

16. ZEUXINE Lindley, *Orchid. Scelet.* 9. 1826 [“*Zeuxina*”], nom. cons.

线柱兰属 xian zhu lan shu

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Haplochilus Endlicher; *Heterozeuxine* T. Hashimoto; *Monochilus* Wallich ex Lindley; *Psychechilos* Breda; *Strateuma* Rafinesque; *Tripleura* Lindley.

Herbs, terrestrial or rarely lithophytic. Rhizome usually elongate, creeping, fleshy, several noded; roots emerging from rhizome nodes, cylindrical, stout. Stem erect or ascending, terete, leafy, glabrous. Leaves cauline or subrosulate, withered or pendulous at anthesis in some species, adaxially green to blackish, sometimes with a white stripe along midvein, linear-lanceolate, obliquely ovate-lanceolate, or elliptic, with or without a petiole-like base sheathing stem, sometimes slightly fleshy. Inflorescence glabrous or pubescent, with a few crowded to scattered sheathing bracts and a few to many flowers in a short to elongate terminal raceme; floral bracts usually equal in length to pedicel and ovary. Flowers resupinate or occasionally erect, small, not opening widely; ovary twisted, glabrous or pubescent. Sepals free, similar, outer surface glabrous to pubescent; dorsal sepal concave, forming a hood with petals; lateral sepals enclosing base of lip. Petals connivent with dorsal sepal, nearly as long as dorsal sepal though usually narrower; lip usually adnate to column margin at base, 2- or 3-partite or rarely entire; hypochile concave-saccate to cymbiform, containing 1 to a few scalelike, subulate or lamellate calli on each side at base; mesochile (when present) short, margin often involute and forming a tube, externally glabrous or pubescent and sometimes with a lamellate flange on each side; epichile dilated, entire to 2-lobed. Column short, dilated, with or without a pair of lateral wings; anther ovoid, 2-locular; pollinia 2, each longitudinally parted, granular-farinaceous, sectile, attached either directly to viscidium or via a short tegula; viscidium ligulate-lanceolate to ovate; rostellum conspicuous, erect, bifid; stigma lobes separate, convex, lateral or at apical corners of column. Capsule erect.

About 80 species: tropical and S Africa, through tropical and subtropical Asia, to New Guinea, NE Australia, and the SW Pacific islands; 14 species (two endemic) in China; two additional species (both endemic) are incompletely known.

This is a taxonomically complex group and further analysis of collections from throughout Asia is necessary before nomenclatural stability can be achieved.

- 1a. Leaves linear to linear-lanceolate, not stalked, base directly sheathing stem.
 - 2a. Plants 4–24 cm tall; ovary and sepals glabrous 1. *Z. strateumatika*
 - 2b. Plants 20–35 cm tall; ovary and sepals pubescent 2. *Z. membranacea*
- 1b. Leaves ovate-lanceolate to elliptic, base contracted into a petiole-like stalk sheathing stem.
 - 3a. Lip entire, rhombic, not adnate to column, base contracted and lacking calli 3. *Z. integrilabella*
 - 3b. Lip 2- or 3-partite, base adnate to column, hypochile concave and containing 2 or more subulate, lamellate, or 2- or 3-digitate calli near base.
 - 4a. Epichile of lip transversely dilated but as broad as or narrower than hypochile, entire to shallowly 2-lobed.
 - 5a. Ovary sparsely hairy; sepals hairy abaxially 5. *Z. philippinensis*
 - 5b. Ovary glabrous; sepals glabrous.
 - 6a. Leaves with a white line along midvein; inflorescence subdensely flowered; lip with a much-reduced mesochile; mesochile margin membranous, glabrous 4. *Z. goodyeroides*
 - 6b. Leaves lacking a white line along midvein; inflorescence laxly flowered; lip lacking a mesochile, apical margin of hypochile fleshy, papillose 6. *Z. agyokuana*
 - 4b. Epichile of lip dilated, broader than hypochile, distinctly 2-lobed.
 - 7a. Plants robust, 30–50 cm tall; leaves 5–12 × 3–7 cm; lateral sepals 8–9 mm 7. *Z. odorata*
 - 7b. Plants slender to somewhat stout, to 35 cm tall; leaves 2–6 × 1–3 cm; lateral sepals 3–7.5 mm.
 - 8a. Midvein of leaves marked with silvery blotches or a white line (also on lateral veins in *Z. gengmanensis*); leaves not usually withering at anthesis.
 - 9a. Stem stout, ca. 5 mm in diam.; lateral veins of leaves marked with white lines; flowers pink; hypochile containing 2 short, rounded calli 8. *Z. gengmanensis*
 - 9b. Stem slender, 1–2 mm in diam.; lateral veins of leaves without white lines; flowers white or pale yellow; hypochile containing 2 2- or 3-digitate to narrowly lamellate calli 9. *Z. nervosa*
 - 8b. Leaves uniformly green or occasionally tinged with red, withering and pendulous at anthesis.
 - 10a. Lip T-shaped; epichile lobes diverging at right angles to axis of lip.
 - 11a. Lip white 10. *Z. parvifolia*
 - 11b. Lip saffron 11. *Z. flava*
 - 10b. Lip Y-shaped; epichile lobes diverging at acute angles to axis of lip; epichile not mucronate at apex.
 - 12a. Lip 7–9 mm; hypochile containing 2 lamellate calli, each often with a linear extension; epichile lobes 3–5.5 mm; column wings lacking 12. *Z. grandis*
 - 12b. Lip to 6 mm; hypochile containing 2 subulate, hooked calli; epichile lobes 2–3 mm; column with triangular or transversely oblong wings.

