

MYRSINACEAE

紫金牛科 *zi jin niu ke*

Chen Jie¹; John J. Pipoly III²

Trees, shrubs, climbers [or rarely herbs]. Leaves simple, alternate, rarely opposite or whorled, without stipules, often glandular. Inflorescences terminal, axillary, or at apices of lateral branches, racemose (often paniculate), corymbose, cymose, umbellate, or fascicled on scaly spur branches in leaf axils. Flowers bisexual or polygamous, rarely unisexual and plants polygamodioecious or dioecious, 4- or 5(or 6)-merous, actinomorphic. Sepals basally connate or free, persistent, usually glandular. Petals basally connate or rarely free, usually glandular. Stamens as many as and opposite to petals, usually adnate to base or throat of corolla tube, sometimes free, rarely united into a tube; anthers 2-celled, dorsifixed, dehiscing longitudinally or by apical slits or pores, rarely transversely septate; filaments present or absent. Ovary superior, rarely inferior to half-inferior, 1-celled; placentation free-central, sometimes basal; ovules 1 to several in 11 to many rows, usually embedded in placenta, anatropous or semicampylotropous. Style 1; stigma simple or lobed. Fruit drupes with fleshy exocarp or capsules. Seeds 1 to many; endosperm fleshy or horny; embryo $x = 10-13, 23$.

About 42 genera and more than 2,200 species: primarily in tropical and subtropical or warm temperate regions of both hemispheres; five genera and 120 species (51 endemic) in China.

Chinese genera of economic value include *Ardisia* (medicine, oil, edible, wild vegetables), *Maesa* (edible, tea, dye), *Aegiceras* (tannin, fine fuel), *Embelia* (vermifuge, edible), *Myrsine* (medicine, fine wood, tannin, fuel).

Chen Chieh. 1979. Myrsinaceae. Fl. Reipubl. Popularis Sin. 58: 1–147.

- 1a. Ovary and fruit semi-inferior to inferior; bracteoles 2; seeds numerous, angular 1. *Maesa*
- 1b. Ovary and fruit superior; bracteoles absent; seeds 1, globose or elongated and curved.
 - 2a. Fruit an elongated curved capsule; anther cells transversely septate; usually mangrove plants 2. *Aegiceras*
 - 2b. Fruit a globose drupe often with a fleshy exocarp; anthers not septate; mountains and broad-leaved forests.
 - 3a. Inflorescences on a long peduncle or at tips of specialized lateral branches; corolla lobes contorted in bud. Stigma usually apiculate 3. *Ardisia*
 - 3b. Inflorescences often on scaly short branches or spurs; corolla lobes imbricate or valvate in bud. Stigma often not apiculate.
 - 4a. Inflorescences racemose or paniculate, terminal or axillary; climbing shrubs, rarely vines 4. *Embelia*
 - 4b. Inflorescences umbellate or fascicled, at axils of apical leaves; shrubs or small trees 5. *Myrsine*

1. MAESA Forsskål, Fl. Aegypt. Arab. 66. 1775.

杜茎山属 *du jing shan shu*

Shrubs or rarely small trees. Leaves entire, serrate, or dentate at margin, usually punctate. Inflorescences racemose, often paniculate; bracts small; bracteoles 2, usually subtending base of calyx. Flowers 5-merous, bisexual or polygamous. Calyx funnelform, adnate to ovary, lobes valvate. Corolla white or yellowish, campanulate, often punctate-lineate. Stamens free, included. Ovary semi-inferior or inferior, aborted in staminate flowers; ovules numerous, on a globose free-central placenta. Style as long as or longer than stamens; stigma entire or 3–5-lobed. Fruit globose or ovoid berries or drupes with a crustose endocarp, apex ± covered by persistent calyx, often longitudinally orange punctate-lineate. Seeds small, numerous, angular, embedded in a hollow placenta.

About 200 species: primarily in Old World tropics; 29 species in China.

- 1a. Branchlet apex hirsute, hirtellous, puberulent, pilose, velutinous, or brown scaly.
 - 2a. Branchlets brown scaly.
 - 3a. Leaf blade leathery, rugose, apex cuspidate-acuminate, acumen 4–6 mm; petiole thick, 2–3.5 cm 1. *M. rugosa*
 - 3b. Leaf blade papery, not rugose, apex caudate-acuminate, acumen 8–20 mm, petiole thin, 0.7–1.5 cm 2. *M. chisia*
 - 2b. Branchlets white pilose-tomentulose or brown velutinous tomentulose, hirsute, or hirtellous and reddish glandular granulose.
 - 4a. Branchlets white pilose-tomentulose or brown velutinous-tomentulose.
 - 5a. Branchlets white pilose-tomentulose.
 - 6a. Leaf blade leathery, secondary veins connected by submarginal vein 3. *M. cavinervis*
 - 6b. Leaf blade membranous, secondary veins free to margin, without submarginal vein 4. *M. montana*
 - 5b. Branchlets brown velutinous-tomentulose.
 - 7a. Leaf blade linear-lanceolate; calyx lobes densely dull red punctate and punctate-

