

63. NEOTTIA Guettard, Hist. Acad. Roy. Sci. Mém. Math. Phys. (Paris, 4°) 1750: 374. 1754, nom. cons.

鸟巢兰属 niao chao lan shu

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Distomaea Spenner; *Listera* R. Brown (1813, nom. cons.), not Adanson (1763); *Neottidium* Schlechtendal; *Nidus* Rivinus; *Polinirhiza* Dulac.

Herbs, small, terrestrial, autotrophic or holomycotrophic. Rhizome short, with many densely crowded, tufted, fibrous or fleshy, sometimes coraloid roots. Stem erect, with several sheathing bracts at base, green, buff, or reddish brown, with or without green leaves. Leaves (when present) 2 [very rarely 3 or 4 in *Neottia ovata* (Linnaeus) Bluff & Fingerhuth], opposite or subopposite, usually borne midway along stem, sessile or subsessile, green, sometimes with white venation, ovate, deltoid-ovate, ovate-cordate, or cordate, base shallowly cordate, truncate, or broadly cuneate. Inflorescence terminal, racemose and many flowered or rarely reduced to a solitary flower; peduncle glabrous or pubescent; floral bracts persistent, usually shorter than ovary, membranous. Flowers small, resupinate or very rarely not resupinate, membranous or fleshy, green, purple, yellowish brown, or reddish; pedicel slender; ovary ellipsoid. Sepals free, similar, spreading. Petals often narrower and shorter than sepals; lip usually much larger than sepals and petals, sometimes with a pair of auricles at base, without a spur but sometimes shallowly concave at base, apex deeply 2-lobed or emarginate, or rarely unlobed; disk sometimes with a glandular pubescent longitudinal strip or a shallow glossy depression. Column suberect, straight or slightly arcuate, long or short, without a foot; anther inserted at rear margin of clinandrium, erect or slightly nodding; filament extremely short and inconspicuous; pollinia 2, each ± longitudinally 2-parted, granular-farinaceous, without caudicles; stigma subterminal, concave or protruding; rostellum spreading horizontally or suberect, ligulate or ovate, large. Capsule small.

About 70 species: E and N Asia, Europe, and North America, with a few species extending into tropical Asia; 35 species (23 endemic) in China.

Neottia tenuis (Lindley) Szlachetko (Fragm. Florist. Geobot., Suppl. 3: 119. 1995; *Listera tenuis* Lindley, J. Proc. Linn. Soc., Bot. 1: 176. 1857) has been noted from Xizang (Press et al., Annot. Checkl. Fl. Pl. Nepal, 220. 2000). However, the present authors found no relevant specimens and therefore could not substantiate the occurrence of this species in China.

1a. Plants holomycotrophic, lacking green leaves.

2a. Lip entire; column (excluding anther and rostellum) less than 0.5 mm.

3a. Floral rachis glabrous; flowers resupinate 7. *N. acuminata*

3b. Floral rachis villous; flowers not resupinate 8. *N. taibaishanensis*

2b. Lip bilobed at apex; column (excluding anther and rostellum) 1.5–4 mm.

4a. Lip distinctly concave at base; apical lobes of lip diverging at an obtuse angle to one another.

5a. Apical lobes of lip 2.5–3 mm; sinus of lip without a short tooth between lobes 5. *N. papilligera*

5b. Apical lobes of lip less than 1 mm; sinus of lip with a short tooth between lobes 6. *N. brevilibris*

4b. Lip not concave at base; apical lobes of lip parallel or diverging at an acute angle to one another.

6a. Lip with a pair of triangular auricles at base 4. *N. tenii*

6b. Lip without a pair of auricles at base.

7a. Lip obovate, 6–10 mm wide 3. *N. megalochila*

7b. Lip narrowly obovate-oblong or cuneate, 1.5–4 mm wide.

8a. Lip narrowly obovate-oblong, 6–9 × 3–4 mm 1. *N. listeroides*

8b. Lip cuneate, 10–12 × 1.5–2 mm 2. *N. camtschatea*

1b. Plants autotrophic, with 2, rarely more, green leaves.

9a. Lip with a pair of auricles near base.

10a. Auricles strongly incurved, embracing column and overlapping one another above column 35. *N. japonica*

10b. Auricles spreading outward, not embracing column.

11a. Lip with a pair of swollen suborbicular lamellae on disk 34. *N. yunnanensis*

11b. Lip without lamellae.

12a. Lip apex 3-lobed 27. *N. karoana*

12b. Lip apex 2-lobed.

13a. Apical lobes of lip diverging widely, ca. 5 mm 28. *N. divaricata*

13b. Apical lobes of lip parallel, slightly incurved, strongly recurved, or diverging at an acute angle, 0.5–3 mm.

14a. Apical lobes of lip strongly recurved and meeting underneath lip 29. *N. brevicaulis*

14b. Apical lobes of lip spreading forward or pendent, not recurved.

15a. Rachis 1.9–2.2 cm, 2- or 3-flowered 30. *N. tianschanica*

15b. Rachis 3–13 cm, 6–19-flowered.

16a. Peduncle ca. 15 cm, ca. 3 × as long as rachis 31. *N. fangii*

16b. Peduncle 6–10 cm, not more than 2 × as long as rachis.

- 17a. Leaves borne at ca. middle of plant; rachis 3–4 cm, 6–8-flowered; pedicel glabrous; basal auricles of lip ca. 1.7 mm 32. *N. pseudonipponica*
- 17b. Leaves borne below middle of plant; rachis 8–13 cm, 10–19-flowered; pedicel pubescent; basal auricles of lip ca. 0.5 mm 33. *N. nanchuanica*
- 9b. Lip without a pair of auricles at base.
- 18a. Plants 40–50 cm tall; leaves 5–7.5 cm 12. *N. mucronata*
- 18b. Plants 4–33 cm tall; leaves 0.6–4 cm.
- 19a. Lip shallowly notched or emarginate at apex, sinus less than 1 mm deep.
- 20a. Rachis 11–13-flowered; lip 3.5–4.5 mm; column ca. 1.5 mm; leaves wider than long 11. *N. taizanensis*
- 20b. Rachis 1–4-flowered; lip 8–10 mm; column 3–4 mm; leaves longer than wide.
- 21a. Leaves inserted above middle of plant, one distinctly larger than other; inflorescence 1- or 2-flowered; rachis sparsely pubescent or almost glabrous 9. *N. biflora*
- 21b. Leaves inserted at ca. middle of plant, equal in size; inflorescence 2–5-flowered; rachis densely pubescent 10. *N. morrisonicola*
- 19b. Lip distinctly 2-lobed at apex, sinus more than 1 mm deep.
- 22a. Lip with a distinct claw at base 26. *N. oblata*
- 22b. Lip not clawed at base.
- 23a. Apical lobes of lip 5–7 mm.
- 24a. Apical lobes of lip linear, 0.5–0.6 mm wide, apices acuminate 21. *N. kuanshanensis*
- 24b. Apical lobes of lip oblong-ovate, subovate, or lanceolate, 1–6 mm wide, apices obtuse-rounded or truncate.
- 25a. Lip with a nectary at base.
- 26a. Leaves 2.5–3.8 × 2.5–4 cm; apical lobes of lip minutely ciliate 22. *N. chenii*
- 26b. Leaves 1–2 × 1.2–2.5 cm; apical lobes of lip not ciliate 23. *N. formosana*
- 25b. Lip without a nectary at base.
- 27a. Lip 3–5(–7) mm wide, without lamellae 24. *N. pinetorum*
- 27b. Lip 7–13 mm wide, with 2 longitudinal lamellae 25. *N. wardii*
- 23b. Apical lobes of lip to 3 mm.
- 28a. Leaves less than 1 cm long and wide 13. *N. microphylla*
- 28b. Leaves more than 1 cm long and wide.
- 29a. Pedicel and ovary distinctly pubescent.
- 30a. Lip ca. 1.7 mm wide; apical sinus without a tooth between lobes 14. *N. puberula*
- 30b. Lip 2.5–3 mm wide; apical sinus with a tooth between lobes 15. *N. smithii*
- 29b. Pedicel and ovary glabrous or occasionally sparsely pubescent.
- 31a. Column 4–5 mm 16. *N. meifongensis*
- 31b. Column 1–3 mm.
- 32a. Stem longer than peduncle and rachis together, leaves borne above middle of plant; disk of lip glandular papillose-pubescent along lateral veins 17. *N. longicaulis*
- 32b. Stem shorter or subequal in length to peduncle and rachis together, leaves borne at or below middle of plant; disk of lip not papillose-pubescent.
- 33a. Lip to 2 mm wide; apical lobes of lip divergent, narrowly linear, ca. 0.5 mm wide.
- 34a. Leaves ovate to deltoid, much longer than broad 18. *N. suzukii*
- 34b. Leaves orbicular-ovate or reniform, ca. as long as broad 19. *N. bambusetorum*
- 33b. Lip 3–7 mm wide; apical lobes of lip usually parallel, oblong-ovate or subovate, 1 mm or more wide.
- 35a. Lip purplish; disk without a longitudinal channel 20. *N. nankomontana*
- 35b. Lip greenish yellow; disk with a longitudinal channel 24. *N. pinetorum*

1. *Neottia listeroides* Lindley in Royle, Ill. Bot. Himal. Mts. 高山鸟巢兰 gao shan niao chao lan
368. 1839.

