Flora of China 25: 343–346. 2009.

119. ERIA Lindley, Bot. Reg. 11: ad t. 904. 1825, nom. cons.

毛兰属 mao lan shu

Chen Xinqi (陈心启 Chen Sing-chi), Luo Yibo (罗毅波); Jeffrey J. Wood

Trichosma Lindley.

Herbs, epiphytic, lithophytic, or rarely terrestrial. Rhizome creeping. Stems pseudobulbous, of 1 distinctly enlarged internode, ovoid, faintly to distinctly angular in transverse section, with 2–4 leaves toward apex; base of pseudobulbs loosely covered by leaf sheaths. Leaves convolute in bud, elliptic to narrowly elliptic, leathery, articulate, tapering at base. Inflorescence axillary, erect, many flowered, pubescent; peduncle subtended by 2 or 3 imbricate sterile bracts arising from opposite leaf base; inflorescence axis covered by brown stellate hairs; floral bracts brown, narrowly ovate to triangular. Flowers opening widely, usually cream-colored to pale yellow and in some species with purple veins or purple markings on column, column foot, and lip, stellate or otherwise, large; ovary angular in cross section, sometimes winged. Sepals narrowly triangular with hairs abaxially; lateral sepals slightly ventrally broadened at base, recurved at apex; mentum distinct. Petals similar to sepals; lip simple or 3-lobed, callus absent or adorned with ridges. Column short, foot incurved; anther cap fleshy, with an obtuse apical median ridge, apex obtuse and covering erect, truncate rostellum; pollinia 8, in 2 groups of 4, each group contained within a distinct 4-chambered pouch at base of anther cap, each pollinium laterally compressed, ± deltoid in lateral view, equal in size, at base attached with white granular caudicles.

About 15 species: mainland Asia and the whole of the Malay Archipelago, east to New Guinea and Bougainville Island; seven species (one endemic) in China.

Lindley established *Eria* based on *E. stellata* (now *E. javanica*). The generic name is derived from the Greek ἔριον (*erion*, wool) and refers to the woolly hairs on the inflorescence and flowers. Lindley, in giving the name, was referring to *Eria pubescens*, now referred to *Dendrolirium lasiopetalum* (see p. 351). Densely woolly pubescence is indeed characteristic of *Dendrolirium* but not very evident in *Eria* s.s. In the same year, Blume (Bijdr. 340, 342, 343, 352. 1825) established the genera *Callostylis*, *Ceratium*, *Dendrolirium*, *Mycaranthes*, and *Trichotosia*. Lindley (Gen. Sp. Orchid. Pl. 65–70. 1830) included Blume's *Dendrolirium* and his own *Pinalia* in *Eria*, including 25 species in the genus. Seidenfaden, in his treatment of Thai *Eria* (Opera Bot. 62: 1–157. 1982), commented, "this genus as circumscribed by Lindley and as understood by later authors, has had so many heterogeneous elements included that considerations must be given to possible separations into more genera."

Eria s.l. comprises ca. 370 species, with ca. 44 species recorded from China. Although no serious modern studies of *Eria* s.l. at the interspecific level have been undertaken over its entire range (apart from Seidenfaden, loc. cit.), conspecificity may be expected to be high, thereby reducing the number of described taxa.

Pridgeon et al. (Gen. Orchid. 4(1): 532. 2005) reported that the recent molecular and morphological phylogenetic analysis of the Eriinae by Ng (Phylogenetic relationships in tribe Podochileae (Orchidaceae: Epidendroideae): based on combined evidence from molecular and morphological data. Unpublished Ph.D. Thesis, University of London. 2002) provided further evidence suggesting that the large and unwieldy *Eria*, in the widely accepted sense, is polyphyletic. Combined ITS, *matK*, and *trnL-F* analysis shows the widely accepted Chinese genera *Ceratostylis* and *Trichotosia* to be nested within *Eria* s.l. Ng recommended the continuing recognition of these. However, former sections of *Eria* s.l. represented in China, viz. *Bryobium*, *Callostylis*, *Conchidium*, and a broadly defined *Pinalia*, are given generic rank. *Eria* sect. *Aeridostachya* J. D. Hooker, *E.* sect. *Cylindrolobus* (Blume) Lindley, and *E.* sect. *Dendrolirium* (Blume) Lindley form a clade and have been amalgamated into a very broadly defined *Callostylis* (Pridgeon et al., loc. cit.: 541–542. 2005). The constituent elements of *Callostylis* are, however, morphologically distinctive, and *Aeridostachya*, *Cylindrolobus*, and *Dendrolirium* are recognized as distinct genera in this account. Other changes affecting Chinese taxa include the inclusion of *Eria* sect. *Pellaianthus* J. D. Hooker into *Campanulorchis* (see p. 346) and *E.* sect. *Strongyleria* Pfitzer into *Mycaranthes* (see p. 348).

