

## BIGNONIACEAE

紫葳科 *zi wei ke*

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Trees, shrubs, or vines, climbers rarely herbs. Leaves opposite, alternate, or whorled, simple or pinnately compound, rarely palmately compound, without stipules, climbers usually with tendrils modified sometimes into hooks or suckers. Inflorescences cymose, paniculate, or racemose, terminal or axillary, rarely flowers borne on old stems; bracts and bractlets present, sometimes deciduous. Flowers bisexual, zygomorphic, usually large. Calyx campanulate or tubular, truncate, 2–5-dentate, or glandular subulate-dentate. Corolla campanulate or funnelliform, usually bilabiate; lobes 5, imbricate or valvate. Fertile stamens 4 (didynamous) and staminode 1, or 2 and staminodes 3, rarely all 5 stamens fertile. Disc fleshy. Ovary superior, 2-locular, rarely 1- or 4-locular; placentation axile or parietal; ovules numerous. Style filiform; stigma 2-lobed. Capsule dehiscent loculicidally or septicidally, rarely fruit fleshy and indehiscent. Seeds numerous, usually winged or with tufts of hairs at both ends; endosperm absent.

About 116–120 genera and 650–750 species: mostly in tropical and subtropical regions; 12 genera and 35 species (21 endemic) in China.

Plants of the Bignoniaceae usually produce large flowers, and many species are widely cultivated in China as ornamentals. These include *Arrabidaea magnifica* Sprague ex Steenis, *Campsis radicans* (Linnaeus) Seemann, *Catalpa speciosa* (Warder ex Barney) Engelman, *Clytostoma callistegioides* (Chamisso) Bureau & Schumann, *Crescentia alata* Humboldt, Bonpland & Kunth, *C. cujete* Linnaeus, *Jacaranda cuspidifolia* Martius, *J. mimosifolia* D. Don, *Kigelia africana* (Lamarck) Benth, *Macfadyena unguis-cati* (Linnaeus) A. H. Gentry, *Pandorea jasminoides* (Linnaeus) Schumann, *Parmetiera cerifera* Seemann, *Podranea ricasoliana* (Tanfani) Sprague, *Pyrostegia venusta* (Ker-Gawler) Miers, *Spathodea campanulata* Beauvois, *Stenolobium stans* (Linnaeus) Seemann, *Tabebuia chrysantha* (Jacquin) G. Nicholson, *T. rosea* (Bertoloni) de Candolle, and *Tecomaria capensis* (Thunberg) Spach.

*Dolichandrone spathacea* (L. f.) Schumann has recently been reported from Hainan (Yaichou, Wanning, Wenchan) and maritime Guangdong (see *A Checklist of Flowering Plants of Isl. and Reefs of Hainan and Guangdong Province, 1994*), but we have not examined Chinese material of the species.

Tao Deding & Yin Wenqing. 1990. Bignoniaceae. In: Wang Wentsai, ed., *Fl. Reipubl. Popularis Sin.* 69: 1–62.

### 1a. Capsule dehiscent septicidally.

2a. Leaves 1-pinnately compound; vines ..... 1. *Nyctocalos*

2b. Leaves 2- or 3-pinnately compound; trees.

3a. Inflorescences cymose; flowers white; corolla tube narrow and long; capsule linear, ca. 32 cm 2. *Millingtonia*

3b. Inflorescences racemose; flowers purple-red; corolla campanulate; capsule oblong-lanceolate, ca. 1 m 3. *Oroxylum*

### 1b. Capsule dehiscent loculicidally.

4a. Leaves simple; fertile stamens 2; seeds with tufts of hairs at both ends ..... 4. *Catalpa*

4b. Leaves pinnately or palmately compound; fertile stamens 4, didynamous or equal; seeds membranous winged.

5a. Calyx spathe-like.

6a. Leaves 1-pinnately compound; inflorescences racemose, terminal; stamens didynamous; capsule long cylindrical, floccose or villous ..... 11. *Markhamia*

6b. Leaves 2-pinnately compound; inflorescences short racemose, borne on old stems; stamens almost equal; capsule linear, glabrous ..... 12. *Mayodendron*

5b. Calyx campanulate.

7a. Vines or herbs.

8a. Vines, with aerial roots; capsule oblong; flowers orange-red ..... 9. *Campsis*

8b. Herbs perennial, biennial, or annual, with or without stems; capsule long horn-shaped; flowers red or yellow ..... 10. *Incarvillea*

7b. Trees or shrubs.

9a. Seeds wingless, compressed globose; leaf axis winged; capsule septum membranous 5. *Pauldopia*

9b. Seeds winged; leaf axis usually wingless; capsule septum thick, usually woody.

10a. Corolla 1.5–4 cm in diam.; calyx 1–2 cm in diam. .... 6. *Fernandoa*

10b. Corolla less than 1 cm in diam.; calyx less than 1 cm in diam.

11a. Septum terete; capsule 4-angled ..... 7. *Stereospermum*

11b. Septum compressed terete; capsule 2-angled ..... 8. *Radermachera*

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## 1. NYCTOCALOS Teijsmann & Binnendijk, J. Bot. Neerl. 4: 366. 1861.

照夜白属 zhao ye bai shu

Vines, without tendrils. Leaves opposite, 1-pinnately compound; leaflets 3–5(–7), entire. Inflorescences racemose, terminal. Calyx campanulate, apex subtruncate; teeth 5, short acute. Corolla white, tube very long, narrowly cylindrical, slightly bilabiate; lobes ovate-rounded, subequal, patent. Stamens 4 and didynamous or 5, inserted high in corolla tube; anthers divergent, ellipsoid, longitudinally dehiscent, apex with a caudate appendage. Disc cushionlike. Ovary short terete; ovules in several rows. Style filiform; stigma compressed. Capsule dehiscent septically, long ellipsoid, compressed, with a persistent calyx. Seeds numerous, compressed, rounded, transparent winged.

About three to five species: Cambodia, China, NE India, Indonesia, Malaysia, Myanmar, Philippines, Thailand; two species in China.

- 1a. Leaves pinnately compound, leaflets 5–7; corolla 9.5–14 cm; stamens 4, didynamous ..... 1. *N. pinnatum*  
1b. Leaves trifoliolate, leaflets 1–3; corolla 5–7 cm; stamens 5, equal or subequal ..... 2. *N. brunfelsiiflorum*

**1. *Nyctocalos pinnatum*** Steenis, Acta Bot. Neerl. 2: 306. 1953.

羽叶照夜白 yu ye zhao ye bai

Vines woody, ca. 20 m. Leaves 1-pinnately compound; lateral petiolule ca. 1 cm, terminal petiolule ca. 3 cm; leaflets 5–7, elliptic, 7–10 × 3–4 cm, thin leathery, base rounded to slightly cordate, apex acuminate; lateral veins 6–8 on each side of midrib. Inflorescences racemose, 2–10-flowered. Pedicel ca. 2 cm in fruit. Calyx cupular, ca. 5 mm. Corolla funnelform, 9.5–14 cm; tube ca. 7 mm in diam. at base, ca. 2 cm in diam. at mouth; lobes ovate-rounded, ca. 2 cm, imbricate. Stamens 4, didynamous, inserted in corolla tube; filaments short, glabrous; anthers ca. 6 mm. Style filiform; stigma 2-lobed. Capsule long ellipsoid, compressed, 12–14 × 4–5 cm, pale green, thick leathery, base strongly constricted into a tube, apex short acute. Seeds numerous, compressed rounded, with membranous and transparent wings, ca. 3 cm in diam. Fl. Jul–Aug, fr. Oct–Nov.

• Humid places in forest; 200–700(–1500) m. S and SE Yunnan (Hekou and Yuanjiang).

**2. *Nyctocalos brunfelsiiflorum*** Teijsmann & Binnendijk, J. Bot. Neerl. 1: 367. 1862.

照夜白 zhao ye bai

*Nyctocalos shanica* MacGregor & W.W. Smith.

Vines. Leaves trifoliolate; lateral petiolule 1–2 cm, terminal petiolule ca. 4.5 cm; leaflets elliptic-lanceolate to elliptic or obovate, 7–14 × 2–6 cm, glabrous, base cuneate, margin entire, apex caudate-acuminate; lateral veins 6–8 on each side of midrib, along with main veins convex on both sides. Inflorescences racemose, ca. 17-flowered, terminal, ca. 40 cm. Calyx ca. 1 cm, mouth ca. 7 mm in diam., apex subtruncate, with 5 subulate teeth ca. 3 mm. Corolla white, 4–5 cm, base constricted; lobes subequal. Stamens inserted at middle of corolla tube; filaments ca. 1.5 cm. Style filiform, glabrous, more than 7 cm; stigma 2-lobed. Capsule long terete, compressed, 18–20 × 5–6 cm, 4–5 mm thick, base constricted into a narrow tube 2–3 cm, apex short acuminate; valves thick leathery. Seeds in several rows, subrounded, membranous winged, 4–5 cm. Fl. Aug–Oct, fr. Sep–Nov.

Forests; 300–600 m. S Yunnan [Indonesia (S Java), Malaysia, N and NE Myanmar, N and SE Thailand].

## 2. MILLINGTONIA Linnaeus f., Suppl. Pl. 45. 1782.

老鸦烟筒花属 lao ya yan tong hua shu

Trees. Leaves opposite, 2- or 3-pinnately compound; leaflets ovate, entire. Inflorescences cymose-paniculate, terminal. Calyx cupular, small, apex subtruncate, with very short teeth. Corolla bilabiate, tube long and narrow, upper lip 2-lobed, lower lip 3-lobed; lobes valvate, ovate-lanceolate, densely pubescent adaxially along margin. Stamens 4, didynamous, inserted high in corolla tube; 1 anther cell fertile and ellipsoid, another caudate and appendagelike. Disc annular-cupular. Ovary sessile, ovoid. Style long; stigma lingulate, compressed, 2-lobed, slightly exerted from corolla tube. Capsule dehiscent septically, long linear, compressed. Seeds in several rows, minute, compressed, winged.