- 13a. Lip straight, or epichile rotated gently downward; epichile lobes obovate-flabellate, 2–2.5 × 2–2.2 mm 13. *Z. affinis*
 13b. Epichile reflexed sharply downward from apex of mesochile; epichile lobes oblong to irregularly rhombic, 2.5–3 × 1.2–1.8 mm 14. *Z. reflexa*

1. *Zeuxine strateumatica* (Linnaeus) Schlechter, Bot. Jahrb. Syst. 45: 394. 1911.

线柱兰 xian zhu lan

Orchis strateumatica Linnaeus, Sp. Pl. 2: 943. 1753; *Adenostylis emarginata* Blume; *A. integerrima* Blume; *A. strateumatica* (Linnaeus) Ames; *A. sulcata* (Roxburgh) Hayata; *Neottia strateumatica* (Linnaeus) R. Brown; *Pterygodium sulcatum* Roxburgh; *Spiranthes strateumatica* (Linnaeus) Lindley; *Tripleura pallida* Lindley; *Zeuxine bonii* Gagnepain; *Z. bracteata* Wight; *Z. brevifolia* Wight; *Z. emarginata* (Blume) Lindley; *Z. integerrima* (Blume) Lindley; *Z. procumbens* Blume; *Z. robusta* Wight; *Z. rupicola* Fukuyama; *Z. stenochila* Schlechter; *Z. strateumatica* f. *rupicola* (Fukuyama) T. Hashimoto; *Z. strateumatica* var. *rupicola* (Fukuyama) S. S. Ying; *Z. sulcata* (Roxburgh) Lindley; *Z. tripleura* Lindley; *Z. wariana* Schlechter.

Plants 4–24 cm tall, slender. Rhizome short. Stem erect or ascending, pale brown, with several to many leaves. Leaves cauline, usually clustered and overlapping, pale brown, linear to linear-lanceolate, sometimes bractlike, 2–8 × 0.2–0.6 cm, base directly sheathing stem, not stalked, apex acuminate. Inflorescence 2–7 cm, glabrous, with a few to more than 20 densely arranged flowers; floral bracts reddish brown, ovate-lanceolate, 8–12 mm, longer than flower, glabrous, apex long acuminate. Flowers resupinate, white or yellowish white, small; ovary and pedicel elliptic-cylindric, 5–6 mm, glabrous. Sepals glabrous; dorsal sepal narrowly ovate-oblong, concave, 4–6 × 2–3 mm, 1-veined, apex obtuse; lateral sepals obliquely oblong, 4–5.5 × 1.5–2.5 mm, 1-veined, apex acute or obtuse. Petals subovate to obovate, oblique, 4–5.5 × 1.5–1.8 mm, glabrous, 1-veined, apex obtuse; lip pale yellow to yellow, cymbiform, 4–5 mm, 3-partite; hypochile concave-saccate, containing 2 subtriangular, lamellate calli; mesochile ca. 1 mm, exterior surfaces minutely papillate toward apex, margin denticulate, involute; epichile transversely elliptic-oblong, 1.4–1.8 × 2–2.5 mm, minutely papillate, apex with a small mucro to slightly emarginate. Column ca. 1.5 mm; wings longitudinally oblong; rostellum arms ca. 0.6 mm. Capsule pale brown, elliptic, ca. 6 mm. Fl. Mar–Jul. $2n = 20, 22, 40, 42, 50, 100$.

Damp grasslands, meadows, valleys, along streams; below 1000 m. Fujian, Guangdong, Guangxi, Hainan, Hubei, Sichuan, Taiwan, Yunnan [Afghanistan, Bhutan, Cambodia, India, Japan, Kashmir, Laos, Malaysia, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; SW Asia, Pacific islands].

This is a weed in Saudi Arabia and the United States (Florida, Hawaii).

2. *Zeuxine membranacea* Lindley, Gen. Sp. Orchid. Pl. 486. 1840.

膜质线柱兰 mo zhi xian zhu lan

Zeuxine debrajiana Sud. Chowdhury; *Z. evrardii* Gagnepain; *Z. godefroyi* H. G. Reichenbach.

