

CAPPARACEAE

山柑科 shan gan ke

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Shrubs, trees, or woody vines, evergreen (deciduous in some *Crateva*), with branched or simple trichomes. Stipules spinelike, small, or absent. Leaves alternate or rarely opposite, simple or compound with 3[–9] leaflets. Inflorescences axillary or superaxillary, racemose, corymbose, subumbellate, or paniculate, 2–10-flowered or 1-flowered in leaf axil. Flowers bisexual or sometimes unisexual, actinomorphic or zygomorphic, often with caducous bracteoles. Sepals 4(–8), in 1 or 2 whorls, equal or not, distinct or basally connate, rarely outer whorl or all sepals connected and forming a cap. Petals (0–)4(–8), alternating with sepals, distinct, with or without a claw. Receptacle flat or tapered, often extended into an androgynophore, with nectar gland. Stamens (4–)6 to ca. 200; filaments on receptacle or androgynophore apex, distinct, inflexed or spiraled in bud; anthers basifixed (dorsifixed in *Stixis*), 2-celled, introrse, longitudinally dehiscent. Pistil 2(–8)-carpellate; gynophore ± as long as stamens; ovary ovoid and terete (linear and ridged in *Borthwickia*), 1-loculed, with 2 to several parietal placentae (3–6-loculed with axile placentation in *Borthwickia* and *Stixis*); ovules several to many, 2-tegmic; style obsolete or highly reduced, sometimes elongated and slender; stigma capitate or not obvious, rarely 3-branched. Fruit a berry or capsule, globose, ellipsoid, or linear, with tough indehiscent exocarp or valvately dehiscent. Seeds 1 to many per fruit, reniform to polygonal, smooth or with various sculpturing; embryo curved; endosperm small or absent.

About 28 genera and ca. 650 species: worldwide in tropical, subtropical, and a few in temperate regions; four genera and 46 species (10 endemic) in China.

Sun Bishin. 1999. Capparaceae (excluding *Cleome*). In: Wu Chengyi, ed., Fl. Reipubl. Popularis Sin. 32: 484–531.

- 1a. Leaves compound, with 3 leaflets.
 - 2a. Leaves opposite; sepals connate to form a cap that splits along one side as petals expand; fruit capsular, linear, after dehiscence leaving a persistent axis 1. *Borthwickia*
 - 2b. Leaves alternate; sepals distinct; fruit a berry, ± ovoid, not dehiscent 2. *Crateva*
- 1b. Leaves simple.
 - 3a. Petals 4; anthers basifixed; placentation parietal; fruit a berry; gynophore equaling or exceeding length of mature fruit 3. *Capparis*
 - 3b. Petals none; anthers dorsifixed; placentation axile; fruit a drupe; gynophore less than 1/5 as long as mature fruit 4. *Stixis*

1. BORTHWICKIA W. W. Smith, Trans. & Proc. Bot. Soc. Edinburgh 24: 175. 1912.

节蒴木属 jie shuo mu shu

Shrubs or small trees, evergreen. Twigs quadrangular with rounded angles. Stipules absent. Leaves opposite, palmately ternate compound; petiole long; leaflet blade margins entire. Inflorescences terminal, racemes; bract at base of pedicels, linear, simple except 1 or 2 on basalmost pedicel pairs with (1 or)3 leaflets. Flower parts spirally arranged on receptacle. Sepals 5–8, connate, forming a tube, membranous. Petals 5–8, distinct, erect, obviously shorter than calyx tube, proximally valvate and distally imbricate. Stamens 60–70 at summit of gynophore. Nectary conical, ascending from petal base to stamen base, surrounding androgynophore. Ovary linear, distally with 4–6 vertical grooves and ridges, 4–6-locular, with axile placentae, each locule with ovules in 2 rows. Fruit a capsule, linear, terete, dehiscent along ventral suture from base to apex leaving persistent axis with 4–6 ridges. Seeds reniform; embryo bent, scarcely differentiated.

One species: S China, Myanmar.

1. *Borthwickia trifoliata* W. W. Smith, Trans. & Proc. Bot. Soc. Edinburgh 24: 175. 1912.

节蒴木 jie shuo mu

Shrubs or small trees, 1–6 m tall. Twigs pale green, drying to yellow green, with dense short white pubescence, later glabrescent, fragrant when fresh and after drying. Petiole (3–)5–13(–20) cm; petiolules ca. 1 cm; leaflet blades membranous, abaxially with white short pubescence on veins, adaxially glabrous, midvein abaxially flat and adaxially raised, secondary veins 7–9 on each side of midvein, reticulate veins visible on

both surfaces; lateral leaflet blades ovate lanceolate, slightly smaller than terminal one, base asymmetric; terminal leaflet oblong, elliptic, lanceolate, or sometimes obovate-lanceolate, (5–)8–20(–30) × (1.5–)4–10(–16) cm. Inflorescences 8–20 cm, sessile, axis with dense white short pubescence; bracts 1–1.5 cm, deciduous. Flower buds ivory-colored, awl-shaped, terete, ca. 15 × 5–6 mm. Pedicel 1.2–1.5 cm, trichomes like those on axis. Sepals ca. 1 cm, with short white pubescence on both surfaces, tube rupturing on one side at anthesis. Petals white, oblong to spatulate, 1.5–1.8 cm, ± equal, 1/3–1/2 as long as calyx tube, proximally thick, distally membranous, glabrous, margin

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ciliate. Androgynophore ca. 5 mm; stamens 60–70. Ovary linear, 1–1.5 cm, 4–6-locular, ridged. Capsule moniliform, 6–9 cm × 4–6 mm, base attenuate, apex with a 3–5 mm beak; pericarp drying blackish brown, thin. Seeds 4–6 per capsule, 2–3 mm,

base truncate, apex pointed; embryo ca. 2 mm. Fl. Apr–Jun, fr. Aug–Sep.

Wet valleys, forests, ravines; 300–1400 m. S Yunnan [E and N Myanmar].

2. CRATEVA Linnaeus, Sp. Pl. 1: 444. 1753.

鱼木属 *yu mu shu*

Trees or sometimes shrubs, evergreen or deciduous, glabrous throughout. Twigs terete or angular, with lenticels, with pith or hollow. Stipules triangular, small, caducous. Leaves alternate, palmately compound; petiole long, distal portion near rachis often with glands; leaflets 3, disarticulating from petiole; petiolules short, thin when young, becoming thick in maturity; lateral leaflet blades with asymmetric base. Inflorescences at tip of new branches, corymbose racemes; rachis either with arrested growth after anthesis or growing through a leafy twig, often with obvious scars after pedicels fall; bract at base of pedicels, caducous. Flowers bisexual or unisexual by failure of one sex to develop. Pedicel long. Receptacle disklike, inner surface concave, with nectary, with sepal and petals on margin. Sepals 4, greenish, equal, obviously smaller than petals, deciduous. Petals 4, white, cream-colored, or yellow, equal, clawed, blade ovate to rhomboid with 4–6 secondary veins on each side of midvein. Stamens (8–)12–50; filaments basally connate to form a 1–4 mm androgynophore. Gynophore 2–8 cm but degenerated in staminate flower; ovary 1-locular, placentae 2, ovules many; style short or absent; stigma inconspicuous, knob-shaped. Fruit a berry, globose or ellipsoid, drooping; pericarp drying to gray, red, purple, or brown, leathery, firm, apically smooth or papillate; fruiting pedicel, receptacle, and gynophore woody and thickened. Seeds 25–50 per berry, embedded in creamy fetid or pungent mesocarp; seed coat smooth; cotyledons convolute, one longer and curved around other; radicle conical, short.

About eight species: worldwide in tropics and subtropics extending north to S Japan in Asia and south to N Argentina in America; five species in China.

Jacobs (Blumea 12: 206. 1964) treated *Crateva falcata* (Loureiro) Candolle (Prodr. 1: 243. 1824; *Capparis falcata* Loureiro, Fl. Cochinch. 1: 331. 1790) as a doubtful species, as did FRPS (32: 490. 1999). Jacobs considered that the name applied to either *C. formosensis* or *C. trifoliata*. The fact that it was cultivated (“Habitat prope Cantonem Sinarum, inculta”) suggests *C. religiosa*. However, Loureiro’s mention of falcate leaflets and red fruit would seem to preclude this. Jacobs could not locate a type. If a type could be found and clearly identified as either *C. formosensis* or *C. trifoliata*, then the name *C. falcata* would have priority in both cases. In the absence of a type and clear application of the name, it seems best to follow Jacobs and FRPS in treating *C. falcata* as a name of uncertain application.

- 1a. Fruit drying red, purple, or brown (immature fruit also), surface smooth; flowering before or with emergence of leaves; dried flowers orangish brown (especially base of flower).
 - 2a. Leaflet blade apices acuminate; leaflets of flowering twigs 10–12 cm, drying pale green to brownish green 1. *C. formosensis*
 - 2b. Leaflet blade apices rounded to obtuse; leaflets of flowering twigs 4.5–8.5 cm, drying pale reddish brown 2. *C. trifoliata*
- 1b. Fruit drying gray (immature fruit also), surface scabrous with roughish dry flat papillae; flowering well after emergence of leaves; dried flowers whitish, pinkish, or cream-colored.
 - 3a. Leaflet blades ovate-orbicular, very thin even at maturity, concolorous or nearly so, adaxially dull, apex acuminate and ca. 1/3 as long as blade; twigs mostly stramineous when dry; fruit 1.8–2.6 cm 3. *C. religiosa*
 - 3b. Leaflet blades oblong-lanceolate, subleathery at maturity, abaxially dull and adaxially glossy, apically gradually tapered, apex less than 1/5 as long as blade; twigs mostly brownish when dry; fruit 2.5–5 cm.
 - 4a. Fruit ellipsoid, surface scabrous when immature, outer layer peeling to reveal a slightly smooth subsurface layer; seed with dorsal crest; leaflets 2.5–4.5 × as long as wide, secondary veins (7–)10–15(–22) on each side of midvein 4. *C. magna*
 - 4b. Fruit globose, surface scabrous, with ash-yellow small flecks; seed without crest; leaflets 2–2.5 × as long as wide, secondary veins 5–10 on each side of midvein 5. *C. unilocularis*

1. *Crateva formosensis* (Jacobs) B. S. Sun in C. Y. Wu, Fl. Reipubl. Popularis Sin. 32: 489. 1999.

台湾鱼木 *tai wan yu mu*

Crateva adansonii Candolle subsp. *formosensis* Jacobs, Blumea 12: 200. 1964.

Shrubs or trees, 2–21 m tall, to 1.5 m d.b.h., deciduous ± at flowering time. Twigs with growth flushes seldom exceeding 10 cm, wrinkly, ribbed, striped, with few lenticels. Petiole drying brown to black, 5–11 cm, glands obvious; petiolules 4–5 mm; leaflet blades 7–11.5 × 2.5–4 cm, membranous, concolorous, drying pale green to brown-green, secondary veins 4–6(or

7) on each side of midvein, apex acuminate to long acuminate. Inflorescences 9–12-flowered; axis 2(–4) cm. Pedicel 1.5–2.8 cm. Sepals drying dark brown, 3–4 mm. Petals yellow, drying light brown, claw ca. 4 mm, blade elliptic and 1.5–1.7 cm. Stamens 10–15; filaments 2.5–3 cm; anthers ca. 3 mm. Gynophore 2.4–3.2 cm. Fruit red to reddish brown, ellipsoid, (2–)3–4.5 cm, smooth; fruiting gynophore 1.5–2(–3) mm thick. Seeds dull mahogany brown, small. Fl. Jun–Jul, fr. Aug–Jan.

Valleys, streambanks, dense forests, orchards, coastal thickets; near sea level to 400 m. N Guangdong, NE Guangxi, Taiwan [S Japan (Ryukyu Islands)].

2. *Crateva trifoliata* (Roxburgh) B. S. Sun in C. Y. Wu, Fl. Reipubl. Popularis Sin. 32: 489. 1999.

钝叶鱼木 *dun ye yu mu*

Capparis trifoliata Roxburgh, Fl. Ind., ed. 1832, 2: 571. 1832; *Crateva adansonii* Candolle subsp. *trifoliata* (Roxburgh) Jacobs; *C. erythrocarpa* Gagnepain; *C. roxburghii* R. Brown var. *erythrocarpa* (Gagnepain) Gagnepain.

Trees or shrubs, 1.5–5(–8) m tall, deciduous ± at flowering time. Twigs drying to red brown, striped. Petiole reddish brown, 4–6.5 cm; petiolules 3–5.5 mm; leaflet blades elliptic to obovate, 6–8 × 3.5–4.5 cm, subleathery, concolorous or abaxially slightly paler, drying dull olive brown, midvein and secondary veins pale red, secondary veins 5 or 6[or 7] on each side of midvein, slender, and slightly raised on both surfaces, reticulate veins not obvious, apex blunt, obtuse, rounded, or seldom acuminate. Inflorescences (4–)10–20-flowered; axis 2.5–5 cm. Flowers open before or as leaves emerge. Pedicel drying orangish red, 3.5–6 cm, at an angle of less than 45° from midvein. Sepals 3–5 × 2–3 mm. Petals white, drying yellow, claw 4–8 mm, blade orbicular and 1–2 cm. Stamens 15–26, purple; filaments 2–3 cm; anthers ca. 2(–3) mm. Gynophore (2.4–)3–5 cm; ovary elliptic, ca. 3 × 2 mm. Fruit drying reddish purple to brown, globose to ellipsoid, 3.2–3.6 cm, smooth, slightly shiny. Seeds ca. 25 per fruit, brownish black, reniform, 5–6 mm, smooth. Fl. Mar–May, fr. (Jul–)Aug–Sep.

Broadleaf or bamboo forests on sandstone or limestone, seashores; near sea level to 300 m. Guangdong, Guangxi (Beihai, Nandan), Hainan, S Taiwan, Yunnan [Cambodia, India, Laos, Myanmar, Thailand, Vietnam].

3. *Crateva religiosa* G. Forster, Diss. Pl. Esc. 45. 1786.

鱼木 *yu mu*

Crateva membranifolia Miquel.

Trees 3–15 m tall, to 40 cm d.b.h. Twigs light greenish to yellowish green when dried, with gray elongated lenticels. Petiole (5–)6–7(–10) cm, adaxially with minute triangular glands near rachis; petiolules 3–5(–7) mm; leaflet blades (4–)5.5–7(–10) × (2–)3–4 cm, 2–2.5 × as long as wide, thin and leathery, abaxially gray, adaxially dull green, midvein reddish, secondary veins 5–10 on each side of midvein, reticulate veins obvious, apex acuminate to abruptly acuminate. Inflorescences racemes or corymbs, 10–25-flowered, with branchlet just below flowers having fewer leaves; axis 3–7 cm, after flowering little elongated, often marked with pedicel scars; bracts 0.8–1.5 cm, leaflike or slender, caducous. Flowers open as leaves emerge. Pedicel 2–5[–9?] cm. Sepals ovate, 2–4.5 × 1.5–3 mm, apex acuminate. Petal white to yellow, claw 3.5–5 mm, blade 1.5–2.2 cm. Stamens 16–22[–30]; filaments 3–6 cm; anthers 2–3 mm. Gynophore 3.5–6.5 cm; ovary ovoid to subcylindric, 3–4 × 1–2 mm. Fruit ovoid to obovoid, 1.8–2.6[–3.5] cm; pericarp 5–10 mm thick, apically scabrous and gray to dust-colored with nearly circular ash-yellow flecks; stipe 2.5–3 mm in diam., thickened, woody. Seeds 25–30 per fruit, dark brown, 1.2–1.8 cm, tuberculate. Fl. Mar–May, fr. Jul–Aug(–Oct). $2n = 26$.