One species: Cambodia, China, Laos, Myanmar, Thailand, Vietnam.

**1. *Millingtonia hortensis*** Linnaeus f., Suppl. Pl. 291. 1782.

老鸦烟筒花 lao ya yan tong hua

Trees 8–25 m tall. Leaves 40–100 cm; petiolule ca. 1 cm; leaflets elliptic, ovate, or ovate-oblong, (2–)5–7 × 1.5–4 cm, glabrous, base rounded, oblique, margin entire, apex acuminate; lateral veins 4 or 5 on each side of midrib. Inflorescences cymose-paniculate, ca. 25 cm in diam.; peduncle and pedicels pale yellow pubescent;

bracts and bractlets deciduous. Pedicel slender, ca. 1 cm. Calyx small, cupular, 2–4 × 2–4 mm, sinuo-late lobed; lobes slightly reflexed. Corolla white, tube 3–7 cm, 2–3 mm in diam. at base; lobes globose in bud, ovate-lanceolate at anthesis, 1–2 cm, densely pubescent along margin adaxially. Ovary glabrous; ovules numerous, 4-rowed. Capsule linear, 30–35 × 1–1.5 cm, compressed. Seeds discoid-oblong, compressed, including wing 1.5–

3.5 × 1–1.5 cm, surrounded by membranous and transparent wings. Fl. Sep–Dec.  $2n = 30$ .

Low altitude slopes; 500–1200 m. S Yunnan [Cambodia, Laos, Myanmar, Thailand, Vietnam; commonly cultivated throughout India, Indonesia, and Malaysia, occasionally naturalized].

### 3. OROXYLUM Ventenat, Decas Gen. Nov. 8. 1808.

木蝴蝶属 mu hu die shu

Trees small, few branched. Leaves opposite, 2- or 3-pinnately compound; leaflets entire. Inflorescences racemose, terminal, erect. Calyx large, purple, broadly campanulate, fleshy, apex subtruncate. Corolla purple-red, campanulate; limb slightly bilabiate; lobes spreading, rounded, margin sinuous. Stamens 5, subequal; filaments slender, long, compressed; anthers ellipsoid, 2-celled. Style filiform; stigma lingulate, compressed. Capsule dehiscent septically, long lanceolate, woody, compressed, ca. 1 m; septum woody. Seeds in several rows, very thin, compressed, rounded, surrounded by a transparent broad wing.

One species: Bhutan, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; one species in China.

**1. Oroxyllum indicum** (Linnaeus) Bentham ex Kurz, Forest Fl. Burma 2: 237. 1877.

木蝴蝶 mu hu die

*Bignonia indica* Linnaeus, Sp. Pl. 2: 625. 1753; *B. pentandra* Loureiro; *Calosanthos indica* (Linnaeus) Blume.

Trees 6–10 m tall. Trunk 15–20 cm in diam.; bark gray-brown. Leaves 2(–4)-pinnately compound, borne nearly at stem apex, 60–130 cm; leaflets triangular-ovate, 5–13 × 3–10 cm, glabrous, becoming blue after drying, base subrounded or cordate, oblique, margin entire, apex short acuminate; lateral veins 5 or 6 on each side of midrib. Inflorescences 40–150 cm. Flowers usually open at night, with foul smell. Pedicel 3–7 cm. Calyx purple, campanulate, 2.2–4.5 × 2–3 cm, glabrous, membranous, becoming subwoody in fruit, apex truncate. Corolla purple-red; tube fleshy, 3–9 × 1–1.5

cm; mouth 5.5–8 cm in diam.; upper lip 2-lobed, lower lip 3-lobed, lobes slightly reflexed. Stamens inserted at middle of corolla tube; filaments ca. 4 cm, slightly exerted from corolla tube, tomentose basally; anthers ellipsoid, 8–10 mm, slightly divergent. Disc large, fleshy, 5-lobed, 4–5 mm thick, ca. 1.5 cm in diam. Style 5–7 cm; stigma 2-parted, ca. 7 × 5 mm. Capsule woody, 40–120 × 5–9 cm, ca. 1 cm thick; valves with midrib, margin convex. Seeds rounded, including papery wing 6–7 × 3.5–4 cm. Fl. Sep–Dec.  $2n = 28, 30, 38$ .

Tropical and subtropical low altitude open forests, roadsides, slopes; 500–900 m. Fujian, Guangdong, Guangxi, Guizhou, Sichuan, Taiwan, Yunnan [Bhutan, Cambodia, India, Indonesia (Java, Sumatra), Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam].

The seeds and bark are used medicinally for alleviating pain and as an antiphlogistic medicine.

### 4. CATALPA Scopoli, Intr. Hist. Natur. 170. 1777.

梓属 zi shu

Trees deciduous. Leaves simple, purple glandular punctate at vein axils abaxially. Inflorescences paniculate, corymbose, or racemose, terminal. Calyx bilabiate or irregularly divided, globose in buds. Corolla campanulate, bilabiate, upper lip 2-lobed, lower lip 3-lobed. Fertile stamens 2, included, inserted at base of corolla tube; staminodes 3. Disc conspicuous. Ovary 2-locular; ovules several. Capsule dehiscent loculicidally, long terete; valves thin; septum slender, terete. Seeds in several rows, rounded, thin membranous, with hair tufts at both ends.

About 13 species: N America and E Asia; four species in China.

1a. Inflorescences cymose-paniculate or paniculate; flowers pale yellow or white.

2a. Corolla yellow, 2-striate at throat and purple spotted adaxially; leaves broadly ovate, 3-dentate above middle, scabrous on both sides ..... 1. *C. ovata*

2b. Corolla yellow-white, pale purple spotted at throat adaxially; leaves ovate-rounded, densely pubescent abaxially ..... 2. *C. tibetica*

1b. Inflorescences corymbose or racemose; flowers pale red or pale purple.

3a. Leaves triangular-cordate; inflorescences few flowered, lateral branches simple ..... 3. *C. bungei*

3b. Leaves ovate; inflorescences many flowered, lateral branches complex ..... 4. *C. fargesii*

**1. Catalpa ovata** G. Don, Gen. Hist. 4: 230. 1837.

梓 zi

*Bignonia catalpa* Thunberg; *Catalpa henryi* Dode; *C. kaempferi* Siebold & Zuccarini.

Trees ca. 15 m tall; young branches sparsely pubescent. Leaves opposite or nearly so, sometimes whorled; petiole 6–18 cm; leaf blade broadly ovate, ca. 25 × 25

cm, scabrous, sparsely pubescent, or glabrescent, base cordate, margin entire or sinuate, usually 3-lobed, apex acuminate; lateral veins 4–6 on each side of midrib, palmately 5–7-veined basally. Inflorescences paniculate, terminal; peduncle sparsely pubescent, 12–28 cm. Calyx bilabiate, 6–8 mm. Corolla campanulate, pale yellow, yellow 2-striate and purple spotted at

throat, ca.  $2.5 \times 2$  cm. Anthers divergent. Style filiform; stigma 2-lobed. Capsule linear, nodding,  $20\text{--}30$  cm  $\times$   $5\text{--}7$  mm. Seeds long ellipsoid,  $6\text{--}8 \times$  ca.  $3$  mm, villous at both ends. Fl. May–Jun, fr. Aug–Oct.  $2n = 40^*$ .

• Slopes; (500–)1900–2500 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjinag [introduced elsewhere].

The fruit are used medicinally for promoting diuresis.

**2. *Catalpa tibetica*** Forrest, Notes Roy. Bot. Gard. Edinburgh 13: 155. 1921.

藏楸 zang qiu

Shrubs or small trees, ca.  $5$  m tall. Leaves broadly ovate, ca.  $23 \times 22$  cm, thin leathery, dark green and glabrous adaxially, pale green and densely pubescent abaxially, basally 5-veined, base slightly cordate or truncate, margin entire, apex acuminate or obtuse. Inflorescences corymbose-paniculate,  $16\text{--}25$  cm, glabrous. Calyx divided to base into 2 parts; lobes navicular. Corolla yellow-white, pale purple spotted at throat, ca.  $4.5$  cm; tube enlarged basally,  $2.5\text{--}4$  cm in diam. at mouth; limb nearly bilabiate; lobes rounded, glabrous. Stamens inserted at base of corolla tube; staminodes minute. Ovary glabrous. Stigma 2-lobed. Capsule terete, striate, ca.  $30 \times 1$  cm. Seeds ellipsoid, thin membranous, filiform pubescent at both ends. Fl. May–Jun, fr. Aug–Sep.

• Slopes, forests; 2400–2700 m. SE Xizang, NW Yunnan.

**3. *Catalpa bungei*** C. A. Meyer, Bull. Acad. Imp. Sci. Saint-Petersbourg 2: 51. 1837.

楸 qiu

*Catalpa syringifolia* Bunge.

Trees  $8\text{--}12$  m tall. Petiole  $2\text{--}8$  cm; leaf blade triangular-ovate or ovate-oblong,  $6\text{--}15 \times$  ca.  $8$  cm, glabrous

abaxially, dark green adaxially, base broadly cuneate or cordate, apex long acuminate. Inflorescences corymbose-racemose, terminal,  $2\text{--}12$ -flowered. Calyx bilabiate, apex acutely 2-dentate. Corollapale red, yellow 2-striate and dark purple spotted at throat,  $3\text{--}3.5$  cm. Capsule linear,  $25\text{--}45$  cm  $\times$  ca.  $6$  mm. Seeds narrowly ellipsoid, ca.  $10 \times 2$  mm, villous at both ends. Fl. May–Jun, fr. Jun–Oct.  $2n = 40^*$ .