Plants 20–35 cm tall, slender. Rhizome short. Stem erect or ascending, pale brown, with several to many leaves. Leaves cauline, usually spaced along stem, pale brown, linear, 4–6 × 0.2–0.6 cm, base directly sheathing stem, not stalked, apex acuminate. Inflorescence 4–11 cm, often puberulent above, with many densely arranged flowers; floral bracts lanceolate, 5–10 mm, lower ones exceeding flower, abaxially pubescent, apex acuminate. Flowers resupinate, white, small; ovary and pedicel elliptic-fusiform, 5–7 mm, pubescent. Sepals puberulent on outer surface; dorsal sepal oblong-lanceolate, concave, ca. 6 × 3 mm, 1-veined, apex acute; lateral sepals oblong, ca. 5.5 × 2.5 mm, apex acute. Petals oblong-ovate, 4–5 × ca. 2.2 mm, glabrous, 1-veined, apex acute; lip white, cymbiform, 4–5 mm, 3-partite; hypochile concave-saccate, containing 2 calli; mesochile short; epichile transversely oblong, ca. 1.2 × 2.5 mm, apex with a small mucro. Column ca. 2 mm. Capsule pale brown, elliptic, ca. 7 mm. Fl. Nov–Jan.

Damp grasslands, meadows, valleys, along streams. Hong Kong [Bhutan, Cambodia, NE India, Myanmar, Thailand, Vietnam].

3. *Zeuxine integrilabella* C. S. Leou, Quart. J. Exp. Forest. Natl. Taiwan Univ. 8(4): 2. 1994.

全唇线柱兰 quan chun xian zhu lan

Hetaeria integrilabella (C. S. Leou) S. S. Ying.

Plants ca. 27 cm tall, slender. Rhizome usually short. Stem erect or ascending, pale reddish brown, 8–18 × 0.3–0.5 cm, 4- or 5-leaved. Leaves subrosulate, abaxially pale red, adaxially green with a silver-white stripe along midvein, oblong to ovate-elliptic, 2–7 × 1.5–3.5 cm, base obtuse or rounded, apex acute; petiole-like base pale purple, 0.5–1.7 cm including tubular sheath. Inflorescence to 15 cm, with 2 or 3 sterile bracts, tomentose, pale purple; rachis 8–14-flowered; floral bracts ovate, shorter than ovary, margin usually ciliate toward apex. Flowers resupinate; ovary and pedicel subcylindric, 7–8 mm, glabrous. Sepals pale brown, unequal in size, concave, glabrous; dorsal sepal elliptic, ca. 5.5 mm; lateral sepals oblong, ca. 5 mm. Petals white, falcate, 1-veined; lip rhombic, ca. 6 × 4 mm, entire, base contracted, not connate with column, lacking calli. Column 2.5–2.8 mm; wings low, triangular; anther ca. 2.2 mm; pollinia ca. 1.3 mm; rostellum arms ca. 1.2 mm. Fl. Apr.

- Broad-leaved forests; 1000–1800 m. C Taiwan.

The shape of the lip indicates that this taxon is a peloric mutant, with the presence of a silver-white stripe on the leaves and the low column wings suggesting an alliance to *Zeuxine goodyeroides*. More material is required on which to base a critical comparison.

4. *Zeuxine goodyeroides* Lindley, Gen. Sp. Orchid. Pl. 486. 1840.

白肋线柱兰 bai lei xian zhu lan

Monochilus galeatus Lindley; *M. goodyeroides* (Lindley) Lindley.

Plants 17–30 cm tall, slender to somewhat stout. Rhizome elongate. Stem erect, 4–6-leaved. Leaves cauline, adaxially green, with a white line along midvein, ovate to oblong-ovate, 3–5.5 × 1.8–2.5 cm, base obtuse, apex acute; petiole-like base 1–2 cm including tubular sheath. Inflorescence 9–18 cm, with 1 or 2 widely spaced sterile bracts, puberulent; rachis 2.5–5 cm, with several to more than 10 subdensely arranged flowers; floral bracts pink, ovate, nearly as long as ovary, abaxially glabrous, apex acuminate. Flowers resupinate, white or pink, small; ovary and pedicel fusiform, 9–10 mm, glabrous. Sepals glabrous, 1-veined; dorsal sepal ovate, concave, ca. 5 × 2.5 mm, apex acute; lateral sepals spreading, narrowly oblong-lanceolate, ca. 4.5 × 1–1.4 mm. Petals white, falcate, ca. 4.5 × 1.5 mm, 1-veined, apex subacute; lip white, cymbiform, ca. 4.5 mm, obscurely 3-partite; hypochile dilated, saccate, ca. 2.5 × 2 mm, containing 2 subulate, hooked calli; mesochile short, ca. 0.5 mm, glabrous, margin involute; epichile transversely dilated but narrower than hypochile, suborbicular or subreniform, ca. 1 × 1.8 mm, membranous, entire to shallowly 2-lobed at apex. Column 2–2.4 mm; wings low, transversely oblong; rostellum arms ca. 0.8 mm. Fl. Sep–Oct.

Forests, valleys, crevices on limestone; 1200–2500 m. W Guangxi, SE Yunnan [Bhutan, NE India, Myanmar, Nepal, Vietnam].