Roadsides, fields; below 200 m. Guangdong, Hainan, Taiwan.

[Bhutan, Cambodia, India, Indonesia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Pacific islands].

The flowers are noted as fragrant. The species is often planted as an ornamental in S China and other S and SE Asian countries. Its dried fruit are used in China as a medicinal drug.

4. *Crateva magna* (Loureiro) Candolle, Prodr. 1: 243. 1824.

沙梨木 *sha li mu*

Capparis magna Loureiro, Fl. Cochinch. 1: 33. 1790; *Crateva lophosperma* Kurz; *C. nurvala* Buchanan-Hamilton.

Trees [or shrubs] [2–]4–20 m tall, to 20 cm d.b.h. Twigs grayish brown, smooth or verrucose, with ± circular lenticels. Petiole (2–)5–12 cm, adaxially with several pale glands toward rachis; petiolules 2–6(–8) mm; leaflet blades ovate-lanceolate to oblong-lanceolate, 7–18 × 3–8 cm, 2.5–4.5 × as long as wide, papery to thinly leathery, abaxially dusty gray, adaxially brownish green and glossy, midvein pale red, secondary veins (7–)10–15(–22) on each side of midvein, reticulate veins obvious, apex acuminate to long acuminate. Inflorescences corymbose racemes, (3–)20–30(–40)-flowered, subtended by several leaves, axis (2–)3–5(–11) cm; peduncle 4–6(–12) cm but 12–28 cm after anthesis. Pedicel 3–4(–6) cm. Sepals lanceolate, 3–5(–10) × 1.2–1.5 mm. Petals white, claw (3–)5–10 mm, blade 1.5–2.5 cm with an abruptly acuminate apex. Stamens 11–17; filaments 2.5–5 cm; anthers 2–3 mm. Gynophore (3.5–)4–6 cm; ovary oblong-ellipsoid, terete, 5–6 × ca. 2 mm. Fruit oblong-ellipsoid to oblong-ovate, 2.5–5 cm, after drying with a thin yellow gray crust that falls off to reveal a smooth subsurface; stipe 1–3 mm wide. Seeds 30–50 per fruit, dark brown, 6–15 × 6–10 × 2–3 mm, slightly flattened, dorsally irregularly crested. Fl. Mar–Apr, fr. Aug–Sep.

Open forests, often along streams and lakes; below 1000 m. Guangdong (Xinyi), Guangxi (Longzhou), Hainan, S Xizang, Yunnan (Hekou, Mengla) [Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Sri Lanka].

In India, the young fruit is eaten, and the leaves and root bark are used medicinally.

5. *Crateva unilocularis* Buchanan-Hamilton, Trans. Linn. Soc. London 15: 121. 1827.

树头菜 *shu tou cai*

Trees 5–10(–20)[–30] m tall. Twigs grayish brown, often hollow, with sparse whitish lenticels. Petiole (3–)5.5–9 cm, glands adaxially toward rachis; petiolules (2.5–)4–7 mm; leaflet blades elliptic, (6.5–)8–10 × 3–4(–5) cm, 2–2.5 × as long as wide, subleathery, glossy, abaxially drying gray, adaxially drying to brown, midvein reddish, secondary veins 5–8(–10) on each side of midvein, apex acuminate to abruptly acuminate. Inflorescences racemes or corymbs, 13–25(–35)-flowered, with a few leaves on basal part; rachis (2–)3–5(–7) cm, after flowering with little increase in length, often with pedicel scars. Pedicel 2–4 cm. Sepals linear to narrowly lanceolate, (3–)4–6 × 2–3 mm. Petal white to creamy but drying pinkish, claw 3–7 mm, blade 1.4–2.4 cm. Stamens 16–20; filaments (2–)3–4.5 cm; anthers 2–3 mm. Gynophore 4–6 cm; ovary oblong-ellipsoid, 3–4 × 1–2 mm. Fruit globose, 3–4 cm; pericarp 2–3 mm

thick, apically scabrous, with nearly circular small ash-yellow flecks; stipe 3–7 mm in diam., thickened, woody. Seeds 30–50 per fruit, dull brown, lens-shaped, 8–10(–12) × 4–10 mm, smooth. Fl. Mar–Jul, fr. Jul–Aug.

Wet areas, commonly cultivated; below 1500 m. Fujian, Guangdong, Guangxi, Hainan, Yunnan [Bangladesh, Bhutan, Cambodia, India, Laos, Myanmar, Nepal, Vietnam].

This species is reported to reach 30 m tall in India.

3. CAPPARIS Linnaeus, Sp. Pl. 1: 503. 1753.

山柑属 shan gan shu

Shrubs, small trees, or vines, evergreen, erect, climbing, or sometimes prostrate. New branches often with branched or simple trichomes, glabrescent or sometimes with persistent trichomes; branchlet base sometimes with subulate scales (cataphylls). Stipular spines straight or curved, sometimes absent. Leaves alternate, spirally arranged or distichous [or secund], simple, petiolate or sometimes sessile; leaf blade herbaceous to leathery, margin entire. Inflorescences superaxillary, axillary, or terminal, racemes, corymbs, umbels, or panicles, sometimes reduced to a single flower but usually 2–10-flowered; bract usually present at base of pedicels but often caducous. Sepals 4, in 2 whorls; sepals of outer whorl often thick, often inwardly concave or becoming navicular, covering other flower parts, sometimes basal one becoming saccate; sepals of inner whorl often thin, ± equal. Petals 4, imbricate, often 2 pairs roughly similar; anterior pair of petals distinct, clawless or sometimes clawed; posterior pair of petals with lateral margins adhering, base asymmetric, margin revolute or rarely inner lateral margin involute from base to near middle, base fully covering disk; petals sometimes all 4 ± equal, distinct. Stamens 7–120. Gynophore ± as long as filaments, scarcely lengthening in fruit but often becoming thicker, sclerified; ovary 1-loculed; placentae 2–6(–8); ovules few to many; style short or obsolete; stigma sessile. Fruit baccate, globose or ellipsoid, often with different color when mature or dry, usually not dehiscent. Seeds 1 to numerous per fruit, reniform to nearly polygonal; embryo bent.

Between 250 and 400 species: mostly in tropical and subtropical regions worldwide but some in temperate regions; 37 species (ten endemic) in China.

- 1a. Inflorescences composed of superaxillary rows of (1–)2–10 flowers.
 - 2a. Flower-bearing portion of twig leafless, situated between two flushes of leaves, often with 50–100 flowers in groups of 4–10 3. *C. multiflora*
 - 2b. Flower-bearing portion of twig leafy, each flower series subtended by a normally developed leaf.
 - 3a. Sepals 5 mm or shorter.
 - 4a. Leaves sessile with a petiole of 1–2 mm; leaf blade base cordate 14. *C. subsessilis*
 - 4b. Leaves with a petiole longer than 3 mm; leaf blade base not cordate.
 - 5a. Spines straight (endemic to Taiwan) 6. *C. henryi*
 - 5b. Spines recurved or absent (mainland of S and SW China).
 - 6a. Leaf blade 2–4 cm wide, apex acute to subacuminate, tip 0.3–0.7(–1) cm; twigs with strongly recurved spines 15. *C. tenera*
 - 6b. Leaf blade 1–2(–3) cm wide, apex caudate, tip (1–)1.5–2.5 cm; twigs often without spines or spines small, ascending 16. *C. urophylla*
 - 3b. Sepals 6 mm or longer.
 - 7a. Spines present and recurved.
 - 8a. Flowering gynophore base white tomentose; leaf blade apex leathery and mucronulate 4. *C. zeylanica*
 - 8b. Flowering gynophore glabrous; leaf blade apex not leathery or mucronulate.
 - 9a. Flowers large, solitary or paired; sepals 1.5–2 cm; stamens 50–60(–75); leaf blade abaxially with papillae 5. *C. hainanensis*
 - 9b. Flowers medium size, in inflorescences of 2–6; sepals 0.7–1(–1.3) cm; stamens 8–40; leaf blade abaxially without papillae 6. *C. henryi*
 - 7b. Spines absent or if present straight.
 - 10a. Ovary densely tomentose, 4–6 mm (including style and stigma); fruit globose, ca. 1 cm, beaked 7. *C. olacifolia*
 - 10b. Ovary glabrous, 1.5–3 mm; fruit subglobose, 1–1.5 cm, not beaked.
 - 11a. Ovary ca. 3 mm, with 4 placentae; fruit 3–7 cm; gynophore 3–5 mm thick; petiole 1–2.2 cm 8. *C. micracantha*
 - 11b. Ovary ca. 2 mm, with 2 placentae; fruit 0.7–2.5 cm; gynophore 0.5–1 mm thick; petiole 0.5–1 cm.
 - 12a. New branches shortly tomentose but eventually glabrescent; leaf blade 2–2.5 × as long as wide; secondary veins 5–8(–10) on each side of midvein.
 - 13a. Leaf blade ovate, base rounded to cuneate but never decurrent on petiole; branchlets with reddish brown to gray trichomes, often with recurved spines 9. *C. bodinieri*
 - 13b. Leaf blade elliptic, base broadly cuneate and decurrent on petiole; branchlets with rust-colored trichomes, often without spines 10. *C. membranifolia*
 - 12b. New branches generally glabrous; leaf blade 1.8–4.5(–9) × as long as wide; secondary veins (4 or)5 or 6 on each side of midvein.

- 14a. Shrubs; twigs without spines; leaf blade thinly herbaceous, lanceolate, 5–11 cm, base rounded, veins obscure on both surfaces; petals inside densely tomentose 11. *C. sabiifolia*
- 14b. Climbers; twigs with spines; leaf blade leathery to thinly leathery, oblong, 9–16 cm, base acute, veins distinct on both surfaces; petals inside glabrous but tomentose at margin.
- 15a. Leaf blade obovate, apex abruptly acuminate 12. *C. sunbisiniana*
- 15b. Leaf blade oblong-lanceolate to ovate-lanceolate, apex acute to acuminate 13. *C. acutifolia*
- 1b. Inflorescences composed of racemes, terminal corymbs, spikes, umbels, axillary fascicles, or sometimes solitary flowers in axils of leaves.
- 16a. Inflorescences terminal racemes, with 15–30 flowers 17. *C. assamica*
- 16b. Inflorescences terminal corymbs, spikes, umbels, axillary fascicles, or sometimes solitary flowers in axils of leaves.
- 17a. Flowers axillary, solitary; anterior sepal distinctly different from other three; upper petals clawed; leaf blade orbicular to suborbicular.
- 18a. Sepals of inner whorl not saccate or galeate, 3–4.5 mm deep in distal half; leaf blade apex acute, obtuse, or retuse but spine-tipped 1. *C. spinosa*
- 18b. Sepals of inner whorl deeply saccate or galeate, 9–15 mm deep in distal half; leaf blade apex shortly mucronate 2. *C. himalayensis*
- 17b. Flowers in terminal corymbs, spikes, axillary fascicles, or umbels (if solitary then sepals ± alike in shape); basal pair of petals without claws or 4 petals ± equal, distinct, and without claws; leaf blade variously ovate, elliptic, or lanceolate.
- 19a. Leaf blade abaxially covered with persistent brown, rust-colored, or ash-yellow trichomes.
- 20a. Leaf blade abaxially with persistent very dense ash-yellow trichomes 30. *C. pubifolia*
- 20b. Leaf blade abaxially with persistent brown or rust-colored trichomes.
- 21a. Petiole 1–3(–4) mm; flowering gynophore base glabrous.
- 22a. Gynophore 1.5–2 cm; stamens ca. 2 cm; fruit globose, blackish brown when dry even when immature 18. *C. dasyphylla*
- 22b. Gynophore 3–4 cm; stamens ca. 3 cm; fruit ellipsoid, gray when dry 19. *C. wui*
- 21b. Petiole longer than 5 mm; flowering gynophore base white pubescent.
- 23a. Ovary (not seen) and fruit surface densely rust-colored tomentose 20. *C. trichocarpa*
- 23b. Ovary and young fruit surface smooth and glabrous (mature fruit not known) 21. *C. viburnifolia*
- 19b. Leaf blade abaxially glabrous, glabrescent, or with whitish, grayish, or fulvous trichomes.
- 24a. Stamens 28–120, anthers ca. 2 mm; sepals 13 mm or longer, inner pair abaxially puberulent.
- 25a. New branches glabrous; leaf blade leathery, both surfaces glabrous when young.
- 26a. Leaf blade dark red when dry, base cordate; petiole 1–1.2 cm; fruit ellipsoid, 9–13 cm 22. *C. fohaiensis*
- 26b. Leaf blade yellowish green when dry, base broadly cuneate to rounded but not cordate; petiole 1.5–2.5 cm; fruit globose, 4.2–5.5 cm 23. *C. formosana*
- 25b. New branches with trichomes; leaf blade subleathery, abaxially with trichomes when young but glabrescent.
- 27a. Sepals 1.7–1.8(–2.1) cm 24. *C. yunnanensis*
- 27b. Sepals 0.8–1.5 cm.
- 28a. Fruit with 4–8 vertical irregularly crested rib ridges when dry and between ribs irregularly raised; sepals 8–12 mm; stamens 45–50(–65) 25. *C. masakai*
- 28b. Fruit smooth when dry; sepals 7–9 mm; stamens 28–36 26. *C. sikkimensis*
- 24b. Stamens 20–80, anthers ca. 1 mm; sepals 3–10 mm, inner pair abaxially glabrous.
- 29a. Leaf blade apex shallowly emarginate at least for some leaves, for others obtuse, rounded, or subacute 27. *C. sepiaria*
- 29b. Leaf blade apex acute, acuminate, obtuse, or rounded but never emarginate.
- 30a. Inflorescences short axillary racemes or fascicles 28. *C. pubiflora*
- 30b. Inflorescences umbellate and sometimes aggregated into panicles.
- 31a. Sepals 2–5(–6) mm; gynophore 0.4–1.2 cm; fruit less than 2(–2.5) cm in diam.
- 32a. Leaf blade base subcordate 29. *C. pachyphylla*
- 32b. Leaf blade base cuneate, broadly cuneate, or rounded.
- 33a. Twigs with trichomes but glabrescent; sepals caducous after anthesis; stamens 20–45; placentae 2 31. *C. cantoniensis*
- 33b. Twigs glabrous; sepals persistent for a short while after anthesis; stamens 7–9(–12); placentae 4 32. *C. floribunda*
- 31b. Sepals 6–10 mm; gynophore 2–5 cm; fruit often 3–5 cm in diam.
- 34a. Inflorescences at least at pedicel base of several flowers with a pair of small yellow spines; spines on flowering twig to 5 mm, recurved to uncinat.

