

## ANACARDIACEAE

漆树科 qi shu ke

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Trees or shrubs, also woody climbers or perennial herbs, resiniferous secretory ducts in bark and foliage, plants turpentine-smelling, blackening when wounded, hermaphroditic, polygamo-dioecious or dioecious. Leaves often clustered distally, alternate, exstipulate, simple, trifoliolate or imparipinnate. Inflorescences terminal or axillary thyrsoids or panicles; floral subtending bracts small, or sometimes large, membranous and fused to pedicel (*Dobinea*). Flowers small, actinomorphic, 3–5-merous, bisexual to unisexual; receptacle sometimes elongate and barrel-shaped (*Mangifera*). Perianth usually double (single in *Pistacia* or lacking in female flowers in *Dobinea*); sepals fused basally and lobed (bractlike in *Pistacia*), imbricate or valvate in bud, caducous or persistent. Petals free or adnate basally to extended receptacle, imbricate or valvate, deciduous to persistent. Stamens in 1 or 2 whorls, 1 (*Anacardium*, *Mangifera*), several, or all fertile; filaments slender, sometimes connate basally (*Anacardium*); anthers ovoid or oblong, introrse, dorsi- or basifixed, longitudinally dehiscent, 2-celled with 4 pollen sacs. Disk usually distinct, intrastaminal to extrastaminal, fleshy, crenulate, stipe-shaped or 5–10-notched, round, flattened or subcupular. Ovary superior, sometimes half inferior or inferior (*Pegia* and *Semecarpus*), either (a) 1-carpellate and 1-locular, (b) syncarpous and 2–5-locular (rarely more), (c) 4–6-carpellate and apocarpous (*Buchanania*), or (d) 5-carpellate and incompletely connate (*Dracontomelon*); stigmas 1–5 (rarely more), ± distinct, each locule with one apotropous ovule, usually with one carpel developing to maturity. Fruit drupaceous or dry and indehiscent (*Dobinea*), sometimes borne on enlarged fleshy hypocarp formed by pedicel and receptacle (*Anacardium* and *Semecarpus*) or fused to membranous accrescent floral subtending bract (*Dobinea*), composed of 1–5, rarely more, cells, each containing 1 seed; epicarp thin; mesocarp usually fleshy, fibrous and resinous; endocarp crustaceous to bony.

About 77 genera and 600 species: mainly in tropical, subtropical, and temperate areas, with the center of diversity in the Malesian region; 17 genera (one introduced) and 55 species (18 endemic, two introduced) in China.

Both of the families Pistaciaceae and Podoaceae (with *Dobinea*) have been included here in the Anacardiaceae based on the molecular studies conducted by Pell (Molecular Systematics of the Cashew Family [Anacardiaceae]. Ph.D. Dissertation, Dept. of Biological Sciences, Louisiana State University. 2004). The two families are separated mainly based on their aberrant reductions in the perianth. The molecular trees clearly show that they are both nested within the Anacardiaceae. In accordance with figs. 3–10 (pp. 66–75) in Pells's dissertation (loc. cit.) and current taxonomy, we have included *Pistacia* in the Rhoeae and *Dobinea* in a tribe of its own, the Dobineae.

Some species of *Dobinea*, *Pistacia*, *Rhus*, and *Toxicodendron* reach altitudes above 2000 m in Guangxi, Guizhou, and Yunnan.

Several representatives for the family are economically important, delivering products such as fruits and nuts, timber, lacquers, and tannins. In China, the resinous sap of *Toxicodendron vernicifluum* and *T. succedaneum* is called Chinese lacquer. *Rhus chinensis* is the host plant of the aphid *Melaphis chinensis* that produces the "Chinese gall," which in turn is a rich source of gallic acid. *Anacardium occidentale* and *Mangifera indica* are widely cultivated as fruit trees, and *Pistacia chinensis* yields a natural yellow dye. Several plants have ornamental value, such as *Cotinus coggygria* var. *cinerea*, which produces spectacular red leaves in the autumn.

The resinous sap of Anacardiaceae hardens and turns black when exposed to the air. Some species in the family, especially of *Toxicodendron* and *Semecarpus*, can cause severe dermatitis after contact, especially in persons who have been sensitized by long-term exposure to the plants.

Ming Tien lu. 1980. Anacardiaceae. In: Cheng Mien & Ming Tien lu, eds., Fl. Reipubl. Popularis Sin. 45(1): 66–135.

### Key to tribes

- 1a. Flower dioecious; female flower subtended by large foliose, membranous bract to which pedicel is adnate, without perianth and stamens (*Dobinea*) ..... 5. Tribe Dobineae
- 1b. Flower bisexual or polygamous; female flower not subtended by foliose bract, with perianth and stamens.
  - 2a. Carpels free, 4–6 or usually only 1 developed; leaves simple, entire (*Anacardium*, *Buchanania*, *Mangifera*) ..... 1. Tribe Anacardiaceae
  - 2b. Carpels 3–5, connate; leaves pinnately compound, sometimes trifoliolate or simple.
    - 3a. Carpels 4 or 5, ovary (1 or)4- or 5-locular (*Choerospondias*, *Dracontomelon*, *Haplospodias*, *Lansea*, *Pegia*, *Spondias*) ..... 2. Tribe Spondiadeae
    - 3b. Carpels 3, ovary 1-locular.
      - 4a. Leaves pinnately compound, trifoliolate or simple; ovary superior; receptacle not inflated at maturity (*Cotinus*, *Pistacia*, *Rhus*, *Terminthia*, *Toxicodendron*) ..... 3. Tribe Rhoeae
      - 4b. Leaves simple; ovary semi-inferior or inferior; fruit buried in inflated receptacle at maturity (*Drimycarpus*, *Semecarpus*) ..... 4. Tribe Semecarpeae

### Artificial key to genera

- 1a. Leaves simple.

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- 2a. Leaf blade margin serrate ..... 17. *Dobinea*  
 2b. Leaf blade margin entire or slightly serrate.  
   3a. Stamens unequal.  
     4a. Stamens 5; fruit not seated on hypocarp, endocarp compressed ..... 3. *Mangifera*  
     4b. Stamens 7–10; fruit seated on hypocarp, endocarp reniform ..... 2. *Anacardium*  
   3b. Stamens equal.  
     5a. Ovary apocarpous, carpels 4–6 ..... 1. *Buchanania*  
     5b. Ovary syncarpous, carpels 1–3.  
       6a. Shrubs usually less than 5 m tall; ovary oblique, compressed, sterile pedicels elongating after anthesis; drupe less than 1 cm ..... 10. *Cotinus*  
       6b. Trees more than 5 m tall; ovary symmetrical, not compressed, pedicels not elongating after anthesis; drupe more than 1 cm.  
         7a. Stamens 10; fruit not buried in inflated receptacle ..... 5. *Haplospindias*  
         7b. Stamens 5; fruit buried in inflated receptacle at maturity.  
           8a. Fruits with remains of perianth at apex, not seated on hypocarp; style 1 ..... 16. *Drimycarpus*  
           8b. Fruits without perianth remains, seated on hypocarp; styles 3 ..... 15. *Semecarpus*
- 1b. Leaves pinnately compound.  
   9a. Perianth reduced to 1 whorl or lacking ..... 11. *Pistacia*  
   9b. Perianth of 2 distinct whorls.  
     10a. Ovary 1-locular; stamens 5.  
       11a. Inflorescence axillary; mesocarp waxy and striate ..... 14. *Toxicodendron*  
       11b. Inflorescence terminal; mesocarp glutinous.  
         12a. Fruit mixed glandular pubescent and pilose, exocarp and mesocarp united ..... 12. *Rhus*  
         12b. Fruit glabrous, exocarp finally separating ..... 13. *Terminthia*  
     10b. Ovary (1 or)4- or 5-locular; stamens 8–10.  
       13a. Woody climbers ..... 9. *Pegia*  
       13b. Trees or shrubs.  
         14a. Ovary with 1 style ..... 4. *Spondias*  
         14b. Ovary with 4 or 5 styles.  
           15a. Flowers 4-merous ..... 8. *Lannea*  
           15b. Flowers 5-merous.  
             16a. Flowers bisexual; styles united apically; endocarp compressed ..... 6. *Dracontomelon*  
             16b. Flowers polygamous; styles free; endocarp not compressed ..... 7. *Choerospondias*

## 1. Tribe ANACARDIEAE

腰果族 yao guo zu

Trees or rarely shrubs, bisexual, polygamous or dioecious. Leaves simple; leaf blade margin entire to slightly serrate. Flowers with 1 or 2 whorls of stamens, equal or unequal in size. Ovary composed of 4–6 free carpels, each with a short style or composed of a single carpel, with an eccentric to lateral style.

About eight genera and 120 species: mainly in tropical Asia, also in tropical Africa, America, and Australia; three genera (one introduced) and ten species (two endemic, two introduced) in China.

### 1. BUCHANANIA Sprengel, J. Bot. (Schrad.) 1800(2): 234. 1802.

山榛子属 shan xian zi shu

Trees or shrubs. Leaves simple, spirally inserted; leaf blade margin entire. Inflorescence paniculate, terminal or axillary. Flowers small, bisexual, 5-merous, white, fragrant, sessile to shortly pedicellate. Calyx small, with 4–6 rounded lobes. Petals imbricate in bud. Stamens 2 × as many as petals; anthers lanceolate to oblong, often sagittate. Disk intrastaminal, cupular, sulcate to crenulate. Carpels 4–6 free, usually only 1 fertile; ovary 1-locular, 1-ovulate; style short; stigma capitate. Drupe with a thick woody endocarp. Seed testa not adnate to endocarp.

About 25 species: tropical Asia ranging through India to Samoa; four species (one endemic) in China.

- 1a. Inflorescence glabrous ..... 1. *B. yunnanensis*  
 1b. Inflorescence minutely pubescent to tomentose.  
   2a. Leaf blade glabrous; anthers sagittate ..... 2. *B. arborescens*  
   2b. Leaf blade with ferruginous hairs on both sides; anthers oblong.

- 3a. Leaf blade oblong-elliptic, 12–24 × 6–10 cm, covered with long hairs; calyx lobes lanceolate ..... 3. *B. latifolia*  
 3b. Leaf blade obovate, 4–12 × 2–5 cm, with minutely pubescent midrib; calyx lobes ovate ..... 4. *B. microphylla*

**1. *Buchanania yunnanensis*** C. Y. Wu, Fl. Yunnan. 2: 364. 1979.

云南山榧子 yun nan shan xian zi

Deciduous trees, ca. 5 m tall; branchlets grayish brown, glabrous, with large lenticels. Leaves not seen. Panicle terminal, 11–20 cm, glabrous, with numerous 2–6 cm branches; peduncle and rachis robust. Flower yellowish green, sessile. Calyx 5-parted, glabrous, lobes suborbicular, ca. 1.5 mm in diam. Petals 5, ovate, ca. 3 × 2 mm, revolute at anthesis. Stamens 10; filaments subulate, ca. 1.5 mm; anthers sagittate, ca. 0.8 mm. Ovary glabrous. Fruit not seen. Fl. Mar.

- Thickets; 1000–1100 m. S Yunnan (Jinghong).

**2. *Buchanania arborescens*** (Blume) Blume, Mus. Bot. 1: 183. 1850.

山榧子 shan xian zi

Evergreen trees; branchlets minutely yellowish pubescent to subglabrous. Petiole 2–2.5 cm; leaf blade obovate-oblong to obovate-elliptic, 8–18 × 4–6 cm, leathery, glabrous, base cuneate, margin entire, apex rounded, lateral veins 10–15 pairs, prominent on both sides. Panicle terminal or axillary, 8–10 cm, minutely ferruginous pubescent. Flowers white. Calyx glabrous, lobes suborbicular, ca. 1 mm with ciliate margins. Petals elliptic to suborbicular, 3–4 mm, fleshy. Stamens equal to petals in length; filaments linear to subulate, longer than anthers; anthers sagittate. Disk large and thick. Carpels 5, minutely pubescent. Drupe lens-shaped, ca. 8 mm, glabrous. Fl. Mar, fr. Jul.

Lowland forests. S Taiwan (Gaoxiong) [Cambodia, India, Indonesia, Laos, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam; Australia, Pacific islands (Solomon Islands)].

**3. *Buchanania latifolia*** Roxburgh, Fl. Ind., ed. 1832, 2: 385. 1832.

豆腐果 dou fu guo

Evergreen trees, 13–15 m tall; young branches dark brown, ferruginous tomentose, branchlets subglabrous, with elevated

lenticels. Petiole 1.5–2.2 cm, with long ferruginous hairs; leaf blade broadly oblong, 12–24 × 6–10 cm, leathery, at first with long ferruginous hairs on both sides, later subglabrous adaxially, base rounded or broadly cuneate, margin entire, slightly revolute, apex rounded to retuse, lateral veins 12–20 pairs, reticulate venation pattern slightly impressed adaxially, prominent abaxially. Inflorescence paniculate, terminal, up to 20 cm; peduncle and rachis robust, densely covered with long ferruginous hairs. Flowers sessile, white, ca. 2.5 mm in diam. Calyx ferruginous pubescent, lobes lanceolate, ca. 1.5 mm, with ciliate margins. Petals oblong, ca. 2.5 mm, glabrous, slightly revolute toward apex. Stamens 10; filaments threadlike, 2 × as long as anthers; anthers oblong. Carpels 5 or 6, densely ferruginous tomentose. Drupe lens-shaped, ca. 9 mm, brownish black at maturity. Fl. Mar–Apr, fr. May–Jul.

Lowland forests; 100–900 m. Hainan, S Yunnan [India, Laos, Malaysia (peninsular), Myanmar, Nepal, Singapore, Thailand, Vietnam].

**4. *Buchanania microphylla*** Engler, Monogr. Phan. 4: 185. 1883.

小叶山榧子 xiao ye shan xian zi

Trees, 5–9 m tall; young branches minutely ferruginous pubescent, later glabrescent. Petiole 8–14 mm, puberulent; leaf blade obovate, 4–12 × 2–5 cm, minutely pubescent along midrib on both sides, base rounded to broadly cuneate, margin entire, apex rounded to retuse, lateral veins 12–20 pairs, reticulate venation pattern prominent on both sides. Inflorescences paniculate, terminal, minutely ferruginous pubescent, with numerous branches. Flowers light yellow; pedicel ca. 1 mm, minutely pubescent. Calyx lobes ovate, ca. 1 mm, minutely pubescent to subglabrous abaxially. Petals oblong, ca. 2.5 × 1 mm, glabrous, revolute in open state. Stamens 10; filaments linear, ca. 1 mm; anthers oblong, shorter than filaments, ca. 0.5 mm. Ovary conical, ca. 0.5 mm, densely hispid. Young fruit lens-shaped, glabrous. Fl. Apr, fr. Jun.

Lowland and hill forests. Hainan [Philippines].

## 2. ANACARDIUM Linnaeus, Sp. Pl. 1: 383. 1753.

腰果属 yao guo shu

Evergreen trees or shrubs, andro-monoecious with functionally staminate and bisexual flowers in same inflorescence. Leaves petiolate, simple; leaf blade margin entire. Panicle terminal, frondo-bracteate with numerous branches. Calyx 5-parted, cup-shaped with pointed lobes. Petals 5, recurved at anthesis. Stamens 7–10, usually 1 (or 2) noticeably larger; filament fused basally; anther broadly ellipsoid. Disk lacking. Ovary obovoid, asymmetrical, 1-locular and 1-ovulate; style 1, lateral, linear. Pedicel enlarging after anthesis into a fleshy hypocarp bearing fruit; fruit a nutlike glabrous drupe with bony endocarp.

Ten species: tropical America; one species (introduced) in China.

**1. *Anacardium occidentale*** Linnaeus, Sp. Pl. 1: 383. 1753.

腰果 yao guo

Trees or shrubs, 4–10 m tall; branchlets glabrous to subglabrous. Petiole 1–1.5 cm; leaf blade obovate, 8–11 × 6–8.5 cm, leathery, glabrous on both sides, base broadly cuneate, margin entire, apex rounded, truncate to retuse, lateral veins ca. 12 pairs, reticulate venation pattern prominent on both sides.

Inflorescence paniculate, 10–20 cm, glabrous to densely grayish sericeous; floral subtending bracts ovate-lanceolate, 5–10 mm, keeled, grayish sericeous abaxially, glabrous adaxially. Flower sessile to shortly pedicellate. Calyx grayish sericeous abaxially, ca. 4 × 1.5 mm. Petals 5, greenish yellow to red, linear-lanceolate, 7–9 × ca. 1.2 mm, grayish sericeous abaxially, minutely pubescent to subglabrous adaxially. Stamens 7–10, larger one 8–9 mm in male flowers, 5–6 mm in bisexual flowers, sterile

stamens 3–4 mm. Ovary ca. 2 mm, glabrous; style 4–5 mm. Fleshy hypocarp 3–7 × 4–5 cm, purplish red at maturity; drupe reniform, 2–2.5 × ca. 1.5 cm. Fl. Mar–Apr, fr. Jul–Aug.

Cultivated. Fujian, Guangdong, Guangxi, Taiwan, Yunnan [native to tropical America].

The edible seeds are referred to as cashew nuts. They are surrounded by a leathery shell (mesocarp), which is rich in liquid. This substance is an important raw material for resin. The liquid contains skin-irritant toxic compounds, which are removed by heating. The fleshy hypocarp, or cashew apple, is processed into jam and dried fruit.