The genus *Pinalia*, established by Lindley in 1826, is newly circumscribed by Pridgeon et al. (loc. cit.: 569. 2005). It now comprises five former sections of *Eria* s.l., viz. *E.* sect. *Hymeneria* Lindley, *E.* sect. *Pinalia* (Buchanan-Hamilton ex D. Don) Lindley, *E.* sect. *Polyura* Schlechter, *E.* sect. *Secundae* Leavitt, and *E.* sect. *Urostachya* Lindley (see p. 352). This is significant because these taxa represent the majority of the former *Eria* s.l., altogether including approximately 160 species. The majority of taxa from China now belong within *Pinalia*.

Eria s.s. is represented by seven species in China. It is typified by the widespread *E. javanica* and comprises about half a dozen allied species mostly restricted to New Guinea, as well as the mainland Asian species formerly placed in *E.* sect. *Trichosma* (Lindley) Lindley, to which the remaining Chinese species belong and among which *E. coronaria* is the most widespread.

1a. Leaves plicate, venation convolute; flowers stellate ..... 1. *E. javanica*
1b. Leaves conduplicate; flowers not as above.
2a. Lip simple ..... 7. *E. vittata*
2b. Lip 3-lobed.
3a. Pseudobulbs ovoid or ovoid-oblong, less than 3 cm.
4a. Pseudobulbs borne mostly 3–6 cm apart on a slender creeping rhizome; disk of lip with 3 undulate-curved median keels running to apex of mid-lobe, with additional reduced keels mostly within mid-lobe; flowers greenish, keels brownish ..... 2. *E. clausa*

4b. Pseudobulbs borne close together; disk of lip with 3 undulate lamellae extending to base of mid-lobe; flowers greenish or yellowish white, mid-lobe of lip purple, lateral lobes with purple spots ..... 3. *E. corneri*

3b. Pseudobulbs narrowly cylindric, short or elongate.

5a. Pseudobulbs 2–2.5 cm, much shorter than leaves; inflorescence much shorter than leaves; leaves 0.8–1.8 cm wide; lip distinctly clawed ..... 6. *E. yanshanensis*

5b. Pseudobulbs (5–)10–20 cm, longer than or ca. as long as leaves; inflorescence ca. as long as or longer than leaves; leaves 1–6 cm wide; lip not clawed.

6a. Inflorescence (1 or)2–4(–6)-flowered; sepals pale greenish yellow, sometimes with a purplish tint, without purple-red spots; lip disk with 3 entire or undulate lamellae running from base to mid-lobe and with 2–4 additional crenate or undulate lamellae on mid-lobe, lip lateral lobes with strong purplish red streaks and a yellow center; leaf apex acute; floral bracts 3–8 mm ..... 4. *E. coronaria*

6b. Inflorescence 7–12-flowered; sepals densely red spotted abaxially; lip disk with 2 diverging keels and 1 keel on mid-lobe, or with 2 entire lamellate keels below middle and 5 undulate lamellate keels above middle and central 3 of latter extending to mid-lobe, confluent, and reduced to a few teeth, lip lateral lobes without purplish red streaks; leaf apex acuminate; floral bracts 6–11 mm ..... 5. *E. gagnepainii*

1. Eria javanica (Swartz) Blume, Rumphia 2: 23. 1839.

香花毛兰 xiang hua mao lan

Dendrobium javanicum Swartz, Kongl. Vetensk. Acad. Nya Handl. 21: 247. 1800; *Eria fragrans* H. G. Reichenbach; *E. stellata* Lindley; *E. striolata* H. G. Reichenbach; *Octomeria stellata* (Lindley) Sprengel; *Pinalia fragrans* (H. G. Reichenbach) Kuntze; *P. stellata* (Lindley) Kuntze; *P. striolata* (H. G. Reichenbach) Kuntze; *Tainia stellata* (Lindley) Pfitzer.

