-lobe ovate-cordate or broadly ovate, 13–17 × 13–16 mm, apex obtuse or mucronate; disk puberulent on lateral lobes and at center of mid-lobe, V-shaped patch at apex of mid-lobe composed of dense, short hairs, with 2 lamellae near base of lip; lamellae pubescent, tapering to base of lip. Column 25–30 mm, winged, minutely hairy at base. Fl. Mar–Jun.

Trees in forests; 1000–1600 m. SE Yunnan [N Vietnam].

**19. *Cymbidium insigne*** Rolfe, Gard. Chron., ser. 3, 35: 387. 1904.

美花兰 mei hua lan

*Cyperorchis insignis* (Rolfe) Schlechter.

Plants terrestrial or lithophytic, autotrophic. Pseudobulbs ovoid or narrowly ovoid, slightly bilaterally flattened, 5–9 × 2.5–4 cm, enclosed in leaf bases. Leaves 6–9, lorate, 60–90 × 0.7–1.2 cm, articulate 7.5–10 cm from base, apex acuminate. Inflorescence suberect or arching, 28–90 cm or longer, somewhat robust; rachis 4–9- or more flowered; floral bracts subtriangular, 3–5 mm, though lower ones 11–15 mm. Flowers not scented, 6–7 cm in diam.; pedicel and ovary 30–40 mm; sepals and petals white or pinkish, sometimes with red spots at base; lip white, often with purplish red spots and striations particularly on lateral lobes, and with a central yellow patch on mid-lobe. Sepals elliptic-obovate, concave, 30–35 × 10–14 mm, apex acute; lateral sepals spreading horizontally or nearly so, slightly oblique. Petals spreading, narrowly obovate, 28–30 × 10–12 mm, apex acute; lip subovate, slightly shorter than petals, base fused to basal margins of column for 2–3 mm, 3-lobed; lateral lobes inconspicuously ciliate; mid-lobe slightly recurved, ovate, margin crisped, apex acute; disk minutely papillate, mid-lobe with a densely hairy patch at center, with 3 lamellae; lamellae densely pubescent, lateral lamellae extending from base of lip to base of mid-lobe and inflated at their apices, central one shorter. Column arcuate, 24–28 mm, winged, puberulent at base on ventral surface; pollinia 2, triangular to subsquare. Fl. Nov–Dec.  $2n = 40$ .

Rocky and grassy places in open forests, shaded and mossy cliffs; 1700–1900 m. E Hainan [N Thailand, Vietnam].

**20. *Cymbidium wenshanense*** Y. S. Wu & F. Y. Liu, Acta Bot. Yunnan. 12: 291. 1990.

文山红柱兰 wen shan hong zhu lan

Plants epiphytic, autotrophic. Pseudobulbs ovoid, slightly bilaterally flattened, 3–6 × 1.5–3 cm, enclosed in leaf bases. Leaves distichous, 4–9, lorate, 45–98 × 1.3–2.1 cm, articulate 8–15 cm from base, apex subacuminate. Inflorescence arching or subpendulous, 28–39 cm; peduncle 5–13 cm, with 5 or 6 sheaths; rachis 3–12-flowered; floral bracts deep purple to yellowish, triangular or linear-lanceolate, 7–16 mm. Flowers fragrant, usually not opening very widely; pedicel and ovary 45–60 mm; sepals and petals white, usually slightly tinged pale purplish red on outer surfaces, petals occasionally with a few purple-red spots at base; lip white or yellowish with dark purple or purplish brown striations and spots, turning reddish brown,

lamellae yellow; column purple-red at apex, white tinged pink toward base. Sepals similar, narrowly obovate-elliptic or broadly oblanceolate, slightly concave, 58–80 × 18–30 mm, apex obtuse to acute; lateral sepals pendulous or downcurved, oblique, outer surfaces carinate. Petals incurved and clasping column, subobovate, oblique, 57–65 × 21–33 mm, apex acute; lip broadly obovate, 56–65 × 58–78 mm, base fused to basal margins of column for 2–3 mm, 3-lobed or obscurely 5-lobed above middle, margin white ciliate, lateral lobes erect and embracing column; lateral lobes in plants with a 3-lobed lip obovate, to 20 mm wide; lateral lobes in plants with a 5-lobed lip composed of a small, ovate to linear basal pair of lobes to ca. 5 mm wide, and a larger, subsquare upper pair to 20 mm wide; mid-lobe deflexed, obovate to nearly oblate, 18–25 × 22–30 mm, apex rounded-obtuse and slightly erose to emarginate, ciliate; disk pubescent, with 2 longitudinal lamellae extending from base of lip to base of mid-lobe; lamellae conspicuously inflated and converging at apex. Column arcuate, 40–48 mm, narrowly winged, sparsely pubescent on ventral surface; pollinia 2, nearly pear-shaped. Fl. Feb–Mar.

Trees in forests; ca. 1500 m. SE Yunnan (Maguan) [Vietnam].

- 1a. Inflorescence arching, 3–7-flowered; sepals 58–64 × 18–21 mm; lip 3-lobed; column ca. 40 mm ..... 20a. var. *wenshanense*
- 1b. Inflorescence arching or subpendulous, 7–12-flowered; sepals 65–80 × 23–26 mm; lip obscurely 5-lobed; column 42–48 mm ..... 20b. var. *quinquelobum*

**20a. *Cymbidium wenshanense* var. *wenshanense***

文山红柱兰(原变种) wen shan hong zhu lan (yuan bian zhong)

Inflorescence arching, 3–7-flowered. Sepals 58–64 × 18–21 mm. Lip 3-lobed. Column ca. 40 mm.

Trees in forests; ca. 1500 m. SE Yunnan (Maguan) [Vietnam].

**20b. *Cymbidium wenshanense* var. *quinquelobum*** (Z. J. Liu & S. C. Chen) Z. J. Liu, S. C. Chen & P. J. Cribb, **comb. et stat. nov.**

五裂红柱兰 wu lie hong zhu lan

Basionym: *Cymbidium quinquelobum* Z. J. Liu & S. C. Chen, Acta Bot. Yunnan. 28: 13. 2006.

Inflorescence arching or subpendulous, 7–12-flowered. Sepals 65–80 × 23–26 mm. Lip obscurely 5-lobed. Column 42–48 mm.

• Trees in broad-leaved forests; ca. 1500 m. SE Yunnan (Maguan).

This variety grows in the same region as the typical variety. Its 5-lobed lip is probably an abnormality rather than a typical feature.

**21. *Cymbidium eburneum*** Lindley, Edwards’s Bot. Reg. 33: ad t. 67. 1847.

独占春 du zhan chun

Plants epiphytic, autotrophic. Pseudobulbs nearly fusiform or ovoid-globose, bilaterally flattened, 4–8 × 2.5–3.5 cm, en-

closed in leaf bases, produced every 2 or 3 years (not annually). Leaves 6–11(–17), lorate, 57–65 × 1.4–2.1 cm, articulate 4–8 cm from base, base distichous-equitant and with brown membranous margins 1–1.5 mm wide, apex acute and slightly 2-lobed, sometimes with a minute mucro in sinus. Inflorescence arising from leaf axils, erect or suberect, 25–40 cm; rachis 1- or rarely 2(or 3)-flowered; floral bracts ovate-triangular, 6–7 mm. Flower slightly fragrant, rather large, 8–12 cm in diam.; pedicel and ovary 25–35 mm; sepals and petals white, sometimes slightly tinged pink; lip white with a central yellow patch and sometimes mottled purplish pink on lateral lobes and mid-lobe, lamellae yellow; column white, sometimes tinged pale pink, sometimes with yellow spots at base. Sepals oblong-obovate, 55–70 × 15–20 mm, apex often subobtusate. Petals narrowly obovate, 55–70 × 13–18 mm, apex acute; lip broadly elliptic, slightly shorter than sepals, base fused to basal margins of column for 3–5 mm, 3-lobed; lateral lobes erect, loosely clasping column, not ciliate; mid-lobe slightly recurved, ovate-triangular, margin undulate; disk papillate or puberulent, with a densely hairy patch on basal half of mid-lobe, with 2 converging lamellae extending from base of lip to near base of mid-lobe. Column 35–45 mm, narrowly winged, subglabrous; pollinia 2, subsquare; viscidium with filiform appendages at base. Capsule subellipsoid, 50–70(–100) × 30–40 mm.

Rocks along valleys and in open forests; 800–2000 m. S and SW Guangxi, S and W Hainan, W Yunnan [India, Myanmar, Nepal, Vietnam].

- 1a. Lip white, not mottled purplish pink on lateral lobes and mid-lobe ..... 21a. var. *eburneum*
- 1b. Lip white, mottled purplish pink on lateral lobes and mid-lobe ..... 21b. var. *longzhouense*

**21a. *Cymbidium eburneum* var. *eburneum***

独占春(原变种) du zhan chun (yuan bian zhong)

*Cyperorchis eburnea* (Lindley) Schlechter.

Sepals and petals white, sometimes tinged pink; lip white, occasionally sparsely mottled purplish pink on mid-lobe only. Fl. Feb–May, fr. Aug–Sep. 2n = 38\*, 40.

Rocks along valleys; ca. 2000 m. S Guangxi, S and W Hainan, W Yunnan [India, Myanmar, Nepal].

**21b. *Cymbidium eburneum* var. *longzhouense* Z. J. Liu & S. C. Chen, Acta Phytotax. Sin. 44: 179. 2006.**

龙州兰 long zhou lan

Sepals and petals white, usually tinged pink on outer surfaces; lip white, conspicuously mottled purplish pink on lateral lobes and mid-lobe. Fl. Apr.

- Rocks in open forests; ca. 800 m. SW Guangxi.