Listera lindleyana (Decaisne) King & Pantling; *Neottia*

dongrergoensis Schlechter; *N. lindleyana* Decaisne; *Nidus listeroides* (Lindley) Kuntze.

Plants leafless, holomycotrophic, 15–35 cm tall. Rhizome with many fleshy roots. Peduncle green, 8–20 cm, slender to robust, pubescent, with 3–5 sheaths; sheaths tubular, 1.5–3 cm, membranous; rachis 6–15 cm, pubescent, subdensely 10- to more than 20-flowered; floral bracts suboblong-lanceolate, lower ones 12–15 mm, to ca. 4 mm above, abaxially pubescent, apex acuminate or acute. Flowers resupinate, pale green or green; pedicel 6–8 mm, slender, pubescent; ovary broadly ellipsoid-fusiform, 3–8 mm, densely pubescent; sepals and petals spreading. Sepals oblong-ovate, 4–5 × 1–1.8 mm, outer surfaces sparsely pubescent, with prominent midvein, apex obtuse; lateral sepals falcate. Petals sublinear to narrowly oblong, 3.8–4.5 × ca. 0.5 mm, glabrous, with prominent midvein; lip pendulous or spreading forward, narrowly obovate-oblong, 6–9 × 3–4 mm, narrowing to 1.5–2 mm wide at base, apex deeply 2-lobed; lobes subparallel to one another, subovate or ovate-lanceolate, 1.5–2.5 × 0.8–1.2 mm, margins minutely ciliate, apices acute or obtuse; sinus with a short tooth between lobes. Column slightly arcuate, 2.5–3 mm; anther inclined toward rostellum, ovoid-ligulate, ca. 0.7 mm; stigma concave, suborbicular; rostellum spreading horizontally, broadly ovate-ligulate, nearly as long as anther. Fl. Jul–Sep. $2n = 40, 46$.

Forests, grassy slopes; (1500–)2500–3900 m. C Gansu, N Shanxi, W Sichuan, S and SE Xizang, NW Yunnan [Bhutan, India, Kashmir, Nepal, Pakistan].

2. *Neottia camtschatea* (Linnaeus) H. G. Reichenbach in Reichenbach, *Icon. Fl. Germ. Helv.* 13/14: 146. 1850–1851.

北方鸟巢兰 bei fang niao chao lan

Ophrys camtschatea Linnaeus, *Sp. Pl.* 2: 948. 1753; *Epipactis kamtschatica* (Georgi) Lindley; *O. kamtschatica* Georgi; *Neottia kamtschatica* (Georgi) Sprengel; *Serapias camtschatea* (Linnaeus) Steudel.

Plants leafless, holomycotrophic, 10–27 cm tall. Rhizome with many long, fleshy roots. Peduncle 7–15 cm, slender to robust, pubescent, with 2–4 sheaths; sheaths tubular, 1–3 cm, membranous; rachis 4–15 cm, pubescent, laxly to subdensely 12–25-flowered; floral bracts narrowly ovate-oblong, lowest ones 5–8 mm, to ca. 4 mm above, membranous, abaxially hairy, apex acute. Flowers resupinate, pale green to greenish white; pedicel 3.5–5.5 mm, slender, sparsely pubescent; ovary fusiform, 2–3 mm, pubescent; sepals and petals spreading. Sepals ligulate-oblong, 5–6 × ca. 1.5 mm, outer surfaces sparsely pubescent, with prominent midvein, apex obtuse; lateral sepals falcate. Petals linear, 3.5–4.5 × ca. 0.5 mm, glabrous, with prominent midvein; lip spreading forward to suberect, cuneate, 10–12 × 1.5–2 mm, base extremely narrow, apex deeply 2-lobed; lobes diverging at an acute angle to one another, narrowly lanceolate or lanceolate, 3.5–5 × ca. 1 mm, margins minutely ciliate, apices acute. Column arcuate, ca. 3 mm; anther inclined toward rostellum, ca. 0.7 mm; stigma concave, suborbicular; rostellum spreading horizontally or slightly down-curved, ovate-oblong or broadly oblong, large, ca. 0.7 mm. Capsule elliptic, 8–9 × 5–6 mm. Fl. Jul–Aug. $2n = 40$.

Forests, forest margins, humid places; 2000–2400 m. Gansu, NW

Hebei, C and W Nei Mongol, NE Qinghai, N Shaanxi, C and N Xinjiang [Kazakhstan, Russia (Far East, Siberia)].

3. *Neottia megalochila* S. C. Chen, *Acta Phytotax. Sin.* 17(2): 17. 1979.

大花鸟巢兰 da hua niao chao lan

Neottia grandiflora Schlechter, *Notes Roy. Bot. Gard. Edinburgh* 5: 104. 1912, not Hooker (1830), nor (A. Richard) Kuntze (1891); *N. schlechteriana* Szlachetko, nom. illeg. superfl.

Plants leafless, holomycotrophic, 20–35 cm tall. Rhizome with many fleshy roots. Peduncle robust, 10–15 cm, glabrous or very sparsely pubescent above, with 3–5 sheaths; sheaths tubular, 2–5 cm, membranous; rachis 6–18 cm, glabrous or sometimes sparsely pubescent, subdensely to densely more than 30-flowered; floral bracts oblong-obovate, 5–7 × ca. 4 mm, lowest (2–)3–10 mm, shorter above, outer surfaces slightly pubescent at base. Flowers relatively large, resupinate, yellowish green or pale green, lip flushed white at margins; pedicel ca. 5 mm, almost glabrous; ovary obovoid, ca. 5 mm, sparsely pubescent; sepals and petals spreading. Dorsal sepal subovate or narrowly elliptic, ca. 5 × 2–3 mm, 1-veined, outer surfaces almost glabrous; lateral sepals falcate, similar to dorsal sepal, but somewhat wider. Petals linear to linear-ligulate, slightly oblique, ca. 4.5 × 1 mm, dilated toward apex, glabrous, 1-veined; lip obovate, 8.5–15 × 6–10 mm, narrowing to ca. 4 mm wide at base, apex deeply 2-lobed; lobes diverging at an acute angle to one another, broadly oblong to subsquare, 2–2.5 × 2–3.5 mm, margins minutely ciliate, apices truncate-rounded and slightly undulate or crenulate; disk with minute papillae. Column slightly arcuate, ca. 4 mm; anther inclined toward rostellum, ca. 0.7 mm; stigma concave, suborbicular, with slightly exerted margins; rostellum subsquare or broadly oblong-ovate, large, ca. 0.7 mm. Fl. Jul–Aug.

• *Pinus* forests, shaded grassy slopes; 3000–3800 m. W Sichuan, NW Yunnan.

4. *Neottia tenii* Schlechter, *Repert. Spec. Nov. Regni Veg.* 19: 376. 1924.

耳唇鸟巢兰 er chun niao chao lan

Plants leafless, holomycotrophic, ca. 25 cm tall. Peduncle sparsely pubescent above, with several sheaths; rachis pubescent, sublaxly ca. 20-flowered; floral bracts lanceolate, 5–6 mm, glabrous or nearly so, apex acuminate. Flowers resupinate; pedicel and ovary 7–8 mm, sparsely pubescent. Sepals lanceolate, 3–4 mm, 1-veined, apex subacute; lateral sepals oblique, slightly falcate. Petals linear-ligulate, slightly shorter than sepals, 1-veined, apex obtuse; lip spreading forward, narrowly oblong, 7–8 × ca. 3.5 mm, with a pair of auricles at base, apex 2-lobed; lobes subparallel to one another, lanceolate, oblique, 1–1.5 mm, margins minutely ciliate, apices acute and slightly incurved; auricles triangular, projecting backward, very small, slightly thickened at base; disk with 3–5 slightly thickened veins. Column slightly arcuate, ca. 2.5 mm; anther inclined toward rostellum, elliptic, ca. 0.6 mm; stigma concave, suborbicular, with slightly exerted margins; rostellum broadly ovate,

rather large, slightly shorter than anther. Fl. unknown.

• N Yunnan.

The present authors have seen no specimens of this species. According to the original description, this species is similar to *Neottia listeroides*, differing only in the presence of a pair of auricles at the base of the lip.

5. *Neottia papilligera* Schlechter, Repert. Spec. Nov. Regni Veg. 16: 356. 1920.

凹唇鸟巢兰 ao chun niao chao lan

Neottia nidus-avis (Linnaeus) Richard var. *manshurica* Komarov; *N. papilligera* f. *glaberrima* Kitagawa.

Plants leafless, holomycotrophic, 27–34 cm tall. Rhizome with many stout, fleshy roots. Peduncle to ca. 25 cm, pubescent, with several sheaths; sheaths tubular, to 4.5 cm, membranous; rachis 10–15 cm, glabrous or pubescent, densely many flowered, though usually with 1–3 more widely spaced flowers at base; floral bracts subulate, 5–6 mm. Flowers resupinate, beige to flesh-colored; pedicel ca. 5 mm, usually glabrous; ovary fusiform, 4–5 mm, glabrous or pubescent. Sepals obovate-spatulate, ca. 3.5 × 1.8 mm, 1-veined, apex obtuse or subtruncate. Petals suboblong, ca. 3.5 × 1.5 mm, 1-veined, apex obtuse; lip subobovate, 5–5.5 mm, distinctly concave at base, apex deeply 2-lobed; lobes diverging at an obtuse (120°–170°) angle to one another, narrowly oblong, usually twisted, 2.5–3 × ca. 1.2 mm, apex obtuse or truncate. Column erect, slightly arcuate, 2–2.5 mm; anther suboblong, ca. 1.2 mm; stigma ligulate, ca. 1 mm, apex shallowly 2-lobed; rostellum slightly downcurved, suboblong, large, ca. 1.2 mm. Capsule ovoid-ellipsoid, 7–8 × 4–5 mm. Fl. Jul–Aug. $2n = 36, 38$.

