

110. PLEIONE D. Don, Prodr. Fl. Nepal. 36. 1825.

独蒜兰属 *du suan lan shu*

Chen Xinqi (陈心启 Chen Sing-chi); Phillip J. Cribb, Stephan W. Gale

Herbs epiphytic, lithophytic, or terrestrial. Pseudobulbs annual, often clustered, ovoid, conic, pyriform, or turbinate, gradually narrowed toward apex to form a distinct neck, sometimes abruptly contracted into a very short neck, 1- or 2-leaved at apex. Leaves usually papery, plicate, usually contracted at base into a short petiole-like stalk, usually deciduous or falling in winter. Inflorescences 1 or 2, arising from base of an old pseudobulb, erect, appearing either before or after leaves, 1- or 2-flowered; floral bracts often colorful, persistent. Flowers large, usually showy, opening widely, sometimes fragrant. Sepals usually free, similar. Petals similar to but usually slightly narrower than sepals; lip conspicuously larger than sepals, entire or obscurely 3-lobed, sometimes basally adnate to column base, apical margin erose or lacerate; disk with a callus consisting of 2 to several lamellae or rows of papillae extending along central veins. Column slightly arcuate, slender, winged above, apex usually erose; pollinia 4, in 2 pairs, waxy, often obovoid and bilaterally flattened. Capsule fusiform, with 3 longitudinal ribs.

About 26 species: from Nepal, across C, S, and E China and Bhutan, south to Laos, Myanmar, Thailand, and Vietnam; 23 species (12 endemic) in China.

- 1a. Pseudobulb 2-leaved.
 - 2a. Plants spring-flowering; leaves developing at flowering.
 - 3a. Lip much broader than long, apex obtuse or emarginate; callus on disk composed of 5–9 lacerate lamellae 5. *P. scopulorum*
 - 3b. Lip ca. as broad as long, apex subacute; callus on disk composed of 5–9 rows of papillae that grade into lacerate lamellae midway along mid-lobe 6. *P. kaatiaea*
 - 2b. Plants autumn-flowering; leaves deciduous or withered at flowering.
 - 4a. Sheaths on pseudobulb warty; pseudobulb green, mottled purplish brown; column 35–45 mm 3. *P. praecox*
 - 4b. Sheaths on pseudobulb smooth; pseudobulb green; column 14–20 mm.
 - 5a. Pseudobulb turbinate to pyriform, usually with a short, indistinct neck; lip 3-lobed at or below middle; apical margin of lip erose; column 17–20 mm 1. *P. maculata*
 - 5b. Pseudobulb ovoid-conic or flask-shaped, apex contracted into an elongate neck; lip 3-lobed above middle; apical margin of lip emarginate and undulate, not erose; column 14–17 mm 2. *P. autumnalis*
- 1b. Pseudobulb 1-leaved.
 - 6a. Plants autumn-flowering; pseudobulb turbinate, dorsiventrally flattened, much thicker than tall; sepals fused in basal half and forming a tube 4. *P. saxicola*
 - 6b. Plants spring-flowering; pseudobulb ovoid to conic, taller than thick; sepals free to base.
 - 7a. Callus on lip composed of rows of individual papillae.
 - 8a. Sepals and petals white.
 - 9a. Lip base saccate and with a short spur 1–2 mm 10. *P. albiflora*
 - 9b. Lip base neither saccate nor spurred 11. *P. humilis*
 - 8b. Sepals and petals pink, rose-purple, pale purplish red, or purple.
 - 10a. Sepals 39–50 mm; petals strongly reflexed 9. *P. aurita*
 - 10b. Sepals 20–35(–45) mm; petals spreading, not reflexed.
 - 11a. Lip with 7 rows of papillae; plants often stoloniferous 7. *P. hookeriana*
 - 11b. Lip with 6 rows of papillae; plants not stoloniferous 8. *P. chunii*
 - 7b. Callus on lip composed of entire, erose, lacerate, or denticulate lamellae.
 - 12a. Flowers orange-yellow, yellow, or yellowish white, sometimes with red, crimson, or brown marks on lip, and sometimes overlaid with purple on sepals and petals.
 - 13a. Lamellae on lip entire 13. *P. forrestii*
 - 13b. Lamellae on lip slightly erose or erose-lacerate.
 - 14a. Sepals and petals yellow, not overlaid with purple 14. *P. ×confusa*
 - 14b. Sepals and petals yellow, overlaid with purple 15. *P. ×christianii*
 - 12b. Flower white, red, or purple, never tinged with yellow.
 - 15a. Floral bract shorter than ovary.
 - 16a. Lip purplish, pink, or sometimes white, with purple or deep red spots on lip; lamellae on lip entire or slightly erose 16. *P. yunnanensis*
 - 16b. Lip purplish pink, sometimes tinged white, with bold broad purple stripes on apical margin; lamellae on lip ragged 17. *P. ×taliensis*
 - 15b. Floral bract ca. as long as or exceeding ovary.

- 17a. Sepals and petals pure white.
 18a. Dorsal sepal 30–40 mm; lamellae on lip entire 13. *P. forrestii*
 18b. Dorsal sepal 50–55 mm; lamellae on lip lacerate 18. *P. grandiflora*
 17b. Sepals and petals bright rose-purple, purplish violet, pink, rose-pink, pale purple, purplish red, or white tinged pink (occasionally pure white in *P. formosana*).
 19a. Lamellae on lip lacerate 12. *P. ×kohlsii*
 19b. Lamellae on lip entire, erose, or denticulate.
 20a. Pseudobulb geniculate-curved; leaf 0.2–1.1 cm wide 23. *P. microphylla*
 20b. Pseudobulb not curved; leaf 2–7 cm wide.
 21a. Sepals 28–35 mm; lip 25–40 mm; column 25–30 mm 22. *P. limprichtii*
 21b. Sepals 35–65 mm; lip 35–55 mm; column 27–45 mm.
 22a. Lip strongly deflexed at apical 1/3, lacking marks on lateral lobes; disk with 2 or 4 denticulate lamellae 21. *P. pleionoides*
 22b. Lip not strongly deflexed, with reddish, brownish, or dark purple marks on lateral lobes; disk with 2–5 entire or erose lamellae.
 23a. Lip usually same color as sepals and petals; disk with 4 or 5 erose, uninterrupted lamellae 19. *P. bulbocodioides*
 23b. Lip usually different in color from sepals and petals; disk with 2–5 entire or erose, usually interrupted lamellae 20. *P. formosana*

1. *Pleione maculata* (Lindley) Lindley & Paxton, Paxt. Fl. Gard. 2: [5]. 1851.