**22. *Cymbidium maguanense* F. Y. Liu, Acta Bot. Yunnan. 18: 412. 1996.**

象牙白 xiang ya bai

Plants epiphytic, autotrophic. Pseudobulbs subcylindric, 4–10 × 2–2.5 cm, enclosed in leaf bases. Leaves 8 or 9, distichous, lorate, 37–76 × 1.2–2.4 cm, base with narrow membra-

nous margins, articulate, apex acuminate and unequally bilobed. Inflorescences 1 or 2, arising from leaf axils, suberect, 20–45 cm; rachis 2–11(–15)-flowered; floral bracts ovate-triangular, 5–6 mm. Flowers fragrant, not opening widely; pedicel and ovary 20–30 mm; sepals and petals white or pinkish, sometimes tinged purplish on outer surfaces; lip white or pinkish, with a suboblong yellow patch at center of mid-lobe; column purplish to pink. Sepals narrowly oblong-elliptic, 48–60 × 15–20 mm, apex acuminate; lateral sepals slightly oblique. Petals narrowly oblong-lanceolate, 46–52 × 8–12 mm, apex acuminate; lip subobovate or obovate-elliptic, 45–52 × 20–32 mm, base fused to basal margins of column for ca. 5 mm, 3-lobed; lateral lobes erect and loosely embracing column; mid-lobe broadly subovate, 12–13 × 14–18 mm, margin crisped; disk densely pubescent on lateral lobes and at center of mid-lobe, with 2 longitudinal lamellae; lamellae inflated and confluent at their apices, forming a subdeltoid callus at base of mid-lobe. Column slightly arcuate, 36–40 mm. Fl. Oct–Dec.

- Trees in forests; 1000–1800 m. SE Yunnan (Maguan, Malipo).

Given that this entity is intermediate in morphology between the sympatric species *Cymbidium eburneum* and *C. mastersii*, it may be of hybrid origin. This possibility needs to be explored.

**23. *Cymbidium changningense* Z. J. Liu & S. C. Chen, Acta Bot. Yunnan. 27: 378. 2005.**

昌宁兰 chang ning lan

*Cymbidium lowianum* (H. G. Reichenbach) H. G. Reichenbach var. *changingense* X. M. Xu.

Plants epiphytic or lithophytic, autotrophic. Pseudobulbs narrowly ovoid, 6–8 × 3–4 cm, bilaterally flattened. Leaves 10–13, distichous, lorate, 52–75 × 1.2–1.7 cm, articulate 6–9 cm from base, apex obliquely bilobed. Inflorescence arising from leaf axils, arching, 35–41 cm; peduncle with 3–5 sheaths 4–11 cm; rachis 16–21 cm, 3–7-flowered; floral bracts triangular, 4–6 × 4–5 mm. Flowers scented, 10–11 cm in diam.; pedicel and ovary 45–55 mm, yellowish green; sepals and petals pale green-yellow or cream-yellow, with purplish red venation or occasionally tinged purplish red; lip yellowish white, with minute purplish red spots and dashes at base and a purplish red patch near apical margins of lateral lobes, and with a purplish red, V-shaped patch and a narrow longitudinal line on mid-lobe; column yellowish white, with irregular purplish red spots and dashes on ventral surface. Sepals narrowly elliptic, 65–71 × 18–20 mm, margins slightly recurved, apex acute; lateral sepals slightly falcate. Petals falcate, narrowly oblong, 63–65 × 9–10 mm, apex acute; lip ovate, 50–55 mm, base fused to basal margins of column for ca. 6 mm, 3-lobed; lateral lobes 35–38 × 12–13 mm; mid-lobe subcordate-ovate, 19–20 × 17–19 mm, margin undulate; disk puberulent, with 2 lamellae; lamellae 13–14 mm, densely white pubescent. Column ca. 40 mm, winged. Fl. Feb–Mar.

- Trees at forest margins, shaded rocks; ca. 1700 m. W Yunnan (Changning).

This entity may be of hybrid origin. It is morphologically intermediate between *Cymbidium lowianum* and *C. mastersii*, both of which grow sympatrically in W Yunnan. Its flower color and shape show distinct similarities to the former, while the smaller flower size and habit are reminiscent of the latter. Further investigation is needed.

X. M. Xu published the name *Cymbidium lowianum* var. *changningense* one month earlier (J. S. China Agric. Univ. 26(3): 120. Jul 2005) than Z. J. Liu and S. C. Chen published *C. changningense* (Aug 2005). The latter authors published the name of a new species, not a new combination, because they made no reference to the varietal name. The two names have the same type (Z. J. Liu 2708).

**24. *Cymbidium mastersii*** Griffith ex Lindley, Edwards's Bot. Reg. 31: ad t. 50. 1845.

大雪兰 da xue lan

*Cyperorchis mastersii* (Griffith ex Lindley) Benth.

Plants epiphytic or lithophytic, autotrophic. Pseudobulbs stemlike, usually 10–30 cm, sometimes to 1 m, growing indeterminate, completely enclosed in distichous leaf bases, rooting from basal part, occasionally producing a small plant at base. Leaves several to many, sometimes to 15–17 or more, lorate, 24–75 × 1.1–1.7(–2.5) cm, subleathery, articulate 3–6(–10) cm from base, apex unequally 2-lobed, with a mucro in sinus. Inflorescences 1 or 2, arising from leaf axils, suberect, 25–45 cm, 2–5- or more flowered; floral bracts triangular, 2–5 mm. Flowers almond-scented, usually not opening widely, 6–6.5 cm in diam.; pedicel and ovary 40–50 mm; sepals and petals white, tinged pink on outer surfaces; lip white with a central yellow patch at base of mid-lobe, lamellae yellow and occasionally with scattered purplish red spots. Sepals narrowly elliptic or broadly lanceolate-oblong, concave, 45–55(–60) × 10–15(–20) mm, apex acute. Petals broadly linear, 42–50 × 7–10 mm, apex acute; lip oblong-ovate, 40–45 mm, base fused to basal margins of column for 3–4 mm, 3-lobed; lateral lobes erect and loosely clasping column, ca. 8 mm wide; mid-lobe ovate, small, ca. 11 × 11 mm, margin undulate; disk puberulent and with a densely hairy patch at center of mid-lobe, with 2 longitudinal lamellae; lamellae convergent at their apices. Column ca. 35 mm; pollinia 2. Capsule fusiform-ellipsoid, ca. 40 × 25 mm. Fl. Oct–Dec, fr. Feb–Apr.  $2n = 40$ .

Trees or rocks in forests; 1600–1800 m. S and W Yunnan [Bhutan, India, Myanmar, Thailand, N Vietnam].

**25. *Cymbidium concinnum*** Z. J. Liu & S. C. Chen, Acta Phytotax. Sin. 44: 179. 2006.

丽花兰 li hua lan

Plants epiphytic, autotrophic. Pseudobulbs subovoid, bilaterally flattened, 4–8 × 2.5–3.6 cm, enclosed in leaf bases. Leaves 13–18, lorate, 30–75 × 0.9–1.4 cm, leathery, articulate 5–12 cm from base, apex acuminate and unlobed. Inflorescence arising from leaf axils, arching, 40–60 cm; peduncle with several sheaths; rachis laxly 18–22-flowered; floral bracts triangular, 2–3 mm. Flowers scented, opening widely, 5–6 cm in diam.; pedicel and ovary 22–27 mm; sepals and petals cream-yellow with pale purple-red venation composed of many small spots; lip cream-yellow with pale purple-red striations on lateral lobes and a purple-red, V-shaped patch and short longitudinal line of same color on mid-lobe, lamellae yellowish with purple-red spots. Sepals narrowly obovate-oblong, slightly concave, 43–46 × ca. 10 mm, apex acute; lateral sepals slightly oblique. Petals falcate, broadly linear, 42–44 × 7–9 mm, apex acute; lip elliptic-obovate, 35–38 mm, base fused to basal margins of column for 2–3 mm, 3-lobed; lateral lobes erect and clasping col-

umn; mid-lobe subcordate or broadly ovate, 9–11 × 9–11 mm, margin undulate; disk minutely hairy, with 2 lamellae; lamellae extending to near base of mid-lobe, hairy, convergent and sometimes fusing with each other at their apices. Column 30–32 mm, winged, hairy on ventral surface. Fl. Oct–Nov.

• Trees in broad-leaved forests; ca. 2300 m. W Yunnan (Lushui).

Among the present authors, Cribb observes that this taxon is close to *Cymbidium mastersii* and may be of hybrid origin, with *C. mastersii* likely to be one of the parents, possibly with introgression from *C. iridoides* or *C. lowianum*. Artificial hybrids of *C. mastersii* with *C. lowianum* and its allies closely resemble *C. concinnum*. Chen observes that, if *C. concinnum* is of hybrid origin, the parents may be *C. mastersii* and *C. tigrinum*.

**26. *Cymbidium elegans*** Lindley, Gen. Sp. Orchid. Pl. 163. 1833.

莎草兰 suo cao lan

Plants epiphytic or lithophytic, autotrophic. Pseudobulbs subovoid, bilaterally flattened, 4–9 × 2–3 cm, enclosed in persistent leaf bases. Leaves 6–16, distichous, lorate, 45–80 × 1–1.7(–2) cm, articulate 4–10 cm from base, apex acuminate or obtuse and usually slightly 2-lobed. Inflorescence arising from lower part of pseudobulb, usually arching, 40–50 cm; rachis pendulous or nodding, centrifugal or centripetal, densely 18–35-flowered; floral bracts small, 2–3 mm. Flowers slightly fragrant, pendulous, narrowly bell-shaped, not opening widely; pedicel and ovary 12–21 mm; sepals and petals cream-yellow to pale yellowish green, sometimes tinged pale pink; lip cream-yellow to pale yellowish green, occasionally with reddish spots, lamellae bright orange. Sepals narrowly obovate-lanceolate, 34–43 × 7–11 mm, apex acute. Petals broadly linear-oblongate, 30–40 × 5–8 mm, apex obtuse; lip oblongate-triangular, 30–40 × 4–8 mm, base fused to basal margins of column for 2–3 mm, 3-lobed; lateral lobes loosely clasping column, not ciliate; mid-lobe small, 6–10 × 5–8 mm, margin slightly undulate, apex slightly bilobed and incurved; disk minutely papillate on lateral lobes and densely pubescent at center of mid-lobe, with 2 longitudinal lamellae extending from base of lip to near base of mid-lobe; lamellae sparsely pubescent, convergent at their apices and with a longitudinal channel between them, sometimes each lamella with a lanceolate appendage 3–5 mm on outside below middle. Column 28–32 mm, puberulent toward base, narrowly winged; pollinia 2, subclavate-obovoid.