Forests. C Heilongjiang, S Jilin [Japan, Korea, Russia (Far East, Siberia)].

6. *Neottia brevilabris* Tang & F. T. Wang, Acta Phytotax. Sin. 1: 65. 1951.

短唇鸟巢兰 duan chun niao chao lan

Plants leafless, holomycotrophic, ca. 38 cm tall. Peduncle somewhat robust, ca. 4 mm in diam., pubescent above, with 6 sheaths; sheaths tubular, to 4 cm, membranous; rachis ca. 4 cm, pubescent, densely more than 10-flowered; floral bracts linear-lanceolate, to 10 mm, glabrous, 1-veined, apex obtuse. Flowers 4–6 mm in diam., resupinate; pedicel and ovary ca. 7.5 mm, pubescent. Dorsal sepal subelliptic, ca. 3 × 1.8 mm, glabrous, 1-veined, apex obtuse; lateral sepals elliptic, slightly oblique, ca. 3 × 1.6 mm, glabrous, 1-veined, apex obtuse. Petals narrowly elliptic, oblique, ca. 2.8 × 1 mm, 1-veined, apex obtuse; lip suboblong-obovate, 4–4.5 × ca. 2.2 mm, shallowly concave at base, apex shallowly 2-lobed; lobes diverging widely, suborbicular or broadly ovate, oblique, ca. 0.8 mm, apices obtuse; sinus with a short tooth between lobes. Column erect, ca. 1.5 mm; anther erect, ovoid, 0.5–0.7 mm; stigma 2-lobed. Capsule oblong, 9–10 × 4–5 mm. Fl. Jun.

• About 1800 m. Chongqing.

7. *Neottia acuminata* Schlechter, Acta Horti Gothob. 1: 141. 1924.

尖唇鸟巢兰 jian chun niao chao lan

Aphyllorchis parviflora King & Pantling; *Neottia asiatica* Ohwi; *N. micrantha* Lindley (1840), not Llave & Lex (1825), nor G. Don (1839); *N. oblonga* Tang & F. T. Wang; *N. parviflora* (King & Pantling) Schlechter (1924), not Smith (1813); *N. subsessilis* Ohwi.

Plants leafless, holomycotrophic, 14–30 cm tall. Rhizome with many fleshy roots. Peduncle 10–25 cm, glabrous, with 3–5 sheaths; sheaths tubular, 1–5 cm, membranous; rachis 4–8 cm, glabrous, densely more than 20-flowered, flowers usually in clusters of 3 or 4; floral bracts oblong-ovate, 3–4 mm, glabrous, apex obtuse. Flowers small, resupinate, yellowish brown; pedicel 3–4 mm, glabrous; ovary elliptic, 2.5–3 mm, glabrous. Dorsal sepal narrowly lanceolate, 3–5 × ca. 0.8 mm, glabrous, 1-veined, apex long acuminate; lateral sepals similar to dorsal sepal, ca. 1 mm wide. Petals narrowly lanceolate, 2–3.5 × ca. 0.5 mm; lip variable in shape, usually ovate, ovate-lanceolate, or lanceolate, 2–3.5 × 1–2 mm, margin slightly incurved, 1- or 3-veined, apex acuminate or obtuse, unlobed. Column extremely short, usually less than 0.5 mm, shorter than rostellum and anther; anther erect, subelliptic, ca. 1 mm; stigma erect, transversely oblong, incurved on both sides, embracing rostellum; rostellum erect, ligulate, to ca. 1 mm. Capsule ellipsoid, ca. 6 × 3–4 mm. Fl. Jun–Aug. $2n = 36$.

Forests, shaded grassy slopes; 1500–4100 m. Gansu, Hebei, Hubei, S Jilin, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, N Yunnan (Dayao) [India (Sikkim), Japan, Korea, Nepal, Russia (Far East)].

8. *Neottia taibaishanensis* P. H. Yang & K. Y. Lang, Acta Phytotax. Sin. 44: 86. 2006.

太白山鸟巢兰 tai bai shan niao chao lan

Plants leafless, holomycotrophic, 12–40 cm tall. Rhizome with many fleshy roots. Peduncle glabrous, with 3 or 4 sheaths; sheaths tubular, membranous; rachis 4–12 cm, villous, densely 20–40-flowered, flowers usually in clusters of 3 or 4; floral bracts oblong, 2.5–3.5 mm, apex mucronate. Flowers small, not resupinate, gray-black, lip with a gray-white margin; pedicel 3–4 mm, glabrous; ovary obovate, ca. 3 mm, subglabrous. Dorsal sepal linear-lanceolate, ca. 5 × 0.5–0.6 mm, glabrous, 1-veined, apex acuminate; lateral sepals similar to but slightly wider than dorsal sepal, oblique. Petals narrowly lanceolate, ca. 3 × 0.5 mm, glabrous, apex acuminate; lip obovate to suborbicular, ca. 3 × 2–2.2 mm, 3-, 4-, or rarely 5-veined, apex mucronate, unlobed. Column very short, less than 0.5 mm, shorter than rostellum and anther; anther erect.

• Mixed *Abies fargesii* and *Betula utilis* forests; ca. 2900 m. Shaanxi.

9. *Neottia biflora* (Schlechter) Szlachetko, Fragm. Florist. Geobot., Suppl. 3: 117. 1995.

二花对叶兰 er hua dui ye lan

Listera biflora Schlechter, Acta Horti Gothob. 1: 143. 1924.

Plants autotrophic, 10–13 cm tall. Rhizome with a few elongate, filiform roots. Stem cylindric, slender, with 1 sheath toward base. Leaves 2, opposite, borne above middle of plant, subsessile, unequal in size (one distinctly larger than other), larger one broadly ovate, 1.2–1.8 × 0.8–1.4 cm, smaller one narrowly ovate, 1–1.5 × 5–7 mm, both with bases rounded and apices acute. Peduncle 2–2.5 cm, pubescent, lacking sterile bracts; rachis very short, sparsely pubescent or almost glabrous, 1- or 2-flowered; floral bracts ovate-lanceolate, 3–5 × ca. 0.8 mm, shorter than pedicel, apex acute. Flowers resupinate, green; pedicel 4–6 mm, nearly glabrous; ovary 4–5 mm, glabrous; sepals and petals not spreading widely. Dorsal sepal ovate-elliptic, 6–7 × 1.2–1.8 mm, outer surface carinate, apex obtuse; lateral sepals linear-lanceolate, ca. 7 × 1 mm, outer surface carinate, apex acute. Petals linear, ca. 6.5 × 1 mm, apex obtuse or acute; lip spreading forward, cuneate, 8–10 × 4–5.5 mm, apex truncate-rounded and shallowly notched, usually with a minute tooth in notch; disk with a groove at base, midvein slightly thickened. Column slightly arcuate, 3–4 mm; anther inclined toward rostellum; rostellum large, but shorter than anther. Fl. Jul.

• Forests; 3000–3900 m. NW Sichuan (Songpan).

10. *Neottia morrisonicola* (Hayata) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 118. 1995.

浅裂对叶兰 *qian lie dui ye lan*

Listera morrisonicola Hayata, *Icon. Pl. Formosan.* 2: 140. 1912; *L. taiwaniana* S. S. Ying; *Neottia taiwaniana* (S. S. Ying) Szlachetko; *Ophrys morrisonicola* (Hayata) Makino.

Plants autotrophic, 4–20 cm tall. Rhizome with a few elongate, filiform roots. Stem cylindric, slender. Leaves 2, opposite, borne at ca. middle of plant, sessile, ovate or ovate-orbicular, 1.5–2 × 1.2–1.8 cm, base rounded, apex acute. Peduncle 2–5 cm, pubescent; rachis 2–6 cm, pubescent, subdensely 2–5-flowered; floral bracts ovate-lanceolate, 6–7 × ca. 3 mm, with 3 inconspicuous veins, apex obtuse. Flowers resupinate, light green, with lip tinged yellowish green at margins, 15–20 mm in diam.; pedicel 4–5 mm; ovary ca. 3.5 mm. Sepals not spreading widely, similar, ovate-lanceolate, 7–8 × 2–2.5 mm, 1-veined, apex acute. Petals linear-lanceolate, 6–7 × 1–1.5 mm, 1-veined, apex acute; lip pendulous or spreading forward, broadly cuneate, 9.5–10 × 5–6.5 mm, with 3 inconspicuous veins, base concave and slightly channeled, margin recurved, apex truncate and shallowly notched or emarginate. Column ca. 3 mm; anther erect, narrow, ca. 1 mm. Capsule obovoid, ca. 8 × 4 mm, with 3 conspicuous ridges. Fl. Jun–Jul.

• Coniferous forests, shaded and damp meadows; 2500–3800 m. Taiwan.

11. *Neottia taizanensis* (Fukuyama) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 119. 1995.

小花对叶兰 *xiao hua dui ye lan*

Listera taizanensis Fukuyama, *Bot. Mag. (Tokyo)* 48: 431. 1934.