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- lineate 5. *M. macilentoides*
- 7b. Leaf blade lanceolate to ovate; calyx lobes puberulent or inconspicuously pellucid.
- 8a. Inflorescences punctate 5–8 mm; leaf base obtuse 6. *M. brevipaniculata*
- 8b. Inflorescences (10–)20–40 mm; leaf blade base truncate to cordate 7. *M. macilenta*
- 4b. Branchlets hirsute or stramineous hirtellous and reddish glandular granulose.
- 9a. Plants hirsute.
- 10a. Petiole 1.2–2.5 cm; pith hollow.
- 11a. Plants gray hirsute; branchlets terete; inflorescences racemose, ca. 6 cm; leaf blade apex caudate-acuminate, margin serrate, teeth not callose 8. *M. insignis*
- 11b. Plants reddish hirsute; branchlets angular; inflorescences glomerate or paniculate, rarely to 4 cm; leaf blade apex cuspidate, margin serrate or dentate, teeth callose 9. *M. permollis*
- 10b. Petiole 0.4–1(–1.2) cm; pith solid.
- 12a. Inflorescences racemose, 0.4–1 cm; leaf blade oblanceolate 10. *M. ambigua*
- 12b. Inflorescences few-branched panicles, 3–7 cm; leaf blade lanceolate 11. *M. longilanceolata*
- 9b. Plants hirtellous and glandular granulose.
- 13a. Petiole 0.4–1 cm; leaf blade base obtuse to rounded.
- 14a. Calyx lobes acuminate; pedicel 1.5–2 mm 2. *M. parvifolia*
- 14b. Calyx lobes acute; pedicel 1.2–1.5 mm 13. *M. marionae*
- 13b. Petiole 1–2(–3) cm; leaf blade base acute.
- 15a. Inflorescences racemose-spicate; pedicel obsolete to 0.8 mm; calyx conic 14. *M. argentea*
- 15b. Inflorescences paniculate or rarely racemose; pedicel 1.8–2 mm; calyx discoid 15. *M. perlarius*
- 1b. Branchlet apex glabrous or glandular granulose, early glabrescent.
- 16a. Branchlet apex glabrous.
- 17a. Leaf blade leathery, apex cuspidate; inflorescences glomerate, shorter than petiole 16. *M. reticulata*
- 17b. Leaf blade membranous or papery, apex caudate-acuminate; inflorescences paniculate, longer than petiole.
- 18a. Leaf blade membranous, adaxially dull, abaxially and hypanthium densely black punctate-lineate; inflorescence rachis and pedicels densely and minutely glandular granulose 7. *M. striatocarpa*
- 18b. Leaf blade papery, adaxially glossy, abaxially and hypanthium inconspicuously pellucid punctate; inflorescence rachis and pedicels glabrous and glossy 18. *M. acuminatissima*
- 16b. Branchlet apex glandular granulose, early glabrescent.
- 19a. Leaf blade margin undulate, subentire, or entire.
- 20a. Leaf blade membranous or papery; pedicel 1–2 mm.
- 21a. Branchlets terete, lenticellate; calyx lobes densely punctate-lineate; bracts and bracteoles wider than long; inflorescence rachis and pedicels glabrous 22. *M. consanguinea*
- 21b. Branchlets angular, without lenticels; calyx lobes punctate; bracts and bracteoles longer than wide; inflorescence rachis and pedicels minutely glandular granulose 23. *M. ramentacea*
- 20b. Leaf blade leathery or rarely papery; pedicel 2.5–4 mm.
- 22a. Leaves prominently black punctate-lineate; bracts subulate, bracteoles and calyx lobes longer than wide, apery, apex acute 21. *M. hupehensis*
- 22b. Leaves inconspicuously pellucid punctate; bracts, bracteoles, and calyx lobes much wider than long, leathery, apex obtuse to rounded.
- 23a. Leaf blade linear-lanceolate, bullate, margin revolute, entire; fruit reddish, punctate-lineate, wrinkled 19. *M. salicifolia*
- 23b. Leaf blade lanceolate, oblong, or rarely ovate, smooth, flat, margin subentire to serrate distally; fruit yellowish, smooth 20. *M. japonica*
- 19b. Leaf blade margin serrate or serrate-dentate.
- 24a. Petiole 2–4 cm.
- 25a. Inflorescences densely and minutely glandular granulose; pedicel 2–2.5 mm at maturity; branchlets sparingly lenticellate; leaves membranous, adaxially dull 24. *M. confusa*
- 25b. Inflorescences glabrous; pedicel 0.8–1.5(–2) mm at maturity; branchlets without lenticels; leaves thin leathery, adaxially glossy 25. *M. membranacea*
- 24b. Petiole 1–1.8 cm.
- 26a. Calyx lobe and bracteoles obtuse to rounded apically; inflorescence rachis and pedicels densely and minutely glandular granulose 26. *M. indica*
- 26b. Calyx lobe and bracteoles acute apically; inflorescence rachis and pedicels glabrous.