5. *Zeuxine philippinensis* (Ames) Ames, *Schedul. Orchid. Corrig.* xxxvii. 1938.

菲律宾线柱兰 *fei lü bin xian zhu lan*

Adenostylis philippinensis Ames, *Schedul. Orchid.* 6: 9. 1923.

Plants slender, ca. 10 cm tall. Rhizome elongate. Stem ascending, pale red-brown, 2–4-leaved. Leaves adaxially green, midrib white with dark green reticulation, triangular-lanceolate, 3.2–6 × 1.4–2.3 cm, 5-veined, apex acuminate; petiole ca. 1.5 cm. Inflorescence ca. 17 cm, hairy, with 5 sterile bracts; rachis ca. 8 cm, 13-flowered; floral bracts hairy. Flowers half opening, resupinate; ovary sparsely hairy. Sepals hairy abaxially; dorsal sepal concave, light brown, ovate, ca. 5 mm; lateral sepals dark green, ovate-lanceolate, ca. 4 mm. Petals white, falcate, ca. 4.5 mm; lip white, ca. 4 mm, obscurely 3-partite; hypochile ventricose-saccate, ca. 1.7 mm wide, inside containing 2 digitate calli; mesochile short; epichile dilated, reflexed, transverse-oblong or subreniform, ca. 1.7 mm wide, nearly entire at apex. Column ca. 2.2 mm. Fl. Feb–Mar.

Forests; ca. 200 m. S Taiwan [Philippines].

6. *Zeuxine agyokuana* Fukuyama, *Bot. Mag. (Tokyo)* 48: 433. 1934.

绿叶线柱兰 *lü ye xian zhu lan*

Hetaeria agyokuana (Fukuyama) Nackejima; *H. cristata* Blume var. *agyokuana* (Fukuyama) S. S. Ying.

Plants 10–25 cm tall, slender. Rhizome short. Stem ascending, purplish green, 4- or 5-leaved. Leaves usually clustered at stem apex, abaxially pale green, adaxially deep green, ovate-elliptic, 3–4.5 × 1.5–2 cm, margin undulate, apex acute; petiole-like base 0.8–1.2 cm including tubular sheath. Inflorescence 5–15 cm, with 2 or 3 sterile bracts, reddish brown,

puberulent; rachis 2–6 cm, laxly 3–10-flowered; floral bracts ovate-lanceolate, 6–8 mm, apex acuminate. Flowers resupinate, small; ovary and pedicel reddish, fusiform, 8–10 mm, glabrous. Sepals reddish brown, glabrous; dorsal sepal ovate, concave, 4–5 × 2.8–3 mm, apex acute to obtuse; lateral sepals widely spreading, lanceolate to narrowly ovate, 4–5 × 1.5–1.6 mm, apex acute. Petals white, narrowly obovate, 4–5 × ca. 2.5 mm, apex acute; lip ovate-cymbiform, shorter than sepals, 3–4 × 1.7–2 mm, 2-partite; hypochile concave-saccate, containing 2 subulate, occasionally divided, hooked calli, apical margin of hypochile slightly involute, thickened and distinctly fleshy, outer surface papillose; epichile much reduced, narrower than hypochile, reniform to ovate, 1–1.5 × ca. 1 mm, apex obtuse. Column ca. 3 mm; wings much reduced and indistinct; anther ca. 1.7 mm; rostellum arms narrowly linear, 1.5–2 mm. Fl. Sep. $2n = 20$.

Shaded humid places in broad-leaved forests; ca. 900 m. N Taiwan [Japan].

7. *Zeuxine odorata* Fukuyama, *Bot. Mag. (Tokyo)* 50: 20. 1936.

香线柱兰 *xiang xian zhu lan*

Heterozeuxine odorata (Fukuyama) T. Hashimoto.

Plants robust, 30–50 cm tall. Rhizome elongate, ca. 5 mm in diam. Stem ascending, stout, 4–6-leaved. Leaves cauline, widely spaced or sometimes clustered, not withering at anthesis, obliquely elliptic to ovate-elliptic, 5–12 × 3–7 cm, base rounded, apex acute; petiole-like base 1.5–3.5 cm including tubular sheath. Inflorescence 20–35 cm, with 3 or 4 sterile bracts, puberulent; rachis 5–8 cm, subdensely 10–15-flowered; floral bracts ovate-lanceolate, ca. 15 × 8 mm, pubescent on abaxial surface and margin, apex acuminate. Flowers fragrant, resupinate, half opening, relatively large; ovary and pedicel subcylindric, 8–10 mm, sparsely pubescent. Sepals whitish green, glabrous to puberulent; dorsal sepal ovate, concave, 6–8 × 4–5.5 mm, apex obtuse; lateral sepals obliquely ovate, 8–9 × 4–4.5 mm, apex obtuse to acute. Petals white, obliquely ovate, 7–8 × 3–4.5 mm, apex mucronate; lip white, Y-shaped, 9–9.5 mm, 3-partite; hypochile slightly dilated, saccate, ca. 4 × 3 mm, containing 2 to several lamellate calli; mesochile flat, ca. 1.5 × 1.5 mm, with 2 longitudinal keels; epichile dilated, ca. 3 × 7 mm, 2-lobed; lobes diverging at an acute angle, subsquare to suborbicular, ca. 2.8 × 2.8 mm, margin undulate, yellowish at base. Column 4–4.5 mm; wings quadrate; anther cordate, ca. 2.5 mm; rostellum arms ca. 2 mm. Fl. Apr. $2n = 20$.

