

# DILLENIACEAE

五桠果科 wu ya guo ke

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Trees, shrubs, or woody climbers, rarely herbs; hairs sclerified and/or silicified, sometimes fasciculate. Leaves simple, rarely pinnatisect or pinnately compound, usually spirally arranged, rarely opposite, petiolate; stipules absent; petiole sometimes winged; leaf blade leathery, herbaceous, or membranous, margin entire or serrate. Flowers bisexual, rarely unisexual, actinomorphic, occasionally zygomorphic, solitary or in racemes, panicles or cymes. Sepals (3 or)4–5(–18), imbricate, persistent, usually leathery or fleshy, sometimes accrescent in fruit. Petals (2 or)3–5(–7), white, yellow, or red, imbricate, crumpled in bud. Stamens numerous (or 1–10), developing centrifugally, free or united basally and then in fascicles; staminodes often present; anthers basifixed, dehiscing by longitudinal slits, apical clefts, or apical pores. Gynoecium (1 or)2–7(–20)-carpellate, superior; carpels free or hemisyncarpous; stylopodia free, apically stigmatic; ovules 1 to numerous, anatropous; placentation submarginal, or basal when ovules 1 or 2. Fruit a follicle, polyfollicle, berry, or capsule, or indehiscent and enclosed by fleshy sepals. Seeds 1 to numerous; endosperm copious, oily; embryo very small, straight, achlorophyllous.

Ten genera and ca. 500 species: pantropical and extending into warm-temperate Australia; two genera and five species in China.

Chang Hung-ta. 1984. Dilleniaceae. In: Feng Kuo-mei, ed., Fl. Reipubl. Popularis Sin. 49(2): 190–195.

- 1a. Woody climbers; flowers small; sepals thinly leathery, not accrescent; anther connective conspicuously expanded laterally; carpels 1–5, on flat receptacle ..... 1. *Tetracera*
- 1b. Trees; flowers large, solitary or in racemes; sepals fleshy, often accrescent; anther connective narrow, linear; carpels 4–20, adnate to conical receptacle ..... 2. *Dillenia*

## 1. TETRACERA Linnaeus, Sp. Pl. 1: 533. 1753.

锡叶藤属 xi ye teng shu

*Delima* Linnaeus.

Evergreen shrubs or climbers. Leaves simple, alternate, petiolate; leaf blade scabrous or smooth, veins pinnate, secondary veins parallel, prominent, margin entire or smooth. Panicles terminal or axillary; bracts and bractlets linear. Flowers bisexual, small, 0.5–3 cm wide, actinomorphic. Sepals (3 or)4 or 5(–15), persistent in fruit, not accrescent, thinly leathery. Petals 3–5, white. Stamens numerous; anthers 2-loculed, with laterally expanded connective, dehiscing longitudinally. Carpels free, 1–5, on flat receptacle; ovules 2 to numerous per carpel. Follicles ovate, irregularly dehiscent. Seeds 1 to numerous, arillate; aril red or purple, fleshy, enclosing at least base of seeds.

About 50 species: tropical and warm-temperate regions, most species in tropical America; two species in China.

*Tetracera xui* H. Zhu & H. Wang (Guihaia 19: 337. 1999), described from Yunnan, could not be treated here because no material was seen by the authors.

- 1a. Carpels densely pubescent; sepals abaxially pubescent; leaf blade abaxially brown hispid ..... 1. *T. scandens*
- 1b. Carpels and sepals glabrous; when mature, abaxial surface of leaf blade glabrous or only veins pubescent ..... 2. *T. sarmentosa*

**1. *Tetracera scandens*** (Linnaeus) Merrill, Interpr. Herb. Amboin. 365. 1917.

毛果锡叶藤 mao guo xi ye teng

*Tragia scandens* Linnaeus, Herb. Amboin. 18. 1754; *Delima sarmentosa* Linnaeus.