秋花独蒜兰 qiu hua du suan lan

Coelogyne maculata Lindley, Gen. Sp. Orchid. Pl. 43. 1830; *C. arthuriana* H. G. Reichenbach; *C. diphylla* (Lindley & Paxton) Lindley; *Pleione diphylla* Lindley & Paxton; *P. maculata* var. *arthuriana* (H. G. Reichenbach) Rolfe ex Kraenzlin; *P. maculata* var. *virginica* H. G. Reichenbach.

Herbs, epiphytic. Pseudobulb green, turbinate to pyriform, 1–3 × 1–1.5 cm, usually with a short, indistinct neck, often enclosed in persistent, smooth sheaths, 2-leaved. Leaves elliptic-lanceolate to oblanceolate, 10–20 × 1.5–3.5 cm, papery, apex acute. Inflorescence appearing after leaves have fallen, erect; peduncle completely enclosed in several membranous sheaths, 5–6 cm; floral bract cucullate, broadly obovate or suborbicular when flattened, 17–30 mm, exceeding ovary, apex obtuse. Flower solitary, suberect or spreading horizontally, fragrant, white or occasionally tinged purplish red, lip with a yellow center and purple blotches on apical margin. Dorsal sepal oblong-lanceolate, 30–40 × 7–9 mm, apex obtuse; lateral sepals broadly lanceolate, falcate, slightly oblique, 30–40 × 8–10 mm, apex acute. Petals oblanceolate, ± falcate, 30–42 × 7–8 mm, apex acute; lip ovate-oblong, 25–35 × 20–25 mm, conspicuously 3-lobed at or below middle; lateral lobes small; mid-lobe 10–13 mm, margin erose, apex emarginate; disk with 5–7 papillate-toothed lamellae; central 2 or 3 lamellae arising at base of lip, all extending almost to apex of lip. Column ± arcuate, 17–20 mm, apex irregularly erose-toothed. Fl. Oct–Nov. 2n = 40.

On tree trunks and mossy rocks in broad-leaved forests; 600–1600 m. W Yunnan [Bhutan, India, Myanmar, Nepal, N Thailand].

In the wild, *Pleione maculata* occasionally crosses with *P. praecox* to produce the hybrid *P. ×lagenaria* Lindley & Paxton, the presence of which in China has not yet been confirmed.

2. *Pleione autumnalis* S. C. Chen & G. H. Zhu, Harvard Pap. Bot. 4: 429. 1999.

长颈独蒜兰 chang jing du suan lan

Herbs, lithophytic. Pseudobulb green, ovoid-conic or flask-shaped, 2.5–4 × 1–1.4 cm, apex contracted into an elongate neck ca. 7 mm, 2-leaved. Leaves falling prior to flowering. Inflorescence erect; peduncle partly or nearly completely enclosed in sheaths, 2–4 cm; floral bract oblong-obovate, 18–22 × 10–13 mm, apical margin usually crisped-erose, apex obtuse. Flower solitary, white; pedicel and ovary 1.5–2 cm. Dorsal sepal oblong-obovate, 33–37 × 9–10 mm, 5–7-veined, apex subacute; lateral sepals slightly oblique. Petals oblong-lanceolate, slightly oblique toward apex, 32–36 × 8–9 mm, 5–7-veined, apex acute; lip broadly ovate or suborbicular when flattened, 23–37 × 24–28 mm, 3-lobed above middle; lateral lobes erect, orbicular, margin undulate, apex rounded; mid-lobe subsquare-ovate or subsquare-orbicular, 10–12 × 12–14 mm, margin undulate, apex emarginate; disk with 2 or 3 broad stripes and densely warty on lateral lobes, and with 7 rows of sparse papillae along central veins, 5 of them extending from near base of lip. Column arcuate, subclavate, 14–17 mm; column wings dilated. Capsule oblanceolate-oblong, ca. 25 × 7–8 mm. Fl. Nov.

● On rocks. SW Yunnan.

3. *Pleione praecox* (Smith) D. Don, Prodr. Fl. Nepal. 37. 1825.

疣鞘独蒜兰 you qiao du suan lan

Epidendrum praecox Smith, Exot. Bot. 2: 73. 1806; *Coelogyne birmanica* H. G. Reichenbach; *C. praecox* (Smith) Lindley; *C. reichenbachiana* T. Moore & Veitch; *C. wallichiana* Lindley; *Cymbidium praecox* (Smith) Lindley; *Dendrobium praecox* (Smith) Smith; *Pleione birmanica* (H. G. Reichenbach) B. S. Williams; *P. concolor* B. S. Williams; *P. praecox* var. *birmanica* (H. G. Reichenbach) Grant; *P. praecox* var. *reichenbachiana* (T. Moore & Veitch) Torelli & Riccaboni; *P. praecox* var. *wallichiana* (Lindley) E. W. Cooper; *P. reichenbachiana* (T. Moore & Veitch) Kuntze; *P. wallichiana* (Lindley)

Lindley & Paxton.

Herbs, epiphytic. Pseudobulb green, mottled purplish brown, usually turbinate, 1.5–4 × 1–2.3 cm, apex abruptly contracted into a conspicuous neck, outer sheaths warty, 2- or rarely 1-leaved. Leaves elliptic-oblancoate to elliptic, 9–20 × 1.7–6.7 cm, papery, base attenuate into a petiole-like stalk 2–6.5 cm, apex acuminate. Inflorescence appearing after leaves have fallen or withered, erect; peduncle 5–10 cm, with 3 papillate sheaths; floral bract oblong-oblancoate, 25–30 × 15–20 mm, exceeding ovary, apex acute. Flower solitary or rarely 2, large, pink to purplish red, rarely white, with a yellow callus and occasionally with purple spots on lip. Dorsal sepal suboblong-lanceolate, 55–60 × 7–8 mm, apex acute; lateral sepals slightly oblique, slightly wider at base than dorsal sepal, apex acute. Petals linear-lanceolate, slightly falcate, 50–70 × 4–6 mm, apex acute; lip obovate-elliptic or elliptic, 40–50 × ca. 30 mm, obscurely 3-lobed; lateral lobes inconspicuous; mid-lobe lacerate on apical margin, apex emarginate; disk with 3–5 rows of papillae extending from base of lip to midway along mid-lobe. Column ± arcuate, 35–45 mm, apex irregularly toothed. Fl. Sep–Oct. $2n = 40$.