Shaded humid places in forests; ca. 300 m. S Taiwan [Japan (Ryukyu Islands)].

8. *Zeuxine gengmanensis* (K. Y. Lang) Ormerod, *Lindleyana* 17: 238. 2002.

耿马齿唇兰 *geng ma chi chun lan*

Anoectochilus gengmanensis K. Y. Lang, *Acta Phytotax. Sin.* 34: 554. 1996.

Plants 18–22 cm tall, somewhat stout. Rhizome elongate. Stem ascending, stout, ca. 5 mm in diam., 5- or 6-leaved. Leaves cauline, not withering at anthesis, abaxially green, adax-

ially dark green, with white line along midvein and lateral veins, ovate to elliptic, 3–5.5 × 2–3 cm, base obliquely cuneate to obtuse, apex acute; petiole-like base 1.5–3 cm including tubular sheath. Inflorescence 8–12 cm, with 2 or 3 sterile bracts, pilose; rachis 5–6 cm, subdensely several to many flowered; floral bracts lanceolate to ovate-lanceolate, slightly shorter than ovary, abaxially puberulent, apex acuminate. Flowers resupinate, pink, small; ovary and pedicel cylindrical-fusiform, 10–12 mm, pubescent. Sepals pubescent; dorsal sepal ovate, concave, ca. 4 × 3 mm, 1-veined; lateral sepals widely spreading, ovate-elliptic, ca. 5.5 × 4 mm, 1-veined. Petals obliquely obovate, ca. 4.5 × 2.2 mm, 1-veined, apex obtuse; lip Y-shaped, ca. 6 mm, 3-partite; hypochile concave-saccate, containing 2 short, rounded calli; mesochile narrow, ca. 0.8 mm; epichile dilated, 2-lobed; lobes diverging at acute angle, quadrate, 2.5–3 × ca. 2 mm. Column ca. 2.8 mm; wings transversely oblong; anther triangular-ovoid, ca. 1.8 mm; rostellum arms ca. 0.5 mm. Fl. May.

- Shaded rocky slopes in forests; ca. 2500 m. SW Yunnan.

9. *Zeuxine nervosa* (Wallich ex Lindley) Trimen, J. Ceylon Branch Roy. Asiat. Soc. 9: 90. 1885.

芳香线柱兰 fang xiang xian zhu lan

Monochilus nervosus Wallich ex Lindley, Gen. Sp. Orchid. Pl. 487. 1840; *Adenostylis formosana* (Rolfe) Hayata; *A. zamboangensis* Ames; *Haplochilus nervosus* (Wallich ex Lindley) D. Dietrich; *Heterozeuxine nervosa* (Wallich ex Lindley) T. Hashimoto; *Zeuxine cognata* Ohwi & T. Koyama; *Z. fluvida* Fukuyama; *Z. formosana* Rolfe; *Z. hengchuanense* S. S. Ying; *Z. somae* Tuyama; *Z. vittata* Rolfe ex Downie; *Z. zamboangensis* (Ames) Ames.

Plants 20–35 cm tall, slender. Rhizome elongate. Stem erect, 1–2 mm in diam., 3–6-leaved. Leaves clustered at stem apex, not usually withering at anthesis, adaxially green, usually with silvery blotches or a white line along midvein, ovate to ovate-elliptic, 4–6 × 1.5–2.5 cm, apex acute; petiole-like base 1–1.5 cm including tubular sheath. Inflorescence 18–28 cm, with 2 or 3 widely spaced sterile bracts, sparsely villous; rachis 3–10 cm, with a few to more than 10 subdensely arranged flowers; floral bracts reddish brown, ovate-lanceolate, cymbiform, 6–10 × 3–4.5 mm, abaxially puberulent to glabrous, margin ciliate, apex acuminate. Flowers fragrant, resupinate, weakly spreading, small; ovary and pedicel fusiform, 8–9 mm, glabrous to puberulent. Sepals reddish brown to yellowish green, glabrous; dorsal sepal ovate, concave, 5–5.5 × 4.5–5 mm, apex acute or subacuminate; lateral sepals oblong-ovate, 6–6.5 × ca. 3.5 mm, apex acute to obtuse. Petals white, ovate, oblique, ca. 5.5 × 3.2 mm, glabrous, apex obtuse; lip white or pale yellow, Y-shaped, to 7 mm, 3-partite; hypochile concave-saccate, ca. 2.5 × 2.5 mm, containing 2 2- or 3-digitate to narrowly lamellate calli; mesochile relatively long and narrow, ca. 1.5 mm, margin incurved; epichile dilated, ca. 4 mm wide, 2-lobed; lobes diverging at an acute angle, suborbicular, ca. 2 × 2 mm. Column ca. 2.2 mm; wings prominent, broadly triangular; rostellum arms ca. 1.2 mm. Fl. Feb–Mar. $2n = 20$.