### 3. MANGIFERA Linnaeus, Sp. Pl. 1: 200. 1753.

杧果属 mang guo shu

Evergreen trees, andro-monoecious with functionally staminate and bisexual flowers in same inflorescence. Leaves petiolate, simple; leaf blade margin entire. Inflorescence a terminal pleiothyrsoid. Flowers small, 4- or 5-merous, with imbricate aestivation. Sepals sometimes united at base. Petals with 1–5 prominent veins adaxially. Stamens 5, free or united with disk basally, usually 1 (or 2) noticeably larger. Disk of 5 separate extrastaminal glands. Ovary glabrous, 1-locular, 1-ovulate; style 1, terminal. Fruit drupaceous; mesocarp fleshy or fibrous; endocarp thick and bony, compressed. Embryo 1 to several by polyembryony.

About 69 species: tropical Asia; five species (one endemic, one introduced) in China.

1a. Inflorescence minutely pubescent.

2a. Inflorescence 20–35 cm; staminodes 3 or 4; drupe 5–10 cm, mesocarp fleshy, endocarp flattened ..... 1. *M. indica*

2b. Inflorescence ca. 14 cm; staminodes absent; drupe 3.5–5 cm, mesocarp thin, endocarp rounded or slightly flattened ..... 2. *M. siamensis*

1b. Inflorescence glabrous.

3a. Leaf blade 2–3 cm wide; fruit rounded; seed oblique ..... 3. *M. persiciforma*

3b. Leaf blade 3–6 cm wide; fruit elongate; seed not oblique.

4a. Pedicel and sepals often sparsely pubescent; drupe not beaked ..... 4. *M. laurina*

4b. Pedicel and sepals glabrous; drupe beaked ..... 5. *M. sylvatica*

#### 1. *Mangifera indica* Linnaeus, Sp. Pl. 1: 200. 1753.

杧果 mang guo

*Mangifera austroyunnanensis* Hu.

Trees, 10–20 m tall; branchlets brown, glabrous. Petiole 2–6 cm, grooved apically, inflated basally; leaf blade oblong to oblong-lanceolate, 12–30 × 3.5–6.5 cm, leathery, deep green adaxially, light green abaxially, glabrous on both sides, base cuneate to obtuse, margin entire, undulate, apex acute to long acuminate, lateral veins 20–25 pairs, midrib prominent on both sides, reticulate venation obscure. Inflorescence paniculate, terminal, 20–35 cm, glabrous to tomentose-pilose; bracts ca. 1.5 mm, lanceolate pubescent. Pedicels 1.5–3 mm, articulate. Sepals ovate-lanceolate, 2.5–3 × ca. 1.5 mm, glabrous to pubescent, acuminate. Petals light yellow with prominent red tree-shaped pattern adaxially, oblong or oblong-lanceolate, 3.5–4 × ca. 1.5 mm, glabrous, recurved at anthesis. Fertile stamen 1, ca. 2.5 mm, with ovate anther; staminodes 4, 0.7–1 mm. Disk inflated, fleshy, 5-lobed. Ovary oblique, ovate, ca. 1.5 mm in diam. at anthesis; style ca. 2.5 mm, eccentric. Drupe oblong to subreniform, greenish yellow to red, 5–10 × 3–4.5 cm; fleshy mesocarp bright yellow; endocarp ± compressed. Fl. Mar–Apr, fr. May–Jul.

Cultivated; 200–1400 m. S Fujian, Guangdong, Guangxi, Taiwan, S Yunnan [native to continental SE Asia; cultivated in tropical regions worldwide].

This species is a popular tropical fruit tree with more than a hundred cultivars.

#### 2. *Mangifera siamensis* Warburg ex Craib, Bot. Tidskr. 32: 330. 1915.

泰国杧果 tai guo mang guo

Trees; branchlets pubescent. Petiole 1–4 cm, flattened apically, inflated basally; leaf blade oblong to lanceolate, 10–19 × 2.5–5 cm, leathery, deep green adaxially, light green abaxially, glabrous, base cuneate or broadly cuneate, margin entire, undulate, apex acute to shortly acuminate, lateral veins 18–22 pairs, midrib prominent on both sides. Inflorescence paniculate, terminal, up to 14 cm, shortly pedunculate, minutely pubescent; floral subtending bracts ca. 1.5 mm, acute. Sepals 5, ca. 2 × 1.5 mm, sparsely tomentose-pilose. Petals oblong or oblong-lanceolate, ca. 2.7 × 1.5 mm, with 3 prominent veins adaxially. Fertile stamen 1, with ca. 11 mm filament and ca. 0.7 mm ovate anther; staminodes absent. Disk 5-lobed. Ovary ca. 0.7 mm; style ca. 1.5 mm. Drupe elliptic-reniform, 3.5–5 × ca. 2.5 cm; mesocarp thin; endocarp reniform, slightly compressed, 2.8–3.5 × 1.8–2 cm. Fl. Mar–Apr, fr. May–Jul.

Lowland forests; 600–700 m. S Yunnan (Jinghong) [Thailand].

#### 3. *Mangifera persiciforma* C. Y. Wu & T. L. Ming, Fl. Yunnan. 2: 368. 1979.

扁桃 bian tao

*Mangifera hiemalis* J. Y. Liang.

Trees, 10–19 m tall; branchlets grayish brown, glabrous. Petiole 1.5–3.5 cm, grooved apically, inflated basally; leaf blade narrowly ovate to lanceolate, 11–20 × 2–2.8 cm, leathery, glabrous, deep green adaxially, light green abaxially, base cuneate, margin entire, undulate, apex acute or shortly acuminate, lateral veins ca. 20 pairs, midrib elevated on both sides, reticulate venation pattern prominent on both sides. Inflorescence paniculate, terminal, branched basally, 10–19 cm, glabrous; floral sub-

tending bracts triangular, ca. 1.5 mm. Pedicels ca. 2 mm, articulated. Sepals ovate, ca.  $2 \times 1.5$  mm, glabrous, concave. Petals yellowish green, with 4 or 5 brown prominent veins adaxially, oblong-lanceolate, ca.  $4 \times 1.5$  mm. Fertile stamen 1, 2.5–3 mm; staminodes (1 or)2 or 3; anthers absent. Disk 4- or 5-lobed. Ovary globose, ca. 1.2 mm in diam. at anthesis; style subterminal, shorter than fertile stamen. Drupe rounded to slightly compressed, 4–5 cm in diam.; mesocarp thin; endocarp oblique, ovate or rhomboid-ovate, compressed, ca.  $4 \times 2.5$  cm. Fl. Apr, fr. May–Jun.

• Lowland forests; 200–600 m. S Guangxi, S Guizhou, SE Yunnan.

**4. *Mangifera laurina*** Blume, Mus. Bot. 1: 195. 1850.

长梗杧果 chang geng mang guo

*Mangifera longipes* Griffith.

Trees, up to 25 m tall; branchlets purplish brown, glabrous. Petiole slender, 2.5–5.5 cm, grooved apically, inflated basally; leaf blade oblong-lanceolate to elliptic-lanceolate, 15–26  $\times$  4–6 cm, leathery, glabrous, base cuneate to broadly cuneate, margin entire, undulate, apex acuminate or caudate-acuminate, lateral veins more than 25 pairs, prominent on both sides. Inflorescence paniculate, terminal, ca. 30 cm, with slender primary branches. Pedicels ca. 1.5 mm, sparsely pubescent to glabrous. Sepals ovate, 2–2.5 mm, sparsely pubescent, acute. Petals with 3 or 4 prominent veins adaxially, linear-oblong, ca.  $4.5 \times 1.5$  mm. Fertile stamen 1, longer than petals; staminodes 2, very short,

with knoblike sterile anthers. Disk 5-lobed. Ovary globose; style subterminal, 3  $\times$  ovary in length. Drupe oblong to subreniform, yellowish green at maturity, 5–6  $\times$  ca. 4 cm; mesocarp thin; endocarp large, subglobose. Fl. Mar, fr. Apr–May.

Lowland forests; ca. 300 m. S Yunnan [Cambodia, Indonesia, Malaysia (peninsular), Philippines, Singapore].

**5. *Mangifera sylvatica*** Roxburgh, Fl. Ind. 2: 438. 1824.

林生杧果 lin sheng mang guo

Trees, 6–20 m tall; branchlets dark brown, glabrous. Petiole 3–7 cm, inflated basally; leaf blade lanceolate to oblong-lanceolate, 15–24  $\times$  3–5.5 cm, papery or thinly leathery, glabrous on both sides, base cuneate, margin entire, apex acuminate, lateral veins 16–20 pairs, prominent on both sides. Inflorescence paniculate, terminal, 15–33 cm, glabrous, with slender primary branches; floral subtending bracts ovate-lanceolate, ca. 1 mm. Pedicels slender, 3–8 mm, glabrous, articulate. Sepals ovate to lanceolate, ca.  $3.5 \times 1.5$  mm, concave, glabrous. Petals white with 3–5 dark brown veins adaxially, lanceolate to linear-lanceolate, ca.  $7 \times 1.5$  mm, recurved and twisted apically at anthesis. Fertile stamen 1, ca. 4 mm; staminodes 1 or 2, shortly subulate to dentate; anther ovoid, ca. 0.7 mm. Ovary globose, ca. 1.5 mm in diam.; style subterminal. Drupe oblique, ovate, 6–8  $\times$  4–5 cm, apex elongated into a curved beak; mesocarp thin; endocarp large, rounded to elliptic. Fl. Apr–May, fr. Jun–Aug.

Lowland and hill forests; 600–1900 m. S Yunnan [Bangladesh, Bhutan, Cambodia, India (Assam, Darjeeling, Sikkim), Myanmar, Thailand].

## 2. Tribe SPONDIADAEAE

槟榔青族 bing lang qing zu

Leaf imparipinnately compound or simple. Stamens in 2 whorls. Carpels 4 or 5 and connate, or 1; ovary 4- or 5-locular or 1-locular, 1-ovulate; styles (1 or)4 or 5, terminal.

About 17 genera and 140 species: tropical Africa, America, and Asia; six genera and nine species (one endemic) in China.

### 4. SPONDIAS Linnaeus, Sp. Pl. 1: 371. 1753.

槟榔青属 bing lang qing shu

*Allospodias* Stapf; *Evia* Commerson ex Blume; *Skoliostigma* Lauterbach; *Solenocarpus* Wight & Arnott; *Wirtgenia* Junghuhn ex Hasskarl.

Entirely or partly deciduous trees. Leaves alternate, spirally arranged, petiolate, imparipinnately compound; leaflet margin serrate or entire. Inflorescence paniculate, terminal or axillary. Flowers 4- or 5-merous, bisexual or functionally unisexual. Stamens 8–10; filaments subulate to filiform, equal in length. Disk intrastaminal, 10-crenate to crenulate. Ovary 4- or 5-locular, with 1 ovule per locule; styles 4 or 5, free, or style 1. Fruit drupaceous; mesocarp juicy; endocarp woody or bony, covered by a fibrous matrix; embryo elongate, straight to slightly curved.

About 11 species: tropical America and tropical Asia; two species in China.

1a. Leaflets 5–11, glabrous on both sides, with submarginal veins; sepals glabrous; drupe elliptic ..... 1. *S. pinnata*

1b. Leaflets 11–23, often covered with hairs, without submarginal veins; sepals minutely pubescent; drupe obovate to

isodiametric ..... 2. *S. lakonensis*

**1. *Spondias pinnata*** (Linnaeus f.) Kurz, Prelim. Rep. Forest Pegu, App. A, 44; App. B, 42. 1875.

槟榔青 bing lang qing

*Mangifera pinnata* Linnaeus f., Suppl. Pl. 156. 1782; *Poupartia pinnata* (Linnaeus f.) Blanco; *Spondias acuminata* Roxburgh; *S. bivenomarginalis* K. M. Feng & P. Y. Mao; *S. mangifera* Willdenow; *Tetrastigma megalocarpum* W. T. Wang.

Deciduous trees, 10–15 m tall; branchlets yellowish brown, glabrous. Petiole 10–15 cm, petiole and rachis glabrous; leaf blade 30–40 cm, imparipinnately compound with 5–11 opposite leaflets; leaflet petiolule 3–5 mm; leaflet blade ovate-oblong to elliptic-oblong, 7–12 × 4–5 cm, papery, glabrous on both sides, base cuneate to rounded, often oblique, margin serrate or entire, apex acuminate, lateral veins 12–25 pairs, slightly impressed adaxially, prominent abaxially, joined with submarginal collecting vein. Inflorescence paniculate, terminal, 25–35 cm, glabrous, basal first order branches 10–15 cm. Flower sessile or subsessile, white, glabrous. Calyx lobes triangular, ca. 0.5 mm. Petals ovate-oblong, ca. 2.5 × 1.5 mm, apically acute. Stamens ca. 1.5 mm. Ovary subglobose, ca. 1 mm; styles 4 or 5, free, ca. 0.5 mm. Drupe ellipsoid to elliptic-ovoid, yellowish orange at maturity, 3.5–5 × 2.5–3.5 cm; inner part of endocarp woody and grooved, outer part fibrous; mature fruit usually with 2 or 3 seeds. Fl. Apr–Jun, fr. Aug–Sep.

Lowland and hill forests; 300–1200 m. S Guangxi, Hainan, S Yunnan [probably native to Indonesia and the Philippines; widely cultivated and naturalized in Bhutan, Cambodia, India, Indonesia, Laos, Malaysia (peninsular), Myanmar, Nepal, Philippines, Singapore, Thailand, and Vietnam].

**2. *Spondias lakonensis*** Pierre, Fl. Forest. Cochinch. 5: t. 375. 1898.

岭南酸枣 *ling nan suan zao*

Deciduous trees, 8–15 m tall; branchlets grayish brown, minutely pubescent. Petiole and rachis terete, minutely pubescent; leaf blade 25–67 cm, imparipinnate with 11–23 opposite to alternate leaflets; leaflet petiolule ca. 2 mm, minutely pubescent; leaflet blade oblong or oblong-lanceolate, 6–13 × 1.5–4 cm, minutely pubescent abaxially along veins, with tufts of hairs in axils of lateral veins, base oblique, broadly cuneate to somewhat rounded, margin entire, apex acuminate, lateral veins 8–10 pairs, without submarginal collecting veins. Inflorescences paniculate, axillary, 15–35 cm, minutely grayish brown pubescent, loosely branched. Flowers subtended by puberulent 0.5–1 mm bracts,

with articulate and minutely pubescent 2.5–3.4 mm pedicels. Calyx ca. 0.6 mm, minutely pubescent, lobes obtuse apically. Petals white, oblong to ovate-oblong, ca. 2.5 × 1 mm, glabrous, 3-veined. Stamens ca. 2.5 mm. Ovary 4(or 5)-locular; style 1. Drupe ovate to obovate, ± angled, red at maturity, 8–10 × 6–7 mm; endocarp 4-angled in cross section, 4-locular with 1 seed per locule.

Forests. Fujian, Guangdong, Guangxi, Hainan, S and SE Yunnan [Laos, Thailand, Vietnam].

- 1a. Leaflets abaxially minutely pubescent along nerves and with hair tufts in axils of lateral veins; inflorescence minutely grayish brown pubescent ..... 2a. var. *lakonensis*  
 1b. Leaflets with long hairs on both sides; inflorescence grayish yellow tomentose .... 2b. var. *hirsuta*

**2a. *Spondias lakonensis* var. *lakonensis***

岭南酸枣(原变种) *ling nan suan zao* (*yuan bian zhong*)

*Allospodias lakonensis* (Pierre) Stapf; *Poupartia chinensis* Merrill.

Leaf blade 25–35 cm; leaflet blade 6–10 × 1.5–3 cm, abaxially minutely pubescent along nerves and with tufts of hair in axils of lateral veins. Inflorescence paniculate, 15–25 cm, minutely grayish brown pubescent. Fl. May–Jun, fr. Sep–Dec.

Forests. Fujian, Guangdong, Guangxi, Hainan [Laos, Thailand, Vietnam].

**2b. *Spondias lakonensis* var. *hirsuta*** C. Y. Wu & T. L. Ming, Fl. Yunnan. 2: 374. 1979.

毛叶岭南酸枣 *mao ye ling nan suan zao*

Leaf blade 25–67 cm; leaflet blade 6–13 × 1.5–4 cm, with long hairs on both sides. Inflorescence paniculate, to 35 cm, grayish yellow tomentose. Fl. Apr–May, fr. Jun–Oct.

- Lowland forests. S and SE Yunnan (Hekou, Jinping, Mengla).

**5. HAPLOSPONDIAS** Kostermans, *Kedondong Ambarella Asia & Pacific*, 9. 1991.

单叶槟榔青属 *dan ye bing lang qing shu*

Medium-sized trees. Leaves pedicellate, blade simple. Inflorescence paniculate, terminal. Flowers 4- or 5-merous, bisexual, pedicellate. Stamens 10. Disk shallowly cup-shaped, margin undulate. Ovary 1-locular; style short and thick. Fruit not seen. Fl. Apr.

Two species: tropical Asia; one species in China.

**1. *Haplospodias haplophylla*** (Airy Shaw & Forman) Kostermans, *Kedondong Ambarella Asia & Pacific*, 9. 1991.

单叶槟榔青 *dan ye bing lang qing*

*Spondias haplophylla* Airy Shaw & Forman, *Kew Bull.* 21: 17. 1967.

Trees, ca. 6 m tall; branchlets purplish brown, glabrous. Petiole 2–6 cm; leaf blade simple oblong-elliptic, 6–10 × 2–5.3 cm, mixed papillose and minutely pubescent on both surfaces especially along veins, base cuneate to cordate, margin entire, apex acute or obtuse, lateral veins ca. 12 pairs, sometimes less,

submarginal veins absent. Inflorescence paniculate, terminal, cylinder-shaped, up to 28 cm; peduncle 4–5 mm thick, ribbed, minutely pubescent; first order branches ascending, 6–13 cm, second order branches short and spreading. Pedicel ca. 2 mm; flower 4- or 5-merous. Calyx cup-shaped, lobes shortly triangular, minutely pubescent. Petals elliptic-oblong, ca. 2.5 × 1 mm, acute, revolute in open state, 3-veined. Stamens 10; filaments ca. 2 mm. Disk shallowly cup-shaped, margin undulate. Ovary ca. 0.5 mm, glabrous, 1-locular; stigma large, compressed, laterally decurrent. Fruit not seen. Fl. Apr.