Trees in forests, cliffs; 1700–2800 m. SW Sichuan, SE Xizang, Yunnan [Bhutan, India, Myanmar, Nepal, N Vietnam].

- 1a. Lamellae on lip without appendages ..... 26a. var. *elegans*  
1b. Lamellae on lip each with a lanceolate  
appendage on outside ..... 26b. var. *lushuiense*

**26a. *Cymbidium elegans* var. *elegans***

莎草兰(原变种) suo cao lan (yuan bian zhong)

*Cymbidium longifolium* D. Don, nom. utique rej.; *Cyperorchis elegans* (Lindley) Blume.

Plants epiphytic. Leaves 6–13. Rachis with 20–35 centrifugal flowers. Lamellae on lip without any appendages. Fl. Oct–Dec.  $2n = 40$ .

Trees in forests, cliffs; 1700–2800 m. SW Sichuan, SE Xizang,

Yunnan [Bhutan, India, Myanmar, Nepal].

**26b. *Cymbidium elegans* var. *lushuiense*** (Z. J. Liu, S. C. Chen & X. C. Shi) Z. J. Liu & S. C. Chen, Gen. *Cymbidium* China, 144. 2006.

泸水兰 *lu shui lan*

*Cymbidium lushuiense* Z. J. Liu, S. C. Chen & X. C. Shi, Shenzhen Sci. Technol. 139: 200. 2005.

Plants lithophytic. Leaves 8–16. Rachis with 18–26 centripetal flowers. Lamellae on lip each with a lanceolate appendage 3–5 mm on outside below middle. Fl. Dec–Jan.

• Cliffs. SW Yunnan (Lushui).

**27. *Cymbidium cochleare*** Lindley, J. Proc. Linn. Soc., Bot. 3: 28. 1858.

垂花兰 *chui hua lan*

*Cymbidium babae* (Kudô ex Masamune) Masamune; *C. kanran* Makino var. *babae* (Kudô ex Masamune) S. S. Ying; *Cyperorchis babae* Kudô ex Masamune; *C. cochlearis* (Lindley) Benth.

Plants epiphytic, autotrophic. Pseudobulbs often fusiform, slightly bilaterally flattened, 3–5 × 1–1.5 cm, enclosed in persistent leaf bases. Leaves 9–16(–18), distichous, lorate, 40–60(–100) × 0.8–1(–1.2) cm, articulate 3–5 cm from base, margin slightly revolute, apex acuminate. Inflorescence lateral, pendulous, 50–60 cm; peduncle dark brown, slender, with several widely spaced sheaths 10–12 cm; rachis centrifugal, 13–16(–22)-flowered; floral bracts whitish, ca. 3 mm. Flowers pendulous, bell-shaped, not opening widely; pedicel and ovary 10–18 mm; sepals and petals tawny-brown; lip yellow-green, with dense, small, purple-red spots. Sepals oblanceolate-spatulate, 40–42 × 6–7 mm, apex acute. Petals oblanceolate, 40–42 × 5–6 mm, apex acute; lip obovate, ca. 43 × 26 mm, base fused to basal margins of column for 2–3 mm, 3-lobed; lateral lobes erect and clasping column, triangular, 10–12 mm wide; mid-lobe deflexed, suborbicular, 7–7.5 mm, margin undulate; disk with a dense patch of short hairs at center of mid-lobe, with 2 lamellae; lamellae inflated and white hairy toward apex. Column ca. 35 mm, slender; pollinia 2, deeply cleft. Fl. Nov–Jan.  $2n = 40$ .

Trees in forests; 300–1800 m. Taiwan, SW Yunnan [India, Myanmar, N Vietnam].

**28. *Cymbidium tigrinum*** E. C. Parish ex Hooker, Bot. Mag. 90: ad t. 5457. 1864.

斑舌兰 *ban she lan*

*Cyperorchis tigrina* (E. C. Parish ex Hooker) Schlechter.

Plants epiphytic or lithophytic, autotrophic. Pseudobulbs subglobose or globose-ovoid, strongly bilaterally compressed, lens-shaped, 3–5 × 3–3.5 cm, naked, with several sheaths at base. Leaves usually 2–4, borne at apex of pseudobulb, narrowly elliptic, 15–20 × ca. 3.5 cm, articulate 1–1.5 cm from base, base contracted into a distinct petiole-like stalk, apex long acuminate. Inflorescence arising from base of pseudobulb,

arching, 10–20 cm; rachis 2–5-flowered; floral bracts triangular, 4–9 mm. Flowers slightly fragrant; pedicel and ovary 20–45 mm; sepals and petals yellowish green, tinged reddish brown and with purplish brown spots near base; lip white tinged purplish brown on lateral lobes and with reddish brown spots and short transverse dashes on mid-lobe, becoming pink following pollination. Sepals narrowly elliptic-lanceolate, 35–40 × 8–12 mm, apex acuminate. Petals narrowly elliptic, 34–38 × 6–10 mm, apex acute; lip subobovate, base fused to basal margins of column for 2–3 mm, 3-lobed; lateral lobes erect, ca. 12 mm wide; mid-lobe recurved, margin undulate; disk minutely papillate, with 2 glabrous longitudinal lamellae extending from base of lip to near base of mid-lobe. Column 25–30 mm; pollinia 2. Fl. Mar–Jul.  $2n = 40$ .

Bare rocks, rocky crevices in open situations; 1500–2700 m. W Yunnan [NE India, Myanmar].

**29. *Cymbidium baoshanense*** F. Y. Liu & H. Perner, Orchidee (Hamburg) 52: 61. 2001.

保山兰 *bao shan lan*

Plants epiphytic, autotrophic. Pseudobulbs ovoid-globose, bilaterally flattened, 3.5–4.5 × 2.5–3 cm, partially enclosed in leaf bases. Leaves 2–7, distichous, somewhat oblanceolate, 20–40 × 2.5–3.2 cm, articulate 3–7 cm from base, base contracted into a distinct petiole-like stalk, apex acuminate and apiculate. Inflorescence arising from base of pseudobulb, suberect or arching, 29–40 cm; peduncle with several long sheaths; rachis 6–9-flowered; floral bracts triangular, ca. 5 mm. Flowers scented, 5–8 cm in diam.; sepals and petals pale green-yellow to pale brown-yellow, sometimes tinged pinkish on outer surfaces; lip white, with a purple-red, submarginal, V-shaped patch and a central line of same color on mid-lobe, lamellae yellowish with many purple-red spots; column yellow, with a few red spots on ventral surface. Sepals lanceolate, concave, 45–58 × 12–15 mm, apex acute. Petals lanceolate, ca. 50 × 8 mm, apex acute; lip broadly subovate, ca. 33 × 25 mm, base fused to basal margins of column for 2–3 mm, 3-lobed; lateral lobes suborbicular, ca. 7 × 7 mm; mid-lobe ovate, ca. 12 × 9 mm; disk with 2 glabrous lamellae extending to base of mid-lobe. Column 29–34 mm. Fl. Mar.

• Forests; 1600–1700 m. SW Yunnan (Longling).

This is a variable taxon. Its pseudobulbs and leaves resemble those of *Cymbidium tigrinum*, and its flowers are intermediate between *C. lowianum* and *C. tigrinum*. Lip patterning is variable, with the apical purple V-shape sometimes being broken up and irregular. It may be a hybrid between the above named species. The artificial hybrid of *C. lowianum* and *C. tigrinum* (registered as *C. 'Lowtiger'*) matches it closely.

**30. *Cymbidium cyperifolium*** Wallich ex Lindley, Gen. Sp. Orchid. Pl. 163. 1833.

莎叶兰 *suo ye lan*

Plants terrestrial or lithophytic, autotrophic. Pseudobulbs produced biennially or annually, small, 1–3 × ca. 1 cm, enclosed in leaf bases. Leaves usually 9–13(–20), lorate, 30–120 × (0.6–)1–1.3 cm, usually distichous-equitant at base, often with membranous margin 1–3 mm wide toward base, articulate 4–5

cm from base, apex acute. Inflorescence arising from near base of pseudobulb, erect, 20–50 cm; peduncle with several sheaths 2–8.5 cm; rachis 3–7-flowered; floral bracts sublanceolate or linear-lanceolate, 14–41 mm, usually exceeding 1/2 length of ovary. Flowers lemon-scented; pedicel and ovary 12–25 mm; sepals and petals usually yellowish green or apple-green, with 5–7 longitudinal red-brown or purple lines; lip yellowish green to pale yellow, with purple striations on lateral lobes and purple spots or patches on mid-lobe. Sepals linear to linear-lanceolate, 20–37 × 4–8 mm, apex acuminate. Petals narrowly ovate, 16–29 × 5–9 mm, apex acuminate; lip ovate or oblong, 14–22 mm, not fused to basal margins of column, slightly 3-lobed; lateral lobes small; mid-lobe strongly recurved, broadly ovate to ovate-elliptic, 9–13 × 8–12 mm, margin sometimes finely crenulate; disk minutely papillate on lateral lobes and toward apex of mid-lobe, with 2 longitudinal lamellae extending from base of lip to near base of mid-lobe; lamellae slightly incurved toward their apices. Column slightly arcuate, 11–16 mm, narrowly winged; pollinia 4, in 2 pairs.