Plants autotrophic, 11–16 cm tall. Rhizome with a few filiform roots. Stem slender, usually with 1 sheath toward base.

Leaves 2, opposite, borne at ca. middle of plant, subsessile, deltoid or ovate-suborbicular, ca. 2 × 2.5 cm, base cuneate or triangular-cuneate, apex acute. Peduncle 2–4 cm, pubescent, with 1–4 sterile bracts; rachis 2.5–5 cm, subdensely 11–13-flowered; floral bracts ovate-lanceolate, ca. 3 × 1–1.5 mm, 1-veined, apex acute. Flowers small, resupinate; pedicel and ovary erect, 6–9 mm, glabrous. Dorsal sepal narrowly ovate, ca. 2 × 0.7 mm, glabrous, 1-veined, apex acute or subacute; lateral sepals oblong, falcate, ca. 2.5 × 1 mm, glabrous, apex subacute. Petals linear or spatulate-linear, ca. 2.3 × 0.3 mm, glabrous, 1-veined, apex subacute; lip erect, spatulate, 3.5–4.5 × ca. 1.3 mm, base cuneate and narrowing to ca. 0.5 mm wide, 3-veined, apex emarginate. Column ca. 1.5 mm. Fl. Jul.

• Forests; ca. 1800 m. N Taiwan.

12. *Neottia mucronata* (Panigrahi & J. J. Wood) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 118. 1995.

短柱对叶兰 *duan zhu dui ye lan*

Listera mucronata Panigrahi & J. J. Wood, *Kew Bull.* 29: 731. 1975.

Plants autotrophic, 40–50 cm tall. Rhizome with many elongate, filiform roots. Stem 15–22 cm, somewhat stout, with 1 or 2 sheaths toward base. Leaves 2, opposite, borne at ca. middle of plant, sessile, broadly ovate to subcordate, 5–7.5 × 4.4–7.9 cm, base broadly cuneate or subcordate, apex acute. Peduncle 6–15 cm, pubescent, with 2 or 3 sterile bracts 3–5 mm; rachis 15–17.5 cm, laxly 12–17-flowered; floral bracts ovate-lanceolate, 3–5 mm, 1-veined, apex acuminate. Flowers resupinate, green; pedicel 4.5–7 mm, pubescent; ovary fusiform, 3.5–5 mm, pubescent; sepals and petals spreading widely. Dorsal sepal elliptic or ovate-elliptic, 4–5 × ca. 1.2 mm, 1-veined, apex obtuse; lateral sepals ovate, oblique, ca. 5 × 1.5 mm, apex obtuse. Petals linear or spatulate-linear, ca. 5 × 0.6 mm, apex obtuse-rounded; lip pendulous or spreading forward, subobovate-cuneate, 8–10 × 6–7 mm, narrowing to ca. 2 mm wide at base, apex deeply 2-lobed; lobes divergent, suboblong, 3.5–4 × 2–3 mm, margins minutely papillose-ciliate; sinus with small tooth between lobes; disk with a distinct thickened central ridge extending from base of lip and continuous with tooth in sinus. Column 1–1.5 mm; anther inclined toward rostellum; rostellum large. Fl. Jul–Aug.

Shaded places in forests; ca. 2400 m. SW Sichuan, Yunnan [Bhutan, India, Japan, Nepal].

13. *Neottia microphylla* (S. C. Chen & Y. B. Luo) S. C. Chen, S. W. Gale & P. J. Cribb, **comb. nov.**

小叶对叶兰 *xiao ye dui ye lan*

Basionym: *Listera microphylla* S. C. Chen & Y. B. Luo, *Novon* 12: 438. 2002.

Plants autotrophic, 5–11 cm tall. Rhizome with a very few elongate, filiform roots. Stem 0.6–2 cm, slender. Leaves 2, opposite, borne below middle of plant, sessile, orbicular-ovate, 0.6–0.8 × 0.7–0.9 cm, minutely glandular hairy on both surfaces, base broadly truncate, apex obtuse-acute. Peduncle 2.6–6 cm, glabrous, sometimes with 1 sterile bract; rachis 1.6–3 cm, sparsely pubescent, laxly 3- or 4-flowered; floral bracts sub-

ovate or ovate-lanceolate, 3–4 × ca. 2 mm, apex acute. Flowers resupinate, greenish white; pedicel arcuate, 1.5–2 mm, slender, glabrous; ovary ca. as long as pedicel, glabrous; sepals and petals not spreading. Dorsal sepal oblong-ovate, ca. 3.5 × 1.5 mm, 1-veined, apex obtuse; lateral sepals lanceolate-ovate, slightly oblique, similar in size to dorsal sepal, outer surface carinate. Petals oblong-ovate, slightly shorter and narrower than dorsal sepal; lip spreading forward, obovate-cuneate, 5–5.5 × ca. 3.5 mm, apex deeply 2-lobed; lobes broadly oblong, ca. 1.4 × 1.6 mm, 3-veined, apices obtuse; sinus with small tooth between lobes; disk with an indistinct ridge extending from base of lip and continuous with tooth in sinus. Column suberect, 1.5–2 mm; anther ca. 1 mm. Capsule erect, ellipsoid, ca. 3 × 2 mm. Fl. Oct. $2n = 40 + 0-2B^*$.

- Grassy slopes; ca. 2500 m. NW Yunnan.

14. *Neottia puberula* (Maximowicz) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 118. 1995.

对叶兰 *dui ye lan*

Plants autotrophic, 8–20 cm tall. Rhizome with very few elongate, filiform roots. Stem cylindrical, slender, usually with 1 or 2 membranous sheaths toward base. Leaves 2, opposite, borne at ca. middle of plant, subsessile, cordate, broadly ovate, or broadly ovate-triangular, 1.5–2.5 × 1.5–2.2 cm, base broadly cuneate or subcordate, margin slightly crisped, apex acute or obtuse. Peduncle 2–7 cm, pubescent; rachis 2.5–7 cm, pubescent, laxly 4–7-flowered; floral bracts lanceolate, 1.5–3.5 mm, glabrous, apex acute. Flowers very small, resupinate, green; pedicel 3–4 mm, pubescent; ovary ca. 6 mm, pubescent; sepals and petals not spreading widely. Dorsal sepal ovate-lanceolate, 1.8–2.4 × 0.8–1 mm, 1-veined, apex subacute; lateral sepals ovate-lanceolate, oblique, 1.5–2.2 × ca. 0.6 mm, apex acute. Petals linear, 1.2–2.2 × ca. 0.5 mm, 1-veined, apex acute; lip narrowly obovate-cuneate or oblong-cuneate, 6–8 × ca. 1.7 mm, margin slightly papillate-ciliate, apex deeply 2-lobed; lobes divergent or nearly parallel, oblong, 1.8–2.5 × 0.8–1 mm; disk with a thickened midvein. Column slightly arcuate, 1.5–2.5 mm; anther inclined toward rostellum; rostellum broadly ovate, large, but shorter than anther. Capsule obovoid, ca. 6 × 3.5 mm. Fl. Jul–Sep, fr. Sep–Oct.

Damp places in dense forests, deep shade of coniferous forests; 1400–2600 m. Chongqing, C and S Gansu, Guizhou, NW Hebei, Heilongjiang, S Jilin, Liaoning, Nei Mongol, Qinghai, N Shanxi, N and NW Sichuan [Japan, Korea, Russia (Far East)].

- 1a. Leaves uniformly green 14a. var. *puberula*
- 1b. Leaves green with grayish white venation 14b. var. *maculata*

14a. *Neottia puberula* var. *puberula*

对叶兰(原变种) *dui ye lan* (yuan bian zhong)

Listera puberula Maximowicz, *Bull. Acad. Imp. Sci. Saint-Petersbourg* 29: 204. 1884; *L. bungeana* Yabe; *L. major* Nakai; *L. savatieri* Maximowicz ex Komarov; *L. yatabei* Makino.

Leaves uniformly green. Apical lobes of lip straight.

Damp places in dense forests; 1400–2600 m. C Gansu, Guizhou, NW Hebei, Heilongjiang, S Jilin, Liaoning, Nei Mongol, Qinghai, N Shanxi, NW Sichuan [Japan, Korea, Russia (Far East)].

14b. *Neottia puberula* var. *maculata* (Tang & F. T. Wang) S. C. Chen, S. W. Gale & P. J. Cribb, *comb. nov.*

花叶对叶兰 *hua ye dui ye lan*

Basionym: *Listera savatieri* Maximowicz ex Komarov var. *maculata* Tang & F. T. Wang, *Acta Phytotax. Sin.* 1: 65. 1951; *L. maculata* (Tang & F. T. Wang) K. Y. Lang; *L. puberula* var. *maculata* (Tang & F. T. Wang) S. C. Chen & Y. B. Luo.

Leaves green, white, or grayish white along midvein and longitudinal lateral veins. Apical lobes of lip slightly incurved toward apex.

- Deep shade of coniferous forests; 2000–2200 m. Chongqing, S Gansu, N Sichuan.

15. *Neottia smithii* (Schlechter) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 118. 1995.

川西对叶兰 *chuan xi dui ye lan*

Listera smithii Schlechter, *Acta Horti Gothob.* 1: 144. 1924.

