

## OLEACEAE

木犀科 mu xi ke

Chang Mei-chen<sup>1</sup>, Qiu Lian-qing<sup>1</sup>; Peter S. Green<sup>2</sup>

Trees or erect or scandent shrubs. Branches and branchlets lenticellate. Leaves opposite, rarely alternate or whorled, simple, trifoliolate, or pinnately compound, without stipules; venation pinnate or palmate. Inflorescences terminal or axillary, in cymes, panicles, racemes, umbels, or fascicles. Flowers actinomorphic, bisexual, rarely unisexual or polygamous and plants monoecious, dioecious, or polygamodioecious. Calyx 4(–16)-lobed or -parted, rarely absent. Corolla 4(–16)-lobed, sometimes almost free to base, rarely absent; lobes sometimes united in pairs at base or into a very short tube. Stamens 2(–4), inserted on corolla tube or hypogynous; anthers dehiscent longitudinally; pollen 3-colpate or 3-colporate. Ovary superior, 2-loculed; ovules 2 in each locule, sometimes 1 or numerous. Style 1 or absent; stigma 2-lobed or capitate. Fruit a drupe, berry, capsule, or samara. Seeds with straight embryo, with or without endosperm; radicle curved upward or downward.

About 28 genera and over 400 species: tropical, subtropical, and temperate regions of world, but mainly in Asia. China has 10 genera and 160 species (95 endemic) and is the center of diversity for the genera *Forsythia*, *Syringa*, *Osmanthus*, and *Ligustrum*.

Many genera are important economically: *Fraxinus* and *Forsythia* (medicinal, ornamental); *Jasminum*, *Osmanthus*, and *Syringa* (spice, ornamental); *Olea* (oil); and *Fraxinus* (timber).

Chang Mei-chen, Miao Bo-mao, Lu Rui-ling, & Qiu Lian-qing *in*: Chang Mei-chen & Qiu Lian-qing, eds. 1992. Oleaceae. Fl. Reipubl. Popularis Sin. 61: 1–222.

- 1a. Fruit samara or capsule.
  - 2a. Fruit samara.
    - 3a. Fruit surrounded by wing; leaves simple ..... 1. *Fontanesia*
    - 3b. Fruit with a elongated apical wing; leaves pinnately compound ..... 2. *Fraxinus*
  - 2b. Fruit capsule.
    - 4a. Corolla yellow, lobes imbricate and longer than tube; branches hollow or with a lamellate pith ..... 3. *Forsythia*
    - 4b. Corolla not yellow, lobes valvate and shorter than or as long as tube; branches with a solid pith ..... 4. *Syringa*
- 1b. Fruit drupe or berry.
  - 5a. Fruit drupe.
    - 6a. Corolla lobes imbricate; flowers fascicled or rarely in short and small panicles ..... 5. *Osmanthus*
    - 6b. Corolla lobes valvate; flowers usually in panicles.
      - 7a. Corolla with an obvious tube, lobes 4 or absent ..... 7. *Olea*
      - 7b. Corolla lobes almost free to base, united in pairs at base, or united into a very short tube up to 1 mm ..... 6. *Chionanthus*
  - 5b. Fruit berry or berrylike.
    - 8a. Corolla urceolate or campanulate; leaves 3-veined ..... 8. *Myxopyrum*
    - 8b. Corolla rotate, funnelform, or salverform; leaves usually pinnately veined.
      - 9a. Corolla lobes 4, valvate; berrylike drupe solitary; leaves simple ..... 9. *Ligustrum*
      - 9b. Corolla lobes 4–16, imbricate; berry usually didymous; leaves pinnately compound, 3-foliolate, or simple ..... 10. *Jasminum*

### 1. FONTANESIA Labillardière, Icon. Pl. Syr. 1: 9. 1791.

雪柳属 xue liu shu

Shrubs or sometimes small trees, deciduous. Branchlets 4-angled. Leaves opposite, simple, sessile or short petiolate, entire or minutely serrate. Inflorescences terminal or axillary panicles or racemes. Flowers small, pedicellate. Calyx 4-parted. Corolla deeply 4-lobed, united only at base. Stamens 2, inserted at base of corolla. Ovules 2 in each locule, pendulous. Style and forked stigma persistent. Fruit samara, flat, surrounded by wing. Seeds 1 in each locule; endosperm fleshy; radicle upward.

One species: SW Asia and China.

**1. *Fontanesia philliraeoides*** Labillardière subsp. **fortunei** *F. argyi* H. Léveillé.  
(Carrière) Yaltirik in P. H. Davis, Fl. Turkey 6: 147. 1978.

雪柳 xue liu

*Fontanesia fortunei* Carrière, Rev. Hort. 1859: 43. 1859;

Shrubs or small trees to 8 m, with upright branches, glabrous. Branchlets angled. Petiole 1–5 mm; leaf blade lanceolate, ovate-lanceolate, or narrowly ovate, 3–12 × 0.8–

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2.6 cm, papery, base cuneate, margin entire, apex acute to acuminate; primary veins 2–8 on each side of midrib, slightly raised or adaxially somewhat impressed. Terminal panicles 2–6 cm, axillary ones 1.5–4 cm. Flowers bisexual or polygamous. Pedicel 1–2 mm. Calyx minute, parted; lobes ovate, membranous, ca. 0.5 mm. Corolla greenish white, almost parted to base; lobes ovate-lanceolate, 2–3 mm. Stamens

exceeding corolla lobes or not. Samara yellow-brown, obovate to obovate-elliptic, 7–9 mm, apex emarginate. Fl. Apr–Jun, fr. Jun–Oct.  $2n = 26^*$ .

\* Near gullies, by streams, or in woods; below 800 m. Anhui, Hebei, Henan, Hubei, Jiangsu, Shaanxi, Shandong, Zhejiang.

*Fontanesia philliraeoides* subsp. *philliraeoides* is distributed in SW Asia.

## 2. FRAXINUS Linnaeus, Sp. Pl. 2: 1057. 1753.

属 qin shu

Wei Zhi<sup>1</sup>; Peter S. Green

Trees or rarely shrubs, deciduous or rarely evergreen. Leaves odd-pinnate, opposite or rarely whorled at branch apices; petiole and petiolule often basally thickened. Inflorescences terminal or axillary toward end of branches, or lateral on branches of previous year, paniculate; bracts linear to lanceolate, caducous or absent. Flowers small, unisexual, bisexual, or polygamous. Calyx 4-toothed or irregularly lobed, sometimes absent. Corolla white to yellowish, 4-lobed, divided to base or absent. Stamens 2, inserted at base of corolla lobes; filaments short, exerted at anthesis. Ovules 2 in each locule, pendulous. Style short; stigma  $\pm$  2-cleft. Fruit a samara with apically elongated wing. Seeds usually 1, ovate-oblong; endosperm fleshy; radicle erect.

About 60 species: mostly in temperate regions and subtropics of the Northern Hemisphere; 22 species in China.

Some species are widely used in China for commercial timber and the bark for medicinal drugs.

- 1a. Panicles from lateral leafless buds of previous year; flowers appear before leaves.
  - 2a. Leaflet blade 1.7–5(–5.5)  $\times$  0.5–1.5 cm; panicles congested, 0.5–1.5 cm.
    - 3a. Leaflets crenate distally, entire proximally; 4 primary veins on each side of midrib ..... 11. *F. xanthoxyloides*
    - 3b. Leaflets sharply serrate; 6 or 7 primary veins on each side of midrib ..... 12. *F. hupehensis*
  - 2b. Leaflet blade (2.5–)5–14(–20)  $\times$  (1–)2–5 cm; panicles lax, 5–20 cm.
    - 4a. Flowers with calyx; samara not twisted ..... 13. *F. platypoda*
    - 4b. Flowers without calyx; samara conspicuously twisted.
      - 5a. Branchlets nearly 4-angled; leaves opposite; leaflets subsessile; inflorescences 15–20 cm, spreading ..... 14. *F. manschurica*
      - 5b. Branchlets terete; leaves in whorls of 3 at top of branches; leaflets petiolulate; inflorescences ca. 5 cm ..... 15. *F. sogdiana*
- 1b. Panicles terminal or from lateral buds of this year; flowers appearing with or after leaves.
  - 6a. Flowers without corolla.
    - 7a. Leaflets broadly ovate, ovate, to lanceolate, 2–7 cm wide ..... 9. *F. chinensis*
    - 7b. Leaflets narrowly lanceolate, 1–1.8(–2.2) cm wide ..... 10. *F. baroniana*
  - 6b. Flowers with corolla.
    - 8a. Bracts persistent; winter buds naked.
      - 9a. Leaflets 3(–5), serrate to crenate; calyx teeth deltate.
        - 10a. Leaflets regularly serrate, abaxially tomentose ..... 5. *F. trifoliolata*
        - 10b. Leaflets remotely crenate, abaxially glabrous ..... 6. *F. punctata*
      - 9b. Leaflets 5 or more, entire; calyx lobes truncate or broadly deltate.
        - 11a. Leaflets 5–7(–11), petioulule 5–10 mm, usually glabrous on both surfaces ..... 2. *F. griffithii*
        - 11b. Leaflets 9–25, petioulule 0–5 mm, midrib at least abaxially hairy.
          - 12a. Leaf rachis rusty tomentose; leaflets scurfy hairy or glabrescent ..... 1. *F. ferruginea*
          - 12b. Leaf rachis and adaxial surface of leaflets densely brown tomentose, leaflets sometimes glabrescent.
            - 13a. Leaflets 9–15, densely tomentose adaxially ..... 3. *F. malacophylla*
            - 13b. Leaflets (11–)15–25, tomentose or glabrescent ..... 4. *F. retusifoliolata*
      - 8b. Bracts caducous or absent; winter buds scaly or tomentose.
        - 14a. Petiolules 5–15 mm.
          - 15a. Leaflets 2–5 cm, margin deeply serrate to incised ..... 15. *F. bungeana*
          - 15b. Leaflets 8–15 cm, margin serrate or serrulate.
            - 16a. Leaflets 7 or 9, abaxially hairy; samara densely red scurfy hairy ..... 10. *F. floribunda*
            - 16b. Leaflets 3–5(–7), glabrous; samara not as above ..... 11. *F. insularis*
        - 14b. Petiolules 0–5 mm.

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- 17a. Leaflets 7 or 9.  
 18a. Leaflets lanceolate, abaxially densely felty; leaf axis subterete ..... 7. *F. sikkimensis*  
 18b. Leaflets ovate-oblong, glabrous or villous on veins abaxially; leaf axis grooved ..... 9. *F. paxiana*
- 17b. Leaflets 3–5(–7).  
 19a. Leaflets 2–5 cm, broadly ovate, rhomboid to ovate or broadly lanceolate to broadly elliptic, with 4–6 primary veins on each side of midrib, margin deeply serrate to incised ..... 15. *F. bungeana*  
 19b. Leaflets 3–12 cm, elliptic, lanceolate, or ovate-lanceolate to broadly lanceolate, with 6–12 veins on each side of midrib, margin coarsely serrate, serrate, or entire.  
 20a. Young shoots puberulent; petiolules pubescent or sparsely crisped hairy.  
 21a. Petiolules 8–15 mm, sparsely crisped hairy; leaflets with 10–12 primary veins on each side of midrib, margin irregularly and coarsely serrate ... 8. *F. depauperata*  
 21b. Petiolules 0–5 mm, pubescent; leaflets with 7–10 primary veins on each side of midrib, margin entire or serrulate in upper part ..... 14. *F. sieboldiana*  
 20b. Young shoots glabrous; petiolules glabrous.  
 22a. Leaflet margin serrate, blade sparsely dotted abaxially ..... 12. *F. odontocalyx*  
 22b. Leaflet margin serrulate, blade not dotted abaxially ..... 13. *F. stylosa*

**1. *Fraxinus ferruginea*** Lingelsheim, Bot. Jahrb. Syst. 40: 212. 1907.

锈毛 xiu mao qin

Trees to 15 m. Branchlets nearly 4-angled, rusty tomentose at first, glabrescent; buds naked. Leaves 10–20(–25) cm; petiole 3–5 cm; leaf rachis and petiolule rusty tomentose; leaflets 9–11(–15); petiolule 2–5 mm; leaflet blade ovate-lanceolate to obliquely oblong, 3–6 × 1–2.5 cm, thin leathery, sparsely scurfy hairy or glabrescent, base attenuate to petiolule or broadly cuneate, margin entire to subentire, apex acuminate to obtuse; primary veins 6–9 on each side of midrib, often villous abaxially. Panicles terminal, to 20 cm in diam., many flowered, congested; bracts lanceolate-linear, 2–6 mm, ± glabrous, persistent. Flowers polygamous, appearing after leaves. Pedicel ca. 3 mm. Calyx cupular, ca. 1.5 mm, apically truncate, puberulent. Corolla white, ca. 3 mm. Stamens subequal to corolla lobes. Samara linear-spatulate, ca. 3.2 cm × 4–5 mm, densely scurfy hairy; wing decurrent to middle of nutlet. Fl. Jun–Jul, fr. Jun–Aug.

Secondary mixed woods on slopes; 1300–1800 m. S Guizhou, Xizang (Chayu Xian), Yunnan [Myanmar].

**2. *Fraxinus griffithii*** C. B. Clarke in J. D. Hooker, Fl. Brit. India 3: 605. 1882.

光蜡树 guang la shu

*Fraxinus bracteata* Hemsley; *F. formosana* Hayata; *F. guilingensis* S. Lee & F. N. Wei; *Ligustrum vaniotii* H. Léveillé.

Trees 10–20 m, nearly evergreen. Branchlets pubescent, glabrescent; buds naked. Leaves 10–25 cm; petiole 3–8 cm; axis glabrous or puberulent; leaflets 5–7(–11); petiolule 5–10 mm; leaflet blade ovate to lanceolate, 2–10(–14) × 1–5 cm (basal pair usually smaller), leathery or thin leathery, adaxially glabrous, abaxially glandular dotted, base blunt to rounded, attenuate to petiolule, or oblique, margin entire, apex obliquely cuspidate to acuminate; primary veins 5 or 6(–10) on each side of midrib, obscure or rarely obvious. Panicles terminal, 10–25

cm, spreading, many flowered; bracts spatulate-linear, 3–10 mm, leafy, puberulent at first. Flowers bisexual, appearing after leaves. Pedicel slender, 2–4 mm. Calyx cupular, ca. 1 mm, puberulent or glabrous, subentire to broadly deltate toothed. Corolla white; lobes navicular, ca. 2 mm. Stamens ca. equal to corolla lobes. Samara broadly lanceolate-spatulate, 2.5–3 cm × 4–5 mm; wing decurrent to about middle of nutlet. Fl. May–Jul, fr. Jul–Nov.  $2n = 46$ .

Dry slopes, forest margins, near villages, by rivers; 100–2000 m. Fujian, Guangdong, Guangxi, Hainan, Hubei, Hunan, Taiwan [Bangladesh, India, Indonesia, Japan (Ryukyu Islands), Myanmar, Philippines, Vietnam].

**3. *Fraxinus malacophylla*** Hemsley, Hooker's Icon. Pl. 26: t. 2598. 1899.

白枪杆 bai qiang gan

*Fraxinus retusifoliolata* Feng ex P. Y. Bai.

Trees to ca. 10 m. Branchlets ridged, 4-angled when young, brown tomentose; buds naked. Leaves to ca. 25 cm; petiole 2–5 cm; axis densely brown tomentose; leaflets 9–15, sessile or subsessile; leaflet blade elliptic to lanceolate-elliptic, (1.5–)3–8(–10) × (1–)1.5–4 cm, thin leathery, adaxially densely brown tomentose to glabrescent, abaxially densely pale villous to yellow tomentose, especially denser along veins and margin, base cuneate to broadly cuneate, rarely rounded, oblique, margin entire, apex acute or obtuse to retuse; primary veins 7–10 on each side of midrib. Panicles terminal or lateral, ca. 16 cm, many flowered; bracts linear, 2–3 mm. Flowers bisexual, appearing after leaves. Pedicel ca. 3 mm. Calyx cupular, ca. 1 mm, apically truncate or with broadly deltate teeth. Corolla white; lobes linear, ca. 3 mm. Stamens scarcely exceeding corolla lobes. Samara narrowly spatulate, 3–4 cm × 6–7 mm; wing decurrent to about middle of nutlet. Fl. Jun, fr. Sep–Oct.

Secondary forests and dry rocky slopes in calcareous montane regions; 500–1900 m. Guangxi, Yunnan [Thailand].

**4. *Fraxinus retusifoliolata*** Feng ex P. Y. Bai, Acta Bot. Yunnan. 5: 177. 1983.

楷叶 kai ye qin

Trees to ca. 7 m. Branchlets ridged, 4-angled when young, brown tomentose; buds naked. Leaves 9–16 cm; petiole 2–3 cm; axis brown tomentose; leaflets (11–)15–25, subsessile; leaflet blade elliptic to oblong, (1.5–)2.5–4.5 × 1–2 cm, thin leathery, adaxially glabrescent, abaxially yellowish tomentose along veins, base cuneate to broadly cuneate, rarely rounded, oblique, margin entire, apex acute or retuse; primary veins 6–8 on each side of midrib. Panicles terminal or lateral, 5–9 cm, many flowered; bracts subspatulate, 5–7 mm. Flowers bisexual, appearing after leaves. Pedicel ca. 2 mm. Calyx cupular, ca. 1 mm, apically truncate or with broadly deltate teeth. Corolla white; lobes linear, ca. 3 mm. Samara narrowly spatulate, 2–2.5 cm × 4–5 mm; wing decurrent to about middle of nutlet. Fl. Jun, fr. Sep–Nov.

\* Dry rocky slopes; ca. 2000 m. Yunnan.

The bark is used for the treatment of malaria.

Further work may show that *Fraxinus retusifoliolata* is not specifically distinct from *F. malacophylla*.

**5. *Fraxinus trifoliolata*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 106. 1916.

三叶 san ye qin

*Fraxinus punctata* S. Y. Hu.

Shrubs or small trees to 8 m, erect. Branches subterete or slightly compressed, glabrous; buds naked or scurfy hairy. Leaves 15–18 cm; petiole 5–6 cm, hirsute or glabrous; axis angled; leaflets 3(–7), terminal 1 larger, with petiolule 1.5–3 cm; leaflet blade ovate to elliptic, 8–12(–15) × 3.5–5(–7) cm, thick papery to leathery, adaxially glabrous, abaxially densely tomentose, base broadly cuneate, decurrent onto petiolule, margin serrate to serrate-crenate, apex acuminate; primary veins (10–)12–14 on each side of midrib. Panicles terminal or lateral, 10–15 cm, densely flowered; bracts linear, glabrous or lanate. Flowers unisexual, ca. 3 mm, appearing after leaves. Staminate flowers: calyx campanulate, ca. 1 mm, teeth deltate; corolla white, lobes linear, equal to stamens, 6–7 mm. Pistillate flowers not seen. Samara spatulate, ca. 3 cm × 5 mm; wing densely scurfy hairy, decurrent to about middle of nutlet, apex rounded or retuse. Fl. May, fr. Jul–Oct.

\* Along rivers, dry rocky mountains; 1500–3500 m. Sichuan, Yunnan.

**6. *Fraxinus punctata*** S. Y. Hu, J. Arnold Arbor. 61: 86. 1980.

斑叶 ban ye qin

Shrubs or small trees. Branches stout; buds scurfy hairy. Leaves to 20 cm; petiole 3.5–6 cm; axis somewhat terete; leaflets 3–5(–7), terminal 1 larger, with petiolule ca. 3 cm; leaflet blade broadly ovate, 8.5–12 × 4–5(–7) cm, leathery, adaxially glabrous; base attenuate to cuneate, margin remotely crenate, apex long acuminate; primary veins 6–10 on each side of midrib. Panicles terminal. Calyx

shallowly cupular, ca. 2 mm; teeth deltate. Samara spatulate, 2.5–3 cm × ca. 5 mm. Fr. Sep.

\* Mixed woods on slopes; 1000–1500 m. Hubei

Doubtfully specifically distinct from *Fraxinus trifoliolata*.

**7. *Fraxinus sikkimensis*** (Lingelsheim) Handel-Mazzetti, Symb. Sin. 7: 1004. 1936.

锡金 xi jin qin

*Fraxinus paxiana* Lingelsheim var. *sikkimensis* Lingelsheim, Bot. Jahrb. Syst. 40: 214. 1907; *F. suaveolens* W. W. Smith.

Trees ca. 17 m tall. Branchlets nearly 4-angled, brown tomentose to glabrescent. Leaves 25–35 cm; petiole ca. 10 cm; axis subterete; leaflets 7–9; petiolule 1–2 mm or absent, densely rusty tomentose; leaflet blade lanceolate, 5.5–12 × 2–4.5 cm (terminal larger), papery to leathery, abaxially densely felty, villose at vein axils, base broadly cuneate or blunt, sparsely serrate, apex acuminate or long acuminate; primary veins 10–12(–18) on each side of midrib, abaxially raised. Panicles terminal or lateral, 15–30 cm, lax; bracts absent. Flowers unisexual, appearing after leaves. Pedicel 3–5 mm. Calyx cupular, ca. 1 mm, shallowly toothed. Staminate flowers: corolla lobes oblong-linear, ca. 3 mm; stamens exceeding lobes. Pistillate flowers: corolla lobes caducous. Samara spatulate, 3–3.5 cm × 4–6 mm; wing decurrent to middle of nutlet. Fl. May, fr. Jul–Oct.

Forests by river valleys, 2000–2800 m. Sichuan, Xizang, Yunnan [India (Assam), Sikkim].

**8. *Fraxinus depauperata*** (Lingelsheim) Z. Wei, Fl. Reipubl. Popularis Sin. 61: 19. 1991.

疏花 shu hua qin

*Fraxinus paxiana* Lingelsheim var. *depauperata* Lingelsheim in Engler, Pflanzenr. IV. 243 (Heft 72): 22. 1920.

Trees ca. 5 m. Branchlets puberulent, later glabrescent; buds ovoid, densely brown tomentose. Leaves 15–25 cm; petiole 5–6 cm; axis sparsely brown tomentose; leaflets 3–5(–7); petiolule 1–2 mm, sparsely crisped hairy; leaflets blade ovate-lanceolate or elliptic, 5–12 × 2–4 cm (terminal larger, basal pair smaller), papery, abaxially sparsely crisped hairy along midrib, base blunt or broadly cuneate, slightly irregularly coarse serrate, apex long acuminate; primary veins 10–12 on each side of midrib. Panicles terminal and lateral, 8–12 cm, lax. Flowers unisexual, appearing after leaves. Pedicel 4–5 mm. Calyx campanulate, ca. 1.5 mm, teeth sharp triangular, longer than tube. Staminate flowers: corolla white, lobes linear, ca. 3 mm, caducous; stamens exceeding lobes. Samara oblanceolate-linear, ca. 3.5 cm × 6 mm; wing decurrent to above middle of nutlet. Fl. May, fr. Jul–Sep.

\* Mixed woods on slopes, 400–1100 m. Hubei, Hunan, Shaanxi.

**9. *Fraxinus paxiana*** Lingelsheim, Bot. Jahrb. Syst. 40: 213. 1907.

秦岭 qin ling qin

Trees up to 20 m. Branchlets nearly 4-angled, glabrous to tomentose; buds broadly ovoid, scurfy to tomentose, becoming dark brown when dry. Leaves 25–35 cm; petiole 5–10 cm; axis grooved to subterete, glabrous or pilose; leaflets 7–9; petiolule 0–2 mm, sparingly to densely tomentose; leaflet blade lanceolate to ovate-oblong, 5–18 × 2–6 cm, papery, glabrous or villous along veins abaxially, base rounded to attenuate, margin crenate, apex acuminate; primary veins 2–16 on each side of midrib. Panicles terminal and lateral, 8–20 cm, lax. Flowers polygamodioecious, appearing after leaves. Pedicel ca. 2 mm. Calyx cupular, membranous, 1–1.5 mm; teeth truncate or broadly deltate. Corolla white; lobes linear-spatulate, ca. 3 mm. Stamens of staminate flowers equal to or slightly longer than corolla lobes, those of bisexual flowers exceeding corolla lobes. Samara linear-spatulate, 2.5–3 cm × ca. 4 mm; wing decurrent to upper part of nutlet. Fl. May–Jul, fr. Sep–Oct.

\* Slopes, forests in valleys; 400–1100 m. Hubei, Hunan, Shaanxi.

*Fraxinus depauperata* and *F. sikkimensis* are very similar to *F. paxiana*, and further studies may show that they are conspecific.

**10. *Fraxinus floribunda*** Wallich in Roxburgh, Fl. Ind. 1: 150. 1820.

多花 duo hua qin

Trees to ca. 25 m. Buds densely brown tomentose. Leaves 15–30 cm; petiole 5–8 cm; leaflets 7–9; petiolule 0.5–1.5 cm; leaflet blade ovate-lanceolate to elliptic, 8–12(–15) × (1–)2–4(–6) cm, thin leathery, adaxially glabrous, abaxially glabrous or pilose along midrib, base broadly cuneate, oblique, margin serrate, serrulate, or basally entire, apex caudate-acuminate; primary veins 10–12 on each side of midrib. Panicles terminal, spreading, many flowered, 20–30 cm. Flowers appearing after leaves. Pedicel 3–4 mm. Calyx cupular, 1–1.5 mm; teeth broadly deltate. Corolla white; lobes oblong, (1.5–)3–4 mm, obtuse. Stamens exceeding corolla lobes. Samara linear, 2–4 cm 4–5 mm; wing decurrent to about middle or distal part of nutlet. Fl. Feb–Apr, fr. Jul–Oct.  $2n = 46$ .

Dense forests, mixed woods of valleys, roadsides; sea level to 2600 m. Guangdong, Guangxi, Guizhou, Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Japan (Ryukyu Islands), Kashmir, Laos, Myanmar, Nepal, Thailand, Vietnam].

The differences between *Fraxinus floribunda* and each of *F. insularis*, *F. odontocalyx*, and *F. stylosa* are so minor that further studies may show that the last three are synonyms of *F. floribunda*.

**11. *Fraxinus insularis*** Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 86. 1889.

苦枥木 ku li mu

*Fraxinus championii* Little; *F. floribunda* subsp.

*insularis* (Hemsley) S. S. Sun; *F. insularis* var. *henryana* (Oliver) Z. Wei; *F. retusa* Champion ex Benthams; *F. retusa* var. *calcicola* C. Y. Wu ex P. Y. Bai; *F. retusa* var. *henryana* Oliver; *F. taiwaniana* Masamune.

Trees 20–30 m. Buds narrowly conical, densely dark-brown tomentose, becoming shiny when dry; branchlets compressed when young. Leaves 10–30 cm; petiole 5–8 cm; leaf axis adaxially plane; leaflets 3–5(–7); petiolule (0.5–)1–1.5 cm; leaflet blade oblong, elliptic-lanceolate, or lanceolate, 6–9(–13) × 2–3.5(–4.5) cm, papery becoming lathery, glabrous, base cuneate or blunt, serrate or entire below the middle, apex acute, acuminate, to caudate; primary veins 7–11 on each side of midrib. Panicles terminal or terminal and lateral, 20–30 cm, many flowered. Flowers appearing after leaves. Pedicel filiform, ca. 3 mm. Calyx campanulate, ca. 1 × 1.5 mm; teeth truncate. Corolla white; lobes spatulate, ca. 2 mm. Stamens longer than corolla lobes. Samara red to brown, long spatulate, 2–4 cm × 3.5–4.5 mm; wing decurrent to upper part of nutlet. Fl. Apr–May, fr. Jul–Sep.

Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan (Kyushu, Okinawa)].

**12. *Fraxinus odontocalyx*** Handel-Mazzetti ex E. Peter, Oesterr. Bot. Z. 90: 125. 1941.

尖萼 jian e qin

*Fraxinus huangshanensis* S. S. Sun; *F. nanchuanensis* S. S. Sun & J. L. Wu.

Trees 10–20 m, subglabrous. Branchlets terete, scabrous. Leaves in whorls of 3 at branch tips; petiole 4–5 cm; axis adaxially with ridges expanding into narrow wings; leaflets 7–11(–13); petiolule 5–12 mm; leaflet blade ovate, lanceolate, or narrowly lanceolate, 2.5–8(–12) × 1.5–4 cm, papery, adaxially glabrous, abaxially with dense minute glandular dots, sometimes puberulent along midrib, base cuneate, attenuate to petiolule, margin irregularly deltate dentate, apex acuminate or long acuminate; primary veins 10–14 on each side of midrib. Cymose panicles lateral at branches of previous year, ca. 5 cm. Flowers polygamous, appearing before leaves, opposite or in whorls of 3; without calyx and corolla. Samara oblanceolate, 3–5 cm × 5–8 mm; wing decurrent to base of nutlet, strongly twisted. Fl. Apr–Jun, fr. Jul–Oct.  $2n = 46$ .

\* On open fields of mountainous regions, roadsides; 800–2400 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Shaanxi, Sichuan, Zhejiang.

**13. *Fraxinus stylosa*** Lingelsheim in Engler, Pflanzenr. IV. 243(Heft 72): 23. 1920.

宿柱 shu zhu qin

*Fraxinus fallax* Lingelsheim; *F. fallax* var. *stylosa* (Lingelsheim) Chun & J. L. Wu.

Trees up to 8 m. Branchlets and leaf axis straight and smooth; buds ovoid, dark brown, shiny when dry. Leaves 6–15 cm; petiole 2–5 cm; leaflets 3–5; petiolule 2–3 mm, glabrous; leaflet blade ovate-lanceolate to broadly lanceolate, 3.5–8 ×

0.8–2 cm, papery, glabrous or white puberulent along veins abaxially, base broadly cuneate, tapered to petiolule, sometimes blunt, margin serrulate, apex long acuminate; primary veins 8–10 on each side of midrib. Panicles terminal or lateral, 8–10(–14) cm, loose. Flowers appearing after leaves. Pedicel ca. 3 mm. Calyx cupular, ca. 1 mm; teeth narrowly triangular. Corolla yellowish; lobes linear-lanceolate, blunt, ca. 2 mm. Staminate flowers with stamens slightly longer than corolla lobes. Pistillate flowers not seen. Samara oblanceolate, 1.5–2(–3.5) cm × 2.5–3(–5) mm; wing decurrent to above middle of nutlet. Fl. May, fr. Sep.

\* Mixed woods on slopes, 1300–3200 m. Gansu, Henan, Shaanxi, Sichuan.

**14. *Fraxinus sieboldiana*** Blume, Ann. Mus. Bot. Lugduno-Batavi 1: 311. 1850.

庐山 lu shan qin

*Fraxinus mariesii* J. D. Hooker.

Trees 5–8 m. Branchlets and leaf rachis puberulent and scurfy hairy; buds ovoid, yellowish tomentose, becoming black. Leaves 7–15 cm; petiole purple, 2–3 cm, puberulent; leaflets 3–5(–7), sessile or with petiolule ca. 5 mm; leaflet blade ovate to lanceolate, 2.5–8 × 1.5–4.5 cm (terminal one largest), papery to thin leathery, glabrous or densely white pubescent along midrib abaxially, base blunt or attenuate, margin entire or serrate over middle, apex acute or acuminate; primary veins 7–10 on each side of midrib. Panicles terminal or lateral, 7–12 cm, many flowered, congested. Flowers polygamous, appearing after leaves. Staminate flowers: calyx inconspicuous; corolla white to yellowish, lobes linear-lanceolate, 3–5 mm, acute. Bisexual flowers with shorter corolla lobes. Samara purple, linear or linear-spatulate, ca. 2.5 cm × 4 mm, usually red glandular dotted and scurfy hairy; wing decurrent to middle of nutlet, apex rounded or retuse. Fl. May–Jun, fr. Sep.

Woods on slopes and by streams in ravines; 500–1200 m. Anhui, Fujian, Jiangsu, Jiangxi, Zhejiang [Japan].

**15. *Fraxinus bungeana*** A. de Candolle, Prodr. 8: 275. 1844.

小叶 xiao ye qin

*Fraxinus bungeana* var. *parvifolia* Wenzig; *F. parvifolia* (Wenzig) Lingelsheim.

Trees or shrubs 2–5 m. Branchlets puberulent, sometimes densely so, gradually glabrescent; terminal bud conical, lateral ones broadly ovoid. Leaves 5–15 cm; petiole 1.5–4.5 cm; axis finely puberulent; leaflets 5–7; petiolule 0.2–1.5 cm, pubescent; leaflet blade broadly ovate, rhomboid to ovate, broadly lanceolate, or elliptic, 2–5 × 1.5–3 cm, papery, glabrous, base broadly cuneate, margin deeply serrate to incised, apex caudate; primary veins 4–6 on each side of midrib. Panicles terminal or lateral, 5–9 cm, sparsely to sometimes densely puberulent. Flowers polygamous, appearing after leaves. Pedicel ca. 3 mm. Staminate flowers: calyx cupular, 0.5 mm, teeth irregular, small; corolla white to yellowish, lobes linear, 4–6 mm. Bisexual flowers: calyx teeth subulate, larger; corolla lobes 6–8 mm. Samara spatulate-oblong, 2–3 cm × 3–5 mm; wing

decurrent to lower part of nutlet. Fl. May, fr. Aug–Sep.  $2n = 46$ .

\* Dry sandy soils, rock crevices; sea level to 1500 m. Anhui, Hebei, Henan, Liaoning, Shandong, Shanxi.

The bark is used as an astringent, antidiarrheal, and antiphlogistic.

**16. *Fraxinus chinensis*** Roxburgh, Fl. Ind. 1: 150. 1820.

白蜡树 bai la shu

Trees 3–20 m. Branchlets glabrous, sparsely villous puberulent or tomentose; buds broadly ovoid or conical, brown tomentose, pubescent or glandular hairy. Leaves 12–35 cm; petiole 3–9 cm; axis puberulent or pilose at first, leaflet joint glabrous or densely tomentose; leaflets 3–7(–9); petiolule 2–15 mm; leaflet blade broadly ovate, ovate, to lanceolate or elliptic to obovate-lanceolate, 4–16 × 2–7 cm (terminal much larger), papery to somewhat leathery, glabrous or villous, sometimes villous only along veins abaxially, base blunt or cuneate, margin regularly serrate to crenate-serrate, sometimes entire in lower half, apex acute to long acuminate or caudate; primary veins 5–10 on each side of midrib. Panicles terminal or lateral, 5–10 cm. Flowers dioecious, opening with leaves. Staminate flowers congested; calyx cupular, 1–1.5 mm; corolla absent. Pistillate flowers lax; calyx tubular, 2–3 mm. Samara spatulate to very narrowly so, 2.5–4 cm 3–7(–15) mm; wing decurrent to middle or lower part of nutlet.

Slopes, along rivers, roadsides, mixed woods; 800–2300 m. China [Japan, Korea, Russia, Vietnam].

*Fraxinus chinensis*, *F. rhynchophylla*, and *F. szaboana*, which have been recognized as distinct species in most of the Chinese literature, are here recognized as one species.

- 1a. Terminal leaflets 2–4(–6) cm broad, ovate, ovate-lanceolate, to lanceolate or elliptic to ovate-oblong, short to long acuminate, margin distinctly serrate ..... 16a. subsp. *chinensis*
- 1b. Terminal leaflets (2.5–)3.5–5(–7) cm broad, usually broadly ovate to elliptic, sometimes ± lanceolate, short acuminate to acuminate or caudate, margin crenate-serrate ..... 16b. subsp. *rhynchophylla*

**16a. *Fraxinus chinensis* subsp. *chinensis***

白蜡树(原亚种) bai la shu (yuan ya zhong)

*Fraxinus caudata* J. L. Wu; *F. chinensis* var. *acuminata* Lingelsheim; *F. chinensis* var. *rotundata* Lingelsheim; *F. chinensis* var. *tomentosa* Lingelsheim; *F. lingelsheimii* Rehder; *F. medicinalis* S. S. Sun; *F. rhynchophylla* Hance var. *huashanensis* J. L. Wu & Z. W. Xie; *F. sargentiana* Lingelsheim; *F. szaboana* Lingelsheim; *F. velutina* Lingelsheim (1907), not Torrey (1848); *F. yunnanensis* Lingelsheim.

Leaflets (3–)5–7(–9), ovate, ovate-lanceolate, to lanceolate or elliptic to obovate-oblong, terminal leaflet (4–)7–10 (–12) × 2–4(–6) cm, villous beside basal part of midrib abaxially, rarely tomentose or almost glabrous, margin

distinctly serrate, apex short to long acuminate; primary veins 6–12 on each side of midrib. Samara spatulate to very narrowly so, 3–3.5(–4) cm × 3.5–7(–15) mm. Fl. Apr–May, fr. Jul–Sep.

Mixed woods in montane regions; 800–2300 m. Throughout China [Korea, Vietnam].

A variable subspecies, cultivated for a long time in China for leaves to feed a species of scale insects that secretes commercial candle wax.

**16b. *Fraxinus chinensis* subsp. *rhynchophylla*** (Hance) E. Murray, *Kalmia* 13: 6. 1983.

花曲柳 hua qu liu

*Fraxinus rhynchophylla* Hance, *J. Bot.* 7: 164. 1869; *F. chinensis* var. *rhynchophylla* (Hance) Hemsley; *F. hopeiensis* Tang; *F. japonica* Blume ex K. Koch.