Forests, rocky places, crevices of rocks; 700–1800 m. Guangdong, S Guangxi, Guizhou, Hainan, Sichuan, Yunnan [Bhutan, Cambodia, India, Myanmar, Nepal, Philippines, Thailand, Vietnam].

- 1a. Pseudobulbs produced biennially; leaves distinctly distichous-equitant at base, with broad membranous margins toward base; fl. Oct–Nov ..... 30a. var. *cyperifolium*  
 1b. Pseudobulbs produced annually; leaves weakly distichous-equitant at base, with narrow membranous margins toward base; fl. Feb–Apr ..... 30b. var. *szechuanicum*

**30a. *Cymbidium cyperifolium* var. *cyperifolium***

莎叶兰(原变种) suo ye lan (yuan bian zhong)

*Cymbidium carnosum* Griffith; *C. viridiflorum* Griffith; *Cyperorchis wallichii* Blume.

Pseudobulbs produced biennially. Leaves 9–20, distichous, distinctly distichous-equitant at base, with membranous margins 2–3 mm wide. Fl. Oct–Nov.  $2n = 36, 40, 42$ .

Forests, rocky places, crevices of rocks; 700–1800 m. Guangdong, S Guangxi, SW Guizhou, Hainan, W Sichuan, S and SE Yunnan [Bhutan, Cambodia, India, Myanmar, Nepal, Philippines, Thailand, Vietnam].

**30b. *Cymbidium cyperifolium* var. *szechuanicum* (Y. S. Wu & S. C. Chen) S. C. Chen & Z. J. Liu, Acta Phytotax. Sin. 41: 83. 2003.**

送春 song chun

*Cymbidium szechuanicum* Y. S. Wu & S. C. Chen, Acta Phytotax. Sin. 11: 33. 1966; *C. faberi* Rolfe var. *szechuanicum* (Y. S. Wu & S. C. Chen) Y. S. Wu & S. C. Chen.

Pseudobulbs produced annually. Leaves 9–13, slightly distichous, slightly distichous-equitant at base, with narrow membranous margins ca. 1 mm wide. Fl. Feb–Apr.

Guizhou, Sichuan, Yunnan [Bhutan].

*Cymbidium ×nujiangense* X. P. Zhou, S. P. Lei & Z. J. Liu (J. S.

China Agric. Univ. 28: 87. 2007) is a hybrid of *C. cyperifolium* var. *szechuanicum* and *C. tortisepalum*.

**31. *Cymbidium ensifolium* (Linnaeus) Swartz, Nova Acta Regiae Soc. Sci. Upsal., ser. 2, 6: 77. 1799.**

建兰 jian lan

*Epidendrum ensifolium* Linnaeus, Sp. Pl. 2: 954. 1753; *Cymbidium arrogans* Hayata; *C. ensifolium* f. *arcuatum* T. K. Yen; *C. ensifolium* f. *falcatum* T. K. Yen; *C. ensifolium* var. *misericors* (Hayata) T. P. Lin; *C. ensifolium* var. *rubrigemmum* (Hayata) T. S. Liu & H. J. Su; *C. ensifolium* var. *striatum* Lindley; *C. ensifolium* var. *susin* T. K. Yen; *C. ensifolium* var. *xiphifolium* (Lindley) S. S. Ying; *C. ensifolium* var. *yakibaran* (Makino) Y. S. Wu & S. C. Chen; *C. gyokuchin* Makino var. *arrogans* (Hayata) S. S. Ying; *C. kanran* Makino var. *misericors* (Hayata) S. S. Ying; *C. micans* Schauer; *C. misericors* Hayata; *C. prompovenium* Z. J. Liu & J. N. Zhang; *C. rubrigemmum* Hayata; *C. xiphifolium* Lindley; *C. yakibaran* Makino; *C. yongfuense* Z. J. Liu & J. N. Zhang; *Jensoa ensata* (Thunberg) Rafinesque; *Limodorum ensatum* Thunberg; *Liugui-shania taiwanensis* Z. J. Liu & J. N. Zhang.

Plants terrestrial, autotrophic. Pseudobulbs ovoid, 1.5–2.5 × 1–1.5 cm, enclosed in leaf bases. Leaves 2–4(–6), lorate, 30–60 × 1–1.5(–2.5) cm, articulate 2–4 cm from base, margin sometimes serrate toward apex, apex acute. Inflorescence arising from base of pseudobulb, erect, 20–35 cm or longer, but usually shorter than leaves; rachis 3–9(–13)-flowered; floral bracts 5–8 mm and mostly less than 1/2 length of ovary, though basal bract to 20 mm. Flowers fragrant, variable in color, usually pale yellowish green, spotted with purple, mid-lobe with a few red spots; pedicel and ovary 20–25(–30) mm. Sepals narrowly oblong or narrowly elliptic, 23–28 × 5–8 mm, apex acute; lateral sepals usually oblique. Petals spreading horizontally, narrowly elliptic or narrowly ovate-elliptic, 15–24 × 5–8 mm, apex acute; lip subovate, 15–23 mm, not fused to basal margins of column, obscurely 3-lobed; lateral lobes erect and loosely clasping column; mid-lobe recurved, ovate, 8–12 × 7–10 mm, margin kinked; disk minutely papillate, with 2 fleshy lamellae; lamellae extending almost to base of mid-lobe, converging in their apical half and forming a short tube. Column slightly arcuate, 10–14 mm, narrowly winged; pollinia 4, in 2 pairs, broadly ovoid. Capsule narrowly ellipsoid, 50–60 × ca. 20 mm. Fl. usually Jun–Oct, fr. Dec–Feb.  $2n = 40^*$ .

Open forests, thickets, grassy places along valleys; 600–1800 m. Anhui, N Fujian, Guangdong, Guangxi, Guizhou, Hainan, W Hubei, Hunan, Jiangxi, SW Sichuan, Taiwan, SE Xizang, SE and W Yunnan, Zhejiang [Cambodia, India, Indonesia, Japan, Laos, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam].

*Cymbidium ×oblancifolium* Z. J. Liu & S. C. Chen, a natural hybrid of *C. ensifolium* and *C. lancifolium*, was recently described (Forestry Stud. China 3: 23. 2000).

**32. *Cymbidium sinense* (Jackson ex Andrews) Willdenow, Sp. Pl. 4: 111. 1805.**

墨兰 mo lan

*Epidendrum sinense* Jackson ex Andrews, Bot. Repos. 3: ad t. 216. 1802; *Cymbidium albojucundissimum* Hayata; *C.*

*chinense* Heynhold; *C. fragrans* Salisbury; *C. hoosai* Makino; *C. sinense* f. *albojucundissimum* (Hayata) Fukuyama; *C. sinense* var. *albojucundissimum* (Hayata) Masamune; *C. sinense* var. *album* T. K. Yen; *C. sinense* f. *aureomarginatum* T. K. Yen; *C. sinense* var. *autumnale* Y. S. Wu; *C. sinense* var. *bellum* T. K. Yen; *C. sinense* var. *margicoloratum* Hayata; *C. sinense* f. *pallidiflorum* S. S. Ying; *C. sinense* f. *taiwanianum* S. S. Ying; *C. sinense* f. *viridiflorum* T. K. Yen; *Wutongshania guangdongensis* Z. J. Liu & J. N. Zhang.

Plants terrestrial, autotrophic. Pseudobulbs ovoid, 2.5–6 × 1.5–2.5 cm, enclosed in leaf bases. Leaves 3–5, deep green, lorate, 45–110(–200) × (1.5–)2–3 cm, thinly leathery, articulate 3.5–7 cm from base. Inflorescence arising from base of pseudobulb, erect, somewhat robust, (40–)50–90 cm, usually slightly longer than leaves; rachis 10–20- or more flowered; floral bracts 4–8 mm and mostly less than 1/2 length of ovary, though basal bract more than 10 mm. Flowers usually strongly fragrant, variable in color, usually dark purple or purplish brown with a paler lip; pedicel and ovary 20–25 mm. Sepals narrowly oblong or narrowly elliptic, 22–35 × 5–7 mm, apex acute. Petals nearly narrowly ovate, 20–27 × 6–10 mm, apex acute; lip ovate-oblong, 17–25(–30) mm, not fused to basal margins of column, obscurely 3-lobed; lateral lobes erect, loosely clasping column; mid-lobe recurved, oblong-ovate, ca. 14 × 10 mm, margin slightly undulate; disk minutely papillate-pubescent, with 2 longitudinal lamellae extending from near base of lip to base of mid-lobe; lamellae converging in their apical half and forming a short tube. Column slightly arcuate, 12–15 mm, narrowly winged; pollinia 4, in 2 pairs, broadly ovoid. Capsule narrowly ellipsoid, 60–70 × 15–20 mm. Fl. (Oct–)Nov–Mar, fr. Dec–May.  $2n = 40$ .

Forests, wet and well-drained shaded places in thickets along streambanks; 300–2000 m. S Anhui, Fujian, Guangdong, Guangxi, SW Guizhou, Hainan, S Jiangxi, SC Sichuan (Emei Shan), Taiwan, Yunnan [India, Japan (Ryukyu Islands), Myanmar, Thailand, Vietnam].

**33. *Cymbidium haematodes* Lindley, Gen. Sp. Orchid. Pl. 162. 1834.**

秋墨兰 qiu mo lan

*Cymbidium ensifolium* (Linnaeus) Swartz subsp. *haematodes* (Lindley) Du Puy & P. J. Cribb; *C. ensifolium* var. *haematodes* (Lindley) Trimen; *C. siamense* Rolfe ex Downie; *C. sinense* (Jackson ex Andrews) Willdenow var. *haematodes* (Lindley) Z. J. Liu & S. C. Chen; *C. sundaicum* Schlechter; *C. sundaicum* var. *estriatum* Schlechter.