Hill forests; ca. 1500 m. S Yunnan [Myanmar].

**6. DRACONTOMELON** Blume, Mus. Bot. 1: 231. 1850.人面子属 *ren mian zi shu*

Trees. Leaves imparipinnately compound; leaflets entire, rarely serrulate. Inflorescence paniculate, axillary or subterminal. Flowers 5-merous, bisexual, pedicellate. Stamens 10, equal to petals in length; filaments linear-subulate. Disk dish-shaped, ± lobed. Ovary 5-locular, locules 1-ovulate; styles 5, joined in upper part. Drupe subglobose; mesocarp fleshy; endocarp pentagonal and slightly compressed in cross section, resembling a face, 5-locular. Seed elliptic, 3-ribbed.

About eight species: tropical Asia; two species (one endemic) in China.

- 1a. Leaflets symmetrical to slightly oblique basally, minutely pubescent along midrib on both surfaces, abaxially with white tufts of hair in axils of lateral veins; drupe ca. 2.5 cm in diam. .... 1. *D. duperreanum*  
 1b. Leaflets conspicuously oblique, glabrous on both surfaces; drupe 3.5–4 cm in diam. .... 2. *D. macrocarpum*

**1. Dracontomelon duperreanum** Pierre, Fl. Forest. Cochinch. 5: t. 374. 1898.

Lowland forests; 100–400 m. Guangdong, Guangxi, SE Yunnan [Vietnam].

人面子 *ren mian zi*

*Dracontomelon sinense* Stapf.

Trees, more than 20 m tall; branchlets minutely gray tomentose. Petiole and rachis ribbed, sparsely pubescent; leaf blade 30–45 cm, imparipinnately compound with 11–15 alternate leaflets; leaflet petiolule 2–5 mm; leaflet blade subcoriaceous, oblong, increasing in size from bottom to top, 5–14.5 × 2.5–4.5 cm, base broadly cuneate or rounded, margin entire, apex acuminate, minutely pubescent along midrib on both surfaces, abaxially with white tufts of hair in vein axils, lateral veins 7–9 pairs, reticulate venation prominent on both surfaces. Inflorescence paniculate, axillary or terminal, 10–23 cm, minutely gray pubescent. Pedicel 2–3 mm, minutely pubescent. Sepals ovate to elliptic-ovate, 3.5–4 × ca. 2 mm, obtuse, with minute grayish yellow pubescence on both surfaces. Petals white, lanceolate or narrowly oblong, ca. 6 × 1.7 mm, glabrous, recurved at anthesis, with 3–5 dark brown veins. Stamens 10; filaments ca. 3.5 mm; anthers ca. 1.5 mm. Disk lobed, undulate. Ovary glabrous, 2.5–3 mm; style ca. 2 mm. Drupe ca. 2 cm, ca. 2.5 cm in diam., yellow at maturity; endocarp compressed, 1.7–1.9 cm in diam., 5-locular or 3- or 4-locular by abortion. Fl. Apr–May, fr. Jun–Nov.

The names *Dracontomelon mangiferum* Blume and *D. dao* (Blanco) Merrill & Rolfe have been misapplied to this species.

**2. Dracontomelon macrocarpum** H. L. Li, J. Arnold Arbor. 25: 306. 1944.

大果人面子 *da guo ren mian zi*

Trees, ca. 18 m tall; branchlets grayish brown, minutely pubescent to glabrous, with white lenticels. Petiole and rachis terete, minutely grayish yellow pubescent; leaf blade to 50 cm, imparipinnately compound with alternate leaflets; leaflet petiolule 4–6 mm, minutely gray pubescent, grooved apically; leaflet blade oblong, highly asymmetrical, 9–13 × 2.5–4 cm, coriaceous, glabrous adaxially, abaxially with tufts of hairs in axils of lateral veins, base oblique with one side acute, one rounded, margin entire, apex acuminate or acute, lateral veins 8–19 pairs, prominent on both surfaces, reticulate venation visible on both surfaces. Inflorescence and flowers not seen. Drupe subglobose, 3.5–5 cm in diam., glabrous, 5-locular, rarely 2–4-locular by abortion; mesocarp fleshy; endocarp ca. 3.5 cm in diam., woody. Seed elliptic-triangular, ca. 12 × 6 mm. Fr. Jun.

• Hill forests; ca. 1200 m. S Yunnan (Mengla).

**7. CHOEROSPONDIAS** B. L. Burtt & A. W. Hill, Ann. Bot. (London), ser. 2, 1: 254. 1937.南酸枣属 *nan suan zao shu*

Deciduous trees, polygamous or dioecious. Leaves imparipinnately compound; leaflets opposite, petiolulate. Flowers 5-merous, unisexual; male flowers arranged in axillary or subterminal pleiothyrsoids; female flowers solitary. Stamens 10; anthers oblong, dorsifixed. Disk 10-lobed. Ovary 5-locular, with 1 apical pendulous ovule per locule; styles 5; stigma capitate. Drupe ellipsoidal to obovate; mesocarp fleshy; endocarp bony with 5 germination holes at apex. Seed without endosperm; cotyledons thick.

One species: Cambodia, China, India, Japan, Laos, Thailand, Vietnam.

**1. Choerospondias axillaris** (Roxburgh) B. L. Burtt & A. W. Hill, Ann. Bot. (London), ser. 2, 1: 254. 1937.

南酸枣 *nan suan zao*

Deciduous trees, 8–20 m tall; branchlets dark purplish brown, minutely pubescent to glabrous, lenticellate. Petiole inflated at base, petiole and rachis minutely pubescent to glabrous; leaf blade 25–40 cm, imparipinnately compound, with 3–6 leaflets; leaflet petiolule slender, 2–5 mm, glabrous to minutely pubescent; leaflet blade ovate to ovate-lanceolate or oblong-

ovate, 4–12 × 2–4.5 cm, papery, glabrous or abaxially with tufts of hair in vein axils, base ± oblique, broadly cuneate to rounded, entire or serrate at base, apex long acuminate, lateral veins 8–10 pairs, prominent on both surfaces, reticulate venation obscure. Male inflorescence 4–10 cm, minutely pubescent to glabrous; floral subtending bracts minute. Male flowers: calyx minutely pubescent to glabrous, lobes triangular, ca. 1 mm, apically obtuse, with purplish red glandular-ciliate hairs along margin; petals oblong, 2.5–3 mm, with brown venation, recurved at anthesis; stamens equal to petals in length, anthers oblong, ca. 1 mm.

Female flowers solitary in axils of distal leaves, larger than male flowers; ovary ca. 1.5 mm, 5-locular, style ca. 0.5 mm. Drupe ellipsoidal or obovate-ellipsoidal, yellow at maturity, 2.5–3 cm, ca. 2 cm in diam.; endocarp 2–2.5 × 1.2–1.5 cm.

Lowland, hill, and mountain forests; 300–2000 m. Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [Bhutan, Cambodia, India, Japan, Laos, Nepal, Thailand, Vietnam].

- 1a. Branchlets and leaves glabrous ..... 1a. var. *axillaris*  
 1b. Branchlets and leaves minutely pubescent ..... 1b. var. *pubinervis*

**1a. Choerospondias axillaris** var. *axillaris*

南酸枣(原变种) nan suan zao (yuan bian zhong)

*Spondias axillaris* Roxburgh, Fl. Ind., ed. 1832, 2: 45. 1832; *Poupartia axillaris* (Roxburgh) King & Prain; *P. fordii* Hemsley; *S. lutea* Engler.

Young branchlets and leaves glabrous. Fl. Mar–Apr, fr. Jul–Oct.

Lowland, hill, and mountain forests; 300–2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Taiwan, SE Xizang, Yunnan, Zhejiang [Cambodia, India, Japan, Laos, Thailand, Vietnam].

**1b. Choerospondias axillaris** var. *pubinervis* (Rehder & E. H. Wilson) B. L. Burt & A. W. Hill, Ann. Bot. (Oxford), n.s., 1: 254. 1937.

毛脉南酸枣 mao mai nan suan zao

*Spondias axillaris* var. *pubinervis* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 173. 1914.

Branchlets and leaves minutely pubescent. Fl. Mar–Apr, fr. Jul–Sep.

• Lowland and hill forests; 400–1000 m. Gansu, Guizhou, W Hubei, W Hunan, Sichuan.

**8. LANNEA** A. Richard in Guillemain et al., Fl. Seneg. Tent. 153. 1831, nom. cons.

厚皮树属 hou pi shu shu

*Calesiam* Adanson.

Trees, dioecious. Leaves imparipinnately compound; leaflets opposite, entire. Inflorescence a terminal panicle or raceme. Flowers 4-merous. Stamens 8; anthers ovoid, reduced and sterile in female flower. Disk intrastaminal. Ovary 4-locular, with 1 apical pendulous ovule per locule; styles 3 or 4, short; stigma subglobose; ovary in male flower rudimentary. Drupe small, subreniform, compressed; mesocarp thin; endocarp woody, 1–4-locular with operculum.

About 70 species: tropical Africa, S and SE Asia; one species in China.

**1. Lannea coromandelica** (Houttuyn) Merrill, J. Arnold Arbor. 19: 353. 1938.

厚皮树 hou pi shu

*Dialium coromandelinum* Houttuyn, Nat. Hist. 2(2): 39. 1774; *Calesiam grande* (Dennstedt) Kuntze; *Haberlia grandis* Dennstedt; *Lannea grandis* (Dennstedt) Engler; *L. wodier* (Roxburgh) Adelbert; *Odina pinnata* Rotte; *O. wodier* Roxburgh; *Rhus odina* Buchanan-Hamilton.

Deciduous trees, 5–10 m tall; branchlets densely covered with ferruginous stellate hairs. Petiole and rachis terete, sparsely covered with ferruginous stellate hairs; leaf blade 10–33 cm, imparipinnately compound, with (5–)7–9(–11) leaflets; leaflet petiolule 1–3 mm, with ferruginous stellate hairs; leaflet blade membranous or papery, ovate or oblong-ovate, 5.5–9 × 2.5–4 cm, adaxially glabrous, abaxially mixed pubescent and ferruginous stellate-haired, base oblique, subrounded, margin entire,

apex long acuminate or caudate-acuminate, lateral veins 6–10 pairs, slightly impressed adaxially, prominent abaxially. Inflorescences panicle or racemose, appearing before leaves, gathered at branch apices or on short shoots in leaf-scar axils, male inflorescence 15–30 cm, female inflorescence smaller; subtending bracts 1–2 mm with ciliate margins. Flowers small, yellow or purplish. Calyx lobes ovate to broadly ovate, ca. 1 mm, glabrous with ciliate margins. Petals ovate-oblong, ca. 2.7 × 1.5 mm, recurved at anthesis. Stamens 8, subequal to petals in male flower, reduced and sterile in female flower. Disk annular. Ovary glabrous, ovoid, 4-locular, usually only 1 ovule fertile. Drupe ovoid to slightly reniform, purplish red at maturity, 6–10 × 0.5–1 mm. Fl. Mar, fr. Apr–Jun.

Lowland and hill forests; 100–1800 m. SW Guangdong, S Guangxi, S Yunnan [Bhutan, India, Myanmar, Nepal, Sri Lanka; cultivated elsewhere in continental SE Asia, such as in Cambodia, Laos, Malaysia, Thailand, Vietnam, where it is probably naturalized].

**9. PEGIA** Colebrooke, Trans. Linn. Soc. London 15: 364. 1827.

藤漆属 teng qi shu

*Phlebochiton* Wallich.

Woody climbers, polygamous. Leaves imparipinnately compound; leaflets opposite to subopposite, serrate. Inflorescences panicle, terminal or axillary. Flowers 5-merous. Stamens 10; anthers subglobose. Disk 5-notched, intrastaminal. Ovary with 5 locules, only 1 fertile and 1 ovulate; styles 5, united; stigma 3–5-lobed. Drupe ovoid or obliquely oblong; mesocarp red; endocarp oblong, thin, bony. Seed oblong, compressed; embryo straight to slightly curved.

Three species: E Himalayan region to the Indochinese peninsula and Kalimantan; two species in China.

- 1a. Branchlets, leaf petiole, leaf rachis, and inflorescence densely yellow tomentose; leaflets ovate ..... 1. *P. nitida*  
 1b. Branchlets, leaf rachis, and leaf petiole ± glabrous; inflorescence minutely pubescent; leaflets oblong ..... 2. *P. sarmentosa*

**1. *Pegia nitida*** Colebrooke, Trans. Linn. Soc. London 15: 364. 1827.

藤漆 teng qi

*Phlebochiton extensum* Wallich; *Robergia hirsuta* Roxburgh; *Tapirira hirsuta* (Roxburgh) J. D. Hooker; *T. extensa* (Wallich) J. D. Hooker ex Marchand.

Woody climbers; branchlets purplish brown, densely yellow tomentose. Petiole and rachis densely yellow tomentose; leaf blade 20–40 cm, imparipinnately compound with 9–15 opposite leaflets; leaflet petiolule 2–3 mm, densely yellow tomentose; leaflet blade ovate or ovate-elliptic, 4–11 × 2–4.5 cm, membranous or papery, adaxially minutely yellow pubescent along midrib, abaxially appressed pubescent along midrib and with yellow tufts of hairs in axils of lateral veins, base slightly oblique, cordate or subcordate, margin serrate distally, rarely entire, apex acuminate or acute, lateral veins 6–8 pairs, prominent on both surfaces. Inflorescence paniculate, 20–35 cm, loosely branched, densely yellow tomentose; floral subtending bracts subulate, ca. 1 mm, pubescent. Pedicel slender, ca. 1.5 mm, glabrous; flower small, white. Calyx glabrous, lobes narrowly triangular, ca. 0.8 mm. Petals narrowly ovate, ca. 1.5 × 0.7 mm, acute. Stamens ca. 0.7 mm; filaments subulate. Disk 5-lobed. Ovary ovoid, ca. 1 mm, glabrous; style ca. 0.5 mm. Drupe ellipsoid, oblique, slightly compressed, ca. 10 × 8 mm, black at maturity. Seed compressed. Fl. Jan–Apr, fr. May–Jul.

Lowland and hill forests; (200–)500–1800 m. W Guangxi, SW Guizhou, S Yunnan [Bhutan, India, Myanmar, Nepal, Thailand].

**2. *Pegia sarmentosa*** (Lecomte) Handel-Mazzetti, Sinensia 3: 187. 1933.

利黄藤 li huang teng

*Phlebochiton sarmentosum* Lecomte, Bull. Soc. Bot. France 54: 528. 1907; *Pegia bijuga* Handel-Mazzetti; *Phlebochiton sinense* Diels.

Woody climbers; branchlets purplish brown, glabrous or subglabrous. Petiole and rachis grooved and minutely pubescent above, glabrous below; leaf blade 15–30 cm, imparipinnately compound with 11–15 opposite leaflets; leaflet petiolule 3–8 mm; leaflet blade oblong or oblong-elliptic, 4–9.5 × 1.5–4 cm, papery, adaxially with minute grayish white papillae, abaxially minutely yellow pubescent along midrib, ± glabrous and with tufts of hairs in axil of lateral veins, base subcordate, margin remotely serrate to entire distally, apex acuminate or acute, lateral veins 6–8 pairs, reticulate venation prominent abaxially. Inflorescence paniculate, 8–20 cm, loosely branched, sparsely, minutely appressed pubescent; floral subtending bracts subulate, ca. 1 mm, pubescent with ciliate margins. Pedicel 1–1.5 mm, glabrous. Calyx glabrous, lobes triangular, ca. 0.8 mm. Petals ovate to elliptic-ovate, ca. 1.5 mm. Stamens ca. 0.7 mm; filaments subulate. Disk 5-lobed. Ovary globose, ca. 1 mm in diam., glabrous; style ca. 0.5 mm. Drupe ellipsoid or ovate-globose, 10–15 × 8–10 mm, compressed. Seed subreniform. Fl. Feb–Apr, fr. Apr–May.

Forests and thickets on rocky soils; 200–900 m. Guangdong, Guangxi, SE Guizhou, SE Yunnan [Cambodia, Indonesia (Kalimantan), Laos, E Malaysia, Thailand, Vietnam].

### 3. Tribe RHOEAE

漆树族 qi shu zu

Trees or shrubs, rarely woody climbers, polygamous or dioecious. Leaves simple, palmately 3-foliolate or imparipinnately compound. Flowers with 1 or 2 whorls of stamens. Ovary 1-locular, rarely 2- or 3-locular, composed of 3 carpels, rarely 1 carpel; style terminal or lateral, free or connate. Drupe 1-seeded; embryo curved, rarely erect.

About 40 genera and over 300 species: tropical, subtropical, and temperate regions; five genera and 28 species (13 endemic) in China.

Although the genus *Rhus* is probably paraphyletic if species of *Toxicodendron* are not included, the distinction between the two genera is respected here mainly because it is practical to have the most poisonous species classified in one genus. This is also in accordance with recently published treatments of the family by Mitchell and Mori (Mem. New York Bot. Gard. 42: 1–76. 1987) and Barfod (in Harling & Andersson, Fl. Ecuador, 9–49. 1987; and in Nordic J. Bot. 8: 3–11. 1988). In this treatment, the fruit characters have been used to distinguish between the two genera. On this background, *Terminthia* poses a particular problem since its fruits combine features reminiscent of both *Rhus* (mesocarp glutinous) and *Toxicodendron* (fruit glabrous, exocarp finally separating). *Terminthia* is here maintained as a unispecific, segregate genus probably with affinity to the African species of *Rhus* (*R. sect. Gerontogae* Engler). The molecular studies conducted by Pell (Molecular Systematics of the Cashew Family [Anacardiaceae]. Ph.D. Dissertation, Dept. of Biological Sciences, Louisiana State University. 2004) shows that if a separate genus such as *Terminthia* is erected to accommodate problematic species, then *Rhus* will have to be split into many entities. Such action should be deferred until more evidence is available.

