

## STAPHYLEACEAE

省沽油科 sheng gu you ke

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Trees or shrubs, deciduous or evergreen. Leaves opposite, odd-pinnately compound, or trifoliolate, rarely simple, stipulate or exstipulate; leaflets with petiolules, less commonly subsessile, pinnately veined. Flowers bisexual to rarely unisexual, pinkish to white, pendent or erect, actinomorphic and hypogynous, arranged in panicles or racemes. Sepals 5, often petaloid, caducous or persistent, imbricate. Petals 5, free or connate at base, imbricate, rarely valvate, as equal as sepals. Stamens 5; filaments free or inserted on corolla tube, alternating with corolla lobes; anthers dehiscent by longitudinal slits. Disk annular to barely discernible. Gynoecium superior; carpels 2 or 3 (or 4), free or weakly united, lobed ovary with as many locules as carpels; style free or slightly united; ovules 1 to several and arranged in 2 rows. Fruits inflated capsules or follicles or berrylike drupes. Seeds globose to ovoid; arilode present or absent.

Three genera and 40–50 species: mainly in tropical or subtropical regions, especially in the N Hemisphere; three genera and 20 species (ten endemic) in China.

*Tapiscia* Oliver, treated in the Staphyleaceae in FRPS (46: 17–20. 1981), is treated in the Tapisciaceae in this volume.

Hsu Ting-zhi. 1981. Staphyleaceae (excluding *Tapiscia*). In: Fang Wen-pei, ed., Fl. Reipubl. Popularis Sin. 46: 16–37.

- 1a. Stipules absent; fruit an indehiscent berrylike drupe ..... 3. *Turpinia*  
1b. Stipules present, caducous; fruit a follicle or a capsule.  
2a. Sepals usually persistent; flower small, not pendent; disk prominent; fruit a follicle; seeds enclosed in a thin fleshy aril ..... 1. *Euscaphis*  
2b. Sepals caducous; flower pendent; disk slightly developed; fruit an inflated capsule; seeds without an aril ..... 2. *Staphylea*

### 1. EUSCAPHIS Siebold & Zuccarini, Fl. Jap. 1: 122. 1840, nom. cons.

野鸦椿属 ye ya chun shu

Small trees or shrubs, deciduous. Winter buds with 2 scales. Leaves odd-pinnate, opposite; stipules caducous; leaflets subcoriaceous, petioluled, margin serrulate. Flowers bisexual, arranged into a terminal panicle. Sepals 5-lobed, persistent, imbricate. Stamens 5, inserted in disk margin; filaments enlarged at base. Disk annular, margin undulate. Ovary superior; styles free, slightly united at base; stigma capitate. Follicles 1–3-locular with persistent sepals. Seeds 1 or 2 per locule, enclosed in a thin white leathery aril; cotyledons rounded.

One species: E Asia.

**1. *Euscaphis japonica*** (Thunberg) Kanitz, Term. Füz. 3: 157 [Exp. Asiae Orient. 24]. 1878.

野鸦椿 ye ya chun

*Sambucus japonica* Thunberg in Murray, Syst. Veg., ed. 14, 295. 1784; *Euodia chaffanjonii* H. Léveillé; *Euscaphis chinensis* Gagnepain; *E. fukienensis* Hsu; *E. japonica* var. *jianningensis* Q. J. Wang; *E. japonica* var. *pubescens* P. L. Chiu & G. R. Zhong; *E. japonica* var. *ternata* Rehder; *E. konishii* Hayata; *E. staphyleoides* Siebold & Zuccarini; *E. tonkinensis* Gagnepain.

Small deciduous trees or shrubs, (2–)3–6(–8) m tall; bark grayish brown, striped. Twigs and buds dark purple. Branches glabrescent. Leaves with pale green rachis, (8–)12–32 cm; stipule linear, pilose, base broad, tapering to tip; leaflets 5–9, rarely 3–11, with unpleasant odor when crushed; petiolule 1–2 mm, glabrescent; leaflet blades elliptic to oblong-ovate or sometimes oblong-lanceolate, rarely ovate, 4–6(–9) × 2–3(–4) cm, papery, glabrous or pilose along veins, adaxially green, abaxially pale,

main vein impressed adaxially and prominent abaxially, lateral veins 8–11, conspicuous on both surfaces, base broadly cuneate to rounded, margin sparsely serrulate with glandular teeth, apex acuminate. Inflorescence a terminal panicle, up to 21 cm. Flower small, yellowish white, 4–5 mm in diam.; pedicel ca. 2 mm. Sepals oval, ca. 2 mm, base united, margin ciliate, apex obtuse. Petals yellowish green, obovate, slightly longer than sepals. Stamens shorter than petals; anthers oval. Ovary ovoid; carpels 3, free or base slightly united. Follicle 1–2 cm, 1–3-locular; pericarp softly leathery, red-brown with irregular ribs. Seeds shining black, subglobose, ca. 5 mm in diam.; arils fleshy. Fl. Apr–Jun, fr. Aug–Nov.

Mountain valleys, open forests. Most provinces in China except NW regions, especially in areas S of the Chang Jiang to Hainan [Japan, Korea, Vietnam].