Plants terrestrial, autotrophic. Pseudobulbs ca. 3 × 1.5 cm, enclosed in leaf bases. Leaves 2–4(or 5), arching, 50–200 × 0.8–1.7 cm, usually lacking serrations along margin. Inflorescence usually held clear of and longer than leaves; rachis to 9-flowered; floral bracts to 20 mm. Flowers 3.5–4 cm in diam.; sepals and petals straw-yellow to light brown, with a strong central red-brown stripe, and several weaker stripes often only distinct toward base; mid-lobe of lip with transverse fine red spots. Sepals slightly obovate, 19–31 × 6–10 mm, apex subacute; lateral sepals pendulous, somewhat oblique. Petals ca. as broad as sepals or slightly narrower; lip not fused to basal margins of column, 3-lobed; lateral lobes narrowly subelliptic;

mid-lobe triangular-elliptic, margin undulate, not kinked, apex rounded or obtuse; disk with 2 incurved ridges between lateral lobes. Column 13–18 mm. Fl. Sep–Oct, fr. Nov–Apr.

Forests; 500–1900 m. Hainan, SW Yunnan [India, Indonesia, Laos, New Guinea, Sri Lanka, Thailand].

**34. *Cymbidium defoliatum* Y. S. Wu & S. C. Chen, Acta Phytotax. Sin. 29: 549. 1991.**

落叶兰 luo ye lan

Plants terrestrial, autotrophic. Pseudobulbs very small, often borne in a row and somewhat rhizomelike, with several thickened roots to 5–8 mm in diam. at base. Leaves 2–4, lorate, deciduous in winter (but often not completely deciduous in cultivation), emerging in spring, only terminal pseudobulb with leaves during growing period, (10–)25–40 × 0.5–1 cm, inconspicuously articulate toward base, apex subobtuse. Inflorescence arising from base of pseudobulb, erect, 10–20 cm; rachis 3- or 4-flowered; floral bracts sublinear-lanceolate, mostly 5–6 mm, though basal one to 10 mm. Flowers fragrant, small, 2–3 cm in diam., very variable in color, greenish white, pale green, pale red, pale yellow, or pale purple; pedicel and ovary 13–17 mm. Sepals narrowly oblong, 12–20 × 3–6 mm, usually 5-veined, apex acute; lateral sepals spreading horizontally. Petals loosely clasping column, narrowly ovate, 10–16 × 2.5–5 mm; lip suboblong-ovate, 10–12 mm, not fused to basal margins of column, obscurely 3-lobed; lateral lobes incurved, small, narrow; mid-lobe recurved, suborbicular, 3–4 × 3–4 mm; disk with 2 longitudinal lamellae extending from near center of lip to base of mid-lobe, ca. 3 mm. Column 7–8 mm; pollinia 4, in 2 pairs. Fl. Jun–Aug.

• N Fujian, Guizhou, Sichuan, Yunnan.

This species is often cultivated in orchid greenhouses. It was reported to be found in Zhejiang, but no specimen has been seen.

**35. *Cymbidium micranthum* Z. J. Liu & S. C. Chen, J. Wuhan Bot. Res. 22: 500. 2004.**

细花兰 xi hua lan

Plants terrestrial, autotrophic. Pseudobulbs narrowly ovoid, 1–1.5 × 0.6–0.8 cm, enclosed in leaf bases. Leaves 1–4, suberect, lorate or linear-lanceolate, 7–22 × 0.5–0.8 cm, leathery, articulate toward base, apex acuminate. Inflorescence lateral, suberect, 8–10 cm, slender; peduncle with many sheaths; sheaths greenish, with brownish red venation, 1.5–1.8 cm; rachis slightly zigzag, 2–2.5 cm, 2- or 3-flowered; floral bracts green, with purple-red venation, lanceolate, 4–5 mm. Flowers rather small, 2–3 cm in diam.; pedicel and ovary 10–15 mm, greenish, with purple-red stripes; sepals purple-brown with deeper-colored venation; petals pale yellow-green with purple-red venation; lip yellowish white, mottled with purplish red. Sepals narrowly elliptic-oblong, 15–17 × 3–4 mm, apex acute and incurved; lateral sepals oblique. Petals narrowly elliptic, 13–15 × 6–7 mm, loosely embracing column, apex acute; lip subovate, 13–15 × 11–12 mm, not fused to basal margins of column, obscurely 3-lobed, apical margins slightly crisped, apex obtuse and incurved; disk with 2 fleshy lamellae ca. 6 mm. Column slightly arcuate, 10–12 mm; pollinia 4, in 2 pairs. Fl. Dec.

- Shrubby and rocky slopes; ca. 1500 m. SE Yunnan (Maguan).

This is another species based upon a specimen with apparently underdeveloped flowers, in which the flowers have not opened fully and the lip remains bent around the column apex. Further investigation, including exploring any possible relationship to the sympatric *Cymbidium kanran*, is needed.

**36. *Cymbidium kanran*** Makino, Bot. Mag. (Tokyo) 16: 10. 1902.

寒兰 han lan

*Cymbidium kanran* var. *aestivale* Y. S. Wu; *C. kanran* var. *purpureohiemale* (Hayata) S. S. Ying; *C. linearisepalum* Yamamoto; *C. linearisepalum* f. *atropurpureum* Yamamoto; *C. linearisepalum* var. *atropurpureum* (Yamamoto) Masamune; *C. linearisepalum* f. *atrovirens* Yamamoto; *C. linearisepalum* var. *atrovirens* (Yamamoto) Masamune; *C. miseriors* Hayata var. *oreophilum* (Hayata) Hayata; *C. nigrovenium* Z. J. Liu & J. N. Zhang; *C. oreophilum* Hayata; *C. purpureohiemale* Hayata; *C. sinokanran* T. K. Yen; *C. sinokanran* var. *atropurpureum* T. K. Yen; *C. tosaense* Masamune.

Plants terrestrial, autotrophic. Pseudobulbs narrowly ovoid, 2–4 × 1–1.5 cm, enclosed in leaf bases. Leaves 3–5(–7), deep green, loriate, 40–70 × 0.9–1.7 cm, thinly leathery, articulate 4–5 cm from base, apical margin often finely toothed. Inflorescence arising from base of pseudobulb, erect, 25–60(–80) cm; rachis laxly 5–12-flowered; floral bracts narrowly lanceolate, mostly 15–26 × 1–2 mm, though basal one to 40 mm. Flowers usually strongly fragrant, variable in color; pedicel and ovary 20–25(–30) mm; sepals and petals pale yellowish green with purplish red striations; lip yellowish, mottled purplish red. Sepals sublinear or linear-lanceolate, 30–50 × 3.5–5(–7) mm, apex acuminate. Petals narrowly ovate or ovate-lanceolate, 20–30 × 5–10 mm; lip subovate, 20–30 mm, not fused to basal margins of column, obscurely 3-lobed; lateral lobes erect, loosely clasping column; mid-lobe recurved, oblong-ovate, 11–16 × 8–12 mm, margin slightly incised; disk minutely papillate-pubescent, with 2 longitudinal lamellae extending from base of lip to base of mid-lobe; lamellae convergent toward apices and forming a short tube. Column slightly arcuate, 10–17 mm, narrowly winged; pollinia 4, in 2 pairs, broadly ovoid. Capsule narrowly ellipsoid, ca. 45 × 18 mm. Fl. Aug–Dec, fr. Feb–Apr.  $2n = 40, 41$ .

Forests, streamsides, shaded places, moist and rocky slopes; 400–2400 m. Anhui, N Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [S Japan, S Korea].

*Cymbidium ×nishiuchianum* Makino ex J. M. H. Shaw (Orchid Rev. 110: 13. 2002) was recently described as a hybrid of *C. goeringii* and *C. kanran*.

**37. *Cymbidium qiubeiense*** K. M. Feng & H. Li, Acta Bot. Yunnan. 2: 334. 1980.

邱北冬蕙兰 qiu bei dong hui lan

Plants terrestrial, autotrophic. Pseudobulbs ovoid, small, 1–1.5 × 0.6–0.9 cm, enclosed in green-purplish brown sheaths; Leaves 2 or 3, deep green, tinged dull purple, loriate, 30–80 × 0.5–1 cm, base contracted into a long petiole-like stalk, margin

serrulate, apex acuminate; petiole-like stalk purplish black, hard and filiform, wiry, 10–20 cm, articulate. Inflorescence arising from near base of pseudobulb, erect, purple, 25–30 cm, laxly 5- or 6-flowered; floral bracts purple, lanceolate, 20–25 mm. Flowers fragrant; pedicel and ovary 25–35 mm; sepals and petals green, petals mottled dark purple at base; lip white, tinged red on lateral lobes and tinged green and spotted with purple on mid-lobe. Sepals linear-lanceolate, ca. 25 × 6 mm, 5-veined. Petals narrowly oblong-lanceolate, ca. 22 × 7 mm; lip elliptic-pandurate, ca. 20 × 10 mm, not fused to basal margins of column, obscurely 3-lobed; lateral lobes erect; mid-lobe recurved, suborbicular, 10–12 mm; disk with 2 longitudinal lamellae extending from base of lip almost to base of mid-lobe. Column slightly arcuate, ca. 13 mm; pollinia 4, in 2 pairs. Fl. Oct–Dec.

- Forests; 700–1800 m. SW Guizhou, SE Yunnan.

*Cymbidium ×purpuratum* L. J. Chen, L. Q. Li & Z. J. Liu (J. S. China Agric. Univ. 28(2): 84. 2007) is a hybrid of *C. qiubeiense* and *C. kanran*; *C. ×latifolium* L. J. Chen, L. Q. Li & Z. J. Liu (loc. cit.: 85. 2007) is a hybrid of *C. qiubeiense* and *C. lancifolium*; and *C. ×uniflorum* L. J. Chen, L. Q. Li & Z. J. Liu (loc. cit.: 86. 2007), not T. K. Yen (1964), is a hybrid of *C. qiubeiense* and *C. serratum*.