• Roadsides. Gansu, Hebei, Henan, Hunan, Jiangsu, Shaanxi, Shandong, Shanxi, Zhejiang; cultivated in Guangxi, Guizhou, and Yunnan.

**4. *Catalpa fargesii*** Bureau, Nouv. Arch. Mus. Hist. Nat., ser. 3, 6: 195. 1894.

灰楸 hui qiu

*Catalpa duclouxii* Dode; *C. fargesii* Wilson, *C. fargesii* f. *duclouxii* (Dode) Gilmour; *C. sutchuenensis* Dode; *C. vesita* Diels.

Trees ca.  $25$  m tall. Petiole  $3\text{--}10$  cm, glabrous or pubescent; leaf blade ovate or triangular-cordate,  $13\text{--}20 \times 10\text{--}13$  cm, thick leathery, base truncate or slightly cordate, apex acuminate; lateral veins 4 or 5 on each side of midrib. Inflorescences corymbose-racemose,  $7\text{--}15$ -flowered, glabrous or pubescent. Calyx divided nearly to base into 2 parts; lobes ovate-rounded. Corolla campanulate, pale red to pale purple, purple spotted adaxially, ca.  $3.2$  cm. Stamens included; staminodes inserted at base of corolla tube; anthers divergent,  $3\text{--}4$  mm. Style filiform, ca.  $2.5$  cm; stigma 2-lobed. Capsule terete, nodding,  $55\text{--}80$  cm; fruiting septum leathery, 2-lobed. Seeds terete, linear, thin membranous, filiform hairy at both ends with hairs  $5\text{--}6$  cm. Fl. Mar–May, fr. Jun–Nov.

• Roadsides, slopes;  $700\text{--}1300$ (– $2500$ ) m. Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Shaanxi, Shandong, Sichuan, Yunnan; frequently cultivated.

## 5. PAULDOPIA Steenis, Acta Bot. Neerl. 18: 425. 1969.

翅叶木属 chi ye mu shu

Shrubs or small trees. Leaves opposite, 2-pinnately compound; rachis narrowly winged; leaflets subsessile, white scaly pubescent adaxially, sparsely glandular abaxially. Inflorescences paniculate, many flowered. Calyx campanulate, 5-lobed. Corolla tube tubular; lobes 5, semirounded. Stamens 4, didynamous. Disc cupular. Ovary 2-locular; ovules borne on septum. Capsule dehiscent loculicidally, terete; septum membranous. Seeds compressed globose, thick, nearly wingless.

One species: China, India, Laos, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam.

**1. *Pauldopia ghorta*** (Buchanan-Hamilton ex G. Don) Steenis, Acta Bot. Neerl. 18: 427. 1969.

翅叶木 chi ye mu

*Bignonia ghorta* Buchanan-Hamilton ex G. Don, Gen.

Hist. 4: 222. 1838; *Radermachera alata* Dop; *R.*

*bipinnata* (Collett & Hemsley) Steenis ex Chatterjee;

*Stereospermum ghorta* (Buchanan-Hamilton ex G. Don)

C. B. Clarke; *Tecoma bipinnata* Collett & Hemsley.

Shrubs  $1.5\text{--}2.5$ (– $6$ ) m tall. Branchlets copiously lenticellate. Leaves sparsely pubescent, ca.  $38$  cm; leaflets ovate-lanceolate,  $3\text{--}7.5 \times 1.5\text{--}2.5$  cm, base cuneate, margin entire, ciliate, apex long acuminate.

Inflorescences cymose-paniculate, terminal, nodding, sometimes flowers densely clustered at peduncle apex,  $8\text{--}12$  cm; peduncle  $15\text{--}20$  cm. Pedicel  $1\text{--}2$  cm, sparsely pubescent. Calyx ca.  $1.5$  cm, less than  $1$  cm in diam.,

apex subtruncate. Corolla lobes semirounded, spreading, red-brown, ca. 1.5 cm, tube dark yellow, 3–6 cm, slightly curved. Filaments filiform, 2–2.5 cm, glabrous; anthers divergent, 2-celled, connective subulate. Style ca. 3 cm, smooth; stigma lingulate. Capsule long terete, ca. 23 × 1 cm, long acuminate at both ends; valves thin

leathery; septum membranous. Fl. May–Jun, fr. Nov–Dec.

Evergreen broad-leaved forests, roadsides, slopes; (600–)1300–1800 m. S Yunnan [India, Laos, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam].

## 6. **FERNANDOA** Welwitsch ex Seemann, J. Bot. 3: 330. 1865.

厚膜树属 hou mo shu shu

*Fernandia* Baillon; *Haplophragma* Dop.

Trees. Leaves 1-pinnately compound; leaflets 2–5(or 6) pairs. Inflorescences cymose, terminal or axillary, pubescent. Calyx tubular or campanulate, usually 2–5-lobed, subzygomorphic or regular, persistent. Corolla funnelform or campanulate; lobes 5, subrounded, sinuate or crenate. Stamens 4, didynamous; anthers 2-celled, slightly divergent, included; staminodes small. Disc annular, occasionally dentate. Ovary terete, glabrous or pubescent, 2-locular; ovules numerous, in 2 rows. Capsule dehiscent loculicidally, 4-angular; valves thin leathery; septum thick, smooth, vertical with fruiting valve. Seeds in 2 rows, numerous, nearly square, narrowly membranous winged at both ends.

About 14 species: four in tropical Africa, three in Madagascar, six in SE Asia (Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam); one species in China.

1. **Fernandoa guangxiensis** D. D. Tao, Acta Phytotax. Sin. 24: 149. 1986.

广西厚膜树 guang xi hou mo shu

Trees 12–15 m tall. Trunk ca. 20 cm in diam.; young branches pale brown, copiously lenticellate, glabrous. Leaves 30–42 cm; leaflets 4 or 5 pairs, oblong to ovate-oblong, 7–13 × 3.5–7.5 cm, glabrous, base truncate or subrounded, oblique, margin entire, apex acuminate. Inflorescences cymose-paniculate, densely flowered, terminal; peduncle 5–7 cm. Calyx campanulate, lobes ca. 5.5 mm. Corolla white, zygomorphic, funnelform;

lobes broadly elliptic, ca. 2.2 × 1.5 cm, apex rounded; tube ca. 5.5 cm, base ca. 1.5 cm in diam. Ovary ca. 1.2 cm, pubescent, sessile. Style ca. 1.7 cm; stigma compressed, 2-lobed. Capsule long terete, 45–70 × 2.5–3 cm, 8–12-striate; valves thin leathery, pale black-brown; septum compressed, 8–10 mm thick, smooth. Seeds including wing ca. 3.5 × 1.5 cm. Fl. and fr. Aug–Dec.

• Forests; ca. 600 m. Guangxi (Longzhou Xian), Yunnan (Mengla Xian).

## 7. **STEREOSPERMUM** Chamisso, Linnaea 7: 720. 1833.

羽叶楸属 yu ye qiu shu

*Dipterosperma* Hasskarl.

Trees deciduous. Leaves 1-pinnately compound, opposite; leaflets entire, elliptic or elliptic-lanceolate. Inflorescences cymose-paniculate, terminal. Calyx campanulate, 5-dentate, sometimes unequal. Corolla lobes subequal, rounded or lacerate, tube small, yellow or pale red. Stamens 4, didynamous, included; anthers divergent. Disc cushionlike. Ovary sessile; ovules numerous, in 1 to several rows. Capsule dehiscent loculicidally, terete, slender, ± 4-angular; septum terete, woody. Seeds inserted in septum, transparent and membranous winged at both ends.

About 15 species: tropical Asia, tropical Africa; three species in China.

1a. Leaflets scabrous, densely pubescent, apex bluntly acute to obtuse ..... 3. *S. neuranthum*

1b. Leaflets nearly smooth on both sides, glabrous, apex acuminate to caudate.

2a. Flowers yellow-white; calyx glabrous ..... 1. *S. colais*

2b. Flowers red-brown; calyx densely puberulent ..... 2. *S. strigillosum*

1. **Stereospermum colais** (Buchanan-Hamilton ex Dillwyn) Mabberley, Taxon 27: 553. 1978.

羽叶楸 yu ye qiu

*Bignonia colais* Buchanan-Hamilton ex Dillwyn, Rev. Hort. 6(26): 28. 1839; *Dipterosperma personatum* Hasskarl; *Stereospermum colais* var. *puberula* (Dop) D. Tao; *S. personatum* (Hasskarl) Chatterjee; *S.*

*personatum* var. *puberula* Dop; *S. tetragonum* de Candolle.

Trees 15–20(–35) m tall. Trunk 15–25(–80) cm in diam. Leaves 25–50 cm; leaflets 3–6 on each side of midrib, long elliptic, 8–14 × 2.5–6 cm, pubescent or glabrous. Inflorescences paniculate, terminal, 20–40 cm; peduncle pubescent or glabrous; bract and bractlets

deciduous. Pedicel 3–4 mm, pubescent or glabrous. Flowers many. Calyx campanulate, purple, pubescent or glabrous, 4–5 × 4–5 mm, 3–5-lobed. Corolla pale yellow, slightly curved, ca. 2 cm, upper lip 2-lobed, lower lip 3-lobed, tomentose at mouth, tube terete. Filaments ca. 1 cm, glabrous. Stigma 2-lobed. Capsule terete, 4-angular, slightly curved, 30–70 cm, ca. 1 cm in diam.; pericarp thick, subwoody; septum 4–7 mm in diam. Seeds ovoid, white membranous winged at apices, including wing ca. 2.8 cm, ca. 5 cm in diam. Fl. May–Jul, fr. Sep–Nov.  $2n = 40$ .