### 10. COTINUS Miller, Gard. Dict. Abr., ed. 4. 1754.

黄栌属 huang lu shu

Polygamous shrubs or small trees, with yellow wood and pungent-smelling resinous exudates. Leaves alternate, borne on slender petioles, simple, entire to slightly serrate. Inflorescence cymose or paniculate, terminal. Pedicel slender, 4–6 × longer than flower, further elongating and turning villous after anthesis in sterile flowers. Calyx 5-parted, lobes ovate-lanceolate, obtuse, persistent. Petals 5, 2 × as long as calyx. Stamens 5, shorter than petals; anthers ovate, shorter than filaments. Ovary obliquely compressed, 1-locular and

1-ovulate; styles 3. Drupe small, dark red to brown, reniform, compressed, glabrous or pubescent. Seed reniform, exalbuminous; seed coat thin; cotyledon complanate.

Five species: Asia, Europe, North America; three species (two endemic) in China.

- 1a. Mature plant less than 1 m tall; leaf blade 1–2 cm in diam.; fruit minutely pubescent ..... 1. *C. nana*  
 1b. Mature plant more than 2 m tall; leaf blade more than 2 cm in diam.; fruit glabrous.  
 2a. Leaf blade broadly elliptic, obovate, or ovate, glabrous or pubescent ..... 2. *C. coggygria*  
 2b. Leaf blade broadly ovate to suborbicular, abaxially with tufts of hair in vein axils ..... 3. *C. szechuanensis*

**1. *Cotinus nana*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 101. 1916.

矮黄栌 ai huang lu

Shrubs 0.5–1.5 m tall. Petiole slender, 3–6 mm; leaf blade orbicular or ovate, 1–2 cm in diam., leathery, glabrous, glaucous, base rounded or broadly cuneate, margin entire, apex rounded, lateral veins and reticulate venation prominent abaxially. Inflorescence paniculate, terminal, much branched, glabrous. Pedicel slender, 6–8 mm, partly pilose; flowers ca. 3 mm in diam. Calyx purplish red, lobes ovate-triangular, ca. 1 mm, acute to obtuse apically, minutely pubescent with ciliate margins. Petals oblong or oblong-elliptic, 2–2.5 mm, glabrous with purplish red venation pattern. Stamens ca. 1.5 mm; filaments linear, ca. 0.9 mm; anthers ovate-oblong. Disk annular. Ovary oblique, subglobose, ca. 0.7 mm in diam., minutely pubescent; styles 3; stigma subcapitate. Drupe subreniform, 3–4 × 2.5–3 mm, compressed, minutely pubescent. Fl. Jul–Aug, fr. Sep–Oct.

• Hill and mountain thickets on rocky soils; 1500–2500 m. NW Yunnan.

**2. *Cotinus coggygria*** Scopoli, Fl. Carniol., ed. 2, 1: 220. 1772.

黄栌 huang lu

*Rhus cotinus* Linnaeus, Sp. Pl. 1: 267. 1753.

Shrubs, 3–5 m tall. Petiole up to 3.5 cm; leaf blade broadly elliptic to obovate, 3–8 × 2.5–6 cm, gray pubescent on both sides or more distinctly so abaxially, base rounded to broadly cuneate, margin entire, apex rounded to retuse, lateral veins 6–11 pairs. Inflorescence paniculate, pubescent. Pedicel 7–10 mm; flower ca. 3 mm in diam. Calyx glabrous, lobes ovate-triangular, ca. 1.2 × 0.8 mm. Petals ovate to ovate-lanceolate, 2–2.5 × ca. 1 mm. Stamens ca. 1.5 mm; anthers ovoid, equal to filaments in length. Disk 5-lobed, purplish brown. Ovary subglobose, ca. 0.5 mm in diam.; styles 3, free, unequal. Drupe reniform, ca. 4.5 × 2.5 mm, glabrous. Fl. Feb–Aug, fr. May–Nov.

Hill forests, hill and mountain thickets; 700–2400 m. Gansu, Guizhou, Hebei, Henan, Hubei, Jiangsu, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [NW India, Nepal, Pakistan; SW Asia, Europe].

- 1a. Leaf blade glabrous ..... 2c. var. *glaucophylla*  
 1b. Leaf blade pubescent.

- 2a. Leaf blade obovate, grayish pubescent on both sides, or more distinctly so abaxially; inflorescence pubescent ..... 2a. var. *cinerea*

- 2b. Leaf blade broadly elliptic, densely pubescent abaxially, especially along

midrib and veins; inflorescence

glabrous or subglabrous ..... 2b. var. *pubescens*

**2a. *Cotinus coggygria* var. *cinerea*** Engler, Bot. Jahrb. Syst. 1: 403. 1881.

灰毛黄栌 hui mao huang lu

*Cotinus cinerea* (Engler) F. A. Barkley.

Leaf blade obovate, grayish pubescent on both sides or more distinctly so abaxially. Inflorescence pubescent. Fl. Feb–Mar, fr. May–Aug.

Hill forests on southern slopes; 700–1700 m. Hebei, Henan, Hubei, Shandong, Sichuan [SW Asia, S Europe].

The wood yields a yellow dye that was used in ancient China. The striking red autumn color of the leaves is famous in Beijing where it is referred to as “west hills red leaf.”

**2b. *Cotinus coggygria* var. *pubescens*** Engler, Bot. Jahrb. Syst. 1: 403. 1881.

毛黄栌 mao huang lu

Leaf blade broadly elliptic, densely pubescent abaxially, especially along midrib and veins. Inflorescence glabrous or subglabrous. Fl. May.

Hill forests; 800–1500 m. Gansu, Guizhou, Henan, Hubei, Jiangsu, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang [SW Asia, S Europe].

**2c. *Cotinus coggygria* var. *glaucophylla*** C. Y. Wu, Fl. Yunnan. 2: 386. 1979.

粉背黄栌 fen bei huang lu

Leaf blade ovate, glabrous, distinctly glaucous abaxially. Fl. May–Aug, fr. Oct–Nov.

• Hill and mountain thickets; 1600–2400 m. Gansu, Shaanxi, Sichuan, Yunnan.

The name *Cotinus coggygria* var. *laevis* (Wallich ex G. Don) Engler has been misapplied to this taxon.

**3. *Cotinus szechuanensis*** A. Pénzes, Acta Bot. Sin. 7(3): 169. 1958.

四川黄栌 si chuan huang lu

Shrubs, 2–5 m tall. Petiole slender, 1–3 cm, glabrous; leaf blade suborbicular or broadly ovate, 2–6 × 2–5 cm, papery, glabrous adaxially, abaxially with tufts of hair in axils of veins, base rounded, apex rounded, rarely slightly retuse or acute, lateral veins prominent. Inflorescence paniculate, terminal, with slender branches, glabrous. Pedicel 3–4 mm, longer and light

purple villous in sterile flowers. Calyx glabrous, lobes ovate-triangular, ca. 1 mm. Petals oblong-elliptic, ca. 1.5 mm, glabrous. Stamens shorter than petals; anthers ovoid. Disk annular. Ovary reniform, ca. 0.7 mm, glabrous, slightly compressed; styles 3,

lateral. Drupe reniform, ca. 4.5 × 3 mm, glabrous, rugose. Fl. May, fr. Oct.

• Hill thickets and grasslands; 800–1900 m. NW Sichuan (Lixian).

## 11. PISTACIA Linnaeus, Sp. Pl. 2: 1108. 1753.

黄连木属 huang lian mu shu

Trees or shrubs, dioecious. Leaves pari- or imparipinnate, rarely 3-foliolate or simple; leaflets entire. Inflorescence paniculate. Male flowers with reduced 1- or 2-parted perianth, or perianth lacking; stamens 3–5, rarely 7, filaments short, adnate to disk, anthers large, ovoid; pistillode small or absent. Female flowers with reduced 2–5-parted perianth; staminode absent; disk minute or absent; ovary superior, 1-locular and 1-ovulate, style short with 3 spreading stigmas. Drupe red at maturity, pointed; endocarp bony. Seed without endosperm.

About ten species: Mediterranean region to Afghanistan, E to SE Asia, Central and South America; two species (one endemic) in China.

In addition to the native species described below, *Pistacia vera* Linnaeus is cultivated in Xinjiang for its edible seeds (pistachio nuts).

- 1a. Deciduous trees, flowers produced before leafing; leaf imparipinnate; leaflets papery, lanceolate or ovate-lanceolate, with acuminate apex; male flowers without pistillode ..... 1. *P. chinensis*  
 1b. Evergreen shrubs to small trees; leaf paripinnate; leaflets leathery, oblong or obovate-oblong, with truncate or retuse apex; male flowers with pistillode ..... 2. *P. weinmannifolia*

### 1. *Pistacia chinensis* Bunge, Enum. Pl. China Bor. 15. 1833.

黄连木 huang lian mu

*Pistacia formosana* Matsumura; *P. philippinensis* Merrill & Rolfe; *Rhus argyi* H. Léveillé; *R. gummifera* H. Léveillé.

Deciduous trees, about 20 m tall; bark dark brown. Petioles minutely pubescent, flattened above; leaf blade imparipinnately compound with 1–13 opposite leaflets; leaf rachis striate, minutely pubescent; petiolule 1–2 mm; leaflet blade lanceolate to ovate-lanceolate, or rarely linear-lanceolate, 5–10 × 1.5–2.5 cm, papery, base oblique, margin entire, apex acuminate or long acuminate, on both sides minutely pubescent along midrib and lateral veins and with prominent venation. Flowers produced before leafing; male inflorescence 6–7 cm, with clustered branches, female inflorescence lax, 15–20 cm, rachis minutely pubescent; floral subtending bracts lanceolate, 1.5–2 mm, minutely pubescent. Pedicels ca. 1 mm, minutely pubescent. Male flowers with 2 lanceolate bracteoles and 2 linear-lanceolate tepals, ca. 1.5 mm; stamens 3–5, filaments less than 0.5 mm, anthers oblong, ca. 2 mm; pistillode absent. Female flowers with 2–4 linear-lanceolate bracteoles and 5 ovate or oblong tepals, 0.7–1.5 × 0.5–0.7 mm; ovary globose, ca. 0.5 mm in diam., glabrous, stigmas thick, red. Drupe obovate-globose, slightly compressed, ca. 5 mm in diam., longitudinally striate in dried condition. Fl. Mar–May, fr. Aug–Nov.

• Hill and mountain forests on rocky soils; 100–3600 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang.

The wood is used for production of furniture and yields a yellow dye.

### 2. *Pistacia weinmannifolia* J. Poisson ex Franchet, Bull. Soc. Bot. France 33: 467. 1886 [“*weinmannifolia*”].

清香木 qing xiang mu

*Pistacia coccinea* Collett & Hemsley.

Evergreen shrubs to small trees, 2–8 m tall. Petiole minutely pubescent; leaf blade paripinnately compound with 8–18 opposite leaflets; leaf rachis narrowly winged, grooved, gray, and minutely pubescent above; leaflet petiolule short; leaflet blade oblong or obovate-oblong, 1.3–3.5 × 0.8–1.5 cm or rarely larger, leathery, minutely pubescent on both sides along midrib, base oblique, broadly cuneate, margin entire and slightly revolute, apex rounded or usually mucronate, lateral veins impressed adaxially and prominent abaxially. Inflorescence axillary among leaves, mixed yellowish brown and red glandular pubescent; floral subtending bract ca. 1.5 mm, brown pubescent. Flowers sessile, purplish red. Male flowers with 2 or 3 oblong bracteoles, and 3–5 oblong-lanceolate membranous tepals, ca. 2 mm; stamens 5(–7), filaments short, anthers oblong with apiculate connective; pistillode reduced. Female flowers with 2–5 ovate-lanceolate bracteoles and 5 ovate-lanceolate membranous tepals, ca. 1.5 mm; ovary globose, ca. 0.7 mm in diam., glabrous, stigmas recurved. Drupe subglobose, 5–6 mm in diam. Fl. Mar–May, fr. Jun–Aug.

Hill and mountain forests on limestone, thickets; 500–2700 m. SW Guangxi, SW Guizhou, SW Sichuan, SE Xizang, Yunnan [N Myanmar].

Aromatic compounds extracted from the leaves are used for the manufacture of incense and candles. The resin is used for medicinal purposes.

## 12. RHUS Linnaeus, Sp. Pl. 1: 265. 1753.

盐麸木属 yan fu mu shu

Deciduous shrubs or trees, polygamous or dioecious. Leaves imparipinnately compound; leaf rachis sometimes winged; leaflets petiolate or sessile, with serrate or entire margin. Inflorescence terminal, paniculate or thyrsoid, floral subtending bracts persistent or deciduous. Flowers functionally unisexual or bisexual, 5-merous. Ovary 1-locular and 1-ovulate; styles 3, often united basally. Drupe

globose, slightly compressed, mixed glandular pubescent and pilose, red at maturity; exocarp and mesocarp united; mesocarp glutinous, red.

About 250 species: subtropical and warm temperate regions of the world; six species (four endemic) in China.

Species in this genus are the hosts of gall-producing insects such as aphids. The galls of *Rhus chinensis* (角倍 “jiao bei”) are particularly sought after for medicinal purposes. Other species in the genus also deliver galls (肚倍 “du bei”), but these are considered to be of an inferior quality.

- 1a. Leaflet margin dentate; male inflorescences more than 25 cm ..... 1. *R. chinensis*  
 1b. Leaflet margin entire or serrulate; inflorescences less than 20 cm.  
 2a. Rachis broadly winged.  
   3a. Leaflets ovate or oblong, with rounded apex, adaxially strigose, abaxially mixed hispid and minutely papillate ..... 2. *R. wilsonii*  
   3b. Leaflets lanceolate, with acute or retuse apex, adaxially sparsely glandular-papillate and minutely pubescent along midrib, abaxially glaucous, glandular-papillate along midrib ..... 3. *R. teniana*  
 2b. Rachis not winged or narrowly so distally.  
   4a. Leaflets 9–17, abaxially white tomentose ..... 4. *R. hypoleuca*  
   4b. Leaflets 7–13, abaxially usually minutely pubescent along midrib.  
     5a. Branchlets ± pubescent; leaflets sessile, ovate to oblong, base rounded or subcordate, apex usually long acuminate ..... 5. *R. punjabensis*  
     5b. Branchlets glabrous; leaflets petiolulate, oblong to lanceolate, base broadly cuneate to rounded, apex acuminate ..... 6. *R. potaninii*

**1. *Rhus chinensis*** Miller, Gard. Dict., ed. 8, *Rhus* no. 7. 1768.

盐麸木 *yan fu mu*

Shrubs to trees, 2–10 m tall; branchlets ferruginous pubescent, lenticellate. Leaf blade sessile, imparipinnately compound; rachis broadly winged to wingless, ferruginous pubescent; leaflets (5–)7–13; leaflet blade ovate to oblong, increasing in size toward apex, 6–12 × 3–7 cm, adaxially dark green, sparsely pubescent or glabrescent, abaxially lighter green, glaucous, and ferruginous pubescent, base rounded to cuneate in terminal leaflet, margin dentate, often crenate, apex acute, lateral veins and reticulate venation impressed adaxially and prominent abaxially. Inflorescence many branched, densely ferruginous pubescent, male ones 30–40 cm, female ones shorter. Pedicel ca. 1 mm, minutely pubescent; flowers white. Male flowers: calyx minutely pubescent, lobes long ovate, ca. 1 mm, with ciliate margins; petals obovate-oblong, ca. 2 mm; stamen filaments ca. 2 mm, anthers ovoid, ca. 0.7 mm; disk annular; ovary reduced to absent. Female flowers: calyx lobes ca. 0.6 mm; petals elliptic-ovate, ca. 1.6 mm; staminodes much reduced; disk annular; ovary ovoid, ca. 1 mm, densely white pubescent, styles 3, stigma capitate. Drupe globose, slightly compressed, 4–5 mm in diam., mixed pilose and glandular-pubescent, red at maturity. Fl. Aug–Sep, fr. Oct.

Lowland, hill, and mountain forests, forests along streams, thickets; 100–2800 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, Cambodia, India, Indonesia, Japan, Korea, Laos, Malaysia, Singapore, Thailand, Vietnam].

- 1a. Rachis winged ..... 1a. var. *chinensis*  
 1b. Rachis not winged ..... 1b. var. *roxburghii*

**1a. *Rhus chinensis* var. *chinensis***

盐麸木(原变种) *yan fu mu* (*yuan bian zhong*)

*Rhus osbeckii* Decaisne ex Steudel; *R. semialata* Murray; *R. semialata* var. *osbeckii* Candolle; *Schinus indicus* N. L. Burman.

Leaf rachis winged. Fl. Jun–Aug, fr. Sep–Nov.

Hill and mountain forests on southern slopes, forests along streams, thickets; 100–2700 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, Cambodia, India, Indonesia, Japan, Korea, Laos, Malaysia, Singapore, Thailand, Vietnam].

The name *Rhus javanica* Linnaeus has been misapplied to this taxon.

**1b. *Rhus chinensis* var. *roxburghii*** (Candolle) Rehder, J. Arnold Arbor. 20: 416. 1939.

滨盐麸木 *bin yan fu mu*

*Rhus semialata* var. *roxburghii* Candolle, Prodr. 2: 67. 1825; *R. javanica* Linnaeus var. *roxburghii* (Candolle) Rehder & E. H. Wilson; *R. roxburghii* Decaisne ex Steudel.