**38. *Cymbidium omeiense*** Y. S. Wu & S. C. Chen, Acta Phytotax. Sin. 11: 32. 1966.

峨眉春蕙 e mei chun hui

*Cymbidium faberi* Rolfe var. *omeiense* (Y. S. Wu & S. C. Chen) Y. S. Wu & S. C. Chen.

Plants terrestrial, autotrophic. Pseudobulbs indistinct. Leaves 4 or 5, loriate, 15–30(–35) × 0.6–1 cm, subleathery, without transparent veins, not articulate toward base, margin slightly serrulate, apex acuminate. Inflorescence subbasal, slightly arching or curved, 15–17 cm; peduncle with 4–6 sheaths 5–25 mm; rachis laxly 3- or 4-flowered; floral bracts linear-lanceolate, 15–25 × 2–4 mm. Flowers fragrant, appearing twice per year, ca. 5 cm in diam.; pedicel and ovary 15–25 mm; sepals and petals pale yellow-green, sepals with a purplish red mid-vein in basal half, petals with purplish red spots; lip pale yellow-green with a central narrowly cordate purplish red patch; column yellowish with purplish red stripes on ventral surface. Sepals linear-lanceolate, 25–30 × 3–5 mm, apex acuminate. Petals rhombic-lanceolate, oblique, 16–18 × 3–4 mm, apex acuminate; lip ovate, ca. 20 mm, not fused to basal margins of column, 3-lobed near middle; lateral lobes erect, suborbicular; mid-lobe recurved, ovate, ca. 11 × 8 mm; disk minutely papillate, with 2 arcuate, glabrous lamellae. Column ca. 11 mm; pollinia 4, in 2 pairs. Fl. Mar–Apr.

- SC Sichuan (Emei Shan).

On further study, this taxon might well prove to be of hybrid origin, probably with *Cymbidium tortisepalum* being one of its parents.

**39. *Cymbidium goeringii*** (H. G. Reichenbach) H. G. Reichenbach, Ann. Bot. Syst. 3: 547. 1852.

春兰 chun lan

*Maxillaria goeringii* H. G. Reichenbach, Bot. Zeitung (Berlin) 3: 334. 1845; *Cymbidium formosanum* Hayata; *C. formosanum* f. *albiflorum* S. S. Ying; *C. forrestii* Rolfe; *C.*



*goeringii* f. *albiflorum* (S. S. Ying) S. S. Ying; *C. goeringii* var. *formosanum* (Hayata) S. S. Ying; *C. goeringii* var. *papyriflorum* Y. S. Wu; *C. pseudovirens* Schlechter; *C. tentyozanense* Masamune; *C. uniflorum* T. K. Yen (1964), not L. J. Chen, L. Q. Li & Z. J. Liu (2007); *C. virens* H. G. Reichenbach; *C. virescens* Lindley; *C. yunnanense* Schlechter.

Plants terrestrial, autotrophic. Pseudobulbs ovoid, small, 1–2.5 × 1–1.5 cm, enclosed in leaf bases. Leaves 4–7, lorate, 20–40(–60) × 0.5–0.9 cm, articulate toward base, margin usually slightly serrate. Inflorescence arising from near base of pseudobulb, erect, usually 2–5 cm, shorter than leaves; rachis usually 1-flowered; floral bracts 40–50 × 7–10 mm, exceeding ovary, loosely embracing ovary. Flowers scented, variable in color, usually yellowish green with purplish brown venation, sometimes olive-green, membranous; pedicel and ovary 20–40 mm. Sepals suboblong to oblong-obovate, 25–40 × 8–12 mm, apex obtuse to acute. Petals spreading forward or loosely embracing column, obovate-elliptic to oblong-ovate, 17–30 × 8–12 mm; lip subovate, 14–28 mm, obscurely 3-lobed; lateral lobes erect, not fused to basal margins of column; mid-lobe strongly recurved, broadly ovate, 7–10 × 7–10 mm, margin slightly undulate; disk minutely papillate, with 2 longitudinal lamellae extending from base of lip to base of mid-lobe; lamellae convergent in apical half and forming a short tube. Column 12–18 mm, broadly winged; pollinia 4, in 2 pairs.

Rocky slopes, forest margins, open places in forests; 300–2200(–3000) m. Anhui, N Fujian, S Gansu, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, NW India, Japan, Korea].

**40. *Cymbidium serratum* Schlechter, Repert. Spec. Nov. Regni Veg. Beih. 4: 73. 1919.**

豆瓣兰 dou ban lan

*Cymbidium formosanum* Hayata var. *gracillimum* (Fukuyama) T. S. Liu & H. J. Su; *C. goeringii* (H. G. Reichenbach) H. G. Reichenbach var. *gracillimum* (Fukuyama) Govaerts; *C. goeringii* var. *serratum* (Schlechter) Y. S. Wu & S. C. Chen; *C. gracillimum* Fukuyama.

Plants terrestrial, autotrophic. Pseudobulbs ovoid, small, 0.8–1.2 × 0.7–1 cm, with thick roots at base. Leaves 3–5, subterminal, lorate, 23–38(–70) × 0.5–0.7 cm, often slightly conduplicate, with translucent veins, not articulate at base, margin usually serrate, apex acuminate. Inflorescence arising from base of pseudobulb, erect, usually 20–30 cm; peduncle with 5 or 6 sheaths; sheaths to 7 cm, with purple-red venation; rachis 1- or very rarely 2-flowered; floral bracts 40–50 mm, much longer than ovary. Flowers not scented, thickly textured; pedicel and ovary 30–35 mm, usually pale purple-red; sepals and petals green, with a purple-red midvein and finer lateral venation; lip white with purple-red markings; column greenish, with minute purple-red spots and striations, tinged purple-red at apex. Sepals narrowly oblong-ovate or suboblong, 36–38 × 11–13 mm, apical margin often incurved, apex subacute. Petals spreading forward and loosely clasping column, suboblong, 20–28 × 9–13 mm, apex obtuse; lip ovate, 20–25 mm, not fused to basal margins of column, 3-lobed; lateral lobes erect; mid-lobe recurved, oblong-ovate, 10–14 × 8–10 mm, apex obtuse; disk with 2 lamellae extending from near base of lip almost to base of mid-

lobe; lamellae convergent at their apices and forming a short tube. Column 12–18 mm, narrowly winged. Fl. Feb–Mar.

• Rocky places, open forests or well-drained and grassy slopes; 1000–3000 m. Guizhou, Hubei, Sichuan, Taiwan, Yunnan.

This species can be distinguished easily from *Cymbidium goeringii* by its narrow and non-articulate leaves, its much longer inflorescence, and its thickly textured and unscented flower with green sepals and petals.

**41. *Cymbidium tortisepalum* Fukuyama, Bot. Mag. (Tokyo) 48: 304. 1934.**

莲瓣兰 lian ban lan

Plants terrestrial, autotrophic. Pseudobulbs ellipsoid or ovoid, small, 1–2 × 0.5–1 cm, enclosed in leaf bases, with thick roots 5–10 mm in diam. Leaves 5–7(–10), stiff or flexuous, lorate, (30–)40–65 × 0.4–1.8 cm, thinly leathery, not articulate at base, margin serrulate, apex acute to acuminate. Inflorescence arising from near base of pseudobulb, erect, 20–30 cm; peduncle with several sheaths; rachis (2 or)3–7-flowered; floral bracts linear-lanceolate, usually 25–40 × 6–9 mm, exceeding ovary. Flowers scented, variable in color; pedicel and ovary 24–32 mm; sepals and petals usually pale greenish yellow or whitish; lip pale greenish yellow or whitish, sometimes with purplish red markings. Sepals oblong or oblong-lanceolate, 30–38 × 7–8 mm, apex acute, sometimes slightly twisted. Petals ovate-lanceolate or oblong, 25–30 × 8–9 mm, apex acute; lip ovate to elliptic, 18–20 × 8–10 mm, not fused to basal margins of column, 3-lobed; lateral lobes erect, small; mid-lobe recurved, ovate or broadly ovate, 10–11 × 9–10 mm; disk with 2 longitudinal lamellae extending from base of lip almost to base of mid-lobe. Column 14–15 mm, with purplish striations on ventral surface; pollinia 4, in 2 pairs.

• Open forests, forest margins, grassy slopes, rocky and scrubby slopes; 800–2500 m. Guizhou, Sichuan, Taiwan, Yunnan.

- 1a. Leaves flexuous, arching, 0.4–1.2 cm wide; floral bracts nearly as long as ovary, usually not exceeding ovary ..... 41a. var. *tortisepalum*
- 1b. Leaves stiff, suberect, 1.3–1.8 cm wide; floral bracts exceeding ovary ..... 41b. var. *longibracteatum*

**41a. *Cymbidium tortisepalum* var. *tortisepalum***

莲瓣兰(原变种) lian ban lan (yuan bian zhong)

*Cymbidium goeringii* (H. G. Reichenbach) H. G. Reichenbach var. *tortisepalum* (Fukuyama) Y. S. Wu & S. C. Chen; *C. lianpan* Tang & F. T. Wang ex Y. S. Wu; *C. longibracteatum* Y. S. Wu & S. C. Chen var. *tortisepalum* (Fukuyama) Y. S. Wu; *C. tortisepalum* f. *albiflorum* S. S. Ying; *C. tortisepalum* var. *viridiflorum* S. S. Ying; *C. tsukengense* C. Chow.

Leaves flexuous, arching, 40–65 × 0.4–1.2 cm. Floral bracts usually 25–35 × 6–7 cm, nearly as long as ovary. Fl. Dec–Mar.