Forests, slopes; 400–1800 m. Guangxi, Guizhou, Hainan, Yunnan [Bangladesh, Bhutan, Cambodia, India, Indonesia (Sumatra), Laos, Malaysia, Myanmar, Nepal, Sikkim, Sri Lanka, Thailand, Vietnam].  
**2. *Stereospermum strigosum*** C. Y. Wu & W. C. Yin in C. Y. Wu, Fl. Yunnan. 2: 710. 1979.

伏毛萼羽叶楸 fu mao e yu ye qiu  
 Trees ca. 5 m tall. Leaflets 7–9, long elliptic, 10–19 × 4–6.5 cm, base broadly cuneate, margin entire, apex acuminate; lateral veins 11 or 12 on each side of midrib, convex abaxially; petiolules 5–7 mm; leaf rachis 14–16 cm. Inflorescences paniculate, terminal, ca. 20 cm. Calyx ca. 10 × 5 mm, densely puberulent; teeth ovate-

triangular. Corolla radial, red, tube short. Capsule long terete, curved, 15–40 cm, slightly 4-angular; pericarp thin leathery. Seeds ovoid, ca. 2.5 cm. Fl. Jul.

• Forests, slopes, humid places; ca. 100 m. S Yunnan.

**3. *Stereospermum neuranthum*** Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42(2): 91. 1873.

毛叶羽叶楸 mao ye yu ye qiu

Trees deciduous, ca. 12 m tall. Young branches pubescent. Leaf rachis pubescent, 14–24 cm; leaflets 3–7(–9), broadly elliptic, 8–14 × 5–10 cm, scabrous and densely broadly cuneate, oblique, margin entire, pubescent adaxially, densely puberulent abaxially, base apex acute to rounded; lateral veins 7 or 8 on each side of midrib; petiolules ca. 1 cm. Inflorescences cymose, terminal, 4–12 cm. Corolla ca. 2.5 cm, pale purple, dark purple striate. Capsule long terete, curved, 20–47 cm × ca. 8 mm, slightly 4-angular; pericarp black, thin leathery. Seeds ovoid, less than 3 cm, indistinctly membranous winged. Fr. Feb–Mar.

Slopes, forests; 500–1600 m. SW Yunnan [Cambodia, India (Manipur), Laos, Myanmar, Thailand, Vietnam].

## 8. RADERMACHERA Zollinger & Moritz in Zollinger, Syst. Verz. 3: 53. 1855.

菜豆树属 cai dou shu shu

Trees. Leaves opposite, 1–3-pinnately compound; leaflets entire, petiolate. Inflorescences paniculate or reduced almost to fascicles, terminal or lateral; bracts and bractlets linear or leaflike. Calyx campanulate, apex 5-lobed or truncate. Corolla funnellform-campanulate or salverform; tube short or long, limb slightly bilabiate; lobes rounded, spreading. Stamens 4(or 5), didynamous or subequal; staminode usually present. Disc annular, slightly fleshy. Ovary terete; ovules numerous, 2-rowed in each locule. Style included; stigma ligulate, 2-lobed. Capsule dehiscing loculicidally, long, terete, 2-angular; septum compressed, woody. Seeds compressed, transparent membranous winged at both ends.

About 16 species: tropical Asia; seven species in China.

1a. Leaves 1-pinnately compound.

2a. Calyx 3–5 × 3–5 mm; corolla pale yellow, ca. 3 cm; leaflets 4–6 cm wide ..... 1. *R. microcalyx*

2b. Calyx ca. 8 mm; corolla white, ca. 3.7 cm; leaflets 7–9 cm wide ..... 2. *R. glandulosa*

1b. Leaves 2- or 3-pinnately compound.

3a. Fertile stamens 5 ..... 3. *R. pentandra*

3b. Fertile stamens 4.

5a. Capsule woody, densely white lenticellate ..... 4. *R. yunnanensis*

5b. Capsule thick leathery, without lenticels.

6a. Petioles, leaf rachis, and inflorescences pubescent ..... 6. *R. frondosa*

6b. Petioles, leaf rachis, and inflorescences glabrous.

7a. Corolla 6–8 cm, white to pale yellow; capsule ca. 85 × 1 cm ..... 5. *R. sinica*

7b. Corolla 3.5–5 cm, golden yellow; capsule ca. 40 × 0.5 cm ..... 7. *R. hainanensis*

**1. *Radermachera microcalyx*** C. Y. Wu & W. C. Yin in C. Y. Wu, Fl. Yunnan. 2: 711. 1979.

小萼菜豆树 xiao e cai dou shu

Trees ca. 20 m tall. Leaves 1-pinnately compound, 40–56 cm; petiolules 1–2 cm; leaflets 5–7, ovate-elliptic to

ovate, 11–26 × 4–6 cm, black glandular abaxially, glabrous, base broadly cuneate to subrounded, oblique, margin entire, apex acute; lateral veins 7–10 on each side of midrib. Inflorescences cymose-paniculate, terminal. Calyx campanulate, 3–5 × 3–5 mm, persistent; teeth 5, minute, apex truncate. Corolla pale yellow; tube ca. 2.5 cm, ca. 5 mm in diam.; lobes ovate-rounded, ca.

1 cm. Style filiform, ca. 2 cm, glabrous. Capsule green, long terete, nodding, 20–28 cm × ca. 6 mm; pericarp thin leathery, dehiscent by 2 valves; septum terete, 2–3 mm in diam. Seeds minute, long ellipsoid, including wing ca. 1 cm. Fl. Jan–Mar, fr. Apr–Dec.

• Guangxi, S Yunnan.

2. **Radermachera glandulosa** (Blume) Miquel, Ann. Mus. Bot. Lugduno-Batavi 3: 250. 1867.

广西菜豆树 *guang xi cai dou shu*

*Spathodea glandulosa* Blume, Bijdr. 762. 1862;

*Bignonia porteriana* Willroth ex A. de Candolle;

*Stereospermum glandulosum* Miquel.

Trees small, glabrous except for pubescent young branches. Leaves 1-pinnately compound; petiolules ca. 6 mm; leaflets 3–7, long elliptic, 18–21 × 8–9 cm, base cuneate, margin entire, apex acute or acuminate. Inflorescences paniculate,

ca. 25 cm, short branched, many flowered. Calyx campanulate, apex slightly truncate, 5–8 mm, glabrous. Corolla white, ca. 3.7 cm; tube pale purple-red abaxially, white and glandular adaxially, 3–4 cm in diam. at mouth, tubular at base; lobes rounded, ca. 8 mm, subentire. Capsule linear, 22–30 cm × 7–8 mm, smooth; pericarp thin; septum 3–4 mm in diam. Seeds compressed globose, including wing ca. 2 cm × 2–3 mm. Fl. Apr, fr. Jul.

Forests, thickets; ca. 900 m. Guangdong, Guangxi [India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand].

**3. *Radermachera pentandra*** Hemsley in J. D. Hooker, Icon. Pl. 28: pl. 2728. 1902.

豇豆树 jiang dou shu

Trees ca. 20 m tall. Branchlets copiously lenticellate. Leaves 2-pinnately compound; leaf rachis ca. 45 cm; lateral petiolules 5–10 mm, terminal ones 3–6 cm; leaflets ca. 23, blade elliptic-lanceolate to ovate-lanceolate, 10–20 × 3–7 cm, glabrous on both sides, densely black glandular abaxially, base cuneate or subrounded, margin entire, apex long acuminate; lateral veins 8 or 9 on each side of midrib. Inflorescences sparsely paniculate; peduncle short. Calyx campanulate, 2.5–3 × ca. 2 cm; teeth 5, ovate-rounded. Corolla orange-yellow, broadly campanulate; tube ca. 5 × 2.5 cm; lobes ovate-rounded, subequal. Stamens 5, inserted high in corolla tube; filaments ca. 1 cm, pubescent; anthers divergent, ellipsoid, with caudate appendages at apex. Capsule terete, nodding, ca. 1 m × 8 mm, 2-angular; pericarp black-green, thin leathery; septum terete, ca. 3 mm in diam. Seeds ovoid, thin membranous, including wing ca. 12 × 3 mm. Fl. Nov–Apr, fr. Oct–Dec.

• Slopes, forests; 1000–1700 m. S Yunnan.

**4. *Radermachera yunnanensis*** C. Y. Wu & W. C. Yin in C. Y. Wu, Fl. Yunnan. 2: 712. 1979.

滇菜豆树 dian cai dou shu

Trees ca. 16 m tall. Barks gray-black. Leaves 2(or 3)-pinnately compound, ca. 70 cm; lateral petiolules 1–5 mm, terminal one 1–2.5 cm; leaflets ovate, 4–9 × 2–5 cm, densely white glandular adaxially, base cuneate, oblique, margin entire, apex caudate-acuminate; lateral veins 5–7 on each side of midrib. Inflorescences cymose-paniculate. Calyx ca. 3 cm × 8 mm; teeth 5, long triangular, ca. 1.2 cm. Corolla white to pale yellow, 7–9 cm. Stamens 4, inserted nearly at base of corolla tube. Capsule gray-black when mature, long terete, subwoody, ca. 50 × 1–1.2 cm, densely white lenticellate, scabrous. Seeds ellipsoid, including wing 1.4–1.7 cm × 3–5 mm. Fl. Apr–May, fr. Aug–Nov.