- 27a. Leaf blade membranous, elliptic to ovate, margin serrate, teeth not callose; inflorescences 7–10 cm, racemose 27. *M. tenera*
- 27b. Leaf blade papery, oblong to oblanceolate, margin serrate-dentate, teeth callose; inflorescences 1.5–4 cm, paniculate.
- 28a. Branchlets with hollow pith; leaf base subrounded or obtuse; bracteole and calyx lobe margins glandular ciliate; fruit ovoid 28. *M. manipurensis*
28. Branchlets with solid pith; leaf base cuneate; bracteole and calyx lobe margins glabrous; fruit globose 29. *M. densistriata*

1. *Maesa rugosa* C. B. Clarke in J. D. Hooker, Fl. Brit. India 3: 508. 1882.

皱叶杜茎山 *zhou ye du jing shan*

Maesa indica (Roxburgh) A. de Candolle var. *retusa* Handel-Mazzetti.

Shrubs 1–3 m tall. Branchlets and leaves densely brown scaly, glabrescent. Branchlets subterete, 2–3 mm in diam.; pith solid. Petiole canaliculate, 2–3.5 cm; leaf blade broadly obovate, 6–16 5–12.5 cm, leathery, rugose, base broadly obtuse to acute, margin serrulate, apex cuspidate-acuminate, acumen 4–6 mm; lateral veins 8–12 on each side of midrib, ending in subapiculate teeth, submarginal vein absent. Inflorescences axillary, paniculate, 3–4 cm, glabrous or puberulent; bracteoles triangular ovate, acute. Flowers creamy yellow, 2–3 mm. Pedicel ca. 1 mm. Calyx lobes broadly ovate, ca. 0.7 mm, orange punctate-lineate, margin entire and ciliate, apex acute or obtuse. Corolla campanulate; lobes as long as tube, ovate or suborbicular, subentire, obtuse or rounded at apex, orange punctate-lineate. Stamens inserted at middle of corolla tube; filaments very short; anthers ovoid. Pistil included. Style cylindrical; stigma lobed. Fruit ovoid, ca. 3 mm in diam., somewhat succulent, pellucid punctate-lineate, slightly longer than persistent calyx lobes. Fl. Jul, fr. Oct.

Mixed forests, scrubs, stream banks, shady places; 2000–2800 m. SE Xizang, NW Yunnan [India].

Leaf apex in var. *retusa* was said to be obtuse, truncate, or slightly retuse, and the taxon probably merits recognition.

2. *Maesa chisia* Buchanon-Hamilton ex D. Don, Prodr. Fl. Nepal. 148. 1825.

密腺杜茎山 *mi xian du jing shan*

Maesa prodigiosa C. Chen.

Shrubs 1–2(–6) m tall. Branchlets angular, sparsely brown scaly, glabrescent, lenticellate; pith solid. Petiole slightly canaliculate, 0.7–1.5 cm; leaf blade oblong, elliptic-lanceolate, to oblanceolate, 8.5–14 2.5–5.5 cm, papery, glabrous, base cuneate, margin serrate, densely and minutely orange punctate-lineate, apex caudate-acuminate, acumen 0.8–2 cm; midrib and lateral veins prominently raised abaxially, lateral veins ca. 10 on each side of midrib, ending in teeth, submarginal vein absent. Inflorescences axillary on biennial branches, paniculate, 1.5–4 cm in fruit, many branched, glabrous; bracts lanceolate, ca. 0.5 mm; bracteoles ovate, glabrous. Flowers unknown. Pedicel 1–2 mm in fruit, glabrous. Fruit globose, 3–4 mm in diam., somewhat fleshy, glabrous, not punctate; persistent calyx

lobes ovate-triangular, glabrous, punctate at tip, ciliate.

Sparse broad-leaved forests, shrubby areas, sunny hillsides; ca. 600–2200 m. SE Xizang, W Yunnan [Bhutan, India, Myanmar, Nepal].

3. *Maesa cavinervis* C. Chen, Acta Phytotax. Sin. 16(3): 79. 1978.