- 35a. Pedicel 0.7–1.7 cm; inflorescences 10–15-flowered (Guangxi and Yunnan) 33. *C. chingiana*
 35b. Pedicel 2.5–3.5 cm; inflorescences 6–9-flowered (Hainan and Taiwan) 34. *C. lanceolaris*
 34b. Inflorescences without spines; spines on flowering twigs short and straight or absent.
 36a. Inflorescences a short raceme or corymb, 7–12-flowered; sepals outside shortly
 pubescent; stamens ca. 25 35. *C. khuamak*
 36b. Inflorescences a subumbel, (1 or) 2–5-flowered; sepals outside glabrous; stamens 35 or
 more.
 37a. New branches glabrous; leaf blade apex shortly mucronate; stamens ca. 35 36. *C. fengii*
 37b. New branches shortly brown pubescent later glabrescent (but near petiole and node
 always with residual trichomes); leaf blade apex emarginate (on at least some
 leaves); stamens 50–70 37. *C. versicolor*

1. *Capparis spinosa* Linnaeus, Sp. Pl. 1: 503. 1753.

山柑 shan gan

Shrubs, prostrate or hanging, 50–80(–100) cm tall. Twigs glabrous to densely long or shortly white pubescent with simple trichomes, soon glabrescent. Stipular spines 4–5 mm, ± flat, apex recurved. Petiole 1–4 mm; leaf blade ovate, obovate, broadly elliptic, or suborbicular, 1.3–3 × 1.2–2 cm, 1–1.7 × as long as wide, fleshy when fresh but later leathery, midvein abaxially raised but gradually becoming obscure from base to apex, secondary veins 4(or 5) on each side of midvein, base rounded, apex acute, obtuse, or retuse but spine-tipped. Flowers solitary in upper axils; buds ± symmetrical. Pedicel 2–6(–9) cm. Calyx zygomorphic; sepals 1.5–2 × 0.6–1.1 cm, outside ± with trichomes, inside glabrous; sepals of outer whorl navicular-lanceolate, outside with several glands, basally shallowly saccate; sepals of inner whorl 1–2 cm, not saccate or galeate, not broadest near base, 3–4.5 mm deep in distal half. Petals dimorphic, ± as long as or slightly longer than anterior sepals; anterior 2 petals white, distinct, claw 4–7 mm, blade oblong-obovate, 1–2 cm, outside with trichomes, apex subemarginate; posterior 2 petals yellowish green to green, enclosed by sepals, thickened, margin connate from base almost to middle. Stamens ca. 80; filaments 2–4 cm, unequal; anthers 2–3 mm. Gynophore ca. 1 cm, sometimes basally sparsely villous; ovary ellipsoid, 3–4 mm, glabrous, apically with vertical thin furrow and ridge; placentae 6–8; ovules numerous; style and stigma obscure, moundlike. Fruit dark green when dry, ellipsoid to oblong-obovoid, 1.5–4 × 0.8–1.8 cm, with 6–8 lengthwise thin ridges, dehiscent; fruiting pedicel and gynophore 3–7 cm, 1.5–2 mm in diam., forming a right angle with each other. Seeds 40–60 per fruit, reddish brown, reniform to globose, 3–4 mm, smooth. Fl. Jun–Jul, fr. Aug–Sep. $2n = 24$.

Plains, desert flats, open and sunny areas; near sea level to 1100 m. Xinjiang, Xizang [Afghanistan, India, Indonesia, Nepal, Pakistan; N Africa, SW Asia, Australia, S Europe].

2. *Capparis himalayensis* Jafri, Pakistan J. Forest. 6: 197. 1956.

爪钾山柑 zhua jia shan gan

Capparis spinosa Linnaeus var. *himalayensis* (Jafri) Jacobs.

Shrubs, prostrate or hanging, 50–80(–100) cm tall. New branches white pubescent with dense long to short simple trichomes, soon glabrescent. Stipular spines pale yellow, 4–5 mm, often flat, apex recurved. Petiole 2–4 mm; leaf blade ovate to

suborbicular, 1.3–3 × 1.2–2 cm, 1–1.25(–1.5) × as long as wide, fleshy when fresh but later leathery, midvein abaxially raised but gradually becoming obscure from base to apex, secondary veins 4(or 5) on each side of midvein, basal 1(or 2) pairs raised at base but inconspicuous when fresh, and abaxially raised, reticulate veins invisible on both surfaces, apex shortly mucronate. Flowers in upper axils, solitary; buds asymmetrical. Pedicel 4–9 cm, ± pubescent. Calyx zygomorphic; sepals 1.5–2 × 0.6–1.1 cm, outside with some trichomes, inside glabrous; sepals of outer whorl navicular-lanceolate, outside with several glands, basally shallowly saccate; sepals of inner whorl 1.7–3.2 cm, deeply saccate or galeate, broadest near apex, 9–15 mm deep in distal half. Petals dimorphic, ± as long as or slightly longer than anterior sepals; anterior 2 petals white, distinct, claw 3–5 mm, blade oblong-obovate and outside with trichomes; posterior 2 petals yellowish green to green, thickened, margin connate from base almost to middle, enclosed by sepals. Stamens ca. 80; filaments 1.8–2.5 cm, unequal; anthers 2–2.5 mm. Gynophore ca. 1 cm at anthesis, sometimes basally sparsely villous; ovary ellipsoid, 3–4 mm, glabrous, apically with vertical thin furrow and ridge; placentae 6–8; ovules numerous; style and stigma obscure, moundlike. Fruit dark green when dry, ellipsoid, 2.5–3 × 1.5–1.8 cm, apically with 6–8 dark red vertical thin ridges at carpel sutures, dehiscent; mesocarp red; pericarp ca. 1.5 mm thick; fruiting pedicel and gynophore 3–4 mm, 1.5–2 mm in diam., forming a right angle with each other. Seeds 40–60 per fruit, reddish brown, reniform, 3–4 mm wide, smooth. Fl. Jun–Jul, fr. Aug–Sep.

Plains, desert flats, open sunny areas; below 1100 m. Gansu (Anxi, Dunhuang), E and N Xinjiang, Xizang (Zanda) [NW India, Nepal, NE Pakistan, Tajikistan; SW Asia (Georgia)].

3. *Capparis multiflora* J. D. Hooker & Thomson in J. D. Hooker, Fl. Brit. India 1: 178. 1872.

多花山柑 duo hua shan gan

Shrubs, sometimes twining, or small trees, 3–6 m tall, to 10 cm d.b.h. Shoots glabrous or with scattered, white branched trichomes, promptly glabrescent; branches terete, slender, spineless or sometimes with small stipular spines more than 1 mm; cataphylls subulate, 2–3 mm wide at base. Petiole 8–11 mm; leaf blade broadly lanceolate to oblong, widest apically from middle, 5–10 × 2.5–3.5 cm but those subtending inflorescences 15–25 × ca. 6 cm, herbaceous, midvein abaxially thickened and obviously elevated, adaxially barely raised, secondary veins 7–10(–12) on each side of midvein and slender, reticulate veins obvious and forming intra-marginal loops, base cuneate to

abruptly contracted, apex acuminate to abruptly acuminate. Inflorescences superaxillary rows of (4–)7–10 flowers, spaced over 5–10 mm, with several rows on a branch section 10–20 cm between old and new leaves. Pedicel 0.6–1.5 cm. Sepals 3–4 × ca. 2 mm, slightly unequal; sepals of outer whorl round, slightly larger, navicular, glabrous or margin and outside sometimes distantly pubescent; sepals of inner whorl round, ovate, or obovate, slightly short and narrow, glabrous or with short pubescence, margin membranous. Petals white, oblong, ca. 5 × 1.5–2 mm, glabrous. Stamens [8–]10–12; filaments 6–9 mm; anthers 0.7–0.8 mm. Gynophore 6–12 mm; ovary ovoid, ca. 1.2 × 1 mm, glabrous or minutely pubescent; placentae 2; ovules several. Fruit globose, 8–10 mm in diam.; stipe ca. 1 mm thick. Seeds 1 or 2[or 3] per fruit, ca. 8 × 6 × 4 mm. Fl. Jun, fr. Dec.

Forested ravines; below 1500 m. S Xizang, S Yunnan [Bhutan, NE India, Myanmar, Nepal, Vietnam].

This species is reported here for the first time from Vietnam (Nin Binh Province, *N. M. Cuong et al.* 674, F, MO).

4. *Capparis zeylanica* Linnaeus, Sp. Pl., ed. 2, 1: 720. 1762.

牛眼睛 niu yan jing

Capparis hastigera Hance; *C. hastigera* var. *obcordata* Merrill & F. P. Metcalf; *C. horrida* Linnaeus f.; *C. swinhoei* Hance.

Shrubs, scandent or trailing, 2–5 m tall. New branches with cataphylls at base, densely pubescent with red brown to gray stellate trichomes, eventually glabrescent. Stipular spines strong, sharp, recurved, 1–5 mm. Petiole 5–12[–20] mm; leaf blade elliptic-lanceolate to obovate-lanceolate, sometimes elliptic, linear, or hastate, 3–8[–13] × 1.5–4[–7.5] cm, subleathery, both surfaces with dense thin gray stellate trichomes when young but soon glabrescent, midvein abaxially raised and adaxially flat or impressed, secondary veins 3–7 on each side of midvein and slender, reticulate veins obvious on both surfaces, base cuneate, rounded, or rarely nearly cordate, apex acute, rounded, or rarely slightly acuminate and often with an outwardly bent or recurved 2–3 mm leathery mucro. Inflorescences superaxillary rows, (1 or)2 or 3(or 4)-flowered, near apex of young branches, with flowers often opened before leaf formation and suggesting racemes. Pedicel 0.5–1.8 cm, slightly stout, densely shortly reddish brown stellate tomentose. Sepals 8–11 × 6–8 mm, slightly unequal, outside ± reddish brown tomentose; sepals of outer whorl nearly orbicular, 1 larger, inside concave, apex acute to obtuse; sepals of inner whorl elliptic. Petals white to rarely yellowish white, oblong, 9–15 × 5–7 mm, glabrous; apical petal pair with red flecks on central base. Stamens 30–45; filaments 3.3–4 cm; anthers 1.2–1.5 mm. Gynophore base gray tomentose; ovary ellipsoid, 1.5–2 mm; placentae 4; ovules many; stigma obvious. Fruit red to purplish red when mature, globose to ellipsoid, 2.5–4 cm in diam., verrucose; pericarp firm when dry; fruiting gynophore 3–4.5 cm × 3–6 mm, glabrous; fruiting pedicel 3–5 mm in diam., thickened, woody. Seeds 10–20 per fruit, reddish brown, 5–8 × 4–6 mm. Fl. Feb–Apr, fr. after Jul. $2n = 40, 44$.

Forest margins, thickets, limestone slopes or sandy soil, scattered grasslands; below 700 m. Guangdong (Leizhou Bandao), Guangxi (Hepu), Hainan [India, Indonesia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Indian Ocean islands].

5. *Capparis hainanensis* Oliver, Hooker's Icon. Pl. 16: t. 1588. 1887.

海南山柑 hai nan shan gan

Shrubs, erect or scandent, 2–3 m tall. Twigs terete, smooth, glabrous, base with subulate cataphylls. Stipular spines ca. 2 mm, slightly recurved, apex tan-colored. Petiole 5–12 mm, glabrous; leaf blade oblong-elliptic to elliptic, 6–9(–12) × 2.5–5(–8.3) cm, leathery, yellow and thin when dry, both surfaces glabrous, abaxially with papillae, midvein adaxially flat or slightly sunken, secondary veins 5–8(–10) on each side of midvein and abaxially thick and raised, reticulate veins dense and impressed on both surfaces, base cuneate, almost rounded, or sometimes slightly cordate, apex obtuse and often shortly mucronate. Flowers axillary, solitary or paired, forming a vertical row in apical axils, often with 1 or 2 bunches of subulate small spines between pedicel and petiole which in fruit become woody and 3–5 mm in diam. Pedicel 1–3 cm. Sepals oblong-elliptic, 1.2–2 × 0.5–0.6 cm, ± equal, apex acute; sepals of outer whorl glabrous; sepals of inner whorl shortly tomentose-pannose, margin white and thin. Petals white to sometimes purple, obovate-oblong, 2–3 × ca. 1.5 cm, glabrous. Stamens (50–)60–75; filaments (2.5–)3–4 cm; anthers ca. 2 mm. Gynophore 3–4 cm, glabrous; ovary ovoid, 5–7 mm; placentae 4; ovules many. Fruit yellow to orangish red, ellipsoid to oblong, ca. 5 × 2.5–3 cm, smooth, apex beakless; fruiting gynophore 3–5 mm in diam., woody. Seeds numerous per fruit, dark red when dry, 6–8 × 4–6 × 3–5 mm, smooth. Fl. Jul–Dec, fr. Dec–Mar.

• Forests, open shrubby areas, coastal thickets, open woods; near sea level to 600 m. Hainan.

6. *Capparis henryi* Matsumura, Bot. Mag. (Tokyo) 13: 33. 1899.

长刺山柑 chang ci shan gan

Capparis micracantha Candolle var. *henryi* (Matsumura) Jacobs.

Shrubs, scandent, ca. 2 m tall. Twigs green, terete, glabrous. Stipular spines 6–7 mm, often recurved. Petiole 0.8–2 cm, glabrous; leaf blade elliptic to slightly obovate, 8–12.5 × 4–4.5 cm, subleathery, glabrous, secondary veins 5–7(–9) on each side of midvein, abaxially raised, and arching and connected near margin, reticulate veins obvious, base rounded to slightly cuneate, apex rounded and with a mucronulate callus. Inflorescences superaxillary rows in apical axils, 2–6-flowered, often appearing before new leaves on young twigs. Pedicel 6–10 mm, sparsely and shortly pubescent when young, promptly glabrescent. Sepals ovate-elliptic, both surfaces glabrous but margin tomentose, apex acute. Petals white, linear-oblong, 8–13 × 3–3.5 mm, both surfaces shortly pubescent particularly near apex, apex obtuse. Stamens 12–16; filaments 2–3 cm; anthers 1.2–1.4 mm. Gynophore 1.8–3 cm, markedly thickened and woody in fruit; ovary almost globose, ca. 2.5 mm, glabrous, 1-loculed; placentae 4; ovules many. Fruit yellowish, globose, 2.5–3.5 cm in diam.; stipe ca. 4 mm wide. Seeds ca. 20 per fruit, ca. 10 × 5 mm.

• Thickets, second growth forests; below 300 m. E and S Taiwan.

7. *Capparis olacifolia* J. D. Hooker & Thomson in J. D. Hooker, Fl. Brit. India 1: 178. 1872.