Leaflets 3–7, terminal leaflet broadly ovate to elliptic, sometimes ± lanceolate, (4–)5–9(–12) × (2.5–)3.5–5(–7) cm, villous to tomentose beside basal part of midrib abaxially, sometimes brownish, margin crenate-serrate, apex short acuminate to acuminate or caudate; primary veins (5 or)6–9 on each side of midrib. Samara narrowly to very narrowly spatulate, 2.5–4 cm × 4.5–7 mm. Fl. Apr–May, fr. Sep–Oct.

Slopes, along rivers, roadsides; below 1500 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Shaanxi, Shandong, Shanxi [Japan, Korea, Russia].

The wood is used for cabinet making.

**17. *Fraxinus baroniana*** Diels, *Bot. Jahrb. Syst.* 36(Beibl. 82): 86. 1905.

狭叶 xia ye qin

Shrubs or small trees to 4 m. Branchlets smooth. Leaves 12–18(–20) cm; petiole 2–3 cm; axis broadly grooved; leaflets 7–9; petiolule 3–5 mm; leaflet blade narrowly lanceolate, (3.5–)5–8(–10) × 1–1.8(–2.2) cm, leathery, adaxially glabrous, abaxially white or yellow barbate along base of midrib, long acuminate at both ends, margin regularly and remotely serrate; primary veins 8–12 on each side of midrib. Panicles terminal or lateral, 8–12 cm, lax. Flowers dioecious, opening with leaves. Pedicel 2–3 mm. Calyx campanulate, ca. 1.5 mm; teeth deltate, membranous. Corolla absent. Samara linear-spatulate, 1.8–2.5 cm × 4–5 mm; wing decurrent to upper part of nutlet. Fl. Apr, fr. May–Jul.

\* Thickets on slopes, along streams and rivers; 700–1300 m. Gansu, Shaanxi, Sichuan.

**18. *Fraxinus xanthoxyloides*** (G. Don) A. de Candolle, *Prodr.* 8: 275. 1884.

椒叶 jiao ye qin

*Ornus xanthoxyloides* G. Don, *Gen. Hist.* 4: 57. 1837.

Shrubs or small trees to 7 m. Branchlets terete and smooth. Leaves 8–12 cm, sometimes only 2 cm on shrubby twigs; petiole 1–1.5 cm; axis with winged ridges; leaflets (5–)7–11(–13), sessile or subsessile; leaflet blade ovate-lanceolate or narrowly elliptic, (0.5–)3–4(–5.5) × 0.5–1.5 cm, subleathery,

glabrous except for white puberulent abaxial base of midrib, base cuneate, slightly oblique, margin crenate, lower part entire, apex obtuse or acute; primary veins ca. 4 on each side of midrib. Cymose panicles lateral at branches of previous year, ca. 5 mm. Flowers polygamous, appearing before leaves. Corolla absent. Staminate flowers without calyx. Bisexual flowers with a minute, cupular calyx persistent in fruit. Samara oblong-linear, 3–5 cm × ca. 5 mm; wing decurrent to lower part of nutlet. Fl. Apr, fr. Oct.  $2n = 46$ .

Dry slopes in valleys; 1000–2800 m. Xizang [Afghanistan, India, Kashmir, Pakistan; N Africa].

**19. *Fraxinus hupehensis*** Ch'ü, Shang, & Su, *Acta Phytotax. Sin.* 18: 366. 1980.

湖北 hu bei qin

Trees to 19 m. Branchlets glabrous or puberulent, turning into thorns when old. Leaves 7–15 cm; petiole ca. 3 cm; axis narrowly winged; leaflets 7–9(–11); petiolule 3–4 mm, puberulent; leaflet blade lanceolate to ovate-lanceolate, 1.7–5 × 0.6–1.8 cm, leathery, adaxially glabrous, abaxially pubescent along base of midrib, base cuneate, margin sharply serrate, apex acuminate; primary veins 6 or 7 on each side of midrib. Cymose panicles lateral at branches of previous year, ca. 1.5 cm. Flowers polygamous, congested, fascicled, appearing before leaves. Corolla absent. Staminate flowers with campanulate calyx. Bisexual flower with minute calyx and truncate calyx teeth. Samara spatulate, 4–5 cm × 5–8 mm. Fl. Feb–Mar, fr. Sep.

\* Hills; 100–600 m. Hubei.

**20. *Fraxinus platypoda*** Oliver, *Hooker's Icon. Pl.* 20: t. 1929. 1890.

象蜡树 xiang la shu

*Fraxinus inopinata* Lingelsheim; *F. spaethiana* Lingelsheim.

Trees to 28 m. Branchlets puberulent or glabrous. Leaves 10–25(–30) cm; petiole 5–6 cm, dilated and semiamplexicaul at base; axis densely pubescent, glabrescent; leaflets 7–11, sessile or subsessile; leaflet blade oblong-elliptic, (4–)6–14 × (1–)2–3.5 cm, thin leathery, adaxially glabrous, densely yellowish villous along midrib abaxially or glabrescent, base blunt or broadly cuneate, slightly oblique, margin obscurely serrulate, apex acuminate to short acuminate; primary veins 10–15 on each side of midrib. Cymose panicles lateral at branches of previous year, 12–15 cm. Flowers polygamodioecious, appearing before leaves. Corolla absent. Calyx of bisexual flowers campanulate, ca. 1.5 mm; teeth deltate. Samara oblong-elliptic, 4–6 cm × 7–10 mm; wing decurrent to base of nutlet. Fl. Apr–May, fr. Aug.

Mixed woods on slopes or in valleys; 1200–2800 m. Gansu, Guizhou, Hubei, Shaanxi, Sichuan, Yunnan [Japan].

**21. *Fraxinus mandschurica*** Ruprecht. *Bull. Phys. Math. Acad. Sci. Saint Pétersburg* 15: 371. 1857.

水曲柳 shui qu liu

*Fraxinus mandschurica* subsp. *brevipedicellata* S. Z. Qu

& T. C. Cui; *F. nigra* Marshall subsp. *mandschurica* (Ruprecht) S. S. Sun; *F. nigra* var. *mandschurica* (Ruprecht) Lingelsheim.

Trees to 30 m. Branchlets 4-angled, glabrous. Leaves 25–35(–40) cm; petiole 6–8 cm; axis with ridges sometimes subulate, leaflet joint brown curly hairy; leaflets 7–11(–13), subsessile; leaflet blade oblong to ovate-oblong, 5–20 × 2–5 cm, papery, adaxially glabrous or sparsely white hirsute, abaxially curly hairy along veins, especially denser at base of midrib, base cuneate to blunt, slightly oblique, margin serrulate, apex acuminate or caudate; primary veins 8–11 on each side of midrib. Panicles lateral at branches of previous year, 15–20 cm; staminate panicles congested; bisexual ones somewhat lax. Pedicel 3–5 mm in staminate panicles, longer in bisexual. Flowers polygamodioecious, appearing before leaves, without calyx and corolla. Samara oblong to obovate-lanceolate, 3–3.5(–4) cm 6–9 mm; wing decurrent to middle or base of nutlet, obviously twisted. Fl. Apr–Jun, fr. Aug–Sep.

Sparse woods on slopes, open valleys of montane regions; 700–2100 m. Gansu, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Shaanxi, Shanxi [Japan, Korea, E Russia].

*Fraxinus mandschurica* is quite similar to the North American *F. nigra*, and most authors, including P. S. Green, prefer to treat the former as a subspecies of the latter.

Important commercial timber.

**22. *Fraxinus sogdiana*** Bunge, Mem. Acad. Imp. Sci. St. Pétersbourg Divers Savana 7: 390. 1852.

天山 tian shan qin

Trees 10–20 m, subglabrous. Branchlets terete, scabrous. Leaves in whorls of 3 at branch tips; petiole 4–5 cm; axis adaxially with ridges expanding into narrow wings; leaflets 7–11(–13); petiolule 5–12 mm; leaflet blade ovate, lanceolate, or narrowly lanceolate, 2.5–8(–12) × 1.5–4 cm, papery, adaxially glabrous, abaxially with dense minute glandular dots, sometimes puberulent along midrib, base cuneate, attenuate to petiolule, margin irregularly deltate dentate, apex acuminate or long acuminate; primary veins 10–14 on each side of midrib. Cymose panicles lateral at branches of previous year, ca. 5 cm. Flowers polygamous, appearing before leaves, opposite or in whorls of 3; without calyx and corolla. Samara oblanceolate, 3–5 cm × 5–8 mm; wing decurrent to base of nutlet, strongly twisted. Fl. Apr–Jun, fr. Jul–Oct.  $2n = 46$ .

Along rivers, open deciduous forests; ca. 500 m. W Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].

### 3. FORSYTHIA Vahl, Enum. Pl. 1: 39. 1804.

连翘属 lian qiao shu

*Rangium* Jussieu.

Shrubs deciduous. Branches hollow or with lamellate pith; branchlets ± 4-angled. Leaves opposite, simple, rarely 3-parted to 3-foliolate, petiolate; leaf blade serrate or entire. Flowers appearing before leaves, bisexual, heterostylous, 1 to several fascicled in leaf axils, pedicellate. Calyx deeply 4-lobed, persistent. Corolla yellow, 4-parted; tube campanulate; lobes longer than tube, imbricate in bud. Stamens 2, inserted at base of corolla tube, scarcely exerted. Ovules many in each locule, pendulous. Style slender; stigma 2-cleft. Fruit a loculicidal capsule. Seeds numerous in each locule, slightly winged; endosperm absent; radicle erect.

About 11 species: mainly in eastern Asia, one in SE Europe; six species in China.

Most species are grown as ornamental shrubs for early spring. The fruit of some species are used medicinally.

- 1a. Branches hollow; calyx lobes (5–)6–7 mm; fruit stalk 7–20 mm.
  - 2a. Leaves serrate, simple or 3-parted to 3-foliolate ..... 1. *F. suspensa*
  - 2b. Leaves entire, all simple ..... 2. *F. mira*
- 1b. Branchlets with lamellate pith; calyx lobes not exceeding 5 mm; fruit stalk less than 7 mm.
  - 3a. Leaf margin serrate or dentate.
    - 4a. Leaf blade long elliptic to lanceolate, or long obovate-elliptic, glabrous ..... 3. *F. viridissima*
    - 4b. Leaf blade broadly ovate, elliptic, or suborbicular, abaxially hairy ..... 4. *F. mandschurica*
  - 3b. Leaf margin entire or sparsely and minutely serrate.
    - 5a. Leaf blade hairy or glabrous, entire or minutely serrate ..... 5. *F. giraldiana*
    - 5b. Leaf blade glabrous, entire ..... 6. *F. likiangensis*

**1. *Forsythia suspensa*** (Thunberg) Vahl, Enum. Pl. 1: 39. 1804.

连翘 lian qiao

*Ligustrum suspensum* Thunberg, Nov. Act. Soc. Sci. Upsal. 3: 207. 1780; *Forsythia fortunei* Lindley; *F. suspensa* var. *fortunei* (Lindley) Rehder; *F. suspensa* var. *latifolia*

Rehder; *F. suspensa* f. *pubescens* Rehder; *F. suspensa* var. *sieboldii* Zabel; *Rangium suspensum* (Thunberg) Ohwi; *Syringa suspensa* (Thunberg) Thunberg ex Murray.

Shrubs. Branches spreading or pendulous; branchlets yellow-brown or gray-brown; internodes hollow. Leaves simple, sometimes 3-parted to 3-foliolate; petiole 0.8–1.5 cm, glabrous or sometimes pubescent; leaf blade ovate, broadly



ovate, or elliptic-ovate, 2–10 × 1.5–5 cm, subleathery, glabrous or sometimes pubescent, or abaxially villous, especially along veins, base rounded to cuneate, margin serrate, apex acute. Flowers solitary or 2 to several in leaf axils. Pedicel 5–6 mm. Calyx lobes oblong, (5–)6–7 mm, ciliate. Corolla yellow; tube subequal to calyx lobes; lobes obovate-oblong or oblong, 1.2–2 cm. Pistil 5–7 mm in flowers with stamens 3–5 mm or ca. 3 mm in flowers with stamens 6–7 mm. Capsule ovoid to long ellipsoid, 1.2–2.5 cm × 6–12 mm, with scattered lenticels; stalk 0.7–1.5 cm. Fl. Mar–Apr, fr. Jul–Sep.

\* Thickets or grassy areas on slopes, valleys, gullies; 300–2200 m. Anhui, Hebei, Henan, Hubei, Jiangsu (cultivated), Shaanxi, Shandong, Shanxi, Sichuan.

The fruit are used as antipyretic and antidote. The plant is ornamental.

Because upright and pendulous branches are found on same plant, *Forsythia suspensa* var. *fortunei* does not merit recognition as a variety.

**2. Forsythia mira** M. C. Chang, Investig. Stud. Nat. 7: 16. 1987.

奇异连翘 qi yi lian qiao

Shrubs scandent, 1.2–3 m. Branchlets brownish, puberulent; internodes hollow. Leaves simple, puberulent; petiole 0.5–2 cm; leaf blade ovate-elliptic, elliptic, to lanceolate, 3–7.5 × 1–4 cm, subleathery, base cuneate to subrounded, margin entire, apex acute. Calyx lobes broadly lanceolate, ca. 5 mm, glabrous. Other flower parts not seen. Capsule solitary, broadly ovoid, 1.5–2 cm × 8–10 mm, with scattered lenticels; stalk 1.2–2 cm. Fr. Jun.

\* Roadsides, slopes. Shaanxi (Shanyang Xian).

**3. Forsythia viridissima** Lindley, J. Hort. Soc. London 1: 226. 1846.

金钟花 jin zhong hua

*Rangium viridissimum* (Lindley) Ohwi.

Shrubs glabrous except for calyx lobes. Branches upright, to 3 m; branchlets green or yellow-green; pith lamellate. Leaves simple; petiole 6–12 mm; leaf blade long elliptic to lanceolate or long obovate-elliptic, 3.5–15 × 1–4 cm, subleathery, base cuneate, margin serrate or entire along distal half, apex acute. Flowers 1–3(–4) in leaf axils. Pedicel 3–7 mm. Calyx lobes broadly ovate or elliptic, 2–4 mm, ciliate. Corolla deep yellow outside, tinged with orange-yellow stripes inside; tube 5–6 mm; lobes narrowly oblong, 0.6–1.8 cm, revolute. Pistil 5.5–7 mm in flowers with stamens 3.5–5 mm or ca. 3 mm in flowers with stamens 6–7 mm. Capsule ovoid, 1–1.5 cm × 6–10 mm, lenticellate; stalk 3–7 mm. Fl. Mar–Apr, fr. Aug–Nov.

\* Ravines, margin of woods near river valleys, streamsides. Anhui, Fujian, Hubei, Hunan, Jiangsu, Jiangxi, NW Yunnan, Zhejiang; widely cultivated in all parts except for S. China.

**4. Forsythia mandschurica** Uyeki, J. Chosen Nat. Hist. Soc. 9: 20. 1929.

东北连翘 dong bei lian qiao

*Rangium mandshuricum* (Uyeki) Uyeki & Kitagawa.

Shrubs ca. 1.5 m. Branchlets green at first, becoming gray-yellow, spreading, glabrous; pith lamellate. Leaves simple; petiole 5–13 mm, pilose or glabrescent; leaf blade broadly ovate, elliptic, or suborbicular, 5–12 × 3–7 cm, papery,

adaxially glabrous, abaxially pilose, base broadly cuneate, subtruncate to subrounded, margin serrate or dentate, apex caudate-acuminate or obtuse. Flowers solitary in leaf axils. Pedicel ca. 5 mm. Calyx lobes ovate-orbicular, 2–3 mm, ciliate. Corolla yellow; tube ca. 5 mm; lobes lanceolate, ca. 1.5 cm, obtuse or retuse. Stamens 2–3 mm. Pistil 3.5–5 mm. Capsule long ovoid, 7–10 × 4–5 mm, obscurely lenticellate; stalk ca. 5 mm.  $2n = 42$ . Fl. May, fr. Sep.

\* Slopes. Liaoning (Jiguan Shan).

*Forsythia mandshurica* is a triploid hybrid that produces abortive seeds. One of its putative parents is probably *F. ovata* Nakai.

**5. *Forsythia giraldiana*** Lingelsheim, Jahresb. Schles. Ges. Vaterl. Cult. 2b (Zool.-bot. Sekt.): 1. 1908.

秦连翘 qin lian qiao

Shrubs. Branches upright, 1–3 m; branchlets brownish, glabrous; pith lamellate. Leaves simple; petiole 5–10 mm, pilose or glabrous; leaf blade long elliptic, ovate to lanceolate, or obovate-elliptic, 3.5–12 × 1.5–6 cm, subleathery, adaxially glabrous or pubescent, abaxially densely villous to glabrous, base cuneate to subrounded, margin entire or sparsely and minutely serrate, apex caudate-acuminate or acute. Flowers 1–3 in leaf axils; pedicellate. Calyx lobes tinged with purple, ovate-deltate, 3–4 mm, ciliate. Corolla yellow; tube 4–6 mm; lobes narrowly oblong, 0.7–1.5 cm. Pistil ca. 3 mm in flowers

with stamens 5–6 mm or 5–7 mm in flowers with stamens 3–5 mm. Capsule ovoid or lanceolate-ovoid, 0.8–1.8 cm × 4–10 mm, with obscure or sparse lenticels; stalk 2–5 mm. Fl. Mar–May, fr. Jun–Oct.  $2n = 28^*$ .

\* Woods on slopes, stone crevices in ravines, flood lands; 800–3200 m. SE Gansu, W Henan, Shaanxi, NE Sichuan.

**6. *Forsythia likiangensis*** Ching & Feng ex P. Y. Bai, Acta. Bot. Yunnan. 5: 178. 1983.

丽江连翘 li jiang lian qiao

Shrubs glabrous except for calyx lobes. Branches 1–3 m; branchlets brownish; pith lamellate. Leaves simple; petiole 5–10 mm; leaf blade ovate to long elliptic, 2–9 × 1–3.5 cm, subleathery, base cuneate or subrounded, margin entire, apex acute to caudate-acuminate. Flowers solitary in leaf axils. Pedicel 1–4 mm. Calyx lobes broadly ovate, 1.5–3 mm, ciliate. Corolla yellow outside, red striped inside; tube 5–6 mm; lobes oblong or elliptic, ca. 1 cm, blunt. Stamens slightly longer than corolla tube. Pistil shorter than stamens. Capsule ovoid, 8–10 × 5–8 mm, obscurely lenticellate; stalk 2–4 mm. Fl. Apr–May, fr. Jun–Oct.

\* Mixed forests in montane regions. Sichuan (Muli Xian), NW Yunnan.

#### 4. SYRINGA Linnaeus, Sp. Pl. 1: 9. 1753.

丁香属 ding xiang shu

Shrubs or small trees, deciduous. Branchlets terete or 4-angled; pith solid; winter buds scaly, terminal buds often absent. Leaves opposite, simple or rarely pinnate, petiolate; leaf blade entire, pinnatisect or occasionally lobed. Inflorescences paniculate, terminal or lateral, generally composed of small cymes. Flowers bisexual, sessile or pedicellate. Calyx campanulate, regularly or irregularly 4-toothed or subtruncate, persistent. Corolla funnelform, salverform, or rotate; lobes 4, spreading or upright, valvate, usually cucullate and beaked at apex. Stamens 2, included or exerted. Ovules 2 in each locule, pendulous. Style filiform, shorter than stamens; stigma 2-cleft. Fruit a loculicidal capsule, slightly compressed. Seeds 2 in each locule, flat, narrowly winged; endosperm present; radicle erect.

About 20 species: Afghanistan, India, Japan, Kashmir, Korea, Nepal, Pakistan, Sikkim; SW Asia, SE Europe; 16 species in China.

Most species of *Syringa* are cultivated as ornamental plants, a few are medicinal.

- 1a. Corolla tube as long as calyx or slightly longer; filament exerted from corolla tube; corolla white or cream colored ..... 16. *S. reticulata*
- 1b. Corolla tube 2.5–8 × longer than calyx; anthers wholly or partly included, occasionally exerted.
- 2a. Panicles terminal, or terminal and lateral.
- 3a. Anthers entirely exerted from corolla tube; flowers white ..... 1. *S. tibetica*
- 3b. Anthers wholly or partly included in corolla tube; flowers red, purple, lilac, pink, or sometimes white.
- 4a. Leaf blade abaxially glabrous ..... 2. *S. yunnanensis*
- 4b. Leaf blade abaxially ± hairy.
- 5a. Corolla tube funnelform, gradually enlarged above middle; corolla lobes usually upright.
- 6a. Panicles nodding to pendulous; fruit ripening reflexed, smooth or sparsely lenticellate ..... 3. *S. komarowii*
- 6b. Panicles erect; fruit ripening not reflexed, smooth ..... 4. *S. wolfii*
- 5b. Corolla tube subcylindric; corolla lobes spreading, if tube slightly funnelform, then lobes not upright.

- 7a. Anthers usually inserted below mouth of corolla tube; leaf blade 1.5–4(–8) × 1–3(–5) cm ..... 7. *S. sweginzowii*
- 7b. Anthers inserted near mouth of corolla tube or slightly protruding; leaf blade 2.5–11(–18) × 1.5–6(–11) cm.
- 8a. Panicles compact, 5–13 cm; corolla tube subcylindric ..... 5. *S. villosa*
- 8b. Panicles loose, 10–25 cm; corolla tube slightly funnelform ..... 6. *S. tomentella*
- 2b. Panicles lateral; terminal buds absent.
- 9a. Leaves pinnately compound, pinnatisect, or lobed.
- 10a. Leaves mostly pinnatisect or lobed, sometimes entire ..... 14. *S. protolaciniata*
- 10b. Leaves pinnately compound, with 7–11(–13) leaflets ..... 15. *S. pinnatifolia*
- 9b. Leaves all entire.
- 11a. Leaf blade base with 2 pairs of veins ± palmately arranged ..... 9. *S. meyeri*
- 11b. Leaf blade with ± pinnate lateral veins, the 2 lowest pairs of veins not closely adjacent.
- 12a. Leaves as broad as long or slightly broader than long.
- 13a. Leaves 1–2 cm broad, almost circular ..... 12. *S. wardii*
- 13b. Leaves 3–8(–15) cm broad, ovate-orbicular to subreniform ..... 13. *S. oblata*
- 12b. Leaves usually manifestly longer than broad, sometimes almost as broad as long.
- 14a. Leaf base truncate to broadly cuneate; corolla lobes 5–8(–10) mm ..... 13. *S. oblata*
- 14b. Leaf base cuneate to subrounded; corolla lobes 2–5 mm.
- 15a. Anthers purple or purple-black; fruit clearly lenticellate; petiole 5–20 mm (sometimes less than 5 mm) ..... 8. *S. pubescens*
- 15b. Anthers yellow; fruit obscurely lenticellate; petiole 2–7 mm.
- 16a. Leaves 2–9 × 2–5 cm, densely villous abaxially ..... 10. *S. mairei*
- 16b. Leaves 1.5–2.5(–4) × 0.8–2(–3) cm, glabrous abaxially, except for a pilose midrib and primary veins ..... 11. *S. pinetorum*

**1. *Syringa tibetica*** P. Y. Bai, Acta Bot. Yunnan. 1: 151. 1979.

藏南丁香 *zang nan ding xiang*

Trees 2.5–4 m, densely pubescent. Petiole 1–1.3 cm; leaf blade oblong or oblong-elliptic, 7–10 × 3.5–5 cm, adaxially subglabrous except along veins or sparsely pubescent, abaxially densely pubescent or pubescent only along veins, base cuneate to subrounded, apex acute or short acuminate. Panicles terminal, 7–13 cm. Pedicel 1–2 mm. Calyx 2–3 mm. Corolla white; tube 5–7 mm; lobes lanceolate, reflexed. Anthers yellow, entirely exerted from corolla tube. Capsule not seen. Fl. Jun.

\* Margins of woods; 2900–3200 m. Xizang (Jilong Xian).

**2. *Syringa yunnanensis*** Franchet, Rev. Hort. 1891: 308. 1891.

云南丁香 *yun nan ding xiang*

*Syringa yunnanensis* var. *pubicalyx* Jien ex P. Y. Bai; *S. yunnanensis* f. *pubicalyx* (Jien ex P. Y. Bai) M. C. Chang.

Shrubs 2–5 m. Branchlets terete or slightly 4-angled, usually glabrous. Petiole 0.5–2 cm, glabrous; leaf blade elliptic, elliptic-lanceolate, to oblanceolate, 2–8(–13) × 1–3.5(–5.5) cm, glabrous or abaxially rarely pubescent along veins, base cuneate or rarely subrounded, apex acute or short acuminate. Panicles erect, terminal, 5–18 × 3–12 cm; rachis and pedicel puberulent or rarely lanose. Pedicel 0.5–1.5 mm. Calyx 1–2.5 mm, glabrous or rarely lanose. Corolla white to lilac-red, 0.7–1.2(–1.7) cm; tube funnelform, 5–8(–13) mm; lobes oblong, spreading. Anthers yellow, usually inserted up to 2 mm

from mouth of corolla tube. Capsule oblong, 1.2–1.7 cm, slightly lenticellate. Fl. May–Jun, fr. Sep.  $2n = 48$ .

\* Thickets, woods on slopes, gullies; 2000–3900 m. SW Sichuan, SE Xizang, NW Yunnan.

Plants with glabrous calyces and puberulent inflorescence rachis have been recognized as f. *yunnanensis*, whereas those with lanate calyces and rachis as f. *pubicalyx*.

**3. *Syringa komarowii*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 9: 82. 1910.

西蜀丁香 *xi shu ding xiang*

Shrubs 1.5–6 m. Branchlets terete, glabrous or pubescent. Petiole 1–3 cm; leaf blade ovate-oblong, oblong-lanceolate, elliptic, to elliptic-obovate, 5–19 × 1.5–7(–9) cm, adaxially glabrous or pubescent along midrib, abaxially pubescent or denser along veins, base cuneate, apex acute to long acuminate. Panicles terminal, nodding to pendulous, compact or lax, 4–25 × 3–13 cm; rachis, pedicel, and calyx densely pubescent to glabrous. Pedicel 0–1.5 mm. Calyx 2–3 mm. Corolla purple-red, red, to pale lilac outside, white inside, 1–2.2 cm; tube funnelform, 0.8–1.5(–2) cm; lobes ovate to ovate-oblong, spreading or usually upright. Anthers yellow, inserted to 2 mm from mouth of corolla tube or somewhat protruding. Capsule ripening usually reflexed, long elliptic, 1–1.5(–2) cm, smooth or sparsely lenticellate.

\* Thickets, woods, near rivers and gullies; 1000–3400 m. S Gansu, W Hubei, S Shaanxi, Sichuan, N Yunnan.

- 1a. Corolla dark colored, lobes mostly ± erect ..... 3a. subsp. *komarowii*

1b. Corolla pale colored, lobes usually spreading  
..... 3b. subsp. *reflexa*

**3a. *Syringa komarowii* subsp. *komarowii***

西蜀丁香 (原亚种) xi shu ding xiang (yuan ya zhong)

*Syringa glabra* (C. K. Schneider) Lingelsheim; *S. komarowii* var. *sargentiana* (C. K. Schneider) C. K. Schneider; *S. sargentiana* C. K. Schneider; *S. villosa* Vahl var. *glabra* C. K. Schneider.

Inflorescences usually ± compact. Corolla somewhat deep purple-red, red, to lilac-red outside; lobes mostly ± erect. Fl. May–Jul, fr. Jul–Oct.  $2n = 46^*$ , 48.

\* Thickets, woods, near rivers; 1000–3400 m. S Gansu, S Shaanxi, Sichuan, N Yunnan.

**3b. *Syringa komarowii* subsp. *reflexa* (C. K. Schneider) P. S. Green & M. C. Chang, Novon 5: 329. 1995.**

垂丝丁香 chui si ding xiang

*Syringa reflexa* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 9: 80. 1910; *S. komarowii* var. *reflexa* (C. K. Schneider) Jien ex M. C. Chang.

Inflorescences somewhat pyramidal, often interrupted. Corolla somewhat light red or pale lilac outside; lobes usually spreading. Fl. May–Jun, fr. Jul–Oct.  $2n = 46^*$ .

\* Woods near gullies; 1800–2900 m. W Hubei, NE Sichuan.

**4. *Syringa wolfii* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 9: 81. 1910.**

辽东丁香 liao dong ding xiang

*Syringa formosissima* Nakai; *S. formosissima* var. *hirsuta* (C. K. Schneider) Nakai; *S. hirsuta* (C. K. Schneider) Nakai; *S. hirsuta* var. *formosissima* (Nakai) Nakai; *S. robusta* Nakai; *S. robusta* var. *rupestris* Baranov & Skvortsov; *S. villosa* Vahl var. *hirsuta* C. K. Schneider; *S. wolfii* var. *hirsuta* (C. K. Schneider) Hatusima.

Shrubs to 6 m. Young branchlets green, becoming gray, glabrous or pubescent. Petiole 1–3 cm, glabrous or pubescent; leaf blade elliptic-oblong, elliptic, or obovate-oblong,  $3.5-12(-18) \times 1.5-7(-10)$  cm, adaxially glabrous or sparsely pubescent, abaxially villous, base cuneate to subrounded, apex usually acute to acuminate. Panicles erect, terminal, 5–30 3–18 cm; rachis, pedicel, and calyx villous or pubescent, occasionally subglabrous. Pedicel 0–2 mm. Calyx 2–3.5 mm. Corolla pale purple to purple-red, 1.2–1.8 cm; tube funnel-form, 1–1.4 cm; lobes oblong-ovate to ovate, upright or spreading. Anthers yellow, inserted near or slightly below mouth of corolla tube. Capsule oblong, (1–)1.2–1.7 cm, smooth. Fl. Jun, fr. Aug.  $2n = 46^*$ .

Mixed forests, thickets, woods, along rivers; 500–1600 m. Heilongjiang, Jilin, Liaoning [Korea, E Russia].

**5. *Syringa villosa* Vahl, Enum. Pl. 1: 38. 1804.**

红丁香 hong ding xiang

*Syringa bretschnideri* Lemoine; *S. emodi* Wallich ex G. Don *rosea* Cornu; *S. villosa* var. *rosea* Cornu ex Rehder.

Shrubs to 4 m, glabrous or puberulent to villous. Petiole 0.8–2.5 cm; leaf blade ovate, broadly elliptic, to obovate-oblong,  $4-11(-18) \times 1.5-6(-11)$  cm, adaxially glabrous, abaxially pilose or barbate only along veins, occasionally glabrous, base cuneate to subrounded, apex acute or short acuminate. Panicles erect, terminal, rather compact,  $5-13(-17) \times 3-10$  cm. Pedicel 0.5–1.5 mm. Calyx 2–4 mm. Corolla lilac-red, pink, to white, 1–2 cm; tube slender, subcylindric, 0.7–1.5 cm; lobes ovate to elliptic, spreading. Anthers yellow, inserted near mouth of corolla tube or slightly protruding. Capsule oblong, 1–1.5 cm, smooth or nearly so. Fl. May–Jun, fr. Sep.  $2n = 46^*$ , 48.

\* Near gullies, riversides, thickets; 1200–2200 m. Hebei, Shanxi.

**6. *Syringa tomentella* Bureau & Franchet, J. Bot. (Morot) 5: 103. 1891.**

毛丁香 mao ding xiang

*Syringa adamiana* I. B. Balfour & W. W. Smith; *S. alborosea* N. E. Brown; *S. rehderiana* C. K. Schneider; *S. tomentella* var. *rehderiana* (C. K. Schneider) Rehder; *S. wilsonii* C. K. Schneider.

Shrubs 1.5–7 m. Branchlets sparsely to densely pubescent. Petiole 0.8–1.5 cm, together with rachis, pedicel, and calyx pubescent, villous, or glabrescent; leaf blade ovate-lanceolate to elliptic-lanceolate, rarely ovate or obovate,  $2.5-11 \times 1.5-5$  cm, adaxially appressed pubescent or glabrous, abaxially hairy as on branchlets or barbate along veins, base cuneate to subrounded, apex acute to acuminate. Panicles erect, terminal or sometimes lateral, loose,  $10-25 \times 4-12$  cm. Pedicel 1–1.5 mm. Calyx 2.5–3 mm. Corolla lilac-red, pink, or white, 1–1.7 cm; tube slightly funnellform, 0.8–1.4 cm; lobes ovate to elliptic, spreading. Anthers yellow, reaching mouth of corolla tube or slightly protruding. Capsule oblong-elliptic, 1.2–2 cm, obviously lenticellate or smooth. Fl. Jun–Jul, fr. Sep.  $2n = 46, 48$ .

\* Woods on slopes, thickets of valley, along gullies; 2500–3500 m. W Sichuan.

**7. *Syringa sweginzowii* Koehne & Lingelsheim, Repert. Spec. Nov. Regni Veg. 8: 9. 1910.**

四川丁香 si chuan ding xiang

*Syringa tetanoloba* C. K. Schneider; *S. tigerstedtii* Harry Smith.

Shrubs 2.5–4 m. Branchlets 4-angled, glabrous. Petiole 0.5–2 cm, glabrous or pilose; leaf blade ovate, ovate-elliptic, to lanceolate,  $1.5-4(-8) \times 1-3(-5)$  cm, adaxially shining and glabrous, abaxially barbate along veins or glabrous, base cuneate to subrounded, margin tinged with purplish red when young, apex acute to acuminate. Panicles erect, terminal or lateral,  $7-25 \times 3-15$  cm; rachis generally 4-angled, including pedicel and calyx purple-brown, puberulent or glabrous. Pedicel 0–2 mm. Calyx 1.5–2 mm. Corolla pink, lilac, to white,

0.9–2 cm; tube slender, subcylindric, 0.6–1.5 cm; lobes ovate-oblong to lanceolate, spreading. Anthers yellow, inserted below or near mouth of corolla tube. Capsule long elliptic, 1.5–2 cm, smooth. Fl. May–Jun, fr. Sep–Oct.  $2n = 46, 48$ .

\* Thickets, woods, near riversides or gullies; 2000–4000 m. W Sichuan.

**8. *Syringa pubescens*** Turczaninow, Bull. Soc. Nat. Moscou 13: 73. 1840.

巧玲花 qiao ling hua

Shrubs 1–4 m. Branchlets 4-angled or subterete, along with petiole, rachis, pedicel, and calyx glabrous, puberulent, pilose or pubescent. Petiole 0.5–2 cm; leaf blade ovate, ovate-elliptic to lanceolate, or obovate to suborbicular, 1.5–8(–13) × 1–6 cm, adaxially glabrous, pilose, or pubescent, abaxially pilose, pubescent, villous, to glabrous, base cuneate to rounded, apex acute to caudate-acuminate or obtuse. Panicles erect, lateral, rarely terminal, 5–16 × 2.5–7 cm; rachis 4-angled or subterete. Flowers subsessile or short pedicellate. Calyx 1.5–2 mm. Corolla purplish red, purple, lilac, pink, to white, 0.8–1.8 cm; tube subcylindric or slightly funnelliform, 0.6–1.7 cm; lobes oblong or ovate, spreading. Anthers purple or purple-black, rarely yellow, inserted on corolla tube at or to 3 mm from mouth. Capsule long elliptic to oblong-lanceolate, 0.7–2 cm, obviously lenticellate.

Slopes, grasslands, woods, thickets, along rivers; 300–3400 m. Gansu, Hebei, Henan, W and NW Hubei, Jilin, Liaoning, S Ningxia, E Qinghai, Shaanxi, W Shandong, Shanxi, NE Sichuan [Korea].

- 1a. Branchlets and inflorescence rachis ± 4-angled.
  - 2a. Branchlets and inflorescence rachis distinctly 4-angled, usually glabrous; anthers inserted on corolla tube 1–3 mm from mouth ..... 8a. subsp. *pubescens*
  - 2b. Branchlets and inflorescence rachis slightly 4-angled, hairy; anthers inserted on corolla tube to 1 mm from mouth ..... 8b. subsp. *patula*
- 1b. Branchlets and inflorescence rachis subterete.
  - 3a. Calyx glabrous; anthers inserted on corolla tube to 1 mm from mouth ..... 8c. subsp. *julianae*
  - 3b. Calyx hairy; anthers inserted on corolla tube to 3 mm from mouth ..... 8d. subsp. *microphylla*

**8a. *Syringa pubescens* subsp. *pubescens***

巧玲花(原亚种) qiao ling hua (yuan ya zhong)

*Syringa wulingensis* Skvortsov & W. Wang.

Branchlets and inflorescence rachis distinctly 4-angled, usually glabrous. Anthers inserted on corolla tube 1–3 mm from mouth. Fl. May–Jun, fr. Jun–Aug.  $2n = 48$ .

\* Slopes, thickets of ravines, along rivers; 900–2100 m. Hebei, Henan, E Shaanxi, W Shandong, Shanxi.

**8b. *Syringa pubescens* subsp. *patula*** (Palibin) M. C. Chang & X. L. Chen, Investig. Stud. Nat. 10: 34. 1990.

关东巧玲花 guan dong qiao ling hua

*Ligustrum patulum* Palibin, Acta Hort. Petrop. 18: 156. 1900; *Syringa koehneana* C. K. Schneider; *S. palibiniana* Nakai; *S. patula* (Palibin) Nakai; *S. pubescens* var. *hirsuta* Skvortsov & W. Wang; *S. velutina* Komarov.