凹脉杜茎山 *ao mai du jing shan*

Shrubs 3–4 m tall. Branchlets terete, white pilose-tomentulose, glabrescent, striate; pith solid. Petiole canaliculate, 5–10 mm, minutely punctate; leaf blade narrowly lanceolate or lanceolate, 10–18×1.7–4 cm, leathery, glabrous, base cuneate or obtuse, densely and minutely punctate, margin serrulate, apex caudate-acuminate; lateral veins 9–15 on each side of midrib, connected by submarginal vein 1–2 mm from margin. Inflorescences axillary, 1- or 2-branched at base, racemose or paniculate, 2–3 cm, puberulent; bracteoles ovate. Corolla ca. 2 mm; lobes elliptic-oblong, longer than tube, glabrous, orange punctate-lineate, margin crenulate, apex subobtusely. Stamens inserted on tube, somewhat exerted. Fruit ovoid, ca. 5 mm in diam., prominently orange punctate-lineate; persistent calyx lobes broadly triangular, auriculate at base, ciliate, orange punctate-lineate, closed at fruit apex. Fr. Aug–Sep.

* Broad-leaved forests, hillsides; 1700–2100 m. Xizang (Motuo).

4. *Maesa montana* A. de Candolle, Prodr. 8: 79. 1844.

金珠柳 *jin zhu liu*

Maesa argentea (Wallich) A. de Candolle var. *kwangsiensis* Handel-Mazzetti, *M. castaneifolia* Mez; *M. formosana* Mez; *M. henryi* H. H. Hu; *M. martinii* H. Léveillé.

Shrubs or trees 2–3(–10) m tall. Branchlets terete, white pilose-tomentulose, glabrescent; pith solid. Petiole deeply canaliculate, 1–1.5(–1.8) cm; leaf blade elliptic, oblong, or lanceolate, rarely broadly ovate, 7–14(–23) 3–7(–9) cm, membranous, base cuneate or obtuse, margin coarsely dentate or undulate with punctate teeth, apex acute or acuminate; lateral veins 8–12 on each side of midrib, ending in teeth, glabrescent or hispidulous, submarginal vein absent. Inflorescences axillary, racemose or paniculate, 2–7(–10) cm, hirsute; bracteoles minute, lanceolate or ovate. Flowers ca. 2 mm. Pedicel 1–2(–3) mm. Calyx lobes ovate or oblong, glabrous or sometimes ciliate, entire, apex obtuse. Corolla white, campanulate; lobes ovate, as long as or longer than tube, orange punctate-lineate, margin entire or crenulate, apex obtuse or

rounded. Stamens inserted at corolla throat, included; anthers orbicular or reniform. Pistil included. Style persistent; stigma minutely lobed. Fruit white, globose or ovoid, 3–4 mm in diam., orange punctate-lineate; persistent calyx lobes covering 2/3–3/4 of fruit. Fl. Feb–Apr, fr. Oct–Dec.

Mixed forests, hillsides; 400–2800 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, SE Xizang, Yunnan [India, Myanmar, Thailand].

5. *Maesa macilentoides* C. Chen, Fl. Yunnan. 1: 817. 1977.

薄叶杜茎山 *bao ye du jing shan*

Shrubs 2–3 m tall. Branchlets angular, brown velutinous-tomentulose; pith solid. Petiole canaliculate, 3–5 mm; leaf blade linear-lanceolate, 9–15 × 1.8–3 cm, papery, glabrous, prominently thinly black punctate-lineate, base rounded, margin subentire to sparsely serrulate, apex acuminate or subcaudate-acuminate; lateral veins 10–12 on each side of midrib, ending in teeth, submarginal vein absent. Inflorescences axillary, paniculate, 0.7–2 cm, 2- or 3-branched, puberulent; bracteoles ovate. Flowers white, ca. 2 mm. Pedicel 0.5–1 mm. Calyx puberulent, to 1 mm; calyx lobes broadly ovate, red punctate-lineate, margin minutely ciliate, apex obtuse. Corolla tubular-campanulate; lobes broadly ovate or subreniform, shorter than tube, red punctate-lineate, margin crenulate, apex rounded. Stamens inserted at middle of corolla tube; anthers ovate, as long as filaments. Pistil included. Style glandular; stigma apiculate. Fruit globose, ca. 4 mm in diam., fleshy, slightly longitudinally ribbed; persistent calyx lobes reaching conical style base, exposed part ca. 1/3 fruit length. Fl. and fr. Feb.

* Broad-leaved forests, valleys, hilly areas, shady places; 800–1300 m. S Yunnan.

6. *Maesa brevipaniculata* (C. Y. Wu & C. Chen) Pipoly & C. Chen, Novon 5: 357. 1995.

短序杜茎山 *duan xu du jing shan*

Maesa parvifolia A. de Candolle var. *brevipaniculata* C. Y. Wu & C. Chen, Fl. Yunnan. 1: 324. 1977.