This species is grown as an ornamental. The wood is used for making furniture, oil from the seeds is used for making soap, and tannin is extracted from the bark. The roots and dry fruits are used medicinally.

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## 2. STAPHYLEA Linnaeus, Sp. Pl. 1: 270. 1753.

省沽油属 sheng gu you shu

Small trees or shrubs, deciduous. Leaves odd-pinnate, usually with 3 or 5 leaflets; stipules caducous; leaflet blades oblong to elliptic, glabrous or sometimes slightly pubescent, margin serrate to serrulate. Inflorescence a panicle or a raceme, usually terminal. Flower bisexual. Sepals 5, of equal size, imbricate. Petals 5, as long as sepals or slightly longer, white, yellow, or pinkish. Stamens 5, inserted at base of petals; filaments glabrous or slightly pubescent. Disk small, inconspicuous. Ovary 2- or 3-locular; styles 2 or 3, free or united; stigma capitate; ovules several per locule. Capsule inflated, bladderlike, with membranous fruit wall, dehiscing at tip of each carpel. Seeds shining yellow to brown.

About 13 species: Asia, Europe, North America; six species (five endemic) in China.

- 1a. Petiolule of terminal leaflet up to 1 cm; capsule flat, 2-lobed ..... 1. *S. bumalda*  
 1b. Petiolule of terminal leaflet more than 1 cm; capsule inflated, usually 3(or 4)-lobed.  
 2a. Petiolule of lateral leaflets 7–14 mm ..... 6. *S. yuanjiangensis*  
 2b. Petiolule of lateral leaflets only 1–3 mm, or leaflets nearly sessile.  
 3a. Filaments glabrous; capsule campanulate, base rounded ..... 5. *S. campanulata*  
 3b. Filaments ± pubescent; capsule cylindrical-obovoid, base acute.  
 4a. Inflorescence a broad corymb; leaflet blades subcoriaceous ..... 2. *S. holocarpa*  
 4b. Inflorescence a raceme; leaflet blades membranous or papery.  
 5a. Leaflet blades membranous, glabrous, margin glandular toothed ..... 3. *S. shweliensis*  
 5b. Leaflet blades papery, pilose along lower portion of midvein on adaxial surface ..... 4. *S. forrestii*

### 1. *Staphylea bumalda* Candolle, Prodr. 2: 2. 1825.

省沽油 sheng gu you

*Bumalda trifolia* Thunberg, Nov. Gen. Pl. 3: 63. 1783, not *Staphylea trifolia* Linnaeus (1753); *S. bumalda* var. *pubescens* N. Li & Y. H. He.

Shrubs, 2(–5) m tall; bark dark red or grayish brown with vertical stripes. Branches spreading, greenish white. Leaves trifoliolate; petiole 2.5–3 cm; petiolule of terminal leaflet 5–10 mm, that of lateral leaflets 1–2 mm; leaflet blades elliptic, ovate, or lanceolate-ovate, (3.5–)4.5–8 × (2–)2.5–5 cm, glabrescent and green on adaxial surface, pubescent along veins and pale green on abaxial surface, base cuneate or rounded, margin serrulate with sharp teeth, apex caudate with ca. 1 cm cauda. Inflorescence a terminal panicle, erect. Flowers white. Sepals light yellow, elliptic. Petals white, obovate to elliptic, 5–7 mm, slightly larger than sepals. Stamens 5, as long as petals. Ovary 2-locular; styles 2, free. Capsule bladderlike, compressed, 2-locular, dehiscing at apex. Seeds shining yellow. Fl. Apr–May, fr. Aug–Sep.

Open forests, roadsides. Anhui, Hebei, Heilongjiang, Jiangsu, Jilin, Liaoning, Shaanxi, Shanxi, Sichuan [Japan, Korea].

The seed oil is used for making soap and paint, and the cortex is used for fiber.

### 2. *Staphylea holocarpa* Hemsley, Bull. Misc. Inform. Kew 1895: 15. 1895.

膀胱果 pang guang guo

Trees or shrubs, 3–5(–10) m tall; twigs glabrous. Leaves trifoliolate; lateral leaflets subsessile, petiolule of terminal leaflet 2–4 cm; leaflet blades oblong-lanceolate to elliptic, 5–10 cm, subcoriaceous, glabrous or densely pubescent on abaxial surface when young and pubescent along veins when mature, green adaxially, pale green abaxially, lateral veins 7–10 pairs, base

obtuse to rounded, sometimes oblique on lateral leaflets, margin serrulate with hard teeth, apex narrowly acuminate. Corymb broad, at least 5 cm, flowering after emergence of foliage. Flowers white or rosy. Capsule inflated to pear-shaped, 4–5 × 2.5–3 cm, base narrow, apex truncate with 3 openings. Seeds subovoid, shining brown. Fl. Apr–May, fr. Sep.

• Open forests on hillsides; 1200–2200 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, E Xizang, SE Yunnan, Zhejiang.