• Slopes, forests; 800–1100 m. Yunnan.

**5. *Radermachera sinica*** (Hance) Hemsley in J. D. Hooker, Icon. Pl. 28: pl. 2728. 1902.

菜豆树 cai dou shu

*Stereospermum sinicum* Hance, J. Bot. 20: 16. 1881;  
*Radermachera tonkinensis* Dop.

Trees ca. 10 m tall. Petioles, leaf axis, and inflorescences glabrous. Leaves 2(or 3)-pinnately compound; leaf rachis ca. 30 cm; lateral petiolules less than 5 mm, terminal one 1–2 cm; leaflets ovate to ovate-lanceolate, 4–7 × 2–3.5 cm, glabrous, base broadly cuneate, margin entire, apex caudate-acuminate; lateral veins 5 or 6 on each side of midrib. Inflorescences paniculate, terminal, erect, 25–35 cm; bracts linear-lanceolate, ca. 10 cm, deciduous, bractlets linear, 4–6 cm. Calyx teeth 5, ovate-lanceolate, ca. 12 mm. Corolla white to pale yellow, campanulate-funnelform, 6–8 cm; lobes rounded, ca. 2.5 cm. Stamens 4, didynamous; staminode present, filiform. Ovules 2-rowed. Style exerted; stigma 2-lobed. Capsule terete, nodding, angular, ca. 85 × 1 cm; pericarp thin leathery, indistinctly lenticellate; septum terete, slightly compressed. Seeds ellipsoid, including wing ca. 2 cm × 5 mm. Fl. May–Sep, fr. Oct–Dec.

Slopes and forests; 300–800 m. Guangdong, Guangxi, Guizhou, Taiwan, Yunnan [Bhutan, India (Assam, Darjeeling), N Myanmar, Vietnam].

**6. *Radermachera frondosa*** Chun & How, Acta Phytotax. Sin. 7: 75. 1958.

美叶菜豆树 mei ye cai dou shu

Trees 7–20 m tall; branchlets puberulent or glabrescent, lenticellate. Leaves 2-pinnately compound; leaflets 5–7, elliptic or ovate, 4–6 × 1.5–3 cm, papery, terminal ones large, base broadly cuneate, apex caudate-acuminate. Inflorescences paniculate, terminal, ca. 30 cm, 3-branched. Flowers white, red-brown in bud. Pedicel 3–5 mm, pubescent. Calyx 1–1.2 cm, 3- or 4-lobed; lobes ovate-triangular, 2–3 mm, acute. Corolla tubular, 3–4 × 2–2.5 cm, glabrous; lobes rounded, ca. 1.2 cm. Disc cupular, ca. 1 mm. Stamens 4, inserted high in corolla tube; anthers linear, ca. 7 mm. Ovules numerous, in several rows. Stigma 2-lobed. Capsule nodding, subterete, 20–40 cm × 5–6 mm. Seeds including wing 7–12 mm. Fl. and fr. throughout year.

• Forests. Guangdong, Guangxi, Hainan.

**7. *Radermachera hainanensis*** Merrill, Philipp. J. Sci. 21: 353. 1922.

海南菜豆树 hai nan cai dou shu

Trees 6–13(–20) m tall, glabrescent. Leaves 2- or 3-pinnately compound; leaflets oblong-ovate or ovate, 4–10 × 2.5–4.5 cm, papery, glabrous, base broadly cuneate, apex acuminate; lateral veins 5 or 6 on each side of midrib. Inflorescences racemose, 1–4 cm, terminal, few flowered. Calyx pale red, tubular, irregular, ca. 1.8 cm, 3–5-lobed. Corolla golden yellow, campanulate, 3.5–5 × ca. 1.5 cm, pubescent adaxially; tube ca. 5 mm in diam. at base; lobes reniform-triangular, ca. 1 cm in diam. Capsule ca. 40 cm × 5 mm;

septom compressed rounded. Seeds ovoid, including wing ca. 1.2 cm, membranous. Fl. Apr.

Slopes, forests; 300–600 m. Guangdong, Hainan, Yunnan [Cambodia, Laos, Thailand].

**9. CAMPSIS** Loureiro, Fl. Cochinch. 2: 377. 1790, nom. cons.

凌霄属 ling xiao shu

Vines woody, deciduous, climbing by aerial roots. Leaves opposite, 1-pinnately compound; leaflets serrate. Inflorescences short paniculate, terminal, or flowers in clusters. Calyx campanulate, subleathery, irregularly 5-lobed. Corolla red or orange-red, campanulate-funnelform, slightly bilabiate; lobes spreading, semirounded. Stamens 4, didynamous, curved, included. Ovary 2-locular, base surrounded by a large disc. Capsule dehiscing loculicidally. Seeds numerous, compressed, membranous, with semitransparent wings.

Two species: one in North America, another in Japan and China.

**1. Campsis grandiflora** (Thunberg) Schumann in Engler & Prantl, Nat. Pflanzenfam. 4(3b): 230. 1894.

凌霄 ling xiao

*Bignonia grandiflora* Thunberg, Fl. Jap. 253. 1784; *B. chinensis* Lamarck; *Campsis adrepens* Loureiro; *C. chinensis* (Lamarck) Voss; *Tecoma chinensis* (Lamarck) K. Koch; *T. grandiflora* Loiselleur-Deslongchamps.

Stems woody. Leaf rachis 4–13 cm; leaflets 7–9; petioles 5(–10) mm; blade ovate to ovate-lanceolate, 3–6(–9) × 1.5–3(–5) cm, glabrous, base broadly cuneate, margin serrate, apex caudate-acuminate; lateral veins 6 or 7 on each side of midrib. Inflorescences short paniculate, terminal; peduncle 15–20 cm. Calyx

campanulate, ca. 3 cm, divided halfway; lobes lanceolate, ca. 1.5 cm. Corolla red adaxially, orange-red abaxially, ca. 5 cm; lobes semirounded. Stamens inserted at base of corolla tube; filaments linear, 2–2.5 cm; anthers divergent, yellow. Style linear, ca. 3 cm; stigma compressed, 2-lobed. Capsule apex obtuse. Fl. May–Aug. 2n = 36, 38, 40.

Fujian, Guangdong, Guangxi, Hebei, Shandong, Shanxi, cultivated in Taiwan [India, Japan, Pakistan, Vietnam].

The plants are cultivated as ornamentals, and the flowers are used medicinally for promoting diuresis.

**10. INCARVILLEA** Jussieu, Gen. Pl. 138. 1789.

角蒿属 jiao hao shu

*Amphicome* Royle, *Neidzwedzkia* B. Fedtschenko.

Herbs erect or prostrate, annual or perennial, with stems or stemless. Leaves simple or 1–3-pinnately divided. Inflorescences racemose, terminal. Calyx campanulate, teeth 5, triangular, rarely enlarged into glands at base. Corolla red or yellow, funnelform, ± bilabiate; lobes rounded, spreading. Stamens 4, didynamous, included; anthers divergent, glabrous, spurred at base. Disc annular. Ovary sessile, 2-locular; ovules numerous, 1- or 2-rowed on each placenta. Stigma compressed, flabellate, 2-lobed. Capsule dehiscing loculicidally, long terete, erect or curved, acuminate, sometimes 4–6-angular. Seeds minute, compressed, laterally with or surrounded by transparent and membranous wings or filiform hairs.

About 16 species: Afghanistan, Bhutan, China, India, Kashmir, Kazakstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Tajikistan, Turkmenistan, Uzbekistan; 12 species in China.

- 1a. Leaves simple, margin crenate ..... 5. *I. forrestii*
- 1b. Leaves pinnately divided or compound, margin entire or serrate.
  - 2a. Leaves 2- or 3-pinnately divided.
    - 3a. Plants with stems; leaves alternate; pedicel 1–5 mm; calyx ca. 5 mm, teeth subulate, base enlarged into glands ..... 1. *I. sinensis*
    - 3b. Plants stemless; leaves basal; pedicel 5–15 mm; calyx 10–15 mm, teeth triangular, base not enlarged into glands ..... 2. *I. dissectifoliola*
  - 2b. Leaves 1-pinnately compound or divided.
    - 4a. Plants 1–2 m tall, with a distinct stem.
      - 5a. Calyx teeth subulate; capsule leathery, terete; anthers pubescent; seeds filiform pubescent at both ends; bracts ca. 3 mm ..... 4. *I. arguta*
      - 5b. Calyx teeth triangular-lanceolate or semirounded; capsule subwoody, ± angled; anthers glabrous; seeds winged; bracts (5–)10–25 mm.
        - 6a. Plants pale brown pubescent; flowers yellow; leaves divided ..... 8. *I. lutea*
        - 6b. Plants glabrous; flowers red or rose; leaves compound.
          - 7a. Calyx teeth semirounded or truncate, mucronate; lateral leaflets 3–4 cm wide .... 6. *I. altissima*
          - 7b. Calyx teeth broadly triangular, acute; lateral leaflets ca. 2 cm wide ..... 7. *I. beresowskii*