Plants autotrophic, 9–12 cm tall. Rhizome with several elongate, filiform roots. Stem slender, with 2 sheaths toward base. Leaves 2, opposite, borne above middle of plant, sessile, green, ovate or ovate-orbicular, 1.3–1.7 × 1.2–1.6 cm, base rounded or broadly cuneate, apex obtuse or subacute. Peduncle pubescent; rachis 1.5–4 cm, pubescent, laxly 2–5-flowered; floral bracts ovate-lanceolate, ca. 4 mm. Flowers small, resupinate, green with paler sepals and petals and a whitish margin to lip; pedicel ca. 3 mm, pubescent; ovary ca. 2 mm, sparsely pubescent. Dorsal sepal narrowly elliptic, ca. 3 × 1.2 mm, 1-veined, apex obtuse; lateral sepals ovate-lanceolate, falcate, ca. 3 × 1.5 mm. Petals linear-ligulate, oblique, ca. 2.8 × 0.4 mm, apex obtuse; lip spreading forward, obovate, ca. 8 × 2.5–3 mm, margin minutely papillose-ciliate, apex deeply 2-lobed; lobes almost parallel, linear-lanceolate, oblique, ca. 2.7 mm; sinus with a triangular tooth between lobes; anther inclined toward rostellum; rostellum broadly ovate, large. Fl. Jul.

- Forests; ca. 3900 m. NW Sichuan.

16. *Neottia meifongensis* (H. J. Su & C. Y. Hu) T. C. Hsu & S. W. Chung, *Taiwania* 54: 83. 2009.

梅峰对叶兰 *mei feng dui ye lan*

Listera meifongensis H. J. Su & C. Y. Hu, *Taiwania* 45: 240. 2000.

Plants autotrophic, 12–25 cm tall. Rhizome with a few clustered, filiform roots. Stem slender, ridged. Leaves 2, opposite, borne at or above middle of plant, sessile, broadly ovate to ovate-deltoid, 1.5–2.5 × 1.8–3.2 cm, base truncate-subcordate, apex acute. Peduncle 3–6 cm, pubescent, with 1–3 ovate-lanceolate sterile bracts 3–5 mm; rachis 3–6 cm, pubescent, laxly 2–7-flowered; floral bracts ovate-lanceolate, 3–4.5 × ca. 2 mm, apex acute. Flowers resupinate, light green, lip tinged pale yellow.

lowish green along margin; pedicel and ovary arcuate, 6–8 mm, glabrous or sometimes sparsely pubescent at base; sepals and petals spreading. Dorsal sepal lanceolate, 3–4.5 × ca. 1.3 mm, apex acute; lateral sepals lanceolate, falcate, 3.5–5.5 × 1.5–2 mm, apex acute. Petals linear-lanceolate, 3–5 × 0.7–1 mm, apex acuminate; lip spreading forward, cuneate-rectangular or broadly oblong, 6–10 × 3–7.5 mm, apex obtuse-rounded and shallowly 2-lobed; lobes ovate-oblong, 1.5–2 × 1.5–2.5 mm; disk with a longitudinal groove at base that extends into a thickened keel running almost to apical sinus, margins ciliate. Column distinctly arcuate above middle, 4–5 mm; anther inclined toward rostellum, ca. 1 mm; rostellum large, ca. 0.8 mm. Fl. Jun–Jul.

• *Abies* and *Tsuga* forests; 2200–3300 m. C Taiwan.

17. *Neottia longicaulis* (King & Pantling) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 117. 1995.

毛脉对叶兰 mao mai dui ye lan

Listera longicaulis King & Pantling, *J. Asiat. Soc. Bengal*, Pt. 2, Nat. Hist. 65: 126. 1896.

Plants autotrophic, 12–15 cm tall. Rhizome with a few filiform roots. Stem 8–10 cm, slender, with 1 sheath at base. Leaves 2, opposite, borne above middle of plant, subsessile, broadly ovate-cordate, ca. 2.5 × 3 cm, base shallowly cordate, apex acute or obtuse. Peduncle ca. 1.5 cm, pubescent, with 1 sterile bract 4–6 mm; rachis 3–4 cm, pubescent, laxly to subdensely 5- or 6-flowered; floral bracts ovate-lanceolate, ca. 3 mm, apex acuminate. Flowers resupinate, yellowish green; pedicel 4–5 mm, almost glabrous; ovary 2–3 mm, glabrous. Dorsal sepal oblong-ovate, ca. 4 × 1.7 mm, 1-veined, apex obtuse; lateral sepals lanceolate, falcate, ca. 4.5 × 1.5 mm, slightly thickened, apex obtuse. Petals linear-lanceolate, ca. 3.5 × 1 mm, 1-veined, apex obtuse; lip suboblong or obovate-oblong, ca. 12 × 7 mm, margin ciliate, apex deeply 2-lobed; lobes nearly parallel or slightly divergent, broadly ovate, ca. 3 mm, apices obtuse; disk glandular papillose-pubescent along lateral veins, midvein thickened. Column arcuate above middle, ca. 2.7 mm; anther inclined toward rostellum; rostellum large. Fl. Jul. $2n = 46$.

Pinus wallichiana forests; ca. 2800 m. S Xizang [Bhutan, NE India].

P. Ormerod (pers. comm.) notes that a comparison of type material of this species and *Listera yueana* (here treated as a synonym of *Neottia pinetorum*) led him to find them conspecific, and he believes what is called *N. longicaulis* here and *L. longicaulis* in FRPS is in fact a different species (see Ormerod, *Taiwania* 48: 91. 2003).

18. *Neottia suzukii* (Masamune) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 119. 1995.

无毛对叶兰 wu mao dui ye lan

Listera suzukii Masamune, *Trop. Hort.* 3: 42. 1933; *L. deltoidea* Fukuyama; *L. uraiensis* S. S. Ying; *Neottia deltoidea* (Fukuyama) Szlachetko; *N. uraiensis* (S. S. Ying) Szlachetko.

Plants autotrophic, 8–30 cm tall. Rhizome with very few elongate, filiform roots. Stem ridged, 3.5–12 cm, with a sheath near base. Leaves 2, opposite, borne at or below middle of

plant, sessile, ovate to deltoid, 2–4 × 1–3 cm, base truncate-rounded, apex acute. Peduncle green or purple, 2.5–10 cm, pubescent; rachis 2.5–9 cm, glabrous, laxly 10- to more than 20-flowered; floral bracts ovate-triangular, 1–2 × 1–1.5 mm, apex acute. Flowers resupinate, pale greenish brown; pedicel and ovary 5–6 mm, glabrous; sepals and petals not spreading. Dorsal sepal ovate, ca. 2.5 × 1.5 mm, 1-veined, apex acute; lateral sepals rhombic to broadly ovate, oblique, ca. 2.5 × 2 mm, apex acute. Petals oblong-ovate, falcate, ca. 2 × 0.8 mm, 1-veined, apex acute; lip narrowly cuneate or obovate-cuneate, 4–8 × 1.5–2 mm, apex deeply 2-lobed; lobes divergent, narrowly linear, 2.5–4 × ca. 0.5 mm, apices acuminate; sinus with a short tooth between lobes; disk with a thickened midvein. Column ca. 1 mm; rostellum spreading forward, ovate, very large. Fl. Jan–Apr.

• Forests; 800–2200 m. NE and S Taiwan.

19. *Neottia bambusetorum* (Handel-Mazzetti) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 117. 1995.

高山对叶兰 gao shan dui ye lan

Listera bambusetorum Handel-Mazzetti, *Symb. Sin.* 7: 1338. 1936.

Plants autotrophic, 10–18 cm tall. Rhizome with a few filiform roots. Stem 1.5–5 cm, with 1 or 2 sheaths toward base. Leaves 2, opposite, borne below middle of plant, orbicular-ovate or reniform, 1.8–2.6 × 1.8–2.8 cm, base obtuse-rounded, apex rounded or subacute. Peduncle pubescent; rachis 5–9 cm, pubescent, laxly 8–20-flowered; floral bracts ovate or broadly ovate, 3–4 mm, apex acute or obtuse. Flowers resupinate, green; pedicel ca. 3 mm, almost glabrous; ovary 1–1.5 mm, glabrous. Sepals elliptic or ovate, ca. 3 × 1 mm, 1-veined, apex obtuse; lateral sepals oblique. Petals linear, ca. 3 × 0.5 mm, apex obtuse; lip subcuneate, ca. 6 × 1.5–2 mm, base attenuate, apex deeply 2-lobed; lobes divergent, narrowly linear, 2–2.5 × ca. 0.5 mm, margins minutely papillose-ciliate, apices obtuse; sinus with a short tooth between lobes. Column slightly arcuate, ca. 2 mm. Fl. Jul.

• Bamboo forests; 3200–3400 m. W Yunnan.

20. *Neottia nankomontana* (Fukuyama) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 118. 1995.

台湾对叶兰 tai wan dui ye lan

Listera nankomontana Fukuyama, *Bot. Mag. (Tokyo)* 49: 291. 1935.