藏东南山柑 zang dong nan shan gan

Shrubs or small trees, 1–5 m tall, with spreading branches. Twigs surrounded at base by a few cataphylls, densely fulvous or grayish tomentose with small ca. 5-armed stellate trichomes. Stipular spines slender, straight, 3–5(–8) mm, ascending or rarely spreading. Petiole 5–6 mm, with trichomes like those on twigs; leaf blade ovate, 7–13 × (3.5–)4–5(–6) cm, (2–)2.2–2.6(–3.5) × as long as wide, ± firmly herbaceous, adaxially rather glossy, surfaces soon glabrescent, midvein flat, secondary veins (5 or) 6 or 7(or 8) on each side of midvein, reticulate veins not distinct, base rounded, apex tapering and gradually acuminate, tip blunt to slightly acute and mucronulate. Inflorescences superaxillary rows, (1 or)2(or 3)-flowered. Pedicel 0.7–1.5 cm, with trichomes. Sepals 8–10 × (3–)4–5(–6) cm, margin membranous and tomentose; sepals of outer whorl navicular, ovate, surfaces glabrous but margins tomentose, apex acute; sepal of inner whorl elliptic. Petals white, (15–)17–22 × ca. 5 mm; anterior petal pairs obovate, ca. 2 mm longer than posterior pairs, outside tomentose toward apex and along margin, apex rounded; posterior petal pairs with a pale purple or yellow blotch. Stamens 34–38; filaments 2.8–3.5 cm; anthers ca. 2 mm. Gynophore 2.7–3.5 cm, often slightly swollen toward apex, glabrous; pistil 4–6 mm; ovary ellipsoid, 1–1.5 mm wide, densely tomentose; placentae 2; style ca. 2 mm, slender, glabrous; stigma knob-shaped. Fruit globose, 7.5–10 mm wide, apex beaked with persistent ca. 2 mm style; pericarp red, fairly thick. Seeds 1(–3) per fruit, 7–8 × ca. 6 mm. Fl. and fr. Apr–Jun.

Moist forests; 600–1500 m. SE Xizang [Bhutan, NE India, Myanmar, Nepal].

8. *Capparis micracantha* Candolle, Prodr. 1: 247. 1824.

小刺山柑 xiao ci shan gan

Capparis liangii Merrill & Chun.

Shrubs or small trees, sometimes scandent. Twigs nearly terete, base with subulate scales, with or without 2–4 mm stipular spines; new twigs glabrous or sparsely shortly pubescent. Petiole 1–2.2 cm; leaf blade oblong-elliptic, oblong-lanceolate, or sometimes ovate-lanceolate, (10–)15–20(–30) × (4–)6–10 cm, membranous when young but leathery when mature, often yellowish green when dry, glabrous, shiny, midvein adaxially slightly raised but central part often grooved, secondary veins (5–)7–10 on each side of midvein, reticulate veins obvious on both surfaces, base cuneate, broadly cuneate, rounded, or sometimes slightly cordate, apex obtuse, rounded, sometimes acute to shortly acuminate, or rarely emarginate. Inflorescences superaxillary rows, 2–7-flowered, above apical axils, with clusters of 1–4 subulate spines 1–1.5 mm between lowest pedicel and petiole. Pedicel ca. 6 mm for basal flowers, ca. 2 cm for apical flowers, pubescent. Sepals ovate to oblong, 6–10 × 3–4 mm, ± equal, glabrous but margin often tomentose, apex acute to obtuse. Petals white, oblong to oblanceolate, 1–2.1 × 0.3–0.7 cm, glabrous, narrowly cuneate, apex almost rounded. Stamens 20–40; filaments (1.5–)1.8–2.5 cm; anthers 1–1.5 mm. Gynophore

2–3.5 cm, glabrous; ovary ovoid to ellipsoid, 2.5–3 mm, with 4 lengthwise grooves; placentae 4; ovules many. Fruit tan, spheroid to ellipsoid, 3–7 × 3–4 cm, surface with 4 slightly obvious to not obvious vertical grooves; pericarp orangish red, ca. 3 mm thick; fruiting gynophore 4–6 mm in diam., woody. Seeds numerous per fruit, dark red, 6–8 × 4–5 × 3–4 mm. Fl. Mar–May, fr. Jul–Aug.

Forests, among shrubs; (400–)1200–2000 m. SW Guangdong, Guangxi (Hepu), Hainan (Baoting), S Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam; Indian Ocean islands].

9. *Capparis bodinieri* H. Lévillé, Repert. Spec. Nov. Regni Veg. 9: 450. 1911.

野香橛花 ye xiang yuan hua

Capparis acutifolia Sweet subsp. *bodinieri* (H. Lévillé) Jacobs; *C. subtenera* Craib & W. W. Smith.

Shrubs or small trees, (1.2–)5–8 m tall, 5–20(–30) cm d.b.h. Twigs with dense reddish brown to gray extremely thin irregular stellate trichomes, glabrescent but leaf axils with some residual trichomes. Stipular spines to 5 mm, recurved. Petiole 5–7 mm; leaf blade ovate to lanceolate, 4–13(–18) × 2–4.5(–6.5) cm, membranous and with trichomes when young but leathery and glabrescent when mature, midvein broad, abaxially raised, and adaxially slightly raised to slightly impressed, secondary veins (5–)7 or 8(–10) on each side of midvein, reticulate veins not obvious in young leaves, base rounded to cuneate but not decurrent on petiole, apex shortly acuminate, acuminate, or acute. Inflorescences superaxillary rows, (1 or)2–6(or 7)-flowered. Pedicel 1–1.2 cm, trichomes like those on branches. Sepals 5–7 mm, outside glabrescent, inside tomentose; sepals of inner whorl navicular, inwardly concave to shallowly saccate, saccate area turning red. Petals white, narrowly obovate with anterior 2 slightly longer and narrower, 1–1.1 cm, both surfaces tomentose but somewhat less so on outer surface. Stamens (18–)20–37; filaments 2–2.5 cm; anthers 1–1.7 mm. Gynophore 2–2.5(–2.9) cm; ovary ovoid, ca. 1.5 × 1 mm; placentae 2. Fruit black, globose, 1.2–1.4 cm in diam.; stipe 0.5–1 mm thick. Seeds 1 to several per fruit, 5–6 mm in diam. Fl. Mar–Apr, fr. Aug–Oct.

Among shrubs, secondary forests, limestone areas, roadsides; 700–1700(–2300) m. Guangxi, E Guizhou, SW Sichuan (Huili), Yunnan [Bhutan, NE India, N Myanmar].

10. *Capparis membranifolia* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42: 70. 1874.

雷公橘 lei gong ju

Capparis acutifolia Sweet subsp. *viminea* Jacobs; *C. viminea* J. D. Hooker & Thomson (1872), not J. D. Hooker & Thomson ex Oliver (1868); *C. viminea* var. *ferruginea* B. S. Sun; *Ficus marchandii* H. Lévillé.

Vines, shrubs, or rarely small trees, 3–6(–10) m tall, 3–15 cm d.b.h. Stem with many stipular spines; branches spineless or with small recurved stipular spines; new twigs rust-colored, densely tomentose, soon glabrescent, without or with tiny stipular spines. Petiole 5–10 mm, trichomes like those on new branches; leaf blade narrowly elliptic-lanceolate, broadest in

middle or slightly basally, 4–13 × 2–6 cm, 2–2.5 × as long as wide, membranous and densely rust-colored shortly tomentose when young but herbaceous to subleathery and glabrescent when old, often yellowish green when dry, midvein abaxially slightly raised and adaxially often impressed from central part basally, secondary veins 5–7 on each side of midvein and raised on both surfaces, reticulate veins obvious, base cuneate to broadly cuneate and decurrent on petiole, apex often constricted, acuminate, and with a 0.5–1 cm tip. Inflorescences superaxillary rows, 2–5-flowered. Pedicel (1–)1.4–1.8 cm, with proximal ones shortest. Sepals broadly elliptic, 5–6 × ca. 3 mm, ± equal, outside and inside and shortly tomentose but glabrescent, margin ciliate, apex acute. Petals white, obovate, 7–10 × 2.5–3 mm, outside glabrescent, inside tomentose, margin hyaline. Stamens 20–28(–35); filaments 2–2.5 cm; anthers ca. 1 mm. Gynophore (1.2–)1.7–2.3 cm; ovary ovoid, ca. 1 mm, 1-loculed; placentae 2. Fruit black to purplish black, globose, 0.8–1.5 cm in diam., scabrous; stipe ca. 0.5 mm thick. Seeds 1–5 per fruit, brown, 5–7 × 4–5 × 3–4 mm, smooth. Fl. Jan–Apr, fr. May–Aug.

Stony mountains, valleys, scattered forests, forest margins, roadsides, brook sides; 100–800(–1500) m. Guangdong, Guangxi, S Guizhou, Hainan, Hunan, S Xizang, S and SE Yunnan [Bhutan, Cambodia, NE India, Laos, Myanmar, Thailand, Vietnam].

11. *Capparis sabiifolia* J. D. Hooker & Thomson in J. D. Hooker, Fl. Brit. India 1: 179. 1872 [*“sabiæfolia”*].

黑叶山柑 hei ye shan gan

Capparis acutifolia Sweet subsp. *sabiifolia* (J. D. Hooker & Thomson) Jacobs; *C. vientianensis* Gagnepain.

Shrubs or small trees, erect to sometimes scandent, glabrous except for petals. Branches green when dry, terete, slender, with vertical thin stripe, without stipular spines. Petiole 5–10 mm, slightly slender; leaf blade narrowly elliptic-lanceolate, broadest at middle or sometimes slightly basally, 5–11(–17.5) × 2.5–4.5(–5.5) cm, 2–3.5 × as long as wide, herbaceous, both surfaces black when dry but particularly adaxially, midvein abaxially raised but concave at least from base to middle, secondary veins 7 or 8 on each side of midvein, arched, and connected near margin, reticulate veins not very obvious, areoles sparse, base cuneate to rounded, apex acuminate to long acuminate and with a 0.5–1.5 cm tip. Inflorescences superaxillary rows, 1–3(or 4)-flowered, apically on twigs. Pedicel 1–2 cm. Sepals 5–6 mm; sepals of outer whorl later with a shallowly saccate base; sepals of inner whorl with a ciliate margin. Petals white, oblong, ca. 8 × 2 mm, ± equal, outside essentially glabrous [or tomentose], inside tomentose. Stamens 18–22; filaments 2–2.5 cm; anthers ca. 0.8 mm. Gynophore (1.6–)2–2.5 cm; ovary ovoid, ca. 1 mm, 1-loculed; placentae 2; style and stigma obscure, only a small short beak at ovary apex. Fruit globose, 7–12 mm in diam., with thin verrucose raised areas, scabrous; fruiting pedicel and gynophore not thickened. Seed 1 or 2 per fruit, ca. 5 mm (mature seeds not seen from China). Fl. Apr–Jul, fr. Sep–Oct.

Mountain slopes, valleys, shade of thickets or forests; 300–1400 m. Hainan (Baoting), Taiwan, S Xizang, S Yunnan (Jinping, Pingbian) [NE India, Laos, Myanmar, N Thailand, Vietnam].

This species is reported here for the first time from Vietnam (Kon Tum Province, *D. K. Harder et al.* 4580, MO).

12. *Capparis sunbisiniana* M. L. Zhang & G. C. Tucker, **nom. nov.**

倒卵叶山柑 dao luan ye shan gan

Replaced synonym: *Capparis acutifolia* Sweet subsp. *obovata* Jacobs, Blumea 12: 433. 1965, not *Capparis obovata* Buchanan-Hamilton ex Candolle, Prodr. 1: 248. 1824.

Shrubs [rarely trees or vines], 1.5–2.5(–6) m tall. Stem with stipular spines; branches spineless or with small recurved stipular spines up to 2 mm; new twigs rust-colored, densely tomentose, soon glabrescent, without or with tiny stipular spines. Petiole 3–6 mm, trichomes like those on new branches; leaf blade obovate, broadest at or slightly above middle, 7–11 × 3–5 cm, 1.8–2.3 × as long as wide, herbaceous and glabrescent when old, dark green when dry, midvein abaxially slightly raised and adaxially often impressed from central part basally, secondary veins 4 or 5(or 6) on each side of midvein and raised on both surfaces, reticulate veins ± obvious, base cuneate, apex abruptly acuminate and with a 0.6–1 cm tip. Inflorescences superaxillary rows, 2–5-flowered. Pedicel (1–)1.4–1.8 cm, with proximal ones shortest. Sepals broadly elliptic, 5–6 × ca. 3 mm, ± equal, outside glabrous, inside shortly tomentose, margin ciliate, apex obtuse. Petals white, obovate, 7–10 × 2.5–3 mm, outside glabrescent, inside tomentose, margin hyaline. Stamens 20–28(–35); filaments 2–2.5 cm; anthers ca. 1 mm. Gynophore (1.2–)1.7–2.3 cm; ovary ovoid, ca. 1 mm, 1-loculed; placentae 2. Fruit black to purplish black, globose, ca. 1.2 cm in diam., barely scabrous; stipe ca. 0.5 mm thick. Seeds 3 per fruit, brown, ca. 5 × 4 × 3 mm, smooth. Fl. ?Jan–Mar, fr. ?Mar–Jul.

Roadsides, thickets; below 400 m. Hainan [Myanmar, Thailand, N Vietnam].

This rare taxon is reported here for the first time from China (Hainan, *Liu* 823, MO); this is also the first fruiting specimen.

13. *Capparis acutifolia* Sweet, Hort. Brit., ed. 2, 585. 1830.

独行千里 du xing qian li

Capparis acuminata Lindley; *C. chinensis* D. Don; *C. kikuchii* Hayata; *C. leptophylla* Hayata; *C. membranacea* Gardner & Champion; *C. membranacea* var. *angustissima* Hemsley; *C. membranacea* var. *puberula* B. S. Sun; *C. tenuifolia* Hayata.

Vines or shrubs, 1–7(–10) m tall, glabrous or twigs, petiole, and pedicels sometimes dirty yellow shortly tomentose but soon glabrescent. Twigs pale yellowish green when dry, terete, spineless or sometimes with ca. 3 mm straight or ascending stipular spines. Petiole 5–7 mm; leaf blade oblong-lanceolate to ovate-lanceolate, 4–15(–19.5) × (0.8–)1.4(–6.3) cm, stiffly herbaceous to subleathery, yellowish green and thin when dried, midvein abaxially raised and adaxially flat or impressed, secondary veins 8–10 on each side of midvein, reticulate veins obvious on both surfaces, base cuneate to sometimes rounded, apex acute to acuminate. Inflorescences superaxillary rows, (1 or)2–4-flowered. Flower buds oblong, 5–6 × ca. 4 mm. Pedicel (0.5–)1.2–1.5 cm, with proximal ones shortest. Sepals of outer whorl ovate and of inner whorl elliptic, ca. (5–)6(–7) × 3–4

mm, outside glabrate, inside tomentose. Petals white, obovate, 9–12 × 3–5 mm, both surfaces ± tomentose or outside glabrous. Stamens (19 or) 20–30; filaments 2–2.7 cm; anthers 1–1.5 mm. Gynophore (1.2–) 1.7–2.3 cm; ovary ovoid to narrowly ovoid, ca. 1 mm, glabrous; placentae 2. Fruit red, subglobose, (0.8–) 1.6–1.9 × 1.2–1.9 cm, with small verrucose areas when dry, apex with a 1–2 mm beak; stipe ca. 0.5 mm thick. Seeds 1 to several per fruit, blackish brown, 7–8(–10) × 5–6 × ca. 4 mm, smooth. Fl. Apr–May, fr. throughout year.