Branchlets and inflorescence rachis slightly 4-angled, usually puberulent or pubescent. Anthers inserted on corolla tube to 1 mm from mouth. Fl. May–Jul, fr. Aug–Oct.  $2n = 46$ .

Grasslands, woods; 300–1200 m. Jilin (Changbai mountain area), Liaoning [Korea].

**8c. *Syringa pubescens* subsp. *julianae*** (C. K. Schneider) M. C. Chang & X. L. Chen, Investig. Stud. Nat. 10: 34. 1990.

光萼巧玲花 guang e qiao ling hua

*Syringa julianae* C. K. Schneider, Ill. Handb. Laubh. 2: 777. 1911; *S. verrucosa* C. K. Schneider.

Branchlets and inflorescence rachis subterete. Calyx purple, glabrous. Anthers inserted on corolla tube to 1 mm from mouth. Fl. May–Jun, fr. Oct.

\* NW Hubei.

**8d. *Syringa pubescens* subsp. *microphylla*** (Diels) M. C. Chang & X. L. Chen, Investig. Stud. Nat. 10: 34. 1990.

小叶巧玲花 xiao ye qiao ling hua

*Syringa microphylla* Diels, Bot. Jahrb. Syst. 29: 531. 1900; *S. giraldiana* C. K. Schneider; *S. microphylla* var. *giraldiana* (C. K. Schneider) S. Z. Qu & X. L. Chen; *S. pubescens* var. *tibetica* Batalin; *S. schneideri* Lingelsheim; *S. trichophylla* T. Tang.

Branchlets and inflorescence rachis subterete. Calyx purple, mostly puberulent, sometimes densely pubescent or subglabrous. Anthers inserted on corolla tube to 3 mm from mouth. Fl. May–Jun (often with two blooming stages annually in cultivation, spring and Aug–Sep), fr. Jul–Oct.  $2n = 46^*, 48$ .

\* Woods in valleys, near rivers, grasslands at mountain tops; 500–3400 m. Gansu, SW Hebei, W Henan, W Hubei, S Ningxia, E Qinghai, Shaanxi, Shanxi, NE Sichuan.

Three varieties have been recognized in subsp. *microphylla*: var. *microphylla* (leaves glabrous adaxially to pubescent or subglabrous except for midrib, sometimes pilose toward base abaxially; corolla purplish red; anthers purple to purple black) is distributed throughout the subspecies range; var. *potaninii* (C. K. Schneider) P. S. Green & M. C. Chang (leaves pilose adaxially, pilose to villous abaxially especially on midrib; corolla white tinged with pink) is restricted to Gansu; and var. *flavoanthera* (X. L. Chen) M. C. Chang (leaves glabrous adaxially to pubescent or subglabrous except for midrib, sometimes pilose toward base abaxially; flowers white; anthers yellow) is restricted to Shaanxi (Foping Xian).

**9. *Syringa meyeri*** C. K. Schneider in Sargent, Pl. Wilson. 1: 301. 1912.

蓝丁香 lan ding xiang

Shrubs to 1.5 m, densely branched. Branchlets slightly 4-angled, puberulent. Petiole 0.6–1.5 cm, glabrous or puberulent; leaf blade elliptic-ovate or elliptic-obovate, sometimes ovate, broadly ovate, or suborbicular, 1–5 × 0.8–3.5 cm, glabrous or pilose along veins abaxially, palmately 5-veined or nearly so, base cuneate to subrounded, apex acute to short acuminate or obtuse. Panicles erect, lateral, 2.5–10 × 2.5–4 cm; rachis and pedicel puberulent. Flowers congested or lax. Pedicel 1–2 mm. Calyx dark purple, ca. 2 mm, glabrous or puberulent. Corolla blue-purple, purplish red, purplish pink, or white, 1.7–2 cm; tube subcylindric, 0.5–1.5 cm; lobes oblong, spreading. Anthers light brown at first, becoming black, inserted below mouth of corolla tube. Capsule long elliptic, 1–2 cm, obviously lenticellate.

\* Slopes. Liaoning.

- 1a. Flowers congested; corolla tube ca. 15 mm; leaf blade 2–5 × 1.5–3.5 cm ..... 9a. var. *meyeri*  
1b. Flowers lax; corolla tube 5–8 mm; leaf blade 1–2 × 0.8–1.8 cm ..... 9b. var. *spontanea*

### 9a. *Syringa meyeri* var. *meyeri*

蓝丁香(原变种) lan ding xiang (yuan bian zhong)

Leaf blade elliptic-ovate or elliptic-obovate, sometimes ovate or suborbicular, 2–5 × 1.5–3.5 cm. Flowers congested. Corolla blue-purple; tube ca. 1.5 cm. Fl. Apr–Jun and Aug–Sep.  $2n = 46, 48$ .

Cultivated in Beijing and Shenyang.

Known only from cultivation and had long been considered as result of selected breeding from *Syringa pubescens*.

9b. *Syringa meyeri* var. *spontanea* M. C. Chang, Investig. Stud. Nat. 10: 33. 1990.

小叶蓝丁香 xiao ye lan ding xiang

*Syringa meyeri* var. *spontanea* f. *alba* (W. Wang, Fuh, & Chao) M. C. Chang; *S. microphylla* Diels var. *alba* W. Wang, Fuh, & Chao; *S. microphylla* f. *alba* (W. Wang, Fuh, & Chao) Kitagawa.

Leaf blade suborbicular or broadly ovate, 1–2 × 0.8–1.8 cm. Flowers lax. Corolla purplish red, purplish pink, or white; tube 5–8 mm. Fl. May, fr. Sep–Oct.  $2n = 46^*$ .

\* Slopes; ca. 500 m. Liaoning (Jin Xian); also cultivated in Beijing, Shenyang, and other areas.

Plants with purplish red to purplish pink and white flowers have been recognized as f. *spontanea* and f. *alba* (W. Wang, Fuh, & Chao) M. C. Chang, respectively.

10. *Syringa mairei* (H. Léveillé) Rehder, J. Arnold Arbor. 15: 302. 1934.

皱叶丁香 zhou ye ding xiang

*Ligustrum mairei* H. Léveillé, Cat. Pl. Yun-Nan 181. 1916; *Syringa chuanxiensis* S. Z. Qa & X. L. Chen; *S. rugulosa* McKelvey.

Shrubs or small trees ca. 2 m. Branchlets terete, usually densely pubescent. Petiole 3–7 mm; leaf blade ovate, broadly elliptic to suborbicular or obovate, 2–9 × 2–5 cm, leathery, adaxially rugose and pubescent, abaxially densely villous, base cuneate to subrounded, apex acute to obtuse; midrib and veins conspicuously impressed. Panicles lateral, rarely terminal, 6–14 cm; rachis pubescent. Flowers subsessile. Calyx purplish red, ca. 2 mm, puberulent. Corolla purplish red, white when expanded, 0.9–1.5 cm; tube slender, subcylindric, 6–11 mm; lobes ovate to oblong-elliptic, spreading. Anthers yellow, inserted near or slightly below mouth of corolla tube. Capsule oblong-lanceolate, 1–2 cm, nearly smooth. Fl. Jul, fr. Jul–Nov.

\* Thickets on slopes or along roadsides; 1900–2600 m. W Sichuan, SE Xizang, N Yunnan.

11. *Syringa pinetorum* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 132. 1916.

松林丁香 song ling ding xiang

Shrubs 1–3 m. Branchlets terete, villous to puberulent, gradually glabrescent. Petiole 2–7 mm; leaf blade ovate, ovate-lanceolate, to lanceolate, 1.5–2.5(–4) × 0.8–2(–3) cm, papery, sparsely pubescent or subglabrous adaxially, pilose along veins abaxially or glabrescent, base cuneate to broadly cuneate, apex acute to acuminate. Panicles erect, lateral, loose, 4–11 × 3–6(–8) cm; rachis, pedicel, and calyx usually puberulent. Pedicel 0–3 mm. Calyx 1.5–3 mm. Corolla lilac or pale red, 1–1.5(–2) cm; tube cylindric, 6–10(–15) mm; lobes ovate to elliptic, spreading. Anthers yellow, inserted on corolla tube to 3 mm from mouth. Capsule long elliptic to lanceolate, 0.8–1.5 cm, nearly smooth. Fl. May–Jul, fr. Jul–Sep.

\* Valleys, under pinewoods; 2200–3600 m. W Sichuan, SE Xizang, NW Yunnan.

12. *Syringa wardii* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 132. 1916.

圆叶丁香 yuan ye ding xiang

Shrubs or small trees 3–5 m, young stems pubescent. Petiole 2–3 mm; leaf blade suborbicular, 1–2 × 1–2 cm, adaxially glabrous, abaxially paler, glabrous or puberulent, base rounded to truncate, very short attenuate onto petiole, apex rounded or obtuse, sometimes very short apiculate-acuminate; primary veins 4 or 5 on each side of midrib, faintly reticulate below. Panicles erect, lateral, loose, 6–10 × 3–7 cm; rachis pubescent. Pedicel 1–3 mm. Calyx ca. 2 mm, almost truncate, teeth minute. Corolla 1.5–1.7 cm; tube cylindric, 1–1.2 cm; lobes ovate, obtuse, 4–5 mm. Anthers inserted slightly above middle of corolla tube. Capsule long elliptic, 1–1.4 cm, nearly smooth. Fl. May–Jun, fr. Sep.

\* Arid scrub on slopes, under woods; 2400–3000 m. SE Xizang, NW Yunnan.

13. *Syringa oblata* Lindley, Gard. Chron. 1859: 868. 1859.

紫丁香 zi ding xiang

Shrubs or small trees to 5 m. Branchlets glabrous, puberulent, or pubescent. Petiole 1–3 cm; leaf blade ovate,

ovate-orbicular, to reniform, slightly broader than long or slightly narrower than long, 2.5–10(–14) × 2.5–8(–15) cm, glabrous or pubescent, villous to glabrescent, base subcordate or truncate to broadly cuneate, apex abruptly acute to long acuminate. Panicles erect, lateral, congested or lax, 4–16(–20) × 3–8(–10) cm. Pedicel 0–3 mm, glabrous or pubescent. Calyx 2–3 mm. Corolla purple, lilac, or sometimes white; tube subcylindric, 0.6–1.7(–2.2) cm; lobes ovate-orbicular to oblong or obovate-orbicular, 4–8(–10) mm, spreading. Anthers yellow, inserted 0–4 mm from mouth of corolla tube. Capsule obovate-elliptic, ovate, to oblong-lanceolate, 0.7–1.5(–2) cm, smooth.

Woods, thickets, valleys, along streams, roadsides, gravely mountains; 100–2600 m. Gansu, Hebei, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, NW Sichuan; widely cultivated in several other provinces [Korea].

- 1a. Leaf blade ovate-orbicular to reniform, usually slightly broader than long, base truncate to subcordate; corolla tube 0.6–1.4 cm, lobes 4–6 mm; capsule 1–1.5(–2) ..... 13a. subsp. *oblata*  
1b. Leaf blade ovate to ovate-orbicular, usually slightly narrower than long, base truncate to broadly cuneate; corolla tube 1–1.7(–2.2) cm, lobes 5–8(–10) mm; capsule 0.7–1.2(–1.5) ..... 13b. subsp. *dilatata*

### 13a. *Syringa oblata* subsp. *oblata*

紫丁香(原亚种) *zi ding xiang* (yuan ya zhong)

*Syringa giraldii* Lemoine; *S. oblata* var. *alba* Rehder; *S. oblata* var. *giraldii* (Lemoine) Rehder; *S. oblata* var. *hupehensis* Pampanini; *S. vulgaris* Linnaeus var. *oblata* (Lindley) Franchet.

Shrubs or small trees to 5 m. Leaf blade ovate-orbicular to reniform, 2.5–10(–14) × 2.5–8(–15) cm, base truncate to usually subcordate, apex abruptly acute to acuminate. Panicles congested or lax, 4–16(–20) × 3–7(–10) cm. Calyx ca. 3 mm. Corolla purple or sometimes white; tube 0.6–1.4 cm; lobes ovate-orbicular to obovate-orbicular, 4–6 mm. Anthers inserted 0–4 mm from the corolla mouth. Capsule 1–1.5(–2) cm. Fl. Apr–May, fr. Jun–Oct. *2n* = 46\*.

\* Woods, thickets on slopes, valleys, along streams or roadsides; 300–2600 m. Gansu, Hebei, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, NW Sichuan; widely cultivated in several other provinces.

White-flowered plants, which are cultivated in provinces north of the Chang Jiang, have been recognized as cultivar *alba*.

13b. *Syringa oblata* subsp. *dilatata* (Nakai) P. S. Green & M. C. Chang, *Novon* 5: 329. 1995.

朝阳丁香 *chao yang ding xiang*

*Syringa dilatata* Nakai, *Bot. Mag.* (Tokyo) 32: 128. 1918; *S. dilatata* var. *alba* W. Wang & Skvortsov; *S. dilatata* f. *alba* (W. Wang & Skvortsov) S. D. Zhao; *S. dilatata* var. *longituba* W. Wang & Skvortsov; *S. dilatata* var. *pubescens* S. D. Zhao; *S. dilatata* var. *rubra* W. Wang & Skvortsov; *S. dilatata* var. *violacea* W. Wang & Skvortsov; *S. oblata* var. *dilatata* (Nakai) Rehder.

Shrubs 1–3 m, many branched. Leaf blade ovate to ovate-orbicular, 3–10 × 2.5–8 cm, base truncate to broadly cuneate, or rarely subcordate, apex short to long acuminate. Panicles lateral, lax, 5–10 × ca. 8 cm. Calyx ca. 2 mm. Corolla lilac or red-lilac to violet-lilac, sometimes white; tube 1–1.7(–2.2) cm; lobes oblong-elliptic, 5–8(–10) mm. Anthers inserted at middle of corolla tube. Capsule 7–12(–15) mm. Fl. May–Jun, fr. Sep.

Gravely mountains; 100–700 m. Jilin (Jian Xian), Liaoning [Korea].

Plants with white flowers have been recognized as f. *alba*, whereas those with red-lilac or violet-lilac flowers, which are cultivated in northern China, may be called f. *oblata*.

14. *Syringa protolaciniata* P. S. Green & M. C. Chang, *Kew Mag.* 6: 121. 1989.

华丁香 *hua ding xiang*

*Syringa buxifolia* Nakai.

Shrubs 0.5–3 m. Branchlets 4-angled, glabrous. Leaves 3–9-parted to -divided or entire, 1–4 × 0.4–2.5 cm; sessile or with petiole to 2.5 cm, glabrous; leaf blade and lobes lanceolate, elliptic, ovate, or obovate, glabrous and abaxially with conspicuous glandular dots, base cuneate, apex obtuse or acute. Panicles lateral, 2–10 cm, usually many paired on upper parts of branches and in a large inflorescence; rachis, pedicel, and calyx glabrous. Pedicel 2–6 mm, slender. Calyx 1.5–2 mm. Corolla lilac or purple, 1–2 cm; tube subcylindric, 7–12 mm; lobes ovate to narrowly elliptic, spreading. Anthers yellow-green, inserted to 2 mm from mouth of corolla tube. Capsule slightly 4-angled, 0.8–1.5 cm, smooth. Fl. Apr–Jun, fr. Jun–Aug. *2n* = 46\*.

\* Woods, steep slopes; 800–1200 m. E & S Gansu, E Qinghai; sometimes cultivated in N China.

15. *Syringa pinnatifolia* Hemsley, *Gard. Chron.*, ser. 3, 39: 68. 1906.

羽叶丁香 *yu ye ding xiang*

*Syringa pinnatifolia* var. *alashanensis* Ma & S. Q. Zhou.

Shrubs 1–4 m. Branchlets generally 4-angled, together with petiole, rachis, pedicel, and calyx glabrous. Leaves pinnately compound; petiole 0.5–1.5 cm; leaflets 7–11(–13), opposite or nearly so, sessile; leaflet blade ovate-lanceolate to ovate, 0.5–3 cm × 3–13 mm, glabrous or adaxially sparsely pubescent, base cuneate to subrounded and usually oblique, apex acute to acuminate or obtuse. Panicles lateral, slightly nodding, 2–6.5 × 2–5 cm. Pedicel 2–5 mm. Calyx ca. 2.5 mm. Corolla white or light red, somewhat tinged with lilac, 1–1.6 cm; tube slightly funnellform, 0.8–1.2 cm; lobes ovate or oblong. Anthers yellow, inserted to 4 mm from mouth of corolla tube. Capsule oblong, 1–1.3 cm, smooth. Fl. May–Jun, fr. Aug–Sep. *2n* = 46\*, 48.

\* Thickets on slopes; 2600–3100 m. Gansu, Nei Mongol, Ningxia, E Qinghai, S Shaanxi, W Sichuan.

16. *Syringa reticulata* (Blume) H. Hara, *J. Jap. Bot.* 17: 21. 1941.

Shrubs or trees 2–10(–15) m, glabrous. Petiole 1–3 cm; leaf blade ovate, ovate-lanceolate, elliptic-ovate, oblong-lanceolate, or suborbicular, 2.5–13 × 1–6(–8) cm, papery or thickly so, glabrous or rarely pubescent abaxially, base rounded, truncate, subcordate, or cuneate, apex acuminate to caudate-acuminate or acute. Panicles lateral, 1 to many paired on same branch and forming an inflorescence 5–20(–27) × 3–20 cm. Pedicel 0–2 mm. Calyx 1–2 mm. Corolla white, rotate, 3–5 mm; tube as long as calyx or slightly longer. Capsule long elliptic to lanceolate, 1.5–2.5 cm, smooth or minutely lenticellate, apex blunt, acute, to acuminate. Fl. May–Aug, fr. Aug–Oct.  $2n = 46^*$ .

Mixed forests, grasslands, gullies, valleys; 100–2400 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi, N Sichuan [Japan, Korea, E Russia].

*Syringa reticulata* subsp. *reticulata* is endemic to Japan.

- 1a. Petiole slender, 1.5–3 cm; capsule acute to acuminate at apex ..... 16a. subsp. *pekinensis*
- 1b. Petiole stoutish, 1–2 cm; capsule blunt at apex ..... 16b. subsp. *amurensis*

**16a. *Syringa reticulata* subsp. *pekinensis* (Ruprecht) P. S. Green & M. C. Chang, Novon 5: 330. 1995.**

北京丁香 bei jing ding xiang

*Syringa pekinensis* Ruprecht, Cl. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 15: 371. 1857; *Ligustrina amurensis* Ruprecht var. *pekinensis* (Ruprecht) Maximowicz; *S. amurensis* Ruprecht var. *pekinensis* (Ruprecht) Maximowicz.

Shrubs or small trees 2–5(–10) m. Petiole slender, 1.5–3 cm; leaf blade ovate to ovate-lanceolate or suborbicular. Calyx 1–1.5 mm. Corolla 3–4 mm. Capsule acute to acuminate at apex. Fl. May–Aug, fr. Aug–Oct.

\* Woods on slopes, valleys, along gullies; 600–2400 m. Gansu, Hebei, Henan, Nei Mongol, Ningxia, Shaanxi, Shanxi, N Sichuan.

Usually cultivated as an ornamental in N China.

**16b. *Syringa reticulata* subsp. *amurensis* (Ruprecht) P. S. Green & M. C. Chang, Novon 5: 329. 1995.**

暴马丁香 bao ma ding xiang

*Syringa amurensis* Ruprecht, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 15: 371. 1857; *Ligustrina amurensis* Ruprecht; *L. amurensis* var. *mandshurica* Maximowicz; *S. reticulata* var. *amurensis* (Ruprecht) Pringle; *S. reticulata* var. *mandshurica* (Maximowicz) H. Hara.

Trees 4–10(–15) m. Petiole stoutish, 1–2 cm; leaf blade broadly ovate, elliptic-ovate to oblong-lanceolate. Calyx 1.5–2 mm. Corolla 4–5 mm. Capsule blunt at apex. Fl. Jun–Jul, fr. Aug–Oct.  $2n = 46^*$ .

Mixed forests on slopes, grasslands, near gullies; 100–1200 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Korea, E Russia].

The bark, trunks, and branches are used as antiphlogistic drug and diuretic. The flowers are used in the preparation of various perfumes.

## 5. OSMANTHUS Loureiro, Fl. Cochinch. 1: 28. 1790.

木犀属 mu xi shu

Shrubs to small trees, evergreen. Leaves opposite, simple, petiolate; leaf blade entire or serrate, usually glandular dotted. Inflorescences cymose, fascicled in leaf axils or in very short and axillary or terminal panicles; bracts 2, united at base, usually ciliate. Flowers bisexual, usually becoming unisexual and plants dioecious or androdioecious. Calyx campanulate, 4-lobed. Corolla usually white or yellowish, campanulate, cylindric, or urceolate, lobed, parted, or divided almost to base; lobes 4, imbricate in bud. Stamens 2(–4), mostly attached to upper half of corolla tube; connective usually minutely mucronate, elongated, or projecting. Ovules 2 in each locule, pendulous. Stigma capitate or 2-cleft. Abortive pistil subulate or conical. Fruit a drupe; endocarp hard or bony; endosperm fleshy; radicle erect.

About 30 species: SE Asia and America; 23 species in China. Two species have been described from Taiwan of which no material has been seen in the preparation of this account: *Osmanthus acutus* Masamune & K. Mori (*O. heterophyllus* var. *acutus* (Masamune & K. Mori) T. S. Liu & J. C. Liao) and *O. kaoi* (T. S. Liu & J. C. Liao) S. Y. Lu (*O. lanceolatus* var. *kaoi* T. S. Liu & J. C. Liao). *Osmanthus dingyensis* P. Y. Bai, described from Xizang, is *Ilex hookeri* King.

The flowers are fragrant in all species; *Osmanthus fragrans* is a well-known spice plant.

- 1a. Cymes in very short panicles, axillary or terminal; anther connective not elongated or projecting.
  - 2a. Leaf blade thick leathery, broadly elliptic to narrowly lanceolate, base cuneate or broadly so; inflorescences compact ..... 1. *O. marginatus*
  - 2b. Leaf blade papery or leathery, narrowly elliptic, oblanceolate, to narrowly obovate, base attenuate; inflorescences loose.
    - 3a. Leaf blade oblanceolate, rarely obovate or narrowly elliptic, 8–14(–19) × 2.5–4.5(–6) cm, usually serrate in distal half; petiole 1.5–3 cm ..... 2. *O. matsumuranus*
    - 3b. Leaf blade narrowly elliptic or narrowly obovate, rarely oblanceolate, 4.5–9 × 1.5–3.5 cm, entire; petiole 1–1.5 cm ..... 3. *O. minor*



- 1b. Cymes fascicled in leaf axils; anther connective usually elongated or projecting.
- 4a. Corolla lobes united in pairs at base, not forming a tube ..... 4. *O. didymopetalus*
- 4b. Corolla lobes united at base into a tube.
- 5a. Corolla tube much longer than lobes, cylindric.
- 6a. Leaf blade usually elliptic, 3–7 cm, obtusely serrate at margin ..... 5. *O. suavis*
- 6b. Leaf blade oblong, broadly elliptic, or broadly ovate, 1–2.5(–4) cm, sharply serrate at margin ..... 6. *O. delavayi*
- 5b. Corolla tube subequalling or shorter than lobes, if longer, then tube urceolate.
- 7a. Branchlets, petiole, and adaxial surface of midrib  $\pm$  hairy.
- 8a. Pedicel puberulent ..... 7. *O. pubipedicellatus*
- 8b. Pedicel glabrous.
- 9a. Corolla lobes longer than or rarely equal to tube.
- 10a. Leaf blade oblong-elliptic or elliptic, usually with 3 or 4 pairs of spiny teeth; stamens attached to base of corolla tube ..... 8. *O. heterophyllus*
- 10b. Leaf blade elliptic to oblanceolate, entire or if serrate, then with ca. 20 pairs of dentate-serrate teeth on each side; stamens attached to middle of corolla tube ..... 9. *O. henryi*
- 9b. Corolla lobes subequalling or rarely shorter than tube.
- 11a. Corolla urceolate, lobes shorter than tube ..... 10. *O. urceolatus*
- 11b. Corolla not urceolate, lobes almost as long as tube.
- 12a. Leaf blade dentate or serrate, if entire then veins obviously raised and reticulate.
- 13a. Petiole 2–5 mm; leaf blade usually with 6–10(–17) pairs of spiny teeth, base  $\pm$  rounded to subcordate, rarely broadly cuneate ..... 11. *O. armatus*
- 13b. Petiole 10–15 mm; leaf blade entire or with 3 or 4 pairs of serrations, base cuneate to blunt ..... 12. *O. venosus*
- 12b. Leaf blade entire.
- 14a. Leaf blade elliptic or obovate, ca. 2  $\times$  as long as broad, base broadly cuneate to rounded ..... 13. *O. cooperi*
- 14b. Leaf blade narrowly elliptic to lanceolate, ca. 4  $\times$  as long as broad, base narrowly cuneate ..... 14. *O. attenuatus*
- 7b. Branchlets, petiole, and midrib usually glabrous.
- 15a. Bracts hairy or at least ciliate.
- 16a. Leaf venation neither reticulate nor raised; bracts hirsute ..... 17. *O. enervius*
- 16b. Leaf venation reticulate or distinctly raised; bracts ciliate.
- 17a. Leaf blade usually ovate-lanceolate or elliptic, serrulations (when present) 2–3 mm ..... 15. *O. yunnanensis*
- 17b. Leaf blade obovate-lanceolate or obovate-elliptic to elliptic, serrulations (when present) 1 mm ..... 16. *O. serrulatus*
- 15b. Bracts glabrous.
- 18a. Calyx less than 1 mm; leaf blade less than 6 cm ..... 18. *O. fordii*
- 18b. Calyx ca. 1 mm; leaf blade usually more than 6 cm.
- 19a. Corolla lobes more than 2  $\times$  as long as tube; leaf veins not reticulate, primary veins impressed adaxially ..... 19. *O. fragrans*
- 19b. Corolla lobes subequal to ca. 2  $\times$  as long as tube.
- 20a. Leaf venation neither reticulate nor raised, blade elliptic or narrowly so ..... 20. *O. gracilinervis*
- 20b. Leaf venation reticulate or raised, blade elliptic to lanceolate or narrowly ovate.
- 21a. Leaf blade lanceolate; stamens attached to distal part of corolla tube ..... 21. *O. lanceolatus*
- 21b. Leaf blade narrowly ovate, elliptic, oblong, or oblanceolate; stamens attached to middle or basal part of corolla tube.
- 22a. Stamens attached to middle of corolla tube; leaf venation reticulate, veins obvious and raised ..... 22. *O. reticulatus*
- 22b. Stamens attached to basal part of corolla tube; leaf venation obscure, reticulate but primary veins raised ..... 23. *O. hainanensis*

**1. *Osmanthus marginatus*** (Champion ex Benth) Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 88. 1889.

厚边木犀 hou bian mu xi

Shrubs or trees 5–10(–20) m. Branchlets, petiole, and leaf blade glabrous. Petiole 1–2.5 cm; leaf blade broadly elliptic to narrowly lanceolate, rarely obovate, 7–20 × 2–5.5 cm, thick or very thick leathery, base narrowly to broadly cuneate, margin entire or rarely obscurely serrate along distal half, apex acuminate; midrib and 6–8 primary veins somewhat impressed adaxially and raised abaxially. Cymes in short and compact panicles, axillary, rarely terminal, 1–2 cm, 10–20-flowered; bracts ovate, 2–2.5 cm. Pedicel 1–2 mm. Calyx 1.5–2 mm. Corolla yellowish or greenish; tube 1.5–2 mm; lobes oblong, reflexed, ca. 1.5 mm. Stamens attached to distal part of corolla tube. Drupe black, ellipsoid or obovoid, 2–2.5 × 1–1.5 cm.

Valleys, dense woods on slopes or in ravines, along streams; 800–2500 m. S Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan (Ryukyu Islands)].

This species is in need of revision. The coastal populations appear to be different from the inland ones, but there is insufficient material of the latter to reach a firm decision.

- 1a. Leaves broadly elliptic, elliptic, lanceolate-elliptic, or rarely obovate, 7–15 × 2.5–5.5 cm, base cuneate to broadly so ..... 1a. var. *marginatus*  
1b. Leaves lanceolate to narrowly lanceolate, 8–20 × 2–4 cm, base narrowly cuneate to cuneate ..... 1b. var. *longissimus*

**1a. *Osmanthus marginatus* var. *marginatus***

厚边木犀(原变种) hou bian mu xi (yuan bian zhong)

*Olea marginata* Champion ex Benth, Hooker's J. Bot. Kew Gard. Misc. 4: 330. 1852; *Gonocaryum sinense* Handel-Mazzetti; *Osmanthus angustifolius* H. T. Chang; *O. apiculatus* H. T. Chang; *O. caudatus* H. T. Chang; *O. corymbosus* H. W. Li; *O. cylindricus* H. T. Chang; *O. longicarpus* H. T. Chang; *O. longispermus* H. T. Chang; *O. marginatus* var. *pachyphyllus* (H. T. Chang) R. L. Lu; *O. matsudai* Hayata; *O. nanchuanensis* H. T. Chang; *O. nudirhachis* H. T. Chang; *O. omeiensis* Fang ex H. T. Chang; *O. pachyphyllus* H. T. Chang; *O. sinensis* (Handel-Mazzetti) Handel-Mazzetti; *O. triandrus* H. T. Chang.

Leaf blade broadly elliptic to lanceolate-elliptic or rarely obovate, 7–15 × 2.5–5.5 cm, base broadly cuneate or cuneate. Fl. May–Jun, fr. Nov–Dec.  $2n = 46^*$ .

Valleys, dense woods on slopes; 800–2500 m. S Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan (Ryukyu Islands)].

**1b. *Osmanthus marginatus* var. *longissimus*** (H. T. Chang) R. L. Lu, Acta Phytotax. Sin. 27: 72. 1989.

长叶木犀 chang ye mu xi

*Osmanthus longissimus* H. T. Chang, Acta Sci. Nat. Univ. Sunyatseni 2: 6. 1982.

Leaf blade lanceolate to narrowly lanceolate, 8–20 × 2–4 cm, base narrowly cuneate to cuneate.

\* Woods on slopes or in ravines, along streams; 1000–1700 m. Fujian, Guangxi, Guizhou, Hunan, Jiangxi, Zhejiang.

**2. *Osmanthus matsumuranus*** Hayata, J. Coll. Sci. Univ. Tokyo 30(1): 192. 1911.

牛失果 niu shi guo

*Osmanthus longipetiolatus* H. T. Chang; *O. marginatus* var. *formosanus* Matsumura; *O. maximus* H. T. Chang; *O. obovatifolius* Kanehira; *O. wilsonii* Nakai.

Shrubs or trees 2.5–10 m, glabrous. Branchlets compressed. Petiole 1.5–3 cm; leaf blade oblanceolate, rarely obovate or narrowly elliptic, 8–14(–19) × 2.5–4.5(–6) cm, thin leathery to thick papery, base attenuate and decurrent, margin entire or serrate along distal half, apex acuminate and mucronate; midrib and (7–)10–12(–15) primary veins adaxially slightly impressed and abaxially raised. Cymes in short panicles, axillary, 1.5–2 cm; bracts broadly ovate, 1–1.5 mm. Pedicel ca. 2 mm. Calyx 1.5–2 mm; lobes 0.5–1 mm. Corolla greenish or pale yellow-green, 3–4 mm; tube equaling reflexed lobes. Stamens attached to distal part of corolla tube. Drupe ripening purple to black, ellipsoid, 1.5–3 × 0.7–1.5 cm. Fl. May–Jun, fr. Nov–Dec.  $2n = 46^*$ .

Dense woods on slopes, thickets of valleys; 800–1500 m. Anhui, Guangdong, Guangxi, Guizhou, Jiangxi, Taiwan, Yunnan, Zhejiang [Cambodia, India, Laos, Vietnam].

**3. *Osmanthus minor*** P. S. Green, Notes Roy. Bot. Gard. Edinburgh 22: 465. 1958.

小叶月桂 xiao ye yue gui

Shrubs or small trees 3–5(–10) m. Petiole 1–1.5 cm, glabrous; leaf blade narrowly elliptic or narrowly obovate, rarely oblanceolate, 4.5–9 × 1.5–3.5 cm, leathery or thick so, base attenuate, margin entire, apex acuminate or sometimes caudate; primary veins 6–8 on each side of midrib, adaxially obscure, abaxially slightly raised. Panicles short, slender, axillary, 1–1.5 cm, 8–12-flowered; bracts deltate, thick, hairy at base. Pedicel ca. 2 mm. Calyx 1–1.5 mm; lobes deltate or ovate. Corolla white; tube 1.5–2 mm, ca. as long as lobes. Stamens attached to distal part of corolla tube. Drupe ripening black, ellipsoid or slightly obovoid, 1.5–2 × 0.8–1.2 cm. Fl. May–Jun, fr. Oct–Nov.

\* Mixed woods. Fujian, Guangdong, Guangxi, Jiangxi, Zhejiang.

**4. *Osmanthus didymopetalus*** P. S. Green, Notes Roy. Bot. Gard. Edinburgh 22: 536. 1958.

双瓣木犀 shuang ban mu xi

Trees 3–9(–18) m. Branchlets glabrous. Petiole 1–2 cm, glabrous or pubescent at first; leaf blade narrowly elliptic, rarely elliptic or lanceolate, 6.5–10(–16) × 2–2.5(–4) cm, thick leathery, base cuneate, margin entire, apex acute; midrib abaxially raised and glabrous or rarely pubescent near petiole; primary veins 5–8 on each side of midrib, obscure adaxially, slightly raised abaxially. Cymes fascicled in leaf axils, 6 to

many flowered; bracts 2–3 mm, pubescent or glabrous. Pedicel 3–10 mm. Calyx ca. 0.5 mm. Corolla white to yellow; lobes lorate, 3–4 mm, united in pairs at base. Stamens attached to united part of corolla lobes. Drupe purple or purplish, narrowly ovoid or ellipsoid, 1.5–2.5 cm × 6–10 mm. Fl. Sep–Oct, fr. Feb.

\* Mixed woods; 800–1500 m. Hainan.

**5. *Osmanthus suavis*** King ex C. B. Clarke in J. D. Hooker, Fl. Brit. India 3: 607. 1882.

香花木犀 xiang hua mu xi

*Siphonosmanthus suavis* (King ex C. B. Clarke) Stapf.

Shrubs or small trees 3–5(–8) m. Branchlets pubescent. Petiole 5–7(–10) mm, glabrous or rarely pubescent; leaf blade elliptic, rarely ovate, 3–7 × 1.5–2.5 cm, thin leathery, glabrous except for midrib adaxially, base cuneate, margin obtusely serrate, apex acute; primary veins 5–8 on each side of midrib, obscure. Cymes fascicled in leaf axils or terminal, 6–9-flowered; bracts broadly ovate, 2–3 mm. Pedicel 3–8 mm. Calyx 3–4 mm. Corolla white or creamy; tube 6–9 mm; lobes 3–4 mm. Stamens attached to middle of corolla tube. Drupe blue-black, ellipsoid or ovoid, ca. 8 × 5 mm. Fl. Apr–May, fr. Oct–Nov.

Dense forests or thickets on slopes; 2400–3000 m. SE Xizang, Yunnan [Bhutan, India, Myanmar, Nepal].

**6. *Osmanthus delavayi*** Franchet, Bull. Mens. Soc. Linn. Paris 1: 613. 1886.

山桂花 shan gui hua

*Ligustrum phillyrea* H. Léveillé; *Siphonosmanthus delavayi* (Franchet) Stapf.

Shrubs 2(–5) m. Branchlets densely pubescent. Petiole 2–3 mm, puberulent at least when young; leaf blade oblong, broadly elliptic or broadly ovate, 1–2.5(–4) × 1–1.5(–2) cm, thick leathery, base broadly cuneate, margin with 6–8 pairs of sharp serrations ca. 1 mm, apex acute to obtuse and mucronulate; midrib raised, pubescent adaxially, especially near petiole, primary veins 4 or 5 on each side of midrib, obscure. Cymes fascicled in leaf axils or terminal, 4–8-flowered; bracts broadly ovate, acute, slightly puberulent. Pedicel 2–5 mm, glabrous or rarely slightly puberulent. Calyx 2–4 mm. Corolla white; tube 6–10 mm; lobes 4–6 mm. Stamens attached to middle of corolla tube; connective elongated into an obvious mucro. Drupe blue-black, long ovoid, 1–1.2 cm. Fl. Apr–May, fr. Sep–Oct.

\* Montane regions, ravines, thickets, mixed woods; 2100–3400 m. Guizhou, Sichuan, Yunnan.

**7. *Osmanthus pubipedicellatus*** L. C. Chia ex H. T. Chang, Acta Sci. Nat. Sunyatseni 2: 15. 1982.

毛柄木犀 mao bing mu xi

Shrubs ca. 3 m. Branchlets, bracts, and pedicels puberulent. Petiole 1.2–1.5(–1.8) cm, puberulent, glabrescent; leaf blade narrowly elliptic, rarely lanceolate, 6.5–9 × 2–3 cm,

thick leathery, glabrous, base narrowly cuneate, margin entire, apex long acuminate; midrib adaxially deeply impressed, abaxially obviously raised; primary veins 6 or 7 on each side of midrib, obscure. Cymes fascicled in leaf axils, with 1 or 2 buds per axil and ca. 5 flowers per bud; bracts 2.5–3 mm. Pedicel 3–5 mm. Calyx ca. 1.5 mm; lobes ca. 1 mm. Corolla white; tube ca. 1 mm; lobes ca. 1.5 mm. Stamens attached to base of corolla tube; connective elongated into a deltate mucro. Drupe not seen. Fl. Sep.