Shrubs 0.5–3 m tall. Branchlets angular, velutinous brown pilosulose-tomentose, barely flexuous; pith solid. Petiole canaliculate, 3–8 mm, pilosulose; leaf blade lanceolate or narrowly ovate, 7–10(–13) 1.5–2.3(–4.5) cm, glabrous to puberulent, base obtuse, margin undulate to very sparsely serrulate, apex caudate-acuminate; lateral veins ca. 8 on each side of midrib, ending in minute punctate teeth, submarginal vein absent. Inflorescences axillary, paniculate, puberulent, 5–8 mm; bracteoles minute, lanceolate, hirsute. Flowers white, fragrant, ca. 1.5 mm. Pedicel ca. 1.5 mm, puberulent. Calyx lobes broadly ovate, acute or obtuse, puberulent, ciliate, inconspicuously pellucid punctate-lineate. Corolla campanulate, ca. 3 × length of calyx lobes; lobes broadly ovate, subequal tube, crenulate, rounded. Stamens shorter than corolla lobes; anthers broadly ovate or reniform, as long as filaments in staminate flowers. Pistil included. Style short, thick; stigma flattened, somewhat lobed. Fruit unknown. Fl. Apr–Jan.

* Evergreen broad-leaved forests, damp places, hillsides, stream banks; 1300–1800 m. Guangxi, Guizhou, Yunnan.

7. *Maesa macilenta* E. Walker, J. Wash. Acad. Sci. 21: 479. 1931.

细梗杜茎山 *xi gen du jing shan*

Shrubs 1–2 m tall. Branchlets angular, brown velutinous-tomentulose; pith solid. Petiole 5(–10) mm; leaf blade ovate to lanceolate, 9–15(–20) × 3.5–5 cm, base truncate to cordate, margin entire to coarsely dentate, apex long acuminate or sometimes falcate; lateral veins 7 or 8 on each side of midrib, obscurely punctate-lineate. Inflorescences axillary, paniculate, (1–)2–4 cm, glabrous or minutely puberulent; bracts subulate; bracteoles triangular-ovate to oblong. Flowers ca. 2 mm. Pedicel 1–2 mm, glabrous. Calyx lobes ovate, inconspicuously punctate-lineate, entire, sometimes minutely ciliate, apex obtuse. Corolla tubular-campanulate; tube ca. 2 × as long as calyx lobes; lobes ca. 1/3 tube length, inconspicuously punctate-lineate, apex rounded. Stamens of staminate flowers unknown, those of pistillate flowers minute, included; anthers ovate. Pistil included. Style slender, less than 1 mm; stigma obscurely lobed. Fruit globose, ca. 4 mm in diam., longitudinal ribs obscure; persistent calyx lobes meeting conical style base, exposed part ca. 1/3 fruit length. Fl. Sep–Oct, fr. May–Jan.

* Evergreen broad-leaved forests; 300–600 m. S Yunnan.

8. *Maesa insignis* Chun, Sunyatsenia 2: 81. 1934.

毛穗杜茎山 *mao sui du jing shan*

Maesa hirsuta E. Walker.

Shrubs 1.2–3(–4) m tall, gray-hirsute. Branchlets terete; pith hollow. Petiole subterete, 1.2–1.9 cm; leaf blade elliptic or ovate, 12–16(–19) × 4–6(–7) cm, base rounded or obtuse, margin coarsely serrate, teeth sharp but not callose, apex caudate-acuminate; lateral veins ca. 10 on each side of midrib, submarginal vein absent. Inflorescences axillary, racemose, ca. 6 cm, hirsute throughout; bracts lanceolate or subulate, ca. 1 mm; bracteoles lanceolate to narrowly so. Flowers yellowish, 2–3 mm. Calyx lobes ovate or subdeltate, ca. 1 mm, punctate-lineate, margin entire, ciliate, apex acute. Corolla campanulate; lobes broadly ovate or suborbicular, ca. as long as or shorter than tube, punctate-lineate, glabrous. Stamens included, inserted above middle of corolla tube; anthers ovate or broadly so, as long as filaments, not glandular. Style ± glandular, persistent; stigma lobed. Fruit white, globose, ca. 5 mm in diam., somewhat fleshy, hirsute, glandular, rarely with obscure longitudinal ribs; persistent calyx lobes closed at fruit apex. Fl. Jan–Feb, fr. Nov.

* Sparse mixed forests, hills. Guangdong, Guangxi, Guizhou.

9. *Maesa permollis* Kurz, J. Asiat. Soc. Bengal. 11: 66. 1871.