Roadsides, stony mountains, thickets, forests; 300–1100 m. Fujian, Guangdong, Hunan, Jiangxi (Dayu), Taiwan, E Zhejiang [Bhutan, India, N Thailand, C Vietnam].

14. *Capparis subsessilis* B. S. Sun, Acta Phytotax. Sin. 9: 110. 1964.

无柄山柑 wu bing shan gan

Shrubs ca. 3 m tall. Twigs pale green when dry, slender, terete, base without subulate scales, glabrous, spineless or with small ascending stipular spines. Petiole 1–2 mm; leaf blade elliptic to slightly obovate-elliptic, broadest at middle or sometimes slightly beyond, 9–12.5 × 3.5–5 cm, 2.5–3 × as long as wide, abaxially light green, adaxially dark green when fresh but grass-yellow when dry, both surfaces glabrous, midvein and secondary veins abaxially raised and adaxially impressed, secondary veins 9–11 on each side of midvein, rejoining before reaching leaf margin, and impressed or abaxially almost flat, base cordate, apex acuminate to long acuminate and with a 0.7–1.6 cm tip. Inflorescences superaxillary rows of 1 or 2 flowers. Flowers not seen at anthesis. Pedicel ca. 1 cm. Fruit only seen when immature, subglobose but slightly oblate, 8–9 mm in diam., surface with small slightly verrucose particles; pericarp firm when dry; fruiting pedicel 2–3 cm, slender, glabrous; fruiting gynophore 2.5–3.8 cm, slender, glabrous. Seeds 1 or 2 per fruit, pale red, reniform, 6–7 mm in diam., smooth. Fl. unknown (in bud in early Jun), fr. Aug–Oct.

Valley forests; 500–1000 m. NW and SW Guangxi (Bose, Longzhou) [N Vietnam].

This species is reported here for the first time from Vietnam (Cao Bang Province, *L. Averyanov et al. CBL 1243*, MO).

15. *Capparis tenera* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 41. 1850.

薄叶山柑 bao ye shan gan

Capparis tenera var. *dalzellii* J. D. Hooker & Thomson.

Shrubs or vines, ca. 3 m tall. Twigs with thin or incurved stipular spines; new twigs glabrous or shortly tomentose but soon glabrescent, with 3–4 mm recurved sharp stipular spines. Petiole 3–5 mm, slender; leaf blade elliptic, ovate, or obovate, 4–7 × 1.8–4 cm, 1.8–2.3 × as long as wide, herbaceous to subleathery, midvein thin and adaxially slightly impressed from middle toward base, secondary veins 4–6 on each side of midvein, reticulate veins slightly obvious, base cuneate to nearly rounded, apex acute to subacuminate and with a 3–7(–10) mm tip. Inflorescences superaxillary rows, (1 or) 2- or 3-flowered. Pedicel 1.5–2.5 cm, slender, glabrous. Sepals 4–5 × 2–3 mm, outside glabrous, inside and margin sometimes with trichomes;

sepals of outer whorl slightly broadly ovate, inside slightly concave; sepals of inner whorl slightly narrowly elliptic, apex acute to obtuse. Petals white; anterior pair 4–7 × ca. 2 mm, both surfaces tomentose; posterior pair red near base, slightly broad, slightly shorter. Stamens [8–] 14–18(–21); filaments ca. 1.5 cm; anthers ca. 1.3 mm. Gynophore 1.5–2.5 cm, glabrous; ovary pyriform, 1–1.5 mm including beaklike style, 1-loculed; placentae 2; ovules several. Fruit red when mature, globose, 7–10 mm in diam., apex rarely shortly tipped; fruiting pedicel and gynophore ca. 0.5 mm thick. Seeds 1 or 2(–4) per fruit, ca. 5 × 4 mm. Fl. Feb–Apr, mature fruit and seed not seen [fr. Aug in Thailand].

Forests; (200–) 1200–1300(–2000) m. S Xizang, W Yunnan [NE India, Myanmar, Sri Lanka, N Thailand; Africa, Indian Ocean islands].

16. *Capparis urophylla* F. Chun, J. Arnold Arbor. 29: 419. 1948.

小绿刺 xiao lü ci

Capparis cuspidata B. S. Sun; *C. tenera* Dalzell var. *caudata* B. S. Sun.

Trees or shrubs, 1.3–2.5(–7) m tall. Stipular spines on stems ca. 5 mm, stout, straight or slightly recurved, base inflated. Twigs green to yellowish green when dry, terete, slender, with vertical slender stripe, without stipular spine or with ascending and slightly incurved ca. 1 mm spines; new twigs glabrous or with extremely thin pale brown stellate trichomes, later glabrescent. Petiole 3–5 mm; leaf blade ovate to elliptic, 3–7 cm, membranous when young but herbaceous when mature, midvein abaxially raised, adaxially impressed, thinly furrowed, or flat, secondary veins 3 or 4 on each side of midvein, reticulate veins inconspicuous, base rounded to cuneate, apex attenuate into a long tail; tail falcately curved or straight, (1–) 1.5–2.5 cm, ca. 2 mm wide at middle. Inflorescences superaxillary rows, 1–3-flowered. Pedicel 6–12(–15) mm. Sepals 3–5 × 2–3 mm, outside glabrous, margin and inside tomentose; sepals of outer whorl ovate, basally shallowly saccate; sepals of inner whorl elliptic. Petals white, anterior pair elliptic and posterior pair ovate, 6–7 × 3–4 mm, distinct, outside almost glabrous, inside tomentose. Stamens 12–20; filaments 1.5–1.9 cm; anthers 1–1.3 mm. Gynophore 1.4–2.5 cm, glabrous; ovary ca. 1 mm, glabrous; placentae 2. Fruit yellow to orangish red, globose, 6–10 mm in diam., nearly smooth; stipe ca. 0.5 mm thick. Seeds (1 or) 2–4 per fruit, 5–6 mm. Fl. Mar–Jun, fr. Aug–Dec.

Roadsides, streambanks, valleys, scattered forests, thickets, often on limestone; 300–1900 m. Guangxi, S and SW Hunan, S Yunnan [N Laos].

17. *Capparis assamica* J. D. Hooker & Thomson in J. D. Hooker, Fl. Brit. India 1: 177. 1872.

总序山柑 zong xu shan gan

Shrubs 2–3 m tall. Twigs tan-colored when dry, glabrous or new branches with distant appressed short pubescence but immediately glabrescent, with cataphylls at base, without stipular spines or sometimes with ascending ca. 1 mm spines. Petiole 5–8 mm, stout, axil often with subulate bracts on sterile twigs; leaf blade oblong to oblong-lanceolate, 12–26 × 3.5–8.5 cm,

subleathery, midvein abaxially raised and adaxially deeply impressed, secondary veins 10–12 on each side of midvein and adaxially impressed, reticulate veins obvious, base cuneate, apex often acuminate. Inflorescences terminal or nearly so, racemes, 1- or 2-fascicled, 10–25 cm, 15–30-flowered; peduncle ca. 1 cm, base covered by dense subulate bracts; rachis slender, with decurrent vertical ribs, with dense appressed short rust-colored pubescence, apex with many fascicular subulate scales. Pedicel 1–2.5 cm, pubescent like rachis; bracts subulate, 1.5–2 mm, with scattered simple trichomes especially distally. Sepals ca. 3.5×1.5 –2 mm, outside sparsely shortly pubescent; sepals of outer whorl ovate, inside concave to navicular; sepals of inner whorl elliptic. Petals white, $3\text{--}4 \times 1.5$ –2 mm; anterior 2 petals elliptic, slightly smaller, basally and margin often shortly pubescent; posterior 2 petals ovate, slightly larger, basally with speckles. Stamens 12–18; filaments 5–6 mm; anthers ca. 1.2 mm. Gynophore 6–8[–11] mm; ovary ovoid, ca. 1.5×1 mm, glabrous, 1-loculed; placentae 2, each with several ovules. Fruit red, globose, 6–9 mm in diam. Seeds 1 or 2 per fruit, 4–5 mm. Fl. (Jan–)Mar–Apr, fr. Aug–Sep.

Valley forests; 500–1200 m. Guangdong, Hainan, Xizang, S and SE Yunnan [Bhutan, NE India (Assam), Laos, Myanmar, Thailand].

18. *Capparis dasyphylla* Merrill & F. P. Metcalf, Lingnan Sci. J. 16: 192. 1937.

多毛山柑 duo mao shan gan

Shrubs, scandent, 1–3 m tall. Twigs and leaves densely persistently appressed shortly pubescent, trichomes white when young and slightly brown when old. Stipular spines 1–2 mm, firm, recurved, often absent by abortion or non-existent. Petiole 2–4 mm, trichomes like those on twigs; leaf blade oblong to oblong-elliptic but variable, $4\text{--}9 \times 2\text{--}4$ cm on old branches and $2\text{--}4 \times 1\text{--}2$ cm on young branches, firmly herbaceous, deeply colored when mature, almost glabrous or midvein shortly pubescent, abaxially pale colored and with persistent trichomes, midvein adaxially flat or impressed, secondary veins 6–10 on each side of midvein, abaxially slender and raised, and adaxially indistinct, reticulate veins not obvious on both sides, base rounded to slightly cordate, apex obtuse, acute, or rarely slightly acuminate or emarginate. Inflorescences terminal on upper twigs, umbels, sessile. Pedicel (1–)1.5–2.5 cm, slender, densely shortly pubescent. Sepals ca. 6×5 mm, slightly unequal; sepals of outer whorl thinly herbaceous, outside shortly pubescent; sepals of inner whorl membranous, both surfaces glabrous. Petals white, obovate, $7\text{--}8 \times 4\text{--}5$ mm, membranous, glabrous except basally distantly pubescent. Stamens 25–45; filaments ca. 2 cm; anthers ca. 2.5 mm. Gynophore filiform, 1.5–2 cm, glabrous; ovary ovoid, 1.5–1.7 mm, glabrous; placentae 3 or 4; ovules many. Fruit blackish brown, globose, 1.1–1.5 cm in diam., smooth; fruiting pedicel and gynophore slightly thickened. Seeds 1–4, ca. 7 mm. Fl. Mar, fr. Jul.

• Thickets, forests; 100–300 m. Hainan.

19. *Capparis wui* B. S. Sun, Acta Phytotax. Sin. 9: 109. 1964.

元江山柑 yuan jiang shan gan

Shrubs or climbers, 2–4 m tall. Branches almost terete,

with recurved and hooked 1–2-mm stipular spines; new twigs slender, flat, with grooves, densely rust-colored appressed shortly pubescent but glabrescent, stipular spines absent. Petiole 1–3 mm, slightly stout, trichomes like those on branches; leaf blade elliptic to almost oblong-elliptic, $(2.5\text{--})3\text{--}7.5 \times (1.5\text{--})2\text{--}4$ cm, when young smaller, thin, and with dense short pubescence on both surfaces, when mature larger, thinly leathery, abaxially with persistent trichomes, and adaxially with sparse trichomes except on midvein, midvein abaxially raised and adaxially flat or impressed, secondary veins 5–7 on each side of midvein, slender, abaxially raised, and adaxially indistinct, reticulate veins not obvious on both sides, base slightly cordate, apex acute, almost rounded, or rarely emarginate. Flowers axillary and solitary or 2–4 in a corymb at twig apices. Pedicel 1.5–2.5 cm, shortly and densely rust-colored appressed pubescent. Sepals 8–9 mm, caducous shortly after anthesis; sepals of outer whorl concave to navicular, herbaceous, outside shortly pubescent, inside glabrous; sepals of inner whorl almost obovate, flat, nearly membranous, pubescent only on basal margin. Petals white, oblong-ovate, 1–1.2 cm, nearly equal, from base to middle thick and densely white tomentose, from middle to apex membranous, transparent, and glabrous, apex rounded. Stamens 38–41; filaments ca. 3 cm; anthers length unknown. Gynophore 3–4 cm; ovary ellipsoid, ca. 3×1.5 mm, 1-loculed; placentae 4; ovules many. Fruit gray, ellipsoid, ca. 3×1.8 cm, scabrous, apex shortly beaked; stipe 2–3 mm in diam., woody. Mature seeds not seen. Fl. Mar, fr. Aug–Sep.

• Dry hot valleys, thickets; 500–600 m. Yunnan (Yuanjiang).

The flowers are noted as fragrant. Jacobs (Blumea 12: 541. 1965) did not see the type but thought the species was close to *Capparis siamensis* Kurz of Cambodia and Thailand. However, *C. siamensis* differs from *C. wui* in having an ovate leaf blade, solitary axillary flowers, longer petals, and a tomentose gynophore and ovary. Also, *C. siamensis* has fruit with distinctive rows of small protuberances (see Chayamarit, Fl. Thailand 5(3): 256. 1991), but, unfortunately, fruit of *C. wui* have never been collected.

20. *Capparis trichocarpa* B. S. Sun, Acta Phytotax. Sin. 9: 113. 1964.

毛果山柑 mao guo shan gan

Vines, of uncertain length. Twigs grayish, terete, ca. 1 cm in diam. Stipular spines to 4 mm, stout, recurved, densely reddish tomentose at least from middle to base. Petiole almost terete, 5–7 mm; leaf blade elliptic to sometimes obovate, $3.5\text{--}6.5 \times 2\text{--}3.2$ cm, leathery, abaxially densely rust-colored tomentose, adaxially not shiny and shortly tomentose or when mature almost glabrous, midvein and secondary veins abaxially raised and adaxially impressed, secondary veins 5 or 6 on each side of midvein, reticulate veins adaxially obviously impressed, base broadly cuneate to almost rounded, apex shortly acuminate to sometimes acute or rounded and with a small callus tip or rarely emarginate to subobcordate. Flowers not seen. Inflorescences corymbs or short racemes. Fruit \pm globose to ellipsoid, $3.5\text{--}5 \times 2.8\text{--}4$ cm, densely tomentose with rusty trichomes, apex with an extremely short beak; fruiting pedicel 2–2.3 cm, ca. 4.5 mm in diam., tomentose like fruit; fruiting gynophore ca. 4.5 cm, ca. 2.5 mm in diam., base with trichomes. Seeds many per fruit. Fl. unknown, fr. from May.

- Among shrubs; 1200–1600 m. Yunnan (Menghai).

Jacobs (Blumea 12: 540. 1965), based on examination of an isotype, believed this to be *Capparis viburnifolia*. However, that species has glabrous ovaries.

21. *Capparis viburnifolia* Gagnepain, Bull. Soc. Bot. France 85: 598. 1939.