\* Sandy soil on slopes. Guangdong.

**8. *Osmanthus heterophyllus*** (G. Don) P. S. Green, Notes Roy. Bot. Gard. Edinburgh 22: 508. 1958.

冬树 dong shu

Shrubs or small trees 2–8 m. Branchlets and petiole pubescent when young. Petiole 5–10 mm; leaf blade oblong-elliptic or elliptic, 4.5–6(–7) × 1.5–2.5(–3) cm, leathery, base cuneate or broadly so, margin entire or with 3 or 4 pairs of spiny teeth 5–9 mm; midrib raised on both surfaces, adaxially pubescent and especially denser near petiole; primary veins adaxially raised, abaxially obscure. Cymes fascicled in leaf axils, 5–8-flowered; bracts 2–2.5 mm, puberulent or glabrous. Pedicel 5–6 mm, glabrous. Calyx 1–1.5 mm. Corolla white; tube 1–2 mm; lobes 2.5–5 mm. Stamens ca. as long as corolla lobes, attached to base of corolla tube. Drupe dark-purple, ovoid, ca. 1.5 × 1 cm.

Taiwan [Japan].

- 1a. Basal inflorescence bracts glabrous or slightly puberulent; corolla tube 1–1.5 mm, lobes 2.5–3.5 mm; leaves entire or spiny margined ..... 8a. var. *heterophyllus*
- 1b. Basal inflorescence bracts densely puberulent; corolla tube 1.5–2 mm, lobes ca. 5 mm; leaves entire ..... 8b. var. *bibracteatus*

**8a. *Osmanthus heterophyllus* var. *heterophyllus***

冬树(原变种) dong shu (yuan bian zhong)

*Ilex heterophylla* G. Don, Gen. Hist. 2: 17. 1832; *Osmanthus integrifolius* Hayata.

Leaf margin entire or with 3 or 4 pairs of spiny teeth 5–9 mm. Bracts glabrous to slightly puberulent. Corolla tube 1–1.5 mm; lobes 2.5–3.5 mm. Fl. Nov–Dec, fr. May–Jun.  $2n = 46^*$ .

Taiwan [Japan].

**8b. *Osmanthus heterophyllus* var. *bibracteatus*** (Hayata) P. S. Green, Notes Roy. Bot. Gard. Edinburgh 22: 516. 1958.

异叶冬树 yi ye dong shu

*Osmanthus bibracteatus* Hayata, Ic. Pl. Formos. 9: 71. 1920; *O. ilicifolius* (Hasskarl) Hort. ex Carrière var. *bibracteatus* (Hayata) K. Mori.

Leaf margin entire. Bracts densely puberulent. Corolla tube 1.5–2 mm; lobes ca. 5 mm.

\* Taiwan.

**9. *Osmanthus henryi*** P. S. Green, Notes Roy. Bot. Gard. Edinburgh 22: 499. 1958.

蒙自桂花 meng zi gui hua

*Osmanthus caudatifolius* P. Y. Bai & J. H. Pang.

Shrubs or small trees 3–4(–10) m. Branchlets puberulent, glabrescent. Petiole 8–10(–12) mm; leaf blade narrowly elliptic to oblanceolate, (7–)8–9(–11) × (2–)3–4.5 cm, thick leathery, base narrowly cuneate, margin entire or with ca. 20 pairs of teeth 1 mm, apex acuminate and caudate; midrib adaxially puberulent, denser near petiole, slightly impressed, abaxially ± raised; primary veins 7–9 on each side of midrib, slightly raised. Cymes fascicled in leaf axils, 4- or 6-flowered; bracts ovate, puberulent. Pedicel 6–10 mm, glabrous. Calyx ca. 1 mm; lobes broadly deltate. Corolla white or yellowish; tube ca. 1 mm; lobes ca. 2 mm. Stamens attached to middle of corolla tube; connective elongated into an obvious mucro. Drupe long ellipsoid, ca. 2 cm. Fl. Oct–Nov, fr. May.

\* Slopes, woods of valleys, thickets on slopes; 1000–3000 m. Guizhou, Hunan, Yunnan.

**10. *Osmanthus urceolatus*** P. S. Green, Notes Roy. Bot. Gard. Edinburgh 22: 527. 1958.

坛花木犀 tan hua mu xi

*Osmanthus hupehensis* H. T. Chang.

Shrubs to 3 m. Branchlets and bracts densely puberulent. Petiole 1–1.5 cm, puberulent; leaf blade elliptic or narrowly so, (4–)5–8(–9) × (1–)2–3(–3.5) cm, thin leathery, glabrous or pubescent only along midrib adaxially, especially near the petiole, base broadly cuneate or rounded-cuneate, margin with 10–15 pairs of serrulations, subentire near base, apex long acuminate; midrib and 6 or 7 primary veins obscure. Cymes fascicled in leaf axils, 3- or 4-flowered; bracts 2–3 mm. Pedicel 5–10 mm, glabrous. Calyx ca. 1 mm; lobes apically rounded, erose. Corolla urceolate, 5–7 mm; lobes broadly deltate, 1–1.5 mm. Stamens attached to basal part of corolla tube; connective apically projecting into a rounded appendage. Drupe not seen. Fl. Sep.

\* Mountains, woods; ca. 1600 m. Hubei, Sichuan.

**11. *Osmanthus armatus*** Diels, Bot. Jahrb. Syst. 29: 532. 1900.

红柄木犀 hong bing mu xi

*Osmanthus obtusifolius* H. T. Chang.

Shrubs or trees 2–6 m. Branchlets pubescent at first, glabrescent. Petiole 2–5(–8) mm, densely pubescent; leaf blade oblong-lanceolate to elliptic, 6–8(–15) × 2–2.5(–4.5) cm, thick leathery, glabrous except for midrib adaxially, base subrounded to subcordate, rarely broadly cuneate, margin with 6–10(–17) pairs of spiny teeth 2–4 mm, or rarely entire, apex acuminate with sharp tip; primary veins (6–)8–10(–15) on each side of midrib, distinctly raised. Cymes fascicled in leaf axils, 4–12-flowered; bracts broadly ovate, pubescent. Pedicel 6–10 mm, glabrous. Calyx 1–1.5 mm. Corolla white, 4–5 mm; tube

ca. as long as lobes. Stamens attached to middle of corolla tube; connective elongated into a mucro. Drupe black, ca. 1.5 × 1 cm. Fl. Sep–Oct, fr. Apr–Jun.  $2n = 46$ .

\* Thickets on slopes; ca. 1400 m. Hubei, Sichuan.

**12. *Osmanthus venosus*** Pampanini, Nuov. Giorn. Bot. Ital., n. ser., 18: 174. 1911.

毛木犀 mao mu xi

*Siphonosmanthus venosus* (Pampanini) Knoblauch.

Shrubs or small trees 2–4(–10) m. Branchlets, petiole, and bracts pubescent. Petiole 1–1.5 cm; leaf blade narrowly elliptic, lanceolate, or oblanceolate, (4.5–)8–10(–14) × (1.5–) 2.5–3(–4) cm, leathery, base cuneate to blunt, margin entire or with 3 or 4 pairs of teeth at middle, rarely fully serrate, apex acuminate or rarely acute; midrib glabrous or puberulent adaxially; primary veins 9–11 on each side of midrib, distinctly raised. Cymes fascicled in leaf axils, 4–10-flowered; bracts ca. 2.5 mm. Pedicel 3–8 mm, glabrous. Calyx 1–1.5 mm. Corolla white; tube ca. 2.5 mm; lobes ovate, ca. 2 mm. Stamens attached to middle of corolla tube; connective apically projecting into a large rounded appendage. Drupe not seen. Fl. Aug–Sep.

\* Montane woods; 300–1100 m. Hubei.

**13. *Osmanthus cooperi*** Hemsley, Bull. Misc. Inform. Kew 1896: 18. 1896.

宁波木犀 ning bo mu xi

Shrubs or small trees 3–5(–8) m. Petiole 1–2 cm; leaf blade elliptic or obovate, (4–)6–8(–10) × (2.5–)3–4(–5) cm, leathery, base broadly cuneate to rounded, margin entire, apex acuminate and slightly caudate; midrib pubescent, denser near petiole, impressed adaxially, raised abaxially; primary veins 7 or 8 on each side of midrib, obscure. Cymes fascicled in leaf axils, 4–12-flowered; bracts broadly ovate, ca. 2 mm, pubescent, rarely glabrous. Pedicel 3–5 mm, glabrous. Calyx 1.5 mm; lobes rounded, ca. 0.5 mm. Corolla white, ca. 4 mm; tube ca. as long as lobes. Stamens attached just above middle of corolla tube; connective elongated into an obvious mucro. Drupe blue-black, 1.5–2 cm. Fl. Sep–Oct, fr. May–Jun.

\* Slopes, shady and moist places in woods of valleys, ravines; 400–800 m. Anhui, Fujian, S Jiangsu, Jiangxi, Zhejiang.

**14. *Osmanthus attenuatus*** P. S. Green, Notes Roy. Bot. Gard. Edinburgh 22: 524. 1958.

狭叶木犀 xia ye mu xi

*Osmanthus lipingensis* D. J. Liu.

Shrubs ca. 4 m. Branchlets, petiole, and bracts puberulent. Petiole 7–10 mm; leaf blade narrowly elliptic to lanceolate, 6–8 × 1.5–2 cm, leathery, glabrous except for midrib adaxially, base narrowly cuneate, margin entire but drying wavy, apex long acuminate and caudate; midrib raised; primary veins 6 or 7 on each side of midrib, obscure. Cymes axillary, 4- or 5(–10)-flowered; bracts ca. 3 mm. Pedicel 2–5 mm, glabrous. Calyx ca. 1 mm; lobes erose. Corolla tube 2–3 mm; lobes ca. 2

mm. Stamens attached to middle of corolla tube; connective elongated into an obvious mucro. Drupe not seen. Fl. Sep.

\* Montane regions, woods on slopes; 2100–2900 m. Guangxi, Guizhou, Yunnan.

**15. *Osmanthus yunnanensis*** (Franchet) P. S. Green, Notes Roy. Bot. Gard. Edinburgh 22: 495. 1958.

野桂花 ye gui hua

*Pittosporum yunnanense* Franchet, Bull. Soc. Bot. France 33: 415. 1886; *Osmanthus bambusifolius* H. T. Chang; *O. brevipetiolatus* H. T. Chang; *O. forrestii* Rehder; *O. forrestii* var. *brevipedicellatus* Handel-Mazzetti; *O. liangshanensis* H. T. Chang; *O. polyneurus* H. T. Chang; *O. rehderianus* Handel-Mazzetti; *O. rehderianus* var. *tenianus* Handel-Mazzetti.

Trees or shrubs 3–6(–10) m. Branchlets smooth, puberulent at first. Petiole 6–10(–15) mm, glabrous or rarely hairy; leaf blade ovate-lanceolate or elliptic, 8–14 × 2.5–4 cm, leathery, base broadly cuneate or subrounded, margin entire or with 20–25 pairs of sharp teeth 2–3 mm, apex acuminate; midrib raised on both surfaces; primary veins 10–12 on each side of midrib, abaxially raised. Cymes fascicled in leaf axils, 5–12-flowered; bracts 2–4 mm, glabrous, margin ciliate. Pedicel ca. 1 cm, glabrous. Calyx ca. 1 mm; lobes apically erose or entire. Corolla yellow-white, ca. 5 mm, almost parted to base; lobes elliptic or broadly ovate. Stamens attached to base of corolla lobes; connective apically projecting into a minute appendage. Drupe purple-black, long ovoid, 1–1.5 cm. Fl. Apr–May, fr. Jul–Aug.

\* Dense woods, mixed forests on slopes, ravines; 1400–2800 m. Sichuan, Xizang, Yunnan.

**16. *Osmanthus serrulatus*** Rehder in Sargent, Pl. Wilson. 2: 610. 1916.

短丝木犀 duan si mu xi

Shrubs or small trees 2–4(–8) m. Branchlets and petiole glabrous or puberulent. Petiole 8–10 mm; leaf blade obovate-lanceolate or obovate-elliptic to elliptic, 6–14 × 2–4.5 cm, leathery, base cuneate, margin with 12–20(–35) pairs of spiny teeth 1 mm, sometimes serrate only on distal half, rarely entire, apex caudate and mucronulate; primary veins 8–10 on each side of midrib, abaxially raised. Cymes fascicled in leaf axils, 4–9-flowered; bracts ciliate or glabrous. Pedicel 1–2 cm, glabrous. Calyx ca. 1 mm; lobes apically acute or erose. Corolla white, 3–4(–5) mm, divided almost to base; lobes 2.5–3.5 mm. Stamens attached to base of corolla lobes; connective elongated into a mucro. Drupe blue-black, ellipsoid, 1–1.5 cm × 6–8 mm. Fl. Apr–May, fr. Nov–Dec.

\* Roadsides, woods, thickets on slopes; 700–2000 m. Fujian, Guangxi, Sichuan.

**17. *Osmanthus enervius*** Masamune & K. Mori, J. Jap. Bot. 15: 548. 1939.

无脉木犀 wu mai mu xi

Trees small, glabrous. Branchlets angular. Petiole 5–7 mm; leaf blade lanceolate or elliptic-lanceolate, 5–7 × 1.5–2 cm, leathery, base cuneate, margin entire, apex acuminate and sharp tipped; midrib slightly impressed adaxially, raised abaxially; primary veins 5 or 6 on each side of midrib, obscure. Cymes fascicled in leaf axils, many flowered; bracts 1–2 mm, hirsute, ciliate. Pedicel 1–5 mm. Calyx ca. 0.8 mm. Corolla tube ca. 1.5 mm; lobes semiorbicular, ca. 1.3 mm. Stamens attached to middle of corolla tube; connective apically projecting into a small and rounded appendage. Drupe not seen.

Taiwan [Japan (Ryukyu Islands)].

**18. *Osmanthus fordii*** Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 88. 1889.

石山桂花 shi shan gui hua

Shrubs ca. 2 m, glabrous. Petiole 5–10 mm; leaf blade elliptic or rarely narrowly ovate, 3–5(–6) × 2–2.5 cm, thin leathery, base broadly cuneate or subrounded, margin entire, apex acute or obtuse; midrib slightly impressed adaxially, raised abaxially; primary veins 4–6 on each side of midrib, raised. Cymes fascicled in leaf axils, 6–12-flowered; bracts ca. 3 mm. Pedicel 1–4 mm. Calyx ca. 0.5 mm, membranous at margin. Corolla white; tube ca. 1.5 mm; lobes rounded, 1.5–2 mm. Stamens attached to middle of corolla tube; connective apically slightly projected into an obtuse appendage. Drupe not seen.

\* Guangdong, cultivated in gardens of Guangxi.

**19. *Osmanthus fragrans*** Loureiro, Fl. Cochinch. 1: 29. 1790.

木犀 mu xi

*Olea fragrans* Thunberg ex Murray, Syst. Veg. ed. 14, 57. 1784; *O. ovalis* Miquel; *Osmanthus longibracteatus* H. T. Chang; *O. macrocarpus* P. Y. Bai.

Trees or shrubs 3–5(–10) m, glabrous. Petiole 0.8–1.2 (–1.5) cm; leaf blade elliptic to elliptic-lanceolate, 7–14.5 × 2.6–4.5 cm, base cuneate or broadly cuneate, margin entire or usually serrulate along distal half, apex acuminate; midrib and 6–8(–10) primary veins adaxially impressed and abaxially raised. Cymes fascicled in leaf axils, many flowered; bracts broadly ovate, 2–4 mm. Pedicel 4–10 mm. Calyx ca. 1 mm. Corolla yellowish, yellow, or orange, 3–4 mm; tube 0.5–1 mm. Stamens attached to middle of corolla tube; connective elongated into an obscure mucro. Drupe purple-black, ellipsoid, oblique, 1–1.5 cm. Fl. Sep–Oct, fr. Mar.  $2n = 46^*$ .

\* Guizhou, Sichuan, Yunnan.

Widely cultivated for the perfume of flowers. Varieties based on flower color are only cultivars.

**20. *Osmanthus gracilinervis*** L. C. Chia ex R. L. Lu, Acta Phytotax. Sin. 27: 71. 1989.

细脉木犀 xi mai mu xi

Shrubs or small trees 2–5 m, glabrous. Petiole ca. 1 cm; leaf blade elliptic or narrowly elliptic, rarely narrowly ovate,

5–9 × 2–3(–3.5) cm, leathery, base broadly cuneate or obtuse, margin entire, apex long acuminate and caudate; midrib adaxially impressed, abaxially raised; primary veins 5–8 on each side of midrib, obscure. Cymes fascicled in leaf axils, 5–12-flowered; bracts ca. 1 mm. Calyx ca. 1 mm; lobes shallowly toothed. Corolla white, ca. 4 mm; tube ca. 2 mm; lobes subovate, equaling or rarely slightly shorter than tube. Stamens attached to middle of corolla tube; connective elongated into an obvious mucro. Drupe green-black, ellipsoid, ca. 1.5 cm. Fl. Sep–Oct, fr. Apr–May.

\* Mixed forests on slopes, dense woods in valleys; 300–1200 m. Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang.

**21. *Osmanthus lanceolatus*** Hayata, J. Coll. Sci. Tokyo 30(1): 192. 1911.

锐叶木犀 rui ye mu xi

*Osmanthus daibuensis* Hayata; *O. gamostromus* Hayata.

Shrubs or small trees 5–12 m. Branchlets and petiole glabrous, sometimes puberulent when young. Petiole 5–10 mm; leaf blade lanceolate, 7–10 × 2–3 cm, leathery, base cuneate, somewhat oblique, margin entire or sometimes serrate, apex long acuminate with sharp tip; midrib slightly impressed adaxially, raised abaxially; primary veins 7–9 on each side of midrib, slightly raised on both surfaces. Cymes fascicled in leaf axils, 7–12-flowered; bracts 1.5–3 mm, glabrous. Pedicel 2–10 mm, glabrous. Calyx ca. 1 mm. Corolla white; tube 1.2–1.5 mm; lobes 2.5–3.5 mm. Stamens attached to distal part of corolla tube; connective elongated into a purple-brown mucro. Drupe pale black, ellipsoid, ca. 9 × 5 mm.

\* Montane regions; 2000–3000 m. Taiwan.

**22. *Osmanthus reticulatus*** P. S. Green, Notes Roy. Bot. Gard. Edinburgh 22: 517. 1958.

网脉木犀 wang mai mu xi

Shrubs or small trees 3–8(–12) m. Petiole 0.5–1.5(–2) cm, glabrous; leaf blade elliptic or narrowly ovate, 6–9 × 2–3.5 cm, leathery, base rounded or broadly cuneate, margin entire or with 15(–30) pairs of sharp teeth, apex acuminate and caudate; midrib glabrescent, adaxially impressed, abaxially raised; primary veins 6–9(–12) on each side of midrib, raised, connected to veinlets in a clear, raised reticulation. Cymes fascicled in leaf axils; bracts 2–3 mm, glabrous or slightly pubescent. Pedicel 3–5(–8) mm, glabrous. Calyx ca. 1 mm. Corolla white; tube ca. 2 mm; lobes 1.5–2 mm. Stamens attached to middle of corolla tube; connective elongated into an obvious mucro. Drupe purple-black, long ellipsoid, ca. 1 cm. Fl. Oct–Nov, fr. May–Jun.

\* Dense woods of montane regions, forests in valleys, along streams. Guangdong, Guangxi, Guizhou, Hunan, Sichuan.

**23. *Osmanthus hainanensis*** P. S. Green, Notes Roy. Bot. Gard. Edinburgh 22: 504. 1958.

显脉木犀 xian mai mu xi

Shrubs or small trees 5–6 m. Branchlets glabrous when young. Petiole 1.5–2 cm, glabrous; leaf blade elliptic, oblong, to oblanceolate, 7–12.5 × 2.5–4.5 cm, thick leathery, base cuneate, margin entire, apex caudate-acuminate and with a blunt tip; midrib adaxially slightly raised; primary veins 9–12 on each side of midrib, raised on both surfaces, connected with veinlets into an obscure reticulation. Cymes fascicled in leaf axils, 4- or 5-flowered; bracts 2–3.5 mm, glabrous. Pedicel 5–7 mm, glabrous. Calyx ca. 1 mm. Corolla white, ca. 5 mm; tube 2–2.5 mm. Stamens attached to basal part of corolla tube; connective slightly elongated into a minute mucro. Drupe ellipsoid or ovoid-ellipsoid, ca. 1.5 × 0.8 cm. Fl. Oct–Nov, fr. May.

\* Woods; ca. 1800 m. Hainan.

## 6. CHIONANTHUS Linnaeus, Sp. Pl. 1: 8. 1753.

流苏树属 liu su shu shu

*Linociera* Swartz.

Trees or shrubs, usually evergreen. Leaves opposite, simple, petiolate; leaf blade entire. Inflorescences axillary or rarely terminal panicles, sometimes cymes, umbels, heads, racemes, or fascicles. Flowers bisexual. Calyx small, 4-toothed or 4-lobed. Corolla white or yellow, 4-parted; lobes almost free to base or united into a very short tube or joined in pairs at base, valvate in bud. Stamens 2, inserted at base of corolla lobes; anthers elliptic or long elliptic, subextrorse. Ovules 2 in each locule, pendulous. Style short; stigma entire or  $\pm$  2-cleft. Fruit a drupe; endocarp bony. Seeds usually 1; endosperm fleshy or absent; radicle upward.

About 80 species: tropical and subtropical Africa, America, Asia, and Australia; 7 species in China.

*Chionanthus* and *Linociera* were treated as independent genera in FRPS. Although *Chionanthus* species are evergreen and pantropical and those of *Linociera* are deciduous and grow in temperate E Asia and North America, the two genera are indistinguishable morphologically and are best treated as one. *Chionanthus caudatus* (Collett & Hemsley) Bahadur & Gaur has been recorded near the border in Myanmar but not, so far, from China. It would key out at *C. ramiflorus* in the following key, but would be distinguished by its oblong-elliptic leaf blades with caudate-acuminate apices and petioles 7–10 mm.

- 1a. Leaves deciduous; corolla 12–30 mm ..... 1. *C. retusus*
- 1b. Leaves evergreen; corolla 2–8 mm.
  - 2a. Petiole 1–2 mm; inflorescences 1–1.5 cm ..... 2. *C. brachythyrus*
  - 2b. Petioles usually longer than 1.5 cm; inflorescences at least 2 cm.
    - 3a. Corolla 5–8 mm ..... 3. *C. longiflorus*
    - 3b. Corolla usually less than 5 mm.
      - 4a. Leaves 16–33 cm, oblanceolate; fruit 5–10  $\times$  2.5–5 cm ..... 5. *C. henryanus*
      - 4b. Leaves 5–20 cm (rarely to 30 cm in *C. ramiflorus*), elliptic, oblong, obovate-lanceolate, to lanceolate or suborbicular; fruit 1–3  $\times$  0.5–2.2 cm.
        - 5a. Leaves with 5 or 6 primary veins on each side of midrib; young stems and inflorescences puberulent ..... 7. *C. guangxiensis*
        - 5b. Leaves with 7–10 primary veins on each side of midrib; young stems and inflorescences usually glabrous.
          - 6a. Leaves 5–11  $\times$  1.5–4 cm, without dense, raised pimples beneath when dried; fruit longitudinally ribbed when dried ..... 4. *C. hainanensis*
          - 6b. Leaves (5–)8–20(–30)  $\times$  (2.5–)4–7(–12) cm, with dense, raised pimples beneath when dried; fruit without longitudinal ribs when dried ..... 6. *C. ramiflorus*

**1. *Chionanthus retusus*** Lindley & Paxton in Paxton's Flow. Gard. 3: 85. 1852.

流苏树属 liu su shu

*Chionanthus retusus* var. *mairei* H. Léveillé.

Shrubs or trees to 20 m. Branchlets terete, spreading, glabrous, or pubescent when young. Petiole 0.5–2 cm, densely covered with curly hairs; leaf blade oblong, elliptic, or orbicular, sometimes ovate or obovate, 3–12  $\times$  2–6.5 cm, usually somewhat leathery, adaxially villous along veins, abaxially villous or glabrescent except on veins, base rounded to cuneate, rarely subcordate, apex blunt, sometimes retuse or acute; primary veins 3 or 4 on each side of midrib, slightly raised. Cymose panicles terminal on lateral shoots, 3–12 cm, glabrescent. Pedicel slender, 0.5–2 cm, glabrous. Calyx 1–3 mm; lobes narrowly deltate or lanceolate, 0.5–2.5 mm. Corolla white; tube 1.5–4 mm; lobes linear-oblanceolate, (1–) 1.5–2.5 cm. Anthers long ovate, 1.5–2 mm. Drupe blue-black or black, pruinose, ovoid, 1–1.5 cm  $\times$  6–10 mm. Fl. Mar–Jun, fr. Jun–Nov.  $2n = 46^*$ .

Mixed forests, thickets, along rivers; below 3000 m. Fujian, Gansu, Guangdong, Hebei, Henan, Jiangxi, Shaanxi, Shanxi, Sichuan, Taiwan, Yunnan [Japan, Korea].

**2. *Chionanthus brachythyrus*** (Merrill) P. S. Green, Kew Bull. 50: 326. 1995.

白枝流苏树 bai zhi liu su shu

*Linociera brachythyrus* Merrill, J. Arnold Arbor. 20: 351. 1939; *Chionanthus leucocladus* (Merrill & Chun) B. M. Miao; *Linociera leucoclada* Merrill & Chun.

Shrubs or small trees 4–12 m. Branchlets subterete, glabrous, slightly compressed at nodes. Petiole 1–2 mm; leaf blade oblong-elliptic or elliptic, 3.5–13(–20)  $\times$  1.5–5.5 cm, papery, glabrous, base cuneate or subobtusate, apex short caudate, with a blunt tip; primary veins 6–10 on each side of midrib, slender, slightly raised. Panicles terminal, 1–1.5 cm, scurfy hairy; peduncle absent or very short. Pedicel 1.2–3 mm. Calyx submembranous, scurfy hairy; lobes acute or acuminate, 1–1.5 mm. Corolla white, 5–7 mm; lobes narrowly elliptic or linear, united in pairs at base. Drupe ovoid-ellipsoid, ca. 11  $\times$  7 mm. Fl. Jan–Mar, fr. Jan of following year.

Mixed woods at mountain summits, forests in valley at lower altitudes. Hainan [Vietnam].

**3. *Chionanthus longiflorus*** (H. L. Li) B. M. Miao, Investig. Stud. Nat. 7: 18. 1987.

长花流苏树 chang hua liu su shu

*Linociera longiflora* H. L. Li, J. Arnold Arbor. 25: 313. 1944.

Trees ca. 10 m, glabrous. Branchlets subterete or slightly compressed, glabrous or nearly so. Petiole 2–3.5 cm; leaf blade ovate-elliptic or elliptic, 6–15 × 3–6.5 cm, papery, sparsely covered with white peltate scales, base attenuate, apex acuminate or long acuminate, rarely slightly obtuse; primary veins 8 or 9 on each side of midrib, raised. Panicles axillary, many flowered, 4–9 cm; peduncle 1.5–4 cm. Pedicel 1–2 mm. Calyx 1–1.5 mm; lobes ovate, 0.6–1 mm, acute or slightly blunt. Corolla 5–8 mm; tube 0.4–0.6 mm; lobes lanceolate, obtuse. Fruit not seen. Fl. Mar.

\* Woods on slopes; ca. 1700 m. Yunnan.

**4. *Chionanthus hainanensis*** (Merrill & Chun) B. M. Miao, Investig. Stud. Nat. 7: 18. 1987.

海南流苏树 hai nan liu su shu

*Linociera hainanensis* Merrill & Chun, Sunyatsenia 5: 168. 1940; *L. ramiflora* (Roxburgh) Wallich ex G. Don f. *caudatifolia* L. C. Chia.

Shrubs or trees 3–12 m, glabrous. Branchlets slightly compressed, scabrous. Petiole (1–)1.5–3 cm; leaf blade obovate, obovate-lanceolate to lanceolate, sometimes elliptic, 5–11 × 1.5–4 cm, thin leathery, adaxially shiny, base attenuate, apex obtuse to short caudate; primary veins 7 or 8 on each side of midrib, slightly raised. Panicles axillary or terminal, 2–7.5 cm. Pedicel 1–2 mm. Calyx 0.5–1 mm; lobes deltate, ca. 0.5 mm, acute. Corolla white, 2–3 mm; lobes oblong, acute or rounded, united in pairs at base, extended in full bloom. Drupe ripening blue-black, ellipsoid, 1.3–1.5 cm × 8–9 mm, with several longitudinal ribs. Fl. Jul–Nov, fr. Mar.

\* Dense forests; below 1500 m. Hainan.

**5. *Chionanthus henryanus*** P. S. Green, Kew Bull. 50: 326. 1995.

李榄 li lan

*Linociera henryi* H. L. Li (1944), not *Chionanthus henryae* H. L. Li (1966).

Shrubs or trees 4–18 m. Branchlets subterete, glabrous or glabrescent, compressed and slightly pubescent when young. Petiole stout, 2.5–4 cm, glabrous; leaf blade oblanceolate, 16–33 × 4–12.5 cm, leathery, glabrous, base attenuate and decurrent, apex abruptly and very short acuminate; primary veins 11 or 12 on each side of midrib, adaxially slightly impressed, abaxially raised. Panicles axillary, including peduncle 9–15 cm, pilose. Flowers subsessile. Calyx pubescent; lobes oblong-ovate, 1–1.5 mm, blunt or acuminate. Corolla 2–3 mm, slightly puberulent or glabrous outside; lobes oblong, acuminate, slightly united at base. Drupe black, narrowly ovoid or narrowly ellipsoid, 5–10 × 2.5–5 cm, lenticellate. Fl. May–Jun, fr. Sep–Apr.

Dense forests of valleys, thickets of ravines; 800–1600 m. Yunnan [Myanmar].

Records of this species have been misidentified as *Linociera insignis* C. B. Clarke.

**6. *Chionanthus ramiflorus*** Roxburgh, Fl. Ind. 1: 106. 1820.

枝花流苏树 zhi hua liu su shu

*Linociera ramiflora* (Roxburgh) Wallich ex G. Don, Gen. Hist. 4: 52. 1837.

Shrubs or trees 3–25 m. Branchlets terete, usually compressed. Petiole 2–5 cm, glabrous; leaf blade elliptic, oblong-elliptic, or ovate-elliptic, rarely lanceolate, (5–)8–20(–30) × (2.5–)4–7(–12) cm, leathery, glabrous, densely dotted with raised pimples especially abaxially, base attenuate, apex acuminate, acute, or obtuse; primary veins 7–10 on each side of midrib, slightly raised or obscure. Panicles axillary or rarely terminal, loose, 2.5–12(–25) cm. Pedicel 1–6 mm. Calyx ca. 1 mm, glabrous or puberulent; lobes ovate, ca. 0.5 mm, acute or obtuse. Corolla white or yellow, 2.5–5.5 mm; lobes oblong, rounded, slightly united at base. Anthers elliptic or oblong. Drupe blue-black, pruinose, ovoid-ellipsoid or ellipsoid, (1–) 1.5–3 × 0.5–2.2 cm.

Woods, thickets, slopes, ravines; below 2000 m. Guangxi, Guizhou, Hainan, Taiwan, Yunnan [India, Nepal, Vietnam; Australia, Pacific Islands].

1a. Corolla 2.5–3 mm ..... 6a. var. *ramiflorus*  
1b. Corolla 3–5.5 mm ..... 6b. var. *grandiflorus*

**6a. *Chionanthus ramiflorus* var. *ramiflorus***

枝花流苏树(原变种) zhi hua liu su shu (yuan bian zhong)

*Linociera ramiflora* f. *pubisepala* L. C. Chia.

Pedicel 1–5 mm. Corolla lobes 2.5–3 mm. Anthers elliptic. Fl. Dec–Jun, fr. May–Mar of following year.  $2n = 46^*$ .

Woods, thickets, slopes, ravines; below 2000 m. Guangxi, Guizhou, Hainan, Taiwan, Yunnan [India, Nepal, Vietnam; Australia, Pacific Islands].

**6b. *Chionanthus ramiflorus* var. *grandiflorus*** B. M. Miao, Investig. Stud. Nat. 7: 17. 1987.

大花流苏树 da hua liu su shu

*Linociera ramiflora* var. *grandiflora* (B. M. Miao) B. M. Miao.

Pedicel 3–6 mm. Corolla lobes 3–5.5 mm. Anthers oblong. Fl. Aug, fr. unknown.

\* Woods on slopes; ca. 1300 m. Guizhou.

**7. *Chionanthus guangxiensis*** B. M. Miao, Guihaia 5: 21. 1985.

广西流苏树 guang xi liu su shu

*Linociera guangxiensis* (B. M. Miao) B. M. Miao.

Shrubs or small trees 3–6 m. Branchlets terete, slightly compressed at nodes when young, puberulent. Petiole 1.2–2 cm, puberulent; leaf blade elliptic or narrowly elliptic, rarely suborbicular, 5–9.5 × 2–4.5 cm, leathery, glabrous, adaxially



shiny, base attenuate and decurrent into a winged petiole, apex short acuminate, rarely rounded; primary veins 5 or 6 on each side of midrib, distinctly raised. Panicles axillary, 2–4 cm, puberulent; peduncle 4–13 mm. Pedicel 0.5–2 mm. Calyx ca. 1.1 mm, glabrous; lobes ovate-deltate, ca. 0.4 mm. Corolla

2–2.4 mm; lobes oblong, 1.8–2.2 mm, united near base. Drupe pruinose, ellipsoid, 1.2–1.9 × 0.9–1.2 cm. Endosperm absent. Fl. Apr, fr. Aug.

\* Woods of calcareous rocky hills; below 600 m. Guangxi.

## 7. OLEA Linnaeus, Sp. Pl. 1: 7. 1753.

木犀榄属 mu xi lan shu

*Tetrapilus* Loureiro.

Trees or shrubs, evergreen, sometimes polygamodioecious. Leaves opposite, simple, petiolate; leaf blade entire or serrate. Inflorescences axillary or terminal panicles, sometimes racemes or umbels. Flowers small, bisexual or unisexual. Calyx small, campanulate, 4-lobed to subtruncate; lobes deltate or ovate, usually ciliate. Corolla with a short tube, 4-lobed; lobes shorter or longer than tube, usually valvate in bud, cucullate. Stamens 2(–4), inserted at base of corolla tube, included; filaments short or absent; anthers ovate, elliptic, or subrounded. Ovules 2 in each locule, pendulous. Style short or absent; stigma capitate or slightly 2-cleft. Fruit a drupe; endocarp thick and hard, sometimes papery. Seeds often 1; endosperm fleshy or bony; radicle short, upward.

More than 40 species: Africa, Asia, Europe, Australia and Pacific Islands; 13 species in China.

- 1a. Corolla deeply divided, lobes longer than corolla tube; leaf blade margin entire.
  - 2a. Leaf blade with domatia in axils of primary veins and midrib abaxially ..... 1. *O. paniculata*
  - 2b. Leaf blade without domatia.
    - 3a. Leaf blade densely lepidote abaxially ..... 2. *O. europaea*
    - 3b. Leaf blade not lepidote abaxially.
      - 4a. Leaf blade margin strongly revolute, apex obtuse ..... 3. *O. parvilimba*
      - 4b. Leaf blade margin slightly revolute, apex acuminate to caudate-acuminate ..... 4. *O. caudatilimba*
- 1b. Corolla lobes shorter than corolla tube; leaf blade margin entire or serrate.
  - 5a. Branchlets, peduncles, and pedicels 4-angled ..... 5. *O. tetragonoclada*
  - 5b. Branchlets, peduncles, and pedicels terete or compressed.
    - 6a. Leaf blade narrowly lanceolate, 7–8 × as long as broad ..... 6. *O. neriifolia*
    - 6b. Leaf blade not narrowly lanceolate, less than 4 × as long as broad.
      - 7a. Pedicel 6–10 mm ..... 7. *O. laxiflora*
      - 7b. Pedicel less than 5 mm.
        - 8a. Apex of leaf blade obtuse, rounded or acute, to slightly acuminate, base attenuate, rarely broader ..... 10. *O. tsoongii*
        - 8b. Apex of leaf blade acuminate to caudate-acuminate, sometimes only slightly so, base cuneate or obtuse.
          - 9a. Leaves pilose to villous abaxially, especially on midrib and primary veins; inflorescences densely villous ..... 9. *O. rosea*
          - 9b. Leaves glabrous abaxially; inflorescence glabrous or hairy, sometimes finely so.
            - 10a. Leaves elliptic to elliptic-lanceolate, sometimes broadly so or ovate, (3–)5–6(–9) × (1.2–)2.5–3(–4), apex usually short caudate-acuminate; petiole puberulent ..... 12. *O. brachiata*
            - 10b. Leaves ovate-oblong to lanceolate or slightly oblanceolate, (6–)8–15(–23) × (2–)3–5(–8) cm, apex long acute-acuminate or acuminate, not shortly so; petiole glabrous.
              - 11a. Petiole 2–7 mm; inflorescences glabrous; fruit globose or subglobose, 1–1.5 cm in diam. .... 11. *O. guangxiensis*
              - 11b. Petiole 5–10 mm; inflorescences pubescent; fruit ellipsoid to ovoid, 1.2–1.8 cm.
                - 12a. Leaves oblong-elliptic, elliptic-lanceolate, ovate-oblong, to slightly oblanceolate, apex acuminate or slightly so; fruit ellipsoid, 1.4–1.8 cm ..... 8. *O. hainanensis*
                - 12b. Leaves lanceolate, apex long acute-acuminate; fruit narrowly ovoid, 1.2–1.5 cm ..... 13. *O. salicifolia*

**1. *Olea paniculata*** R. Brown, Prodr. 523. 1810.

腺叶木犀榄 xian ye mu xi lan

*Linociera yunnanensis* H. T. Chang; *Olea glandulifera* Desfontaines.