Leaf rachis not winged. Fl. Aug–Sep, fr. Oct–Dec.

• Lowland, hill, and mountain forests, thickets; 200–2800 m. Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan.

**2. *Rhus wilsonii*** Hemsley, Bull. Misc. Inform. Kew 1906: 155. 1906.

川麸杨 *chuan fu yang*

Shrubs, 1–4 m tall; branchlets at first grayish yellow pubescent, reddish brown. Petiole 1–2 cm, pubescent; leaf blade imparipinnately compound, 10–20 cm; rachis winged, 2–4 mm wide, pubescent; leaflets sessile, 11–19(–27); leaflet blade ovate or oblong, 2–6 × 0.8–2 cm, adaxially strigose, abaxially glaucous, mixed pilose and papillose, base oblique, cuneate to subrounded, margin entire or rarely sparsely serrate, apex rounded, mucronate, rarely acute or retuse, midrib and lateral veins impressed adaxially, midrib prominent abaxially. Inflorescence 3–10 cm; peduncle and rachis white pubescent; floral subtending bracts lanceolate, 1–3 mm. Pedicel 1–3 mm, pubescent; flowers

light yellow. Calyx glabrous or sparsely glandular-pubescent, lobes triangular-ovate, ca. 1 mm, with ciliate margins, apex rounded. Petals ovate-oblong, ca. 2 mm, apex rounded, venation featherlike, brown, white hairy adaxially. Stamines of female flowers ca. 1 mm, with ovoid anthers; disk 5-lobed; ovary tomentose; styles 3, glabrous. Drupe globose, ca. 4 mm in diam., mixed pubescent and glandular-pubescent, red at maturity. Fl. Apr–Jun, fr. Sep–Oct.

• Hill and mountain thickets on limestone; 300–1300(–2300) m. SW Sichuan, NE Yunnan.

**3. *Rhus teniana*** Handel-Mazzetti, Symb. Sin. 7: 637. 1933.

滇麸杨 dian fu yang

Shrubs, 1–3 m tall; branchlets minutely grayish white pubescent to almost glabrous, sparsely lenticellate. Leaf blade imparipinnately compound, 11–19 cm; rachis winged, 4–6 mm wide; leaflets sessile, ca. 15, alternate or subopposite; leaflet blade lanceolate, 2.5–6 × 0.8–1.6 cm, adaxially sparsely papillose and minutely pubescent along midrib, abaxially glaucous, yellowish brown punctulate to sparsely papillate and strigose along midrib, base oblique, broadly cuneate or subrounded, margin entire, apex acute or retuse, lateral veins 11–14 pairs. Inflorescence ca. 3 cm; rachis and branches minutely pubescent; floral subtending bracts lanceolate. Pedicels 1–2 mm; flowers yellowish white, tomentose. Calyx sparsely pubescent at base, lobes triangular-ovate, ca. 1 mm, with ciliate margins. Petals ovate-oblong, ca. 2 mm, apex rounded, strigose along midrib abaxially. Stamines of female flowers ca. 1 mm; disk 5-lobed; ovary white tomentose; styles 3. Drupe not seen. Fl. Apr–Jun, fr. Aug–Oct.

• Hill thickets; ca. 1900 m. N Yunnan (Dayao).

**4. *Rhus hypoleuca*** Champion ex Benth, Hooker's J. Bot. Kew Gard. Misc. 4: 43. 1852.

白背麸杨 bai bei fu yang

Shrubs or small trees; branchlets minutely grayish pubescent to glabrous, sparsely lenticellate. Petiole and rachis grayish tomentose, wingless; leaf blade imparipinnately compound, 20–30 cm; leaflets sessile, 9–17, opposite; leaflet blade ovate-lanceolate or lanceolate, 5–9.5 × 2–3.5 cm, adaxially gray tomentose along midrib, abaxially densely white tomentose, base oblique, margin entire to sparsely serrate, slightly revolute, apex acuminate, lateral veins ca. 11 pairs, midrib and lateral veins slightly impressed adaxially and prominent abaxially. Inflorescence to 20 cm, grayish yellow tomentose. Pedicel 1–2 mm, grayish yellow tomentose; flowers white. Calyx lobes ca. 0.5 mm, minutely pubescent, margins ciliate. Petals obovate-oblong, ca. 2 mm, margins ciliate, abaxially with white hairs along midrib. Male flowers with filament equal in length to anther. Disk annular. Female flowers with globose ovary, densely covered with white hairs. Drupe ca. 4 mm in diam., mixed pilose and red glandular-pubescent. Fl. Aug, fr. Sep–Oct.

• Hill forests; 800–1500 m. Fujian, Guangdong, S Hunan, Taiwan.

**5. *Rhus punjabensis*** J. L. Stewart ex Brandis, Forest Fl. N. W. India 120. 1874.

旁遮普麸杨 pang zhe pu fu yang

Trees or small trees, 5–15 m tall; branchlets pubescent to minutely pubescent. Leaf blade imparipinnately compound; rachis narrowly winged or wingless distally; leaflets sessile or subsessile, 7–13; leaflet blade oblong-ovate or oblong, 5–12 × 2–4.5 cm, both sides glabrous to minutely pubescent along midrib or lower side pubescent, base rounded or subcordate, margin entire, apex acuminate or long acuminate, lateral veins ca. 20 pairs, prominent abaxially. Inflorescence 15–20 cm, densely minutely pubescent; floral subtending bracts 1–2 mm, subulate, minutely pubescent. Pedicel ca. 1 mm; flowers white. Calyx minutely pubescent, lobes narrowly triangular, ca. 1 mm, margins ciliate. Petals oblong, ca. 2 × 1 mm, minutely pubescent on both sides, margins ciliate, revolute at anthesis. Stamen filaments ca. 2 mm in male flowers, minutely pubescent proximally; anthers ovate; staminode filaments ca. 1 mm in female flowers. Disk purplish red. Ovary globose, ca. 1 mm in diam., white pubescent; male flower with sterile ovary. Drupe subglobose, ca. 4 mm in diam., purplish red at maturity, mixed pilose and glandular-pubescent.

Hill and mountain forests; 400–3500 m. Gansu, Guizhou, W Hubei, W Hunan, S Shaanxi, Sichuan, S and SE Xizang, N Yunnan [N India, Kashmir].

*Rhus punjabensis* var. *punjabensis* is distributed in NW India.

- 1a. Branchlets, leaf rachis, leaf petiole, and lower side of leaflet midrib minutely pubescent ..... 5a. var. *sinica*  
 1b. Branchlets, leaf rachis, leaf petiole, and lower side of leaflet midrib densely pubescent ..... 5b. var. *pilosa*

**5a. *Rhus punjabensis* var. *sinica*** (Diels) Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 176. 1914.

红麸杨 hong fu yang

*Rhus sinica* Diels, Bot. Jahrb. Syst. 29: 432. 1900; *R. echinocarpa* H. Léveillé, p.p. as to *Cavalerie 2003*; *R. esquirolii* H. Léveillé; *R. mairei* H. Léveillé.

Branchlets, leaf rachis, leaf petiole, and lower side of leaflet midrib minutely pubescent; rachis narrowly winged distally. Fl. Jun–Jul, fr. Jul–Sep.

• Hill and mountain forests; 400–3000 m. S Gansu, Guizhou, W Hubei, W Hunan, S Shaanxi, Sichuan, SE Xizang, Yunnan.

**5b. *Rhus punjabensis* var. *pilosa*** Engler, Monogr. Phan. 4: 378. 1883.

毛麸杨 mao fu yang

Branchlets, leaf rachis, leaf petiole, and lower side of leaflet midrib densely pubescent; rachis narrowly winged distally. Fl. Jun–Jul, fr. Jul–Sep.

Hill and mountain forests; 2000–3500 m. W Sichuan, S and SE Xizang, NW Yunnan [N India, Kashmir].

**6. *Rhus potaninii*** Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 11: 110. 1889 [*“potanini”*].

青麸杨 qing fu yang

Deciduous trees, 5–8 m tall; branchlets glabrous. Petiole

minutely pubescent; leaf blade imparipinnately compound; rachis wingless; leaflets 7–11; leaflet petiolule short; leaflet blade oblong or oblong-lanceolate, 5–10 × 2–4 cm, both sides minutely pubescent or subglabrous, base oblique, subrounded, margin entire, apex acuminate. Inflorescence 10–20 cm, minutely pubescent. Calyx minutely pubescent, lobes ovate, ca. 1 mm, margins ciliate. Petals ovate or ovate-oblong, 1.5–2 × ca. 1 mm, minutely pubescent, margins ciliate, revolute at anthesis.

Stamen filaments ca. 2 mm in male flowers; anthers ovate; staminode filaments short in female flowers. Disk conspicuous. Ovary globose, ca. 0.7 mm in diam., densely white tomentose. Drupe subglobose, 3–4 mm in diam., densely mixed pilose and glandular-pubescent, red at maturity. Fl. May–Jul, fr. Jul–Oct.

• Hill and mountain forests, thickets; 900–2500 m. S Gansu, Henan, S Shaanxi, S Shanxi, Sichuan, NW Yunnan.

### 13. *TERMINTHIA* Bernhardt, Linnaea 12: 134. 1838.

三叶漆属 san ye qi shu

Shrubs or small trees, polygamous. Leaf blade 3(or 5)-foliolate; leaflet margin serrate or entire. Inflorescence terminal, paniculate; floral subtending bracts persistent. Flowers functionally unisexual or bisexual, 4- or 5-merous. Ovary 1-locular and 1-ovulate, compressed, glabrous. Drupe exocarp thinly membranous, glabrous, finally separating from mesocarp; mesocarp red, glutinous, united with endocarp.

One species: Bhutan, China, NE India, N Myanmar.

**1. *Terminthia paniculata*** (Wallich ex G. Don) C. Y. Wu & T. L. Ming, Fl. Yunnan. 2: 408. 1979.

三叶漆 san ye qi

*Rhus paniculata* Wallich ex G. Don, Gen. Syst. 2: 73. 1832;  
*Toxicodendron paniculatum* (Wallich ex G. Don) Kuntze.

Shrubs or small trees, 2–6 m tall; branchlets glabrous, lenticellate. Petioles 2.5–4 cm, glabrous, channeled above; leaf blade palmately 3-foliolate or rarely 5-foliolate; leaflets sessile; leaflet blade oblong or oblanceolate, lateral leaflets 3–7 × 1.5–3 cm, terminal leaflet 6–11 × 2–4 cm, papery, base broadly cuneate, entire or shallowly undulate, apex obtuse, lateral veins

prominent on both sides. Inflorescence paniculate, terminal or axillary, 12–20 cm, with many slender branches, yellow hirsute. Pedicel ca. 1 mm, minutely pubescent; flowers light yellow, 4- or 5-merous. Calyx glabrous, lobes obtuse, ovate, ca. 0.5 mm. Petals elliptic, ca. 1.5 × 0.8 mm, with featherlike venation pattern. Stamen filaments ca. 0.5 mm; anthers ovoid, ca. 0.3 mm. Disk 10-lobed. Ovary globose, 0.5–0.8 mm in diam., glabrous; styles 3, free; stigma capitate. Drupe subglobose, slightly compressed, ca. 4 mm in diam.; exocarp orange-red at maturity, finally separating; mesocarp glutinous. Fl. Sep–Nov, fr. Nov–May.

Forest patches, thickets, herbaceous steppes; 400–1500 m. SE to SW Yunnan [Bhutan, NE India, N Myanmar].

### 14. *TOXICODENDRON* Miller, Gard. Dict. Abr., ed. 4. 1754.

漆树属 qi shu shu

Deciduous shrubs or trees, rarely a woody climber, with white latex in phloem, turning black upon air exposure, polygamous or dioecious. Leaves imparipinnately compound, 3-foliolate or simple. Inflorescence axillary, paniculate or racemose, often pendulous at fructification; floral subtending bracts deciduous. Flowers functionally unisexual or bisexual, 5-merous. Ovary 1-locular and 1-ovulate; styles 3, often united basally. Drupe subglobose or oblique, glabrous or minutely pubescent to hirsute, never glandular pubescent; exocarp thin, yellow, dehiscent or indehiscent at maturity; mesocarp white waxy, with brown longitudinal resin ducts.

About 20 species: disjunctly distributed in E Asia and North America; 16 species (six endemic) in China.

The hardened resin produced in the phloem of *Toxicodendron succedaneum* (Japanese lacquer tree) and *T. vernicifluum* (varnish tree) is used for decoration of traditional handicrafts. The resinous effluvia are poisonous and may cause severe dermatitis in sensitized persons.

- 1a. Woody climbers; leaf blade 3-foliolate; stamens equal to petals in length ..... 1. *T. radicans*  
1b. Trees or shrubs; leaf blade imparipinnately compound; stamens exserted.  
2a. Branchlets, petiole, and leaf rachis robust; infructescence erect; drupe minutely pubescent, fruit epicarp irregularly dehiscent at maturity.  
3a. Leaflets glabrous or minutely pubescent abaxially along midnerve ..... 2. *T. griffithii*  
3b. Leaflets ferruginous tomentose.  
4a. Petiole, leaf rachis, and inflorescence glabrous ..... 3. *T. hookeri*  
4b. Petiole, leaf rachis, and inflorescence ferruginous pubescent.  
5a. Leaflets oblong, veinlets slightly impressed adaxially; inflorescence peduncle ca. 20 cm ..... 4. *T. fulvum*  
5b. Leaflets ovate to oblong-elliptic, veinlets slightly prominent adaxially; inflorescence peduncle 3–9 cm ..... 5. *T. wallichii*  
2b. Branchlets, petiole, and leaf rachis slender; infructescence pendulous; drupe glabrous or rarely bristly, fruit epicarp indehiscent at maturity.

- 6a. Branchlets, leaf rachis, and petiolules pubescent, hirsute, or tomentose; inflorescence pubescent.
- 7a. Inflorescence half as long as pinnately compound leaf.
- 8a. Branchlets, leaf rachis, and inflorescence densely covered with straight hairs; leaflet margin ciliate; drupe bristly, wider than long ..... 6. *T. trichocarpum*
- 8b. Branchlets, leaf rachis, and inflorescence covered with curved or curled hairs; leaflet margin glabrous; drupe glabrous, longer than wide ..... 7. *T. sylvestre*
- 7b. Inflorescence equal to or longer than pinnately compound leaf.
- 9a. Leaflets pubescent abaxially along midrib, margin glabrous, petiolule 4–7 mm; drupe subsymmetrical ..... 8. *T. vernicifluum*
- 9b. Leaflets hirsute or pubescent on both surfaces, margin ciliate, petiolule sessile to 2 mm; drupe oblique.
- 10a. Plants covered with erect hairs; leaflets 5–7, with acute apex, leaflet margin entire or rarely serrate toward apex ..... 9. *T. hirtellum*
- 10b. Plants covered with appressed hairs; leaflets 7–11, with long acuminate to caudate-acuminate apex, leaflet margin crenate ..... 10. *T. yunnanense*
- 6b. Branchlets, leaf rachis, and petiolules glabrous; inflorescence glabrous or rarely minutely pubescent.
- 11a. Inflorescence minutely pubescent; drupe symmetrical ..... 11. *T. acuminatum*
- 11b. Inflorescence glabrous; drupe oblique to symmetrical.
- 12a. Shrubs less than 1.5 m tall; inflorescence racemose ..... 12. *T. delavayi*
- 12b. Trees or small trees; inflorescence paniculate.
- 13a. Inflorescence half as long as pinnately compound leaf; petals not with featherlike venation pattern.
- 14a. Leaflet ovate to ovate-oblong, apex long acuminate to caudate; drupe oblique, compressed, acute apically ..... 13. *T. succedaneum*
- 14b. Leaflet oblong-ovate to oblong-lanceolate, apex acuminate; drupe symmetrical to subsymmetrical, not compressed, long beaked ..... 14. *T. rostratum*
- 13b. Inflorescence equal to pinnately compound leaf in length; petals with featherlike venation pattern.
- 15a. Leaflet obovate-elliptic to obovate-oblong, apex acute or acuminate, without apiculum; flower 3–4 mm in diam. .... 15. *T. grandiflorum*
- 15b. Leaflets falcate-lanceolate, apex acuminate, with apiculum; flower less than 2 mm in diam. .... 16. *T. calcicola*

**1. *Toxicodendron radicans*** (Linnaeus) Kuntze subsp. **hispidum** (Engler) Gillis, *Rhodora* 73: 213. 1971.

刺果毒漆藤 ci guo du qi teng

*Rhus toxicodendron* Linnaeus var. *hispida* Engler, Bot. Jahrb. Syst. 29: 433. 1900; *R. intermedia* Hayata.

Woody climbers; branchlets brown, striate, at first ferruginous pubescent. Petiole 5–10 cm, yellow pubescent, channeled above; leaf blade 3-foliolate; lateral leaflets sessile to subsessile, blade oblong to ovate-elliptic, 6–13 × 3–7.5 cm, base oblique, rounded, margin entire, terminal leaflet with pubescent 0.5–2 mm petiolule, blade obovate-elliptic to obovate-oblong, 8–15 × 4–8.5 cm, base attenuate, apex acute or shortly acuminate; leaflet blades glabrous adaxially, pubescent along midrib and lateral veins abaxially, with reddish brown tufts of hair in axils of lateral veins. Inflorescence paniculate, ca. 5 cm, with yellowish brown hairs; floral subtending bracts ca. 2 mm, pubescent. Pedicel ca. 2 mm, hairy; flowers yellowish green. Calyx glabrous, lobes ovate, ca. 1 mm. Petals oblong, ca. 3 mm, revolute at anthesis, with inconspicuous brown featherlike venation pattern. Stamens equal to petals in length; filaments linear, ca. 2 mm; anthers oblong, ca. 1 mm. Disk glabrous. Ovary globose, ca. 0.5 mm in diam. Drupe oblique-ovoid, ca. 5 × 6 mm, yellow at maturity, with ca. 1 mm bristles; mesocarp thick, waxy. Fl. May, fr. Jun–Aug.