莢蒾叶山柑 jia mi ye shan gan

Shrubs or woody vines, to 6 m tall. Twigs stout, with ridges, densely rust-colored villous, eventually glabrescent. Stipular spines 2–5 mm, thick, often recurved, trichomes in proximal half like on those of branches. Petiole 0.6–1.5 cm; leaf blade elliptic, oblong, or sometimes obovate, 5–9 × (2.5–)3–5 cm, leathery, abaxially densely rust-colored villous, adaxially dark green and nearly glabrous except midvein, midvein abaxially raised and adaxially almost flat to slightly impressed, secondary veins 5–7 on each side of midvein, abaxially raised, and adaxially gradually impressed toward margin, reticulate veins abaxially not obvious and adaxially obviously slightly impressed, base broadly cuneate to subcordate, margin ± revolute, apex acute and with a 2–8-mm tip. Inflorescences terminal, corymbs, 3–4 cm wide, 3–10-flowered; peduncle absent. Pedicel 2–3 cm, ca. 2 mm in diam., with very dense trichomes. Sepals ca. 1.5 × 0.6–1 cm; sepals of outer whorl concave, almost covering inner whorl, leathery, outside densely rust-colored villous, inside glabrous; sepals of inner whorl with membranous margin. Petals white [to purple], obovate, ca. 2 × 1.5 cm, proximally white pubescent and outside especially obviously so. Stamens ca. 75; filaments ca. 2.5 cm; anthers 1.5–1.7 mm. Gynophore 2–3.5 cm, white villous near base; ovary ovoid, ca. 3 mm, apically smooth and glabrous, 1-loculed; placentae 4; ovules many. Fruit unknown. Fl. Feb–Mar.

Moist forests; 1000–1300 m. S Yunnan [N Thailand, C and N Vietnam].

22. *Capparis fohaiensis* B. S. Sun, Acta Phytotax. Sin. 9: 114. 1964.

勐海山柑 meng hai shan gan

Vines, woody. Twigs reddish brown when dry, almost terete, stout, glabrous, pith reddish brown and often with translucent areas. Stipular spines 1–3 mm, recurved, sometimes absent. Petiole nearly terete, 1–1.2 cm, 2–2.5 mm in diam.; leaf blade elliptic, 13–19 × 8–11 cm, thickly leathery, dark red when fresh, slightly shiny, both surfaces glabrous, midvein abaxially raised and adaxially impressed, secondary veins 5–8 on each side of midvein and slightly raised on both surfaces, reticulate veins visible on both surfaces, areoles loose, base cordate and slightly asymmetric, apex rounded, shortly mucronate, and often reflexed or inwardly concave. Inflorescences axillary short racemes or corymbs or axillary and at twig apex thus forming a panicle; peduncle 4–7.5 cm, glabrous; rachis short, rust-colored tomentose. Pedicel 2–3 cm, stout, trichomes like those on rachis. Sepals ca. 1.8 cm; sepals of outer whorl concave to hemispheric, thickly leathery, outside densely and shortly red tomentose, inside pink and with trichomes; sepals of inner whorl broadly elliptic, almost flat, thinner, with reddish brown trichomes. Petals membranous, ± equal, both surfaces

glabrous. Stamens ca. 110; filaments 1–1.2 cm; anthers ca. 4 mm. Ovary ovoid, ca. 3 mm, 1-loculed, glabrous; placentae (3 or)4; ovules many. Fruit often almost dark red, ellipsoid, 9–13 × 5–7.5 cm, smooth or slightly roughened, apex with a very short thick tip; pericarp pink, 6–10 mm thick; fruiting pedicel markedly thickened, glabrous; fruiting gynophore 4–5 cm, 4–10 mm in diam., woody, glabrous. Seeds many per fruit, dark red, ca. 2 × 1.2 cm, smooth. Fl. Jun, fr. Oct–Nov.

- Riversides, secondary forests; 400–1000 m. S Yunnan.

Jacobs (Blumea 12: 540. 1965), based on examination of an isotype, believed this to be *Capparis sikkimensis* subsp. *yunnanensis* (treated here as *C. yunnanensis*).

23. *Capparis formosana* Hemsley, Ann. Bot. (London) 9: 145. 1895.

台湾山柑 tai wan shan gan

Capparis kanehirae Hayata ex Kanehira; *C. sikkimensis* Kurz subsp. *formosana* (Hemsley) Jacobs.

Vines, woody, to 30 cm d.b.h. Twigs dark red to dark blackish brown, stout, glabrous, with or without stipular spines; new twigs densely very thin grayish pubescence of simple trichomes. Stipular spines stout, firm, recurved, to 5–6 mm, base to 7 mm wide. Petiole 1.5–2.5 cm, stout, glabrous; leaf blade oblong to sometimes ovate or obovate-oblong, 10–18 × 3.5–8.5 cm, thickly leathery, both surfaces glabrous, abaxially slightly pale colored, adaxially bright green and slightly shiny, midvein abaxially raised and adaxially impressed, secondary veins 6–8 on each side of midvein, reticulate veins obvious, base broadly cuneate to rounded, apex obtuse, rounded, or sometimes acute. Inflorescences axillary or terminal, umbels, 3–8(–20)-flowered; peduncle to 10 cm. Flowers fragrant. Pedicel 3–4 cm, with extremely thin grayish pubescence. Sepals 0.7–2 cm; sepals of outer whorl nearly orbicular, extremely concave, thick, fleshy, outside with brownish pubescence, inside glabrous; sepals of inner whorl nearly petal-form, thinner, margin broad and thin, apically forming a short hood. Petals white, obovate, 1.2–2.7 × 0.5–0.8 cm, inside with trichomes. Stamens 30–120; filaments ca. 1.5 cm; anthers ca. 2.5 mm. Gynophore 3–3.5 cm; ovary ellipsoid, ca. 5 mm, glabrous; placentae 3 or 4; ovules many. Fruit deep purple, globose, ellipsoid, or ovoid, 4–5.5 cm in diam., surface smooth or sometimes irregularly verrucose; pericarp 5–7(–10) mm thick, woody; fruiting pedicel and gynophore roughly equal, both 6–8 cm, 5–11 mm in diam., woody. Seeds 12–15 per fruit, nearly ellipsoid, slightly flat, ca. 2 × 1.5 × 1.2 cm, smooth; seed coat ca. 1.5 mm thick. Fl. Apr–May, fr. Aug–Feb.

Dense montane forests; 700–1000(–2400?) m. S Guangdong, Hainan, S and SE Taiwan [Japan (Ryukyu Islands), N Vietnam].

This species is reported here for the first time from Vietnam (Ninh Binh Province, Vinh 87, F, NY), previously misidentified as *Capparis fohaiensis*.

24. *Capparis yunnanensis* Craib & W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 91. 1916.

苦子马槟榔 ku zi ma bing lang

Capparis bhamoensis Raizada; *C. sikkimensis* Kurz subsp. *yunnanensis* (Craib & W. W. Smith) Jacobs.

Shrubs or vines, 2.5–6 m tall. Branches pale purplish brown when dry, almost terete, pith pale red; new twigs slightly flat, with grooves, densely short tan pubescent, later glabrescent. Stipular spines to 5 mm, stout, recurved, often aborted or absent on flowering twigs. Petiole ca. 1 cm, trichomes like those on branches; leaf blade elliptic, elliptic-lanceolate, or sometimes nearly obovate, often tan-colored when dry, glabrous but abaxially slightly shortly pubescent when young but glabrescent, midvein abaxially raised and adaxially impressed, secondary veins 6–8 on each side of midvein and adaxially indistinct, reticulate veins not obvious, base broadly cuneate to rounded, apex rounded, obtuse, or sometimes acute. Inflorescences axillary subumbels or on flowering twig central and apical part together forming a terminal panicle, 3–7-flowered, with abortive leaflets; peduncle 2–6 cm, with dense tan trichomes. Pedicel 1.5–4[–5] cm, trichomes like those on peduncle. Sepals 1–1.7 cm; sepals of outer whorl nearly orbicular, inwardly concave, leathery, outside densely tan tomentose; sepals of inner whorl nearly flat, thin. Petals white, obovate, ca. 2 × 1.5 cm, membranous, inside tomentose. Stamens (60–)85–95; filaments 3–3.5 cm, basally hairy; anthers ca. 2 mm. Gynophore 3–4 cm, glabrous; ovary ovoid, ca. 3 mm, glabrous, apex with small mucronulate tip; placentae 4; ovules many. Fruit tan when dry, ellipsoid to nearly globose, (3–)4–7 × 3–5 cm, smooth, apex acute to shortly beaked; fruiting pedicel and gynophore together 7–9 cm, 3–7 mm in diam., thickened, woody. Seeds many per fruit, tan, 1.5–2 × ca. 1.3 × 1 cm, smooth. Fl. Mar–Apr, fr. Oct–Dec.

Valleys, mixed forests; 1200–2300 m. Guangdong, S and W Yunnan [N Myanmar, N Thailand, N Vietnam].

25. *Capparis masakai* H. Léveillé, Fl. Kouy-Tchéou, 59. 1914–1915.

马槟榔 ma bing lang

Capparis sikkimensis Kurz subsp. *masakai* (H. Léveillé) Jacobs.

Shrubs or climbers, to 7.5 m tall. New branches reddish, slightly flat, with vertical ridges and stipular stripes, densely shortly rust-colored tomentose. Stipular spines to 5 mm but often absent on flowering twigs, stout, recurved, sulcate, hollow, base inflated, apex sharp. Petiole 1.2–2.1 cm, ca. 2 mm in diam., trichomes like those on branches; leaf blade elliptic, oblong, or sometimes elliptic-obovate, 7–20 × 3.5–9 cm, nearly leathery, often dark reddish brown when dry, abaxially densely rust-colored shortly tomentose but glabrescent, adaxially almost glabrous, midvein slightly broad, abaxially lavender and raised, and adaxially impressed, secondary veins 6–10 on each side of midvein and abaxially lavender and slightly raised, reticulate veins not obvious, base rounded to broadly cuneate, apex rounded to obtuse or sometimes acute to acuminate. Inflorescences axillary subumbels or axillary and terminal together forming a 10–20-cm panicle, 3–8-flowered, densely rust-colored shortly tomentose, often with abortive leaflets; peduncle 1–5 cm. Pedicel 3–4 cm. Sepals 8–12 × 5–8 mm, outside densely rust-colored shortly tomentose, inside glabrous; sepals of outer whorl inwardly concave to hemispheric, leathery; sepals of inner whorl slightly inwardly concave, thin. Petals white

to pink, 1.2–1.5 cm, both surfaces tomentose; apical petal pair broadly oblong-obovate, base wrapping disk; basal petal pair narrowly oblong. Stamens 45–50(–65); filaments ca. 1.5 cm; anthers 2–3 mm. Gynophore 2–3 cm, glabrous; ovary ovoid, 2–3 × 1–1.5 mm, apically with several vertical ridges and grooves, glabrous; placentae (3 or)4, each with 7–9 ovules. Fruit reddish purplish brown when mature and dry, globose to nearly ellipsoid, 4–6 × 4–5 cm, with 4–8 vertical rib ridges, crest 3–6 mm tall, apex with a ca. 1.5-cm beak; fruiting pedicel and gynophore together 4.5–7 cm, 3–5 mm in diam., thickened, woody; pericarp reddish purple, ca. 5 mm thick, stiffly leathery. Seeds more than 10 per fruit, reddish purplish brown, ca. 1.8 × 1.5 × 1 cm. Fl. May–Jun, fr. Nov–Dec.

• Valleys, dense forests, slopes, limestone areas; below 1600 m. Guangdong, Guangxi, S Guizhou, SE Yunnan.

26. *Capparis sikkimensis* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 43: 181. 1875.

锡金山柑 xi jin shan gan

Capparis cathcartii Hemsley ex Gamble.

Shrubs, vines, or small trees, 4–6 m tall. Branches pale purplish brown when dry, almost terete, pith pale red; new twigs slightly flat, with grooves, densely light reddish brown pubescent with simple trichomes, later glabrescent. Stipular spines to 5 mm, stout, recurved, often aborted or absent on flowering twigs. Petiole 1–2 cm, trichomes like those on branches; leaf blade elliptic, elliptic-lanceolate, or ovate, 7–12 × 3–7 cm, often tan-colored when dry, glabrous but abaxially slightly shortly pubescent when young but glabrescent, midvein abaxially raised and adaxially impressed, secondary veins 6–8 on each side of midvein and adaxially indistinct, reticulate veins not obvious, base broadly cuneate to rounded, apex rounded, obtuse, or sometimes acute. Inflorescences axillary subumbels or axillary and on flowering twigs and together forming a terminal panicle, 3–10-flowered; peduncle 2–6 cm, with dense tan trichomes. Pedicel 1.5–5 cm, trichomes like those on peduncle. Sepals 7–9 mm; sepals of outer whorl nearly orbicular, inwardly concave, covering inner whorl, leathery, outside densely tan tomentose; sepals of inner whorl nearly flat, thin. Petals white, obovate, 2(–3) cm × 7–9 mm, membranous, inside tomentose. Stamens 28–36; filaments ca. 1 cm; anthers 3–4 mm. Gynophore 2–4 cm, glabrous; ovary ovoid, 2–4 mm, glabrous; placentae 4; ovules many. Fruit tan when dry, globose, 2.5–4 × 2–3.5 cm, smooth, apex acute to shortly beaked; fruiting pedicel and gynophore together 7–9 cm, 3–5 mm in diam., thickened, woody. Seeds 4–8 per fruit, tan, 1.5–2 × ca. 1 cm, smooth. Fl. May–Jun, fr. Sep–Nov.

Open forests; 1200–1800 m. Xizang [Bhutan, NE India, C Myanmar].

27. *Capparis sepiaria* Linnaeus, Syst. Nat., ed. 10, 2: 1071. 1759.

青皮刺 qing pi ci

Capparis flexicaulis Hance; *C. glauca* Wallich ex J. D. Hooker & Thomson.

Shrubs, sometimes scandent, 0.6–3 m tall. Twigs thick,

zigzagged, with dense ash-yellow pubescence when young then glabrescent. Stipular spines 2–5 mm, stout, sharp, recurved. Petiole 3–6 mm, densely shortly pubescent; leaf blade oblong-elliptic, oblong-ovate, or sometimes linear-oblong, 2–5(–7) × (0.8–)1–2(–3.2) cm, herbaceous to subleathery, abaxially with persistent trichomes at least on midvein, adaxially pale green when dry, glabrous or soon glabrescent, and slightly shiny, midvein abaxially raised and adaxially flat but slightly impressed near base, secondary veins 4–6(–9) on each side of midvein and slender, reticulate veins not obvious, base cuneate, rounded, or sometimes slightly cordate, apex obtuse, rounded, or often emarginate. Inflorescences terminal on lateral shoots, subumbellate or shortly racemose, sessile, (6–)10–22(–25)-flowered; rachis 0.5–3.5 cm, densely pubescent. Flowers fragrant. Pedicel 0.8–2 cm, slender, glabrous. Sepals ovate, 3–5 × 3–4 mm; sepals of outer whorl concave, herbaceous, glabrous, margin narrowly membranous; sepals of inner whorl slightly smaller, thin, margin broadly membranous. Petals white, oblong-obovate, 4–6 × 1.5–3 mm, membranous, ± pubescent. Stamens 25–45; filaments 5–6 mm, rather crinkled; anthers ca. 0.5 mm. Gynophore 7–10(–12) mm, slender, often shortly pubescent near base; ovary ovoid, ca. 1.5 mm, glabrous; placentae 2. Fruit dark brown when dry, globose, ca. 1 cm in diam., smooth; fruiting pedicel slender, 1–1.5 cm; fruiting gynophore 4–10 mm. Seeds 1–4 per fruit, 6–8 × 3–4 mm. Fl. Apr–Jun, fr. Aug–Dec. $2n = 40$.

Seasides, slopes, thickets or scattered forests; near sea level to 300 m. S Guangdong, S Guangxi, Hainan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, NE Australia, Indian Ocean islands, Madagascar].