Pseudobulbs cylindric, 6–7 × 1.2–1.5 cm, with 3 sheaths, 2-leaved near apex. Leaf blade spatulate to obovate-lanceolate, 36–40 × 5–6 cm, with 7–10 main veins, base attenuate, apex acuminate. Inflorescences lateral or subterminal, 40–50 cm, many flowered, sheathing at base; rachis rusty pubescent; floral bracts deciduous, ovate-lanceolate, 1.2–1.5 cm. Flowers fragrant, white, sepals rusty pubescent abaxially; pedicel and ovary nearly as long as floral bracts, rusty pubescent. Dorsal sepal lanceolate, 15–20 × ca. 4 mm, long acuminate; lateral sepals falcate-lanceolate, 15–20 × 4–5 mm, long acuminate; mentum ca. 5 mm. Petals lanceolate, 15–20 × ca. 4 mm, long acuminate; lip ovate-lanceolate in outline, ca. 14 × 7–8 mm, 3-lobed; lateral lobes suberect, oblong, 6–7 mm, obtuse; mid-lobe oblong-lanceolate, 7–8 × ca. 3 mm, acuminate; disk with 3 or 5 lamellae extending to near apex of mid-lobe. Column ca. 5 mm (with anther cap), thickened, foot 5–6 mm. Fl. Aug–Oct. 2*n* = 36.

Lithophytic in rocky places, sometimes in forests; 300–1000 m. C Taiwan, S Yunnan [NE India, Indonesia, Laos, Malaysia, Myanmar, New Guinea, Philippines, Thailand].

2. Eria clausa King & Pantling, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 65: 121. 1896.

匍茎毛兰 pu jing mao lan

Eria corneri H. G. Reichenbach var. *clausa* (King & Pantling) A. N. Rao.

Rhizome creeping, slender. Pseudobulbs borne (1–)3–6 cm apart on rhizome, ovoid or ovoid-oblong, 1.5–3 × 0.6–1 cm, apex 1–3-leaved. Leaf blade elliptic or elliptic-oblong, 5–15 × 1.5–3 cm, with grayish white papillae on both surfaces when dry, with 5 or 6 main veins, acuminate or long acuminate; petiole 1–3 cm. Inflorescence 1, rarely 2, subterminal, 8–10 cm, shorter than leaves, sparsely 2–6-flowered; peduncle 2–2.5 cm, with 2 membranous basal sheaths; floral bracts ovate to triangular, 1–4 mm. Flowers yellowish green or pale green; pedicel and ovary 5–7 mm. Dorsal sepal oblong, 8–10 × 2–3 mm, obtuse; lateral sepals falcate-lanceolate, 7–10 × 3–3.5 mm, obtuse; mentum ca. 4 mm. Petals fusiform-oblong, 6–10 × 2–2.5 mm, obtuse; lip obovate in outline, ca. 7 × 5–7 mm, 3-lobed; lateral lobes ± obliquely oblong; mid-lobe broadly ovate, ca. 3 × 2–2.5 mm, obtuse; disk with 3 high median lamellae extending from base to apex of mid-lobe, undulate-curved distally, with additional shorter, sinuous outer lamellae mostly restricted to mid-lobe. Column ca. 4 mm (with anther cap), foot ca. 3 mm. Capsule ellipsoid, 1–1.5 cm × 6–8 mm; fruiting pedicel ca. 2 mm. Fl. Mar, fr. Apr–May.

Epiphytic on tree trunks or lithophytic on rocks in broad-leaved forests; 1000–1700 m. W Guangxi, SE Xizang, S and SE Yunnan [Bhutan, N India, Myanmar, Vietnam].

Averyanov (Opred. Orkhid. Vetnama, 227, 400. 1994) treated *Eria clausa* as a synonym of the related *E. corneri*. King & Pantling (Ann. Roy. Bot. Gard. Calcutta 8: 121. 1898) suggested that *E. clausa* might be a cleistogamous form of *E. vittata*, whereas Rao (J. Econ. Taxon. Bot. 20: 708. 1996) suggested that it was a cleistogamous form of *E. corneri*. They differ, however, in that *E. corneri* has clustered pseudobulbs, while *E. clausa* has well-spaced pseudobulbs.

3. Eria corneri H. G. Reichenbach, Gard. Chron., n.s., 10: 106. 1878.

半柱毛兰 ban zhu mao lan

Eria goldschmidtiana Schlechter; *E. septemlamella* Hayata.