Evergreen woody climbers to 30 m. Young branchlets densely pubescent, glabrescent. Petiole 1–1.5 cm, pubescent; leaf blade ovate or obovate, 4–10 × 2.5–5 cm, leathery, scabrous, abaxially brown hispid, scaberulose, adaxially sparsely setose, with strumose protuberance, secondary veins 9–12, approximately parallel, obviously prominent on abaxial surface, slightly depressed on adaxial surface, veinlets unclear, base rounded, often oblique, apex rounded or obtuse, sometimes slightly acute. Panicles terminal, 10–20 cm, many flowered;

peduncle and pedicels pubescent; bracts lanceolate, 4–6 mm, hairy; bractlets linear-lanceolate, 2–3 mm, hairy. Flowers 6–8 mm in diam. Sepals 4 or 5, ovate, 3–4 mm, abaxially pubescent, persistent in fruit, slightly curved, apex rounded. Petals 3, white, slightly longer than sepals, deciduous. Stamens numerous, as long as sepals. Carpels 1(or 2), densely gray pubescent; ovules several. Follicles ovate, ca. 1 cm, apex with persistent bent beaklike style, ± pubescent. Seeds 1 or 2, 3–4 mm; aril fringed, enclosing base of seeds.

Yunnan [India, Indonesia, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

**2. *Tetracera sarmentosa*** (Linnaeus) Vahl, Symb. Bot. 3: 70. 1794.

锡叶藤 xi ye teng

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*Delima sarmentosa* Linnaeus, Gen. Pl., ed. 5, App. 1754 ["sarmentosa"]; *Sequiera asiatica* Loureiro; *Tetracera asiatica* (Loureiro) Hoogland; *T. levinei* Merrill.

Evergreen woody climbers to 20 m, ramose. Branchlets scabrous, hairy when young, later glabrous. Petiole 1–1.5 cm, pubescent; leaf blade orbicular, 4–12 × 2–5 cm, leathery, very scabrous, setose when young, later abaxial surface glabrous or only veins pubescent, with protuberance, secondary veins 10–15, obviously prominent on abaxial surface, base broadly cuneate or approximately rounded, usually oblique, margin entire or finely serrate distally, apex obtuse or rounded, sometimes

slightly acute. Panicles terminal, 6–25 cm, many flowered; peduncle pubescent, zigzag. Flowers 6–8 mm in diam. Sepals 5, free, broadly ovate, 4–5 mm, unequal, persistent in fruit, apex obtuse, glabrous or occasionally sparsely hairy, ciliate. Petals 3, white, ovate, as long as sepals. Stamens numerous, shorter than sepals. Carpels 1(or 2), glabrous; style longer than stamens. Follicles ca. 1 cm, orange, pericarp thinly leathery and slightly bright when dry, with persistent style. Seed 1, black; aril yellow, fringed, enclosing base of seeds. Fl. Apr–May.

Sparse forests, thickets, barren hills. Guangdong, Guangxi, Hainan, Yunnan [India, Indonesia, Malaysia, Myanmar, Sri Lanka, Thailand].

## 2. DILLENIA Linnaeus, Sp. Pl. 1: 535. 1753.

五桠果属 wu ya guo shu

Trees, rarely shrubs, evergreen or rarely deciduous. Bark red, gray, or brown. Leaves simple, alternate, to 50 cm, with or without persistent or deciduous amplexicaul wings. Flowers solitary or in few- to many-flowered racemes, large. Sepals (4 or)5(–18), fleshy, often accrescent. Petals (4 or)5(–7) or absent. Stamens very numerous, inner often with longer anthers than outer; anthers dehiscent by 2 (sub)apical pores or less often by 2 longitudinal slits, connective narrow, linear. Carpels partially joined, 4–20, adnate to conical receptacle; ovules 1 to numerous per carpel. Fruit enclosed by enlarged sepals, carpels dehiscent along ventral suture or indehiscent. Seeds usually only 1 or few per carpel, arillate or not.

About 65 species: Madagascar to Fiji, most species in tropical Asia; three species in China.

- 1a. Flowers solitary; flower buds and fruits more than 5 cm in diam.; anthers dehiscent with pores; carpels 16–20 ..... 1. *D. indica*  
 1b. Flowers 2–7 in fascicles or racemes; flower buds and fruits less than 5 cm in diam.; anthers dehiscent with pores or longitudinal slits; carpels 5–9.  
 2a. Leaf blade obovate to long obovate; flower buds 4–5 cm in diam.; anthers dehiscent with pores; carpels 8 or 9 ..... 2. *D. turbinata*  
 2b. Leaf blade oblong to obovate-oblong; flower buds less than 2 cm in diam.; anthers dehiscent with longitudinal slits; carpels 5 or 6 ..... 3. *D. pentagyna*

### 1. *Dillenia indica* Linnaeus, Sp. Pl. 1: 535. 1753.

五桠果 wu ya guo

*Dillenia speciosa* Thunberg.