28. *Capparis pubiflora* Candolle, Prodr. 1: 246. 1824.

毛蕊山柑 mao rui shan gan

Capparis cerasifolia A. Gray; *C. lutoensis* C. E. Chang.

Shrubs or trees, 2–6 m tall. New branches with dense silky branched trichomes, promptly or eventually glabrescent, at base with needlelike cataphylls ca. 1 mm. Stipular spines 3–6 mm, flat or slightly recurved, sometimes absent. Petiole 6–8(–12) mm; leaf blade oblong-lanceolate to rarely nearly obovate, 6–15.5 × (1.6–)2.5–6 cm, ± leathery, grass-yellow to olive-colored when dry, midvein abaxially raised and adaxially almost flat, secondary veins (6 or)7–10(–12) on each side of midvein, thin, and yellow, reticulate veins obvious, base cuneate, broadly cuneate, or sometimes nearly rounded, apex acuminate with a tip to 2 cm, sometimes abruptly acute, or rarely obtuse. Inflorescences axillary, racemes, 1–5(–10)-flowered; rachis base and apex with subulate scales 1–2.5 mm. Pedicel 1–2[–4] cm, tomentose at anthesis but later glabrescent, base with a narrow bract. Sepals 4–6 × 2.5–4 mm, ± equal, outside shortly pubescent; sepals of outer whorl with apex acute to obtuse; sepals of inner whorl with apex obtuse to rounded. Petals white, pink, or pale green, oblong-obovate, 8–10 × 3–4 mm, apex outside tomentose. Stamens 20–30; filaments 2–3 cm; anthers 0.7–1.2 mm. Gynophore 1.5–2.5 cm, densely white tomentose at anthesis but glabrescent in fruit; ovary ellipsoid, ca. 1.5 × 1 mm, densely white tomentose at anthesis but later glabrescent; placentae 2 or 3; ovules many. Fruit black, subglobose to almost

ellipsoid, 8–10(–20) mm in diam., glabrous, smooth or verruculose, apex umbonate; pericarp solid; stipe ca. 0.5 mm thick. Seeds 5–15(–25) per fruit, black, ca. 6 × 5 × 4 mm. Fl. Mar–May, fr. Jul–Dec.

Thickets, forests; below 1100 m. Guangdong, E Guangxi, Hainan, Taiwan (Huoshao Dao) [Indonesia, Malaysia, New Guinea, Philippines, Thailand, Vietnam].

29. *Capparis pachyphylla* Jacobs, Blumea 12: 476. 1965.

厚叶山柑 hou ye shan gan

Shrubs or small trees, 4–15 m tall, with scandent branches. Twigs tan, nearly terete, with simple fulvous trichomes curved distally, gradually glabrescent, with cataphylls at base. Stipular spines 1–3 mm, spreading to recurved, with trichomes, base conic. Petiole 3–5 mm; leaf blade elliptic, 8–13 × 4–5.7 cm, decidedly leathery, abaxially shortly pubescent, adaxially glabrous, midvein adaxially flat or grooved basally or over entire length, secondary veins 5–7 on each side of midvein and abaxially obvious, reticulate veins not obvious, base subcordate, apex obtuse to rounded and mucronulate. Inflorescences at apex on lateral branches forming short racemes, or axillary and terminal on lateral twigs thus forming a panicle, 3–6-flowered; peduncle 2–3 cm, trichomes like those on new twigs. Pedicel 5–7 mm. Sepals 5–6 mm; sepals of outer whorl inwardly concave, outside shortly pubescent, inside glabrous; sepals of inner whorl obovate, ± same size, nearly flat, outside shortly tomentose at middle, inside glabrous. Petals white to purple, obovate-oblong, ca. 7 × 3–4 mm, glabrous except for marginal fringe of trichomes. Stamens ca. 33. Gynophore 2.5–3 cm, glabrous; ovary ellipsoid, ca. 1 mm, glabrous; placentae 2; ovules many. Fruit unknown. Fl. Mar–Apr.

Steep banks and gorges; 600–1200 m. SE Xizang [NE India (Aka Hills, Assam)].

This species is most similar to *Capparis cataphyllosa* Jacobs of NE India (Manipur) and *C. cinerea* Jacobs of N Myanmar. The preceding description is based on that of Jacobs (Blumea 12: 476–477. 1965).

30. *Capparis pubifolia* B. S. Sun in C. Y. Wu, Fl. Yunnan. 2: 64. 1979.

毛叶山柑 mao ye shan gan

Vines, woody. Stems with hooked stipular spines but spines on fruiting branches aborted and becoming very small papillary raised areas or absent; twigs 2–3 mm in diam., densely ash-yellow then grayish pannose-tomentose. Petiole 0.9–1.1 cm, trichomes like those on twigs but denser; leaf blade ovate to elliptic, 5–9 × 2.5–4 cm, olive-colored when dry, slightly shiny, abaxially densely ash-yellow persistently pannose-tomentose, adaxially glabrescent when mature except for residual trichomes on midvein, midvein adaxially impressed and particularly obvious at both ends, secondary veins 10–12 on each side of midvein, at an angle of ca. 60° from midvein, nearly parallel, abaxially raised and with particularly dense trichomes, and adaxially slender and slightly raised, reticulate veins invisible on both surfaces. Inflorescences axillary corymbs or short racemes or both axillary and terminal forming a panicle; peduncle to 2 cm, trichomes like those on twigs. Flow-

ers not seen. Fruit brown when dry, nearly globose, 3–3.5 × 2–2.6 cm, smooth, apex not beaked; sarcocarp red; fruiting pedicel ca. 1.7 cm, ca. 2 mm in diam., residual trichomes visible; fruiting gynophore 3–3.5 cm, ca. 2 mm in diam. at middle, thickened, woody, glabrous. Seeds many per fruit, mature ones not seen. Fl. unknown, fr. Oct and later.

• Thickets, slopes; 800–1300 m. Guangxi (Ningming), Yunnan (Funing).

31. *Capparis cantoniensis* Loureiro, Fl. Cochinch. 1: 331. 1790.

广州山柑 *guang zhou shan gan*

Capparis pumila Champion ex Bentham; *C. sciaphila* Hance; *Cudrania bodinieri* H. Léveillé; *Vanieria bodinieri* (H. Léveillé) Chun.

Shrubs, scandent, 2–5 m tall. Older twigs cylindrical, nearly glabrous, internode 1–4 cm; twigs light gray to light green, straight and not bent, with ridge angle when young, pale yellow pubescent. Stipular spines firm, flat or recurved, 2–5 mm, on flower twigs small or absent, apex often dark black. Petiole 4–6(–10) mm, trichomes like those on twigs; leaf blade oblong, oblong-lanceolate, or sometimes ovate, 5–10(–12) × 1.5–4 cm, nearly leathery, abaxially orangish red when young but reddish brown when dry, adaxially pale green when dry, glabrous or when young midvein on both surfaces apically sparsely shortly pubescent but glabrescent, midvein abaxially raised and adaxially impressed, secondary veins 7–10(–12) on each side of midvein and inconspicuous, base cuneate to broadly cuneate, apex often acuminate and shortly mucronate. Inflorescences axillary and subumbellate or axillary and terminal thus forming a panicle, to 11-flowered; peduncle 1–3 cm, trichomes like those on twigs; bracts early falling, subulate, 1–2 mm; bractlets small, sometimes absent. Flowers fragrant or not. Pedicel 7–12 mm. Sepals 4–5 × ca. 3 mm; sepals of outer whorl navicular, outside shortly pubescent particularly near base, inside glabrous, margin membranous and glabrous; sepals of inner whorl elliptic to obovate, slightly smaller, margin white, membranous, and with white cilia. Petals white, obovate to oblong, 4–6 × 1.5–2.5 mm, inside basal and central parts white pubescent. Stamens 20–45; filaments white when fresh but red when dry, 0.8–1.5 cm; anthers 0.7–0.8 mm. Gynophore 6–8(–12) mm, glabrous; ovary nearly ellipsoid, ca. 1.5 × 1 mm, glabrous; placentae 2. Fruit spheroid to ellipsoid, 1–1.5 cm in diam., smooth; pericarp thin, leathery. Seeds 1 to several per fruit, globose or nearly ellipsoid, 6–7 mm. Fl. and fr. almost all year.

Wet and shaded water sides, hillsides, shrub thickets, open forests; near sea level to 800(–1100) m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, S and SE Yunnan [Bhutan, E India, Indonesia, Myanmar, S Philippines, Thailand, Vietnam; Indian Ocean islands].

32. *Capparis floribunda* Wight, Ill. Ind. Bot. 1: 35. 1838.

少蕊山柑 *shao rui shan gan*

Capparis oligostema Hayata.

Shrubs or climbers, 2–4 m tall. Twigs glabrous or sparsely dark yellow shortly pubescent, without stipular spine or with reflexed small spines. Petiole 0.5–1.5 cm; leaf blade oblong-ovate to oblong-obovate, (4–)6–10(–13) × (1.5–)2–4(–6) cm,

slightly fleshy when fresh, firmly herbaceous when dry, light green, both surfaces glabrous, midvein abaxially raised and adaxially flat or slightly impressed, secondary veins 7–9 on each side of midvein, slender, abaxially not obvious, and adaxially slightly raised, reticulate veins obscure, base rounded to cuneate, margin often revolute, apex obtuse to slightly mucronate. Inflorescences terminal panicle of many subumbels, to 15 cm, often also with axillary small panicles; peduncle 1–2 cm. Pedicel 1–1.5 cm. Sepals elliptic to nearly orbicular, 2–4 × 1.5–2.5 mm, ± equal, spreading, inwardly concave, caducous after anthesis; sepals of inner whorl with broad membranous margin. Petals white, oblong to ovate, 3–5 × 1.5–2 mm, extremely thin. Stamens 7–9(–12); filaments 8–10 mm; anthers 2–2.5 mm with thin tip. Gynophore 4–6 mm, glabrous; ovary ovoid, 1.5–2 mm, glabrous; placentae 4. Fruit orangish red, globose, 1.5–2(–2.5) cm in diam., smooth; fruiting pericarp thin, leathery. Seeds 1–3 per fruit, 10–12 × ca. 6 mm. Fl. May, fr. Jan.

Seasonal forests, thickets; below 200 m. S Taiwan (Pingdong) [Indonesia, Myanmar, Philippines, Sri Lanka, C and S Thailand, S Vietnam; Indian Ocean islands].

The flowers and fruit are unknown for Chinese specimens.

33. *Capparis chingiana* B. S. Sun, Acta Phytotax. Sin. 9: 115. 1964.

野檳榔 *ye bing lang*

Shrubs or climbers, to 5 m tall. Twigs black when dry, terete, rust-colored shortly pubescent when young but glabrescent. Stipular spines to 5 mm, stout, recurved, apex sharp. Petiole 5–10 mm, trichomes like those on twigs; leaf blade obovate-oblong, obovate-elliptic, or sometimes elliptic, 3.5–8.5 × 1.8–4 cm, thinly leathery, yellowish green to dark brown when dry, both surfaces glabrous except abaxial midvein with sparse short pubescence but glabrescent, midvein abaxially raised and adaxially impressed or flat, secondary veins 4 or 5 on each side of midvein, slender, abaxially obvious, and adaxially not obvious, reticulate veins not obvious on both surfaces, base cuneate to rounded, apex acute, obtuse, or rounded and sometimes shortly tipped. Inflorescences axillary corymbs or short racemes or axillary and on branch apex together forming a panicle, 10–15-flowered; peduncle 2–4 cm, with a spine at base; axis densely rust-colored shortly tomentose. Pedicel 0.7–1.7 cm, with a pair of yellow sharp spines at base, trichomes like those on rachis. Sepals ca. 7.5 × 4–5 mm; sepals of outer whorl inwardly concave to navicular, outside rust-colored shortly pubescent, inside glabrous; sepals of inner whorl obovate, glabrous. Petals narrowly orbicular, 8–9 × ca. 3 mm, glabrous except margins basally ciliate. Stamens 35–40; filaments length unknown; anthers length unknown. Gynophore 1.5–2 cm; ovary ovoid, ca. 2 × 1.5 mm; placentae 4; ovules many. Fruit purplish black when mature, globose, 1.5–4 cm in diam., smooth; fruiting gynophore 2–3 mm in diam., thickened, woody. Seeds 7–9 or more per fruit, reddish brown, ca. 10 × 8 × 5 mm, smooth. Fl. Mar–May, fr. Nov–Dec.

• Thickets or forests on stony mountains; below 1000 m. N and W Guangxi, SE Yunnan.

Jacobs (Blumea 12: 540. 1965) surmised this is a subspecies of *Capparis sikkimensis*.

34. *Capparis lanceolaris* Candolle, Prodr. 1: 248. 1824.

兰屿山柑 lan yu shan gan

Shrubs, scandent or trailing, ca. 1.5 m tall. Twigs mostly hanging, not squamate, with appressed trichomes, often with recurved stipular spines to 7 mm. Petiole 7–11 mm; leaf blade oblong, 4–8[–15] × 2–4[–6] cm, subleathery, glabrous but abaxially often slightly yellowish brown pubescent, secondary veins 6–10 on each side of midvein, base rounded to rarely nearly cordate, margin ± revolute, apex acuminate to rarely rounded or emarginate but often with an acute mucronulate tip. Inflorescences mostly axillary and sometimes terminal, umbellate, 6–9-flowered. Pedicel 2.5–3.5 cm, glabrous, base with a pair of ca. 2-mm spines or spineless. Sepals (5–)6–7 × ca. 5 mm, glabrous, margin membranous; sepals of outer whorl herbaceous; sepals of inner whorl flat, thinner, distinct while in bud, margin rarely with small cilia. Petals white [yellowish white, pink, or red, rarely tinged with pale green outside], obovate, 8–11 × 4–6 mm, base with many trichomes. Stamens 20(–40); filaments 2–3 cm; anthers ca. 1 mm. Gynophore 2–3[–4.5] cm; ovary ellipsoid, 1–2 mm, glabrous; placentae 3 or 4. Fruit pale bluish black, subglobose to globose, 1–1.2 × 1–1.2 cm. Seeds 3 or more per fruit, 8–12 × 5–12 mm. Fl. Jun–Jul, fr. from at least Jul.

Thickets and trailsides, stony soils; sea level to 300 m. Hainan, Taiwan (Lan Yu) [Indonesia, New Guinea, Philippines; SW Pacific islands].

35. *Capparis khuamak* Gagnepain, Bull. Soc. Bot. France 85: 598. 1939.

屏边山柑 ping bian shan gan

Capparis trichopoda B. S. Sun.