Pseudobulbs ± clustered, ovoid-oblong or ellipsoid, 2–5 × 1–2.5 cm, apex 2- or 3-leaved. Leaf blade elliptic-lanceolate or obovate-lanceolate, (15–)20–45 × 1.5–6 cm, both surfaces with grayish white papillae when dry, apex acuminate or long acuminate; petiole 2–3 cm. Inflorescence subterminal, 6–22 cm, more than 10-flowered (sometimes to 60-flowered); floral bracts deltoid, ca. 1 mm. Flowers white or slightly tinged with yellow, with white linear projections on sepals and petals; pedi-

cel and ovary 7–8 mm. Dorsal sepal ovate-triangular, ca. 10 × 2 mm, acuminate; lateral sepals falcate-triangular, ca. 10 × 5 mm, obtuse-rounded and apiculate; mentum obtuse. Petals linear-lanceolate, slightly falcate, ca. 10 × 1.2 mm; lip ovate in outline, ca. 10 × 6 mm, 3-lobed; lateral lobes suberect, suborbicular, rounded; mid-lobe ovate-triangular, 3–3.5 × ca. 2 mm, obtuse, with ca. 7 crested or fimbriate lamellae; disk with 3 undulate lamellae extending to base of mid-lobe. Column subcylindric, ca. 3 mm, foot ca. 5 mm. Capsule obovoid-cylindric, ca. 1.5 cm × 5–6 mm; fruiting pedicel ca. 3 mm. Fl. Aug–Sep, fr. Oct–Dec. 2*n* = 36.

Epiphytic on trees or lithophytic on rocks in forests; 500–1500 m. S Fujian, S and W Guangdong, S Guangxi, SW Guizhou, Hainan, Taiwan, SE Yunnan [Japan (Ryukyu Islands), Vietnam].

4. Eria coronaria (Lindley) H. G. Reichenbach, Ann. Bot. Syst. 6: 271. 1861.

足茎毛兰 zu jing mao lan

Coelogyne coronaria Lindley, Edwards's Bot. Reg. 27 (Misc.): 83. 1841; *Eria cylindropoda* Griffith; *E. medogensis* S. C. Chen & Z. H. Tsi; *E. suavis* (Lindley) Lindley; *Trichosma coronaria* (Lindley) Kuntze; *T. suavis* Lindley.

Plants glabrous, turning black when dried. Rhizome creeping, 4–5 mm in diam., often with funnel-shaped sheaths 6–7 mm. Pseudobulbs contiguous or 1–2 cm apart from each other, cylindric, 5–15 cm × 3–6 mm. Leaves 2, subterminal, sessile, narrowly elliptic or obovate-elliptic, rarely ovate-lanceolate, 6–16 × 1–4 cm, acute or obtuse. Inflorescence arising between leaves, 10–30 cm, 2–6-flowered; floral bracts lanceolate or linear, rarely ovate-lanceolate, 5–8 mm. Flowers white, with purple stripes on lip; pedicel and ovary ca. 1.5 cm. Dorsal sepal elliptic-lanceolate, ca. 17 × 5 mm, obtuse; lateral sepals falcate-lanceolate, ca. 15 × 5 mm, obtuse; mentum conspicuous. Petals oblong-lanceolate, ca. 17 × 4.5 mm, obtuse; lip oblong in outline, 14–15 × 11–12 mm, 3-lobed; lateral lobes divaricate, suborbicular or suboblong; mid-lobe triangular or subsquare, ca. 5 × 4 mm, acute or subtruncate; disk with 3 entire or undulate lamellae running from base to mid-lobe and with 2–4 additional crenate or undulate lamellae on mid-lobe. Column ca. 5 mm, foot ca. 5 mm. Capsule obovoid-cylindric, ca. 2 cm; fruiting pedicel ca. 3 mm. Fl. May–Jun. 2*n* = 34, 36, 38, 44, 52.

Epiphytic on tree trunks or lithophytic on rocks in forests; 1300–2100 m. Guangxi, Hainan, SE Xizang, NW and S Yunnan [Bhutan, India, Nepal, Thailand, Vietnam].

Eria medogensis, described from SE Xizang, represents a peloric form of *E. coronaria* in which the lip is undifferentiated and resembles the sepals and petals.

5. Eria gagnepainii A. D. Hawkes & A. H. Heller, Lloydia 20: 130. 1957 [*"gagnepaini"*].

香港毛兰 xiang gang mao lan

Trichosma simondii Gagnepain, Bull. Mus. Natl. Hist. Nat., sér. 2, 22: 505. 1950; *Eria herklotsii* P. J. Cribb; *E. rubropunctata* Seidenfaden, nom. illeg. superfl.