- 1a. Leaflet blades glabrous; flowers white ..... 2a. var. *holocarpa*  
 1b. Leaflet blades densely pubescent on abaxial surface when young and pubescent along veins when mature; flowers rosy to pinkish ..... 2b. var. *rosea*

### 2a. *Staphylea holocarpa* var. *holocarpa*

膀胱果(原变种) pang guang guo (yuan bian zhong)

*Tecoma cavaleriei* H. Léveillé; *Xanthoceras enkianthiflorum* H. Léveillé.

Leaflet blades glabrous when young. Flowers white. Fl. Apr–May, fr. Sep.

• Open forests; 900–2200 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, E Xizang, Zhejiang.

### 2b. *Staphylea holocarpa* var. *rosea* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 186. 1916.

玫红省沽油 mei hong sheng gu you

Leaflet blades densely pubescent on abaxial surface when young and pubescent along veins when mature. Flowers rosy to pinkish. Fl. Apr–May, fr. Sep.

• Open forests; 1400–2000 m. W Hubei, Sichuan, SE Yunnan.

**3. *Staphylea shweliensis*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 13: 184. 1921.

腺齿省沽油 xian chi sheng gu you

Trees or shrubs, 6–9 m tall, young branches glabrous. Leaves imparipinnate, 3-foliolate; rachis 4–6 cm; stipules 2–3 cm, linear-lanceolate, membranous; terminal petiolule ca. 1.5 cm, lateral ones ca. 3 mm; leaflet blades elliptic, 6–8 × 3–3.5 cm, membranous, glabrous, green adaxially and light green to pale abaxially, lateral veins 5 or 6 pairs, base broadly cuneate, margin glandular serrulate, apex acuminate. Inflorescence with 20–30 flowers terminally on new branchlets; bracts linear, 2–3 mm; peduncle 4–6 cm. Flowers white to light yellow; pedicel ca. 8 mm. Sepals elongate-orbicular, ca. 8 mm. Petals obovate, as long as sepals. Filaments slightly puberulent. Ovary 2-locular; style 2, slightly villous. Fruits not seen.

- Forests; ca. 2700 m. NW Yunnan (Nu Jiang).

**4. *Staphylea forrestii*** I. Balfour, Notes Roy. Bot. Gard. Edinburgh 13: 183. 1921.

嵩明省沽油 song ming sheng gu you

Trees, (8–)10–17 m tall; old branches yellowish brown with vertical stripes, glabrous. Leaves trifoliolate, rarely 5-foliolate; rachis 4–7 cm, glabrous, grayish brown; terminal petiolule (1–)2.5–3.5 cm, lateral ones 2–3 mm or lateral leaflets sessile; leaflet blades oblong-oval to elliptic, (6–)8–10 × (2.5–)3.5–4.5 cm, papery, glabrous and dark green adaxially, slightly pubescent along veins near base of blade and pale green abaxially, veins conspicuous on both surfaces, lateral veins 6 or 7 pairs, base broadly cuneate, margin serrate, slightly revolute, apex acuminate. Inflorescence an axillary raceme, flowering before foliage, bracteoles linear. Flowers 9–12 mm; pedicel 4–5(–8) mm. Sepals linear-deltoid, 7–9 × ca. 4 mm, glabrous or exterior slightly pubescent at base. Petals spatulate, ca. 9 mm, glabrous, inserted at disk margin. Stamens alternate to petals; filaments ca. 7 mm, base glabrous; anthers ca. 2 mm. Ovary 1-locular, with numerous ovules per locule; styles 3, ca. 7 mm including ovary, base slightly pubescent; stigma capitate. Capsules 4.5–6.5 × 2–3.5 cm, columnar to campanulate, base rounded. Seeds 5–7 mm in diam., shining, olive green to yellow. Fl. May, fr. Aug.

- Open forests on slopes; 2300–2700 m. N Guangdong (Ruyuan), Guizhou, S Sichuan (Huidong), Yunnan (Songming).

### 3. **TURPINIA** Ventenat, Mém. Cl. Sci. Math. Inst. Natl. France 1807(1): 3. Jul 1807, nom. cons., not Bonpland (Apr 1807).

山香圆属 shan xiang yuan shu

*Triceros* Loureiro.

Trees or shrubs, evergreen or deciduous. Leaves opposite, exstipulate, odd-pinnately compound or simple; petiole constricted at tip; leaflet blades leathery, sometimes with stipels. Inflorescence a panicle, terminal or axillary. Flowers small, white, actinomorphic, bisexual, rarely unisexual. Sepals 5, imbricate, persistent. Petals 5, rounded, sessile, imbricate. Stamens 5, arranged at margin of disk; filaments flat. Floral disk conspicuous, margin undulate. Ovary sessile, 3-locular; styles 3, separate or united; stigmas capitate; ovules anatropous, numerous, arranged in 2 rows. Berry subglobose, indehiscent. Seed coat hard membranous or osseous.

Between 30 and 40 species: Asia, Central, North, and South America; 13 species (five endemic) in China.

1a. Leaves simple (rarely trifoliolate in *T. subsessilifolia*).