On tree trunks and mossy rocks in forests, cliffs; 1200–2500(–3400) m. SE Xizang, SE and SW Yunnan [Bangladesh, Bhutan, NE India, Laos, Myanmar, Nepal, N Thailand, N Vietnam].

4. *Pleione saxicola* Tang & F. T. Wang ex S. C. Chen, Acta Phytotax. Sin. 25: 473. 1987.

岩生独蒜兰 *yan sheng du suan lan*

Herbs, epiphytic or terrestrial. Pseudobulb dark green, turbinate, dorsiventrally flattened, 0.7–1.1 × 1–2 cm, apex abruptly contracted into a conspicuous neck, outer sheaths slightly warty, 1-leaved. Leaf developing at flowering, suboblong-lanceolate to oblancoate, 10–18 × 1.7–3.7 cm, papery, base attenuate into a petiole-like stalk 3–7 cm, apex acute. Inflorescence erect; peduncle 7–10 cm, with 2 or 3 membranous sheaths at base; floral bract oblancoate, 20–30 × ca. 10 mm, exceeding ovary, apex acute. Flower solitary, large, to 10 cm in diam., rose-red with a white base and a yellow or white callus on lip. Sepals fused in basal half and forming a tube; dorsal sepal oblancoate, ca. 63 × 8 mm, apex acute; lateral sepals slightly oblique, slightly wider at base than dorsal sepal, apex acute. Petals oblancoate, slightly shorter and narrower than sepals, apex acute; lip broadly elliptic, ca. 55 × 22–25 mm, base cuneate and with a claw ca. 13 mm, distinctly 3-lobed above middle; lateral lobes broadly ovate, 3–4 × 4–5 mm, margin undulate-crenate; mid-lobe suborbicular, ca. 8 × 15 mm, apex rounded and slightly irregularly crenulate; disk with 3 entire or slightly undulate lamellae extending from base of lip to midway along disk. Column ± arcuate, 40–46 mm, apex irregularly toothed. Fl. Sep.

Cliffs along streams; 2400–2500 m. SE Xizang, NW Yunnan [Bhutan].

5. *Pleione scopulorum* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 13: 218. 1921.

二叶独蒜兰 *er ye du suan lan*

Bletilla scopulorum (W. W. Smith) Schlechter; *Jimensia scopulorum* (W. W. Smith) Garay & R. E. Schultes.

Herbs, terrestrial. Pseudobulb green, usually ovoid, slightly oblique, 1–2.5 × 0.6–1.5 cm, tapering at apex into a conspicuous long neck, 2-leaved. Leaves developing at flowering, lanceolate, oblancoate, or narrowly elliptic, 4–13 × 1–2.3 cm, papery, base attenuate into a petiole-like stalk enclosed in tubular sheaths, apex acute. Inflorescence erect; peduncle 12–18 cm, lacking sheaths; floral bract oblancoate, 18–27 mm, shorter than or almost as long as ovary, apex obtuse to acute. Flowers solitary or rarely 2 or 3, rose-purple or rarely white and tinged pale purplish blue, usually with a yellow center and dark purple spots on lip, sepals and petals rarely yellow. Dorsal sepal elliptic-lanceolate or narrowly ovate, 25–32 × 7–9 mm, apex acuminate; lateral sepals obliquely elliptic, 21–30 × 8–10 mm, apex apiculate. Petals oblancoate or narrowly ovate-oblong, 25–32 × 7–9 mm, apex subacute or obtuse; lip transversely elliptic or suboblate, 20–25 × 25–30 mm, much broader than long, obscurely 3-lobed, apical margin denticulate, apex obtuse and sometimes emarginate; disk with 5–9 lacerate lamellae extending from base of lip to midway along mid-lobe; lamellae 1–1.5 mm tall. Column ± arcuate, 15–20 mm; column wings very narrow below middle, dilated above, to 5 mm tall at apex, apex irregularly dentate. Capsule fusiform-oblong, 20–30 mm. Fl. May–Jul, fr. Oct. $2n = 40$.

Rocky grasslands in coniferous forests, mossy rocks along streams, subalpine scrubby meadows; 2800–4200 m. SE Xizang, NW and SW Yunnan [NE India, Myanmar].

6. *Pleione kaatiae* P. H. Peeters, Richardiana 3: 132. 2003.

卡氏独蒜兰 *ka shi du suan lan*

Herbs, terrestrial. Pseudobulb green, ovoid or conic, slightly oblique, 1–2 × 1.5–1.8 cm, 2-leaved. Leaves developing at flowering, lanceolate, oblancoate, or narrowly elliptic, 4–10 × 1–2 cm, papery, base attenuate into a petiole-like stalk enclosed in tubular sheaths, apex acute. Inflorescence erect; peduncle 10–13 cm, lacking sheaths; floral bract lanceolate, 18–22 mm, shorter than or almost as long as ovary, apex obtuse to acute. Flower solitary, rose-purple, tinged pale purplish blue, usually with a yellow center and dark purple spots on lip. Dorsal sepal elliptic-lanceolate, 30–32 × 7–9 mm, apex acuminate; lateral sepals obliquely elliptic, 28–30 × 8–10 mm, apex apiculate. Petals narrowly oblancoate, 30–32 × ca. 7 mm, apex acute; lip broadly ovate, 20–25 × 25–30 mm, usually ca. as broad as long, obscurely 3-lobed, apical margin erose, apex subacute; disk with 5–9 rows of papillae extending from base of lip and grading into lacerate lamellae midway along mid-lobe; papillae 1–1.5 mm tall. Column ± arcuate, 18–20 mm; column wings very narrow below middle, dilated above, to 5 mm tall at apex, apex irregularly dentate. Capsule fusiform-oblong, 14–20 mm. Fl. Jun–Jul, fr. Oct.

• Rocky grasslands in coniferous forests, mossy rocks along streams, subalpine scrubby meadows. W Sichuan.

This species is very closely allied to *Pleione scopulorum* but differs in having a distinctive ovoid pseudobulb, smaller flowers with narrower, falcate petals, and a narrower lip with a subacute apex and a predominantly papillose rather than lamellate callus.

7. *Pleione hookeriana* (Lindley) Rollisson, Gen. Cat., Orchids, 43. 1876–1878.