- 4b. Plants 0.1–0.4 m tall, stemless or short stemmed.
- 8a. Leaves pinnately lobed, margin irregularly lobed or parted; calyx teeth subulate, base enlarged into glands ..... 3. *I. potaninii*
- 8b. Leaves usually pinnately compound, margin entire or serrate; calyx teeth triangular or long ovate, base not enlarged into glands.
- 9a. Leaflets entire; plants short stemmed ..... 12. *I. compacta*
- 9b. Leaflets serrate; plants stemless.
- 10a. Leaflets scabrous; plants 10–20 cm tall ..... 11. *I. younghusbandii*
- 10b. Leaflets glabrous; plants 20–40 cm tall.
- 11a. Lateral leaflets 4–11 pairs, long elliptic-lanceolate; base obtuse to subrounded; corolla ca. 6.5 cm; style ca. 3 cm ..... 9. *I. delavayi*
- 11b. Lateral leaflets 2–4(–8) pairs, ovate to ovate-lanceolate, base cordate or broadly cuneate; corolla 7–10 cm; style 5–7 cm ..... 10. *I. mairei*

**1. *Incarvillea sinensis*** Lamarck, Encycl. 3: 243. 1789.

角蒿 jiao hao

Herbs annual or perennial, with branched stems, ca. 80 cm tall. Roots subwoody, branched. Leaves alternate, not clustered at stem base, 2- or 3-pinnately divided. Inflorescences sparsely racemose, ca. 20 cm; bractlets green, linear, 3–5 mm. Pedicel 1–5 mm. Calyx green with purple-red, campanulate, ca. 5 × 5 mm, teeth subulate, base enlarged into glands. Corolla campanulate-funnelform, ca. 4 × 2.5 cm, constricted into tubular base; lobes rounded. Stamens inserted at base of corolla tube; anthers adherent. Style pale yellow. Capsule pale green, narrowly terete, 3–6(–10) cm, ca. 5 mm in diam., apex caudate-acuminate. Seeds compressed globose, ca. 2 mm in diam., surrounded by transparent and membranous wings, apex incised.

• Slopes, fields; 500–2500(–3900) m. W Gansu, Hebei, Heilongjiang, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, SE Xizang, NW Yunnan.

- 1a. Flowers pale rose or pale red, sometimes purple ..... 1a. var. *sinensis*
- 1b. Flowers pale yellow ..... 1b. var. *przewalskii*

**1a. *Incarvillea sinensis* var. *sinensis***

角蒿(原变种) jiao hao (yuan bian zhong)

*Incarvillea sinensis* subsp. *variabilis* (Batalin) Grierson; *I. variabilis* Batalin.

Leaves variable in shape; flowers pale rose, pale red, or purple. Fl. May–Sep, fr. Oct–Nov.  $2n = 22$ .

• Slopes, fields; 500–2500(–3900) m. W Gansu, Hebei, Heilongjiang, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, N Sichuan, SE Xizang, NW Yunnan.

**1b. *Incarvillea sinensis* var. *przewalskii*** (Batalin) C. Y. Wu & W. C. Yin in C. Y. Wu, Fl. Reipubl. Popularis Sin. 69: 36. 1990.

黄花角蒿 huang hua jiao hao

*Incarvillea variabilis* var. *przewalskii* Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 14: 180. 1895; *I. sinensis* subsp. *variabilis* f. *przewalskii* (Batalin) Grierson.

Flowers pale yellow. Fl. Jul–Sep.

• Slopes; 2000–2600 m. Gansu, Qinghai, Shaanxi, NW Sichuan.

**2. *Incarvillea dissectifoliola*** Q. S. Zhao, Acta Phytotax. Sin. 26: 78. 1988.

裂叶波罗花 lie ye bo luo hua

Herbs perennial, stemless. Rhizome fleshy, robust. Leaves basal, 2-pinnatisect; rachis 20–30 cm, 1-sulcate, puberulent; leaflets 7 or 8 pairs, 3–6 × 2–3 cm, sessile, divided into 3 or 4 segments on each side, puberulent, margin crenate. Scape 30–50(–80) cm, 10-sulcate; raceme 5–8-flowered; bracts lanceolate, 1–1.2 cm; bractlets linear to lanceolate, 3–5 mm. Pedicel 0.5–1.5 cm. Calyx broadly campanulate, 1–1.5 cm, 5-veined; lobes triangular, ca. 7 × 8 mm, reflexed mucronate, puberulent. Corolla narrowly funnelform; tube purple outside, ca. 4 cm, ca. 5 mm wide at base, ca. 1.5 cm wide distally; lobes 5, subrounded, purplish, ca. 1.2 cm in diam. Filaments inserted at base of corolla tube. Ovary glabrous. Stigma flabellate. Fruit not known. Fl. Jun.

• Slopes; ca. 3000 m. Sichuan.

**3. *Incarvillea potaninii*** Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 11: 492. 1892.

聚叶角蒿 ju ye jiao hao

Herb perennial, 20–25 cm tall, with stems. Leaves alternate, usually clustered at stem base, 1-pinnately divided; leaf rachis ca. 6 cm; leaflets 3–7, ovate, unequal, ca. 2 cm × 5–10 mm, margin irregularly lobed or parted. Inflorescences racemose, terminal; peduncle 8–15 cm. Pedicel 2–5 mm. Calyx campanulate, 4–5 × 4–5 mm; teeth subulate, base enlarged into glands, ca. 4 mm. Corolla red, funnelform, 4–4.5 cm, ca. 1 cm in diam., base constricted into a tube ca. 3 mm in diam.; lobes rounded, patent, ca. 1.2 × 1.5 cm, margin ciliate. Staminode ca. 1 cm, apex enlarged. Capsule terete, 5–6 cm × ca. 5 mm, apex acuminate. Seeds ovoid to subglobose, ca. 4.5 × 2.5 mm; wings 1.5–2 mm, membranous.

Slopes. Nei Mongol [Mongolia].

**4. *Incarvillea arguta*** (Royle) Royle, Ill. Bot. Himal. Mts. 296. 1836.

两头毛 liang tou mao

Herbs perennial, to 1.5 m tall. Leaves alternate, 1-pinnately compound, not clustered at stem base, ca. 15 cm; leaflets 5–11, ovate-lanceolate, 3–5 × 1.5–2 cm, pale green and glabrous abaxially, dark green and pubescent

adaxially, base broadly cuneate, unequal, margin serrate, apex long acuminate. Inflorescences racemose; bracts subulate, ca. 3 mm; bractlets less than 1.5 mm. Calyx campanulate, 5–8 mm; teeth subulate, 1–4 mm, base subtriangular, not enlarged into glands. Corolla pale red or purple-red, campanulate-funnelform, ca. 4 × 2 cm; tube 1.8–2.2 cm. Stamens adherent; anthers divergent. Capsule linear, terete, leathery, ca. 20 cm. Seeds numerous, minute, acute and filiform pubescent at both ends. Fl. Mar–Jul, fr. Sep–Dec.

Slopes, thickets; 1400–2700(–3400) m. Gansu, W and NW Guizhou, SW Sichuan, Xizang, N Yunnan [India, Nepal].

1a. Inflorescences 6–20-flowered; pedicel 8–25 mm; bractlets borne at pedicel base 4a. var. *arguta*

1b. Inflorescences 4–10-flowered; pedicel 2–4 cm; bractlets borne at ca. middle of pedicel ..... 4b. var. *longipedicellata*

**4a. *Incarvillea arguta* var. *arguta***

两头毛(原变种) liang tou mao (yuan bian zhong)

*Amphicome arguta* Royle, Ill. Bot. Himal. Mts. t. 72. 1835; *Incarvillea arguta* var. *daochengensis* Q. S. Zhao; *I. diffusa* Royle.

Inflorescences 6–20-flowered; bractlets borne at base of pedicel. Pedicel 0.8–2.5 cm. Fl. Mar–Jul, fr. Sep–Dec.

Slopes, thickets; 1400–2700(–3400) m. Gansu, W and NW Guizhou, SW Sichuan, Xizang, N Yunnan [India, Nepal].

The whole plant is used medicinally for the treatment of injuries.

**4b. *Incarvillea arguta* var. *longipedicellata*** Q. S. Zhao, J. Sichuan Univ. (Nat. Sci.) 4: 94. 1983.

长梗两头毛 chang geng liang tou mao

Inflorescences terminal, 4–10-flowered; bractlets borne at ca. middle of pedicel. Pedicel 3–4 cm. Calyx teeth margin not ciliate. Fl. May–Jul, fr. Sep–Dec.

• Sichuan, Xizang.

**5. *Incarvillea forrestii*** Fletcher, Notes Roy. Bot. Gard. Edinburgh 18: 310. 1935.

单叶波罗花 dan ye bo luo hua

Herbs perennial, 15–30(–60) cm tall, glabrescent.

Leaves alternate, simple; petiole 2–5(–15) cm; leaf blade ovate-elliptic, 6–8(–20) × 3–6(–15) cm, papery, base and apex subrounded, margin crenate; lateral veins 7–9 on each side of midrib. Inflorescences racemose, 6–12-flowered, terminal; peduncle 2–4 cm; bracts 5–12 mm. Pedicel 5–10 mm. Calyx campanulate, 1.4–2 cm; teeth 2–4 × 7–10 cm, apex acute. Corolla red, ca. 5.5 × 3 cm; tube 4.5–5 cm, purple-red striate and spotted adaxially; lobes rounded, 1.4–1.8 × 1.8–2.2 cm.

Capsule lanceolate, compressed, 4-angled, 4–6(–9) cm × 5–7 mm, apex acuminate. Seeds ovoid, 5–6 × 3–4 mm; wing ca. 1 mm wide. Fl. May–Jul, fr. Aug–Nov.

• Grassland, thickets; 3000–3500 m. SW Sichuan, NW Yunnan.