**5. *Staphylea campanulata*** J. Wen, Brittonia 45: 247. 1993.

钟果省沽油 zhong guo sheng gu you

Trees, 3–13 m tall. Axillary buds ± rounded, slightly flat, obtuse at apex. Leaves trifoliolate; rachis 4.5–13 cm, glabrescent or slightly pilose; stipules linear, 2–2.5 cm, caducous; petiolule of lateral leaflets 2–4 mm, pilose, that of terminal leaflet 15–45 mm, pubescent or slightly glabrescent; leaflet blades elliptic to oblong-elliptic, (4.2–)7–12 × (2–)3–5.5 cm, subcoriaceous, glabrous or pilose on lower portion of midvein of young leaflets adaxially, pubescent along veins and veinlets or glabrescent abaxially, lateral veins 9–11 pairs, base acute to obtuse, margin serrulate, apex acuminate to acute, usually oblique in lateral leaflets. Raceme terminal or axillary, 6.5–12 cm. Flowers pinkish; pedicel glabrous, 12–16.6 mm. Sepals petal-like, elliptic, 11–12 × 5–5.5 mm. Petals equal to or slightly longer than sepals. Stamens as long as petals; filaments glabrous. Ovary 3-locular, slightly pubescent; styles 3; stigma united. Capsule ± campanulate, 2.5–4 × 2.5–3.5 cm, dehiscent at tip of each carpel, rounded at base, tip of segment acute. Seeds shining yellowish brown, 7–9 mm. Fl. May, fr. Jun–Sep.

- Forests, moist mountain slopes, near ravines, roadsides; 900–2200 m. Sichuan (Dujiang Yan, Emei, Maowen).

**6. *Staphylea yuanjiangensis*** K. M. Feng & T. Z. Hsu, Acta Bot. Yunnan. 6: 395. 1984.

元江省沽油 yuan jiang sheng gu you

Small trees, 4–5 m tall; branches glabrous, grayish brown. Leaves usually 3(or 5)-foliolate; rachis 3–11 cm, grayish brown, glabrous; petiolule of terminal leaflet 8–25 mm, that of lateral ones 7–14 mm; leaflet blades oblong or elliptic-ovate, (7–)8–12 × (3–)4–4.5 cm, papery, glabrous, dark green adaxially and pale abaxially, main vein prominent abaxially, lateral veins 7–9 pairs, impressed adaxially, base cuneate to obtuse, margin serrate, slightly revolute, apex acuminate. Panicle terminal, ca. 12 cm, slightly pubescent; bracts deltoid. Pedicel 2–6 mm. Sepals 5, oblong-elliptic, 4–7 mm, ciliate. Petals spatulate, 8–10 mm, glabrous. Stamens reciprocal on petals; filaments ca. 8 mm, slightly pubescent; anthers ca. 2 mm. Ovary 3-locular, with 6–8 ovules per locule; styles 3. Capsule 4–6 × 1.2–2 cm, columnar-campanulate, base acute. Seeds ca. 3.5 mm, shining. Fl. Apr, fr. Apr.

- About 2400 m. Yunnan (Yuan Jiang).

- 2a. Leaves/leaflets cordate at base ..... 1. *T. subsessilifolia*  
 2b. Leaves not cordate at base.  
 3a. Ovary and style pubescent.  
 4a. Flowers large, 8–10(–12) mm in diam.; leaf blade thickly papery, elliptic to oblong ..... 2. *T. arguta*  
 4b. Flowers small, ca. 5.5 mm in diam.; leaf blade coriaceous, oblong to lanceolate ..... 3. *T. formosana*  
 3b. Ovary and style glabrous.  
 5a. Inflorescence a racemose cyme; leaf blade with 12–14 lateral veins, prominent on both surfaces, blade yellowish green and shining adaxially when dry ..... 4. *T. simplicifolia*  
 5b. Inflorescence a panicle; leaf blade with 8–10 lateral veins, prominent only abaxially, blade grayish green adaxially when dry, not shining ..... 5. *T. indochinensis*  
 1b. Leaves pinnately compound.  
 6a. Lower part of style and ovary hirsute; fruit pubescent ..... 6. *T. affinis*  
 6b. Style and ovary glabrous; fruit often glabrous.  
 7a. Filaments pubescent ..... 7. *T. ternata*  
 7b. Filaments glabrous.  
 8a. Pericarp 2–5 mm thick or more.  
 9a. Fruit 2–2.5 cm in diam.; leaflets 3–9, blades oblong-elliptic; flowers arranged loosely ..... 8. *T. pomifera*  
 9b. Fruit ca. 1.7 cm in diam.; leaflets 1–3(–5), blades elliptic to ovate; flowers arranged into a compact inflorescence ..... 9. *T. ovalifolia*  
 8b. Pericarp 0.5–1(–1.5) mm thick.  
 10a. Seeds ca. 1 cm in diam. .... 10. *T. macrosperma*  
 10b. Seeds ca. 5 mm in diam.  
 11a. Leaflets 3(or 4); peduncle with 2 deciduous bracts at apex ..... 11. *T. robusta*  
 11b. Leaflets more than 3(or 4); peduncle without bracts at apex.  
 12a. Leaflet blades papery or subcoriaceous, elliptic, 5–6 × 2–3 cm; inflorescence with flowers loosely arranged ..... 12. *T. montana*  
 12b. Leaflet blades coriaceous, oblong, 10–12 × 2–4 cm; flowers arranged densely ..... 13. *T. cochinchinensis*