毛唇独蒜兰 *mao chun du suan lan*

Coelogyne hookeriana Lindley, Fol. Orchid. 5(Coelogyne): 14. 1854; *C. hookeriana* var. *brachyglossa* H. G. Reichenbach; *Pleione hookeriana* var. *brachyglossa* (H. G. Reichenbach) Rolfe; *P. laotica* Kerr.

Herbs, epiphytic. Pseudobulb green or purple, ovoid to conic, 1–2 × 0.5–1 cm, base sometimes attached to a slender rhizome, 1-leaved. Leaf still immature or not developing at flowering, elliptic-lanceolate or suboblong, 6–10 × 2–2.8 cm, papery, base attenuate into a petiole-like stalk 2–3 cm, apex acute. Inflorescence erect; peduncle 6–10 cm, with several membranous sheaths below middle; floral bract suboblong, 10–17 × 4–5 mm, apex obtuse. Flower solitary, small; sepals and petals pale purplish red to nearly white, lip white with a yellow center and purple or yellowish brown spots; pedicel and ovary 10–20 mm. Dorsal sepal suboblong or oblanceolate, 20–35(–45) × 6–10 mm, apex acute; lateral sepals lanceolate, falcate, slightly oblique, usually as wide as but slightly shorter than dorsal sepal, apex acute. Petals oblanceolate, 20–35 × 5–7 mm, apex acute; lip oblate or subcordate, 25–40 × 27–45 mm, obscurely 3-lobed, apical margin irregularly denticulate or almost entire, apex emarginate; disk with 7 rows of papillae extending along central veins from near base of lip almost to apex of mid-lobe; hairs to ca. 2 mm tall. Column ± arcuate, 15–26(–30) mm; column wings very narrow below middle, dilated above, to 6–10 mm tall at apex, apex usually slightly denticulate. Capsule suboblong, 10–25 mm. Fl. Apr–Jun, fr. Sep. 2n = 40.

On tree trunks, mossy rocks and cliffs at thicket margins; 1600–3100 m. N Guangdong, N and W Guangxi, SE Guizhou, S Xizang, SE Yunnan [Bhutan, NE India, N Laos, Myanmar, Nepal, ?Thailand].

8. *Pleione chunii* C. L. Tso, Sunyatsenia 1: 148. 1933.

陈氏独蒜兰 *chen shi du suan lan*

Pleione hookeriana (Lindley) Rollisson var. *sinensis* G. Kleinhans ex Torelli & Riccaboni; *P. milanii* Braem.

Herbs, terrestrial or lithophytic. Pseudobulbs usually clustered in large colonies, green or pale green, pyriform to conic, 2.5–4.5 × ca. 1.2 cm, tapering at apex into a conspicuous neck, 1-leaved. Leaf elliptic-lanceolate or narrowly elliptic, 6–20 × 2–3(–4.6) cm, apex acute. Inflorescence appearing with young leaf, erect; peduncle 5–7 cm, enclosed in tubular sheaths at base; floral bracts green, narrowly elliptic-oblanceolate, ca. 25 × 10–15 mm. Flowers solitary or rarely 2, large, pale pink to rose-purple, often paler toward base, lip white with a longitudinal yellow or orange-yellow stripe at center and brown-red spotted toward apex; pedicel and ovary 16–20 mm. Dorsal sepal narrowly elliptic or oblong-elliptic, 24–35 × 7–10 mm, apex subacute; lateral sepals obliquely elliptic, slightly shorter and wider than dorsal sepal, apex subacute. Petals spreading, oblanceolate or spatulate, 24–33 × 5–9 mm, apex rounded or obtuse; lip broadly flabellate when flattened, 20–25 × 25–30 mm, obscurely 3-lobed above middle, lateral margins erect and embracing column, apical margin dentate or irregularly erose, apex emarginate; disk with 6 rows of long papillae extending from base of lip almost to apex of mid-lobe. Column 20–23 mm; col-

umn wings very narrow below middle, dilated above, apex irregularly denticulate. Fl. Apr–May.

• Forests; 1400–2800 m. N Guangdong, Guangxi, Guizhou, Hubei, W Yunnan.

This species is treated by some authorities as a variety of *Pleione hookeriana*. Indeed, it is very similar in its lip shape and flower color. However, *P. chunii* has distinct pseudobulbs and larger flowers with a callus on the lip composed of six rows of papillae. It has been confused with *P. aurita*, but that species has a distinct floral morphology and bright rose-purple flowers.

9. *Pleione aurita* P. J. Cribb & H. Pfennig, Orchidee (Hamburg) 39: 111. 1988.

艳花独蒜兰 *yan hua du suan lan*

Herbs, epiphytic. Pseudobulb green or pale green, conic, somewhat angular in cross section, 2–4 × 1–2 cm, 1-leaved. Leaf erect, oblanceolate, 8–18 × 2–4 cm, apex acute. Inflorescence erect; peduncle 5–7 cm; floral bract pale pink with darker veins, narrowly elliptic-oblanceolate, cucullate, ca. 25 × 10–15 mm, apex acute or subacute. Flower solitary, showy, pale pink, rose-pink, or purple, paler toward base of floral segments, lip with a yellow or orange-yellow stripe at center; pedicel and ovary green, arcuate, 16–20 mm, 6-ribbed. Dorsal sepal hooded over column, narrowly elliptic or oblong-elliptic, 39–50 × 11–15 mm, apex subacute; lateral sepals porrect or spreading weakly, obliquely elliptic, 39–43 × 14–16 mm, apex subacute. Petals strongly reflexed, oblanceolate or spatulate, 39–43 × 14–19 mm, apex obtuse or rounded; lip broadly flabellate when flattened, deeply cucullate, 39–40 × 50–60 mm, obscurely 3-lobed toward apex, apical margin undulate and irregularly erose, apex emarginate; disk with 4 or 5 rows of long papillae extending from base of lip to ca. 5 mm from apex of mid-lobe. Column clavate, 25–30 mm, apex irregularly dentate; column wings narrow. Fl. Apr–May.

• Montane forests; 1400–2800 m. W Yunnan.

10. *Pleione albiflora* P. J. Cribb & C. Z. Tang, Bot. Mag. 184: 117. 1983.