Damp places in forests; 200–1200 m. S Taiwan, S and SW Yunnan [Bangladesh, Bhutan, Cambodia, NE India, Japan (Ryukyu Islands), Laos, Nepal, Philippines, Sri Lanka, Thailand, Vietnam].

10. *Zeuxine parvifolia* (Ridley) Seidenfaden, Dansk Bot. Ark. 32(2): 82. 1978.

白花线柱兰 bai hua xian zhu lan

Hetaeria parvifolia Ridley, J. Straits Branch Roy. Asiat. Soc. 39: 87. 1903; *Adenostylis benguetensis* Ames; *Zeuxine benguetensis* (Ames) Ames; *Z. boninensis* Tuyama; *Z. gracilis* (Breda) Blume var. *sakagutii* (Tuyama) Hashimoto; *Z. gracilis* var. *tenuifolia* (Tuyama) T. Hashimoto; *Z. leucochila* Schlechter; *Z. sakagutii* Tuyama; *Z. shuishiehensis* S. S. Ying; *Z. tenuifolia* Tuyama; *Z. tonkinensis* Gagnepain.

Plants 15–22 cm tall, slender. Rhizome elongate. Stem erect, pale purplish brown, 3–6-leaved. Leaves cauline, widely spaced, withered or pendulous at anthesis, pale green, ovate to elliptic, 2–4(–6) × 1.2–2 cm, apex obtuse to acute; petiole-like base 1–1.5 cm including tubular sheath, margin sometimes ciliate. Inflorescence 10–20 cm, with 2 or 3 sterile bracts, pubescent; rachis 2–7.5 cm, with 3 to more than 10 laxly to subdensely arranged flowers; floral bracts pale red, ovate-lanceolate, 4–7 mm, shorter than ovary, pubescent abaxially and on margin, apex long acuminate. Flowers resupinate, small; ovary and pedicel fusiform, 6–9 mm, puberulent. Sepals dark green to purple-brown, sparsely puberulent; dorsal sepal ovate-lanceolate to ovate, 3.8–4.5 × 2–2.8 mm, 1-veined, apex acute; lateral sepals weakly to widely spreading, oblong-ovate, slightly oblique, 3.8–4.5 × 1.5–2 mm, 1-veined, apex acute to obtuse. Petals white, suboblanceolate-oblong, oblique, 4–4.5 × 1.2–1.3 mm, 1-veined, base attenuate, apex subobtuse; lip white or pale yellow, T-shaped, 3.5–5 mm, 3-partite; hypochile saccate, containing 2 subulate, hooked calli; mesochile ca. 1 mm, margin involute toward apex; epichile transversely oblong, ca. 1 × 3–4 mm, composed of 2 lobes diverging at right angles to axis of lip, often with a small mucro at apex between lobes; lobes suboblong, 1.5–2 × 0.8–1.2 mm, apical margin entire or sometimes irregularly denticulate. Column ca. 2 mm; wings much reduced and indistinct; anther ovoid-lanceolate, ca. 1.5 mm; rostellum arms linear, ca. 0.8 mm. Fl. Feb–Aug. $2n = 20$.

Damp places, rocky soils in forests, mountain slopes; 200–1700 m. Hainan, Hong Kong, Taiwan, S and SW Yunnan [Cambodia, Japan, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

This is a widespread and variable species in need of critical review. Reassessment of type material for certain synonyms placed here may reveal that they represent distinct species. The Japanese names are tentatively considered conspecific, following Garay and Sweet (Orchids S. Ryukyu Islands, 83–85. 1974).

11. *Zeuxine flava* (Wallich ex Lindley) Trimen, J. Ceylon Branch Roy. Asiat. Soc. 9: 90. 1885.

黄花线柱兰 huang hua xian zhu lan

Monochilus flavus Wallich ex Lindley, Gen. Sp. Orchid. Pl. 487. 1840; *Haplochilus flavus* (Wallich ex Lindley) D. Dietrich; *Zeuxine aurantiaca* Schlechter.

Plants 20–30 cm tall, slender. Stem erect, 3- or 4-leaved. Leaves spaced, often withered and pendulous at anthesis, broadly lanceolate to narrowly ovate, 5–6 × 1.5–2 cm, apex

acuminate; petiole-like base including tubular sheath 1–1.2 cm. Inflorescence to 13 cm, with several sterile bracts, pubescent; rachis 4–5 cm, 8–15-flowered; floral bracts lanceolate, ca. 5 mm, hairy abaxially, apex caudate. Flowers resupinate, not fully opening, saffron, small; pedicel and ovary glabrescent, ca. 1.2 cm. Dorsal sepal subovate, concave, ca. 3.5×2 mm; lateral sepals oblique, ca. 3×1.2 mm. Petals oblong, ca. 2.5×1 mm; lip T-shaped, ca. 3 mm, 3-partite; hypochile saccate, inside with 2 hooked calli; mesochile ca. 1 mm, with involute margin; epichile transversely oblong, ca. 1×4.5 mm, with 2 lobes diverging at nearly right angles to axis of lip. Column ca. 2 mm. Fl. May.