**1. *Turpinia subsessilifolia*** C. Y. Wu, Fl. Yunnan. 2: 355. 1979.

心叶山香圆 xin ye shan xiang yuan

Small trees, 2–5 m tall. Twigs robust, black-gray or brown-gray, nodes swollen, lenticels conspicuous. Leaves simple, rarely trifoliolate, opposite, sessile or shortly petiolate, no more than 5 mm; blade ovate to oblong-ovate, 11–14(–16.5) × 5.5–7(–8) cm, coriaceous, glabrous, adaxially lustrous green, abaxially pale green, main vein impressed adaxially and prominent abaxially, lateral veins 5–9(–11) pairs, slightly discernible adaxially and conspicuous abaxially, base subcordate, rarely rounded, margin glandular crenate or -serrate, apex apiculate, cusp 5–10(–15) mm. Inflorescence terminal or axillary, paniculate, ca. 11 cm, rarely cymose; pedicels dark purple, slightly pubescent, with flowers loosely arranged. Flower small, ca. 3 mm in diam., creamy with purple. Sepals yellowish white, oblong, ca. 1.5 × 1.1 cm, margin ciliate, exterior pubescent. Petals oval, ca. 2 × 1.8 mm, ciliate, inserted on disk margin. Floral disk undulate. Ovary superior; styles 3, free, as long as anther. Fruit not seen. Fl. Apr–Jun.

• Dry forests, limestone forests, wooded limestone mountaintops; ca. 1700 m. SE Yunnan (Xichou).

This species usually possesses simple leaves, whereas trifoliolate leaves are also recorded. This species has been hypothesized to be a possible transitional taxon between trifoliolate species and ones with simple leaves in this genus. Phylogenetic studies are needed to test this hypothesis.

**2. *Turpinia arguta*** (Lindley) Seemann, Bot. Voy. Herald, 371. 1857.

锐尖山香圆 rui jian shan xiang yuan

Shrubs, deciduous, 1–3 m tall; old branches gray-brown and young branches speckled. Leaves simple; stipules borne on interior side of petiole; petiole 1.2–1.8 cm; leaf blade elliptic to oblong-oval, 7–22 × 2–6 cm, thickly papery or coriaceous, glabrous or pubescent, lateral veins 10–13 pairs, prominent adaxially and conspicuous abaxially, base rounded or broadly cuneate, margin glandular serrulate, apex acuminate, cusp 1.5–2 mm. Panicle terminal, short, (4–)5–8(–17) cm. Flowers 8–10(–12) mm in diam., white; pedicel with 2 bracteoles on middle. Sepals deltoid, green, ciliate or not. Petals white, glabrous. Stamens alternate on petals; filaments ca. 6 mm, slightly pubescent. Floral disk present. Ovary and style pubescent. Fruits subglobose, green when young, black when dry, (7–)10(–12) mm in diam., coarse, apex cuspidate. Seeds 2 or 3. Fl. Mar–Apr, fr. Sep–Oct.

• Forests, shrubby areas, dry areas, roadsides; 400–700 m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Zhejiang.

- 1a. Leaf blade thickly papery, glabrous ..... 2a. var. *arguta*  
 1b. Leaf blade coriaceous, adaxially pubescent ..... 2b. var. *pubescens*

**2a. *Turpinia arguta* var. *arguta***

锐尖山香圆(原变种) rui jian shan xiang yuan (yuan bian zhong)

*Ochranthe arguta* Lindley, Bot. Reg. 21: t. 1819. 1836; *Eyreia vernalis* Champion; *Maurocenia arguta* Kuntze; *Staphylea simplicifolia* Gardner & Champion.

Leaf blade thickly papery, glabrous.

• Forests, shrubby areas, dry areas, roadsides; 400–700 m. Chongqing (Chengkou), Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Zhejiang.

**2b. *Turpinia arguta* var. *pubescens*** T. Z. Hsu, Fl. Reipubl. Popularis Sin. 46: 28, 291. 1981.

绒毛锐尖山香圆 rong mao rui jian shan xiang yuan

Leaf blade coriaceous, abaxially pubescent, especially along veins.

• Forests. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi.

**3. *Turpinia formosana*** Nakai, J. Arnold Arbor. 5: 80. 1924.

台湾山香圆 tai wan shan xiang yuan

Small trees; branches dry brown-black, nodes swollen. Leaves simple; petiole (2–)3–5 cm, base greatly swollen; leaf blade oblong or oval to lanceolate, 8–12(–25) × 4–7 cm, leathery, glabrous, midvein prominent abaxially, lateral veins 6–8 pairs, rarely obvious adaxially and conspicuous abaxially, base cuneate, margin sparsely serrate, apex acuminate or blunt. Panicle terminal or axillary, with flowers sparsely arranged, ca. 15 cm, glabrous; bracteoles caducous. Flowers ca. 5.5 mm in diam., yellowish white. Sepals oblong-oval, ca. 3.5 mm, glabrous. Petals spatulate, ca. 4 mm, glabrous. Stamens inserted in floral disk; filaments ca. 4.5 mm, slightly pubescent. Ovary superior, 3-locular, pubescent, as well as style; stigma capitate. Fruit globose, green or yellowish purple, 8–15 mm in diam. Fl. Apr, fr. Jun.