Trees 6–20 m. Branchlets compressed, glabrous. Petiole 1.5–3 cm, glabrous; leaf blade ovate-elliptic to elliptic-lanceolate, 8.5–18 × 3.5–6.5 cm, papery, minutely lepidote, with domatia in axils of primary veins and midrib abaxially, base cuneate, margin entire, apex acuminate to long acuminate; primary veins 8–11 on each side of midrib, slightly raised. Panicles terminal or axillary, 8–10 cm. Flowers bisexual. Pedicel 0–3 mm. Calyx ca. 1 mm. Corolla white; tube ca. 1 mm; lobes elliptic, 1.5–2 mm, obtuse. Drupe ripening yellow-brown, long ovoid, somewhat oblique, 1.2–1.5 cm × 6–7 mm. Fl. Apr–May, fr. Jul–Nov.

Moist ravines, open valleys; 1200–2400 m. Yunnan [India, Indonesia, Kashmir, Malaysia, Nepal, New Guinea, Pakistan, Sri Lanka; Australia].

**2. *Olea europaea*** Linnaeus, Sp. Pl. 1: 8. 1753.

木犀榄 mu xi lan

Trees or shrubs to 10 m, evergreen. Branchlets angular, along with petiole and leaf blade densely silvery-gray or rusty lepidote. Petiole 2–5 mm; leaf blade narrowly lanceolate to elliptic, rarely narrowly ovate, 1.5–10 × 0.5–2 cm, leathery, glabrous, base cuneate or attenuate, margin entire, apex acute to acuminate and mucronate to cuspidate; primary veins 5–11 on each side of midrib, obscure, somewhat raised adaxially. Panicles axillary or terminal, 2–4 cm. Flowers bisexual or functionally unisexual, subsessile. Calyx 1–1.5 mm. Corolla white, 2.5–4 mm; tube ca. 1 mm; lobes elliptic-oblong, involute, 1.5–3 mm. Drupe ellipsoid or subglobose, 0.7–4 cm.  $2n = 46$ .

- 1a. Abaxial surface of leaf blade silvery-grey lepidote; fruit large, 2–4 cm, mesocarp thick, fleshy..... 2a. subsp. *europaea*  
1b. Abaxial surface of leaf blade somewhat rusty lepidote; fruit small, 7–9 mm, mesocarp somewhat fleshy but thin ..... 2b. subsp. *cuspidata*

**2a. *Olea europaea* subsp. *europaea***

木犀榄(原亚种) mu xi lan (yuan ya zhong)

Trees to 10 m. Branchlets and leaf blade abaxially densely silvery-gray lepidote. Leaf blades narrowly elliptic to elliptic, rarely narrowly ovate, 1.5–9 × 0.5–2 cm, apex acute to acuminate, mucronate. Panicles axillary or subterminal, 2–4 cm. Flowers bisexual or functionally unisexual. Drupe ellipsoid, 2–4 cm, mesocarp thick and fleshy. Fl. Apr–May, fr. Jun–Sep.

Widely cultivated in Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang. Probably originating in the Mediterranean region or SW Asia.

The fruit are used for oil and food.

**2b. *Olea europaea* subsp. *cuspidata*** (Wallich ex G. Don) Ciferri, L'Olivicoltura 19(5): 96. 1942.

锈鳞木犀榄 xiu lin mu xi lan

*Olea cuspidata* Wallich ex G. Don, Gen. Hist. 4: 49. 1837; *O. ferruginea* Royle.

Shrubs or small trees 3–10 m. Branchlets and leaf blade abaxially rusty lepidote. Leaf blade narrowly lanceolate to narrowly oblong-elliptic, 3–10 × 1–2 cm, apex acuminate, cuspidate. Panicles axillary, 1–4 × 1–2 cm. Flowers bisexual. Drupe broadly ellipsoid or subglobose, 7–9 × 4–6 mm, mesocarp somewhat fleshy, thin. Fl. Apr–Aug, fr. Aug–Nov.

Woods, along rivers; 600–2800 m. Yunnan [Afghanistan, India, Kashmir, Nepal, Pakistan; E and S Africa, SW Asia].

**3. *Olea parvilimba*** (Merrill & Chun) B. M. Miao, Fl. Reipubl. Popularis Sin. 61: 126. 1992.

小叶木犀榄 xiao ye mu xi lan

*Linociera parvilimba* Merrill & Chun, Sunyatsenia 5: 169. 1940.

Trees 12–15 m, glabrous. Branchlets somewhat compressed. Petiole 3–10 mm; leaf blade elliptic or oblong-elliptic, 3.5–9 × 1.2–3.2 cm, thick leathery, dotted with peltate scales, base attenuate, margin entire, strongly revolute, apex obtuse; primary veins 5–7 on each side of midrib, slightly impressed. Panicles terminal or nearly so, 1.5–2 cm. Flowers bisexual. Pedicel 1–1.5 mm. Calyx ca. 1 mm. Corolla yellow-green, ca. 2 mm; lobes long ovate, 1–1.3 mm, blunt. Drupe long ellipsoid, 1.2–1.4 cm × ca. 5.5 mm, ribbed when dry. Fl. Sep, fr. Sep–Dec.

\* Woods at mountain summits; ca. 1000 m. Hainan.

**4. *Olea caudatilimba*** L. C. Chia, Acta Phytotax. Sin. 3: 339. 1954.

尾叶木犀榄 wei ye mu xi lan

*Osmanthus polyneurus* P. Y. Bai.

Trees 3–8 m. Branchlets slightly compressed, puberulent. Petiole 8–10 mm, pubescent; leaf blade lanceolate or oblong-elliptic, 5.5–9 × 2–3.5 cm, leathery, glabrous, base cuneate or broadly cuneate, margin entire, apex acuminate to caudate-acuminate and obtuse; primary veins 10–15 on each side of midrib, slender, nearly at right angles to midrib, slightly raised. Panicles axillary or terminal, 2.5–3 cm, few flowered, pubescent. Flowers bisexual. Pedicel 0–3 mm. Calyx 1.5–2 mm. Corolla yellowish, ca. 3 mm; lobes long elliptic, ca. 2 mm, obtuse. Drupe long ellipsoid, 7–12 × 3.5–6.5 mm, sparsely lenticellate. Fl. Apr, fr. May–Jun.

\* Rocky crevices of calcareous montane regions; ca. 1500 m. Yunnan.

**5. *Olea tetragonoclada*** L. C. Chia, Acta Phytotax. Sin. 3: 341. 1952.

方枝木犀榄 fang zhi mu xi lan

Shrubs 1.2–6 m. Branchlets, peduncles, and pedicels 4-angled, puberulent or pubescent. Petiole 1–3 mm, pubescent;

leaf blade oblong-elliptic to lanceolate, 2.5–6 × 0.7–2 cm, leathery, usually puberulent, base broadly cuneate or obtuse, margin entire, apex obtuse or sometimes retuse; primary veins 7 or 8 on each side of midrib, obscure. Panicles axillary or terminal, 0.7–2 cm. Flowers bisexual. Pedicel 0–2 mm. Calyx ca. 1 mm, pubescent. Corolla yellowish, 2–2.5 mm; tube 1–1.5 mm; lobes ovate, 0.7–1 mm. Drupe pruinose, ellipsoid, 8–10 × 5–8 mm. Fl. May, fr. Dec.

\* Thickets, dense forests, tops of calcareous mountains; 900–1000 m. Guangxi.

**6. *Olea neriifolia*** H. L. Li, J. Arnold Arbor. 25: 212. 1944.

狭叶木犀榄 xia ye mu xi lan

Shrubs 1.2–5 m, polygamodioecious. Branchlets terete. Petiole 3–8 mm, glabrous; leaf blade very narrowly lanceolate to narrowly elliptic, leathery, 5–11.5 × 0.7–1.3 cm, glabrous, base attenuate, margin entire, apex acuminate, rarely obtuse; primary veins obscure. Panicles axillary, 2–6 cm. Staminate flowers: pedicel slender, 0.5–1.5 mm; calyx ca. 0.5 mm; corolla white, 1.2–1.4 mm, lobes broadly ovate, ca. 0.4 mm, acute. Bisexual flowers: pedicel 1.5–2 mm; calyx ca. 0.7 mm; corolla white, becoming rose, 1.7–2 mm, lobes broadly ovate, 0.4–0.5 mm, acute. Drupe ripening yellow-brown, ellipsoid, 7–8 × 3–5 mm, ribbed. Fl. Mar–Sep, fr. Sep–Oct.

\* Woods near streams at low elevations. Hainan.

The name *Linociera harmandii* Gagnepain has been incorrectly applied to this species (Merrill & Chun, Sunyatsenia 5: 168. 1940).

**7. *Olea laxiflora*** H. L. Li, J. Arnold Arbor. 25: 314. 1944.

疏花木犀榄 shu hua mu xi lan

Shrubs ca. 2.5 m, polygamodioecious, glabrous except for calyx. Branchlets subterete. Petiole 1–1.5 cm; leaf blade elliptic-oblong to lanceolate, 9–13 × 2.5–4 cm, leathery, abaxially densely dotted with peltate scales, base cuneate, margin entire, apex caudate-acuminate and with acumen to 2 cm; primary veins 8–12 on each side of midrib, somewhat impressed adaxially, raised abaxially. Panicles axillary, staminate ones slender, 4–7 cm. Staminate flowers: pedicel 6–10 mm; calyx 1–1.5 mm, lobes ciliate; corolla white, 3–3.5 mm, lobes ovate-orbicular, ca. 1 mm. Bisexual flowers and fruit not seen. Fl. Nov.

\* Mixed woods; 1600–2200 m. Yunnan.

**8. *Olea hainanensis*** H. L. Li, J. Arnold Arbor. 25: 213. 1944.

海南木犀榄 hai nan mu xi lan

*Tetrapilus hainanensis* (H. L. Li) L. Johnson.

Shrubs or small trees 3–30 m, polygamodioecious, glabrous or only inflorescences sparsely pubescent. Branchlets subterete. Petiole 5–10 mm; leaf blade oblong-elliptic, elliptic-lanceolate, ovate-oblong, or slightly oblanceolate, 8–16 × 2.5–5.5 cm, leathery, base cuneate, margin irregularly sparsely serrate, often bluntly so, or subentire, apex acuminate; primary veins 7–9 on each side of midrib, impressed adaxially, raised abaxially. Panicles terminal or axillary, 2–7.5 cm. Flowers white or yellow. Pedicel 1–3 mm.

Staminate flowers: calyx 0.5–1 mm, with sparse peltate scales; corolla 1.5–2.5 mm, lobes ovate-orbicular, 0.5–0.7 mm. Bisexual flowers: calyx 1–1.5 mm; corolla 2.5–3.5 mm, with peltate scales, lobes ovate-orbicular, 1–1.5 mm. Drupe purple-black or purple-red, ellipsoid, 1.4–1.8 cm × 7–9 mm, 8–10-ribbed when dry. Fl. Oct–Nov, fr. Nov–Apr.

\* Woods of valleys and along streams; below 700 m. Guangdong, Hainan.

**9. *Olea rosea*** Craib, Bull. Misc. Inform. Kew 1911: 411. 1911.

红花木犀榄 hong hua mu xi lan

*Linociera menghaiensis* H. T. Chang; *Olea densiflora* H. L. Li.

Shrubs or small trees 2–15 m, polygamodioecious. Branchlets terete, densely pubescent. Petiole 0.5–1.5 cm, densely villous or glabrescent; leaf blade lanceolate to narrowly ovate-elliptic, 7–17.5 × 2–6.5 cm, leathery, villous abaxially especially on midrib and primary veins, or subglabrous but midrib puberulent adaxially, base cuneate, margin entire or sometimes irregularly sparsely serrate, apex acuminate to caudate-acuminate; primary veins 6–10 on each side of midrib, impressed adaxially, distinctly raised abaxially. Panicles terminal or axillary, densely villous, staminate ones 2.5–14 × 2.5–7 cm, bisexual ones 1.2–3(–10) cm. Staminate flowers: pedicel 0.5–2 mm, villous; calyx lobes 0.5–1 mm, villous; corolla yellow-white, drying rose, 1.5–2.5 mm, lobes suborbicular, 0.5–1 mm. Bisexual flowers: pedicel 0–2 mm; calyx as in staminate flowers; corolla 3–4 mm, lobes orbicular, 0.5–1 mm. Drupe ripening red-purple, long ellipsoid, 1.2–1.7 cm × 5–6 mm, drying obscurely ribbed. Fl. Feb–Sep, fr. Jul–Nov.

Moist and dense forests of valleys; 800–1800 m. Yunnan [Cambodia, Laos, Thailand, Vietnam].

**10. *Olea tsoongii*** (Merrill) P. S. Green, Kew Bull. 50: 338. 1995.

云南木犀榄 yun nan mu xi lan

*Ligustrum tsoongii* Merrill, Philipp. J. Sci. 21: 506. 1922; *Olea brevipes* L. C. Chia; *O. yuennanensis* Handel-Mazzetti; *O. yuennanensis* var. *xeromorpha* Handel-Mazzetti.

Shrubs or trees 3–15 m, polygamodioecious. Branchlets terete, finely pubescent to glabrescent. Petiole 3–10 mm, pubescent to finely puberulent; leaf blade oblanceolate, obovate-elliptic, elliptic, or elliptic-oblong, (3–)4–9(–14) × (1.5–)2–3(–6) cm, leathery, glabrous or puberulent along midrib especially near petiole, base attenuate, margin entire or finely serrate, teeth sharp and ca. 0.5 mm, apex acute to obtuse or rounded, often slightly acuminate; primary veins 5–7 on each side of midrib, often obscure. Inflorescences axillary, paniculate, 2–10 cm, puberulent to glabrescent. Flowers usually in subumbellate groups, white, yellowish, or red. Staminate flowers: pedicel 1–5 mm, slender, glabrous; calyx 1–1.5 mm; corolla 2–3.5(–4.5) mm, lobes broadly deltate, 0.5–1.2 mm. Bisexual flowers: pedicel 0–2 mm, stout; calyx as in staminate flowers; corolla 2–4.5 mm, lobes 0.5–1.5 mm. Drupe

purple-black, ovoid-globose, long ellipsoid, or subglobose, 6–13 × 3–9 mm. Fl. Feb–Nov, fr. May–Dec.

\* Forests or thickets; 800–2300 m. Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Yunnan.

The seed oil is used in food and industry.

*Olea dioica* Roxburgh, which does not occur in China, was recognized in FRPS on the basis of misidentified plants of *O. isoongii*.

**11. *Olea guangxiensis*** B. M. Miao, Guihaia 5: 22. 1985.

广西木犀榄 *guang xi mu xi lan*

Shrubs or small trees 2–4 m, glabrous. Branchlets terete. Petiole 2–7 mm; leaf blade lanceolate or long elliptic, (6–)9–23 × (2.5–)3–8 cm, leathery, base cuneate, margin irregularly serrate or rarely entire, apex acuminate; primary veins 6–10 on each side of midrib, impressed adaxially, raised abaxially, arcuate near margin. Panicles axillary, 1.5–2 cm. Pedicel 1–2 mm. Calyx ca. 1.7 mm, dotted with peltate scales. Corolla ca. 2 mm; lobes long elliptic. Drupe blue or black, subglobose, 1–1.5 cm diam. Fl. May, fr. Aug–Dec.

\* Dense and moist forests in valleys or on mountain tops. Guangdong, Guangxi, SE Guizhou.

**12. *Olea brachiata*** (Loureiro) Merrill, Lingnaam Agric. Rev. 2: 127. 1925.

滨木犀榄 *bin mu xi lan*

*Tetrapilus brachiatus* Loureiro, Fl. Cochinch. 2: 611. 1790.

Shrubs 1–9 m, polygamodioecious. Branchlets terete, finely puberulent. Petiole 3–5 mm, puberulent; leaf blade

elliptic or elliptic-lanceolate, broadly so or ovate, (3–)5–6(–9) × (1.2–)2.5–3(–4) cm, leathery, glabrous except for midrib puberulent toward base adaxially, base cuneate, margin irregularly serrate in distal half, teeth sharp or blunt, ca. 0.5 mm, or rarely entire, apex acuminate to short caudate-acuminate; primary veins 5–7 on each side of midrib, usually obscure. Inflorescences axillary, paniculate, 0.5–3 cm, puberulent or glabrous. Flowers often in subumbellate groups. Bisexual flowers: pedicel 1–1.5 mm, pubescent or glabrescent; calyx ca. 1 mm, puberulent; corolla white, 2–2.5 mm, lobes ovate-orbicular, 0.5–1 mm. Drupe ripening purple-black or blue-purple, globose, 5–7 mm in diam. Fl. Oct–Mar, fr. Jun–Aug.

Forests, thickets; below 700 m. Guangdong, Hainan [SE Asia].

**13. *Olea salicifolia*** Wallich ex G. Don, Gen. Hist. 4: 48. 1837.

喜马木犀榄 *xi ma mu xi lan*

Trees small, polygamodioecious. Branchlets subterete, glabrous. Petiole 5–10 mm; leaf blade lanceolate to elliptic-lanceolate, (7–)10–15(–23) × (2–)3–4.5(–7) cm, somewhat leathery, glabrous, base cuneate to broadly so or obtuse, margin entire, apex long acute-acuminate; primary veins 7–9 on each side of midrib, somewhat obscure. Panicles axillary, 4–12 cm, very finely pubescent. Pedicel 0–3 mm. Calyx 4-lobed, ca. 0.5 mm. Corolla 2.5–3 mm; lobes ca. 1 mm. Drupe narrowly ovoid, 1.2–1.5 cm × 5–7 mm. Fl. Jun, fr. Sep.

Woods on slopes; sea level to 1400 m. Xizang [India, Myanmar].

*Olea gamblei* C. B. Clarke was recognized in FRPS, but the record is based on misidentified plants of *O. salicifolia*.

## 8. MYXOPYRUM Blume, Bijdr. 683. 1826.

胶核木属 *jiao he mu shu*

Shrubs scandent. Branchlets 4-angled. Leaves opposite, simple, petiolate; leaf blade entire or serrate, prominently 3-veined, glabrous. Inflorescences axillary panicles, many flowered. Flowers small, bisexual. Calyx 4-lobed. Corolla yellow or pink, urceolate with fleshy tube longer than lobes or campanulate with tube shorter than lobes; lobes 4, valvate in bud. Stamens 2, inserted at base of corolla tube; anthers dehiscing longitudinally. Ovules 2 in each locule, ascending. Stigma sessile, minute, 2-cleft. Fruit a berry, subglobose. Seeds with fleshy or cuticular endosperm; radicle downward.

About 4 species: Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, New Guinea, Philippines, Thailand, Vietnam; 2 species in China.

- 1a. Inflorescences 4.5–6.5 cm; fruit 10–20 mm in diam.; corolla lobes shorter than tube ..... 1. *M. pierrei*  
1b. Inflorescences 7–19 cm; fruit 5–10 mm in diam.; corolla lobes longer than tube ..... 2. *M. smilacifolium*

**1. *Myxopyrum pierrei*** Gagnepain, Bull. Soc. Bot. France 80: 78. 1933.

海南胶核木 *hai nan jiao he mu*

*Myxopyrum hainanense* L. C. Chia.

Shrubs scandent. Branchlets narrowly winged, glabrous. Petiole 0.5–1.5 cm, canaliculate above; leaf blade elliptic or elliptic-lanceolate, 10–18 × 4.5–7.5 cm, leathery, glabrous, dotted with peltate scales, base broadly cuneate to somewhat rounded, slightly oblique, margin entire or sometimes serrate, apex acuminate to acute or obtuse; veins raised. Panicles axillary, 4.5–6.5 cm, minutely papillose hairy. Flowers sub-

sessile. Calyx 0.6–0.8 mm, minutely papillose hairy; lobes deltate, ca. 0.4 mm. Corolla urceolate, constricted at throat; tube ca. 1 mm; lobes elliptic, ca. 0.5 mm, obtuse. Anthers subglobose, ca. 0.5 mm in diam. Berry subglobose or obovoid, 0.8–2 cm in diam., papillose. Fl. Aug–Oct, fr. Sep–Apr. 2n = 22\*.

Under shade of woods; below 1300 m. Hainan [Laos, Thailand, Vietnam].

**2. *Myxopyrum smilacifolium*** Blume, Mus. Bot. 1: 320. 1850.

阔叶胶核木 *kuo ye jiao he mu*

*Myxopyrum ellipticifolium* H. T. Chang.

Shrubs scandent. Branchlets glabrous. Petiole 5–10 mm, canaliculate above; leaf blades elliptic or ovate-elliptic, 10–16 × 4–10 cm, leathery, glabrous, dotted with peltate scales, base

broadly cuneate to obtuse, margin entire or finely serrate, apex acute to short acuminate. Panicles axillary, 7–19 cm, finely papillate hairy to glabrous. Flowers subsessile. Calyx ca. 0.5 mm; lobes elliptic, ca. 0.5 mm. Corolla campanulate; tube ca. 1 mm; lobes linear-spatulate, ca. 1.5 mm. Berry globose, 5–10 mm in diam. Fr. Dec.

Forest; ca. 700 m. Hainan [Bangladesh, Cambodia, India, Laos, Myanmar, Thailand, Vietnam].

## 9. LIGUSTRUM Linnaeus, Sp. Pl. 1: 7. 1753.

女贞属 nu zhen shu

*Parasyringa* W. W. Smith.

Shrubs or small trees, deciduous or evergreen. Leaves opposite, simple, short petiolate; leaf blade entire. Inflorescences terminal panicles of cymes, rarely lateral. Flowers bisexual, sessile or pedicellate. Calyx campanulate, truncate or 4-toothed, persistent. Corolla white, rotate, funnelform, or salverform, 4-lobed; lobes ca. as long as or shorter than corolla tube, valvate in bud. Stamens 2, inserted at mouth of corolla tube, included or exerted; anthers yellow or sometimes purple, oblong. Ovules 2 in each locule, pendulous. Style shorter than stamens; stigma 2-cleft. Fruit a berrylike drupe with membranous or papery endocarp, rarely drupaceous or loculicidal. Seeds 1–4; endosperm fleshy; radicle short, upward.

About 45 species: Asia, Australia, Europe; 27 species in China. *Ligustrum japonicum* Thunberg and *L. ovalifolium* Hasskarl, native to Japan and South Korea, are widely cultivated in China. No material of *L. matsudae* Kanehira ex Shimizu & Kao and *L. seisuiense* Shimizu & Kao, both described from Taiwan, has been seen.

- 1a. Fruit eventually dehiscent ..... 1. *L. sempervirens*  
1b. Fruit indehiscent.  
2a. Leaf blade obovate-lanceolate to oblong-lanceolate, 5.5–8 cm ..... 2. *L. obovatilimbum*  
2b. Leaf blade of a different shape, length various.  
3a. Corolla tube ca. 2 × as long as lobes or longer.  
4a. Leaves 4–5 × as long as broad, narrowly lanceolate to narrowly oblong-elliptic ..... 18. *L. angustum*  
4b. Leaves 1–3 × as long as broad, with a different range of shapes.  
5a. Inflorescences (1–)3-flowered; primary veins 1–3 on each side of midrib ..... 19. *L. morrisonense*  
5b. Inflorescences many flowered; primary veins more than 3 on each side of midrib.  
6a. Fruit reniform, obviously curved ..... 20. *L. henryi*  
6b. Fruit neither reniform nor curved.  
7a. Inflorescences 10–18 × 8–16 cm ..... 27. *L. expansum*  
7b. Inflorescences 1–8 × 1–4 cm.  
8a. Inflorescences open, somewhat paniculate, 2–8 × 1.5–4 cm.  
9a. Leaf apex long acuminate, blade lanceolate, elliptic, or often narrowly  
so ..... 22. *L. pedunculare*  
9b. Leaf apex acute to slightly acuminate or retuse, blade ovate-orbicular  
to ovate-lanceolate or elliptic-oblong to broadly elliptic.  
10a. Inflorescence rachis glabrous; pedicel 1–3 mm; primary leaf  
veins usually obscure adaxially ..... 23. *L. pricei*  
10b. Inflorescence rachis densely pubescent; pedicel 0–1 mm; primary  
leaf veins obviously sunken adaxially ..... 10. *L. xingrenense*  
8b. Inflorescences dense, ± cylindric, 1–5.5 × 1–3 cm.  
11a. Corolla 12–16 mm; anthers 4–5 mm ..... 26. *L. longitubum*  
11b. Corolla 4–11 mm; anthers 1.5–3 mm.  
12a. Leaf blade ± leathery, glabrous abaxially, veins usually obscure  
on both surfaces ..... 21. *L. delavayanum*  
12b. Leaf blade papery, hairy abaxially, especially on midrib, or  
glabrous.  
13a. Leaf blade 0.8–6 × 0.4–2.5 cm, obtuse to acute ..... 24. *L. obtusifolium*  
13b. Leaf blade 4–7(–10) × 2–3(–4.5) cm, acute to slightly  
acuminate ..... 25. *L. leucanthum*  
3b. Corolla tube ca. as long as lobes or slightly shorter.  
14a. Leaf blade narrowly lanceolate or linear-lanceolate, rarely elliptic-lanceolate,  
3–8(–25) mm broad ..... 3. *L. gracile*

- 14b. Leaf blade of a different combination of characters.
- 15a. Leaf apex usually retuse, rounded, or obtuse; leaf blade 1–4(–6.5) cm, with (2 or)3 or 4(or 5) primary veins each side of midrib.
- 16a. Inflorescence branches narrowly contracted, 2–5 × longer than broad ..... 4. *L. quihoui*
- 16b. Inflorescences lax, 1–2 × as long as broad.
- 17a. Petiole 6–12 mm; leaf blade (2.5–)3–6.5 cm ..... 6. *L. amamianum*
- 17b. Petiole 0–5 mm; leaf blade 1–4 cm.
- 18a. Pedicel slender, less than 0.5 mm thick, (1–)1.5–4 mm ..... 7. *L. tenuipes*
- 18b. Pedicel stoutish, ca. 0.5 mm thick, 0–2 mm.
- 19a. Leaves broadest at upper third, obovate-elliptic to obovate-orbicular ..... 9. *L. retusum*
- 19b. Leaves broadest at middle, ovate, elliptic-oblong, ovate-elliptic, or suborbicular.
- 20a. Petiole 2–5 mm; leaf blade 1.5–2 cm broad; fruit obovoid, slightly curved ..... 8. *L. stronglylophyllum*
- 20b. Petiole 0–2 mm; leaf blade 0.8–1.2 cm broad; fruit subglobose ..... 5. *L. punctifolium*
- 15b. Leaf apex acute to long acuminate; leaf blade (2–)4–17 cm, with more than 4 primary veins on each side of midrib.
- 21a. Primary veins (6–)9–15 on each side of midrib ..... 11. *L. compactum*
- 21b. Primary veins 4–11 on each side of midrib.
- 22a. Fruit curved, reniform or long obovoid.
- 23a. Branchlets, rachis, and pedicels hairy; leaf blade papery ..... 12. *L. robustum*
- 23b. Branchlets, rachis, and pedicels glabrous; leaf blade leathery (papery in f. *latifolium*) ..... 13. *L. lucidum*
- 22b. Fruit usually not curved.
- 24a. Inflorescence rachis glabrous or nearly so; fruit usually ellipsoid ..... 14. *L. lianum*
- 24b. Inflorescence rachis ± hairy; fruit subglobose or ellipsoid.
- 25a. Leaf blade thick leathery.
- 26a. Leaf blade ca. 2 × as long as broad; inflorescence rachis densely pubescent; pedicel 0–1 mm ..... 10. *L. xingrenense*
- 26b. Leaf blade 3–4 × as long as broad; inflorescence rachis puberulent; pedicel 1–2 mm ..... 15. *L. yunguiense*
- 25b. Leaf blade papery to thin leathery, rarely leathery.
- 27a. Leaf blade glabrous or occasionally pubescent only along midrib adaxially, ovate to elliptic; pedicel 0–1 mm ..... 16. *L. confusum*
- 27b. Leaf blade ± hairy, if glabrous, then blade lanceolate and inflorescences axillary or terminal; pedicel 1–5 mm ..... 17. *L. sinense*

1. *Ligustrum sempervirens* (Franchet) Lingelsheim in Engler, Pflanzenr. IV. 243(Heft 72): 95. 1920.

裂果女贞 lie guo nu zhen

*Syringa sempervirens* Franchet, Bull. Mens. Soc. Linn. Paris 1: 613. 1886; *Parasyringa sempervirens* (Franchet) W. W. Smith.

Shrubs evergreen, 1–4 m, puberulent, glabrescent. Branchlets angular. Petiole 0–5 mm; leaf blade elliptic, ovate, to suborbicular, 1.5–6 × 0.8–4.5 cm, leathery, glabrous except for midrib sometimes puberulent and glandular dotted, base cuneate to subrounded, apex acute to short acuminate or obtuse; primary veins 3–5 on each side of midrib, obscure, often drying rugose adaxially. Panicles terminal, 2–10 × 2–8 cm, densely flowered; rachis angular. Flowers subsessile. Calyx 1.5–2.5 mm. Corolla 6–8 mm; tube longer than lobes. Stamens nearly reaching apex of corolla lobes; anthers ca. 2 mm. Fruit purple-black, ellipsoid, ca. 8 × 5

mm, at first fleshy, eventually loculicidal. Fl. Jun–Aug, fr. Sep–Nov.

\* Slopes, thickets by rivers; 1900–2700 m. SW Sichuan, NW Yunnan.

2. *Ligustrum obovatilimum* B. M. Miao, Acta Phytotax. Sin. 23: 55. 1985.

倒卵叶女贞 dao luan ye nu zhen

Shrubs evergreen, 1–2 m. Branchlets subterete, glabrous. Petiole 5–7 mm, smooth; leaf blade obovate-lanceolate to oblong-lanceolate, 5.5–8 × 2–2.5 cm, leathery, glabrous adaxially, densely glandular dotted abaxially, base attenuate, apex broadly acute to obtuse; primary veins 5–7 on each side of midrib, slightly raised. Flowers not seen. Fruiting branches terminal, ca. 13 × 12 cm, glabrous; fruit-bearing peduncle 4-angled, 2.5–3 cm. Calyx glabrous; teeth ovate, persistent. Fruit ellipsoid, 5–6 × ca. 4 mm, with 4-angled stalk 2–3 mm. Fr. Dec.

\* Open places; ca. 200 m. Guangdong (Luofu Shan).

**3. *Ligustrum gracile*** Rehder in Sargent, Pl. Wilson. 2: 602. 1916.

细女贞 xi nu zhen

*Ligustrum compactum* (Wallich ex G. Don) J. D. Hooker & Thomson ex Brandis var. *glabrum* (Mansfeld) Handel-Mazzetti; *L. quihoui* Carrière var. *glabrum* Mansfeld.

Shrubs deciduous, 0.5–3 m. Branchlets often puberulent. Petiole 1–8 mm, slender, glabrous; leaf blade narrowly lanceolate or linear-lanceolate, rarely elliptic-lanceolate, 1–4 (–8.5) cm × 3–8 (–25) mm, papery, glabrous, abaxially glandular dotted, base cuneate or obtuse, apex acuminate or obtuse and mucronulate; primary veins 3–5 (–7) on each side of midrib, obscure. Panicles terminal or axillary, 5–13 × 1.5–10 cm. Flowers subsessile. Calyx 1–1.5 mm, glabrous. Corolla 3–5.5 mm; tube ca. as long as lobes. Stamens approaching apex of corolla lobes; anthers 1.5–2.5 mm. Fruit blue-black, obovoid, 5–7 × 3–5 mm. Fl. May–Aug, fr. Aug–Nov.  $2n = 46^*$ .

\* Thickets on slopes, flood lands; 800–3800 m. Sichuan, Yunnan.

**4. *Ligustrum quihoui*** Carrière, Rev. Hort. 1869: 377. 1869.

小叶女贞 xiao ye nu zhen

*Ligustrum argyi* H. L. 関eill ; *L. brachystachium* Decaisne; *L. quihoui* var. *brachystachium* (Decaisne) Handel-Mazzetti; *L. quihoui* var. *trichopodium* Y. C. Yang.

Shrubs semievergreen, 1–3 m. Branchlets terete, puberulent, glabrescent. Petiole 0–5 mm; leaf blade lanceolate, elliptic, to obovate, 1–4 (–5.5) × 0.5–2 (–3) cm, thin leathery, glabrous or rarely puberulent along midrib, base attenuate, apex acute to obtuse or retuse; primary veins 2–4 (or 5) on each side of midrib. Panicles terminal, contracted, 4–15 (–22) × 2–4 cm; rachis with leaflike bracts reduced in size upward. Flowers subsessile. Calyx 1.5–2 mm, glabrous. Corolla 4–5 mm; tube ca. as long as lobes. Stamens exceeding corolla lobes; anthers ca. 1.5 mm. Fruit purple-black, obovoid, ellipsoid, or subglobose, 5–9 × 4–7 mm. Fl. May–Jul, fr. Aug–Nov.

\* Near gullies or roadsides, thickets along rivers; 100–2500 m. Anhui, NW Guizhou, Henan, Hubei, Jiangsu, Jiangxi, S Shaanxi, Shandong, Sichuan, Xizang (Chayu Xian), Yunnan, Zhejiang.

**5. *Ligustrum punctifolium*** M. C. Chang, Acta Phytotax. Sin. 23: 53. 1985.

斑叶女贞 ban ye nu zhen

Shrubs evergreen, ca. 2 m. Branchlets terete, minutely puberulent. Petiole 0–2 mm; leaf blade elliptic-oblong or ovate, 1–2 × 0.8–1.2 cm, leathery, glabrous except for midrib sometimes puberulent and brown glandular dotted, base cuneate to subrounded, apex obtuse or retuse, occasionally acute; primary veins 2 or 3 on each side of midrib, obscure or adaxially slightly raised. Panicles terminal, ca. 5 × 2 cm. Pedicel 0.5–1.5 mm, glabrous. Calyx ca. 1.5 mm, glabrous; Corolla 6–7 mm; tube ca. as long as lobes. Stamens reaching apex of corolla lobes. Fruit subglobose, ca. 5 mm in diam. Fl. Aug, fr. Oct.

Flood plains. Hong Kong [Vietnam].

*Ligustrum punctifolium* is close to *L. retusum* and further study is needed to establish it as a separate species.

**6. *Ligustrum amamianum*** Koidzumi, Pl. Nov. Amami-Ohsima 7: 143. 1929.

台湾女贞 tai wan nu zhen

*Ligustrum japonicum* Thunberg var. *pubescens* Koidzumi.

Shrubs evergreen, to 3 m. Branchlets terete, puberulent at first, soon glabrous. Petiole 6–12 mm, glabrous; leaf blade elliptic or broadly ovate to suborbicular, (2.5–)3–6.5 × 1.5–3.5 cm, leathery, glabrous, densely glandular dotted, base obtuse or decurrent, margin strongly revolute, apex obtuse or acute, sometimes retuse; primary veins 3–5 on each side of midrib, impressed adaxially, slightly raised abaxially. Panicles terminal, almost as long as broad; rachis pubescent or glabrous. Flowers subsessile. Calyx ca. 1.5 mm. Corolla 4–6 mm; tube ca. as long as lobes. Stamens nearly approaching apex of corolla lobes; anthers ca. 2 mm. Fruit subglobose or ovoid, 6–7 mm in diam. Fl. May, fr. Nov–Dec.

Woods on calcareous mountain ridges; 1000–3000 m. Hong Kong, NE and C Taiwan [Japan (Ryukyu Islands)].

**7. *Ligustrum tenuipes*** M. C. Chang, Acta Phytotax. Sin. 23: 54. 1985.

细梗女贞 xi geng nu zhen

Shrubs evergreen, ca. 1.5 m. Branchlets terete, pubescent, glabrescent. Petiole 1–4 mm, slightly puberulent; leaf blade oblong to ovate-orbicular, 1–3 × 0.5–1.5 cm, leathery, glabrous, sometimes adaxially puberulent along midrib and drying rugose, base broadly cuneate to subrounded, apex obtuse and retuse; primary veins 3 or 4 on each side of midrib, usually obscure. Panicles terminal, 3–5 × 2.5–4 cm; rachis and pedicel slender, pubescent or glabrous. Pedicel (1–)1.5–4 mm. Calyx ca. 1 mm, glabrous. Corolla ca. 4 mm; tube slightly shorter than lobes. Fruit globose or ellipsoid, ca. 7 × 5 mm. Fl. May, fr. Nov.

\* Stony mountains or under light woods at mountaintop, 100–300 m. NE Guangxi.