• Hill forests; (600–)1600–2200 m. Guizhou, Hubei, Hunan, Sichuan, Taiwan, Yunnan.

The name *Rhus orientalis* (Greene) C. K. Schneider (*Toxicodendron orientale* Greene) has been misapplied to this taxon.

The remaining numerous subspecies and varieties of *Toxicodendron radicans* are distributed in North America.

**2. *Toxicodendron griffithii*** (J. D. Hooker) Kuntze, Revis. Gen. Pl. 153. 1891.

裂果漆 lie guo qi

Small trees; branchlets glabrous or subglabrous, lenticellate. Petiole 5.5–9 cm, petiole and rachis glabrous; leaf blade imparipinnately compound; leaflet petiolule 2–3 mm, minutely pubescent to glabrous; leaflets 7–11, opposite; leaflet blade oblong or ovate-oblong, 9–25 × 4–8 cm, coriaceous, adaxially glabrous, turning dark brown when dried, abaxially ferruginous, glabrous to minutely pubescent along veins, sometimes with tufts of hair in axils of veins, base rounded to subcordate, margin entire, lateral veins 15–20 pairs, reticulate venation prominent abaxially. Inflorescence paniculate, 13–22 cm, minutely pubescent; peduncle 5–6 cm, minutely pubescent, striate and lenticellate. Calyx minutely pubescent to subglabrous, lobes broadly ovate. Petals linear-oblong. Disk conspicuous. Ovary globose, densely pubescent. Drupe subglobose, (4–5 or)8–10 mm in diam., light yellow, minutely pubescent; epicarp irregularly dehiscent at maturity; mesocarp thick, waxy, with brown longitudinal resin ducts; endocarp compressed, ca. 3 × 5 mm.

Hill and mountain forests and thickets; 1400–2500 m. SW Guizhou, Yunnan [India (Darjeeling)].

- 1a. Inflorescence 20–22 cm; drupe 4–5 mm in diam. .... 2b. var. *microcarpum*  
 1b. Inflorescence 13–15 cm; drupe 8–10 mm in diam.  
 2a. Leaflets 7–11, oblong or oblong-ovate, abaxially glabrous or minutely pubescent along veins ..... 2a. var. *griffithii*  
 2b. Leaflets 7–9, oblong or elliptic-oblong, abaxially with tufts of hair in axils of veins ..... 2c. var. *barbatum*

**2a. Toxicodendron griffithii** var. **griffithii**

裂果漆(原变种) lie guo qi (yuan bian zhong)

*Rhus griffithii* J. D. Hooker.

Leaflets 7–11, oblong to oblong-ovate, abaxially glabrous or minutely pubescent along veins. Inflorescence 13–15 cm. Drupe 8–10 mm in diam. Fl. May–Jun, fr. Sep–Nov.

Hill and mountain thickets; 1900–2300 m. SW Guizhou (Anlong), Yunnan (Kunming, Shizong) [India (Darjeeling)].

**2b. Toxicodendron griffithii** var. **microcarpum** C. Y. Wu & T. L. Ming, Fl. Yunnan. 2: 397. 1979.

小果裂果漆 xiao guo lie guo qi

Inflorescence 20–22 cm. Drupe 4–5 mm in diam. Fl. May–Jun, fr. Sep–Oct.

- Evergreen hill forests; 1400–1800 m. SE Yunnan (Wenshan).

**2c. Toxicodendron griffithii** var. **barbatum** C. Y. Wu & T. L. Ming, Fl. Yunnan. 2: 397. 1979.

镇康裂果漆 zhen kang lie guo qi

Leaflets 7–9, oblong to elliptic-oblong, abaxially with tufts of hair in axils of veins. Inflorescence 13–15 cm. Drupe 8–10 mm in diam. Fl. Jun, fr. Oct.

- Hill and mountain forests; 2400–2500 m. SW Yunnan (Zhenkang).

**3. Toxicodendron hookeri** (Sahni & Bahadur) C. Y. Wu & T. L. Ming var. **microcarpum** (C. C. Huang ex T. L. Ming) C. Y. Wu & T. L. Ming, Fl. Reipubl. Popularis Sin. 45(1): 110. 1980.

小果大叶漆 xiao guo da ye qi

*Toxicodendron insigne* (J. D. Hooker) Kuntze var. *microcarpum* C. C. Huang ex T. L. Ming, Fl. Yunnan. 2: 395. 1979.

Trees or small trees, 6–8 m tall; branchlets ferruginous tomentose, later grayish brown, glabrous, lenticellate. Petiole 10–14 cm, glabrous or subglabrous, lenticellate; leaf blade imparipinnately compound; leaflets 7–9, opposite; leaflet petiolule 3–5 mm, ferruginous tomentose; leaflet blade elliptic or oblong, 14–23 × 6–9 cm, coriaceous, adaxially glabrous, abaxially ferruginous tomentose, base rounded or truncate, margin entire, apex acute or acuminate, lateral veins 20–35 pairs, veinlets prominent abaxially. Inflorescence paniculate, 20–35 cm, gla-

brous to sparsely pubescent; peduncle 6–10 cm, striate and lenticellate; floral subtending bracts ca. 1 mm, glabrous. Pedicel ca. 1 mm, ferruginous pubescent. Calyx glabrous, lobes broadly ovate, ca. 0.5 mm, with obtuse apex. Petals oblong, ca. 2 mm, glabrous, with brown featherlike venation pattern. Stamens equal to petals in length; filaments subulate, ca. 1 mm; anthers oblong, ca. 0.75 mm. Disk 5-lobed. Ovary globose, ca. 0.5 mm in diam., pubescent. Drupe globose, 4–5 mm in diam., yellow and lucid at maturity, minutely pubescent; epicarp thin, irregularly dehiscent; mesocarp thick, waxy, with brown longitudinal resin ducts; endocarp slightly compressed, 2.5–3 × 3.5–4 mm. Fl. Jul, fr. Aug–Sep.

- Hill and mountain forests; 1200–2600 m. SE Xizang (Médog), NW Yunnan (Gongshan).

*Toxicodendron hookeri* var. *hookeri* is distributed in NE India.

**4. Toxicodendron fulvum** (Craib) C. Y. Wu & T. L. Ming, Fl. Yunnan. 2: 394. 1979.

黄毛漆 huang mao qi

*Rhus fulva* Craib, Kew Bull. 361. 1926.

Trees, ca. 10 m tall; branchlets yellow tomentose. Petiole and rachis ferruginous tomentose; leaf blade imparipinnately compound, 30–70 cm; leaflets 9–13, opposite; leaflet blade oblong, 8–14 × 3.5–4 cm, coriaceous, adaxially minutely pubescent or subglabrous along midrib, abaxially ferruginous tomentose, base oblique, rounded to truncate, margin entire or rarely obscurely serrulate distally, apex acuminate or acute, lateral veins ca. 25 pairs, prominent abaxially, veinlets slightly impressed adaxially and prominent abaxially. Inflorescence paniculate, 20–33 cm; peduncle robust, 8–20 cm, peduncle and rachis ferruginous tomentose; floral subtending bracts to 1.7 mm, caducous. Flowers sessile to subsessile. Calyx lobes oblong to broadly ovate, ca. 0.5 mm, sparsely pubescent or subglabrous. Petals oblong, slightly longer than calyx. Drupe subglobose, 5–6 mm in diam.; epicarp thin, yellow, lucid, minutely pubescent, irregularly dehiscent at maturity; mesocarp thick, waxy, with brown longitudinal resin ducts. Fl. May–Jun, fr. Aug–Oct.

Hill forests on limestone; ca. 1000 m. S Yunnan (Mengla, Menglian) [N Thailand].

**5. Toxicodendron wallichii** (J. D. Hooker) Kuntze, Revis. Gen. Pl. 154. 1891.

绒毛漆 rong mao qi

Trees, 5–7 m tall, rarely more; branchlets ferruginous tomentose, lenticellate. Petiole and rachis ferruginous tomentose; leaf blade imparipinnately compound to 30 cm; leaflets 7–11, opposite; leaflet petiolule 1–3 mm, tomentose; leaflet blade ovate-elliptic to oblong-elliptic, 10–13 × 5–7 cm, coriaceous, adaxially minutely pubescent, sometimes only along midrib, abaxially ferruginous tomentose, base rounded to subcordate, margin entire, apex acuminate, lateral veins 20–25 pairs, veinlets prominent abaxially. Inflorescence paniculate, 12–15 cm, less than half as long as pinnately compound leaf; peduncle and rachis ferruginous tomentose, lenticellate. Flowers light yellow, sessile to subsessile. Calyx lobes ca. 0.7 mm, glabrous. Petals oblong, ca. 2 mm. Stamens equal to petals in length. Disk

5-lobed. Ovary globose, ferruginous pubescent. Infructescence erect; drupe globose, minutely pubescent; epicarp thin, irregularly dehiscent at maturity; mesocarp thick, waxy, with brown longitudinal resin canal.

Lowland, hill, and mountain forests; 700–2400 m. SW Guangxi, S Xizang, SE and W Yunnan [N India, Nepal].

1a. Drupe 8–10 mm in diam. .... 5a. var. *wallichii*  
1b. Drupe small, less than 5 mm in diam.

..... 5b. var. *microcarpum*

### 5a. *Toxicodendron wallichii* var. *wallichii*

绒毛漆(原变种) rong mao qi (yuan bian zhong)

*Rhus wallichii* J. D. Hooker, Fl. Brit. India 2: 11. 1876, based on *R. juglandifolia* Wallich ex D. Don, Prodr. Fl. Nepal. 248. 1825, not Willdenow ex Schultes (1820); *R. vernicifera* Candolle, p.p.

Drupe 8–10 mm in diam. Fl. Apr, fr. Aug–Oct.

Hill and mountain forests; 1800–2400 m. S Xizang (Gyirong) [N India, Nepal].

5b. *Toxicodendron wallichii* var. *microcarpum* C. C. Huang ex T. L. Ming, Fl. Yunnan. 2: 394. 1979.

小果绒毛漆 xiao guo rong mao qi

Drupe less than 5 mm in diam. Fl. Apr, fr. Jun–Oct.

• Lowland, hill, and mountain forests; 700–2400 m. SW Guangxi, SE Xizang, SE and W Yunnan.

6. *Toxicodendron trichocarpum* (Miquel) Kuntze, Revis. Gen. Pl. 154. 1891.

毛漆树 mao qi shu

*Rhus trichocarpa* Miquel, Ann. Mus. Bot. Lugduno-Batavi 2: 84. 1866; *R. echinocarpa* H. Léveillé, p.p. excluding *Cavalerie* 2003.

Deciduous trees or shrubs; young branchlets yellowish brown pubescent, later gray, brown lenticellate; buds yellow tomentose. Petiole 5–7 cm, yellowish brown pubescent, inflated at base; rachis terete or rarely narrowly winged distally; leaf blade imparipinnately compound, 20–40 cm; leaflets 9–15, sessile or subsessile; leaflet blade ovate or ovate-oblong or elliptic, gradually increasing in size toward apex, 7–10 × 2.5–4.5 cm, papery, adaxially sparsely appressed pubescent or subglabrous to minutely pubescent along midrib, abaxially densely yellow pubescent to sparsely pubescent, base oblique, rounded to truncate, margin entire or rarely undulate-serrate, ciliate, apex acuminate and obtuse, lateral veins prominent abaxially. Inflorescence paniculate, 10–20 cm, densely yellowish brown pubescent, with racemose 1.5–3 cm first order branches; floral subtending bracts ca. 1 mm. Pedicel ca. 1.5 mm, pubescent; flowers yellowish green. Calyx glabrous, lobes narrowly triangular, ca. 0.8 mm, obtuse apically. Petals obovate-oblong, ca. 2 mm, revolute at anthesis. Filaments ca. 1.5 mm; anthers ovoid, ca. 0.8 mm. Disk 5-lobed. Ovary globose, minutely setaceous. Drupe oblate, 5–6 × 7–8 mm, yellow and lucid, minutely setaceous; epicarp thin, separating; mesocarp thick, waxy, with brown longitudinal resin ducts; endocarp 4–5 × ca. 6 mm. Fl. Jun, fr. Jul–Sep.

Hill and mountain forests, thickets; 900–2000 m. Anhui, Fujian, Guizhou, Hubei, Hunan, Jiangxi, Zhejiang [Japan, Korea].

7. *Toxicodendron sylvestre* (Siebold & Zuccarini) Kuntze, Revis. Gen. Pl. 154. 1891 [“*silvestre*”].

木蜡树 mu la shu

*Rhus sylvestris* Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(2): 140. 1845.

Trees or small trees, to 10 m tall; young branchlets and terminal buds yellowish brown tomentose. Petiole 4–8 cm, petiole and rachis densely yellow tomentose; leaf blade imparipinnately compound, 18–30 cm; leaflets 7–15, opposite; leaflet petiolule sessile to short; leaflet blade ovate to ovate-elliptic or oblong, 4–10 × 2–4 cm, papery, adaxially appressed pubescent to minutely pubescent along midrib, abaxially densely pubescent, base oblique, rounded or broadly cuneate, margin entire, apex acuminate or acute, lateral veins 15–25 pairs, prominent on both surfaces, veinlets prominent abaxially. Inflorescence paniculate, 8–15 cm, densely ferruginous tomentose; peduncle 1.5–3 cm. Pedicel ca. 1.5 mm, minutely pubescent; flowers yellow. Calyx glabrous, lobes ovate, ca. 0.8 mm, obtuse apically. Petals oblong, ca. 1.6 mm, with brown featherlike venation pattern. Stamens exserted; filaments linear, ca. 1.5 mm; anthers ovoid, ca. 0.5 mm; stamens shorter in female flowers and with subulate filaments. Disk 5-lobed. Ovary globose, ca. 1 mm in diam., glabrous. Drupe oblique, compressed, ca. 8 × 6–7 mm, apex eccentric, glabrous and lucid; epicarp thin, separating; mesocarp thick, waxy, with brown longitudinal resin canal. Fl. Apr–May, fr. Jun–Oct.

Lowland, hill, and mountain forests; 100–800(–2300) m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, NW Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea].

8. *Toxicodendron vernicifluum* (Stokes) F. A. Barkley, Amer. Midl. Naturalist 24: 680. 1940.

漆树 qi shu

*Rhus verniciflua* Stokes, Bot. Mat. Med. 2: 164. 1812; *R. succedanea* Linnaeus var. *himalaica* J. D. Hooker; *R. succedanea* var. *silvestrii* Pampanini; *R. vernicifera* Candolle, p.p.; *Toxicodendron verniciferum* (Candolle) F. A. Barkley; *T. vernicifluum* var. *shaanxiense* J. Z. Zhang & Z. Y. Shang.

Deciduous trees to 20 m tall; branchlets yellowish brown pubescent. Petiole 7–14 cm, inflated at base, petiole and rachis minutely pubescent; leaf blade imparipinnately compound, 15–30 cm; leaflets 9–13, opposite; leaflet petiolule 4–7 mm, pubescent; leaflet blade ovate to ovate-elliptic or oblong, 6–13 × 3–6 cm, membranous to papery, adaxially glabrous or minutely pubescent along midrib, abaxially yellow pubescent, base oblique, rounded or broadly cuneate, margin entire, apex acute or acuminate, lateral veins 10–15 pairs, prominent on both surfaces. Inflorescence paniculate, 15–30 cm, grayish yellow minutely pubescent, with slender branches. Pedicel 1–3 mm, shorter and more robust in female flowers. Calyx lobes ovate, ca. 0.8 mm, apically obtuse, glabrous. Petals yellowish green, oblong, ca. 2.5 × 1.2 mm, with brown featherlike venation pattern. Stamens ca. 2.5 mm; filaments equal to anthers in length, shorter

in female flower; anthers oblong. Disk 5-lobed. Ovary globose, glabrous; styles 3. Infructescence pendulous; drupe symmetrical, 5–6 × 7–8 mm, glabrous; epicarp thin, indehiscent; mesocarp thick, waxy, with brown longitudinal resin ducts; endocarp ca. 3 × 5 mm. Fl. May–Jun, fr. Jul–Oct.

Hill and mountain forests; 800–2800 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang [India, Japan, Korea].

This species is a main source of varnish used in the manufacture of lacquer-ware.

**9. *Toxicodendron hirtellum*** C. Y. Wu ex T. L. Ming, Fl. Reipubl. Popularis Sin. 45(1): 139. 1980.

硬毛漆 ying mao qi

Shrubs, ca. 1.2 m tall; young branchlets pubescent. Petiole and rachis pubescent; leaf blade imparipinnately compound, 6–8 cm; leaflet petiolule to ca. 1 mm; leaflets 5–7, opposite; leaflet blade ovate to ovate-oblong, 1.5–3.5 × 1–1.5 cm, papery, both surfaces sparsely yellow pubescent to densely hairy along midrib, base oblique, rounded or broadly cuneate, margin entire or undulate and serrate distally, ciliate, apex acute. Inflorescence racemose to 7 cm at fructification, densely yellow pubescent. Flowers not seen. Fruit stalk ca. 2 mm; persistent calyx glabrous, lobes ovate-triangular, ca. 0.7 mm; drupe obliquely ovate, asymmetrical, ca. 6 × 7 mm, apex eccentric, glabrous, lucid. Fl. May–Jun, fr. Aug–Oct.

- Hill forests on limestone; ca. 1400 m. S Sichuan (Huili).