毛杜茎山 *mao du jing shan*

Shrubs 1–3(–6) m tall, reddish hirsute. Branchlets angular; pith hollow. Petiole 2–3(–5) cm; leaf blade elliptic to broadly oblong-obovate, (12–)20–31 × (6–)12–29 cm, densely pilose or hirsute abaxially especially along veins, base

broadly truncate to subcordate, margin serrate or dentate, teeth callose, apex cuspidate; lateral veins ca. 10 on each side of midrib, ending in teeth, submarginal vein absent. Inflorescences axillary, glomerate or paniculate, rarely to 4 cm, densely hirsute; bracteoles ovate. Flowers white or yellowish, ca. 3 mm. Pedicel rarely to 1 mm. Calyx lobes ovate, densely hirsute or pilose, margin narrowly scarious, ciliate, apex acute. Corolla tubular-campanulate, glabrous; tube 1.5–2 mm; lobes ca. 0.7 mm, ovate or subrounded, spreading. Stamens included, attached at middle of corolla tube; anthers broadly elliptic, ca. as long as filaments. Pistil included. Style short; stigma obscurely lobed. Fruit ovoid, 4–5 mm in diam., densely brown hirsute, apex acute or apiculate; persistent calyx lobes meeting at fruit apex. Fl. Mar, fr. Nov–Dec.

Mixed forests, hillsides, valleys, stream banks, damp places; 500–1600 m. SW and S Yunnan [Laos, Myanmar, Thailand].

10. *Maesa ambigua* C. Y. Wu & C. Chen in C. Chen, Fl. Yunnan. 1: 331. 1977.

坚髓杜荃山 jian sui du jing shan

Shrubs 1–4 m tall, reddish hirsute. Branchlets angular, longitudinally ridged; pith solid. Petiole canaliculate, 4(–10) mm; leaf blade elliptic to broadly obovate, 12–22 × 6–22 cm, papery, punctate, base broadly rounded to truncate or subcordate, sometimes asymmetric, margin coarsely serrate or serrate-dentate, apex long acuminate or caudate-acuminate, acumen 1–1.8 cm; lateral veins ca. 10 on each side of midrib, flat adaxially, hirsute, ending in noncallose teeth, submarginal vein absent. Inflorescences axillary, short racemose, 4–10 mm, hirsute throughout; bracts subulate, ca. 1 mm; bracteoles narrowly ovate, inserted up to middle of pedicel. Flowers ca. 2 mm. Pedicel 0.5–1 mm. Calyx lobes triangular-ovate, ca. 1.5 mm, as long as tube or longer, punctate-lineate. Corolla campanulate, ca. 2 mm; lobes 1/3–1/2 length of tube, subrounded, punctate-lineate. Stamens included, inserted at distal part of corolla tube; anthers broadly ovate, shorter than filaments. Pistil included. Style persistent; stigma lobed. Fruit globose, ca. 2 mm in diam., hirsute; persistent calyx lobes meeting at fruit apex. Fl. Mar, fr. Jul–Oct.

Dense evergreen broad-leaved forests, valleys, damp places; 900–1500 m. SE Yunnan [Vietnam].

11. *Maesa longilanceolata* C. Chen, Novon 4: 323. 1994.

长叶杜荃山 chang ye du jing shan

Shrubs 2(–5) m, reddish hirsute. Branchlets angular, longitudinally ridged; pith solid. Petiole canaliculate, 7–12 mm; leaf blade oblong or lanceolate, 6–14 × 2.5–4.8 cm, papery, densely hirsute along primary and secondary veins, strigose along others, base broadly obtuse or subrounded, margin irregularly dentate distally, teeth callose and punctate, entire toward base, apex caudate-acuminate; lateral veins 7 or 8 on each side of midrib, ending in teeth, punctate-lineate, submarginal vein absent. Inflorescences axillary, paniculate, (3–)5–7 cm, hirsute; bracteoles oblong or

ovate, 0.6–0.8 mm, acuminate, minutely hirsute, margin ciliate. Flowers white, ca. 2 mm. Pedicel 1.2–1.5 mm, hirsute. Sepals broadly ovate, glabrous, margin entire, ciliate, prominently orange punctate-lineate, apex acute. Corolla campanulate; tube 1.2–1.5 mm; lobes suborbicular, margin erose, ciliate, subequalling tube, orange punctate-lineate, apex rounded. Stamens and pistil unknown. Fruit globose or ovoid, 3–4 mm in diam., glabrous, longitudinally ribbed; persistent sepals meeting at conical style base. Fl. Apr, fr. Oct–Nov.

* Broad-leaved forests, hillsides, valleys, river banks; 1300–1800 m. SE Xizang, NW Yunnan.

12. *Maesa parvifolia* Aug. de Candolle, Repert. Spec. Nov. Regni. Veg. 8: 353. 1910.