Open forests in limestone areas; ca. 1400 m. SE Yunnan [Bhutan, N India, Malaysia, Myanmar, Nepal, Thailand, Vietnam].

12. *Zeuxine grandis* Seidenfaden, Dansk Bot. Ark. 32(2): 90. 1978.

大花线柱兰 da hua xian zhu lan

Plants 12–25 cm tall, slender. Rhizome elongate. Stem erect, 3–6-leaved. Leaves cauline, withered and pendulous at anthesis, green, often tinged with red, lanceolate, narrowly elliptic, or ovate, $2-5 \times 1-2$ cm, apex acute; petiole-like base 1.5–2.5 cm including tubular sheath. Inflorescence 6–20 cm, with 2 or 3 sterile bracts, pubescent; sterile bracts small, abaxially pubescent; rachis 2–10 cm, laxly to subdensely 4–23-flowered; floral bracts lanceolate, ca. 10 mm, slightly shorter than ovary, abaxially pubescent, apex long acuminate. Flowers resupinate, relatively large; ovary and pedicel narrowly elliptic, 7–10 mm, pubescent. Sepals greenish, ovate, $5-7.5 \times$ ca. 3 mm, pubescent; dorsal sepal tinged white toward apex, 1-veined, apex obtuse; lateral sepals slightly longer than dorsal sepal, 1-veined, margin white, apex obtuse to acute. Petals white, oblong, slightly oblique, $5-7.5 \times 2-3$ mm, glabrous, 2-veined, apex obtuse-subtruncate; lip white, sometimes with a yellow patch on disk, Y-shaped, 7–9 mm, 3-partite; hypochile concave-saccate, ca. 2×1.5 mm, containing 2 lamellate calli, each often with a linear extension; mesochile ca. 2 mm, narrow, margin erect; epichile dilated, distinctly 2-lobed; lobes not diverging widely, orbicular to obovate, $3-5.5 \times 3-4$ mm, apical margin undulate. Column ca. 3 mm; wings lacking; rostellum arms ca. 1 mm. Fl. Feb–Apr.

Forests; ca. 600 m. Hainan, Hunan [Thailand, Vietnam].

13. *Zeuxine affinis* (Lindley) Bentham ex J. D. Hooker, Fl. Brit. India 6: 108. 1890.

宽叶线柱兰 kuan ye xian zhu lan

Monochilus affinis Lindley, Gen. Sp. Orchid. Pl. 487. 1840; *Adenostylis arisanensis* (Hayata) Hayata; *Zeuxine arisanensis* Hayata; *Z. sutepensis* Rolfe ex Downie; *Z. taiwaniana* S. S. Ying; *Z. uraiensis* S. S. Ying.

Plants 11–30 cm tall, slender. Rhizome elongate. Stem erect, deep reddish brown to greenish brown, 4–6-leaved. Leaves subrosulate, withered and pendulous at anthesis, often reddish, ovate, ovate-lanceolate, or elliptic, $2.5-4 \times 1.2-2.5$ cm, apex acute or obtuse; petiole-like base ca. 1 cm including

tubular sheath. Inflorescence 5–20 cm, with 1 or 2 puberulent sterile bracts, pubescent, pale brown; rachis 3–9 cm, subdensely several to many flowered; floral bracts ovate-lanceolate, 7–8 mm, pubescent on margin and lower half of abaxial surface, apex long acuminate. Flowers resupinate or occasionally erect, small; ovary and pedicel fusiform, 5–6 mm, glabrous to puberulent. Sepals not spreading, dark brownish green at base, white toward apex, pubescent; dorsal sepal broadly ovate, $4-5 \times$ ca. 2.5 mm, concave, 1-veined, apex obtuse or acute; lateral sepals ovate-oblong, slightly oblique, $3.5-4.5 \times$ ca. 2.5 mm, 1-veined, apex obtuse. Petals white, elliptic to obovate, oblique, ca. as long as dorsal sepal, 1.5–2 mm wide, 1-veined, apex obtuse; lip white or pale yellow, Y-shaped, 4.5–6 mm, 3-partite; hypochile concave-saccate, containing 2 subulate, hooked calli; mesochile short, to 1 mm, tapering toward apex, margin involute; epichile dilated, 2-lobed; lobes not diverging widely, obovate-flabellate, widening toward apex, $2-2.5 \times 2-2.2$ mm. Column 1.5–2 mm; wings triangular; anther ovoid-lanceolate, to 2 mm; rostellum arms oblong, ca. 0.6 mm. Fl. Feb–Apr. $2n = 20$.