**6. *Incarvillea altissima*** Forrest, Notes Bot. Gard. Edinburgh 13: 164. 1921.

高波罗花 gao bo luo hua

Herbs perennial, ca. 2 m tall, glabrous. Leaves 1-pinnately compound, 7–8 cm; lateral leaflets elliptic, 5–

7 × 3–4 cm, margin serrate. Inflorescences racemose, terminal, 10–30-flowered, ca. 65 cm; bracts linear, 1.2–2.5 cm; bractlets linear. Pedicel 5–10 mm. Calyx campanulate, 1.5–1.7 cm; teeth 2–2.5 × 5–6 mm, rounded to truncate, apex mucronate. Corolla pale red, 5–5.5 cm; lobes rounded or emarginate, 1.6–1.8 × 2.5–2.8 cm, glandular pubescent. Staminode ca. 1.5 mm. Capsule long horned, ca. 6 cm, 4-angular, apex acuminate. Seeds broadly ovoid, 4.5–5 × 3.5–4 mm, brown, surrounded by a membranous wing 1–2 mm wide. Fl. Jun–Aug.

• Thickets, forests; 2100–2800 m. SW Sichuan, C Xizang, N and W Yunnan (Lijiang, Yongping, Yongshan).

**7. *Incarvillea beresowskii*** Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 14: 181. 1895.

四川波罗花 si chuan bo luo hua

*Incarvillea longiracemosa* Sprague; *I. lutea* Bureau & Franchet subsp. *longiracemosa* (Sprague) Grierson; *I. wilsonii* Sprague.

Herbs perennial, ca. 1 m tall, glabrous. Leaves 1-pinnately compound; lateral leaflets 3–6 pairs, long elliptic, 6–7 × ca. 2 cm, base oblique; terminal leaflets elliptic, 2–7 × 1–3.2 cm, entire or serrate.

Inflorescences racemose, terminal, more than 17-flowered, ca. 53 cm; bracts 0.5–1.5 cm, lanceolate; bractlets linear. Pedicel 5–10 mm. Calyx campanulate, yellow-green, 1.5(–3.0) × 0.8–1.5 cm; teeth broadly triangular, ca. 4 × 4–7 mm, apex acute. Corolla rose or red, patent; tube 3.5–5 cm, base constricted; lobes ovate, ca. 2 × 1.4–2.5 cm. Filaments yellow-green; anthers yellow. Style long, pale yellow; stigma compressed, 2-lobed. Capsule 4-angled, 8–10 × 1–1.3 cm, dehiscing by 2 leathery valves, apex acute. Seeds pale brown, ca. 4.5 × 3 mm, surrounded by a wing ca. 1 mm, puberulent. Fl. May–Jul, fr. Jul–Oct.

• Slopes; 2100–3000(–4200) m. NW Sichuan, Xizang (W to Lhasa).

**8. *Incarvillea lutea*** Bureau & Franchet, J. Bot. (Morot) 5: 137. 1891.

黄波罗花 huang bo luo hua

*Incarvillea principis* Bureau & Franchet.

Herbs perennial, ca. 1 m tall, pale brown pubescent. Roots fleshy, 1–2 cm in diam. Leaves 1-pinnately divided, mostly borne below middle of stem, 12–27 cm; lateral leaflets 6–9 pairs, sessile, elliptic-lanceolate, 5–9 × 1.5–3 cm, margin serrate, pubescent on veins. Inflorescences racemose, 5–12-flowered; bractlets linear, 1–1.5 cm. Pedicel 5–10 mm. Calyx campanulate, green with purple spots, veins dark purple, 1.5–3 cm; teeth broadly triangular, 5–10 mm, apex acute. Corolla yellow, purple spotted and striate at base, 5–6(–8) cm, mouth ca. 3 cm in diam.; tube ca. 4 cm; lobes rounded, 1.5–2 × 2–2.5 cm, glandular. Staminode ca. 1 mm;

filaments and anthers pale yellow. Capsule pale brown, lanceolate, ca. 10 × 1.3–1.5 cm, 6-angled, woody, apex acuminate. Seeds pale yellow-brown, ovoid or globose, 4–4.5 × 3–4.5 mm, apex rounded or emarginate, usually gray pubescent; wings ca. 1 mm wide. Fl. May–Aug, fr. Sep–Nov.

• Forests, slopes, grasslands; 2000–3400 m. W Sichuan, C Xizang, NW Yunnan.

**9. *Incarvillea delavayi*** Bureau & Franchet, J. Bot. (Morot) 5: 138. 1891.

红波罗花 hong bo luo hua

Herbs perennial, stemless, ca. 30 cm tall, glabrous. Leaves basal, 1-pinnately divided, 8–25 cm; leaf rachis ca. 20 cm; lateral leaflets 4–11 pairs, elliptic-lanceolate, 4–7 × 1–3 cm, glabrous, base obtuse to subrounded, margin serrate, apex acuminate; terminal leaflets 1.5–3.5 × 1–2.5 cm, subsessile. Inflorescences racemose, 2–6-flowered, terminal; peduncle ca. 30 cm; bracts ca. 1 cm; bractlets ca. 5 mm. Pedicel 0.5–1.5 cm. Calyx campanulate, 1.3–2 cm; teeth 5–7 × 5–7 mm, apex caudate-acuminate. Corolla red, campanulate, ca. 6.5 × 3.5 cm; tube ca. 5 cm; lobes semirounded, spreading. Filaments ca. 2.5 cm; anthers ovoid, versatile. Style ca. 3 cm; stigma compressed, flabellate. Capsule gray-brown, 4-angled, 5–7.5 cm, woody. Seeds broadly ovoid, glabrous on 1 side, pubescent on another, ca. 5 × 3–4 mm. Fl. Jul.  $2n = 18, 22$ .

• Grasslands, slopes; 2400–3900 m. W Sichuan, NW Yunnan.

**10. *Incarvillea mairei*** (H. Léveillé) Grierson, Notes Roy. Bot. Gard. Edinburgh 23: 341. 1961.

鸡肉参 ji rou shen

Herbs perennial, stemless, 30–40 cm. Leaves basal, 1-pinnately compound; lateral leaflets 2–8 pairs, ovate to ovate-lanceolate, glabrous, base slightly cordate to broadly cuneate, margin serrate, apex obtuse to acuminate. Inflorescences racemose, 2–4-flowered, subterminal; peduncle subequalling or much longer than pedicels; bractlets linear, ca. 1 cm. Calyx campanulate, ca. 2.5 cm; teeth triangular, apex acuminate. Corolla purple-red or pale red, 7–10 × 5–7 cm; tube 5–6 cm; lobes rounded. Anthers adherent and surrounding style, strongly divergent. Style 5–7 cm; stigma flabellate, thin membranous, 2-lobed. Capsule conical, 6–8 × ca. 1 cm, indistinctly striate. Seeds broadly ovoid, numerous. Fl. May–Aug, fr. Jul–Nov.

Slopes, roadsides, grasslands, forests; 2400–4500 m. Qinghai, Sichuan, SE and E Xizang, NW and SW Yunnan [Bhutan, Nepal].

1a. Peduncle subequalling pedicel 10c. var. *grandiflora*

1b. Peduncle much longer than pedicel.

2a. Lateral leaflets 2 or 3 pairs .... 10a. var. *mairei*

2b. Lateral leaflets 4–8 pairs 10b. var. *multifoliolata*

**10a. *Incarvillea mairei*** var. *mairei*

鸡肉参(原变种) ji rou shen (yuan bian zhong)

*Tecoma mairei* H. Léveillé, Cat. Pl. Yun Nan 20. 1915; *Incarvillea compacta* Maximowicz var. *brevipes* (Sprague) Wehrhahn; *I. grandiflora* Bureau & Franchet var. *brevipes* Sprague; *I. racemosa* Q. S. Zhao.

Lateral leaflets 2 or 3 pairs, margin serrate, apex obtuse. Peduncle ca. 22 cm. Pedicel 1–3 cm. Fl. May–Jul, fr. Sep–Nov.

• Slopes, roadsides; 2400–4500 m. W Sichuan, E Xizang, N and NW Yunnan.

**10b. *Incarvillea mairei*** var. *multifoliolata* (C. Y. Wu & W. C. Yin) C. Y. Wu & W. C. Yin in W. T. Wang, Fl. Reipubl. Popularis Sin. 69: 45. 1990.

多小叶鸡肉参 duo xiao ye ji rou shen

*Incarvillea mairei* var. *mairei* f. *multifoliolata* C. Y. Wu & W. C. Yin in C. Y. Wu, Fl. Yunnan. 2: 271. 1979.

Leaflets 4–8 pairs, ovate-lanceolate, margin serrulate to subentire, apex acuminate. Peduncle much longer than pedicels. Fl. Jun–Aug, fr. Aug–Oct.

• Forests, slopes, grasslands; 3200–4200 m. NW Sichuan, NW Yunnan.

**10c. *Incarvillea mairei*** var. *grandiflora* (Wehrhahn) Grierson, Notes Roy. Bot. Gard. Edinburgh 23: 344. 1961.

大花鸡肉参 da hua ji rou shen

*Incarvillea compacta* Maximowicz var. *grandiflora* Wehrhahn, Die Garten-Stauden 2: 947. 1931; *I. grandiflora* Bureau & Franchet (1891), not Poirlet (1821), not Sprengel (1827).

Peduncle subequalling pedicels. Fl. Jun–Jul, fr. Jul–Sep. Slopes, grasslands; 2500–3700 m. Qinghai, Sichuan, SE Xizang, NW Yunnan (Lijiang, Zhongdian) [Bhutan, Nepal].