小叶杜荃山 xiao ye du jing shan

Shrubs or climbers 0.5–3 m tall, decumbent. Branchlets angular, hirtellous and glandular granulose, glabrescent, flexuous; pith solid. Petiole canaliculate, 4–6 mm, puberulent; leaf blade elliptic or ovate, 2.5–6(–10) 1–1.8(–4) cm, papery, base obtuse to rounded, apex acuminate or rarely acute, glabrous to puberulent, base cuneate or obtuse to rounded, margin undulate to sparsely serrulate, apex acuminate to caudate-acuminate, rarely acute; lateral veins ca. 8 on each side of midrib, ending in punctate teeth, submarginal vein absent. Inflorescences axillary, paniculate, 3–7 cm, puberulent; bracteoles minute, lanceolate, hirsute. Flowers white, fragrant, ca. 1.5 mm. Pedicel 1.5–2 mm, puberulent. Calyx lobes broadly ovate, puberulent, orange punctate-lineate, margin entire, ciliate, apex acuminate. Corolla campanulate, ca. 3 length of calyx lobes; lobes broadly ovate, subequalling tube, crenulate, rounded. Stamens shorter than corolla lobes; anthers broadly ovate or reniform, ca. as long as filaments in staminate flowers. Pistil included. Style short, thick; stigma flattened, somewhat lobed. Fruit unknown. Fl. Feb–Apr.

Mixed forests, shrubby areas, sunny hillsides; 400–1700 m. Guangdong, Guangxi, Hainan, SE Yunnan [N Vietnam].

13. *Maesa marioniae* Merrill, Brittonia 4: 160. 1941.

毛脉杜荃山 mao mai du jing shan

Shrubs 1.5–2(–5) m tall. Branchlets angular, reddish hirtellous and glandular granulose, glabrescent; pith solid. Petiole canaliculate, 7–10 mm, hirtellous, glabrescent; leaf blade elliptic, oblong, or lanceolate, 6–14 × 2.5–4.8 cm, base broadly obtuse to rounded, margin dentate distally and entire toward base, apex acuminate to caudate-acuminate or rarely acute; lateral veins 7 or 8 on each side of midrib, hirtellous or subglabrous, punctate-lineate, ending in glandular teeth, submarginal vein absent. Inflorescences axillary, paniculate, 3–5 cm, hirtellous; bracteoles oblong-ovate or ovate, 0.6–0.8 mm, puberulent, ciliate. Flowers white, ca. 2 mm. Pedicel 1.2–1.5 mm, puberulent. Calyx lobes broadly ovate, punctate-lineate, glabrous, margin entire, ciliolate, apex acute. Corolla campanulate, ca. 1.2 mm; lobes broadly

ovate or subrounded, erose, subequalling tube. Filaments ca. 1 mm, longer than anthers; anthers elliptic. Pistil included. Style very short, persistent. Fruit globose or ovoid, 3–4 mm in diam., glabrous, somewhat fleshy, ribbed; persistent calyx lobes meeting at about style base, exposed part ca. 1/3 fruit length.

Broad-leaved forests, hillsides, valleys, river banks; 1300–1800 m. Xizang, NW Yunnan [Myanmar].

14. *Maesa argentea* (Wallich) A. de Candolle, Ann. Sci. Nat., Bot., ser. 2, 16: 96. 1841.

银叶杜茎山 yin ye du jing shan

Baeobotrys argentea Wallich in Roxburgh, Fl. Ind. 2: 233. 1824.

Shrubs or rarely small trees to 5 m tall. Branchlets densely hirtellous and glandular granulose; pith solid. Petiole canaliculate, 1.8–2(–3) cm, sparsely pilose; leaf blade ovate or broadly elliptic, 12–17(–22) × 5–9(–11) cm, sparsely hirtellous and glandular granulose abaxially, glabrescent adaxially except granulose veins, reticulate punctate-lineate, base acute, margin serrate-dentate, apex acuminate; lateral veins ca. 8 on each side of midrib, ending in teeth, submarginal vein absent. Inflorescences axillary, racemose-spicate, 1–4(–5) cm, axis pilose; bracteoles ovate, sparsely pilose. Flowers white, (2–)3 mm. Pedicel subobsolete to 0.8 mm, hirtellous. Calyx conical; lobes ovate, glabrous, punctate-lineate, margin entire, apex acute or obtuse. Corolla tubular-campanulate, ca. 3 mm; tube ca. 2 mm; lobes ca. 1 mm, punctate-lineate, margin ± erose-denticulate near base; apex broadly obtuse. Stamens included, inserted at middle of corolla tube; anthers ovate, shorter than filaments. Pistil included. Style cylindrical; stigma 3- or 4-lobed. Fruit globose to broadly ovoid, 3–4(–5) mm in diam., fleshy, punctate-lineate, glabrous; persistent calyx lobes meeting at fruit apex. Fl. Mar–Apr, fr. Sep–Oct.

Broad-leaved forests, hilly areas, valleys, stream banks, damp places; 1500–2900 m. Sichuan, Yunnan [India, Myanmar, Nepal].

15. *Maesa perlarius* (Loureiro) Merrill, Trans. Amer. Philos. Soc., n. ser. 24: 298. 1935.