Plants autotrophic, 12–20 cm tall. Stem cylindrical, 4–7 cm, slender. Leaves 2, opposite, borne at ca. or below middle of plant, sessile, broadly ovate, 1.8–2 × 1.5–2.5 cm, base truncate, apex acute. Peduncle 3–6 cm, pubescent, with 3 sterile bracts; rachis 5–8 cm, pubescent, laxly 5–8-flowered; floral bracts lanceolate, ca. 3 mm, apex acute. Flowers resupinate, greenish, lip purplish; pedicel and ovary 7–9 mm, glabrous. Sepals spreading to slightly reflexed, membranous, 1-veined; dorsal sepal ligulate, 2.5–3.5 × 1–1.3 mm, apex obtuse; lateral sepals ligulate, falcate, 3–5 × 1.3–2 mm. Petals spreading, linear, 2.5–3.5 × ca. 0.6 mm, slightly dilated at base, 1-veined, apex obtuse; lip spreading forward, narrowly cuneate, ca. 7 × 3.5 mm, slightly

fleshy at center, apex deeply 2-lobed; lobes parallel, subovate, 2–3 × ca. 1 mm, apices obtuse. Column erect, arcuate above middle, 2.5–3 mm. Fl. Jul.

- Coniferous forests; 2600–3200 m. C and N Taiwan.

21. *Neottia kuanshanensis* (H. J. Su) T. C. Hsu & S. W. Chung, *Taiwania* 54: 83. 2009.

关山对叶兰 *guan shan dui ye lan*

Listera kuanshanensis H. J. Su, *J. Exp. Forest Natl. Taiwan Univ.* 13: 206. 1999.

Plants autotrophic, 12–14 cm tall. Rhizome with a few elongate, filiform roots. Stem 5–7 cm, slender. Leaves 2, opposite, borne at ca. middle of plant, subsessile, deltoid or ovate-suborbicular, ca. 1.5 × 1.8–2 cm, membranous, base broadly truncate, apex acute. Peduncle pubescent, with 2 sterile bracts; rachis 3–4 cm, pubescent, laxly 3–7-flowered; floral bracts ovate-lanceolate, ca. 3.5 mm, apex acute. Flowers resupinate, greenish; pedicel and ovary ca. 8 mm, glabrous; sepals and petals spreading widely. Dorsal sepal ovate-lanceolate, ca. 3.3 × 1 mm, base slightly contracted, apex acute; lateral sepals falcate, ca. 3.5 × 1.2 mm, base broadly cuneate, apex acute. Petals linear-lanceolate, ca. 3.3 × 0.5 mm, apex obtuse; lip lanceolate, ca. 14 × 2.5 mm, apex deeply 2-lobed; lobes divergent, linear, 6.5–7 × 0.5–0.6 mm, apices acuminate; disk with a longitudinal keel. Column arcuate toward apex, 2.5–3 mm; rostellum ca. 0.9 mm. Fl. Aug.

- Forests; 2600–2700 m. S Taiwan.

22. *Neottia chenii* S. W. Gale & P. J. Cribb, **nom. nov.**

巨唇对叶兰 *ju chun dui ye lan*

Replaced synonym: *Listera grandiflora* Rolfe var. *megalochila* S. C. Chen, *Acta Phytotax. Sin.* 25: 473. 1987, not *Neottia megalochila* S. C. Chen, *Acta Phytotax. Sin.* 17(2): 17. 1979 [see p. 187]; *L. megalochila* (S. C. Chen) S. C. Chen & G. H. Zhu.

Plants autotrophic, 13–23 cm tall. Stem slender, usually with 1 sheath toward base. Leaves 2, opposite, borne near or above middle of plant, broadly ovate or ovate-cordate, 2.5–3.8 × 2.5–4 cm, apex subacute. Peduncle pubescent, with 1 or 2 sterile bracts 8–10 mm; rachis 3.5–6.5 cm, pubescent, 3–6-flowered; floral bracts ovate-lanceolate, 6–7 mm. Flowers resupinate, greenish yellow; pedicel and ovary 11–12 mm, nearly glabrous; sepals and petals spreading widely to reflexed. Dorsal sepal subelliptic, ca. 6.5 × 2.2 mm, apex subacute; lateral sepals elliptic-lanceolate, oblique, ca. 6.5 × 2 mm, apex subacute. Petals linear, ca. 6.5 × 1 mm; lip spreading forward, subobovate-oblong, 15–16 × 7–10 mm, slightly narrowing to ca. 5 mm wide at base, apex deeply 2-lobed; lobes subovate-oblong, 5–6 mm, margins minutely ciliate, apices truncate; disk with a V-shaped nectary at base. Column slightly arcuate, 6–7 mm. Fl. Jun–Jul.

- Forests; 2200–2800 m. S Gansu, W Sichuan.

The specific epithet honors the first co-author of the present treatment of *Neottia*.

23. *Neottia formosana* S. C. Chen, S. W. Gale & P. J. Cribb, **nom. nov.**

长唇对叶兰 *chang chun dui ye lan*

Replaced synonym: *Listera macrantha* Fukuyama, *Rep. (Annual) Taihoku Bot. Gard.* 3: 86. 1933; *Neottia macrantha* (Fukuyama) Szlachetko, *Fragm* (1995), not *Neottia macrantha* Sweet, *Hort. Brit.*, ed. 2, 485. 1830.

Plants autotrophic, 10–20 cm tall. Rhizome with a few elongate, filiform roots. Stem ridged, with 1 or 2 sheaths toward base, 7–14 cm to height of leaves. Leaves 2, opposite, sessile, broadly ovate or ovate-suborbicular, 1–2 × 1.2–2.5 cm, base subcordate, apex truncate-rounded and sometimes mucronate. Peduncle 3–5 cm, pubescent; rachis 2–5 cm, pubescent, laxly 2–6-flowered; floral bracts ovate-cuspidate, 2–5 × 2–4 mm, 1-veined, apex acuminate. Flowers resupinate, yellowish green; pedicel and ovary 8–9.5 mm; sepals and petals spreading. Dorsal sepal narrowly ovate-lanceolate, 4–5.5 × 1–2 mm, 1-veined, base slightly contracted, apex acute; lateral sepals ovate-lanceolate, falcate, 4–5.5 × 1.8–2.8 mm, 1-veined. Petals linear, 3–4.5 × 0.7–1 mm, 1-veined, apex acute; lip spreading forward, cuneate, 11–20 × 5.5–8.5 mm, apex truncate and deeply 2-lobed; lobes slightly divergent, ovate-oblong, ca. 6 × 2.5–4 mm, apices rounded; disk with a longitudinal groove and a nectary near base. Column green, distinctly arcuate above middle, 4–5 mm; anther erect, ovoid-lanceolate, ca. 0.9 mm. Fl. Jun–Aug.

- Forests; 2200–3300 m. Taiwan.

24. *Neottia pinetorum* (Lindley) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 118. 1995.

西藏对叶兰 *xi zang dui ye lan*

Listera pinetorum Lindley, *J. Proc. Linn. Soc., Bot.* 1: 175. 1857; *L. brachybotryosa* Tang & F. T. Wang; *L. yueana* Tang & F. T. Wang [“*yüana*”]; *Neottia yueana* (Tang & F. T. Wang) Szlachetko.

Plants autotrophic, 6–33 cm tall. Rhizome with a few elongate, filiform roots. Stem 4–15 cm, slender, with 1 sheath toward base. Leaves 2, opposite, borne at ca. middle of plant, sessile, broadly ovate to ovate-cordate, 1–3.5 × 1–4 cm, base shallowly cordate to nearly broadly truncate, apex acute. Peduncle pubescent; rachis 3–12 cm, pubescent, laxly 2–14-flowered; floral bracts ovate-lanceolate or ovate, 3–6 mm, apex acuminate. Flowers resupinate, greenish yellow; pedicel 4–6 mm, almost glabrous; ovary 3–4.5 mm, glabrous; sepals and petals not spreading widely. Dorsal sepal narrowly elliptic or nearly oblong, 3–4 × 1–1.5 mm, 1-veined, apex obtuse; lateral sepals narrowly elliptic, falcate, 3–4 × 1.2–1.5 mm, apex acute or obtuse. Petals linear, 3–4 × 0.5–1 mm, apex subacute; lip pendulous, variable in shape, obovate-cuneate, oblong-cuneate, sub-linear-cuneate, or oblanceolate, 7–13 × 3–5(–7) mm, apex deeply 2-lobed; lobes parallel or occasionally divergent, oblong-ovate, 2–5 × 1–2 mm, margins slightly papillate, apices obtuse-rounded; sinus sometimes with a short tooth between lobes; disk with a longitudinal channel extending from base of lip almost to sinus. Column slightly arcuate above middle, 2–2.5 mm; anther inclined toward rostellum; rostellum large, ca. as long as anther. Fl. Jun–Jul. *2n* = 40.

Dense forests, *Picea* and *Abies* forests; 2200–3600 m. N Fujian, S and SE Xizang, W Yunnan [Bhutan, NE India, Nepal].

25. *Neottia wardii* (Rolfe) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 119. 1995.

大花对叶兰 da hua dui ye lan

Listera wardii Rolfe, *Notes Roy. Bot. Gard. Edinburgh* 8: 127. 1913; *L. grandiflora* Rolfe; *Neottia grandiflora* (Rolfe) Szlachetko (1995), not Hooker (1830), nor (A. Richard) Kuntze (1891), nor Schlechter (1912).