**10. *Toxicodendron yunnanense*** C. Y. Wu, Fl. Yunnan. 2: 401. 1979.

云南漆 yun nan qi

Shrubs, ca. 1.5 m tall; young branchlets reddish brown and yellow pubescent, buds densely yellow hairy. Petiole 3–8.5 cm, petiole and rachis yellow pubescent, rachis very narrowly winged distally; leaf blade imparipinnately compound, 8–23 cm; leaflets 7–11(–21), opposite; leaflet petiolule very short to subsessile; leaflet blade ovate-lanceolate, elliptic-lanceolate, or narrowly lanceolate, gradually increasing in size toward apex, 3.5–8.5 × 1.2–3.8 cm, terminal leaflet up to 10.5 cm, papery, both surfaces yellow pubescent to densely hairy along midrib, base oblique, broadly cuneate to rounded, margin undulate-crenate, ciliate, apex long acuminate or caudate-acuminate, lateral veins prominent on both surfaces. Inflorescence racemose, 3–9.5 cm, yellow pubescent; peduncle slender; floral subtending bracts lanceolate, pubescent. Pedicel ca. 2 mm, yellow pubescent; flowers white. Calyx glabrous, lobes ovate, ca. 0.7 mm, obtuse apically. Petals oblong, ca. 2 mm, obtuse apically, glabrous, with brown featherlike venation pattern. Stamens shorter than petals; filaments ca. 0.5 mm; anthers oblong, ca. 1.2 mm. Disk 5-lobed. Ovary globose, ca. 0.5 mm wide. Young drupe obliquely ovate, compressed, 4–5 × 5–6 mm, glabrous, lucid.

- Hill and mountain forests and thickets; 400–2200 m. SW Sichuan, Yunnan.

1a. Leaflets 7–9, leaflet blade ovate-lanceolate

to elliptic-lanceolate, margin undulate-crenate; inflorescence 3–9.5 cm ..... 10a. var. *yunnanense*

1b. Leaflets (7–)11–21, leaflet blade narrowly lanceolate, margin entire; inflorescence to 21 cm ..... 10b. var. *longipaniculatum*

**10a. *Toxicodendron yunnanense* var. *yunnanense***

云南漆(原变种) yun nan qi (yuan bian zhong)

Leaflets 7–9, leaflet blade ovate-lanceolate to elliptic-lanceolate, margin undulate-crenate. Inflorescence 3–9.5 cm. Fl. May, fr. Jul–Sep.

- Hill and mountain forests; 1600–2200 m. Yunnan (Eshan, Fumin, Shuangbai, Songming).

**10b. *Toxicodendron yunnanense* var. *longipaniculatum*** C. Y. Wu & T. L. Ming, Fl. Reipubl. Popularis Sin. 45(1): 140. 1980.

长序云南漆 chang xu yun nan qi

Leaflets (7–)11–21, leaflet blade narrowly lanceolate, margin entire. Inflorescence to 21 cm. Fl. Apr–May.

- Hill and mountain thickets; 400–2200 m. SW Sichuan (Leibo), Yunnan (Kunming).

**11. *Toxicodendron acuminatum*** (Candolle) C. Y. Wu & T. L. Ming, Fl. Reipubl. Popularis Sin. 45(1): 119. 1980.

尖叶漆 jian ye qi

*Rhus acuminata* Candolle, Prodr. 2: 68. 1825; *R. succedanea* Linnaeus var. *acuminata* (Candolle) J. D. Hooker; *Toxicodendron caudatum* C. C. Huang ex T. L. Ming; *T. succedaneum* (Linnaeus) Kuntze var. *acuminatum* (Candolle) C. Y. Wu & T. L. Ming.

Small trees, 4–7.5 m tall; branchlets grayish brown, lenticellate, buds brown, glabrous or subglabrous. Petiole 5–10 cm, petiole and rachis slender; leaf blade imparipinnately compound, 16–28 cm; leaflets 5–9, opposite; leaflet petiolules 3–5 mm; leaflet blade elliptic or oblong, gradually increasing in size toward apex, 5–11 × 2–5 cm, papery, glabrous on both surfaces, glaucous abaxially, base rounded or broadly cuneate, margin entire, apex long caudate, lateral veins 15–25 pairs, subparallel. Inflorescence paniculate to 12 cm; rachis and first order branches slender, minutely pubescent. Pedicel 1.5–2 mm, minutely pubescent; flowers yellowish green. Calyx minutely pubescent, lobes ovate, ca. 1 mm, obtuse apically. Petals oblong, 2.5–3 × ca. 1 mm, revolute at anthesis. Stamens ca. 2 mm; filaments equal to anthers in length. Disk 5-lobed. Ovary ovoid, glabrous. Drupe oblate, symmetrical, 4–5 × 5–6 mm, glabrous, slightly lucid. Fl. May–Jul, fr. Aug–Oct.

Hill and mountain forests; 1600–2600 m. S Xizang, SW Yunnan (Zhenkang) [Bhutan, N India, Kashmir, Nepal].

**12. *Toxicodendron delavayi*** (Franchet) F. A. Barkley, Amer. Midl. Naturalist 24: 680. 1940.

小漆树 xiao qi shu

Shrubs, 0.5–2 m tall; branchlets purplish red, often glaucous, glabrous; buds glabrous or minutely pubescent. Petiole

3.5–5 cm; leaf blade imparipinnately compound, to 13 cm; leaflets 5–11, opposite; leaflet petiolule 1–2 mm; leaflet blade ovate-lanceolate to linear-lanceolate, 3.5–9 × 0.5–2.5 cm, papery, sparsely pubescent when newly formed to eventually glabrous on both surfaces, base ± oblique, broadly cuneate or rounded, margin entire to sparsely serrate distally, apex acute to acuminate, lateral veins 12–16 pairs, prominent on both surfaces. Inflorescence racemose, 6–8.5 cm, glabrous; peduncle slender, 4–5 cm; floral subtending bracts lanceolate, ca. 1 mm. Pedicel ca. 1 mm; flowers light yellow, ca. 2 mm in diam. Calyx glabrous, lobes triangular, ca. 0.8 mm, obtuse apically. Petals oblong, ca. 2 mm, with brown featherlike venation pattern. Stamens ca. 1.5 mm; filaments linear, equal to anthers in length; anthers oblong. Disk 10-lobed. Ovary ovoid, ca. 1 mm in diam., glabrous. Drupe oblique, slightly compressed, ca. 6 mm in diam., glabrous, lucid.

• Hill and mountain forests, thickets; 1100–2500 m. SW Sichuan, C and N Yunnan.

- 1a. Leaflets 9–11 or more; buds and newly formed leaflets sparsely pubescent ..... 12c. var. *quinquejugum*  
 1b. Leaflets 5–9; buds and leaflets glabrous.  
 2a. Leaflets ovate-lanceolate to lanceolate, 3.5–5.5 × 1.2–2.5 cm, base slightly oblique ..... 12a. var. *delavayi*  
 2b. Leaflets narrowly lanceolate to linear-lanceolate, 4–9 × 0.5–1.5 cm, base conspicuously oblique ..... 12b. var. *angustifolium*

### 12a. *Toxicodendron delavayi* var. *delavayi*

小漆树(原变种) xiao qi shu (yuan bian zhong)

*Rhus delavayi* Franchet, Bull. Soc. Bot. France 33: 466. 1886.

Buds and leaflets glabrous; leaflets 5–9, ovate-lanceolate to lanceolate, 3.5–5.5 × 1.2–2.5 cm, base slightly oblique. Fl. May–Jun, fr. Sep–Oct.

• Hill and mountain forests, thickets; 1100–2500 m. SW Sichuan, C and NW Yunnan.

12b. *Toxicodendron delavayi* var. *angustifolium* C. Y. Wu, Fl. Yunnan. 2: 407. 1979.

狭叶小漆树 xia ye xiao qi shu

Buds and leaflets glabrous; leaflets 5–9, narrowly lanceolate to linear-lanceolate, 4–9 × 0.5–1.5 cm, base conspicuously oblique. Fr. Jul.

• Hill and mountain forests, thickets; 1100–2500 m. SW Sichuan (Jinyang), N Yunnan (Yongshan, Wuding).

12c. *Toxicodendron delavayi* var. *quinquejugum* (Rehder & E. H. Wilson) C. Y. Wu & T. L. Ming, Fl. Reipubl. Popularis Sin. 45(1): 124. 1980.

多叶小漆树 duo ye xiao qi shu

*Rhus delavayi* var. *quinquejuga* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 184. 1914.

Buds pubescent; leaflets 9–11 or more, pubescent when newly formed, base conspicuously oblique. Fl. May–Jul, fr. Aug–Oct.

• Hill and mountain forests, thickets; 1900–2400 m. SW Sichuan, C and NW Yunnan.

13. *Toxicodendron succedaneum* (Linnaeus) Kuntze, Revis. Gen. Pl. 154. 1891.

野漆 ye qi

Trees or shrubs, 1–2(–10) m tall; branchlets glabrous to pubescent, terminal buds glabrous to tomentose. Petiole 6–9 cm, glabrous or pubescent; rachis terete or narrowly winged distally, glabrous to pubescent; leaf blade imparipinnately compound, 20–35 cm; leaflets 5–15, opposite or subopposite; leaflet petiolule indistinct or 2–5 mm; leaflet blade oblong-elliptic to ovate-lanceolate, 3–16 × 0.9–5.5 cm, papery or thinly leathery, glabrous to sparsely pubescent on both surfaces, glaucous abaxially, base oblique, rounded or broadly cuneate, margin entire, apex acuminate to caudate-acuminate, lateral veins 15–22 pairs, slightly prominent on both surfaces. Inflorescence paniculate, 7–15 cm, many branched, glabrous. Pedicel ca. 2 mm; flowers yellowish green, ca. 2 mm in diam. Calyx glabrous, lobes broadly ovate, ca. 1 mm, obtuse apically. Petals oblong, ca. 2 mm, obtuse apically, with ± conspicuous featherlike venation pattern, revolute at anthesis. Stamens exerted; filaments linear, ca. 2 mm; anthers ovoid, ca. 1 mm. Disk 5-lobed. Ovary globose, glabrous. Drupe large, asymmetrical, 7–10 mm in diam., compressed, apex eccentric; epicarp thin, yellow, glabrous; mesocarp thick, white, waxy, with brown longitudinal resin ducts.

Lowland and hill forests, lowland thickets on limestone; 100–1500(–2500) m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [Cambodia, India, Japan, Korea, Laos, Thailand, Vietnam].

From the fruits of this species a wax is extracted for use in varnishes and polishes.

- 1a. Shrubs, 1–2 m tall; leaflets 5–7, sessile or subsessile, rachis narrowly winged distally, leaflet blade 3–5 × 0.9–1.9 cm ..... 13c. var. *microphyllum*  
 1b. Trees; leaflets 9–15, petiolule 2–5 mm, rachis terete, leaflet blade 5–16 × 1–5.5 cm.  
 2a. Buds glabrous or subglabrous; leaves glabrous ..... 13a. var. *succedaneum*  
 2b. Buds yellow tomentose; leaves sparsely pubescent ..... 13b. var. *kiangsiense*

### 13a. *Toxicodendron succedaneum* var. *succedaneum*

野漆(原变种) ye qi (yuan bian zhong)

*Rhus succedanea* Linnaeus, Mant. Pl. 2: 221. 1771; *Augia sinensis* Loureiro; *R. succedanea* var. *japonica* Engler.

Trees; buds glabrous or subglabrous. Leaf rachis terete; leaflets 9–15; leaflet petiolule 2–5 mm; leaflet blade 5–16 × 1–5.5 cm, glabrous on both surfaces. Fl. May, fr. Jul–Oct.

Lowland and hill forests; (100–)300–1500(–2500) m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [Cambodia, India, Japan, Korea, Laos, Thailand, Vietnam].

**13b. *Toxicodendron succedaneum* var. *kiangsiense*** C. Y. Wu ex T. L. Ming in M. Cheng & T. L. Ming, Fl. Reipubl. Popularis Sin. 45(1): 140. 1980.

江西野漆 jiang xi ye qi

Trees or small trees; buds yellow tomentose. Leaf rachis terete; leaflets 9–15; leaflet petiolule 2–5 mm; leaflet blade 5–16 × 1–5.5 cm, sparsely pubescent on both surfaces. Fr. Jun–Sep.

- Lowland and hill forests; 500–600 m. S Jiangxi (Anyuan).

**13c. *Toxicodendron succedaneum* var. *microphyllum*** C. Y. Wu & T. L. Ming, Fl. Reipubl. Popularis Sin. 45(1): 140. 1980.

小叶野漆 xiao ye ye qi

Small shrubs, 1–2 m tall. Leaf rachis narrowly winged distally; leaflets 5–7, sessile to subsessile; leaflet blade 3–5 × 0.9–1.9 cm. Fl. May–Jun, fr. Sep.

- Lowland thickets on limestone; 100–200 m. N Guangxi (Lingui).

**14. *Toxicodendron rostratum*** T. L. Ming & Z. F. Chen, Acta Bot. Yunnan. 16: 347. 1994.

喙果漆 hui guo qi

Trees, ca. 18 m tall; branchlets glabrous, glaucous, yellow lenticellate; buds pubescent. Petiole 6–12 cm; leaf blade imparipinnately compound, 17–32 cm; leaflets 7–11, opposite; leaflet petiolule 3–6 mm; leaflet blade oblong-ovate to oblong-lanceolate, 6–13.5 × 2.5–5 cm, papery, glabrous on both surfaces, base subrounded, margin entire, apex acuminate, lateral veins 13–18 pairs, prominent on both surfaces. Inflorescence paniculate, 4.5–9 cm, glabrous. Pedicel ca. 2 mm; flowers small, ca. 2 mm in diam. Calyx glabrous, lobes ca. 0.5 mm. Petals lanceolate, ca. 1.5 × 0.5 mm, revolute at anthesis. Stamens ca. 1.7 mm, exserted. Disk shallowly cup-shaped, 5-lobed. Ovary globose, ca. 0.8 mm in diam., glabrous; style 1, 3-lobed. Drupe ovoid, ca. 12 × 6 mm, slightly compressed, with 4–5 mm beak apically. Fl. Apr–May, fr. Aug–Oct.

- Hill forests; ca. 1200 m. S Yunnan (Menglian).

**15. *Toxicodendron grandiflorum*** C. Y. Wu & T. L. Ming, Fl. Yunnan. 2: 404. 1979.

大花漆 da hua qi

Trees or shrubs, 3–8 m tall; branchlets purplish red, glabrous, glaucous; buds purplish brown, glabrous. Petiole 4–6.5 cm, petiole and rachis slender, purplish red, glabrous, often glaucous; leaf blade imparipinnately compound, 20–30 cm; leaflets 7–15, opposite or subopposite; leaflet petiolule 5–15 mm; leaflet blade obovate-elliptic to lanceolate, 5.5–10 × 1.5–3.5 cm, papery, glabrous on both surfaces, glaucous abaxially, base broadly cuneate to decurrent, margin entire, apex acuminate to acute, lateral veins ca. 20 pairs, prominent on both

surfaces. Inflorescence paniculate, 15–25(–30) cm, glabrous. Pedicel 2–3 mm, glabrous; flowers light yellow, ca. 4 mm in diam. Calyx glabrous, lobes broadly ovate, ca. 1 mm, obtuse apically. Petals elliptic, ca. 3 × 1.5 mm, obtuse apically, with brown featherlike venation pattern, revolute at anthesis. Stamen filaments subulate, ca. 1.5 mm; anthers ovate-oblong, ca. 2 mm. Disk 5-lobed. Ovary subglobose, ca. 0.5 mm in diam. Drupe oblique, compressed, 6–7 × 7–8 mm, glabrous, light yellow at maturity, lucid.

- Hill and mountain forests, thickets; 700–2700 m. SW Sichuan, C, NW, and SE Yunnan.

1a. Leaflet blade obovate-elliptic to obovate-oblong; leaflet petiolule ca. 5 mm ..... 15a. var. *grandiflorum*

1b. Leaflet blade lanceolate; leaflet petiolule 10–15 mm ..... 15b. var. *longipes*

**15a. *Toxicodendron grandiflorum* var. *grandiflorum***

大花漆(原变种) da hua qi (yuan bian zhong)

Leaflet petiolule ca. 5 mm; leaflet blade obovate-elliptic to obovate-oblong. Fl. Apr–Jul, fr. Aug–Oct.

- Hill and mountain forests, thickets; 700–2700 m. SW Sichuan, C, NW, and SE Yunnan.

**15b. *Toxicodendron grandiflorum* var. *longipes*** (Franchet) C. Y. Wu & T. L. Ming, Fl. Yunnan. 2: 405. 1979.

长柄大花漆 chang bing da hua qi

*Rhus succedanea* Linnaeus var. *longipes* Franchet, Pl. Delavay. 2: 148. 1889.

Leaflet petiole 10–15 mm; leaflet blade lanceolate. Fl. May–Jun, fr. Jul–Sep.

- Hill and mountain thickets; 700–2500 m. SW Sichuan (Muli), NW Yunnan (Binchuan, Heqing, Lijiang, Zhongdian).

**16. *Toxicodendron calcicola*** C. Y. Wu, Fl. Yunnan. 2: 405. 1979 [*“calcicolum”*].

石山漆 shi shan qi

Shrubs or small trees, 3–7 m tall; branchlets purplish red, glabrous, glaucous; buds glabrous. Petiole 3.5–8 cm, petiole and rachis slender, glabrous; leaf blade imparipinnately compound, 15–25 cm; leaflets 7–9, opposite, sessile to subsessile; leaflet blade falcate-lanceolate, 4–8.5 × 1–3.5 cm, membranous, glabrous on both surfaces, glaucous-green abaxially, base oblique, rounded or broadly cuneate, margin entire to sparsely serrate distally, apex acuminate, ± curved, with apiculum, lateral veins 12–18 pairs, prominent on both surfaces. Inflorescence paniculate, 12–18 cm, glabrous, many branched; peduncle and rachis slender; floral subtending bracts lanceolate, ca. 2 mm. Pedicel ca. 3 mm. Calyx glabrous, lobes ovate, ca. 0.7 mm, obtuse apically. Petals oblong, with brown featherlike venation pattern, obtuse apically. Anthers ovate-oblong. Disk 5-lobed. Ovary ovoid, glabrous. Drupe not seen. Fl. Apr–May.