白花独蒜兰 *bai hua du suan lan*

Herbs, epiphytic or lithophytic. Pseudobulb ovoid-conic, 3–4.5 × 0.8–1.8 cm, with an elongated neck, 1-leaved. Leaf immature at anthesis, lanceolate, falcate, apex acute. Inflorescence erect; peduncle 3–13 cm, covered by 3 or 4 membranous sheaths except at apex; floral bracts erect, obovate, 20–35 mm, apex rounded or truncate. Flower solitary, nodding, fragrant, white, rarely with pale mauve lines on sepals and petals, lip with bold crimson, brown, or brownish yellow central stripes or tinged purple at apex; pedicel and ovary 20–30 mm. Sepals narrowly elliptic, 44–55 × 8–10 mm, apex obtuse. Petals oblanceolate, 45–55 × 8–9 mm, apex obtuse or subrounded; lip broadly ovate, 45–57 × 30–40 mm, obscurely 3-lobed, apical margin lacerate, base saccate and forming a short spur 1–2 mm; lateral lobes incurved; disk with 5 rows of long papillae in apical half of lip. Column slightly arcuate, 33–40 mm, apex without teeth. Fl. Apr–May.

On tree trunks or mossy rocks and cliffs in shaded places; 2400–

3300 m. NW Yunnan [N Myanmar].

11. *Pleione humilis* (Smith) D. Don, Prodr. Fl. Nepal. 37. 1825.

矮小独蒜兰 ai xiao du suan lan

Epidendrum humile Smith, Exot. Bot. 2: 75. 1806; *Coelogyne humilis* (Smith) Lindley; *C. humilis* var. *albata* H. G. Reichenbach; *C. humilis* var. *tricolor* H. G. Reichenbach; *Pleione diantha* Schlechter; *P. humilis* var. *adnata* Pfitzer; *P. humilis* var. *pulchella* E. W. Cooper; *P. humilis* var. *purpurascens* Pfitzer.

Herbs, epiphytic or lithophytic. Pseudobulb olive-green, flask-shaped with a long neck, 2–6 × 0.8–2 cm, apex with 1 leaf. Leaf oblanceolate to elliptic, 18–25 × 2.8–3.5 cm, apex acute. Inflorescence produced before leaf, 1- or 2-flowered; peduncle clothed in scarious sheaths; floral bract obovate, 20–32 × 8–12 mm, apex subacute to obtuse. Flowers spreading to nodding; sepals and petals white, lip white, spotted and streaked with crimson or yellow-brown with a central pale yellow zone; pedicel and ovary 2–3 cm. Dorsal sepal linear-ob lanceolate, 34–47 × 6–7 mm, apex subacute; lateral sepals obliquely oblanceolate, 40–53 × 70–90 mm, apex subacute. Petals obliquely linear-ob lanceolate, 31–42 × 5–7 mm, apex rounded; lip oblong-elliptic, obscurely 3-lobed in front, 34–44 × 25–31 mm, base saccate, margin lacerate in apical half, apex emarginate; lateral lobes erect-incurved, callus consisting of 5–7 barbate lamellae. Column 26–28 mm, broadly winged, apex irregularly dentate.

Epiphytic in moss, on *Rhododendron* and other tree species, plants often forming rings or collars around trunks or branches; 1800–3200 m. SE Xizang [Bhutan, NE India (Assam, Manipur, Sikkim), Myanmar, Nepal].

Pleione humilis is known from NE India, and almost certainly grows in adjacent parts of SE Xizang (indeed, it was noted from there by Press et al., Annot. Checkl. Fl. Pl. Nepal, 224. 2000). However, the present authors found no relevant specimens and therefore could not substantiate the occurrence of this species in China.

12. *Pleione ×kohlsii* Braem, Schlechteriana 2: 168. 1991.

春花独蒜兰 chun hua du suan lan

Herbs, terrestrial or possibly epiphytic. Pseudobulb green, pyriform, 3–4.5 × 1–1.7 cm, 1-leaved. Leaf erect, green, 10–20 × 2–5 cm. Inflorescence appearing with young leaf, erect; peduncle ca. 7 cm; floral bracts narrowly elliptic to oblanceolate, 24–28 × ca. 4 mm, exceeding ovary. Flower solitary, purplish violet or pink, lip tinged pale yellow with a yellow throat and with reddish brown spots and stripes. Dorsal sepal narrowly elliptic, 40–45 × 10–14 mm, apex obtuse; lateral sepals narrowly suboblong-elliptic, 40–45 × 12–14 mm, apex obtuse. Petals falcate, oblanceolate, 40–45 × 8–10 mm, narrower than sepals, apex obtuse or subacute; lip orbicular when flattened, obscurely 3-lobed, lateral margins erect and embracing column, apical margin lacerate, apex emarginate; lateral lobes narrowly subelliptic, margin minutely erose; disk with 5 lacerate lamellae. Column clavate, 25–28 mm.

- Forests; 2400–2800 m. W Yunnan.

This entity is thought to be a natural hybrid between *Pleione forrestii* and *P. aurita*.

13. *Pleione forrestii* Schlechter, Notes Roy. Bot. Gard. Edinburgh 5: 106. 1912.

黄花独蒜兰 huang hua du suan lan

Herbs, epiphytic or lithophytic. Pseudobulb green, conic or ovoid-conic, 1.5–3 × 0.6–1.8 cm, 1-leaved. Leaf appearing after flowering, subelliptic to narrowly elliptic-lanceolate, 10–15 × 3–7 cm, papery, base attenuate into a petiole-like stalk 2–3 cm, apex acute or obtuse. Inflorescence erect; peduncle usually 4–9 cm, nearly completely enclosed in 3 or 4 scarious sheaths; floral bracts oblong-lanceolate or lanceolate, 27–33 × 5–7 mm, conspicuously longer than ovary, apex obtuse or subacute. Flower solitary, orange-yellow, pale yellow, or yellowish white, rarely pure white, with brown or crimson spots and marks on lip; pedicel and ovary 9–15 mm. Dorsal sepal oblanceolate, 30–40 × 7–8 mm, apex acute; lateral sepals oblong-ob lanceolate, oblique, 30–40 × 8–9 mm, apex obtuse. Petals oblanceolate, falcate, 36–42 × 7–8 mm, apex subacute; lip broadly obovate-elliptic or nearly broadly rhombic, 32–40 × 28–32 mm, base contracted into a short claw, 3-lobed; lateral lobes erect and embracing column, apex rounded; mid-lobe subquadrate, apical margin lacerate, apex emarginate; disk with 5–7 entire but usually slightly undulate lamellae extending from base of lip to midway along mid-lobe. Column arcuate, 25–30 mm; column wings obscure. Fl. Mar–May. $2n = 38^*, 39^*, 40^*, 42^*, 44^*$.