• Forests; below 100–1500 m. Taiwan.

**4. *Turpinia simplicifolia*** Merrill, Philipp. J. Sci. 27: 34. 1925.

亮叶山香圆 liang ye shan xiang yuan

*Turpinia simplicifolia* var. *longipes* C. Y. Wu; *T. unifoliata* Merrill.

Small trees or shrubs, 3–7(–10) m tall; branches brown or gray-brown when dry. Leaves simple; petiole 1.5–5.5 cm, base greatly swollen; leaf blade oblong to oblong-elliptic, 9–18 × 3.5–7 cm, thinly leathery, adaxially yellowish green and lustrous when dry, lateral veins 12–14 pairs, conspicuous on both sides, base cuneate or broadly cuneate, margin crenulate with teeth relatively hard in texture, apex abruptly acuminate, cusp to 1–1.5 cm. Paniculate cyme 7–12 cm. Flowers small, ca. 3 mm in diam. Sepals white, oval, 1–1.5 mm, ciliate. Petals white or yellow, elliptic, ca. 2 mm. Stamens slightly shorter than petals; filaments flat; anthers ovoid. Ovary 3-locular; ovules 2 per locule. Berry light green, subglobose, 5–10 mm in diam., surface of exocarp coarse, apex with 3 concave slits. Seeds nearly globose, 3–5 mm in diam., light yellow. Fl. Mar–Jun, fr. Jul–Sep.

Dense forests, valleys; 400–1000 m. Guangdong, N and SW Guangxi (Daxin, Ningming, Rongshui) [Indonesia, Malaysia, Philippines].

**5. *Turpinia indochnensis*** Merrill, J. Arnold Arbor. 19: 43. 1933.

疏脉山香圆 shu mai shan xiang yuan

Small trees or shrubs, 2–8 m tall; bark yellowish brown to light brown. Leaves simple; petiole 6–30 mm, base swollen; leaf blade oblong, oval to obovate-elliptic, 7–13(–15) × 3.5–7.5 cm, glabrous, adaxially lustrous green, abaxially greenish, lateral veins 8–10 pairs, conspicuous adaxially and prominent abaxially, base cuneate to broadly so, margin sparsely serrate, with teeth relatively hard or bony, apex cuspidate. Panicle terminal, 12(–23) cm. Flower small, ca. 5 mm in diam.; pedicel ca. 2 mm. Sepals leathery, elliptic to obovate-elliptic, 3–5 mm. Petals membranous, spatulate, 3.5(–4) mm, white when dry, glabrous. Stamens ca. 3.5 mm; filament ca. 1.2 mm, flat, base enlarged to ca. 1 mm wide, white tomentose. Floral disk conspicuous, undulate. Ovary oval, ca. 1.5 mm in diam., white tomentose, 3-locular with 4 ovules per locule; styles 3, free. Berry subglobose, (6–)10 mm in diam., exocarp ca. 1.5 mm thick. Seeds irregularly globose, ca. 5 mm in diam., brownish. Fl. Mar–Apr, fr. Aug–Nov.

Forests; below 100–1300 m. Hainan (Baoting), SE Yunnan (Hekou, Pingbian, Xichou) [Vietnam].

**6. *Turpinia affinis*** Merrill & L. M. Perry, J. Arnold Arbor. 22: 550. 1941.

硬毛山香圆 ying mao shan xiang yuan

Trees, whole plants glabrous except inflorescence; bark dark brown. Leaves odd-pinnate; stipule caducous; rachis 6–14 cm; leaflets 2–4, rarely 5; petiolule 1–1.5 cm; leaflet blades oblong-elliptic, 7–18 × 2.5–6 cm, leathery, lateral veins 7–10 pairs, slightly conspicuous, base cuneate to obtuse, margin crenate, apex acuminate, cusp 1–1.25 cm. Panicle ca. 30 cm, spreading, pubescent. Pedicel ca. 1.5 mm. Petals obovate-elliptic, ca. 4 mm, margin ciliate, interior tomentose. Filaments ca. 3 mm, base enlarged to 1 mm wide, pubescent; anthers oblong-oval, 1(–1.2) mm. Floral disk conspicuous, undulate, ca. 1/2 as long as ovary. Ovary ca. 1 mm; style ca. 2 mm, hirsute at base; ovules 6–8. Berry subglobose, 1–1.5 cm in diam., style persistent with stiff hairs, exocarp 0.5–1 mm thick. Fl. Mar–Apr, fr. Aug–Nov.

• Forests in ravines and valleys; (500–)1000–2000 m. Guangxi, Guizhou, Sichuan, Yunnan.