Shrubs, scandent, 4–15 m tall. Twigs tan, nearly terete, densely yellowish gray then tan-colored tomentose, gradually glabrescent, usually with stipular spines but sometimes spines not obvious or absent; new twigs yellowish gray, flat, with hollow sulcus and raised ridge. Stipular spines to 3 mm, recurved, hooked, with trichomes, base conic. Petiole 1.2–1.8 cm, with dense trichomes, adaxially with a narrow groove; leaf blade elliptic, 5–11 × 2–4.5 cm, nearly leathery, both surfaces glabrous or when young abaxial midvein sparsely shortly pubescent, midvein abaxially raised and adaxially impressed to thinly grooved, secondary veins 5–9 on each side of midvein but not obvious on both surfaces or abaxially sometimes visible, reticulate veins not obvious, base rounded, apex obtuse to acute and often shortly mucronate. Inflorescences at apex of lateral branches or axillary and terminal on flowering twigs, panicles of corymbs or short racemes, with few leaves, 6–10-flowered; peduncle 2–4 cm, trichomes like those on new twigs. Sepals ca. 8 mm; sepals of outer whorl inwardly concave to navicular, outside shortly pubescent, inside glabrous; sepals of inner whorl obovate, nearly flat, outside shortly tomentose at middle, inside glabrous. Petals white, obovate-oblong, 9–12 × 3–4 mm, roughly equal, outside glabrous, inside shortly tomentose from base to middle. Stamens 20–28; filaments 2–2.5 cm; anthers 2–2.5 mm. Gynophore 2.5–3 cm, glabrous; ovary ellipsoid, glabrous; placentae 3 or 4; ovules many. Fruit globose, 3–4 cm in diam., scabrous; pericarp ca. 3 mm thick; sarcocarp

pink, with an odor. Seeds ca. 20 per fruit, ca. 1.5 × 1 cm. Fl. May, fr. unknown for China.

Wet areas, scattered forests; 1300–1400 m. SE Yunnan (Dawei Shan, Pingbian) [Laos, Vietnam].

36. *Capparis fengii* B. S. Sun, Acta Phytotax. Sin. 9: 113. 1964.

文山山柑 wen shan shan gan

Shrubs, scandent, to 10 m tall, smooth, glabrous except on petals. Twigs with yellow hemispheric raised areas; new twigs dark brown but tan-colored when dry, nearly terete, obviously sulcate, pith white. Stipular spines 2–3 mm, stout, recurved. Petiole subterete, 5–11 mm; leaf blade orbicular-lanceolate, 9–12 × 3–4 cm, firmly papery when mature, both surfaces yellowish green when dry, midvein dark red, slightly broad, abaxially raised, and adaxially impressed, secondary veins 9 or 10(–13) on each side of midvein, slender, and slightly raised on both surfaces, reticulate veins not very obvious, base cuneate and slightly asymmetric, apex acute to acuminate and with a 2–3-mm mucronate tip. Inflorescences axillary and terminal, corymbs, 3–5-flowered, without microphylls; peduncle flat, 1–3 cm. Pedicel 1.5–3 cm. Sepals ca. 9 × 7 mm, caducous after anthesis, both surfaces glabrous; sepals of outer whorl inwardly concave to navicular; sepals of inner whorl obovate, nearly flat. Petals at first white then red, obovate-oblong, ca. 1.5 cm, outside densely shortly tomentose from base to middle, inside with trichomes throughout. Stamens ca. 35; filaments 2.5–3 cm; anthers 3–4 mm. Gynophore 3–5 cm; ovary nearly globose, 2–2.5 × 1.5–2 mm, apex with an extremely short beak; placentae 4, each with a few ovules. Fruit dark tan-colored when dry, nearly globose, 5.5–6 × ca. 5 cm, with dense thin verrucose raised areas; pericarp pale red, ca. 2 mm thick; fruiting pedicel thickened, ca. 3 mm in diam., woody; fruiting gynophore thickened to ca. 3 mm in diam., woody. Seeds 20–30 per fruit, ca. 2 × 2 × 1.3 cm. Fl. Apr–May, fr. Oct.

• Valleys, wet areas, thickets or forests; 400–1300 m. SE Yunnan.

Jacobs (Blumea 12: 540. 1965) thought this may be a synonym of *Capparis versicolor*, but it has larger leaves and other differences (summarized in the key).

37. *Capparis versicolor* Griffith, Notul. Pl. Asiat. 4: 577. 1845.

屈头鸡 qu tou ji

Capparis koi Merrill & Chun.

Shrubs or vines, (1.3–)2–10 m tall, 4–6 cm d.b.h. New branches shortly brown pubescent, glabrescent, but in petiole and node always with residual trichomes. Stipular spines stout, flat or slightly recurved, apex black, sometimes reduced to papillary raised area. Petiole 5–9 mm; leaf blade elliptic to oblong-elliptic, 3.5–8 × 1.5–3.5 cm, subleathery, midvein abaxially pale yellow, raised, and adaxially narrow and impressed, secondary veins 6–9 on each side of midvein, abaxially nearly flush, and adaxially slightly raised, reticulate veins sparse and not obvious, base cuneate, apex acute to obtuse and often emarginate. Inflorescences axillary and/or terminal, umbelliform corymbs, (1 or)2–5-flowered; peduncle 1–5 cm, stout, often with sharply ridged angles, apex often with (1 or)2(or 3)

reduced leaves. Flowers fragrant. Pedicel 1.5–3 cm, stout. Sepals 9–11 × 8–10 mm, glabrous; sepals of outer whorl inwardly concave to navicular, nearly orbicular; sepals of inner whorl elliptic. Petals white, purple, or pink, nearly orbicular to obovate, 1.2–1.7 × 0.7–1.4 cm, glabrous or inside shortly pubescent near base. Stamens 50–70; filaments 2.5–3.5[–4.5] cm; anthers 1.5–2.3 mm. Gynophore 3–5 cm, glabrous; ovary ellipsoid, ca. 2 mm, glabrous; placentae 4; ovules many. Fruit black, globose, 3–5 cm in diam., scabrous, sometimes with a few

nodulate verrucose raised areas; pericarp 2–3 mm thick, solid when dry; fruiting pedicel and gynophore 3–5 mm in diam., thickened, woody. Seeds ca. 15 per fruit, nearly polygonal, 1.7–2.4 × 1.2–1.5 × 0.9–1.2 cm. Fl. Apr–Jul, fr. (Jul–)Aug–Feb(–Apr).

Slightly dry areas, sandy areas, scattered forests or among shrubs; 100–1000 m. Guangdong, Guangxi, Hainan [India (Assam), Malaysia (peninsular), Myanmar, S Thailand, Vietnam].

4. STIXIS Loureiro, Fl. Cochinch. 1: 290, 295. 1790.

班果藤属 ban guo teng shu

Roydsia Roxburgh.

Woody vines [or clambering shrubs]. Twigs often with lenticels. Stipular spines absent. Leaves alternate, simple; petiole sometimes geniculate, apically often thickened; leaf blade leathery, sometimes with pellucid spots, glabrous or sometimes with trichomes, midvein adaxially with small pustules, margin entire. Inflorescences axillary racemes [or terminal panicles], many flowered; bracts subulate, often caducous. Flowers small. Pedicel short. Sepals (5 or)6, basally connate into a short tube, lobes erect, spreading, or reflexed. Petals absent. Androgynophore terete, short; stamens (15–)20–50(–100); filaments distinct, unequal with outermost shortest; anthers dorsifixed. Gynophore ± as long as filaments; ovary nearly globose or ovoid, glabrous or with trichomes, apically often with vertical grooves, 3(or 4)-loculed, placentation axile; placentae each with 4–10 ovules; style solitary, linear, entire or divided into 3(or 4) subulate stigmas, sometimes unlobed. Fruit drupaceous, ellipsoid, small, surface with lenticels, apex often with persistent style; fruiting pedicel and gynophore ± equal, forming a woody stipe much shorter than fruit. Seeds 1(–3) per fruit, ellipsoid, erect, covered by sarcocarp; seed coat thin; cotyledons fleshy, unequal, larger surrounding smaller.

About seven species: SE Asia; three species in China.

- 1a. Leaf blade abaxially glabrous; ovary glabrous; gynophore 7–10 mm; sepals erect or spreading at anthesis 1. *S. suaveolens*
 1b. Leaf blade abaxially puberulent or glabrescent; ovary tomentose; gynophore 0.7–2.5 mm; sepals reflexed at anthesis.
 2a. Inflorescences 12–35 cm, branched; stamens (20–)26–30[–40]; style 1–1.5 mm; fruit ca. 4 cm 2. *S. ovata*
 2b. Inflorescences 5–9 cm, mostly unbranched; stamens 16–24; style ca. 0.5 mm; fruit ca. 2 cm 3. *S. scandens*

1. *Stixis suaveolens* (Roxburgh) Pierre, Bull. Mens. Soc. Linn. Paris 1: 654. 1887.

班果藤 ban guo teng

Roydsia suaveolens Roxburgh, Pl. Coromandel 3: 87. 1819.

Vines 1–15 m, woody. Twigs pale red to pale tan-colored when dry, stout, terete, shortly pubescent, soon glabrescent; internode length unequal, to 5 cm or longer. Petiole (1–)2–3(–5) cm, stout, with bubblelike raised structures, apically with slightly inflated pulvinus; leaf blade elliptic, oblong, or oblong-lanceolate, broadest at middle but sometimes slightly basally or apically, (10–)15–28[–40] × (3.5–)4–10 cm, leathery, both surfaces glabrous, reticulate veins obvious, base cuneate to nearly rounded, apex nearly rounded to ± acuminate and with a 5–12-mm tip. Inflorescences axillary, racemes or sometimes branched or forming panicles, 15–25 cm, at first erect then drooping; axis shortly pubescent to shortly tomentose; bracts linear to ovate, 3–6 mm, trichomes like those on axis. Pedicel 2–4 mm, stout. Receptacle (torus) ca. 3.5 mm in diam., dish-shaped. Sepals (5 or)6, pale yellow, elliptic-oblong, (4–)5–6(–9) × 2–3 mm, erect or spreading, never reflexed, both surfaces densely tomentose, apex acute to obtuse. Androgynophore ca. 2 mm, glabrous; stamens (27–)40 to ca. 80; filaments 4–6(–11) mm, pubescent; anthers 0.5–0.7 mm. Gynophore 7–10 mm, with

dense tan pubescence; ovary ellipsoid, 1.7–2.5 mm, glabrous or basally sometimes with trichomes; styles 3(or 4), apex recurved; stigma absent. Fruit orange when mature, ellipsoid, 3–5 × 2.5–4 cm, surface with thin yellow verrucose flecks; endocarp thin, woody; fruiting pedicel plus gynophore 0.7–1.3 cm, ca. 5 mm in diam. Seed ellipsoid, 1.8–2 cm. Fl. Apr–May, fr. Aug–Oct.

Thickets, open forests, along rivers; near sea level to 1500 m. Guangdong, W Guangxi, Hainan, S Xizang, S and SE Yunnan [Bangladesh, Bhutan, Cambodia, NE India, Laos, Myanmar, Nepal, N and NE Thailand, Vietnam].

The flowers are noted as fragrant. The fruit is eaten in Hainan and NE India.

2. *Stixis ovata* (Korthals) H. G. Hallier subsp. ***fasciculata*** (King) Jacobs, Blumea 12: 8. 1963.

即锥序斑果藤 ji zhui xu ban guo teng

Roydsia fasciculata King, Ann. Roy. Bot. Gard. Calcutta 5(2): 121. 1896; *Stixis fasciculata* (King) Gagnepain.

Vines 1.5–3[–15] m, woody. Twigs pale red or pale tan-colored when dry, stout, terete, lenticellate, pubescent with stellate and simple brownish trichomes, eventually glabrescent; internode length unequal, to 5 cm or longer. Petiole 1–2(–4?) cm, terete; leaf blade elliptic, oblong, or oblong-lanceolate,

broadest at middle or slightly apically, (11–)14–17 × (2.5–)3–5.5[–9] cm, both surfaces sparsely pubescent with stellate trichomes, eventually glabrous except along veins, secondary veins 6–8 on each side of midvein, reticulate veins obvious, base cuneate to narrowly cuneate, apex nearly rounded to acuminate and with a 5–12-mm tip. Inflorescences terminal, sparsely branched panicles, (8–)12–35 cm, at first erect then drooping; axis shortly pubescent to shortly tomentose; bracts linear, 3–6 mm, trichomes like those on axis. Pedicel 3–6 mm, slender. Receptacle (torus) dish-shaped, ca. 1 mm in diam. Sepals (5 or)6, pale yellow, ovate-lanceolate, 4–6 × 1.5–2.5 mm, reflexed, both surfaces densely tomentose, apex acute to obtuse. Androgynophore ca. 2 mm, glabrous; stamens (20–)26–30[–40]; filaments 3–5 mm, glabrous; anthers 0.5–0.7 mm. Gynophore 2–2.5 mm, with dense tan pubescence; ovary ellipsoid, 1.7–2.5 mm, glabrous or basally sometimes with trichomes; styles 3(or 4), apex recurved; stigma obscurely 3-lobed. Fruit orange when mature, ellipsoid, ca. 4 × 3 cm, surface with thin yellow verrucose flecks; endocarp thin, woody; fruiting pedicel plus gynophore 6–8 mm, ca. 5 mm in diam. Seed ellipsoid, 1.2–1.5 cm. Fl. Apr–May, fr. Aug–Oct.

Forests; ca. 1200 m. S Yunnan [Laos, Myanmar, Vietnam].

Stixis ovata subsp. *ovata* differs in having longer inflorescences and an entirely glabrous gynophore. It is found in Indonesia (Borneo) and Malaysia.

3. *Stixis scandens* Loureiro, Fl. Cochinch. 1: 295. 1790.

和闭脉斑果藤 he bi mai ban guo teng

Vines 1–15 m, woody. Twigs pale red or pale tan-colored when dry, stout, terete, pubescent with stellate and simple brownish trichomes, eventually glabrescent; internode length unequal, to 5 cm or longer. Petiole (1–)2–3(–5?) cm, stout, with bubblelike raised structures, apically with a slightly inflated pulvinus; leaf blade oblong to oblong-lanceolate, broadest at middle or apically, 11–13 × 4–5.5 cm, herbaceous to sub-leathery, both surfaces glabrous or abaxially sometimes with a few trichomes near veins, secondary veins 5–8 on each side of midvein, reticulate veins obvious, base cuneate to nearly rounded, apex nearly rounded to ± acuminate and with a 5–12-mm tip. Inflorescences axillary, racemes, 5–7.5(–9) cm, erect; axis densely pubescent to fulvous tomentose; bracts subulate, 2–3.5 mm, trichomes like those on axis. Pedicel 3–6 mm, stout. Receptacle (torus) ca. 1 mm in diam. Sepals (5 or)6, pale yellow, obovate, 5–6 × 1–1.2 mm, reflexed, both surfaces densely tomentose, apex obtuse. Androgynophore 0.2–0.5 mm, glabrous; stamens 16–24; filaments 2.5–5 mm, pubescent; anthers 0.5–0.7 mm. Gynophore 0.7–1.5 mm, with dense brownish pubescence; ovary ellipsoid, 2–2.5 mm, pubescent; style ca. 0.5 mm, apex recurved; stigma unlobed. Fruit orange when mature, ellipsoid, ca. 2 × 1.7 cm, surface with thin yellow verrucose flecks; endocarp thin, woody; fruiting pedicel plus gynophore ca. 6 mm, ca. 5 mm in diam. Seed ellipsoid, 1.6–2 cm. Fl. Apr–May, fr. Aug–Oct.

Forests; 100–1200 m. S Yunnan [NE India (Assam), Laos, Myanmar, Vietnam].