Evergreen trees to 30 m tall, ca. 1.2 m d.b.h. Bark reddish brown, exfoliating; young branchlets brown pubescent, glabrescent; leaf scars obvious. Petiole narrowly winged; leaf blade oblong or obovate-oblong, 15–40 × 7–14 cm, secondary veins (20–)30–40(–70) on either side, parallel, margin obviously serrate. Flowers solitary, 12–20 cm in diam., more than 5 cm in diam. in bud. Sepals 5, approximately rounded, 4–6 cm in diam., thickly fleshy. Petals white, obovate, 7–9 cm. Stamens in 2 distinct groups, outer very numerous, slightly curved in bud, inner ca. 25, apically reflexed outward in bud; anthers dehiscent with 2 pores. Carpels 16–20; stylodia spreading; ovules many per carpel. Aggregate fruit globose, 10–15 cm in diam., indehiscent; persistent sepals fleshy, slightly swollen. Seeds 5 or more per carpel, exarillate.

Valleys, streamsides. S Guangxi, S Yunnan [Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam].

The fruit of this species is edible.

### 2. *Dillenia turbinata* Finet & Gagnepain, Bull. Soc. Bot. France 52(Mém. 4): 11. 1906.

大花五桠果 da hua wu ya guo

Evergreen trees to 30 m tall. Branchlets stout, brown tomentose, glabrescent. Petiole 2–6 cm, narrowly winged; leaf blade obovate to long obovate, 12–30 × 7–14 cm, secondary veins (9–)15–22(–40) on either side, margin serrate. Racemes terminal, 3–5-flowered; peduncle 3–5 cm, stout, both bracts and bractlets absent. Flowers 2–7, fragrant, 10–12 cm in diam., 4–5 cm in diam. in bud. Sepals oval, 2.5–4.5 × 2–3 cm, thickly fleshy, unequal, outer ones larger than inner ones. Petals yellow, yellowish white, or reddish, obovate, 5–7 cm, thin, base narrow, apex rounded. Stamens in 2 distinct groups, outer very numerous, slightly curved in bud, 1.5–2 cm, inner ca. 25, reflexed in bud; anthers dehiscent with pores. Carpels 8 or 9, ca. 1 cm; ovules many per carpel. Pseudocarps indehiscent, reddish to dull red. Seeds 1 or more per mature carpel, exarillate. Fl. Apr–May.

Mixed evergreen forests, wet places in valleys; 700–1000 m. S Guangxi, Hainan, S Yunnan [Vietnam].

### 3. *Dillenia pentagyna* Roxburgh, Pl. Coromandel 1: 21. 1795.

小花五桠果 xiao hua wu ya guo

*Dillenia hainanensis* Merrill.

Deciduous trees to 15 m tall, to 1 m d.b.h. Bark smooth, gray, exfoliating; branchlets glabrous, stout. Petiole 2–5 cm, glabrous, with narrow wings; leaf blade oblong to obovate-oblong, 20–60 × 10–25 cm, leathery, secondary veins 25–50 on

either side, margin with shallowly undulate teeth. Flowers 2–7, small, fascicled at top of lateral spurs, 2–3 cm in diam., less than 2 cm in diam. in bud; pedicels 2–4 cm, bractlets deciduous. Sepals 5. Petals 5, yellow, obovate. Stamens in 2 distinct groups, outer 60–90, 3–4 mm, slightly curved in bud, inner ca. 10, reflexed, 6–9 mm; anthers dehiscing with longitudinal slits.

Carpels 5 or 6, 3.5–4 mm in diam.; stylodia spreading; ovules 5–20 per carpel. Pseudocarp indehiscent, yellow, orange, or red; carpels each 1(or 2)-seeded. Seeds exarillate. Fl. Apr–May.

Rain forests, thickets, hills; below 400 m. Hainan, Yunnan [Bhutan, India, Indonesia, Malaysia, Myanmar, Nepal, Thailand, Vietnam].