- On humus-covered rocks and tree trunks in open forests and at forest margins; 2200–3200 m. N and NW Yunnan.

Reviewer L. Averyanov notes that *Pleione forrestii* also occurs in N Vietnam. However, the present authors could not substantiate this record because they found no relevant specimens.

- 1a. Sepals and petals orange-yellow to pale yellow 13a. var. *forrestii*
- 1b. Sepals and petals pure white 13b. var. *alba*

13a. *Pleione forrestii* var. *forrestii*

黄花独蒜兰(原变种) huang hua du suan lan (yuan bian zhong)

Flower orange-yellow to pale yellow with brown or crimson spots and marks on lip. Fl. Apr–May.

- On humus-covered rocks and tree trunks in open forests and at forest margins; 2200–3200 m. NW Yunnan.

13b. *Pleione forrestii* var. *alba* (H. Li & G. H. Feng) P. J. Cribb in P. J. Cribb & Butterfield, Gen. *Pleione*, ed. 2, 88. 1999.

白瓣独蒜兰 bai ban du suan lan

Pleione alba H. Li & G. H. Feng, Acta Bot. Yunnan. 6: 193. 1984; *P. forrestii* f. *alba* (H. Li & G. H. Feng) Torelli & Riccaboni.

Flower pure white, with crimson marks on apical part of lip. Fl. Mar–Apr.

- Mixed forests; 2700–3100 m. N Yunnan (Dayao).

14. *Pleione ×confusa* P. J. Cribb & C. Z. Tang, Bot. Mag. 184: 126. 1983.

芳香独蒜兰 fang xiang du suan lan

Herbs, terrestrial or lithophytic. Pseudobulb green or dark olive-green, conic-ovoid, 2–2.5 × 2–2.5 cm, 1-leaved. Leaf not developing at flowering, elliptic-lanceolate to oblanceolate, 10–15 × 3–4 cm, apex acuminate. Inflorescence erect or suberect; peduncle reddish, 2–5 cm; floral bract pale maroon with deeper venation, oblanceolate, ca. 25 × 10–15 mm, apex acute. Flower solitary, primrose-yellow to pale yellow, with red marks on lip, fragrant. Sepals elliptic-lanceolate, 37–42 × 7–12 mm, apex acute; lateral sepals slightly oblique, slightly wider than dorsal sepal. Petals oblanceolate, 38–42 × 7–9 mm, apex acute; lip ovate-orbicular, 25–32 × 30–35 mm, obscurely 3-lobed, apical margin lacerate, apex emarginate; disk with 4–6 erose-lacerate lamellae. Column 35–40 mm; column wings obscure. Fl. Apr–May. $2n = 40$.

NW Yunnan [N Myanmar].

This entity is thought to be a natural hybrid between the yellow-flowered *Pleione forrestii* and the white-flowered *P. albiflora*. Its flower is pale yellow, very similar in color to, but a little paler than, that of *P. forrestii*. The lamellae on the lip are lacerate, not entire as in *P. forrestii* or fimbriate as in *P. albiflora*.

15. *Pleione ×christianii* H. Perner, *Orchidee Beih.*, Deutsch. Orchid. Ges. 6: 12. 1999.

滇西独蒜兰 dian xi du suan lan

Pseudobulb 1-leaved at apex. Flower solitary, yellow overlaid with purple on sepals and petals, boldly striped with red on apical half of lip; lip 3-lobed; disk with 5 slightly erose lamellae. Fl. Apr–May.

• W Yunnan.

This entity is thought to be a natural hybrid between *Pleione forrestii* and *P. yunnanensis*. It can be distinguished easily from the two by the color of the flower.

16. *Pleione yunnanensis* (Rolfe) Rolfe, *Orchid Rev.* 11: 292. 1903.

云南独蒜兰 yun nan du suan lan

Coelogyne yunnanensis Rolfe, *J. Linn. Soc., Bot.* 36: 23. 1903; *Pleione chivuana* Tang & F. T. Wang; *P. yunnanensis* var. *chivuana* (Tang & F. T. Wang) G. Kleinhaus ex Torelli & Riccaboni.

Herbs, terrestrial or lithophytic. Pseudobulb green, ovoid, narrowly ovoid, or conic, 1.5–3 × 1–2 cm in diam., 1-leaved. Leaf very immature or undeveloped at anthesis, lanceolate to narrowly elliptic, 6.5–25 × 1–3.5 cm, papery, base attenuate into a petiole-like stalk 1–6 cm, apex acuminate or subacute. Inflorescence erect; peduncle 10–20 cm, with several sheaths below middle; floral bracts obovate to obovate-oblong, 20–30 × 5–8 mm, shorter than ovary, apex obtuse. Flowers solitary or rarely 2, purplish, pink, or sometimes white, with purple or deep red spots on lip; pedicel and ovary 30–45 mm, usually deep red. Dorsal sepal oblong-oblanceolate, 35–40 × 6–8 mm, apex obtuse; lateral sepals oblong-lanceolate or elliptic-lanceolate, slightly oblique, 35–40 × 6–10 mm, usually slightly wider than dorsal sepal, apex obtuse. Petals oblanceolate, 35–40 × 5–

7 mm, base cuneate, apex obtuse; lip broadly obovate, 30–40 × 25–30 mm, 3-lobed; lateral lobes erect and loosely embracing column, broad, apex rounded; mid-lobe subquadrate, apical margin irregularly erose-lacerate, apex emarginate; disk with 3–5 entire or slightly erose lamellae extending from base of lip to base of mid-lobe. Column ± arcuate, 18–23 mm; column wings very narrow below middle, dilated above, apex 5–6 mm tall and irregularly dentate at apex. Capsule fusiform-cylindric, 25–30 × ca. 12 mm. Fl. Apr–May, fr. Sep–Oct. $2n = 40, 120$.

On mossy rocks in forests and at forest margins, shaded and rocky places on grassy slopes and under ericaceous shrubs; 1100–3500 m. N and W Guizhou, SW Sichuan, SE Xizang, NW and SE Yunnan [N Myanmar].

17. *Pleione ×taliensis* P. J. Cribb & Butterfield, *Gen. Pleione*, ed. 2, 123. 1999.