**8. *Ligustrum strongylophyllum*** Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 93. 1889.

宜昌女贞 yi chang nu zhen

Shrubs evergreen, 1–4 m. Branchlets subterete, puberulent, sometimes densely so. Petiole 2–5 mm, puberulent; leaf blade ovate, ovate-elliptic, or suborbicular, 1.5–3 × 1.5–2 cm, leathery, glabrous, sometimes puberulent along midrib and adaxial surface rugose, base subrounded or cuneate, apex subacute to somewhat rounded; primary veins 3 (or 4) on each side of midrib, usually obscure. Panicles terminal, spreading, 4.5–12 × 4–9 cm; rachis angular, particularly in fruit. Pedicel 0–2 mm. Calyx 1–1.5 mm. Corolla 4–6 mm; tube ca. as long as lobes. Stamens not exceeding corolla lobes; anthers 1–2 mm. Fruit black, obovoid, 6–9 × 3–5 mm, slightly curved. Fl. Jun–Aug, fr. Aug–Oct.

\* Under woods in ravines, thickets at mountaintop, along rivers; 300–2500 m. Gansu, Hubei, Shaanxi, Sichuan.

**9. *Ligustrum retusum*** Merrill, Lingnan Sci. J. 14: 49. 1935.

小叶女贞 xiao ye nu zhen

Shrubs evergreen, 2–3 m. Branchlets terete, puberulent, glabrescent. Petiole 1–4 mm, glabrous or puberulent; leaf blade obovate-elliptic to obovate-orbicular, 1–4 × 0.7–2 cm, leathery, glabrous, base cuneate, apex obtuse and retuse; primary veins 3 or 4 on each side of midrib, obscure or slightly raised. Panicles terminal, 3–6 × 2.5–4.5 cm; rachis puberulent. Flowers sessile or short pedicellate. Calyx ca. 1 mm, glabrous. Corolla ca. 4 mm; tube shorter than lobes. Stamens exceeding corolla lobes; anthers ca. 1.2 mm. Fruit subglobose or ellipsoid, 4–5 × ca. 3 mm. Fl. Jul–Aug, fr. Dec–Apr.

Woods on slopes, near seashore. Hainan [Vietnam].

**10. *Ligustrum xingrenense*** D. J. Liu, Acta Phytotax. Sin. 26: 243. 1988.

兴仁女贞 xing ren nu zhen

Shrubs evergreen, 0.5–3 m. Branchlets densely pubescent when young, becoming sparsely so later. Petiole 2–5 mm, puberulent; leaf blade ovate-orbicular to ovate-lanceolate, 2.5–5.5 × 1.5–2.5 cm, leathery, glabrous or sparsely puberulent along midrib abaxially, base cuneate to subrounded, apex acute to short acuminate or retuse; primary veins 4(or 5) on each side of midrib, deeply impressed adaxially. Panicles terminal, 2–8 cm; rachis remaining densely pubescent in fruit. Pedicel 0–1 mm. Calyx ca. 1.5 mm. Other parts of flowers not seen. Fruit subglobose or ellipsoid, 5–6 × 3–5 mm. Fr. Sep–Mar.

\* Thickets, woods, shady and wet places in valleys; 400–1600 m. W Guizhou, E Yunnan.

**11. *Ligustrum compactum*** (Wallich ex G. Don) J. D. Hooker & Thomson ex Brandis, Forest Fl. N. W. India 310. 1874.

长叶女贞 chang ye nu zhen

Shrubs or small trees to 12 m, semievergreen. Branchlets terete, pubescent when young, glabrescent or velutinous. Petiole 0.5–2.5 cm, glabrous, puberulent or velutinous; leaf blade elliptic-lanceolate to ovate-elliptic, 5–15 × (2–)3–6(–8) cm, papery, glabrescent, sometimes midrib only puberulent adaxially, or velutinous, base rounded to cuneate, apex acute to long acuminate; primary veins (6–)9–15 on each side of midrib, slightly prominent. Panicles usually terminal, 7–20 × 7–16(–24) cm; rachis angular, particularly in fruit. Flowers subsessile. Calyx 1–1.5 mm. Corolla 3.5–5 mm; tube ca. as long as lobes. Stamens reaching apex of corolla lobes; anthers 1–2.5 mm. Fruit blue-black or black, ellipsoid or subglobose, 7–10 × 4–6 mm, usually slightly curved.

Valleys; 600–3400 m. Hubei, Sichuan, Xizang, Yunnan [India, Nepal].

- 1a. Branchlets pubescent or glabrescent; petioles and inflorescences glabrous or sometimes puberulent ..... 11a. var. *compactum*
- 1b. Branchlets, petioles, and inflorescences

velutinous ..... 11b. var. *velutinum*

**11a. *Ligustrum compactum* var. *compactum***

长叶女贞(原变种) chang ye nu zhen (yuan bian zhong)

*Olea compacta* Wallich ex G. Don, Gen. Hist. 4: 48. 1837;  
*Ligustrum chenaultii* Hickel.

Branchlets pubescent when young, glabrescent. Petiole and inflorescences glabrous or sometimes puberulent. Fl. Mar–Jul, fr. Aug–Dec.

Under woods in valleys; 600–3400 m. Hubei, Sichuan, Xizang, Yunnan [India, Nepal].

**11b. *Ligustrum compactum* var. *velutinum*** P. S. Green, Bot. Mag. 182: t. 759. 1978.

毛长叶女贞 mao chang ye nu zhen

*Ligustrum yunnanense* L. Henry.

Branchlets, petiole, and inflorescences velutinous.

\* Valleys. Hubei, Sichuan, Xizang, Yunnan.

**12. *Ligustrum robustum*** (Roxburgh) Blume subsp. *chinense* P. S. Green, Kew Bull. 50: 385. 1995.

粗壮女贞 cu zhuang nu zhen

*Ligustrum purpurascens* Y. C. Yang; *L. tibeticum* Decaisne.

Shrubs or small trees 1–10 m, deciduous. Branchlets terete, sparsely puberulent, glabrescent. Petiole 2–8 mm, pubescent or glabrescent; leaf blade lanceolate to subovate or elliptic, 4–11 2–4 cm, papery, glabrous or sometimes puberulent along midrib adaxially, base broadly cuneate or subrounded, apex long acuminate; primary veins 5 or 6 on each side of midrib. Panicles terminal, 5–15 × 3–11 cm; rachis angular in fruit, puberulent. Pedicel 0–2 mm. Calyx ca. 1 mm, minutely hirsute or glabrescent. Corolla 4–5 mm; tube ca. as long as lobes. Stamens nearly reaching apex of corolla lobes; anthers 1.5–1.8 mm. Fruit black, reniform or long obovoid, 7–10(–12) × 3–6 mm, curved. Fl. Jun–Jul, fr. Jul–Dec.

\* Woods in montane regions; 400–2000 m. S Anhui, NW Fujian, Guangdong (Lechang Xian), W Guangxi, Guizhou, E Hubei, W Hunan, Jiangxi, Sichuan, Yunnan.

*Ligustrum robustum* subsp. *robustum* grows in Cambodia, India, Laos, Myanmar, Thailand, and Vietnam.

**13. *Ligustrum lucidum*** W. T. Aiton, Hortus Kew. 1: 19. 1810.

女贞 nu zhen

*Esquirolia sinensis* H. Léveillé; *Ligustrum compactum* (Wallich ex G. Don) J. D. Hooker & Thomson ex Brandis var. *latifolium* W. C. Cheng; *L. esquirolii* H. Léveillé; *L. lucidum* var. *esquirolii* (H. Léveillé) H. Léveillé; *L. lucidum* f. *latifolium* (W. C. Cheng) P. S. Hsu.

Shrubs or trees to 25 m, evergreen or deciduous, glabrous. Branchlets terete. Petiole 1–3 cm; leaf blade ovate to



sometimes broadly elliptic or elliptic to lanceolate, 6–17 × 3–8 cm, leathery or papery, base rounded or sometimes attenuate, apex acute to acuminate or sometimes obtuse; primary veins 4–11 on each side of midrib, slightly raised or obscure. Panicles terminal, 8–20 × 8–25 cm; rachis angular in fruit. Flowers sessile or nearly so. Calyx 1.5–2 mm. Corolla 4–5 mm; tube ca. as long as lobes. Stamens approaching apex of corolla lobes; anthers 1–1.5 mm. Fruit deep blue-black, ripening red-black, reniform or nearly so, 7–10 × 4–6 mm. Fl. May–Jul, fr. Jul–May.

\* Woods; below 2900 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang.

Evergreen plants with (4 or)5 or 6(–9) primary veins on each side of leaf blade midrib have been recognized as f. *lucidum*, whereas deciduous plants with 7–11 primary veins on each side of leaf blade midrib as f. *latifolium* (W. C. Cheng) P. S. Hsu.

Grown for culturing wax insects to obtain white wax. The fruit is used as a tonic.

**14. *Ligustrum lianum*** P. S. Hsu, Acta Phytotax. Sin. 11: 200. 1966.

华女贞 hua nu zhen

Shrubs or small trees 0.6–7(–15) m, evergreen. Branchlets subterete, puberulent to glabrescent. Petiole 0.5–1.5 cm, puberulent or glabrescent; leaf blade elliptic to ovate-lanceolate, 4–13 × 1.5–5.5 cm, leathery, glabrous except for midrib pilose abaxially, base broadly cuneate or rounded, apex acuminate or long acuminate; primary veins 4–6 on each side of midrib, slightly prominent. Panicles terminal, 4–12 × 2–11 cm; rachis and pedicel glabrous or nearly so. Pedicel 0.5–2 mm. Calyx 1–1.5 mm. Corolla 4–5 mm; tube ca. as long as lobes. Stamens approaching apex of corolla lobes; anthers ca. 2 mm. Fruit black or red-brown, usually ellipsoid, 6–12 × 5–7 mm. Fl. Apr–Jun, fr. Jul–Apr.

\* Woods in ravines; 400–1700 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Zhejiang.

**15. *Ligustrum yunguiense*** B. M. Miao, Acta Phytotax. Sin. 26: 241. 1988.

云贵女贞 yun gui nu zhen

Shrubs or small trees 1.5–5 m, evergreen. Branchlets terete, brown and puberulent at first, becoming gray-black and glabrous. Petiole 1–1.5 cm, glabrous; leaf blade lanceolate or elliptic-lanceolate, 6–9 × 1.5–3.5 cm, thick leathery, glabrous, base attenuate, apex acute to caudate-acuminate; primary veins 4 on each side of midrib. Panicles terminal, 5–13 × 7.5–12 cm; rachis puberulent. Pedicel 1–2 mm. Calyx ca. 1 mm, glabrous. Corolla 3–3.5 mm; tube ca. as long as lobes or slightly shorter. Stamens not exceeding corolla lobes; anthers 1.5–1.8 mm. Fruit black, subglobose. Fl. May, fr. Sep–Oct.

\* Woods, thickets in valleys; 1500–2100 m. Guizhou, Yunnan.

**16. *Ligustrum confusum*** Decaisne, Nouv. Arch. Mus. Hist. Nat. Paris, ser. 2, 2: 24. 1897.

散生女贞 san sheng nu zhen

Shrubs or small trees to 8 m. Branchlets terete, puberulent when young, glabrescent. Petiole 4–5(–10) mm, glabrous or puberulent; leaf blade ovate to elliptic, sometimes lanceolate, 2.5–7(–10) × 1.3–3(–5) cm, thin leathery, glabrous or sometimes pubescent near base of midrib adaxially, base cuneate to broadly cuneate or rounded, apex acuminate or acute; primary veins 4–6 on each side of midrib. Panicles terminal, 4–11 × 2–8 cm; rachis puberulent to pubescent. Flowers subsessile. Calyx 1–1.5 mm, glabrous. Corolla 4–5 mm; tube ca. as long as lobes. Stamens not exceeding corolla lobes; anthers 1–1.5 mm. Fruit black or black-brown, subglobose to obovoid, 6–11 mm in diam.

Thickets near gullies; 800–2100 m. Xizang, Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal, Sikkim, Vietnam].

1a. Fruit 6–9 mm in diam. .... 16a. var. *confusum*  
1b. Fruit 7–11 mm in diam. .... 16b. var. *macrocarpum*

**16a. *Ligustrum confusum* var. *confusum***

散生女贞(原变种) san sheng nu zhen (yuan bian zhong)

*Ligustrum gyirongense* P. Y. Bai.

Fruit 6–9 mm in diam. Fl. Mar–Apr, fr. Jul.

Thickets near gullies; 800–2000 m. Xizang, Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal, Sikkim, Vietnam].

**16b. *Ligustrum confusum* var. *macrocarpum*** C. B. Clarke in J. D. Hooker, Fl. Brit. India 3: 616. 1882.

大果女贞 da guo nu zhen

Fruit 7–11 mm in diam.

Woods in montane regions; ca. 2100 m. Xizang [India].

**17. *Ligustrum sinense*** Loureiro, Fl. Cochinch. 1: 19. 1790.

小蜡 xiao la

Shrubs or small trees 2–4(–7) m, deciduous. Branchlets terete, villous, pubescent, pilose, puberulent, to glabrescent. Petiole 2–8 mm; leaf blade ovate, oblong, elliptic to lanceolate, or suborbicular, 2–7(–13) × 1–3(–5.5) cm, densely villous to sparsely pubescent or glabrous, papery to somewhat leathery, base cuneate to subrounded, apex acute to acuminate, sometimes obtuse and retuse; primary veins 4–6(or 7) on each side of midrib, impressed or plane adaxially, somewhat raised abaxially. Panicles terminal or axillary, 4–11 × 3–8 cm, with or without leaf at base. Pedicel 1–5 mm. Calyx 1–1.5 mm, glabrous or pubescent. Corolla 3.5–5.5 mm; tube slightly shorter than lobes. Stamens reaching apex of corolla lobes or exceeding that; anthers ca. 1 mm. Fruit subglobose, 5–8 mm in diam.

Mixed forests, valleys, along streams, thickets, woods, ravines; 200–2700 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Vietnam].

1a. Leaf blade lanceolate, glabrous; panicles axillary or terminal ..... 17b. var. *luodianense*  
1b. Leaf blade with different characters.  
2a. Panicles axillary or rarely terminal, not leafy at base, or rarely leafy.

- 3a. Leaf veins usually not sunken adaxially; calyx glabrous ..... 17f. var. *myrianthum*
- 3b. Leaf veins obviously sunken adaxially; calyx hairy ..... 17g. var. *concaum*
- 2b. Panicles usually terminal, leafy at base.
- 4a. Calyx pubescent; leaf blade usually densely yellow-brown hairy abaxially ..... 17c. var. *coryanum*
- 4b. Calyx glabrous.
- 5a. Adaxial leaf veins obviously impressed ..... 17d. var. *rugosulum*
- 5b. Adaxial leaf veins usually plane.
- 6a. Branchlets and inflorescence rachis sparsely pubescent or glabrescent; leaf blade usually densely yellow villous abaxially ... 17e. var. *opienense*
- 6b. Branchlets and inflorescence rachis usually densely pubescent or pilose.
- 7a. Leaf blade ovate to oblong or suborbicular, sparsely pubescent or glabrescent abaxially ..... 17a. var. *sinense*
- 7b. Leaf blade elliptic to lanceolate, usually densely rusty pilose abaxially ..... 17h. var. *dissimile*

**17a. *Ligustrum sinense* var. *sinense***

小蜡 (原变种) xiao la (yuan bian zhong)

*Ligustrum calleryanum* Decaisne; *L. deciduum* Hemsley; *L. microcarpum* Kanehira & Sasaki; *L. microcarpum* var. *shakaroense* (Kanehira) Shimizu & Kao; *L. nokoensis* Masamune & K. Mori; *L. shakaroense* Kanehira; *L. sinense* var. *nitidum* Rehder; *L. sinense* var. *stauntonii* (A. de Candolle) Rehder; *L. stauntonii* A. de Candolle.

Branchlets and inflorescence rachis pubescent or pilose, glabrescent. Leaf blade ovate, oblong, lanceolate, or suborbicular, 2–7(–9) × 1–3(–3.5) cm, papery or thin leathery, sparsely pubescent or glabrescent. Panicles usually terminal, leafy at base. Calyx glabrous. Fl. Mar–Jun, fr. Sep–Dec. 2n = 46.

Mixed forests on slopes, valleys, along streams; 200–2600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Vietnam].

The bark is used as antipyretic; often cultivated as a hedge plant.

**17b. *Ligustrum sinense* var. *luodianense*** M. C. Chang, Investig. Stud. Nat. 6: 77. 1986.

罗甸小蜡 luo dian xiao la

*Ligustrum longipedicellatum* H. T. Chang.

Branchlets and inflorescence rachis sparsely pubescent or puberulent. Leaf blade lanceolate, leathery, glabrous. Panicles axillary or terminal, with or without leaf at base. Fl. Mar.

\* Thickets along rivers or on slopes; 200–300 m. Guangdong, Guizhou (Luodian Xian), Yunnan.

**17c. *Ligustrum sinense* var. *coryanum*** (W. W. Smith) Handel-Mazzetti, Symb. Sin. 7: 1011. 1936.

多毛小蜡 duo mao xiao la

*Ligustrum coryanum* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 13: 165. 1921.

Branchlets, inflorescence rachis, petiole, and leaf blade abaxially densely yellow-brown or yellow villous or minutely hirsute, occasionally hairy only along abaxial veins. Panicles terminal, leafy at base. Calyx generally pubescent. Fl. Mar–Apr, fr. Nov–Dec.

\* Mixed forests of montane regions; 500–2500 m. Sichuan (Jinsha Jiang), C Yunnan.

**17d. *Ligustrum sinense* var. *rugosulum*** (W. W. Smith) M. C. Chang, Investig. Stud. Nat. 6: 78. 1986.

皱叶小蜡 zhou ye xiao la

*Ligustrum rugosulum* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 44. 1917; *L. robustum* (Roxburgh) Blume var. *chayuense* P. Y. Bai.

Leaf blade ovate-lanceolate to elliptic, 4–13 × 2–5.5 cm; veins obviously impressed adaxially. Panicles terminal, leafy at base. Calyx glabrous. Fl. Apr–Jun, fr. Sep–Dec.

Valleys, along rivers, woods, thickets; 400–2000 m. SE Xizang, Yunnan [Vietnam].

**17e. *Ligustrum sinense* var. *opienense*** Y. C. Yang, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser., 12: 119. 1939.

峨边小蜡 e bian xiao la

Branchlets and inflorescence rachis slightly pubescent or glabrescent. Leaf blade oblong-lanceolate or ovate-lanceolate, 4.5–10 × 2–3.5 cm, usually densely yellow villous abaxially, rarely hairy only along veins. Panicles terminal, leafy at base. Calyx glabrous. Fl. Jun, fr. Aug–Oct.

\* Thickets near roadsides or gullies, under dense woods in calcareous montane regions; 500–2100 m. Sichuan.

**17f. *Ligustrum sinense* var. *myrianthum*** (Diels) Hoefker, Mitt. Deutsch. Dendr. Ges. 24: 57. 1915.

光萼小蜡 guang e xiao la

*Ligustrum myrianthum* Diels, Bot. Jahrb. Syst. 29: 533. 1900; *L. bodinieri* H. Léveillé; *L. groffiae* Merrill.

Branchlets, inflorescence rachis, and abaxial surface of leaf blade densely covered with rusty or yellow-brown soft or minutely hirsute hairs, rarely glabrescent. Leaf blade elliptic-

lanceolate to ovate-elliptic, leathery. Panicles axillary, not leafy at base. Calyx glabrous. Fl. May–Jun, fr. Sep–Dec.

\* Woods or thickets on slopes, in ravines, or along streams; 100–2700 m. Fujian, Gansu (Wen Xian), Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan.

**17g. *Ligustrum sinense* var. *concauum*** M. C. Chang, *Investig. Stud. Nat.* 6: 81. 1986.

滇桂小蜡 dian gui xiao la

Leaf veins obviously sunken adaxially. Panicles axillary or sometimes terminal, not or sometimes leafy at base. Calyx pubescent. Fl. Apr–May, fr. Aug–Nov.

\* Woods in valleys or along streams; 500–1200 m. W Guangxi, E Yunnan.

**17h. *Ligustrum sinense* var. *dissimile*** S. J. Hao, *Guihaia* 13: 340. 1993.

异型小蜡 yi xing xiao la

Branchlets and inflorescence rachis densely pilose. Leaf blade elliptic to lanceolate; veins not sunk adaxially, usually densely rusty pilose abaxially. Panicles terminal, leafy at base. Calyx glabrous. Fl. Apr–May, fr. Aug–Nov.

\* Thickets on slopes; 400–1200 m. Guangxi, Guizhou, Yunnan.

**18. *Ligustrum angustum*** B. M. Miao, *Acta Phytotax. Sin.* 23: 55. 1985.

狭叶女贞 xia ye nu zhen

Shrubs ca. 1.5 m, evergreen. Branchlets terete, puberulent, glabrescent. Petiole 3–5 mm, glabrous; leaf blade narrowly lanceolate to narrowly oblong-elliptic, 3–5 cm × 6–11 mm, leathery, glabrous, base attenuate toward petiole, apex acute to acuminate or rarely obtuse; primary veins 3–5 on each side of midrib, obscure. Panicles terminal, compact, 2–4 × 1.5–2.5 cm; rachis puberulent. Flowers sessile or nearly so. Calyx 1–1.5 mm, glabrous. Corolla ca. 6 mm; tube ca. 2.5 × as long as lobes. Stamens approaching apex of corolla lobes; anthers ca. 1.2 mm. Fruit unknown. Fl. Apr–May.

\* Shady places in ravines; ca. 200 m. Guangxi, Guizhou.

**19. *Ligustrum morrisonense*** Kanehira & Sasaki, *Trans. Nat. Hist. Soc. Formosa* 21: 147. 1931.

玉山女贞 yu shan nu zhen

*Ligustrum delavayanum* Hariot subsp. *morrisonense* (Kanehira & Sasaki) B. M. Miao.

Shrubs low, sometimes prostrate. Branchlets pubescent. Petiole 0.5–3 mm, pubescent; leaf blade broadly ovate to elliptic or suborbicular, 0.7–2 cm × 5–10 mm, glabrous or rarely pubescent at base abaxially, base cuneate to rounded, apex obtuse; primary veins 1–3 on each side of midrib, obscure. Flowers subsessile, clustered in groups of 2 or 3 at tips of lateral branchlets, rarely solitary. Calyx 2–3 mm. Corolla 8–10 mm; tube 1.5–2.5 × as long as lobes. Stamens not exceeding corolla lobes; anthers 1.5 mm. Fruit ovoid. Fl. Apr–Jul.

\* Gravely mountain ridges; 1000–1800 m. Taiwan.

**20. *Ligustrum henryi*** Hemsley in F. B. Forbes & Hemsley, *J. Linn. Soc., Bot.* 26: 90. 1889.

丽叶女贞 li ye nu zhen

Shrubs 0.2–4 m, evergreen. Branchlets densely rusty pubescent to puberulent. Petiole 1–5 mm, puberulent or glabrous; leaf blade broadly ovate to suborbicular or broadly lanceolate, 1.5–4.5(–5.5) × 1–2.5(–3) cm, thin leathery, glabrous except for midribs sometimes puberulent adaxially, base broadly cuneate to rounded, apex short acuminate, tip often rounded but mucronulate; primary veins 4 or 5 on each side of midrib, slightly impressed adaxially, obscure abaxially. Panicles terminal, (1.5–)2–4 × 1.5–3 cm; rachis pubescent. Flowers subsessile. Calyx ca. 1 mm, glabrous. Corolla 6–7 mm; tube 2–3 × as long as lobes. Stamens approaching tips of corolla lobes; anthers 2–3 mm. Fruit black, reniform, 6–10 × 3–5 mm, curved. Fl. May–Jun, fr. Jul–Oct.

\* Woods in ravines; below 1800 m. Gansu, Guangxi, Guizhou, Hubei, W Hunan, Shaanxi, Sichuan, Yunnan.

**21. *Ligustrum delavayanum*** Hariot, *J. Bot. (Morot)* 14: 172. 1900.

紫药女贞 zi yao nu zhen

*Ligustrum delavayanum* var. *ionandrum* (Diels) H. Léveillé; *L. ionandrum* Diels; *L. prattii* Koehne.

Shrubs 1–4 m, evergreen. Branchlets subterete, densely puberulent. Petiole 1–5(–10) mm, puberulent; leaf blade elliptic to oblong-lanceolate or ovate, 1–4 × 0.6–2 cm, thin leathery, glabrous or puberulent along midrib adaxially, base attenuate or subrounded, apex acute or acuminate, occasionally obtuse; primary veins 2–6 on each side of midrib, obscure or slightly raised. Panicles 1–5.5 × 1–2 cm, terminal or in leaf axils of last year's branches, puberulent to pilose. Pedicel 0–3 mm. Calyx ca. 1 mm, glabrous. Corolla 4–7.5 mm; tube ca. 2 × as long as lobes. Stamens not exceeding corolla lobes; anthers purple, 1.5–2 mm. Fruit black, ellipsoid or globose, 5–9(–11) × 4–7(–8) mm. Fl. May–Jul, fr. Jul–Dec. *2n* = 46.

\* Thickets or woods on slopes; 500–3700 m. Guizhou, W Hubei, Sichuan, Yunnan.

**22. *Ligustrum pedunculare*** Rehder in Sargent, *Pl. Wilson.* 2: 609. 1916.

总梗女贞 zhong geng nu zhen

Shrubs or small trees 2–4(–7) m, evergreen. Branchlets terete, densely puberulent. Petiole 2–8 mm, glabrous or puberulent above; leaf blade lanceolate, elliptic or often narrowly so, to slightly oblanceolate, 3–9 × 1–3.5(–4) cm, leathery, glabrous, base cuneate to obtuse, apex long acuminate, sometimes acute; primary veins 3–6 on each side of midrib, obscure adaxially, slightly raised abaxially. Panicles terminal, 2–7 × 1.5–4 cm; rachis angular in fruit, pubescent. Pedicel 0–3 mm. Calyx ca. 1.5 mm, glabrous. Corolla 5–6 mm; tube 2–3 × as long as lobes. Stamens approaching to tips of corolla lobes; anthers 2–3 mm. Fruit black, ellipsoid, 7–10 × 5–7 mm. Fl. May–Jul, fr. Aug–Dec.

\* Woods or thickets in montane regions, valleys; 300–2600 m. Guizhou, W Hubei, Hunan, Shaanxi, Sichuan.

**23. *Ligustrum pricei*** Hayata, Icon. Pl. Formos. 5: 123. 1915.

阿里山女贞 a li shan nu zhen

*Ligustrum formosanum* Rehder; *L. japonicum* var. *pricei* (Hayata) T. S. Liu & J. C. Liao.

Shrubs or small trees, 1–8 m. Branchlets finely puberulent. Petiole 1–4 mm, glabrous or finely puberulent above; leaf blade elliptic-oblong to broadly elliptic, (1.5–)2.5–6 × (1.3–)2–2.5 cm, somewhat leathery, glabrous, base cuneate to broadly attenuate, apex acute to short acuminate; primary veins ca. 4, obscure to slightly raised adaxially, raised abaxially. Panicles terminal on side shoots, 2–7 × 1.5–4 cm, glabrous. Pedicel 1–3 mm. Calyx 1.5–2 mm, glabrous. Corolla 6–8 mm; tube ca. 2 × as long as lobes. Anthers ca. 2 mm, slightly shorter than corolla. Fruit ellipsoid, mature ones not seen.

\* Forests and river banks; 900–1700 m. Taiwan

**24. *Ligustrum obtusifolium*** Siebold & Zuccarini, Abh. Math.-Phys. C. Königl. Bayer. Akad. Wiss. 4: 168. 1846.

Shrubs 0.5–3 m, deciduous and many branched. Branchlets minutely pilose to pubescent or puberulent. Petiole 1–2 mm, glabrous or pubescent; leaf blade oblong, oblong-lanceolate, elliptic, ovate to long obovate-elliptic, or oblanceolate, 0.8–6 × 0.4–2.5 cm, papery, scattered pilose to glabrous or sparsely pubescent, base cuneate or broadly so, apex acute or obtuse, mucronulate, sometimes slightly retuse; primary veins 3–5(–7) on each side of midrib, often obscure or abaxially slightly raised. Panicles terminal, 1.5–4 × 1.5–3 cm, densely flowered. Pedicel 0–2 mm, puberulent, pubescent or glabrous. Calyx 1–2 mm, puberulent, pubescent, or glabrous. Corolla 5–10 mm; tube 1.5–2.5 × as long as lobes. Stamens reaching about middle of corolla lobes; anthers lanceolate, 2–3 mm. Fruit purple-black, subglobose to broadly ellipsoid, 5–8 × 4–6 mm. Fl. May–Jun, fr. Aug–Oct.  $2n = 46^*$ .

Hills, gullies, woods; 100–600 m. Heilongjiang, Jiangsu, Liaoning, Shandong, Zhejiang [Japan, Korea].

*Ligustrum obtusifolium* subsp. *obtusifolium* is restricted to Japan and Korea.

- 1a. Shrubs 0.5–1.5 m tall; leaf blade 0.8–3 × 0.4–1.3 cm ..... 24a. subsp. *microphyllum*  
1b. Shrubs 2–3 m tall; leaf blade 1.5–6 × 0.5–2.5 cm ..... 24b. subsp. *suave*

**24a. *Ligustrum obtusifolium*** subsp. *microphyllum* (Nakai) P. S. Green, Kew Bull. 50: 385. 1995.

东亚女贞 dong ya nu zhen

*Ligustrum ibota* Siebold f. *microphyllum* Nakai, Bot. Mag. (Tokyo) 32: 124. 1918.

Shrubs 0.5–1.5 m. Branchlets minutely pilose or puberulent. Leaf blade oblong or elliptic to ovate or oblanceolate, 0.8–3 × 0.4–1.3 cm, scattered pilose to glabrous, or only puberulent along midrib. Calyx 1–2 mm, puberulent or gla-

brous. Corolla 7–8 mm; tube ca. 2.5 × as long as lobes.  $2n = 46^*$ .

Hills. Jiangsu (Yuntai Shan), Zhejiang (Putuo Shan, Daishan Xian) [Japan, Korea].

**24b. *Ligustrum obtusifolium*** subsp. *suave* (Kitagawa) Kitagawa, J. Jap. Bot. 40: 134. 1965.

辽东水蜡树 liao dong shui la shu

*Ligustrum ibota* Siebold & Zuccarini var. *suave* Kitagawa, Bot. Mag. (Tokyo) 48: 612. 1934; *L. amurense* Carrière; *L. ibota* var. *amurense* (Carrière) Mansfeld.

Shrubs 2–3 m, many branched. Branchlets puberulent or pubescent. Leaf blade oblong-lanceolate to long obovate-elliptic, 1.5–6 × 0.5–2.5 cm, glabrous or rarely sparsely pubescent. Calyx 1.5–2 mm, puberulent or pubescent. Corolla 5–10 mm; tube 1.5–2 × as long as lobes.  $2n = 46^*$ .

\* Woods along mountain streams, gullies; 100–600 m. Heilongjiang, Jiangsu, Liaoning, Shandong, Zhejiang (Zhoushan Archipelago).

**25. *Ligustrum leucanthum*** (S. Moore) P. S. Green, Kew Bull. 50: 384. 1995.

蜡子树 la zi shu

*Phylarodoxa leucantha* S. Moore, J. Bot. 13: 229. 1875; *Ligustrum acutissimum* Koehne; *L. acutissimum* var. *glabrum* Z. Y. Zhang; *L. molliculum* Hance; *L. subsessile* S. Y. Hu.

Shrubs or small trees 1.5 m, deciduous, villous, minutely hirsute or glabrous. Petiole 1–3 mm; leaf blade elliptic to lanceolate, or elliptic-ovate, (2.5–)4–7(–10) × 2–3(–4.5) cm, papery or subleathery, base cuneate to subrounded, apex acute to short acuminate or obtuse; primary veins 4–6(–8) on each side of midrib, obscure adaxially, slightly raised abaxially. Panicles terminal, 1.5–4 × 1.5–2.5 cm. Pedicel 0–2 mm. Calyx 1.5–2 mm. Corolla 5–11 mm; tube ca. 2 × as long as lobes. Stamens reaching to 2/3 of corolla lobes; anthers lanceolate, ca. 3 mm. Fruit black, subglobose to globose, 5–10 × 5–8 mm. Fl. Jun–Jul, fr. Aug–Nov.  $2n = 46$ .

\* Woods or thickets on slopes, ravine or wastelands, or along streams; 300–2500 m. Anhui, Fujian, S Gansu, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Sichuan, Zhejiang.

**26. *Ligustrum longitubum*** (P. S. Hsu) P. S. Hsu, Investig. Stud. Nat. 6: 106. 1986.

长筒女贞 chang tong nu zhen

*Ligustrum henryi* Hemsley var. *longitubum* P. S. Hsu in P. C. Chen & al., Obser. Fl. Hwangshan 162. 1965.

Shrubs 1–3 m, semievergreen. Branchlets terete, densely brown hispidulous when young, glabrescent. Leaves sessile or with petiole to 5 mm; leaf blade ovate, elliptic, to lanceolate, 2–7.5 × 1–3 cm, thin leathery, glabrous or sparsely hispidulous only along midrib abaxially, base broadly cuneate to subrounded, apex acute to acuminate; primary veins 3–8 on each side of midrib, deeply impressed adaxially, raised

abaxially. Panicles terminal, 2–5 × 2–3 cm; rachis brown villous. Flowers sessile. Calyx 1.5–3 mm, glabrous. Corolla 1.2–1.6 cm; tube 2–3 × as long as lobes. Stamens reaching about middle of corolla lobes; anthers lanceolate, 4–5 mm; connective ca. 1 mm. Fruit oblong-ellipsoid, 6–10 × 4–6 mm. Fl. Jun–Jul, fr. Aug–Oct.

\* Evergreen broad-leaved forests along mountain streams or gullies; 200–700 m. S Anhui, E Jiangxi, W Zhejiang.

**27. *Ligustrum expansum*** Rehder in Sargent, Pl. Wilson. 2: 600. 1916.

扩展女贞 kuo zhan nu zhen

Shrubs ca. 3 m, deciduous. Branchlets and petiole

sparsely puberulent, glabrescent. Petiole 0.5–1.2 cm; leaf blade oblong-lanceolate to elliptic, 2.5–12 × 1.5–5.5 cm, papery, glabrous or abaxially villous, base cuneate, apex acute to acuminate. Panicles terminal, spreading, 10–18 × 8–16 cm; rachis pubescent. Flowers sessile or nearly so. Calyx ca. 2 mm, glabrous. Corolla salverform, 7–10 mm; tube 1.5–2 × as long as lobes. Stamens not exceeding corolla lobes; anthers ca. 2 mm. Fruit oblong-ellipsoid, ca. 10 × 5 mm. Fr. Sep.

\* Along streams; ca. 1300 m. W Hubei.

## 10. JASMINUM Linnaeus, Sp. Pl. 1: 7. 1753.

素馨属 su xin shu

Trees or erect or scandent shrubs, evergreen or deciduous. Branchlets terete or angular and grooved. Leaves opposite or alternate, rarely whorled, simple, 3-foliolate, or odd-pinnate; petiole usually articulated. Inflorescences basically cymose, in panicles, racemes, corymbs, umbels, or heads; bracts subulate or linear, sometimes leafy. Flowers bisexual, usually heterostylous, usually fragrant. Calyx campanulate, cupular, or funnelform, 4–16-lobed. Corolla white or yellow, rarely red or purple, salverform or funnelform; lobes 4–16, imbricate in bud, sometimes doubled in cultivation. Stamens 2, included, inserted about middle of corolla tube; filaments short; anthers dorsifixed, introrse. Ovules 1 or 2 in each locule. Style filiform; stigma capitate or 2-lobed. Fruit a berry, didymous or one half aborted. Seeds without endosperm; radicle downward.

More than 200 species: Africa, Asia, Australia, South Pacific Islands, one species in the Mediterranean region; 43 species in China.

1a. Leaves alternate.

2a. Calyx lobes subulate-linear, as long as or longer than tube; corolla lobes often acute ..... 3. *J. floridum*

2b. Calyx lobes deltate, truncate or subulate, shorter than or rarely as long as tube; corolla lobes often rounded.

3a. Leaflets (2 or)3(or 5), blade 3–12.5 cm; cymes in panicles, 10–120-flowered; pedicel 1–1.2(–2) cm ..... 1. *J. subhumile*

3b. Leaflets 3–9(–13), blade 0.2–6 cm; cymes in umbels, corymbs, or panicles, 1–10(–15)-flowered; pedicel 0.2–3 cm ..... 2. *J. humile*

1b. Leaves opposite.

4a. Leaves pinnatipartite or pinnately compound.

5a. Calyx lobes deltate, rarely subulate-linear, less than 2 mm ..... 15. *J. polyanthum*

5b. Calyx lobes subulate-linear, (2–)3–10 mm.

6a. Inner surface of flowers pink, often reddish outside; leaves often irregularly divided with lateral leaflets decurrent onto rachis ..... 13. *J. ×stephanense*

6b. Inner surface of flowers white, often reddish outside; leaves regularly divided, lateral leaflets not decurrent.