Plants autotrophic, 15–25 cm tall. Rhizome with a few elongate, filiform roots. Stem cylindrical, slender, with 1 membranous sheath toward base. Leaves 2, opposite, borne above middle of plant, sessile, green, broadly ovate or ovate-cordate, 2.5–4 × 2.5–4.2 cm, base broadly cuneate or shallowly cordate, margin slightly crisped or sometimes irregularly denticulate, apex subacute or mucronate. Peduncle 3.5–5 cm, pubescent, with 1 or 2 sterile, ovate bracts to ca. 8 mm; rachis 3–7 cm, pubescent, laxly 2–7-flowered; floral bracts ovate-lanceolate, 5–7 mm, apex acute to acuminate. Flowers rather large, resupinate, green or greenish yellow, lip with a thin white margin; pedicel 5–6 mm, almost glabrous; ovary narrowly conic, ca. 6 mm, glabrous; sepals and petals spreading widely. Dorsal sepal rhombic-elliptic or elliptic, 6–7 × ca. 2.2 mm, 1-veined, apex subacute; lateral sepals elliptic-lanceolate, oblique, 6–7 × ca. 2 mm, apex acute. Petals linear, 6–7 × ca. 1 mm, apex acuminate; lip spreading forward, obovate-cuneate, 16–19 × 7–13 mm, much narrower at base, apex deeply 2-lobed; lobes divergent or sometimes almost parallel, subovate, 5–6 × 4–6 mm, margins minutely papillose-ciliate, apices obtuse-rounded; disk with 2 longitudinal lamellae connected to base of column, midvein slightly thickened. Column arcuate above middle, ca. 7 mm; anther inclined toward rostellum; rostellum large, nearly as long as anther. Fl. Jun–Jul.

• Damp places in scrub and coniferous forests; 2300–3500 m. W Hubei, N and W Sichuan, SE Xizang, NW Yunnan.

26. *Neottia oblata* (S. C. Chen) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 118. 1995.

圆唇对叶兰 yuan chun dui ye lan

Listera oblata S. C. Chen, *Kew Bull.* 35: 759. 1981.

Plants autotrophic, ca. 23 cm tall. Rhizome with several clustered roots. Stem with 1 sheath toward base. Leaves 2, opposite, borne at ca. middle of plant, subcordate, ca. 2.8 × 3–3.5 cm, base slightly cordate, apex subacute; bractlike leaflets ovate-lanceolate, 5–6 mm, turning into floral bracts farther up stem. Peduncle pubescent, with 3 sterile bracts 5–6 mm; rachis ca. 6.5 cm, pubescent, laxly 7-flowered; floral bracts ovate-lanceolate, ca. 5 mm. Flowers large, resupinate; pedicel ca. 4 mm, pubescent; ovary clavate, ca. 4 mm, almost glabrous; sepals and petals spreading widely. Dorsal sepal narrowly elliptic, ca. 5 × 2 mm, 1-veined, apex obtuse; lateral sepals elliptic-lanceolate, oblique, ca. 6.5 × 2.5 mm, apex subacuminate. Petals linear, nearly as long as lateral sepals, ca. 0.7 mm wide; lip suborbicular or oblate, ca. 13 × 12 mm, base abruptly contracted into a

claw ca. 2 × 1.5 mm, margin minutely papillose-ciliate, apex deeply 2-lobed; lobes parallel but somewhat overlapping toward apex, broadly ovate, ca. 4.5 × 6 mm, apices rounded; disk with midvein thickened and deep brown. Column slightly arcuate, ca. 5.5 mm; rostellum protruding, large. Fl. unknown.

• Chongqing.

27. *Neottia karoana* Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 117. 1995.

卡氏对叶兰 ka shi dui ye lan

Listera micrantha Lindley, *J. Proc. Linn. Soc., Bot.* 1: 176. 1857; *Diphryllum micranthum* (Lindley) Kuntze.

Plants autotrophic, 6–13 cm tall. Stem with 1 oblong sheath toward base. Leaves 2, opposite, borne below middle of plant, sessile, cuneate or ovate, 0.5–1.1 × 0.4–0.9 cm, apex obtuse to subacute. Peduncle 5–10 cm, minutely pubescent; rachis 3–5 cm, pubescent, laxly 4–10-flowered; floral bracts narrowly ovate, concave, ca. 1 mm, apex acute. Flowers resupinate, pale green; pedicel and ovary 2–5 mm, glabrous. Sepals and petals subequal, elliptic, 2–3.3 × 1–1.5 mm, apex subacute, 1-veined; lip deflexed, rectangular, 2–2.5 × 0.5–1.7 mm, 3-veined, with a pair of suborbicular auricles near base, apex 3-lobed; lobes triangular, middle lobe exceeding lateral lobes. Column erect, 0.8–1 mm; anther inclined toward rostellum; rostellum short. Fl. Sep.

Forests; 2800–3100 m. W Yunnan [NE India (Sikkim)].

28. *Neottia divaricata* (Panigrahi & P. Taylor) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 117. 1995.

叉唇对叶兰 cha chun dui ye lan

Listera divaricata Panigrahi & P. Taylor, *Kew Bull.* 30: 559. 1975.

Plants autotrophic, 15–24 cm tall. Stem slender, with 2 or 3 tubular sheaths near base. Leaves 2, opposite, borne at ca. middle of plant, sessile, broadly ovate-cordate, 2–3 × 1.7–3.1 cm, base shallowly cordate to subtruncate, apex subacute. Peduncle 3–8 cm, pubescent, with 2–5 sterile bracts 4–5 mm; rachis 3–7 cm, pubescent, densely 8–14-flowered; floral bracts linear-lanceolate, 6–8 mm, 1-veined, apex acute. Flowers erect, resupinate, pale yellow or pale green; pedicel 2.5–4 mm, slender, glabrous; ovary fusiform, 1.8–3 mm, glabrous; sepals and petals spreading. Dorsal sepal oblong-lanceolate, ca. 2.2 × 0.9 mm, 1-veined, apex obtuse; lateral sepals oblong-lanceolate, oblique, ca. 3.5 × 1.5 mm, apex acute. Petals slightly incurved, linear-lanceolate, ca. 2.8 × 1 mm, 1-veined, apex obtuse; lip erect or spreading forward, obovate-flabellate, 3–4 × ca. 8 mm, with a pair of triangular auricles near base, apex deeply 2-lobed; lobes diverging widely, oblong or oblong-lanceolate, ca. 5 × 2 mm, 3- or 4-veined, apices obtuse; sinus with a tooth between lobes. Column suberect, 1.5–2 mm; anther inclined toward rostellum; rostellum ascending, ovate, slightly shorter than anther. Fl. Jul–Aug.

Tsuga forests; 3000–3500 m. SE Xizang [NE India].

29. *Neottia brevicaulis* (King & Pantling) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 117. 1995.

短茎对叶兰 *duan jing dui ye lan*

Listera brevicaulis King & Pantling, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 65: 126. 1896.

Plants autotrophic, 20–30 cm tall. Rhizome with filiform roots. Stem short, with 1 or 2 membranous sheaths. Leaves 2, opposite, borne below middle of plant and almost prostrate on ground, sessile, cordate to suborbicular, 0.5–1.5 × 0.5–1.5 cm, apex acute. Peduncle 6–8 cm, pubescent, with 1 or 2 sterile bracts; rachis 1–7 cm, subdensely 3–8-flowered, pubescent; floral bracts rhombic. Flowers resupinate, secund, uniformly green; pedicel and ovary 4–8 mm. Dorsal sepal elliptic, ca. 4 × 1 mm; lateral sepals ovate, oblique, ca. 4 × 1.2 mm, apex acuminate. Petals narrowly elliptic, ca. 3.5 × 1 mm; lip spreading forward, cuneate, ca. 6 × 4 mm, with a pair of triangular auricles near base, apex deeply bilobed; lobes strongly recurved and meeting underneath lip, ca. 2 × 1.3 mm. Column ca. 1.5 mm. Fl. Aug.

Dense bamboo forests, grasslands; ca. 3300 m. NW Yunnan [NE India (Sikkim)].

30. *Neottia tianschanica* (Grubov) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 119. 1995.

天山对叶兰 *tian shan dui ye lan*

Listera tianschanica Grubov, *Rast. Tsentral. Azii, Mater. Bot. Inst. Komarova* 7: 106. 1977.

Plants autotrophic, 3–4 cm tall. Rhizome with a few elongate roots. Stem slender, with 2 or 3 tubular sheaths at base. Leaves 2, opposite, borne at ca. middle of plant, broadly ovate to ovate, 0.9–1.5 × 0.8–1.4 cm, base broadly cuneate to subtruncate, apex subrounded to obtuse-acute. Peduncle pubescent; rachis 1.9–2.2 cm, pubescent, 2- or 3-flowered; floral bracts lanceolate, 1.5–3 mm, almost glabrous, acuminate. Flowers resupinate, green, lip tinged whitish green along apical margins; pedicel and ovary 2–3 mm, puberulent on ribs. Dorsal sepal narrowly elliptic-ovate, 2–2.5 × 1–1.1 mm, 1-veined, apex obtuse; lateral sepals narrowly ovate, oblique, 2.5–3 × 1–1.2 mm, 1-veined. Petals suboblong, 2.5–3 × 0.5–0.6 mm, apex obtuse; lip spatulate, 3.5–4.5 × 2–2.5 mm, with a pair of small auricles at base, apex shallowly 2-lobed; lobes diverging at an acute angle, suborbicular or broadly ovate, ca. 0.5 mm; disk with a fleshy callus near base. Column less than 1 mm; rostellum small. Fl. Jun.

• Open wet places in *Picea* forests; 2100–2200 m. C Xinjiang (N Tian Shan, Ürümqi).