大理独蒜兰 da li du suan lan

Pseudobulb 1-leaved. Leaf not fully developed at flowering. Floral bract shorter than ovary. Flower purplish pink, sometimes tinged white, with bold broad purple stripes on apical margin of lip; disk with 4 or 5 ragged lamellae. Fl. Apr–May.

• Grassy and shrubby banks, under ericaceous shrubs and trees, under *Pinus yunnanensis*; 2400–2700 m. NW Yunnan.

This entity is thought to be a natural hybrid of *Pleione yunnanensis* and *P. bulbocodioides*. It is similar to *P. yunnanensis* by having an elongate pedicel and ovary, but it differs by having a purplish pink flower, ragged lamellae on the lip, and broad purple stripes on the apical margin of the lip.

18. *Pleione grandiflora* (Rolfe) Rolfe, *Orchid Rev.* 11: 291. 1903.

大花独蒜兰 da hua du suan lan

Coelogyne grandiflora Rolfe, *J. Linn. Soc., Bot.* 36: 22. 1903; *Pleione barbarae* Braem; *P. braemii* Pinkepank; *P. harbordii* Braem; *P. moelleri* Braem; *P. mohrii* Braem; *P. pinkepankii* Braem & H. Mohr.

Herbs, lithophytic. Pseudobulb green, subconic, 3–4.5 × 1.2–1.5 cm, enclosed by fibrous remains of basal sheaths, 1-leaved. Leaf very immature at anthesis, lanceolate, papery, base attenuate into a petiole-like stalk, apex acute. Inflorescence erect; peduncle 10–15 cm, covered by 3 or 4 membranous sheaths in lower 2/3; floral bracts narrowly elliptic, 23–40 mm, exceeding ovary, apex obtuse. Flower solitary, large, white, sometimes with dark purplish red or brown spots and streaks on lip. Dorsal sepal oblanceolate, 50–55 × 10–15 mm, apex rounded; lateral sepals narrowly elliptic, slightly oblique, 48–55 × 10–15 mm, usually slightly shorter but wider than dorsal sepal, apex obtuse. Petals oblanceolate, falcate, 50–55 × 8–10 mm, apex rounded; lip broadly ovate-elliptic to flabellate, 50–55 × 30–40 mm, obscurely 3-lobed, base narrowed into a claw ca. 10 mm, upper part of lateral margins and apical margin coarsely lacerate, apex emarginate; disk with 4 or 5(–7) irregularly lacerate lamellae. Column arcuate, 38–40 mm, apex not toothed; column wings very narrow. Fl. May.

On rocks in forests; 2600–2900 m. SE and SW Yunnan [N

Vietnam].

19. *Pleione bulbocodioides* (Franchet) Rolfe, *Orchid Rev.* 11: 291. 1903.

独蒜兰 du suan lan

Coelogyne bulbocodioides Franchet, *Nouv. Arch. Mus. Hist. Nat.*, sér. 2, 10: 84. 1888; *C. delavayi* Rolfe; *C. henryi* Rolfe; *C. pogonioides* Rolfe; *Pleione communis* Gagnepain; *P. communis* var. *subobtusa* Gagnepain; *P. delavayi* (Rolfe) Rolfe; *P. fargesii* Gagnepain; *P. ganchuenensis* Gagnepain; *P. henryi* (Rolfe) Schlechter; *P. mairei* Schlechter; *P. rhombilabia* Handel-Mazzetti; *P. smithii* Schlechter.

Herbs, terrestrial or lithophytic. Pseudobulb ovoid to ovoid-conic, with a conspicuous neck, 1–2.5 × 1–2 cm, 1-leaved. Leaf immature at anthesis, developing after flowering, narrowly elliptic-lanceolate or suboblanceolate, 10–25 × 2–5.8 cm, papery, base attenuate into a petiole-like stalk 2–6.5 cm, apex acute or acuminate. Inflorescence erect; peduncle 7–20 cm, covered by 3 tubular sheaths below middle; floral bracts linear-oblong, (20–)30–40 mm, apex obtuse. Flowers solitary or rarely 2, pink to pale purple, with dark purple marks on lip; pedicel and ovary 10–25 mm. Dorsal sepal lanceolate to oblanceolate, 35–50 × 7–9 mm, apex acute or obtuse; lateral sepals narrowly elliptic or oblong-oblanceolate, slightly oblique, 35–50 × 8–10 mm, apex subacute or obtuse. Petals oblanceolate, slightly oblique, 35–50 × 4–7 mm, apex acute; lip obovate or broadly obovate when flattened, 35–45 × 30–40 mm, base cuneate and adnate to column, obscurely 3-lobed, apical margin lacerate; mid-lobe subquadrate, apex emarginate; disk with 4 or 5 erose lamellae 1–1.5 mm tall; central lamella (when present) usually shorter but taller than others. Column ± arcuate, 27–40 mm; column wings very narrow below middle, dilated above, 6–7 mm tall at apex, irregularly dentate. Capsule suboblong, 27–35 mm. Fl. Apr–Jun. $2n = 40^*$, 120^* .

• Humus-covered soil, on mossy rocks in evergreen broad-leaved forests and at thicket margins; 900–3600 m. Anhui, N Fujian, S Gansu, N Guangdong, N Guangxi, Guizhou, Hubei, Hunan, S Shaanxi, Sichuan, SE Xizang, C and NW Yunnan.

20. *Pleione formosana* Hayata, *J. Coll. Sci. Imp. Univ. Tokyo* 30(1): 326. 1911.

台湾独蒜兰 tai wan du suan lan

Pleione bulbocodioides (Franchet) Rolfe var. *nivea* (Fukuyama) S. S. Ying; *P. formosana* f. *alba* Torelli & Riccaboni; *P. formosana* f. *nivea* Fukuyama; *P. formosana* var. *nivea* (Fukuyama) Masamune; *P. hookeriana* (Lindley) Rollisson f. *nivea* (Fukuyama) M. Hiroe; *P. hui* Schlechter; *P. pricei* Rolfe.