7a. Inflorescences subumbellate; corolla lobes 6–12 × 3–8 mm ..... 12. *J. officinale*

7b. Inflorescences with middle pedicels conspicuously shorter than lateral ones; corolla lobes 13–22 × 8–14 mm ..... 14. *J. grandiflorum*

4b. Leaves simple or 3-foliolate.

8a. Leaves 3-foliolate, sometimes with some leaves simple.

9a. Calyx lobes leafy; corolla yellow.

10a. Evergreen; corolla 2–4.5 cm in diam. .... 4. *J. mesnyi*

10b. Deciduous; corolla 2–2.5 cm in diam. .... 5. *J. nudiflorum*

9b. Calyx lobes not leafy; corolla white, sometimes red, pink, or purple on outside.

11a. Terminal leaflet slightly larger than or equal to lateral leaflets.

12a. Leaves leathery; inflorescences many flowered ..... 16. *J. lanceolaria*

12b. Leaves membranous; inflorescences 3–7-flowered ..... 17. *J. flexile*

11b. Terminal leaflet much larger than lateral leaflets.

13a. Leaflets 3-veined at base ..... 6. *J. urophyllum*

- 13b. Leaflets pinnately veined.
  - 14a. Terminal leaflet 6–8 × as large as lateral ones; terminal petiolule 1–6 mm ..... 19. *J. wengeri*
  - 14b. Terminal leaflet ca. 2 × as large as lateral ones; terminal petiolule 0.7–3 cm.
    - 15a. Leaves glabrous, except for tufts of hairs in axils of main veins underneath; calyx glabrous ..... 9. *J. dispernum*
    - 15b. Leaves pubescent; calyx pilose ..... 18. *J. sinense*
- 8b. Leaves simple.
  - 16a. Calyx lobes deltate or subtruncate, 0–2 mm.
    - 17a. Leaves prominently 3- or 5-veined.
      - 18a. Leaves long attenuate-acute; corolla lobes much shorter than tube ..... 6. *J. urophyllum*
      - 18b. Leaves acuminate, but not attenuately so; corolla lobes longer than tube ..... 25. *J. cinnamomifolium*
    - 17b. Leaves pinnately veined.
      - 19a. Venation obscure above and below; petiole 1–4.5 cm ..... 16. *J. lanceolaria*
      - 19b. Venation not obscure; petioles usually less than 2 cm.
        - 20a. Leaves narrowly lanceolate to lanceolate, more than 3 × as long as broad ..... 10. *J. duclouxii*
        - 20b. Leaves broadly ovate, ovate, elliptic, to lanceolate or obovate to obovate-oblong, not more than 2.5 × as long as broad.
          - 21a. Leaves 3.5–10 cm (rarely more).
            - 22a. Inflorescences 9- to many flowered; corolla lobes 8–17 mm; leaf base cuneate to rounded ..... 23. *J. seguinii*
            - 22b. Inflorescences 1–5-flowered; corolla lobes 4–10 mm; leaf base rounded to truncate or subcordate.
              - 23a. Leaves broadly ovate to elliptic or ovate-lanceolate, base broadly cuneate to truncate; calyx ca. 1 mm; corolla lobes 4–5 mm ..... 24. *J. microcalyx*
              - 23b. Leaves oblong to obovate-oblong, base truncate to subcordate; calyx ca. 3 mm; corolla lobes 8–10 mm ..... 26. *J. pierreanum*
          - 21b. Leaves 10–22 cm (rarely less).
            - 24a. Leaves thick leathery, ovate, elliptic, or ovate-lanceolate; inflorescences axillary, rachis 2–3 cm ..... 22. *J. coffeinum*
            - 24b. Leaves papery or somewhat leathery, lanceolate to broadly lanceolate, or ovate, oblong to obovate; inflorescences axillary or terminal, rachis 5–10 cm.
              - 25a. Leaves broadly ovate to ovate-lanceolate, broadest in lower third, often with tufts of hairs in the axils of the main veins and midrib below; corolla lobes 5–7 mm ..... 9. *J. dispernum*
              - 25b. Leaves oblong to elliptic-lanceolate, or ovate to obovate, broadest about middle; corolla lobes 8–11 mm.
                - 26a. Leaves with ca. 6 primary veins on each side of midrib, lowest at a sharp angle to midrib; tip of corolla usually blunt in bud, corolla tube 1.8–2.5 cm ..... 20. *J. subglandulosum*
                - 26b. Leaves with 8 or 9 primary veins on each side of midrib, lowest at a broad angle to midrib; tip of corolla usually acute in bud, corolla tube 1.5–1.8 cm ..... 21. *J. attenuatum*
    - 16b. Calyx lobes subulate-linear, 2 mm or more.
      - 27a. Leaves strongly 2- or 4-veined laterally from base (sometimes obscurely pinnately veined in *J. beesianum*).
        - 28a. Inflorescences with conspicuous leafy bracts at base ..... 27. *J. pentaneurum*
        - 28b. Inflorescences without leafy bracts at base.
          - 29a. Leaves 1–4.5 cm.
            - 30a. Leaves ovate, primary veins 3–5 on each side of midrib; corolla white, tube 1.7–2 cm, lobes 14–16 mm ..... 28. *J. guangxiense*
            - 30b. Leaves ovate to lanceolate, primary veins 1–3 on each side of midrib, obscure, sometimes only basal pair slightly obvious; corolla red, tube 0.9–1.5 cm, lobes 3–9 mm ..... 8. *J. beesianum*
          - 29b. Leaves 2.5–13 cm.

- 31a. Leaves ovate to lanceolate; calyx lobes (5-)10-17 mm ..... 30. *J. nervosum*  
 31b. Leaves linear to narrowly elliptic or narrowly ovate; calyx lobes  
 2-4 mm ..... 29. *J. laurifolium*
- 27b. Leaves pinnately veined.  
 32a. Inflorescences and calyx glabrous.  
 33a. Leaves 1-1.5 × 0.7-1 cm, obovate to elliptic or suborbicular ..... 42. *J. yuanjiangense*  
 33b. Leaves 5-19 × 1.3-8.5 cm.  
 34a. Leaves leathery, primary veins 7-11 on each side of midrib;  
 calyx lobes 5-18 mm, enlarged to 2-3 cm in fruit ..... 43. *J. lang*  
 34a. Leaves papery, primary veins 3-5(-9) on each side of midrib;  
 calyx lobes 2-5 mm, not enlarged in fruit.  
 35a. Leaves ca. 3 × as long as broad, primary veins 5-9 on each  
 side of midrib; inflorescences 3-6-flowered, open; pedicel  
 10-40 mm; corolla tube 1-1.4 cm, lobes 0.7-0.9 cm ..... 11. *J. fuchsiifolium*  
 35a. Leaves ca. 2 × as long as broad, primary veins 3-5 on  
 each side of midrib; inflorescences many flowered, dense;  
 pedicel 0-1 mm; corolla tube 1.5-2.5 cm, lobes 0.8-1.7 cm ..... 35. *J. tonkinense*
- 32b. Inflorescence and calyx ± hairy.  
 36a. Stems rusty villous and tomentose, sometimes densely so.  
 37a. Inflorescences 1-4-flowered.  
 38a. Leaf blade leathery, 1-3.5 × 1-2.5 cm ..... 31. *J. nintoooides*  
 38b. Leaf blade papery 7-10 × 2.5-7 cm ..... 32. *J. craibianum*  
 37b. Inflorescences many flowered.  
 39a. Leaf blade with 6 or 7 primary veins on each side of midrib,  
 elliptic to broadly ovate or cordate, 6.5-19 cm ..... 33. *J. rufohirtum*  
 39b. Leaf blade with 3 or 4 primary veins on each side of midrib,  
 ovate or elliptic to lanceolate, 1.5-11 cm.  
 40a. Inflorescences with leafy bracts at base; calyx lobes  
 1.5-2.5 mm ..... 19. *J. wengeri*  
 40b. Inflorescences without leafy bracts at base; calyx lobes  
 5-14 mm ..... 34. *J. elongatum*
- 36b. Stems glabrous, pubescent, or pilose, sometimes densely so, if villous  
 then not rusty.  
 41a. Leaf blade 1-1.5 × 0.7-1 cm ..... 42. *J. yuanjiangense*  
 41b. Leaf blade at least 2 × 1.5 cm.  
 42a. Leaves ca. 4 × as long as broad, narrowly lanceolate ..... 7. *J. prainii*  
 42b. Leaves not narrowly lanceolate, 2-3 × as long as broad.  
 43a. Leaves without tufts of hairs in vein axils.  
 44a. Leaves ovate-cordate, base cordate, pilose on both  
 surfaces; corolla tube 1.2-1.5 cm ..... 36. *J. multiflorum*  
 44b. Leaves ovate to lanceolate, base often cuneate to  
 rounded or truncate, pubescent or glabrous except  
 along veins abaxially; corolla tube 1.5-3 cm.  
 45a. Leaves usually acuminate, 4.5-15 cm; corolla  
 lobes 1.2-1.7 cm ..... 35. *J. tonkinense*  
 45b. Leaves acute, 1.5-11 cm; corolla lobes  
 0.8-1.1 cm ..... 34. *J. elongatum*
- 43b. Leaves with tufts of hairs in axils of main veins and  
 midrib below.  
 46a. Pedicel less than 3 mm.  
 47a. Inflorescences with leafy bracts at base;  
 corolla tube ca. 3 cm; calyx green ..... 37. *J. longitubum*  
 47b. Inflorescences without leafy bracts; corolla  
 tube 1.4-2.2 cm; calyx white ..... 38. *J. albicalyx*  
 46b. Pedicel (3-)8-20 mm.  
 48a. Flowers solitary; leaves elliptic or narrowly  
 ovate, rarely suborbicular, 1.5-2.7 cm broad ... 39. *J. rehderianum*  
 48b. Flowers 3-5 together, rarely solitary; leaves  
 elliptic to lanceolate, orbicular or obovate,

2–8 cm broad.

- 49a. Petiole 5–10 mm; leaf apex acute to acuminate; corolla lobes lanceolate, ca. 3 mm broad ..... 40. *J. hongshuihoense*
- 49b. Petiole 2–6 mm; leaf apex usually blunt, rarely very short acuminate; corolla lobes oblong to suborbicular, 5–9 mm broad ..... 41. *J. sambac*

**1. *Jasminum subhumile*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 8: 127. 1913.

滇素馨 dian su xin

*Jasminum diversifolium* Kobuski; *J. diversifolium* var. *glabricyosum* (W. W. Smith) Kobuski; *J. diversifolium* var. *subhumile* (W. W. Smith) Kobuski; *J. diversifolium* var. *tomentosum* L. C. Chia; *J. heterophyllum* Roxburgh (1920), not Moench (1794); *J. heterophyllum* var. *glabricyosum* W. W. Smith; *J. heterophyllum* var. *subhumile* (W. W. Smith) Kobuski; *J. subhumile* var. *glabricyosum* (W. W. Smith) P. Y. Bai.

Shrubs or small trees 0.5–5 m. Branchlets angular, together with petiole, pedicel, and calyx glabrous or pubescent to tomentose. Leaves alternate, compound or simple; petiole 0.5–6 cm; leaf blade ovate, sometimes suborbicular or lanceolate, 1.5–14 × 1–6.5 cm, along with leaflet blade leathery, glabrous or pubescent along midrib abaxially; leaflets (2 or)3(or 5), sessile or with petiolule to 3 cm; leaflet blade ovate or ovate-lanceolate, 3–12.5 × 1–5 cm, base rounded or cuneate, apex acute to acuminate; primary veins 3–6 on each side of midrib, obscure. Paniculate cymes terminal, 7–12 cm in diam., 10–120-flowered; bracts linear, 1–5(–10) mm. Pedicel 1–1.2(–2) cm. Calyx lobes wavy or truncate. Corolla yellow, nearly funnelform; tube 0.8–1.2 cm; lobes 4 or 5, broadly ovate, suborbicular, or oblong, 3–9 mm. Berry black or red-black, globose or ellipsoid, 1–1.6 × 0.5–1.6 cm. Fl. Mar–Jul, fr. Aug.

Along streams, woods; 700–3300 m. SW Sichuan, Yunnan [India, Myanmar, Nepal].

**2. *Jasminum humile*** Linnaeus, Sp. Pl. 1: 7. 1753.

矮探春 ai tan chun

Shrubs or small trees 0.3–3 m, sometimes scandent. Branchlets angular, along with petiole, pedicel, and calyx glabrous, pubescent, or puberulent. Leaves alternate, compound or simple; petiole 0.5–2 cm; leaf and leaflet blades leathery or papery, glabrous or adaxially short setose and abaxially pubescent along veins; leaflets 3–9(–13), usually 5; leaflet blade ovate to lanceolate, rarely obovate, terminal one 0.6–6 × 0.2–2 cm, lateral ones 0.2–4.5 × 0.2–2 cm, with 2–4 primary veins on each side of midrib, base rounded or cuneate, margin sometimes spiny-ciliate, apex acute to caudate. Cymes terminal, in umbels, corymbs, or panicles cymose, 1–10(–15)-flowered, rarely with linear bracts 2–4 mm. Pedicel 0.2–3 cm. Calyx lobes deltate to subulate, shorter than tube. Corolla yellow, nearly funnelform; tube 0.8–1.6 cm; lobes orbicular or ovate, 3–7 mm, often rounded at apex. Berry ripening purple-black, ellipsoid or globose, 6–11 × 4–10 mm.

Woods, thickets; 1100–3800 m. Gansu, W Guizhou, SW Sichuan, Xizang, Yunnan [Afghanistan, India, Tajikistan; SW Asia].

- 1a. Terminal leaflets 1–6 × 0.4–2 cm, apex acute to caudate ..... 2a. var. *humile*
- 1b. Terminal leaflets 0.6–2.5(–4) × 0.2–1 cm, apex usually blunt ..... 2b. var. *microphyllum*

**2a. *Jasminum humile* var. *humile***

矮探春 (原变种) ai tan chun (yuan bian zhong)

*Jasminum humile* var. *siderophyllum* (H. Léveillé) Kobuski; *J. mairei* H. Léveillé; *J. mairei* var. *siderophyllum* H. Léveillé.

Plants 0.5–3 m. Leaflets 3–7(–13), usually 5; blade ovate to lanceolate, rarely obovate, terminal one 1–6 × 0.4–2 cm, lateral ones 0.5–4.5 × 0.3–2 cm, leathery, apex acute to caudate. Inflorescences umbellate, corymbose, or paniculate-cymose, 1–10(–15)-flowered. Pedicel 0.5–3 cm. Calyx lobes deltate, shorter than tube. Corolla tube 0.8–1.6 cm. Fl. Apr–Jul, fr. Jun–Oct.  $2n = 26^*$ .

Woods; 1100–3500 m. W Guizhou, SW Sichuan, Xizang, Yunnan [Afghanistan, India, Tajikistan; SW Asia].

**2b. *Jasminum humile* var. *microphyllum*** (L. C. Chia) P. S. Green, Notes Roy. Bot. Gard. Edinburgh 23: 370. 1961.

狭叶矮探春 xiao ye ai tan chun

*Jasminum humile* f. *microphyllum* L. C. Chia, Acta Phytotax. Sin. 2: 27. 1952.

Plants 0.3–2 m. Leaflets 3–9, usually 5–7; blade ovate, obovate, elliptic, to lanceolate, terminal one 0.6–2.5(–4) cm × 2–10 mm, lateral ones 0.2–2(–2.5) cm × 2–7(–10) mm, papery, apex usually blunt, sometimes acuminate. Cymes 2–6-flowered, or flowers solitary. Pedicel 0.2–1.5 cm. Calyx lobes subulate or sharp deltate, 0.2–1(–1.5) mm. Corolla tube 9–10 mm.

\* Thickets, woods; 1600–3800 m. Gansu, Sichuan, SE Xizang, NW Yunnan.

**3. *Jasminum floridum*** Bunge, Mem. Acad. Imp. Sci. St. Pétersbourg Divers Savans 2: 116. 1833.

探春花 tan chun hua

*Jasminum argyi* H. Léveillé; *J. floridum* subsp. *giraldii* (Diels) B. M. Miao; *J. floridum* var. *spinescens* Diels; *J. giraldii* Diels; *J. humile* Linnaeus var. *kansuense* Kobuski; *J. humile* var. *microphyllum* f. *kansuense* (Kobuski) B. M. Miao; *J. tsinglingense* Lingelsheim.



Shrubs erect or scandent, 0.4–3 m. Branchlets 4-angled, twisted, glabrous to pubescent. Leaves alternate, compound or simple; petiole 2–10 mm; leaflets 3 or 5 (or 7), terminal petiolule 2–12 mm, lateral ones subsessile; leaf and leaflet blades ovate to elliptic, rarely obovate or suborbicular, 0.7–4(–5) × 0.5–2 cm, adaxially shiny, drying rugose, glabrous, sometimes puberulent along midrib, to densely villous, abaxially glabrous to sparsely to densely villous, base cuneate or rounded, apex acute, rarely blunt; veins obscure. Cymes terminal, 3–25-flowered; bracts subulate, 3–7 mm. Pedicel 0–2 cm. Calyx with 5 raised ribs, glabrous to sparsely pubescent; tube 1–2 mm; lobes subulate-linear, 1–3 mm. Corolla yellow, nearly funnelliform; tube 0.9–1.5 cm; lobes ovate or oblong, 4–8 mm, often acute at apex. Berry ripening black, globose, 5–10 mm in diam. Fl. May–Oct, fr. Aug–Nov.

\* Slopes, valleys, woods, thickets; below 2000 m. Gansu, N Guizhou, Hebei, Henan, Hubei, Shaanxi, Shandong, Shanxi, Sichuan.

#### 4. *Jasminum mesnyi* Hance, J. Bot. 20: 37. 1882.

迎春花 ying chun hua

*Jasminum primulinum* Hemsley.

Subshrubs erect, evergreen, 0.5–5 m. Branchlets 4-angled, glabrous. Leaves opposite, 3-foliolate or simple at base of branchlets; petiole 0.5–1.5 cm; leaf blade broadly ovate or elliptic, sometimes suborbicular, 3–5 × 1.5–2.5 cm, along with leaflet blade subleathery, glabrescent, veins obscure; leaflet blade narrowly ovate or ovate-lanceolate to narrowly elliptic, base cuneate, apex blunt and mucronulate, terminal one 2.5–6.5 × 0.5–2.2 cm, basally decurrent into a short petiolule, lateral ones sessile, 1.5–4 × 0.6–2 cm. Flowers usually solitary, axillary or rarely terminal; bracts leafy, obovate or lanceolate, 5–10 mm. Pedicel 3–8 mm. Calyx campanulate; lobes 5–8, leafy, lanceolate, 4–7 mm. Corolla yellow, funnelliform, 2–4.5 cm in diam.; tube 1–1.5 cm; lobes 6–8, doubled in cultivation, broadly obovate or oblong, 1.1–1.8 cm. Berry ellipsoid, 6–8 mm in diam. Fl. Nov–Aug, fr. Mar–May.  $2n = 24, 26^*$ .

\* Ravines, woods; 500–2600 m. Guizhou, SW Sichuan, Yunnan.

#### 5. *Jasminum nudiflorum* Lindley, J. Hort. Soc. London 1: 153. 1846.

迎春花 ying chun hua

Shrubs erect, creeping or forming an intricate cushion, deciduous, 0.3–5 m. Branchlets 4-angled, somewhat narrowly winged, glabrous. Leaves opposite, 3-foliolate or often simple at base of branchlets; petiole 3–10 mm, glabrous; leaf blade ovate or elliptic, sometimes suborbicular, 0.7–2.2 cm × 4–13 mm; leaflet blade ovate to elliptic, rarely obovate, base cuneate, apex acute or obtuse, mucronulate, veins obscure, terminal one sessile or basally decurrent into a short petiolule, 1–3 × 0.3–1.1 cm, lateral ones sessile, 0.6–2.3 cm × 2–11 mm. Flowers solitary, axillary or rarely terminal; bracts ovate to lanceolate, leafy, 3–8 mm. Pedicel 2–3 mm. Calyx green; lobes 5 or 6, narrowly lanceolate, somewhat leafy, 4–6 mm. Corolla yellow, 2–2.5 cm in diam.; tube 0.8–2 cm; lobes 5 or 6, oblong or elliptic, 0.8–1.3 cm. Berry ovoid or ellipsoid, ca. 6 × 3–4 mm.

\* Thickets, ravines, slopes; 800–4500 m. Gansu, Shaanxi, Sichuan, SE Xizang, NW Yunnan.

- 1a. Erect, scrambling or creeping shrubs, shoots  
3–5 m ..... 5a. var. *nudiflorum*  
1b. Dwarf, intricately branched shrubs, 0.3–1.2 m  
tall ..... 5b. var. *pulvinatum*

#### 5a. *Jasminum nudiflorum* var. *nudiflorum*

迎春花 (原变种) ying chun hua (yuan bian zhong)

*Jasminum angulare* Bunge (1833), not Vahl (1794); *J. sieboldianum* Blume.

Shrubs erect or creeping, 0.3–5 m. Branchlets 4-angled, somewhat narrowly winged. Corolla tube 0.8–2 cm. Berry ellipsoid, ca. 6 × 3 mm. Fl. Jun, fr. May.  $2n = 24^*, 39^*, 48^*, 52$ .

\* Thickets on slopes; 800–2000 m. Gansu, Shaanxi, Sichuan, SE Xizang, NW Yunnan. Widely cultivated in China.

#### 5b. *Jasminum nudiflorum* var. *pulvinatum* (W. W. Smith) Kobuski, J. Arnold Arbor. 13: 154. 1932.

垫状迎春 dian zhuang ying chun

*Jasminum pulvinatum* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 209. 1920.

Shrubs 0.3–1.2 m. Branchlets many, intricate, forming a cushion, apically leafless, becoming spiny, those of first year slender, ca. 1 mm in diam. Corolla tube 0.8–1.4 cm. Berry ovoid, ca. 6 × 3–4 mm; stalk to 1.5 cm. Fl. Apr–Sep, fr. May–Sep.

\* Ravines, slopes, thickets; 1900–4500 m. SW Sichuan, SE Xizang, NW Yunnan.

#### 6. *Jasminum urophyllum* Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 81. 1889.

川素馨 chuan su xin

*Jasminum brevidentatum* L. C. Chia; *J. brevidentatum* var. *ferrugineum* L. C. Chia; *J. cathayense* Chun ex L. C. Chia; *J. taiwanianum* Masamune; *J. urophyllum* var. *henryi* Rehder; *J. urophyllum* var. *wilsonii* Rehder.

Shrubs scandent, 2–3 m. Branchlets striped, glabrous to densely villous. Leaves opposite, 3-foliolate or sometimes simple; petiole 0.5–4 cm; leaf and leaflet blade ovate, elliptic, to lanceolate, leathery, glabrous or abaxially pubescent, 3-veined, base rounded or subcordate, sometimes cuneate, apex acuminate to caudate-acuminate; blade of simple leaves 5–17 × 2–5 cm; terminal leaflet blade (3–)6–12.5 × 1.3–4 cm, with petiolule 0.8–2.5 cm, lateral ones 2–7.5 × 0.8–2.5 cm, with petiolule 0.5–5 mm. Corymbs or corymbose cymes terminal or axillary, 3–13-flowered, glabrous to pubescent; bracts linear, 0.5–8 mm. Pedicel 0.5–4 cm, along with calyx glabrous to densely pubescent. Calyx lobes deltate or sharply so, usually less than 2 mm. Corolla white; tube 1.2–1.8 cm; lobes 5 or 6, 4–7(–10) mm. Berry ripening purple-black, ellipsoid or subglobose, 0.8–1.2 cm × 5–12 mm. Fl. May–Oct, fr. Aug–Dec.

\* Valleys, woods; 900–2200 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Taiwan, Yunnan.

**7. *Jasminum prainii*** H. Léveillé, Repert. Spec. Nov. Regni Veg. 10: 148. 1911.

披针叶素馨 pi zhen ye su xin

*Jasminum pinfaense* Gagnepain; *Ophiorrhiza esquirolii* H. Léveillé.

Vines woody, twining, to 3 m. Branchlets terete, striped, twisted, glabrous or puberulent. Leaves opposite, simple; petiole 0.5–1.7 cm, twisted, often pubescent; leaf blade narrowly lanceolate, 7.5–19 × 2–3.5(–4.5) cm, leathery, glabrous or sparsely pubescent abaxially, sometimes with glandular dots, base rounded or cuneate, apex acuminate; primary veins 4–10 on each side of midrib. Corymbs 3–9-flowered, dense, opposite or whorled, axillary or terminal, elongated in fruit into racemes or few-branched panicles; bracts linear, 2–5 mm. Pedicel 1–9 mm, pubescent or glabrous. Calyx sparsely pubescent or glabrous, shedding in fruit; lobes 5 or 6, setaceous-subulate, 5–10 mm. Corolla white, funnelliform; tube 1–1.5 cm; lobes 5, ovate, 3–7 mm. Berry black, globose, 6–10 mm in diam. Fl. Apr–Jun, fr. Jun–Jul.

\* Dense woods on slopes; 1000–1500 m. Guangxi, Guizhou.

**8. *Jasminum beesianum*** Forrest & Diels in Diels, Notes Roy. Bot. Gard. Edinburgh 5: 253. 1912.

红素馨 hong su xin

*Jasminum beesianum* var. *ulotrichum* Handel-Mazzetti; *J. valbrayi* H. Léveillé; *J. violascens* Lingelsheim; *J. wardii* Adamson.

Vines woody, twining, 1–3 m. Branchlets 4-angled, twisted, pubescent when young, rarely densely villous. Leaves opposite, simple; petiole 0.5–3 mm, villous; leaf blade ovate to lanceolate, rarely suborbicular, 1–4 × 0.3–1.8 cm, papery or subleathery, glabrous to pubescent or villous, base rounded, truncate, or broadly cuneate, apex acute to acuminate; primary veins 1–3 on each side of midrib, obscure, sometimes only basal pair slightly obvious. Cymes lateral, 2–5-flowered, or flowers solitary in leaf axils; bracts linear, 4–10 mm. Pedicel 0.2–1.8 cm, glabrous or pubescent. Calyx glabrous or villous; lobes 5–7, subulate-linear, 3–10 mm. Corolla red or purple, funnelliform; tube 0.9–1.5 cm, villous below throat inside; lobes 4–8, ovate-orbicular, 3–9 mm. Berry black, globose or ellipsoid, 5–12 × 5–9 mm. Fl. Nov–Jun, fr. Jun–Nov.  $2n = 26$ .

\* Slopes, grasslands, thickets, woods; 1000–3600 m. Guizhou, Sichuan, Yunnan.

**9. *Jasminum dispernum*** Wallich in Roxburgh, Fl. Ind. 1: 99. 1820.

双子素馨 shuang zi su xin

*Jasminum forrestianum* Kobuski.

Shrubs scandent, to 6 m. Branchlets twisted or 4-angled, glabrous except for minutely hirsute nodes. Leaves opposite, compound and simple, sometimes all simple; petiole 1–1.5 cm;

leaf and leaflet blades broadly ovate to ovate-lanceolate, glabrous or tufted hairy in vein axils abaxially, base rounded or subcordate, apex acute or acuminate; primary veins 5–10 on each side of midrib; blade of simple leaves 4–16 × 1.5–7.5 cm; leaflets 3–5, terminal one with petiolule 0.7–2.5 cm, long ovate, 6–15 × 2.5–6.5 cm, lateral ones sessile or short petiolulate, 1.5–7 × 1–3 cm, primary veins 2 or 3 on each side of midrib. Paniculate cymes terminal and many flowered or axillary and 3–20-flowered; bracts linear, 1–5 mm. Pedicel 2–10 mm, glabrous. Calyx glabrous; lobes 5, deltate, ca. 0.5 mm. Corolla pink or purple-red outside, white inside, funnelliform; tube 1.1–1.2 cm; lobes 5, ovate, 5–7 mm. Berry purple-black, globose or ovoid, 1–1.3 cm × 6–12 mm. Fl. Mar–Jun, fr. Aug–Apr.

Woods; 1700–2800 m. Xizang, W Yunnan [Bhutan, India, Kashmir, Nepal].

**10. *Jasminum duclouxii*** (H. Léveillé) Rehder, J. Arnold Arbor. 15: 307. 1934.

丛林素馨 cong lin su xin

*Melodinus duclouxii* H. Léveillé, Repert. Spec. Nov. Regni Veg. 2: 114. 1906; *J. dunicola* W. W. Smith; *J. schneideri* H. Léveillé.

Shrubs scandent, 2.5–5 m. Branchlets dark purple-red, obscurely angular or terete. Leaves opposite, simple; petiole stout, 2–10 mm, twisted; leaf blade narrowly lanceolate to lanceolate, 5.5–18.5 × 1.5–5 cm, leathery, glabrous, base rounded, apex caudate-acuminate or acuminate; primary veins 10–20 on each side of and nearly at right angles to midrib, slightly raised adaxially, obscure abaxially. Cymes corymbose, rarely racemose, 3–15-flowered, opposite and axillary or terminal and in fascicles of 4; bracts scaly, 1–2 mm. Pedicel 2–15 mm, thickened upward, glabrous. Calyx campanulate; lobes 5, sharply deltate, 0.5–1 mm. Corolla white, pink, or purple outside, nearly funnelliform; tube 1.1–2 cm; lobes 4 or 5, oblong or ovate, 6–11 mm. Berry black, globose, 6–12 mm in diam. Fl. Dec–May, fr. May–Dec.

\* Ravines, woods, thickets; 1200–3100 m. SW Guangxi, Yunnan.

**11. *Jasminum fuchsifolium*** Gagnepain, Bull. Soc. Bot. France 80: 74. 1933.

倒吊钟叶素馨 dao diao zhong ye su xin

Shrubs scandent. Branchlets 4-angled and twisted, hollow, glabrous. Leaves opposite, simple; petiole 4–10 mm, narrowly winged; leaf blade ovate to ovate-lanceolate or narrowly elliptic, 5–17.5 × 1.3–4.5(–6) cm, papery or membranous, base rounded, truncate, or cuneate, apex acuminate or acute; primary veins 5–9 on each side of midrib, arcuate. Flowers axillary, in 3–6-flowered lax racemose cyme, or in 3-flowered umbellate cymes; bracts linear, 1–6 mm. Pedicel 1–4 cm, thickened upward. Calyx campanulate, glabrous; lobes 5, subulate or deltate, 2–3 mm. Corolla white, salverform; tube 1–1.4 cm, not widened upward; lobes 5 or 6, oblong to

lanceolate, 7–9 mm. Berry ripening blue-purple, globose or ellipsoid, 6–10 mm in diam. Fl. Jun–Sep, fr. Oct–Jan.

\* Slopes, thickets; 1000–2200 m. W Guangxi, Guizhou, Yunnan.

**12. *Jasminum officinale*** Linnaeus, Sp. Pl. 1: 7. 1753.

素方花 su fang hua

Shrubs scandent, 0.4–5 m. Branchlets angular or grooved, glabrous, sparsely pubescent, or appressed hairy. Leaves opposite, pinnatifid or pinnately compound, often simple at base of branchlets; petiole 0.4–4 cm, glabrous or appressed hairy; leaflets 3–9, glabrous or sparsely pubescent with appressed hairs; terminal leaflet ovate to narrowly elliptic, 0.5–4.5 × 0.2–2 cm, base cuneate, apex acute or acuminate, rarely obtuse; lateral ones ovate to elliptic or suborbicular, 0.3–3 cm × 2–13 mm, base rounded or cuneate, apex acute or obtuse. Cymes umbellate or subumbellate, terminal or rarely axillary, 1–10-flowered; bracts linear, 1–10 mm. Flowers heterostylous. Pedicel 0.4–2.5 cm. Calyx cupular, 1–3 mm, glabrous or sparsely pubescent with appressed hairs; lobes subulate-linear, (3–)5–10 mm. Corolla white, sometimes red outside; tube 1–1.5(–2) cm; lobes 5, narrowly ovate to oblong, 6–12 mm. Berry ripening dark red, becoming purple, globose or ellipsoid, 7–10 × 5–9 mm.

Valleys, ravines, thickets, woods, along rivers, meadows; 1800–4000 m. SW Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Tajikistan].

- 1a. Terminal leaflets 0.5–1.6 × 0.2–0.5 cm ..... 12b. var. *tibeticum*  
1b. Terminal leaflets 1–4.5 × 0.4–2 cm.  
2a. Young stems, petioles, leaves, and calyces glabrous or only finely pubescent ..... 12a. var. *officinale*  
2b. Young stems, petioles, leaves, and calyces appressed hairy ..... 12c. var. *piliferum*

**12a. *Jasminum officinale* var. *officinale***

素方花(原变种) su fang hua (yuan bian zhong)

*Jasminum affine* Royle ex Lindley; *J. officinale* var. *affine* (Royle ex Lindley) G. Nicholson; *J. officinale* f. *affine* (Royle ex Lindley) Rehder.

Plants 0.4–5 m. Leaflets (3–)5–7(–9), glabrous or sparsely pubescent, terminal one 1–4.5 × 0.4–2 cm, lateral ones ovate to elliptic, 0.5–3 × 0.3–1.3 cm; petiole glabrous. Calyx glabrous or sparsely pubescent. Fl. May–Aug, fr. Sep.  $2n = 46^*$ .

Valleys, ravines, thickets, woods, alpine meadows; 1800–3800 m. SW Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Tajikistan].

**12b. *Jasminum officinale* var. *tibeticum*** C. Y. Wu ex P. Y. Bai, Acta Bot. Yunnan. 1: 155. 1979.

西藏素方花 xi zang su fang hua

Plants 0.4–2 m. Leaflets 7–9, terminal one 0.5–1.6 cm × 2–5 mm, lateral ones 3–10 × 2–6 mm. Fl. Jun–Jul.

\* Valleys, thickets, along rivers; 2100–4000 m. W Sichuan, Xizang.

**12c. *Jasminum officinale* var. *piliferum*** P. Y. Bai, Acta Bot. Yunnan. 1: 155. 1979.

具毛素方花 ju mao su fang hua

Leaflets 3–5, terminal one 1–2.5 cm × 5–13 mm, lateral ones usually suborbicular, sometimes broadly ovate or elliptic, 0.6–1.5 cm × 6–10 mm; petiole, leaflet blade, and calyx appressed hairy. Fl. Jun, fr. Aug.

\* Valleys, alpine woods; 2600–2700 m. Xizang.

**13. *Jasminum* × *stephanense*** Lemoine, Cat. No. 195, pl. 9. 1921.

淡红素馨 dan hong su xin

*Jasminum xizhangense* B. M. Miao.

Shrubs scandent, 0.3–10 m. Branchlets angular and grooved, pubescent. Leaves opposite, pinnatifid or compound with 3–9 leaflets, often simple at base of branchlets, pubescent when young; petiole 0.5–2 cm; leaf blade ovate, 1–3 cm × 5–10 mm; leaflet blade ovate or elliptic, 0.5–3.8 cm × 2–15 mm, base rounded, apex acute to short acuminate. Umbellate cymes terminal or axillary, 1–5-flowered; bracts linear, 6–10 mm. Pedicel 0.5–2 cm. Calyx pubescent or glabrous; tube 2–4 mm; lobes linear, 2–5(–7) mm. Corolla pink or purple, or red outside, pink inside; tube 1–1.8 cm; lobes ovate, 6–11 mm. Berry black, subglobose, 5–7 mm in diam. Fl. May–Aug.  $2n = 26$ .

\* Thickets, woods, ravines; 2200–3100 m. Sichuan, Xizang, Yunnan.

A hybrid derived from *Jasminum officinale* and *J. beesianum*

**14. *Jasminum grandiflorum*** Linnaeus, Sp. Pl., ed. 2, 1: 9. 1762.

素馨花 su xin hua

*Jasminum officinale* Linnaeus var. *grandiflorum* (Linnaeus) Stokes; *J. officinale* f. *grandiflorum* (Linnaeus) Kobuski.

Shrubs scandent, 2–4 m. Branchlets terete, angular or grooved. Leaves opposite, pinnatifid or compound with 5–9 leaflets; petiole 0.5–4 cm; leaflet blade ovate or narrowly so (terminal one usually narrowly rhomboid), 0.7–3.8 × 0.5–1.5 cm, base cuneate or blunt, apex acute, acuminate, or blunt, sometimes mucronate. Cymes terminal or axillary, 2–9-flowered; bracts linear, 2–3 mm. Pedicel 0.5–2.5 cm, middle pedicel of cymes conspicuously shorter. Calyx glabrous; lobes subulate-linear, (3–)5–10 mm. Corolla white, salverform; tube 1.3–2.5 cm; lobes often 5, oblong, 1.3–2.2 cm. Fruit not seen. Fl. Aug–Oct.  $2n = 26^*$ .

Widely grown in Sichuan, Yunnan [native of Arabia].

Cultivated in warm and tropical countries for its fragrant flowers.

**15. *Jasminum polyanthum*** Franchet, Rev. Hort. 1891: 270.

1891.

多花素馨 duo hua su xin

*Jasminum blinii* H. Léveillé; *J. delafieldii* H. Léveillé.