Shaded places in forests, forest margins, valleys; 800–1700 m. Guangdong, Hainan, Hunan, Taiwan, Yunnan [Bangladesh, Bhutan, India, Laos, Malaysia, Myanmar, Thailand, Vietnam].

Hong Kong plants previously treated as *Zeuxine gracilis* (Breda) Blume (e.g., by S. Y. Hu, Gen. Orchidaceae Hong Kong, 50. 1977) are probably referable here.

14. *Zeuxine reflexa* King & Pantling, Ann. Roy. Bot. Gard. Calcutta 8: 291. 1898.

折唇线柱兰 zhe chun xian zhu lan

Plants 15–30 cm tall, slender. Rhizome elongate. Stem erect, greenish brown, 4–6-leaved. Leaves cauline, widely spaced, withered at anthesis, bright green, ovate-lanceolate, $3-4 \times 1.5-2$ cm, base obtuse, apex acute; petiole-like base 1–2.5 cm including tubular sheath. Inflorescence 10–20 cm, with 1 or 2 pubescent sterile bracts, villous; rachis 5–8 cm, subdensely several to densely many flowered; floral bracts reddish brown, ovate-lanceolate, 6–8 mm, pubescent, margin ciliate, apex acuminate. Flowers resupinate, small; ovary and pedicel subcylindric-elliptic, 8–10 mm, pubescent. Sepals not widely spreading, dark greenish brown, puberulent; dorsal sepal ovate, $3-4.5 \times$ ca. 2 mm; lateral sepals ovate, slightly oblique, $3-4.3 \times$ ca. 1.8 mm. Petals white, suboblong to subovate, ca. as long as to slightly longer than dorsal sepal, apex acute to obtuse; lip Y-shaped, $3.8-5.2$ mm, 3-partite, white at base, mesochile and epichile sometimes yellow; hypochile saccate, containing 2 subulate, hooked calli; mesochile flat, variable in length, to 1.5 mm; epichile dilated, reflexed downward, 2-lobed; lobes diverging at an acute angle, oblong to irregularly rhombic, $2.5-3 \times 1.2-1.8$ mm. Column 2–2.5 mm; wings low, transversely oblong; anther triangular-lanceolate, ca. 1.5 mm; rostellum arms oblong, ca. 0.8 mm. Fl. Apr.

Open places in forests; ca. 700 m. Hong Kong, Taiwan [Bhutan, NE India, Thailand].

A collection from Hong Kong at Kew (*Barretto s.n.*) is tentatively referred here.

Incompletely known species

Zeuxine nijimae Tatewaki & Masamune, Bot. Mag. (Tokyo) 46: 772. 1932 [*“nijimai”*].

眉原线柱兰 mei yuan xian zhu lan

Plants ca. 20 cm tall, slender. Rhizome ascending. Stem 2-leaved. Leaves ovate-lanceolate, slightly oblique, ca. 2.5×1.5 cm, membranous, base rounded, apex acute; petiole-like base ca. 0.7 cm including tubular sheath. Rachis ca. 2 cm, 2- or 3-flowered; floral bracts ovate-lanceolate, ca. as long as ovary, apex acuminate. Flowers small. Dorsal sepal ovate, concave, ca. 6 mm, apex acuminate; lateral sepals obliquely ovate, ca. 5×2 mm, 1- or 3-veined, apex obtuse. Petals ovate-deltoid, ca. 5×2.5 mm, apex acute; lip Y-shaped, ca. 4 mm; epichile 2-lobed; lobes obliquely orbicular, ca. 2×1.5 mm. Column ca. 2 mm. Fl. Apr.

• C Taiwan.

The type material has not been seen by us. This taxon is possibly conspecific with *Zeuxine affinis*.

Zeuxine kantokeiensis Tatewaki & Masamune, Bot. Mag. (Tokyo) 46: 772. 1932.

关刀溪线柱兰 guan dao xi xian zhu lan

Plants ca. 30 cm tall, slender. Leaves withered at anthesis. Inflorescence 9–21 cm, pubescent, with a few sterile bracts; sterile bracts ovate-deltoid, ca. 10×3 mm, apex acuminate; rachis 3–9 cm; floral bracts ovate, ca. 4×2 mm, apex acute-acuminate. Flowers subaxially arranged, small; ovary ovoid, ca. 3 mm including pedicel. Dorsal sepal ovate, concave, ca. 3 mm, outer surface pubescent, 1-veined, apex acute to obtuse; lateral sepals obliquely ovate, ca. 2×1 mm, 3-veined, apex acute to obtuse. Petals oblong, ca. 2×1 mm, glabrous, apex obtuse; lip T-shaped; epichile 2-lobed; lobes ca. 1.3×1 mm, apex obtuse. Column ca. 1 mm; rostellum arms linear, ca. 1 mm. Fl. Apr.

• C Taiwan.

The type material has not been seen by us. This taxon is possibly conspecific with *Zeuxine parvifolia*.