**7. *Turpinia ternata*** Nakai, J. Arnold Arbor. 5: 78. 1924.

三叶山香圆 san ye shan xiang yuan

Trees, evergreen, ca. 10 m tall; branches glabrous. Leaves trifoliolate, sometimes simple leaves on upper branches, glabrous; petiole 1–9 cm, base swollen; petiolule 0.5–3 cm; leaflet blades narrowly oblong to oblong-lanceolate, 5–17 × 2.8–6 cm, abaxially pale, with prominent lateral veins, base cuneate, margin crenately serrate, apex acuminate. Plants dioecious. Panicle terminal or subterminal, 20–30 cm, glabrous; bracts and bracteoles small, deltoid, caducous. Male flower with sepals 4 or 5, imbricate, glabrous, sometimes margin ciliate, 1–1.5 mm; petals 4 or 5, subspatulate, yellowish or white, 2–3 mm; stamens 4 or 5, anthers oval, white; gynoeceum vestigial. Female flower with sepals 4 or 5, oblong to oval-oblong, 2–3 mm; petals yellowish or white, 3–4 mm; stamens 4 or 5; ovary globose to ovoid, ca. 1 cm in diam. Seeds black or dark brown, lustrous.

Forests. Taiwan [S Japan].

**8. *Turpinia pomifera* (Roxburgh) Candolle, Prodr. 2: 3. 1825.**

大果山香圆 da guo shan xiang yuan

Trees, 8(–15) m tall, or shrubs; branches gray, glabrous, nodes swollen. Leaves odd-pinnate, 15–50 cm; stipules 2, borne between petioles of two opposite leaves, deltoid, caducous; leaflets 3–9; stipel lanceolate-rounded to suboval, caducous; terminal petiolule ca. 5 cm, lateral ones 5–15 mm; leaflet blades oblong-elliptic, rarely suboval, 8–14(–20) × (2.5–)5–7(–8) cm, thinly coriaceous, glabrous, lateral veins 7 or 8(or 9) pairs, conspicuous on both sides, base broadly cuneate, margin serrate, apex acuminate with cusp. Panicle terminal, to 21 cm. Flowers 3.5–4 mm in diam. Anthers lanceolate-oblong, usually acuminate. Berry up to 2.5 cm in diam., surface of exocarp coarse when young, 2–5 mm thick at maturity. Fl. Jan–Apr, fr. Jun–Aug.

Forests, forest margins, roadsides; 300–1400(–1500) m. S and W Guangxi, S Yunnan [Bhutan, India, Malaysia, Nepal, N Vietnam].

- 1a. Fruit large, 1.5–2.5 cm in diam. .... 8a. var. *pomifera*  
1b. Fruit small, less than 1 cm in diam. .... 8b. var. *minor*

**8a. *Turpinia pomifera* var. *pomifera***

大果山香圆(原变种) da guo shan xiang yuan (yuan bian zhong)

*Dalrympelea pomifera* Roxburgh, Pl. Coromandel 3: 76. 1820.

Fruit large, 1.5–2.5 cm in diam.

Forest margins, roadsides; 300–700 m. S Yunnan [Bhutan, India, Malaysia, Nepal, N Vietnam].

**8b. *Turpinia pomifera* var. *minor* C. C. Huang, Fl. Yunnan. 2: 358. 1979.**

山麻风树 shan ma feng shu

Fruit small, not over 1 cm in diam.

• Forests; 700–1400(–1500) m. S and W Guangxi (Debao, Fusui), S Yunnan.

**9. *Turpinia ovalifolia* Elmer, Leafl. Philipp. Bot. 2: 490. 1908.**

卵叶山香圆 luan ye shan xiang yuan

*Turpinia lucida* Nakai; *T. pachyphylla* Merrill.

Trees; branches dark brown when dry. Leaves 1–3(or 5)-foliolate, ca. 25 cm; petiole 10–14 mm; leaflet blades oval, 10–15 × 5–7 cm, thinly coriaceous, adaxially olive green, abaxially greenish, lateral veins 6 pairs, conspicuous on both sides, base broadly cuneate to rounded, margin glandular serrate, apex acuminate. Panicle terminal, glabrous, ca. 25 cm, many flowered. Flowers ca. 4.5 mm in diam. Sepals leathery, ovate-elliptic, ca. 4 mm, margin ciliate. Petals thin, narrow, ciliate, apex obtuse. Filaments ca. 2.5 mm, glabrous. Ovary 3-locular; style 1; ovules 6 per locule and arranged in 2 rows. Berry globose, ca. 17 mm in diam.

Forests. Taiwan (Huoshao Dao, Lan Yu) [Philippines].

**10. *Turpinia macrosperma* C. C. Huang, Fl. Yunnan. 2: 358. 1979.**

大籽山香圆 da zi shan xiang yuan

Trees, ca. 8 m tall, some up to 20 m; branches black-brown when dry. Leaves odd-pinnate; petiole 1–1.5 cm, glabrous; rachis up to 30 cm; leaflets (5–)7; leaflet blades oval to oblong-oval, 12–16.5 × 5.5–7 cm, papery or thinly papery, glabrous, lateral veins 7–9 pairs, conspicuous abaxially, base obtuse-rounded, margin serrate, apex acuminate to obtuse with cusp. Panicle terminal. Flower not seen. Ovary 2- or 4-locular; ovule 1 per locule. Berry green, irregularly globose, 1–1.2 cm in diam., exocarp thin, ca. 0.2 mm. Seeds yellowish, 8–10 mm in diam., lustrous.