Vines woody, twining, 1–10 m. Branchlets terete or angular, glabrous. Leaves opposite, pinnatifid or pinnately compound; petiole 0.4–2 cm; leaflets 5–7; leaflet blade papery or thin leathery, glabrous or with tufts of hairs in vein axils abaxially; terminal leaflet with petiolule 0–2 cm, lanceolate or ovate, (1.5–)2.5–9.5 × (0.6–)1–3.5 cm, base cuneate or rounded, apex acute to caudate-acuminate; lateral ones sessile or short petiolulate, ovate, (1–)1.5–8.5 × (0.5–)1–2.7 cm, base rounded or subcordate, apex obtuse or acute. Racemes or panicles terminal or axillary, 5–50-flowered; bracts subulate, 1–6 mm. Flowers heterostylous. Pedicel 0.5–2.5 cm. Calyx glabrous or puberulent; tube 1–2 mm; lobes 5, deltate or subulate-linear, less than 2 mm. Corolla white, red outside and in bud; tube 1.3–2.5 cm; lobes 5, oblong or narrowly ovate, 0.9–1.5 cm. Berry black, subglobose, 6–11 mm in diam. Fl. Feb–Aug, fr. Nov.

\* Valleys, thickets, woods; 1400–3000 m. Guizhou, Sichuan, Yunnan.

Cultivated for aromatic oil and as ornamental.

**16. *Jasminum lanceolaria*** Roxburgh, Fl. Ind. 1: 97. 1820.

清香藤 qing xiang teng

*Fagara volubilis* E. Pritzl ex Diels; *Jasminum discolor* Franchet; *J. dunnianum* H. Léveillé; *J. lanceolaria* var. *puberulum* Hemsley; *J. lanceolaria* f. *unifoliolatum* Handel-Mazzetti; *J. pachyphyllum* Hemsley; *J. shimadai* Hayata.

Shrubs scandent, 10–15 m, glabrous or pubescent. Branchlets terete. Leaves opposite or nearly so, 3-foliolate, sometimes simple by reduction of lateral leaflets at base of inflorescences; petiole 1–4.5 cm, glabrous to puberulent; terminal leaflet with petiolule 0.5–4.5 cm; leaflet blade elliptic, ovate, to lanceolate, rarely suborbicular, 3.5–16 × 1–9 cm, leathery, base rounded or cuneate, apex obtuse to caudate; primary veins 5–7 on each side of midrib, very obscure. Compound cymes often paniculate, terminal or axillary, many flowered, congested or open; bracts linear, 1–5 mm. Flowers heterostylous. Pedicel 0–5 mm. Calyx tubular, enlarged in fruit; lobes deltate or subtruncate. Corolla white, salverform; tube 1.7–3.5 cm; lobes 4 or 5, lanceolate to oblong, 5–10 mm. Berry black, drying orange-yellow, globose or ellipsoid, 0.6–1.8 × 0.6–1.5 cm. Fl. Apr–Oct, fr. Jun–Mar.  $2n = 26^*$ .

Slopes, thickets, dense valley forests; below 2200 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, India, Myanmar, Thailand, Vietnam].

**17. *Jasminum flexile*** Vahl, Symb. Bot. 3: 1. 1794.

盈江素馨 ying jiang su xin

*Jasminum yingjiangense* P. Y. Bai

Vines. Branchlets terete, glabrous. Leaves opposite, (2 or)3-foliolate; petiole 1.5–2.5 cm; leaflet blade ovate-lanceolate, membranous, glabrous adaxially, tufted hairy in vein axils abaxially, base rounded-cuneate, apex caudate-acuminate; primary veins 6–8 on each side of midrib; terminal leaflet 7–8.5 × 2.3–3.5 cm, petiolule 1.6–1.8 cm; lateral ones 4.5–6.5 × 1.3–2.5 cm, petiolule 1–3 mm. Cymes or paniculate cymes axillary, 3–7-flowered; bracts linear, 1.5–2 mm, sparsely puberulent. Pedicel 2–11 mm. Calyx cupular, glabrous; lobes 5, minutely deltate or almost truncate, less than 0.5 mm. Corolla white; tube ca. 2 cm; lobes 5, oblong, 6–8 mm. Fruit not seen. Fl. Nov.

About 300 m. Yunnan (Yingjiang Xian) [India, Sri Lanka].

**18. *Jasminum sinense*** Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 80. 1889.

华素馨 hua su xin

*Jasminum bodinieri* H. Léveillé; *J. sinense* Hemsley var. *septentrionale* Handel-Mazzetti; *Lonicera cavalerieri* H. Léveillé; *L. rehderi* H. Léveillé not Merrill.

Vines twining, 1–8 m. Branchlets terete, densely rusty villous. Leaves opposite, 3-foliolate; petiole 0.5–3.5 cm; leaflet blade ovate to ovate-lanceolate, rarely suborbicular or elliptic, papery, rusty pubescent and more densely so along veins abaxially, base rounded or rounded-cuneate, apex obtuse, acute, to acuminate, primary veins 3–6 on each side of midrib; terminal leaflet 3–12.5 × 2–8 cm, petiolule 0.8–3 cm; lateral leaflets 1.5–6.5 × 0.8–5 cm, petiolule 1–6 mm. Cymes terminal or axillary, many-flowered congested panicles, rarely 1-flowered in leaf axils. Flowers heterostylous. Pedicel 0–5 mm. Calyx pilose; lobes linear, 1–5 mm, slightly enlarged in fruit. Corolla white or yellowish, salverform; tube 1.5–4 cm; lobes 5, oblong or lanceolate, 0.6–1.4 cm. Berry black, globose or subglobose, 0.8–1.7 cm × 6–10 mm. Fl. Jun–Oct, fr. Sep–May.

\* Slopes, thickets, woods; below 2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang.

**19. *Jasminum wengeri*** C. E. C. Fischer, Bull. Misc. Inform. Kew 1931: 283. 1931.

异叶素馨 yi ye su xin

*Jasminum anisophyllum* Kobuski.

Shrubs 2–3 m, densely rusty villous. Branchlets terete. Leaves opposite, 3-foliolate, rarely simple; petiole 1–10 mm; leaflet blade ovate or elliptic, membranous or papery, appressed villous, especially denser along veins abaxially; terminal leaflet with petiolule 1–6 mm, 4–10.5 × 3–5.5 cm, base rounded-truncate, apex acute to acuminate, rarely obtuse, primary veins 3 or 4 on each side of midrib; lateral ones with short petiolule or sessile, 0.5–1.8 cm × 2–7 mm, base broadly cuneate or rounded, sometimes oblique, apex acute or obtuse, veins obscure. Cymes terminal or axillary, many flowered, congested; bracts leafy at base of cymes. Pedicel 0–2 mm. Calyx tomentose; tube 2–2.5 mm; lobes 5, subulate-linear,

1.5–2.5 mm. Corolla white; tube 2–3 cm; lobes 6–8, narrowly lanceolate, 1–1.2 cm. Fruit not seen. Fl. Aug–Sep.

Thickets, mixed forests; 700–1300 m. Yunnan [Myanmar].

**20. *Jasminum subglandulosum*** Kurz, J. Bot. 13: 329. 1875.

腺叶素馨 xian ye su xin

*Jasminum sempervirens* Kerr; *J. wangii* Kobuski.

Shrubs scandent, 2–7 m. Branchlets, abaxial leaf surface, pedicel, and calyx red glandular dotted when young. Leaves opposite, simple; petiole 1.5–3 cm; leaf blade obovate, ovate, or elliptic, 10–22 × 6–10 cm, papery or thin leathery, shiny and glabrous adaxially, tufted hairy in vein axils abaxially, base cuneate or rounded-cuneate, apex very short acuminate; primary veins ca. 6 on each side of midrib, slightly raised. Cymes racemose, terminal or axillary, lax, 2–9-flowered; bracts linear, 1–3 mm. Pedicel 0.5–2.5 cm, flat and thickened upward. Calyx glabrous; tube 2–2.5 mm; lobes 5, deltate, ca. 0.5 mm. Corolla white, salverform; tube 1.8–2.5 cm; lobes 6–8, narrowly lanceolate, 8–11 mm. Berry purple-black, ellipsoid or globose, 1.2–1.6 cm × 6–11 mm. Fl. Aug–Oct, fr. Apr.

Ravines, mixed forests; 400–1400 m. Yunnan [India, Myanmar, Thailand].

**21. *Jasminum attenuatum*** Roxburgh ex G. Don, Gen. Hist. 4: 62. 1837.

大叶素馨 da ye su xin

*Jasminum banlanense* P. Y. Bai; *J. robustifolium* Kobuski.

Vines woody, stout, glabrous. Branchlets terete, inconspicuously striped. Leaves opposite, simple; petiole 1–2 cm, twisted; leaf blade oblong to elliptic-lanceolate, 10–17 × 4–6.5 cm, leathery, base broadly cuneate to rounded, apex short acuminate or obtuse, sometimes cuspidate; primary veins 8 or 9 on each side of midrib, at 60–70° to midrib, slightly raised, often obscure abaxially. Cymes terminal or axillary, racemose or in few-branched panicles, 5–9-flowered; bracts linear, 2–3 mm. Pedicel 0.5–3.5 cm, flat and thickened upward. Calyx campanulate; lobes obtuse and subtruncate, enlarged in fruit. Corolla white, tube 1.5–1.8 cm; lobes 5, 8–10 mm. Berry green-white becoming orange-red, ovoid, 1–1.6 × 0.8–1.1 cm. Fr. Mar.

Ravines, thickets, woods; 1200–1700 m. Yunnan [India, Myanmar, Thailand].

**22. *Jasminum coffeinum*** Handel-Mazzetti, Anz. Akad. Wiss. Wien. Math.-Nat. 62: 235. 1925.

咖啡素馨 ka fei su xin

Vines scandent. Branchlets terete or 4-angled, narrowly winged, glabrous. Leaves opposite, simple; petiole 1–2 cm, articulate at middle; leaf blade ovate, elliptic, or ovate-lanceolate, 10–22 × 4.5–10.5 cm, leathery, glabrous, sparsely glandular dotted abaxially, base rounded, rarely broadly cuneate or subcordate, apex short caudate; primary veins 5–9 on

each side of midrib, at 50–60° to midrib. Racemes subopposite or fascicled in leaf axils, 3–10-flowered; bracts ovate or spatulate, 2–5 mm, fleshy. Pedicel 1–7 mm, thickened upward. Calyx puberulent; tube ca. 4 mm; lobes 5, narrowly deltate, 1–2 mm. Corolla white, fleshy; tube ca. 2.2 cm; lobes 7, lanceolate, 1–1.2 cm, base auriculate. Berry purple-black, ellipsoid, 2.3–2.7 × 1.5–1.8 cm. Fl. Mar, fr. May.

Dense woods, stony slopes; 300–500 m. SW Guangxi, SE Yunnan [Vietnam].

**23. *Jasminum seguinii*** H. Léveillé, Repert. Spec. Nov. Regni Veg. 13: 151. 1914.

亮叶素馨 liang ye su xin

*Jasminum seguinii* var. *latilobum* Handel-Mazzetti; *J. taliense* W. W. Smith.

Vines woody, twining, 1–7 m. Branchlets terete or flat, glabrous. Leaves opposite, simple; petiole 4–12 mm, articulate at middle; leaf blade ovate to narrowly elliptic, rarely lanceolate, 4–10(–14) × 1.5–4(–6.5) cm, leathery, glabrous except for tufted hairs in vein axils abaxially, base cuneate or rounded, apex acute, acuminate, or cuspidate; primary veins 4–7 on each side of midrib, slightly raised. Cymes racemose or paniculate, terminal or axillary, spreading; bracts subulate or lanceolate, 2–10 mm, smaller in size upward. Flowers heterostylous. Pedicel 0–2.2 cm, slightly thickened upward, glabrous. Calyx cupular, glabrous; lobes 4, deltate, rarely broadly linear, 0.5–1(–3) mm. Corolla white, salverform; tube slender, 1–2 cm; lobes 6–8, narrowly lanceolate, 0.8–1.7 cm. Berry black, subglobose, 0.5–1.5 cm in diam. Fl. May–Oct, fr. Aug–Apr.

Grasslands on slopes, along streams, in thickets or woods; below 2700 m. Guangxi, Guizhou, Hainan, Sichuan, Yunnan [Thailand].

**24. *Jasminum microcalyx*** Hance, J. Bot. 21: 323. 1883.

小萼素馨 xiao e su xin

*Jasminum inornatum* Hemsley.

Shrubs scandent, to 5 m. Branchlets terete, glabrous or slightly pubescent. Leaves opposite, simple; petiole 5–12 mm, articulate at middle, puberulent; leaf blade broadly ovate, elliptic, to ovate-lanceolate, 3.5–9 × 1.5–4.5 cm, leathery, glabrous except for tufts of hairs in vein axils abaxially, base broadly cuneate, rounded, or truncate, apex acute to acuminate; primary veins 3 or 4 on each side of midrib, slightly obvious. Cymes terminal or axillary, (1 or)2–5-flowered; bracts linear, ca. 1 mm. Pedicel clavate, 1–5 mm. Calyx urceolate, ca. 1 mm; lobes 4 or 5, orbicular or subtruncate. Corolla white; tube 1–1.6 cm; lobes 5 or 6, ovate, 4–5 mm. Berry black, ellipsoid, 9–12 × 4–6 mm. Fl. May–Oct, fr. Dec–Feb.

Valleys, woods, thickets; lower altitudes. Guangdong, Guangxi, Hainan, Yunnan (Mengla Xian) [Vietnam].

**25. *Jasminum cinnamomifolium*** Kobuski, J. Arnold Arbor. 20: 64. 1939.

樟叶素馨 zhang ye su xin

Shrubs scandent, 1–4 m, glabrous. Branchlets terete or grooved. Leaves opposite, simple; petiole 4–10 mm, articulate; leaf blade elliptic or rarely lanceolate, 5–10.5 × 1.5–4.5 cm, papery or thin leathery, 3- or 5-veined from base, base cuneate or rounded, apex acute to acuminate. Flowers solitary or in umbellate cymes, terminal or axillary, 1–5-flowered; bracts linear, 2–4 mm. Pedicel 1.4–2.5 cm, thickened upward. Calyx tube 2–3 mm; lobes 5, deltate, 1–2 mm. Corolla white, salverform; tube 0.9–1.3 cm; lobes 9–11, lanceolate, 1.1–3 cm. Berry black, subglobose or ellipsoid, 1–1.5 × 0.8–1.5 cm. Fl. Mar–Sep, fr. May–Nov.

\* Woods; below 1400 m. Hainan, Yunnan (Zhenkang Xian).

**26. *Jasminum pierreanum*** Gagnepain, Bull. Bot. Soc. France 80: 76. 1933.

心叶素馨 xin ye su xin

*Jasminum cordatum* (Merrill & Chun ex L. C. Chia) L. C. Chia; *J. seguinii* H. Léveillé var. *cordatum* Merrill & Chun ex L. C. Chia.

Shrubs scandent, ca. 2 m, glabrous or nearly so. Branchlets slender when young. Leaves opposite, simple; petiole 2–7 mm, articulate, pubescent; leaf blade oblong or obovate-oblong, rarely oblong-lanceolate, 4.5–9 × 2–4 cm, papery, with hair tufts in vein axils abaxially, base truncate to subcordate, apex slightly acuminate to acute; primary veins 4–7 on each side of midrib, slightly raised. Cymes terminal or axillary, (1 or) 2–5-flowered; bracts linear or broadly linear. Pedicel 2–10 mm, slightly thickened upward. Calyx campanulate, ca. 3 mm; lobes 4, deltate, 0.5–1 mm. Corolla yellow-white; tube 1.3–1.7 cm; lobes 5, narrowly lanceolate, 8–10 mm. Berry subglobose, 5–7 mm in diam. Fl. Aug–Sep, fr. Dec–Feb.

Sparse woods, sandy areas; low elevations. Hainan [Cambodia, Vietnam].

**27. *Jasminum pentaneurum*** Handel-Mazzetti, Anz. Akad. Wiss. Wien. Math.-Nat. 59: 110. 1932.

厚叶素馨 hou ye su xin

Shrubs scandent, 1–9 m. Branchlets terete or blunt angular, hollow, pubescent or glabrous. Leaves opposite, simple; petiole 0.5–1.8 cm, articulate at basal part, twisted; leaf blade broadly ovate to elliptic or suborbicular, rarely lanceolate, 4–10 × 1.5–6.5 cm, leathery, glabrous, 3- or 5-veined from base, base rounded or broadly cuneate, rarely cordate, apex acuminate or caudate-acuminate. Cymes congested in heads, terminal or axillary, many flowered; bracts at base of inflorescences leafy, 1–2 cm. Flowers heterostylous. Pedicel 1–5 mm, thickened in fruit, pubescent. Calyx lobes 6–7, linear, 5–8(–14) mm. Corolla white; tube 2–3 cm; lobes 6–9, lanceolate or oblong, 1–2 cm. Berry black, globose, ellipsoid, or reniform, 0.9–1.8 cm × 6–10 mm. Fl. Aug–Feb, fr. Feb–May of following year.  $2n = 26^*$ .

Valleys, thickets, mixed forests; below 900 m. Guangdong, Guangxi, Hainan [Vietnam].

**28. *Jasminum guangxiense*** B. M. Miao, Bull. Bot. Res.,

Harbin 4(1): 103. 1984.

广西素馨 guang xi su xin

Vines woody, 3–4 m. Branchlets terete, pubescent. Leaves opposite, simple; petiole 2–5 mm, articulate at middle, pubescent; leaf blade drying blackish, ovate or narrowly so, 1.8–4.5 × 1.5–2.4 cm, leathery, glabrous except for puberulent midrib, 3–5-veined, base rounded or subcordate, apex acute and mucronate. Flowers solitary or in fascicles of 3, terminal or axillary; bractlets linear, 2–9 mm. Pedicel 1–7 mm, pubescent or glabrescent. Calyx glabrous; tube 2–3 mm; lobes linear, 4–6 mm. Corolla white; tube 1.7–2 cm; lobes 8, lanceolate or oblong-elliptic, 1.4–1.6 cm. Berry didymous. Fl. Aug.

\* Valleys, woods; 400–600 m. Guangxi (Longzhou Xian).

**29. *Jasminum laurifolium*** Roxburgh var. ***brachylobum*** Kurz, Forest Fl. Burma 2: 152. 1877.

桂叶素馨 gui ye su xin

Vines evergreen, twining, 0.5–5 m, glabrous. Branchlets terete. Leaves opposite, simple; petiole 4–12 mm, articulate near base; leaf blade linear to narrowly elliptic or narrowly ovate, 5–12.5 × 0.7–3.3 cm, leathery, 3-veined, base cuneate or rounded, apex acuminate to caudate, rarely obtuse or acute. Flowers usually solitary, terminal or axillary, or in 1–8-flowered cymes; bractlets linear, 2–5 mm. Pedicel 0.7–2.3 cm. Calyx tube 2–3 mm; lobes 4–12, linear, 2–3(–4) mm. Corolla white, salverform; tube 1.6–2.4 cm; lobes 8–12, lanceolate or linear-lanceolate, 1.5–2 cm, spreading. Berry black and shiny, oblong-ovoid, 0.8–2.2 cm × 4–11 mm. Fl. May, fr. Aug–Dec.  $2n = 26^*$ ,  $52^*$ .

Valleys, thickets, rocky slopes; below 1200 m. Guangxi, Hainan, Xizang, Yunnan [India, Myanmar].

**30. *Jasminum nervosum*** Loureiro, Fl. Cochinch. 1: 20. 1790.

青藤仔 qing teng zi

*Jasminum amplexicaule* Buchanan-Hamilton ex G. Don var. *elegans* (Hemsley) Kobuski; *J. anastomosans* Wallich ex A. de Candolle *J. cinnamomifolium* Kobuski var. *axillare* Kobuski; *J. elegans* (Hemsley) Yamamoto; *J. hemsleyi* Yamamoto; *J. laurifolium* Roxburgh var. *villosum* H. Léveillé; *J. nervosum* var. *elegans* (Hemsley) L. C. Chia; *J. nervosum* var. *villosum* (H. Léveillé) L. C. Chia; *J. trineuron* Kobuski; *J. undulatum* Ker-Gawler var. *elegans* Hemsley.

Shrubs scandent, 1–5 m, glabrous or sparsely pubescent. Branchlets terete. Leaves opposite, simple; petiole 2–10 mm, articulate; leaf blade ovate to lanceolate, 2.5–13 × 0.7–6 cm, papery, 3- or 5-veined from base, base broadly cuneate to truncate, rarely subcordate, apex acute to acuminate. Flowers terminal or axillary, solitary or in 3–5-flowered cymes; bracts linear, 1–13 mm. Pedicel 1–10 mm. Calyx lobes 7 or 8, linear, (0.5–)1–1.7 cm, often enlarged in fruit. Corolla white, salverform; tube 1.3–2.6 cm; lobes 8–10, lanceolate, (0.8–)1.5–2.5 cm. Berry red becoming black, globose, 0.7–2 cm × 5–13 mm. Fl. Mar–Jul, fr. Apr–Oct.

Slopes, thickets, mixed forests; below 2000 m. Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Xizang, Yunnan [Bhutan, Cambodia, India, Laos, Myanmar, Nepal, Sikkim, Vietnam].

**31. *Jasminum nintoooides*** Rehder in Sargent, Pl. Wilson. 2: 615. 1916.

银花素馨 yin hua su xin

Shrubs scandent, ca. 0.5 m, usually rusty villous. Branchlets terete. Leaves opposite, simple; petiole 1–4(–6) mm; leaf blade ovate or broadly ovate, 1–3.5 × 1–2.5 cm, leathery, base truncate or rounded, rarely subcordate, apex obtuse or acute, mucronulate; primary veins 3 or 4 on each side of midrib, obscure but basal pair usually obvious. Flowers solitary in leaf axils or 2–4 in terminal fascicles; bractlets linear, ca. 2 mm. Pedicel 2–4 mm. Calyx lobes linear, 2–4 mm. Corolla white; tube 1.7–2.2 cm; lobes 5 or 6, lanceolate, 0.8–1.3 cm. Berry purple-black, subglobose or ellipsoid, 0.7–1.3 × 0.6–1.2 cm. Fl. May–Sep, fr. Oct–Jan.

\* Stony slopes, dense forests; 1300–1600 m. SE Yunnan.

**32. *Jasminum craibianum*** Kerr, Bull. Misc. Inform. Kew 1938: 27. 1938.

毛萼素馨 mao e su xin

*Jasminum pilosicalyx* Kobuski.

Vines woody. Branchlets terete, densely rusty villous. Leaves opposite, simple; petiole 3–10 mm, sparsely rusty villous; leaf blade ovate-elliptic or narrowly ovate, 7–10 × 2.5–7 cm, papery, sparsely villous and abaxially denser, base subcordate or subrounded, apex abruptly acuminate; primary veins ca. 5 on each side of midrib. Flowers solitary, terminal or axillary, sometimes in 3-flowered terminal cymes; bracts linear, 2–3 mm, along with pedicel and calyx densely villous. Pedicel 2–5 mm. Calyx tube ca. 1.5 mm; lobes 5, filiform, 3–6 mm. Corolla white; tube 1.5–1.8 cm; lobes 1–1.2 cm. Fruit not seen. Fl. Jul.

Woods; ca. 400 m. Hainan [Thailand].

**33. *Jasminum rufohirtum*** Gagnepain, Bull. Soc. Bot. France 80: 77. 1933.

云南素馨 yun nan su xin

*Jasminum yunnanense* Jien ex P. Y. Bai.

Vines woody. Branchlets terete, rusty villous. Leaves opposite or nearly so, simple, rusty villous when young; petiole 5–12 mm; leaf blade elliptic, broadly ovate, or cordate, 6.5–19 × 3.3–9 cm, papery, puberulent along veins adaxially, base broadly cuneate to subcordate or blunt, apex acuminate, acute, or short caudate; primary veins 6 or 7 on each side of midrib, slightly impressed. Cymes terminal, congested, many flowered; bracts leafy at base, 1.5–2 cm, densely tomentose, upper ones linear and 4–10 mm. Pedicel very short or absent. Calyx yellow, rusty tomentose; tube 1–3 mm; lobes 5–8, linear, 5–8 mm, enlarged in fruit. Corolla white, salverform; tube ca. 2.5 cm; lobes 5–8, lanceolate, 1–1.2 cm. Berry purple-black, ellipsoid or subglobose, 1–1.3 cm × 6–10 mm. Fl. Apr–May, fr. May–Jun.

Valleys, thickets; ca. 800 m. Yunnan [Laos, Vietnam].

**34. *Jasminum elongatum*** (Bergius) Willdenow, Sp. Pl., ed. 4, 1: 37. 1797.

扭肚藤 niu du teng

*Nyctanthes elongata* Bergius, Phil. Trans. 61: 289. 1772; *Jasminum amplexicaule* Buchanan-Hamilton; *J. esquirolii* H. Léveillé; *J. ligustroides* L. C. Chia; *J. undulatum* Ker-Gawler.

Shrubs scandent, 1–7 m. Branchlets terete, slightly pubescent to densely tomentose. Leaves opposite, simple; petiole 2–6 mm; leaf blade ovate to lanceolate, (1.5–)3–11 × 2–5.5 cm, papery, pubescent or glabrescent except for hairy veins abaxially, base rounded, truncate, or subcordate, apex usually acute; primary veins 3 or 4 on each side of midrib. Cymes terminal or axillary, many flowered, congested; bracts linear or ovate-lanceolate, 1–5(–9) mm. Pedicel 1–4 mm. Calyx densely tomentose to glabrescent; lobes 6–8, subulate-filiform, 5–10(–14) mm. Corolla white, salverform; tube 1.5–2(–3) cm; lobes 6–9, lanceolate, 8–11(–14) mm. Berry black, subglobose or ovoid, 1–1.2 cm × 5–8 mm. Fl. Apr–Dec, fr. Aug–Mar. 2n = 26\*.

Thickets, mixed forests; below 900 m. Guangdong, Guangxi, Guizhou, Hainan, Yunnan [India, Indonesia, Malaysia, Myanmar, Vietnam; N Australia].

*Jasminum elongatum* is a very widespread and variable species.

**35. *Jasminum tonkinense*** Gagnepain, Bull. Soc. Bot. France 80: 77. 1933.

密花素馨 mi hua su xin

*Jasminum coarctatum* Roxburgh var. *caudatifolium* P. Y. Bai.

Shrubs scandent, 1–7 m. Branchlets flat, slightly swollen at nodes, pubescent. Leaves opposite, simple; petiole 2–10 mm, articulate near middle; leaf blades ovate or elliptic to lanceolate, 4.5–15 × 2–8 cm, papery, glabrous or sparsely pubescent along veins, base cuneate to rounded, rarely subcordate, apex acute to caudate-acuminate; primary veins 3–5 on each side of midrib. Cymes lateral, in heads or panicles, many flowered, congested; bracts leafy at base of inflorescences, 0.5–2.5 cm, upper ones linear and 2–4 mm. Flowers heterostylous. Pedicel short or absent. Calyx glabrous or pubescent, rarely villous; lobes 2–5 mm. Corolla white, salverform; tube 1.5–2.5 cm; lobes 5–9, narrowly lanceolate, (0.8–)1.2–1.7 cm. Berry black, ellipsoid or cylindrical, 1–1.5 cm × 6–12 mm. Fl. Nov–May, fr. Apr–Jun of following year.

Woods, thickets, ravines; 600–2000 m. S Guangxi, Guizhou (Anlong Xian), Yunnan [Vietnam].

*Jasminum tonkinense* is sometimes confused with *J. coarctatum* Roxburgh.

**36. *Jasminum multiflorum*** (N. L. Burman) Andrews, Bot. Repos. 8: t. 496. 1807.

毛茉莉 mao mo li

*Nyctanthes multiflora* N. L. Burman, Fl. Indica 5. 1768;

*Jasminum pubescens* (Retzius) Willdenow.

Shrubs, scrambler or weak climbers to 3 m. Branchlets terete, densely pilose. Leaves opposite, simple; petiole 5–10 mm, densely pilose; leaf blade ovate-cordate, often broadly so, 3–8 × 1.5–5 cm, papery, ± scattered pilose on both surfaces, glabrescent, except on midrib and veins, base cordate, apex acute to sometimes slightly acuminate, mucronulate; primary veins 3 or 4 on each side of midrib. Inflorescences terminal on side shoots, many flowered, congested; bracts leafy, basal ovate, 1.5–2 cm, upper linear, 3–5 mm. Pedicel 0–2 mm. Calyx densely pilose; tube ca. 1 mm; lobes 6–9, filiform, (2–)5–7 mm. Corolla white, sweetly scented; tube 1.2–1.5 cm; lobes 7–9, acute, 1–1.5 cm. Fruit not seen. Fl. Oct–Apr.

Widely cultivated in southern China and round the world [Native to India and perhaps elsewhere in SE Asia, but certainly not in Nepal, Pakistan, and Sri Lanka, and doubtfully in Myanmar and Vietnam].

**37. *Jasminum longitubum*** L. C. Chia ex B. M. Miao, Bull. Bot. Res., Harbin 4(1): 107. 1984.

长管素馨 chang guan su xin

Vines woody. Branchlets terete, pubescent. Leaves opposite, simple; petiole 2–7 mm, articulate at middle, pubescent; leaf blade ovate or oblong, 3.5–8.5 × 1.5–4 cm, leathery, glabrous except for vein axils with hair tufts abaxially, base subcordate or rounded, apex acute to acuminate, rarely blunt; primary veins 3–5 on each side of midrib. Flowers solitary or in 2- or 3-flowered terminal cymes; bracts at base of inflorescences leafy, 1.5–2.2 cm, upper ones subulate, ca. 1.5 mm. Pedicel ca. 2 mm or shorter, pubescent. Calyx pubescent; tube ca. 3.5 mm; lobes linear, 4–9 mm. Corolla white; tube ca. 3 cm; lobes 6 or 7, lanceolate, 1–1.4 cm. Fruit not seen. Fl. Aug.

\* Guangxi (Longzhou Xian).

**38. *Jasminum albicalyx*** Kobuski, J. Arnold Arbor. 20: 64. 1939.

白萼素馨 bai e su xin

Shrubs scandent, 1–3 m. Branchlets terete, pubescent when young. Leaves opposite or nearly so, simple; petiole 2–5 mm, articulate, pubescent; leaf blade ovate or elliptic, 3.5–10.5 × 1.5–4.5 cm, papery, pubescent along veins and with tufted hairs at vein axils abaxially, base blunt or subcordate, apex acute to acuminate; primary veins 3–5 on each side of midrib, obvious. Cymes terminal or axillary, 2–5-flowered; bracts linear, 1–10 mm. Pedicel absent or less than 3 mm. Calyx white, drying yellow-white, pubescent or glabrous; tube 2–3 mm; lobes 5–8, linear, 4–12 mm. Corolla white; tube 1.4–2.2 cm; lobes 5 or 6, ovate or lanceolate, 5–10 mm. Berry subglobose, 0.6–1.5 cm × 4–7 mm. Fl. Oct–Nov, fr. Mar.

\* Montane regions, dense woods; low altitudes. Guangxi.

**39. *Jasminum rehderianum*** Kobuski, Sunyatsenia 3: 110. 1936.

白皮素馨 bai pi su xin

Shrubs scandent, to 3 m. Branchlets terete, sparsely villous when young. Leaves opposite, simple; petiole 2–6 mm, twisted, articulate at middle, villous; leaf blade elliptic or narrowly ovate, rarely suborbicular, 2–5.5 × 1.5–2.7 cm, papery or thin leathery, glabrous adaxially except for hairy midrib, pubescent along midrib and tufted hairy at vein axils abaxially, base rounded or cuneate, apex acute or obtuse and mucronate; primary veins 2–4 on each side of midrib, slightly raised. Flowers solitary, terminal or axillary; bracts linear, 1–2 mm. Pedicel 0.8–2 cm, sparsely villous. Calyx glabrous outside, villous inside; lobes 6 or 7, linear, 5–8 mm. Corolla white or yellow-white, salverform; tube 1.5–2 cm; lobes 5, lanceolate, 1.3–2.2 cm. Berry didymous, black, ripening subglobose or ellipsoid, 7–12 × 5–7 mm. Fl. Aug–Sep, fr. Sep–Mar.

\* Slopes, woods; low altitudes. Hainan.

**40. *Jasminum hongshuihoense*** Jien ex B. M. Miao, Fl. Reipubl. Popularis Sin. 61: 217. 1992.

绒毛素馨 rong mao su xin

*Jasminum tomentosum*, S. Y. Bao ex P. Y. Bai (1983), not Knoblauch (1893).

Vines woody. Branchlets terete, pubescent. Leaves opposite, simple; petiole 5–10 mm, usually twisted, pubescent; leaf blade elliptic to lanceolate, rarely obovate, 4.5–19 × 2–7 cm, papery, glabrous adaxially except for sparsely pubescent midrib, pubescent then glabrescent abaxially, often tufted hairy in vein axils abaxially, base cuneate, blunt, or subcordate, apex acute to acuminate, rarely blunt; primary veins 4–10 on each side of midrib. Umbellate cymes terminal or axillary, 1–5-flowered; bracts linear, 2–5 mm. Pedicel 0.8–1.8 cm, thickened upward, glabrous or pubescent. Calyx pubescent, shedding in fruit; tube ca. 2 mm; lobes 5–8, linear, 4–5 mm. Corolla white, salverform; tube ca. 1.4 cm; lobes 6–8, lanceolate, 1–1.2 cm × ca. 3 mm. Berry blue-black, subglobose, ca. 1.7 × 1.5 cm. Fl. Apr, fr. Oct.

\* Along streams, forest slopes; 300–1000 m. Guangxi, Guizhou, Yunnan.

Very close to and possibly conspecific with *Jasminum eberhardtii* Gagnepain of Vietnam.

**41. *Jasminum sambac*** (Linnaeus) Aiton, Hort. Kew. 1: 8. 1789.

茉莉花 mo li hua

*Nyctanthes sambac* Linnaeus, Sp. Pl. 1: 6. 1753.

Shrubs erect or scandent, to 3 m. Branchlets terete or slightly compressed, sometimes hollow, sparsely pubescent. Leaves opposite, simple; petiole 2–6 mm, articulate, pubescent; leaf blade orbicular to elliptic or obovate, 4–12.5 × 2–7.5 cm, papery, glabrous except for tufted hairs at vein axils abaxially, both ends blunt, sometimes base subcordate; primary veins 4–6 on each side of midrib. Cymes terminal, (1 or)3(or 5)-flowered; bracts subulate, 4–8 mm. Flowers very fragrant. Pedicel 0.3–2 cm. Calyx glabrous or sparsely pubescent; lobes 8–9, linear, 5–7 mm. Corolla white; tube 0.7–1.5 cm; lobes oblong to



suborbicular, 5–9 mm broad. Berry purple-black, globose, ca. 1 cm in diam. Fl. May–Aug, fr. Jul–Sep.  $2n = 26^*$ .

Native to India, widely cultivated in S China and elsewhere in the world for its very fragrant flowers that are used in tea flavoring and in perfumes. The flowers and leaves are also medicinal.

**42. *Jasminum yuanjiangense*** P. Y. Bai, Acta Bot. Yunnan. 7: 241. 1985.

元江素馨 yuan jiang su xin

Shrubs scandent, ca. 2 m. Branchlets subterete, often in whorls of 3, striped, densely gray pubescent then glabrescent. Leaves opposite or in whorls of 3, simple; petiole 0.5–3 mm, articulate at middle, puberulent; leaf blade obovate, rarely elliptic or suborbicular, 1–1.5 cm × 7–10 mm, papery or thin leathery, glabrous except for puberulent base of midrib abaxially, base cuneate, apex retuse or blunt and mucronate; primary veins 1 or 2 on each side of midrib, obscure, sometimes only basal pair obvious. Flowers solitary or 2 or 3 in axillary or terminal cymes; bracts subulate-linear, 1.5–5 mm. Flowers very fragrant. Pedicel 1–2 mm, glabrous or puberulent. Calyx campanulate, glabrous; tube 1.5–2 mm; lobes 5–6, subulate, 2–3.5 mm. Corolla white; tube 1.8–2.3 cm; lobes 5–7, oblong, 1.2–1.5 cm. Berry didymous or single, purple-black, ellipsoid, 1–1.5 cm × 8–9 mm. Fr. to May of following year.

\* Thickets in valleys; 300–600 m. Yunnan (Yuanjiang Xian, Yuanyang Xian)

**43. *Jasminum lang*** Gagnepain in Lecomte, Fl. Indo-Chine 3:

1046. 1933.

梔花素馨 zhi hua su xin

*Jasminum gardeniiflorum* L. C. Chia.

Shrubs scandent, ca. 5 m, glabrous. Branchlets terete or compressed. Leaves opposite, simple; petiole 0.8–2.5 cm, articulate at middle; leaf blade ovate, elliptic, to lanceolate, 5.5–19 × 3–8.5 cm, leathery, base rounded or broadly cuneate, apex acuminate to caudate-acuminate; primary veins 7–11 on each side of midrib, slightly raised, at 50–60° to midrib. Flowers solitary, or in 2–6-flowered racemes, terminal or axillary; bracts linear, 5–11 mm. Pedicel 0.4–1.8 cm, thickened upward. Calyx glabrous; tube cylindric, 2.8–4 mm; lobes 6–8, linear, 0.5–1.8 cm, enlarged to 2–3 cm in fruit. Corolla white, pink outside; tube 2–3 cm; lobes 7–8, narrowly lanceolate, 2–2.5 cm. Berry purple, ellipsoid, 1.7–2 × 1.1–1.8 cm. Fl. Apr, fr. Jun.

Thickets, forests; 200–600 m. S Guangxi, SE Yunnan [Vietnam].