Plants glabrous, turning black when dried. Rhizomes creeping, 4–5 mm in diam., with funnel-shaped sheaths 0.7–1.5 cm. Pseudobulbs contiguous or 1–3 cm apart from each other, cylindric, slender, 5–23 cm × 3–6 mm, base with a long, fibrously lacerate sheath. Leaves 2, subterminal, sessile, narrowly elliptic, elliptic-lanceolate, oblong-lanceolate, or obovate-elliptic, 10–26 × 2.5–6 cm, with 5–9 main veins, acuminate. Inflorescence 1(or 2), arising between leaves, 6–40 cm, up to 12-flowered; floral bracts ovate-lanceolate to linear, 6–11 mm, acuminate. Flowers pure white at first, turning cream-colored and then yellow as they age, scented or unscented; pedicel and ovary 1–1.5 cm. Dorsal sepal narrowly elliptic or oblong-elliptic, 14–16 × 3–5 mm, acute or obtuse; lateral sepals falcate-elliptic or falcate-lanceolate, 12–16 × 5–8 mm, obtuse to acuminate; mentum ca. 5 mm, obtuse. Petals oblong-lanceolate, slightly curved, 11–13 × 1.5–3 mm, acute or obtuse; lip suborbicular or ovate-orbicular in outline, ca. 9 × 8 mm, 3-lobed; lateral lobes parallel to mid-lobe, suboblong or ovate-triangular, obtuse; mid-lobe 2–3 × ca. 2 mm, subtriangular or ovate-triangular, acute; disk with 2 diverging keels and 1 keel on mid-lobe, or with 2 entire lamellate keels below middle and 5 undulate lamellate keels above middle and central 3 of latter extending to mid-lobe, confluent, and reduced to a few teeth. Column ca. 5 mm, foot ca. 5 mm. Fl. Feb–Apr.

Epiphytic on trees or lithophytic on rocks in forests; 1500–2100 m. Hainan, Hong Kong, SE Xizang, NW to S Yunnan [Vietnam].

6. Eria yanshanensis S. C. Chen, Acta Phytotax. Sin. 26: 239. 1988.

砚山毛兰 yan shan mao lan

Plants turning black when dried. Rhizome flexuous, short, sparsely pubescent; pseudobulbs contiguous, cylindric, 2–2.5 cm × 2–3 mm, with longitudinal stripes, apex 2-leaved. Leaf blade oblong-oblanceolate, 9.5–13.8 × 0.8–1.8 cm, nearly leathery when dried, usually with 9 main veins, subacute. Inflorescence terminal, 15–19 cm, laxly 9- or 10-flowered; floral bracts lanceolate, 3–4(–7) mm. Flowers glabrous. Dorsal sepal lanceolate-oblong, ca. 8 × 2 mm, shortly acuminate; lateral sepals subovate, 6–7 × 2–2.5 mm, subacute. Petals slightly curved, narrowly oblong, ca. 6 × 1.5 mm, subacute; lip obovate-cuneate in outline, ca. 9 × 5–6 mm, with a basal claw 4–4.5 mm, distally 3-lobed; lateral lobes subovate, broadly obtuse; mid-lobe suborbicular, ca. 1.5 × 3 mm, margin irregularly crenate or undulate, apex mucronate; disk with a central, suborbicular lamella ca. 0.7 mm tall in basal half and 6 or 7 irregularly fimbriate lamellae above. Column ca. 1.5 mm (not including anther cap). Capsule oblong-ellipsoid, ca. 1 cm × 5–6 mm; fruiting pedicel 5–6 mm. Fl. unknown, fr. Oct.

● Epiphytic in dense forests; ca. 1100 m. S and SE Yunnan.

7. Eria vittata Lindley, J. Proc. Linn. Soc., Bot. 3: 51. 1858.

条纹毛兰 tiao wen mao lan

Pinalia vittata (Lindley) Kuntze.

Plants glabrous. Rhizome slender, glabrous, with a funnel-shaped sheath on each node. Pseudobulbs 2–2.5 cm apart from each other, slightly curved, cylindric, 6–7 cm × 6–8 mm, apex

2-leaved. Leaf blade elliptic or elliptic-lanceolate, 14–19 × 2–4 cm, with 8 or 9 main veins, acuminate. Inflorescence subterminal, usually pendulous, 14–18 cm, many flowered; floral bracts persistent, lanceolate to subulate, 1–4 mm. Flowers grayish green, with purplish brown stripes on sepals and petals, ca. 1 cm in diam.; pedicel and ovary ca. 1 cm. Dorsal sepal oblong, ca. 12 × 3 mm, obtuse; lateral sepals obliquely triangular-oblong, falcate, ca. 10 × 4 mm, acute; mentum ca. 5 mm. Petals lanceolate-oblong, ca. 12 × 5 mm, obtuse; lip oblong in outline, ca. 12 × 5 mm, base attenuate, margin entire, apex subtruncate and slightly mucronulate, with 5 undulate lamellae running nearly from base to apex. Column laterally compressed, nearly ca. 7 mm (with anther cap), slender, foot to 7 mm. Fl. unknown.

Lithophytic on rocks in forests along valleys; ca. 1600 m. SE Xizang [NE India, Myanmar, Thailand].

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