• Grassy slopes, open forests, forest margins; 800–2500 m. W Sichuan, Taiwan, W Yunnan.

**41b. *Cymbidium tortisepalum* var. *longibracteatum* (Y. S.**

Wu & S. C. Chen) S. C. Chen & Z. J. Liu, Acta Phytotax. Sin. 41: 81. 2003.

春剑 chun jian

*Cymbidium longibracteatum* Y. S. Wu & S. C. Chen, Acta Phytotax. Sin. 11: 31. 1966; *C. goeringii* var. *longibracteatum* (Y. S. Wu & S. C. Chen) Y. S. Wu & S. C. Chen; *C. longibracteatum* var. *flaccidifolium* Y. S. Wu; *C. longibracteatum* var. *rubisepalum* Y. S. Wu; *C. longibracteatum* var. *tonghaiense* Y. S. Wu.

Leaves stiff, suberect, 50–65 × 1.3–1.8 cm. Floral bracts usually 30–40 × 8–10 mm, exceeding ovary, often embracing ovary. Fl. Jan–Mar.

• Rocky and scrubby slopes; 1000–2000 m. Guizhou, Sichuan, Yunnan.

**42. *Cymbidium faberi*** Rolfe, Bull. Misc. Inform. Kew 1896: 198. 1896.

蕙兰 hui lan

*Cymbidium cerinum* Schlechter; *C. faberi* f. *viridiflorum* S. S. Ying; *C. fukienense* T. K. Yen; *C. oiwakense* Hayata; *C. scabroserrulatum* Makino; *Eulophia yunnanensis* Rolfe; *Semiphajus evrardii* Gagnepain.

Plants terrestrial, autotrophic. Pseudobulbs inconspicuous. Leaves 4–8, suberect, 25–80 × 0.7–1.2 cm, with transparent veins, conduplicate at base, not articulate, margin sharply serrate. Inflorescence arising from axil of uppermost leaf, suberect or slightly curved, 35–50(–80) cm; peduncle with many long sheaths; rachis 5–11- or more flowered; floral bracts linear-lanceolate, usually 10–20 × 2–5 mm, ca. 1/2 as long as ovary. Flowers usually very fragrant; pedicel and ovary 20–26 mm; sepals and petals pale yellowish green; lip pale yellowish green with purplish red patches. Sepals sub lanceolate-oblong or narrowly obovate, 25–35 × 6–8 mm, apex acute. Petals oblong-ovate, 22–30 × 7–9 mm, apex acute; lip oblong-ovate, 20–25 mm, not fused to basal margins of column, 3-lobed; lateral lobes erect; mid-lobe strongly recurved, ligulate, 12–16 × 5–10 mm, margin usually crisped; disk papillate or puberulent, with 2 longitudinal lamellae extending from base of lip to base of mid-lobe; lamellae convergent toward their apices and forming a short tube. Column slightly arcuate, 12–16 mm, narrowly winged; pollinia 4, in 2 pairs, broadly ovoid. Capsule narrowly subellipsoid, 50–55 × ca. 20 mm. Fl. Mar–May, fr. Jul–Sep.  $2n = 40, 42^*, 43, 44$ .

Damp but well-drained slopes, open shrubby places; 700–3000 m. Anhui, N Fujian, S Gansu, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangxi, S Shaanxi, Sichuan, Taiwan, E Xizang, Yunnan, Zhejiang [N India, Nepal].

**43. *Cymbidium nanulum*** Y. S. Wu & S. C. Chen, Acta Phytotax. Sin. 29: 551. 1991.

珍珠矮 zhen zhu ai

Plants terrestrial, autotrophic, with a slightly fleshy subterranean rhizome, lacking pseudobulbs. Rhizome compressed, cylindrical, 5–6 cm or longer, usually more than 1 cm in diam., many noded. Leaves 2 or 3, erect, lorate, 25–30 × 1–1.2 cm,

midvein concave on both surfaces, base enclosed by several purplish sheaths, not articulate, margin denticulate, apex sub-acute. Inflorescence arising from base of plant, erect, 10–13 cm; rachis laxly 3- or 4-flowered; floral bracts linear or linear-lanceolate, 4–9 mm. Flowers fragrant, 2.5–3.2 cm in diam.; pedicel and ovary 16–20 mm; sepals and petals usually yellowish green with 5 purplish red longitudinal striations; lip yellowish green with purplish red striations on lateral lobes and purplish red markings on mid-lobe. Sepals oblong, 13–16 × 6–7 mm, apex obtuse-rounded and apiculate; lateral sepals spreading horizontally. Petals oblong, 11–14 × 6–7 mm, loosely clasping column, apex obtuse-rounded; lip oblong-ovate, 8–10 mm, not fused to basal margins of column, obscurely 3-lobed; lateral lobes suberect, small; mid-lobe ovate-elliptic, ca. 3 × 2 mm; disk with 2 longitudinal lamellae; lamellae convergent toward their apices. Column 6–7 mm; pollinia 4, in 2 pairs. Fl. Jun.

• Rocky places in forests. SW Guizhou, Hainan, SE and SW Yunnan.

**44. *Cymbidium teretipetiolatum*** Z. J. Liu & S. C. Chen, Orchidee (Hamburg) 53: 338. 2002.

奇瓣红春素 qi ban hong chun su

Plants terrestrial, autotrophic. Pseudobulbs ovoid, 1–1.4 × 0.7–1 cm, 2- or 3-noded, usually borne on a rhizome; rhizome subterranean, 4–5 × 0.4–0.5 mm. Leaves 3–5, lorate, 40–50 × 0.6–0.9 cm, contracted at base into a petiole-like stalk, apex acute; petiole-like stalk not articulate, basally cylindrical-tubular and sometimes equitant to form a pseudostem. Inflorescence arising from base of pseudobulb, 19–21 cm; peduncle with several sheaths 4–5 cm; rachis 2–4-flowered; floral bracts greenish, linear-lanceolate, 25–30 mm. Flowers not scented, 6–7 cm in diam.; pedicel and ovary 30–35 mm; sepals and petals white-green, tinged brownish or pinkish, with green venation; lip similar in color to sepals and petals but somewhat paler and usually with red spots along basal margins of lateral lobes. Sepals oblong-lanceolate or suboblong, 30–40 × 6–7 mm, apex acuminate. Petals similar to sepals though sometimes slightly shorter; lip ovate, 19–21 × 9–10 mm, not fused to basal margins of column, unlobed or obscurely 3-lobed; lateral lobes suborbicular; mid-lobe oblong-ovate, ca. 15 × 6 mm, apex obtuse; disk without keels or lamellae. Column slightly arcuate, greenish, flushed ivory-white at apex, ca. 13 mm; pollinia 4, in 2 pairs. Fl. Jan–Feb.

• Open forests; ca. 1000 m. S Yunnan.

This species may be based on a plant with deformed flowers. The petals of the type appear deformed and the lip is petaloid, lacking the callus ridges that are typical of the species in this group. Its relationship with *Cymbidium tortisepalum* needs further investigation.

**45. *Cymbidium lancifolium*** Hooker, Exot. Fl. 1: ad t. 51. 1823.

兔耳兰 tu er lan

*Cymbidium aspidistrifolium* Fukuyama; *C. bambusifolium* Fowlie (1986), not Roxburgh (1832); *C. javanicum* Blume; *C. javanicum* var. *aspidistrifolium* (Fukuyama) F. Maekawa; *C. lancifolium* f. *aspidistrifolium* (Fukuyama) T. P. Lin; *C. lancifolium* var. *aspidistrifolium* (Fukuyama) S. S. Ying; *C. lancifolium* var. *papuanum* (Schlechter) S. S. Ying; *C. lancifolium* var.

*syunitianum* (Fukuyama) S. S. Ying; *C. maclehoseae* S. Y. Hu; *C. nagifolium* Masamune; *C. papuanum* Schlechter; *C. syunitianum* Fukuyama.

Plants lithophytic or terrestrial, autotrophic. Pseudobulbs usually somewhat tufted, cylindrical to narrowly fusiform, usually tapering toward apex, slightly bilaterally flattened, 2–7(–15) × 0.5–1(–1.5) cm, several noded, naked. Leaves 2–4, borne at apex of pseudobulbs, oblanceolate-oblong to narrowly elliptic, 6–17(–25) × 1.9–4(–6) cm, base contracted into a petiole-like stalk, apical margin finely toothed, apex acuminate; petiole-like stalk 3–18 cm, articulate. Inflorescence lateral, arising from an intermediate node of pseudobulb, erect, 8–20 cm or longer; rachis (1 or) 2–6-flowered; floral bracts lanceolate, 10–15 mm. Flowers usually not scented, 2–2.5 cm in diam.; pedicel and ovary 20–25 mm; sepals and petals white or pale green, midvein sometimes purplish brown; lip white or pale green with purplish brown markings. Sepals oblanceolate-oblong, 22–27(–30) × 5–7 mm, apex acute. Petals suboblong, 15–23 × 5–7 mm, apex acute; lip ovate-oblong, 15–20 mm, not fused to basal margins of column, obscurely 3-lobed; lateral lobes erect and loosely clasping column; mid-lobe recurved, broadly ovate, 6–11 × 6–12 mm; disk with 2 longitudinal lamellae extending from base of lip to base of mid-lobe; lamellae convergent toward their apices and forming a short tube. Column ca. 15 mm; pollinia 4, in 2 pairs. Capsule narrowly ellipsoid, ca. 50 × 15 mm. Fl. May–Aug, fr. Oct–Dec.  $2n = 38^*$ , 39, 40, 42.

Open forests, bamboo forests, forest margins, broad-leaved forests, humus-rich rocks along valleys; 300–2200 m. N Fujian, Guangdong, Guangxi, Guizhou, Hainan, S Hunan, S Sichuan, Taiwan, SE Xizang, Yunnan, S Zhejiang [Bhutan, Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Thailand, Vietnam].