- Hill forests on limestone; ca. 1500 m. SE Yunnan (Xichou).

## 4. Tribe SEMECARPEAE

肉托果族 rou tuo guo zu

Trees, polygamous or dioecious. Leaves simple, petiolate. Flower small, (3–)5-merous with 1 whorl of stamens. Disk intrastaminal. Ovary 1-celled, superior (*Semecarpus*) to inferior (*Drimycarpus*); ovule laterally to apically attached; styles 1 to 3, terminal.

About five genera and 80 species: tropical Asia; two genera and six species (one endemic) in China.

## 15. SEMECARPUS Linnaeus f., Suppl. Pl. 25, 182. 1782.

肉托果属 rou tuo guo shu

*Melanocommia* Ridley; *Nothopegiopsis* Lauterbach; *Oncocarpus* A. Gray.

Inflorescence paniculate, terminal or axillary. Stamen filaments linear; anthers ovate-cordate, versatile. Disk cup-shaped. Ovary superior to semi-inferior, 1-locular and 1-ovulate; styles 3, free or united basally. Drupe ovate-globose, inserted on an inflated hypocarp formed by fused calyx and floral receptacle. Seed testa not fused with endocarp.

About 50 species: tropical Asia to Oceania; four species in China.

- 1a. Deciduous trees; leaf blade papery to thinly leathery ..... 1. *S. microcarpus*  
 1b. Usually evergreen trees; leaf blade leathery.  
 2a. Leaf blade 25–50 cm; pedicel ca. 2 mm; petals more than 5 mm; fruit ca. 2.5 cm ..... 2. *S. longifolius*  
 2b. Leaf blade 15–35 cm; pedicel less than 1 mm; petals 1.5–3 mm; fruit 1–2 cm.  
 3a. Leaf blade glabrous abaxially; inflorescence ca. 15 cm; drupe rounded, ca. 1 cm in diam. .... 3. *S. reticulatus*  
 3b. Leaf blade with hairs abaxially, or if rarely glabrous then with papillae; inflorescence 15–30 cm;  
 drupe ovoid to broadly ellipsoid, 0.7–1.5 cm in diam. .... 4. *S. cuneiformis*

**1. *Semecarpus microcarpus*** Wallich ex J. D. Hooker, Fl. Brit. India 2: 31. 1876 [*“microcarpa”*].

小果肉托果 xiao guo rou tuo guo

Deciduous trees, ca. 18 m tall; branchlets purplish brown eventually turning grayish brown, minutely pubescent. Petiole 1–1.5 cm, ferruginous tomentose; leaf blade obovate, 9.5–16 × 5.5–8.5 cm, papery to thinly leathery, adaxially minutely pubescent along midrib, abaxially grayish white and sparsely pubescent, base acute or obtuse, margin entire or undulate, apex rounded or retuse, midrib slightly impressed adaxially, elevated abaxially, lateral veins ca. 15 pairs, prominent abaxially. Inflorescence paniculate, ca. 15 cm, densely ferruginous tomentose; floral subtending bracts ca. 1.5 mm, densely ferruginous tomentose. Male flower sessile, yellowish green; calyx densely gray minutely pubescent, lobes triangular, ca. 0.5 mm, margins ciliate; petals ovate, 1.5–2 mm, with grayish white minute pubescence and brown featherlike venation pattern; stamens 1.5–2 mm, filaments linear, ca. 1 mm, anthers ovoid; disk brown; sterile ovary yellow tomentose. Female flower and fruit not seen. Fl. Apr–Jun.

Hill forests; ca. 1200 m. SW Yunnan (Ruili) [N Myanmar].

**2. *Semecarpus longifolius*** Blume, Mus. Bot. 1: 188. 1850 [*“longifolia”*].

大叶肉托果 da ye rou tuo guo

*Buchanania halmaheirae* Miquel; *Semecarpus euphlebius* Merrill; *S. gigantifolius* S. Vidal; *S. lanceolatus* Merrill; *S. testaceus* Elmer; *S. verniciferus* Hayata & Kawakami.

Trees; branchlets gray, lenticellate. Petiole 1–3 cm; leaf

blade oblong-lanceolate to ovate-lanceolate, 25–50 × 5.5–12 cm, leathery, glabrous on both surfaces, adaxially lucid, abaxially glaucescent, base obtuse, margin entire, apex acute to shortly caudate, midrib slightly elevated adaxially and elevated abaxially, lateral veins ca. 20 pairs, reticulate venation pattern prominent on both surfaces. Inflorescence paniculate, ca. 17 cm; floral subtending bracts ca. 1 mm, with ciliate margins. Pedicel ca. 2 mm; flowers white. Calyx campanulate, ca. 2.5 mm, with 5 ± conspicuous teeth. Petals ovate-lanceolate, ca. 5.5 × 2.5 mm. Stamens shorter than petals; filaments linear, ca. 3 mm; anthers oblong, ca. 2 mm. Ovary ovoid, ca. 2 mm. Drupe rounded, ca. 2.5 × 2 cm.

Seashores. Taiwan (Hengchun peninsula, Hualian, Lan Yu) [E Indonesia, Philippines].

The name *Semecarpus subracemosus* Kurz has been misapplied to this species.

**3. *Semecarpus reticulatus*** Lecomte, Bull. Soc. Bot. France 54: 610. 1907 [*“reticulata”*].

网脉肉托果 wang mai rou tuo guo

Trees, 10–30 m tall; branchlets robust, grayish white, glabrous, striate and lenticellate. Petiole 1.5–5 cm, glabrous, channeled above, inflated at base; leaf blade oblanceolate, 15–30 × 4–7.5 cm, leathery, glabrous on both surfaces, adaxially lucid, glaucescent, base subrounded, margin entire, crisped, apex acute to shortly acuminate, midrib slightly impressed adaxially, elevated abaxially, lateral veins ca. 15 pairs, prominent abaxially, reticulate venation conspicuous on both surfaces. Inflorescence paniculate, ca. 15 cm, tomentose; floral subtending bracts 1–2 mm, tomentose. Pedicel 0.5–1 mm, grayish white tomentose. Calyx tomentose, lobes triangular ca. 0.5 mm with ciliate mar-

gins. Petals oblong to ovate-oblong, 1.5–2 × ca. 1 mm, sparsely mixed glandular-pubescent and tomentose. Stamen filaments linear, ca. 2 mm; anthers ca. 0.7 mm. Disk glabrous. Ovary tomentose. Drupe rounded, ca. 1 cm in diam., lower part covered by hypocarp. Fl. Feb–Apr, fr. May–Jun.

Hill forests; 500–1400 m. S Yunnan (Jinghong, Mengla) [Laos, N Thailand, Vietnam].

**4. *Semecarpus cuneiformis*** Blanco, Fl. Filip. 220. 1837.

钝叶肉托果 *dun ye rou tuo guo*

*Semecarpus elmeri* Perkins; *S. ferrugineus* Merrill; *S. lanceolatus* Ridley; *S. megabotrys* Merrill; *S. merrillianus* Perkins; *S. micranthus* Perkins; *S. obtusifolius* Merrill; *S. perrottetii* Marchand; *S. philippinensis* Engler; *S. pilosus* Merrill; *S. ridleyi* Merrill; *S. taftianus* Perkins; *S. thyrsoideus* Elmer; *S. whitfordii* Merrill.

Trees, 4–20 m tall; branchlets brownish. Petiole 1–3 cm, sparsely pubescent; leaf blade obovate-oblong to narrowly

elliptic, 8–35 × 2–9 cm, leathery, adaxially glabrous to minutely pubescent, abaxially variable in hairiness from densely tomentose or pubescent to rarely glabrous, with distinct papillae except on midrib and major veins, base cuneate to obtuse, margin entire, apex variable from acute to rounded, lateral veins 11–25 pairs, prominent abaxially, reticulate venation prominent abaxially, distinct to indistinct adaxially. Inflorescence paniculate, 15–30 cm, tomentose or pubescent; floral subtending bracts 0.5–3 mm. Pedicel missing or very short; flowers greenish white. Calyx lobes broadly ovate, 0.5–1 mm, obtuse apically. Petals ovate-oblong to elliptic, 1.5–3 mm, minutely pubescent to glabrous, longitudinally veined. Stamens 2.5–3 mm; anthers ca. 0.7 mm; staminodes in female flowers ca. 1 mm. Disk round, flat, 1–2 mm across, pilose. Ovary ca. 2 mm across, densely pubescent. Drupe ovoid to broadly ellipsoid, 1–2 × 0.7–1.5 cm, apex obtuse, lower part covered by hypocarp.

Disturbed open vegetation; lowlands. Taiwan (Lan Yu) [E Indonesia, Philippines].

**16. DRIMYCARPUS** J. D. Hooker in Bentham & J. D. Hooker, Gen. Pl. 1: 424. 1862.

辛果漆属 *xin guo qi shu*

Inflorescence racemose, axillary or terminal. Flowers 5-merous. Stamen filaments subulate; anthers ovate-cordate, versatile. Disk annular. Ovary inferior, 1-locular and 1-ovulate; style 1. Drupe with remnants of floral parts at apex.

Two species: China, India, Myanmar, Nepal, Vietnam; two species (one endemic) in China.

1a. Leaf blade elliptic to oblong-lanceolate, apex acuminate, margin crisped; drupe ca. 2 cm in diam. .... 1. *D. racemosus*

1b. Leaf blade obovate, apex truncate to retuse, margin revolute; drupe ca. 2.5 cm in diam. .... 2. *D. anacardiifolius*

**1. *Drimycarpus racemosus*** (Roxburgh) J. D. Hooker in Bentham & J. D. Hooker, Gen. Pl. 1: 424. 1862.

辛果漆 *xin guo qi*

*Holigarna racemosa* Roxburgh, Fl. Ind., ed. 1832, 2: 82. 1832.

Trees, 8–18 m tall; branchlets grayish brown, glabrous, striate and lenticellate. Petiole 1–2 cm, robust, grooved above; leaf blade elliptic to oblong-lanceolate, 20–34 × 5–10 cm, leathery, glabrous on both surfaces, adaxially lucid, abaxially glaucescent, base cuneate to rounded, margin entire, usually crisped, apex acuminate, lateral veins 15–20 pairs, impressed adaxially, prominent abaxially. Inflorescences paniculate or racemose, 2–10 cm, minutely pubescent to glabrescent; floral subtending bract triangular-ovate, ca. 0.5 mm. Pedicel ca. 1.5 mm. Calyx glabrous, with obtuse-triangular, ca. 0.7 mm lobes. Petals ovate to broadly ovate, erect, 2.5–3 × ca. 1.7 mm, glabrous. Stamen filaments subulate, ca. 0.5 mm; anthers ovate-cordate, versatile; pistillode missing in male flower. Ovary inferior in hermaphrodite flower, ca. 2.5 mm in diam.,

glabrous; style ca. 1 mm. Drupe elliptic, ca. 2 cm in diam. Fr. Apr–Jun.

Dense lowland forests; 100–900 m. SE Yunnan (Hekou, Jinping, Maguan) [Bhutan, India, Myanmar, Nepal, Vietnam].

**2. *Drimycarpus anacardiifolius*** C. Y. Wu & T. L. Ming, Fl. Yunnan. 2: 413. 1979 [*“anacardiifolius”*].

大果辛果漆 *da guo xin guo qi*

Trees, ca. 15 m tall; branchlets longitudinally angled, yellowish brown, glabrous, lenticellate. Petiole thick and compressed, ca. 2.5 cm, glabrous; leaf blade obovate, 9–11.5 × 5.8–6.4 cm, thick, leathery, glabrous on both surfaces, base attenuate, margin entire, slightly revolute, apex truncate to retuse, midrib not prominent adaxially, elevated abaxially, lateral veins 8 or 9 pairs, perpendicular to midrib and parallel, prominent adaxially and abaxially. Inflorescence racemose, axillary or terminal, 4–6 cm in fruiting stage, glabrous. Flowers not seen. Fruit pedicel ca. 1.5 cm; drupe subglobose, ca. 2.5 cm in diam., yellowish green, glabrous, longitudinally ribbed. Fr. May.

• Hill forests; 600–700 m. S Yunnan (Cangyuan).

**5. Tribe DOBINEEAE**

九子母族 *jiu zi mu zu*

Shrubs or perennial herbs, dioecious. Leaves simple or 3-foliolate, petiolate, serrate. Floral subtending bracts conspicuous. Flowers dimorphic; male perianth 4- or 5-merous, with distinct calyx and corolla; female flower without perianth. Stamens 8–10, diplostemonous. Disk intrastaminal, annular. Ovary 1-celled, superior; ovule basally attached; style 1, terminal; stigma 1. Fruit dry, indehiscent, attached to midrib of accrescent floral subtending bract.

About two genera and three species: E Himalayan region to SW China; one genus and two species (one endemic) in China.

## 17. DOBINEA Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 249. 1825.

九子母属 *jiu zi mu shu*

*Podoon* Baillon.

Shrubs or perennial herbs, dioecious. Leaves alternate to opposite, petiolate, simple, serrate. Inflorescence terminal or axillary, paniculate or racemose. Flowers dimorphic. Male flower subtended by small, linear bract, pedicellate; calyx campanulate, 4- or 5-dentate; petals 4 or 5, oblong to spatulate; stamens 8–10; pistillode present. Female flower subtended by large foliose, membranous bract to which pedicel is adnate; calyx, petals, and staminodes absent; disk annular; style 1, terminal, linear. Fruit lens-shaped, attached to midrib of accrescent, membranous, reticulately veined floral subtending bract.

Two species: E Himalayan region to SW China; two species (one endemic) in China.

- 1a. Perennial herbs; leaves alternate, ovate, base cordate, margin irregularly serrate; flowers 4- or 5-merous; female inflorescence racemose; floral subtending bracts large with rounded apex; fruit 3–4 mm in diam. .... 1. *D. delavayi*  
 1b. Shrubs; leaves opposite, oblong-lanceolate, base rounded, margin regularly serrulate; flowers 4-merous; female inflorescence paniculate; floral subtending bracts small with retuse to emarginate apex; fruit 2–2.5 mm in diam. .... 2. *D. vulgaris*

**1. *Dobinea delavayi*** (Baillon) Baillon, Bull. Mens. Soc. Linn. Paris 2: 834. 1890.

羊角天麻 *yang jiao tian ma*

*Podoon delavayi* Baillon, Bull. Mens. Soc. Linn. Paris 1: 681. 1887.

Perennial herbs, 1–1.5 m tall; rhizome robust, elongate, terete, purplish brown; stem purple, striate, minutely pubescent distally. Leaves alternate; petiole decreasing in length from 1.5–6 cm basally to sessile toward shoot apices; leaf blade ovate to ovate-lanceolate, 6–11 × 3–9 cm, membranous, minutely pubescent adaxially, hirsute abaxially, base cordate, margin irregularly serrate, apex acuminate or acute, lateral veins 5–7 pairs, prominent abaxially. Male inflorescence thyrsoid, terminal or axillary, 8–15 cm, pubescent; floral subtending bract ca. 2 mm, pubescent; pedicel slender, 1–1.5 mm, pubescent; calyx campanulate, ca. 1.5 mm, 4(or 5)-dentate, glabrous to minutely pubescent; petals 4(or 5), greenish white, spatulate to clawed, ca. 1.8 mm; stamens 8(–10), ones opposite calyx lobes longer, filaments filiform, 1–2 mm, anthers ovate, ca. 0.4 mm; disk annular, purplish red; pistillode conical, ca. 1 mm, pubescent. Female inflorescence racemose, 7–14 cm, terminal or axillary, pubescent; floral subtending bract membranous, elliptic, ca. 1.5 × 1 mm, pubescent, margins ciliate, adnate to pedicel; calyx, petals, and staminodes lacking; disk annular; ovary subglobose, ca. 0.5 mm in diam., minutely pubescent. Fruit achenelike, 3–4 mm in diam., minutely pubescent; accrescent floral subtending bract elliptic to suborbicular, 2–2.5 cm in diam., entire or serrate, retic-

ulately veined, sparsely pubescent to glabrescent, with ciliate margin.

• Hill thickets and grasslands; 1100–2300 m. SW Sichuan, C and NW Yunnan.

The rhizome is used in traditional Chinese medicine.

**2. *Dobinea vulgaris*** Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 249. 1825.

九子母 *jiu zi mu*

Shrubs, 1–3 m tall; branchlets minutely pubescent. Leaves opposite; petiole 0.5–1.4 cm, minutely pubescent; leaf blade oblong-lanceolate, 7.5–11(–17.5) × 2.3–3.5(–5) cm, papery, sparsely puberulent or glabrescent on both surfaces, base rounded to cuneate, margin serrulate, apex acuminate. Inflorescence paniculate, terminal, ca. 18 cm, minutely pubescent. Male flowers subtended by linear bracteole; calyx campanulate, 4-lobed; petals 4, clawed; stamens 8, ones opposite to sepals longer; pistillode present. Female flowers subtended by linear bract; calyx, petals, and staminodes lacking; disk annular; ovary ovoid, ca. 1.5 mm in diam., style longer than ovary, recurved. Fruit pedicel adnate to accrescent floral subtending bract, bract membranous, grayish white, suborbicular, 1–1.3 cm in diam., margin serrulate and ciliate, apex retuse to emarginate, mucronate, reticulately veined; fruit slightly compressed, 2–2.5 mm in diam.

Hill forests; 1300–1400 m. SE Xizang (Médog), NW Yunnan (Gongshan) [Bhutan, NE India, Nepal].