• Moist forests; 1100–1400 m. Yunnan (Gongshan).

**11. *Turpinia robusta* Craib, Bull. Misc. Inform. Kew 1926: 361. 1926.**

粗壮山香圆 cu zhuang shan xiang yuan

Trees, ca. 8 m tall; branches glabrous, bark red-brown, lenticels impressed. Leaves trifoliolate, rarely 4-foliolate; rachis gray-white when dry, glabrous; petiolule 3–10 mm, adaxially sulcate, with 2 glands present at apex; leaflet blades oblong to oblong-ovate or oblong-obovate, ca. 14 × 6 cm, leathery or thinly leathery, lateral veins 8(–10) pairs, conspicuous abaxially, base obtuse, rarely cuneate, margin serrulate or crenate, apex acuminate. Panicle axillary, 8–15 cm; bracts 2 present at peduncle apex, ca. 6 × 2.5(–4) mm, caducous, glabrous. Pedicel 0.7–4 cm. Sepals nearly ovate or oblong-ovate, ca. 1.75 × 1.5 mm, ciliate, apex obtuse. Petals obovate, ca. 2 × 1.5 mm, ciliate, apex obtuse. Filaments ca. 1.5 mm, glabrous, base broad and acuminate to apex; anthers ca. 0.75 mm. Floral disk undulate. Styles 3, short, free at apex. Fruit not seen. Fl. starting in Jan.

Limestone forests; ca. 900 m. S Yunnan [N Thailand].

**12. *Turpinia montana* (Blume) Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 46: 182. 1875.**

山香圆 shan xiang yuan

*Zanthoxylum montanum* Blume, Bijdr. 248. 1825; *Turpinia glaberrima* Merrill; *T. glaberrima* var. *stenophylla* Merrill & L. M. Perry; *T. gracilis* Nakai; *T. montana* var. *glaberrima* (Merrill) T. Z. Hsu; *T. montana* var. *stenophylla* (Merrill & L. M. Perry) T. Z. Hsu; *T. parva* Koorders & Valetton.

Small trees; branches greenish white. Leaves odd-pinnate; rachis ca. 15 cm, slim; leaflets 5; terminal petiolule up to 15 mm, slender, green, lateral ones 2–3 mm; leaflet blades oblong to oblong-oval, (4–)4.5–6 × 1.5–4 cm, papery, glabrous, adaxially green, abaxially greenish, lateral veins many, conspicuous abaxially and faint adaxially, base broadly cuneate, margin sparsely crenate or serrate, apex cuspidate with cusp 5–7 mm. Inflorescence terminal, main axis up to 17 cm. Flowers small, ca. 3 mm in diam., densely arranged on panicle. Sepals broadly ovate, ca. 1.3 mm, glabrous. Petals ovate to rounded, ca. 2 mm, tomentose or glabrescent. Filaments glabrous. Ovary 2- or 3-locular; ovule 1 per locule. Berry dark purple, globose, 4–7 mm in diam., exocarp thin, ca. 0.2 mm.

Forests on slopes, dense forests, moist forests. Guangdong, Guangxi, Guizhou, Yunnan [India, Indonesia (Java, Sumatra), Myanmar, Thailand, Vietnam].

**13. *Turpinia cochinchinensis*** (Loureiro) Merrill, J. Arnold Arbor. 19: 43. 1938.

越南山香圆 yue nan shan xiang yuan

*Triceros cochinchinensis* Loureiro, Fl. Cochinch. 1: 184. 1790; *Maurocena cochinchinensis* (Loureiro) Kuntze; *Turpinia microcarpa* Wight & Arnott; *T. nepalensis* Wallich ex Wight & Arnott.

Trees, deciduous, 6–7(–12) m tall; old branches dark brown or black-brown, young branches gray, lenticels brown, impressed. Leaves odd-pinnate, 15–21 cm; leaflets 3–5; leaflet blades oblong to oblong-obovate, (6–)10–12(–13) × 2.5–4(–5)

cm, leathery, glabrous, lateral veins 7 or 8(–10) pairs, conspicuous, base acute, margin crenately serrate, apex acuminate. Panicle terminal or axillary, compact, with densely arranged small flowers, 8–14(–23) cm; bracts and bracteoles small, caducous. Sepals broadly ovate, 1–1.5 mm, margin white. Petals oblong, ca. 2 mm. Stamens as long as petals; anthers rounded with 2 thecae. Floral disk undulate. Styles 3, ca. 1 mm; stigma nearly saucer-shaped. Berry dark brown, ca. 7 mm in diam., with 3 short horns (remains of styles).

Moist and shady forests; 1200–2100 m. Guangdong, Guangxi, Guizhou, Sichuan, S Yunnan [Bhutan, India, Malaysia, Myanmar, Nepal, Thailand, Vietnam].