31. *Neottia fangii* (Tang & F. T. Wang ex S. C. Chen & G. H. Zhu) S. C. Chen, S. W. Gale & P. J. Cribb, **comb. nov.**

扇唇对叶兰 *shan chun dui ye lan*

Basionym: *Listera fangii* Tang & F. T. Wang ex S. C. Chen & G. H. Zhu, *Novon* 12: 438. 2002.

Plants autotrophic, to 29 cm tall. Rhizome with a few elongate, filiform roots. Stem ca. 10.5 cm, slender, with 1 tubular sheath more than 2 cm toward base. Leaves 2, opposite, borne below middle of plant, subsessile, ovate-orbicular, 2.4–2.8 × 2.8–3 cm, adaxially minutely puberulent, base cuneate-subcordate, apex acute-rounded. Peduncle ca. 15 cm, pubes-

cent; rachis ca. 4.5 cm, pubescent, 11-flowered; floral bracts subovate-oblong, 1.5–2.5 × ca. 0.8 mm, sparsely pubescent on both surfaces. Flowers erect or spreading, resupinate; pedicel 3.5–4.5 mm, pubescent; ovary ca. 2 mm, sparsely pubescent or glabrescent; sepals and petals spreading. Sepals ovate-oblong, ca. 2 × 0.8 mm, 1-veined, apex obtuse; lateral sepals slightly oblique. Petals similar to dorsal sepal but slightly narrower; lip spreading forward to suberect, spatulate-obovate, ca. 5 × 3 mm, contracted below middle into a claw, dilated apical portion fan-shaped, ca. 2 × 3 mm, apex deeply 2-lobed; lobes diverging at an acute angle, subquadrate, ca. 2 mm, apices truncate; sinus with a small tooth between lobes; claw ca. 2.8 × 0.8 mm, with a pair of broadly ovate-deltoid auricles ca. 0.8 mm at base. Column ca. 2 mm. Fl. Jul.

• Forests; 800–1000 m. NW Sichuan.

32. *Neottia pseudonipponica* (Fukuyama) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 118. 1995.

耳唇对叶兰 *er chun dui ye lan*

Listera pseudonipponica Fukuyama, *Bot. Mag. (Tokyo)* 49: 665. 1935.

Plants autotrophic, ca. 20 cm tall. Stem slender, with tubular sheaths at base. Leaves 2, opposite, borne at ca. middle of plant, ovate-suborbicular or nearly reniform-suborbicular, 2–2.5 × 3–3.5 cm, base subcordate, apex rounded and with caudate tip. Peduncle ca. 6 cm, pubescent; rachis 3–4 cm, pubescent, laxly 6–8-flowered; floral bracts ovate-lanceolate, 1–3 mm, apex subacute. Flowers spreading, resupinate; pedicel and ovary 6–8 mm, glabrous. Dorsal sepal linear-oblong, 3.2–3.5 × 0.7–1 mm, 1-veined, base narrowed, apex slightly obtuse; lateral sepals linear-oblong, 3.5–3.7 × ca. 0.7 mm, 1-veined, apex slightly obtuse. Petals linear-oblong, 3.5–3.7 × 0.8–1 mm, 1-veined, apex obtuse; lip subobovate or obtriangular, 5–6 mm, narrowly clawed at base, dilated apical portion obcordate, apex deeply 2-lobed; lobes diverging at an acute angle, oblong, oblique, ca. 2.5 × 4 mm, margins entire or minutely denticulate; sinus with a tooth between lobes; claw with a pair of oblan-ceolate auricles ca. 1.7 mm at base. Column erect, ca. 2.5 mm; anther ca. 0.7 mm; rostellum broadly ovate. Fl. unknown.

• Forests. C Taiwan.

33. *Neottia nanchuanica* (S. C. Chen) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 118. 1995.

南川对叶兰 *nan chuan dui ye lan*

Listera nanchuanica S. C. Chen, *Kew Bull.* 35: 761. 1981.

Plants autotrophic, 25–30 cm tall. Rhizome with a few elongate, filiform roots. Stem slender, with 1 or 2 sheaths near base. Leaves 2, opposite, borne below middle of plant, subsessile, broadly ovate or broadly ovate-cordate, 3.2–6 × 3–6 cm, base broadly cuneate or nearly shallowly cordate, apex obtuse or acute. Peduncle 6–10 cm, pubescent, with 3 sterile bracts 4–6 mm; rachis 8–13 cm, pubescent, laxly 10–19-flowered; floral bracts ovate-lanceolate, 3.5–4.5 mm, apex acuminate. Flowers spreading horizontally, resupinate, pale green; pedicel 5–9 mm, pubescent; ovary narrowly elliptic, 2.5–4 mm, glabrous; sepals and petals reflexed. Dorsal sepal oblong or narrowly elliptic,

2.8–3 × ca. 1 mm, 1-veined, apex obtuse; lateral sepals ovate-oblong, oblique, ca. 3 × 1.5 mm. Petals sublinear or narrowly oblong, ca. 2.6 × 0.8 mm, 1-veined; lip subobovate, 7–9 × 3.5–6.5 mm, narrowing at base into a claw, apex deeply 2-lobed; lobes parallel or slightly incurved and overlapping toward apex, subobovate-oblong, 2.5–3 × 1.5–2.2 mm, margins ciliate, apices obtuse; sinus with a short tooth between lobes; claw 0.7–1.3 mm wide, with a pair of subovate or subsquare auricles ca. 0.5 mm near base. Column suberect, ca. 2 mm; anther inclined toward rostellum; rostellum broadly ovate, large, nearly as long as anther but wider. Fl. Jul.

- Forests or forest margins; 2000–2100 m. Chongqing.

34. *Neottia yunnanensis* (S. C. Chen) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 119. 1995.

云南对叶兰 yun nan dui ye lan

Listera yunnanensis S. C. Chen, *Kew Bull.* 35: 759. 1981.

Plants autotrophic, 37–47.5 cm tall. Rhizome with a few roots. Stem with 1 tubular sheath at base. Leaves 2, opposite, borne below middle of plant, sessile, ovate, 5.5–6 × 4.4–5 cm, base slightly cordate, apex acute or mucronate. Peduncle pubescent, with 1 sterile bract 3–8 mm; rachis 14–16 cm, pubescent, laxly 24–35-flowered; floral bracts lanceolate, nearly as long as pedicel. Flowers resupinate, green; pedicel ca. 4 mm, sparsely pubescent; ovary fusiform, ca. 3 mm, glabrous; sepals and petals spreading. Dorsal sepal narrowly ovate-elliptic, 2.5–3 × ca. 1 mm, 1-veined, apex obtuse; lateral sepals ovate, oblique, 2.5–3 × ca. 1.3 mm, 1-veined. Petals suboblong, 2.5–2.8 × 0.5–0.6 mm, apex rounded; lip narrowly obovate-cuneate, 6–7 × 2.5–5 mm, with a pair of auricles near base, apex deeply 2-lobed; lobes diverging at an acute angle, narrowly lanceolate, 3–4 mm, margins minutely ciliate, apices acuminate; disk with a pair of somewhat fleshy calli at base and a pair of swollen, suborbicular lamellae midway along length of lip; auricles ovate-oblong, ca. 1.3 × 0.6 mm. Column ca. 1 mm; rostellum ovate, slightly shorter than anther. Fl. Aug.

- Mixed forests; ca. 2300 m. SE Yunnan.

35. *Neottia japonica* (Blume) Szlachetko, *Fragm. Florist. Geobot.*, Suppl. 3: 117. 1995.

日本对叶兰 ri ben dui ye lan

Listera japonica Blume, *Coll. Orchid.* 115. 1859; *Diphryllum japonicum* (Blume) Kuntze; *L. shaoi* S. S. Ying; *L. shikokiana* Makino; *Neottia shaoi* (S. S. Ying) Szlachetko; *Ophrys japonica* (Blume) Makino; *O. shikokiana* (Makino) Makino.

Plants autotrophic, 10–18 cm tall. Rhizome with very few elongate, filiform roots. Stem 6–8 cm tall, slender, ridged, with 1 or 2 tubular sheaths at base, purple or pale green. Leaves 2, opposite, borne slightly below middle of plant, sessile, ovate-triangular, 1–1.8 × 1–1.6 cm, base cordate or truncate, apex acute. Peduncle 3–5 cm, pubescent; rachis 3–5 cm, pubescent, laxly 3–8-flowered; floral bracts broadly ovate, very small, 1–2 mm, acute. Flowers resupinate, purplish green, lip deep purple; pedicel elongate, 9–12 mm, slender, glabrous or slightly pubescent toward base; ovary 1–3 mm, glabrous; sepals and petals reflexed. Dorsal sepal obovate-elliptic, 1.8–2.5 × 0.8–1 mm,

apex acute or obtuse; lateral sepals ovate, oblique, 2–2.5 × 0.7–1.1 mm, apex obtuse. Petals lanceolate or lanceolate-linear, 1.8–2.5 × ca. 0.5 mm, apex obtuse; lip narrowly cuneate, ca. 6 mm, with a pair of auricles at base, apex deeply 2-lobed; lobes diverging at an acute angle, linear, ca. 4 mm, apex obtuse or acute; sinus with a triangular tooth between lobes; auricles

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strongly incurved, embracing column and overlapping one another above column, slender. Column less than 1 mm. Fl. May–Jul.

Forests; 1400–3000 m. C and N Taiwan [S Japan (Ryukyu Islands)].