**11. *Incarvillea younghusbandii*** Sprague, Bull. Misc. Inform. Kew 1907: 320. 1907.

藏波罗花 zang bo luo hua

Herbs 10–20 cm tall, stemless. Roots fleshy, 6–11 mm in diam. Leaves basal, 1-pinnately compound; leaf axis 3–4 cm; lateral leaflets 2–5 pairs, sessile, ovate-elliptic, 1–2 × ca. 1 cm, scabrous, margin serrate; terminal leaflet ovate-rounded to rounded, 3–5(–7) × 3–5(–7) cm, base cordate, apex obtuse or rounded. Inflorescences short racemose, 3–6-flowered or solitary. Pedicel 6–9 mm. Calyx campanulate, 0.8–1.2 cm, glabrous; teeth 5, unequal, smooth, 5–7 mm. Corolla funnellform, 4–7 cm; tube orange-yellow, ca. 3 mm at base, upward ca. 8 mm in diam.; lobes patent, rounded. Anthers versatile, connective with a basal spur ca. 1 mm. Ovules 1- or 2-rowed on each placenta. Stigma flabellate, 2-lobed. Capsule subwoody, strongly curved, 3–4.5 cm, 4-angled. Seed nearly black, ellipsoid, ca. 5 × 2.5 mm, concave on 1 side, convex on another, surrounded by wings, scaly. Fl. May–Aug, fr. Aug–Oct.

• Gravel, slopes, thickets; 4000–5500 m. Qinghai, Xizang.

**12. *Incarvillea compacta*** Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 27: 521. 1881.

密生波罗花 mi sheng bo luo hua

*Incarvillea bonvalotii* Bureau & Franchet.

Herbs perennial, 20–30 cm tall. Roots fleshy, conical, 15–23 cm. Leaves 1-pinnately compound, clustered at stem base, 8–15 cm; lateral leaflets 2–6 pairs, ovate, 2–

3.5 × 1–2 cm, base rounded, apex acuminate; terminal leaflets ovate-rounded, entire. Inflorescences densely racemose, clustered at stem apex; bracts 1.8–3 cm. Pedicel 1–4 cm, linear. Calyx green or purple-red, with dark purple spots, campanulate, 1.2–1.8 cm; teeth triangular, 6–12 × 5–7 mm. Corolla red or purple-red, 3.5–4 × ca. 2 cm; tube purple striate adaxially, purple and with black spots abaxially; lobes rounded, apex

emarginate, with glands. Stamens inserted at base of corolla tube; anthers adherent; staminode small, curved. Ovules 2-rowed in each locule. Style ca. 4 cm; stigma flabellate. Capsule narrowly lanceolate, acute at both ends, distinctly 4-angled, ca. 11 × 1 cm. Fl. May–Jul, fr. Aug–Dec.

• Slopes, thickets, grasslands; 2600–4100 m. S Gansu, Qinghai, SW Sichuan, Xizang (W to Lhasa), NW Yunnan.

## 11. MARKHAMIA Seemann ex Baillon, Hist. Pl. 10: 47. 1888.

猫尾木属 mao wei mu shu

Trees. Leaves opposite, 1-pinnately compound. Inflorescences terminal. Flowers yellow or yellow-red. Calyx closed in bud, laterally divided to base, spathe-like at anthesis, floccose to lanate-woolly. Corolla lobes 5, subequal, rounded, tube short. Stamens 4, didynamous. Capsule dehiscent loculicidally, long, terete, compressed, yellow-brown floccose to lanate-woolly; septum woody, compressed, with 1 concave midrib. Seeds long ellipsoid, 2-rowed in each locule, transparent and membranous winged at both ends.

About ten species: mostly tropical Africa; one species in China.

**1. Markhamia stipulata** (Wallich) Seemann ex K. Schumann in Engler & Prantl, Nat. Pflanzenfam. 4(3b): 242. 1895.

西南猫尾木 xi nan mao wei mu

Trees 5–15 m tall. Young branches, leaves, and peduncles yellow-brown pubescent to tomentose. Leaves 30–55 cm; leaflets 4–8 pairs, long elliptic to elliptic-ovate, 12–23 × 4–9 cm, base broadly cuneate to subrounded, sometimes oblique, margin entire to serrulate, apex acute to acuminate; lateral veins 8 or 9 on each side of midrib; petiolules 1–4 mm or leaflets subsessile.

Inflorescences terminal racemes, rusty yellow pubescent, 4–10-flowered. Flowers 10–14 cm in diam. Pedicel 2–6 cm. Calyx ca. 5.5 × 4 cm, brown-yellow tomentose to floccose. Corolla yellow to dirty yellow, ca. 10 cm; tube red-brown or purple on lower part, 1.5–2 cm in diam. at base; mouth 10–15 cm in diam.; lobes irregularly wrinkled. Stamens and style included. Capsule linear, compressed, 30–70 × 2–3 cm. Seeds long ellipsoid, including wing 3–5 × 1–1.3 cm. Fl. Sep–Dec, fr. Jan–Apr.

Sparse forests, humid places; 300–1700 m. Fujian, Guangdong, Guangxi, Hainan, Yunnan [Cambodia, Laos, Myanmar, Thailand, Vietnam].

1a. Calyx and capsule floccose ..... 1a. var. *stipulata*

1b. Calyx and capsule sparsely to densely lanate-woolly ..... 1b. var. *kerrii*

**1a. Markhamia stipulata** var. *stipulata*

西南猫尾木(原变种) xi nan mao wei mu (yuan bian zhong)

*Spathodea stipulata* Wallich, Pl. Asiat. Rar. 3: 20. 1832; *Bignonia stipulata* (Wallich) Roxburgh; *Dolichandrone stipulata* (Wallich) C. B. Clarke; *D. stipulata* var. *velutina* (Kurz) C. B. Clarke; *Markhamia indica* P. H. Hô; *M. stipulata* var. *velutina* (Kurz) Sprague; *Spathodea velutina* Kurz.

Leaflets pubescent to glabrescent, margin serrulate to subentire. Calyx and capsule floccose. Fl. Sep–Dec, fr. Feb–Mar.  $2n = 40$ .

Forests; 300–1700 m. Guangdong, Guangxi, Hainan, S Yunnan [Cambodia, Laos, Myanmar, Thailand, Vietnam].

**1b. Markhamia stipulata** var. *kerrii* Sprague, Bull. Misc. Inform. Kew 1919: 310. 1919.

毛叶猫尾木 mao ye mao wei mu

*Dolichandrone cauda-felina* (Hance) Benth & J. D. Hooker; *D. stipulata* (Wallich) C. B. Clarke var. *kerrii* (Sprague) C. Y. Wu & W. C. Qin; *Markhamia cauda-felina* (Hance) Sprague; *M. stipulata* var. *cauda-felina* (Hance) Santisuk; *Spathodea cauda-felina* Hance.

Leaflets rusty yellow pubescent when young, glabrescent adaxially, pubescent to puberulent abaxially, margin ± serrulate to subentire. Calyx and capsule sparsely to densely lanate-woolly. Fl. Sep–Dec, fr. Jan–Apr.

Sparse forests, humid places; 900–1200 m. Fujian, Guangdong, Guangxi, Hainan, Yunnan [Laos, Myanmar, Thailand, Vietnam].

## 12. MAYODENDRON Kurz, Prelim. Rep. Forest Veg. Pegu, App. D: t. 1. 1875.

火烧花属 huo shao hua shu

Trees evergreen. Leaves opposite, 2-pinnately compound; leaflets entire. Inflorescences short racemose, borne on old stems or short lateral branches. Calyx tubular, spathe-like, laterally divided, densely puberulent abaxially. Corolla tubular, orange-yellow; lobes 5, rounded, subequal, reflexed, constricted at base. Stamens 4, subequal, inserted at base of corolla tube; anthers divergent. Disc annual. Ovary long terete, 2-locular. Stigma lingular, compressed, 2-

lobed. Capsule dehiscent loculicidally, linear; valves thin leathery. Seeds 2-rowed on each placenta, thin membranous, transparent and membranous winged at both ends.

One species: S China, India, Laos, Myanmar, Vietnam.

*Mayodendron* is sometimes reduced to synonymy of *Radermachera*, a view supported by T. Santisuk.

**1. *Mayodendron igneum*** (Kurz) Kurz, Prelim. Rep. Forest Veg. Pegu, App. D: t. 1. 1875.

火烧花 huo shao hua

*Spathodea igneum* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42(2): 77. 1871; *Radermachera ignea* (Kurz) Steenis.

Trees evergreen, ca. 15 m tall, 15–20 cm in diam. Bark smooth. Young branches white lenticellate. Leaves 2-pinnately compound, ca. 60 cm; leaf axis terete, striate; petiolule of lateral leaflets ca. 5 mm, that of terminal leaflet ca. 3 cm; leaflets ovate to ovate-lanceolate, 8–12 × 2.5–4 cm, glabrous, base broadly cuneate, oblique, margin entire, apex long acuminate; lateral veins 5 or 6 on each side of midrib. Inflorescences short racemose, borne on old stems or short lateral branches, 5–13-flowered; peduncle 2–4 cm. Pedicel 5–10 mm. Calyx tubular, spathe-like, ca. 10 × 7 mm, puberulent abaxially. Corolla orange-yellow to golden yellow, tubular, 6–7 × 1.5–1.8 cm; lobes semirounded, ca. 5 mm, reflexed. Stamens subequal; filaments ca. 4.5 cm, puberulent at base; anthers connective elongated into a mucro. Style ca. 6 cm; stigma 2-lobed. Capsule long linear, nodding, ca. 45 cm × 7 mm; valves thin leathery; septum narrow, terete, woody. Seeds ovoid, thin membranous, including wings 1.3–1.6 cm. Fl. Feb–May, fr. May–Sep.

Slopes and forests; 100–1900 m. Guangdong, Guangxi, Taiwan, S Yunnan [Laos, Myanmar, Thailand, Vietnam].