Herbs, lithophytic, epiphytic, or terrestrial. Pseudobulb green or dark purple, compressed ovoid or ovoid, 1.3–4 × 1.7–3.7 cm, 1-leaved. Leaf immature or developing at anthesis, elliptic or oblanceolate, 10–30 × 3–7 cm, papery, base attenuate into a petiole-like stalk 3–4 cm, apex acute or obtuse. Inflorescence erect; peduncle 7–16 cm, with 2 or 3 membranous sheaths at base; floral bracts linear-lanceolate to narrowly elliptic, 22–40 mm, apex acute. Flowers solitary or rarely 2, some-

times slightly fragrant, rose-pink or occasionally white, lip often yellowish with reddish or brownish marks; pedicel and ovary 15–27 mm. Dorsal sepal narrowly elliptic-oblanceolate or spatulate-oblanceolate, 42–57 × 9–15 mm, apex acute; lateral sepals narrowly elliptic-oblanceolate, slightly oblique, 40–55 × 10–15 mm, apex acute or subacute. Petals linear-oblanceolate, 42–60 × 10–15 mm, apex subacute; lip broadly ovate-elliptic to orbicular when flattened, 40–55 × 30–46 mm, obscurely 3-lobed, apical margin lacerate, apex emarginate; disk with 2–5 entire or erose lamellae; lamellae usually interrupted along their length, central one (when present) shorter than others. Column 28–42 mm, apex obscurely toothed. Capsule dark brown, fusiform, ca. 40 mm. Fl. Mar–Apr. $2n = 38^*$, 40^* , $40 + 2B^*$, 42^* .

• Humus-covered soil, on rocks in montane forests and at forest margins; 600–1500 m (1500–2500 m in Taiwan). N and W Fujian, SE Jiangxi, Taiwan, S Zhejiang.

21. *Pleione pleionoides* (Kraenzlin) Braem & H. Mohr, *Orchis* 65–66: 124. 1989.

美丽独蒜兰 mei li du suan lan

Pogonia pleionoides Kraenzlin, *Bot. Jahrb. Syst.* 29: 267. 1901; *Pleione amoena* Schlechter; *P. hubeiensis* Torelli & Riccaboni; *P. speciosa* Ames & Schlechter; *P. votolinii* Torelli & Riccaboni.

Herbs, terrestrial or lithophytic. Pseudobulb conic, 2.5–3 × ca. 1.5 cm, surface rough, 1-leaved. Leaf immature at anthesis, elliptic-lanceolate, 14–20 × ca. 2.5 cm, papery, apex acute. Inflorescence erect; peduncle 8–18 cm; floral bracts linear-lanceolate, 25–31 mm, exceeding ovary, apex acute. Flowers solitary or rarely 2, bright rose-purple, with yellow or white lamellae on lip. Dorsal sepal narrowly elliptic, 40–65 × 6–13 mm, apex acute; lateral sepals slightly oblique, 40–65 × 7–14 mm, slightly wider than dorsal sepal, apex acute. Petals oblanceolate, ± falcate, 42–64 × 5–10 mm, apex acute; lip subrhombic to obovate when flattened, 42–55 × 35–42 mm, strongly deflexed at apical 1/3, very obscurely 3-lobed, apical margin denticulate; disk with 2 or 4 denticulate lamellae. Column 35–45 mm. Fl. Jun. $2n = 40^*$, 80^* .

• On humus-covered or mossy rocks, cliffs in forests; 1700–2300 m. Chongqing, Guizhou, W Hubei.

22. *Pleione limprichtii* Schlechter, *Repert. Spec. Nov. Regni Veg. Beih.* 12: 346. 1922.

四川独蒜兰 si chuan du suan lan

Pleione bulbocodioides (Franchet) Rolfe var. *limprichtii* (Schlechter) P. J. Cribb.

Herbs, terrestrial or lithophytic. Pseudobulb green or purple, conic-ovoid, 3–4 × 2–2.5 cm, with an elongated neck, 1-leaved. Leaf immature at anthesis, lanceolate, ca. 13 × 4 cm, papery, apex acute. Inflorescence erect; peduncle 10–12 cm, covered by several sheaths below middle; floral bracts pale purplish red, oblanceolate, 22–25 × 6–8 mm, exceeding ovary, apex acute. Flowers solitary or rarely 2, purplish red to rose-pink, lip with brick-red spots and white lamellae. Dorsal sepal narrowly elliptic, 30–35 × 5–9 mm, apex acute; lateral sepals narrowly elliptic, slightly oblique, 28–35 × 6–10 mm, slightly

wider but shorter than dorsal sepal, apex acute. Petals oblanceolate, falcate, 30–35 × 4–5 mm, apex acute; lip suborbicular, 25–40 × 25–35 mm, obscurely 3-lobed toward apex, apical margin lacerate, apex emarginate; disk with 4 irregularly denticulate or erose lamellae. Column ± arcuate, 25–30 mm; column wings very narrow below middle, dilated above. Fl. Apr–May. $2n = 40, 80$.

On humus-covered or mossy rocks, cliffs; 2000–2500 m. SW Sichuan, Yunnan [N Myanmar].

23. *Pleione microphylla* S. C. Chen & Z. H. Tsi, Acta Phytotax. Sin. 38: 182. 2000.

小叶独蒜兰 xiao ye du suan lan

Herbs, epiphytic. Pseudobulb ovoid-cylindric, 0.7–1.5 × 0.3–0.5 cm, geniculate-curved, 1-leaved; new pseudobulb arising directly from middle of old one. Leaf not fully developed at flowering, narrowly oblong or oblong-lanceolate, 2–6 × 0.2–1.1 cm, base contracted into a slender petiole-like stalk 1.5–2.8 cm. Inflorescence erect; peduncle 1.7–2 cm; floral bract oblong-lanceolate, 15–22 mm. Flower solitary, white with yellow streaks on lip, petals tinged pale pink toward apex; pedicel and ovary 7–8 mm. Dorsal sepal oblong-lanceolate, 33–36 × 6–7 mm; lateral sepals oblique. Petals oblanceolate, 31–34 × 4–6 mm; lip orbicular-rhombic, ca. 30 × 28 mm, base narrowed into a distinct claw 7–8 mm, obscurely 3-lobed; margins of lateral lobes slightly undulate and erose; mid-lobe broadly ovate, ca. 12 × 12 mm, apical margin erose, apex emarginate; disk with 2 entire lamellae extending from midway along lip to base of

mid-lobe, interrupted for ca. 2 mm halfway along. Column ca. 32 mm, slender. Fl. Apr.

• S Guangdong.

Like many similar species, the leaf of *Pleione microphylla* begins to emerge at flowering but continues to develop after anthesis. The first hint of the leaf often can be seen in flowering plants in cultivation.