**46. *Cymbidium recurvatum*** Z. J. Liu, S. C. Chen & P. J. Cribb, *sp. nov.*

长茎兔耳兰 chang jing tu er lan

Type: China. Yunnan: Baoshan Shi, Xishan Qu, Ban Tou Po, in thicket, alt. 1700 m, 11 May 2005, Z. J. Liu 3043 (holotype, NOCC).

*Species nova* *Cymbidie caulescenti similis, a quo inflorescentia multo brevior uniflora, labello maculis duabus purpuratis et lobis lateralibus purpureis praedito differt.*

Plants terrestrial, autotrophic. Pseudobulbs usually borne in fascicles of 2 or 3, erect, greenish, stemlike, cylindrical, 18–23 × 0.5–0.7 cm, fleshy, 6–8-noded, with a sheath at each node; sheaths persistent, amplexicaul, lanceolate, 1.8–6.5 cm, membranous. Leaves 2–4, subterminal, elliptic-oblong or obovate-oblong, 6–9 × 1.2–2.4 cm, base contracted into a petiole-like stalk, apical margin serrulate, apex shortly acuminate; petiole-like stalk 1–2.5 cm, articulate. Inflorescence lateral, arising from a node toward apex of pseudobulb, erect, 9–11 cm; peduncle with 3–5 sheaths; sheaths greenish white, lanceolate, 1–1.6 cm, membranous, amplexicaul at base; rachis usually 1-flowered; floral bract lanceolate, 9–11 mm. Pedicel and ovary 20–24 mm; sepals pale green-yellow, midvein purple toward base; petals white, midvein purple and with purple spots; lip

whitish, with purple lateral lobes and 2 or 3 purple patches on mid-lobe; column white with purple markings. Sepals narrowly oblong or oblanceolate-oblong, 23–26 × 2–5 mm, apex acuminate and recurved. Petals ovate-oblong, 21–23 × 6–7 mm, apex acuminate; lip subovate, 17–20 mm, not fused to basal margins of column, 3-lobed; lateral lobes suberect, subovate, loosely embracing column; mid-lobe recurved, subovate, 9–11 × 6–8 mm; disk with 2 longitudinal lamellae extending from base of lip to base of mid-lobe; lamellae convergent toward their apices and forming a short tube. Column 10–12 mm; pollinia 4, in 2 pairs. Fl. Aug–Sep.

• Well-drained shrubby slopes; ca. 1700 m. SW Yunnan (Baoshan).

This taxon is characterized by its cylindrical, rather long, stemlike pseudobulb and by its subterminal leaves. It has a 1-flowered inflorescence, but this could be atypical. The lip has purple lateral lobes and two or three purple patches on the mid-lobe. It is quite unlike *Cymbidium caulescens* Ridley (the type of which is at K), which has a several-flowered inflorescence and has a non-elongated pseudobulb, the base of which is covered in acute sheaths. Some plants of *C. lancifolium* have elongated pseudobulbs (as illustrated under its synonyms by Mark et al., *Orchid Digest* 13: 36. 1986), suggesting that the utility of this character to distinguish the two species could be misleading. Green sepals and petals are found in *C. lancifolium* var. *aspidistrifolium*, but that entity has a shorter pseudobulb and leaves without serrated margins.

**47. *Cymbidium rhizomatsum*** Z. J. Liu & S. C. Chen, *J. Wuhan Bot. Res.* 20: 421. 2002.

二叶兰 er ye lan

Plants terrestrial, autotrophic, with a subterranean rhizome. Rhizome whitish yellow, cylindrical, 7–10 × 0.6–1.5 cm, branched, several noded, with small wartlike outgrowths, with several fleshy roots to 9 × 0.8 cm. Leaves 2, basal, emerging after anthesis, narrowly elliptic to elliptic, 6–8 × 1.8–2.5 cm, thinly leathery, contracted into a short petiole-like stalk at base, apex acute; petiole conduplicate or somewhat tubular, ca. 2 cm, articulate. Inflorescence arising from apical node of rhizome, erect, 15–20 cm, slender; peduncle greenish with several green sheaths 1–2.5 cm; rachis (1 or) 2- or 3-flowered; floral bracts greenish, narrowly ovate, 9–15 × 5–7 mm. Flowers opening widely; pedicel and ovary 15–25 mm; sepals and petals greenish to whitish, petals with a purplish red longitudinal line at base; lip greenish to whitish with purplish red markings. Dorsal sepal narrowly obovate-elliptic, ca. 27 × 5 mm, apex acute-acuminate; lateral sepals linear-obovate, ca. 25 × 4 mm, apex acute. Lip ovate, ca. 14 × 11 mm, not fused to basal margins of column, obscurely 3-lobed; lateral lobes erect, small; mid-lobe recurved, ovate, ca. 7 × 6 mm; disk with 2 convergent lamellae extending from base of lip to base of mid-lobe. Column 11–13 mm; pollinia 4, in 2 pairs. Capsule erect, narrowly ellipsoid, ca. 35 × 10 mm. Fl. Aug–Sep, fr. Nov–Dec.

• SE Yunnan.

Among the present authors, Cribb observes that this taxon is probably best treated as a variety of the widespread and variable *Cymbidium lancifolium*. It does not differ significantly from *C. lancifolium* var. *papuanum* (a synonym of *C. lancifolium* in the present treatment), which also has long rhizomes, short pseudobulbs, and small leaves. The

latter has been found in New Guinea and Thailand. On the other hand, Chen observes that *C. rhizomatosum* is quite different from *C. lancifolium* and differs by its leaves appearing after anthesis.

**48. *Cymbidium macrorhizon*** Lindley, Gen. Sp. Orchid. Pl. 162. 1833.

大根兰 da gen lan

*Cymbidium aphyllum* Ames & Schlechter (1919), not (Roxburgh) Swartz (1799); *C. szechuanense* S. Y. Hu; *Pachyrrhizanthé aphyllum* (Ames & Schlechter) Nakai; *P. macrorhizon* (Lindley) Nakai.

Plants terrestrial, mycotrophic, lacking green leaves and pseudobulbs. Rhizome subterranean, white, ascending or suberect, 5–10 × 0.3–0.7 cm, fleshy, often branched, several noded, slightly papillate, with 1 or 2 short roots to 1 cm. Inflorescence usually arising from apex of rhizome, erect, 11–18 cm or longer; peduncle usually purplish red or cream-yellow tinged purplish red at base, green above, with several sheaths 1–2.5 cm; rachis 2–5-flowered; floral bracts linear-lanceolate, 6–11 mm. Flowers 3–4 cm in diam.; pedicel and ovary 20–25 mm; sepals and petals white or yellowish with a purplish red longitudinal line; lip white or yellowish with purplish red markings. Sepals narrowly obovate-oblong, 20–22 × 4–5 mm, apex acute. Petals narrowly elliptic, 15–18 × 5–6 mm, apex acute; lip subovate, 13–16 mm, not fused to basal margins of column, slightly 3-lobed; lateral lobes erect; mid-lobe slightly recurved, triangular-ovate, 5–7 × 4–6 mm; disk papillate, with 2 longitudinal lamellae extending from base of lip to base of mid-lobe; lamellae convergent at their apices and forming a short tube. Column slightly arcuate, ca. 10 mm, narrowly winged; pollinia 4, in 2 pairs, broadly ovoid. Capsule erect, green. Fl. Jun–Aug.  $2n = 38$ .

Forests along riversides, forest margins, open grassy slopes; 700–1500 m. Chongqing, SW Guizhou, SW Sichuan, NE Yunnan [N India, Japan, Laos, Myanmar, Nepal, Pakistan, Thailand].

**49. *Cymbidium multiradicatum*** Z. J. Liu & S. C. Chen, Acta Bot. Yunnan. 26: 297. 2004.

多根兰 duo gen lan

Plants terrestrial, lacking green leaves and pseudobulbs at anthesis (and possibly afterward). Rhizome subterranean, yellowish white, 9–12 × 0.6–1.2 cm, fleshy, often branched, several noded, slightly papillate, with several hairy roots 8–12 cm. Inflorescence arising from apex of rhizome, suberect, 40–45 cm; peduncle greenish, tinged purplish red, with 4 or 5 pale yellow-green sheaths 4–5 cm; rachis 5–10 cm, 3–10-flowered; floral bracts pale yellow-green, narrowly triangular, 12–15 mm. Flowers not opening widely, purple-red to yellowish; pedicel and ovary greenish, 15–17 mm. Sepals narrowly elliptic-lanceolate, 17–19 × 3–5 mm, apex acuminate; lateral sepals slightly oblique. Petals narrowly elliptic, 11–13 × 4–5 mm, apex acuminate; lip elliptic-ovate, 13–14 × 5–7 mm, not fused to basal margins of column, 3-lobed; lateral lobes suberect; mid-lobe slightly recurved, ovate, 5–6 × 4–4.5 mm, apical margin crisped; disk with 2 fleshy lamellae. Column slightly arcuate, 11–12 mm; pollinia 4, in 2 pairs. Capsule erect, green. Fl. Jun–Jul.

• Humus-rich places in dense forests; ca. 1500 m. SE Yunnan (Malipo).

Among the current authors, Cribb observes that this is unlikely to be a mycotrophic species, given that it has typical autotrophic roots, not the rhizomatous structure found in all mycotrophic orchids. It also has green capsules, thus it is photosynthetic at least when in fruit. This taxon is close to *Cymbidium lancifolium* but probably warrants specific rank. It is not known whether it has been grown in cultivation to ascertain if it develops leaves after flowering. As mentioned under *C. rhizomatosum*, elongate rhizomes are found in *C. lancifolium* var. *papuanum* (a synonym of *C. lancifolium* in the present treatment). On the other hand, Chen observes that the flowers of *C. multiradicatum* differ greatly from either *C. lancifolium* or other species, showing little relationship with them.