鲫鱼胆 ji yu dan

Dartus perlarius Loureiro, Fl. Cochinch. 1: 124. 1790; *Maesa sinensis* A. de Candolle; *M. tonkinensis* Mez.

Shrubs 1–3 m tall. Branchlets hirtellous and glandular granulose, sometimes glabrous; pith solid. Petiole canaliculate, ca. 10 mm; leaf blade elliptic to broadly ovate, 7–11 (–12) × 3–5(–6) cm, densely hirtellous when young, base acute, margin coarsely serrate distally and entire toward base, apex acute or acuminate; lateral veins 7–9 on each side of midrib, ending in teeth, submarginal vein absent. Inflorescences axillary, paniculate or rarely racemose, 2–4 cm, hirtellous and glandular granulose; bracts lanceolate or subulate, less than 2 mm; bracteoles lanceolate or subovate. Flowers ca. 2 mm. Pedicel 1.8–2 mm. Calyx discoid; lobes broadly ovate, punctate-lineate, hirsute or glabrous, margin entire, ciliate, apex obtuse or acute. Corolla ca. 2 × as

long as calyx lobes, punctate-lineate, glabrous; lobes broadly ovate, as long as tube, irregularly crenulate. Stamens inserted at distal half of corolla tube; anthers broadly oblong or reniform, not glandular, shorter than filaments. Pistil included. Style thick, cylindrical; stigma 4-lobed. Fruit globose, ca. 3 mm in diam., punctate-lineate, glabrous, 1/4–1/3 exposed; persistent calyx lobes rarely meet at fruit apex. Fl. Mar–Apr, fr. Dec–May.

Sparse broad-leaved forests, shrubby areas, hillsides, damp places; 200–1400 m. Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Yunnan [Thailand, Vietnam].

16. *Maesa reticulata* C. Y. Wu in C. Chen, Fl. Yunnan. 1: 330. 1977.

网脉杜茎山 wang mai du jing shan

Trees glabrous. Branchlets thick, wrinkled, obtusely angular; pith solid. Petiole subterete to terete, (1.5–)2–3 cm; leaf blade broadly obovate or elliptic, 15–24 × 7–14 cm, leathery, glabrous, base rounded or broadly obtuse, margin crenulate with sharp teeth, apex cuspidate; veins prominently raised on both surfaces, densely and minutely pustulate, scabrous especially adaxially; lateral veins ca. 10 on each side of midrib, running into marginal vein. Inflorescences axillary, contorted racemes appearing glomerate, shorter than petiole. Flowers unknown. Pedicel ca. 2.5 cm in fruit. Fruit ovoid, ca. 5 mm in diam., punctate-lineate, pustulate; persistent calyx lobes triangular, meeting at fruit apex. Fr. Jun.

Broad-leaved forests, valleys; 200–400 m. S Yunnan [Vietnam].

17. *Maesa striatocarpa* C. Chen, Novon 4: 322. 1994.

纹果杜茎山 wen guo du jing shan

Shrub to 5 m tall. Branchlets angular, 2–2.5 mm in diam., apices glabrous; pith solid. Leaf blade abaxially, calyx, corolla lobes, pistil, and fruit densely black punctate-lineate. Petiole canaliculate, 1–2 cm; leaf blade elliptic to obovate, 8–14.5 × 3.3–6 cm, membranous, dull adaxially, glabrous, base cuneate, rounded, obtuse or sometimes subtruncate, margin subrevolute, sparsely serrate-dentate with callose teeth, apex caudate-acuminate, acumen 1–2 cm; lateral veins 7–10 on each side of midrib, ending in teeth. Inflorescences axillary or sometimes terminal, paniculate, 5–12 cm; bracteoles ovate, entire, black punctate-lineate. Flowers white, ca. 2 mm. Pedicel 1.3–1.5 mm. Calyx lobes ovate, persistent, glabrous, margin entire, ciliate; apex acute. Corolla short campanulate, lobes equaling or longer than tube, broadly ovate to subreniform, margin minutely denticulate or crenulate, apex rounded. Stamens inserted at middle of corolla tube, included; anthers broadly ovate or reniform, ca. as long as filaments. Pistil included. Style short, persistent, stigma subcapitate, slightly lobed. Fruit yellowish, globose, 2–3 mm in diam. Fl. Jan–May, fr. Aug–Nov.

* Dense broad-leaved forests, damp seepage areas on hillsides, 1300–1800 m. Yunnan.

18. *Maesa acuminatissima* Merrill, Philipp. J. Sci. 23: 257. 1923.

米珍果 mi zhen guo

M. striata Mez var. *opaca* Pitard.

Shrubs 1–2(–4) m tall. Branchlets terete, slender, glabrous; pith hollow. Petiole canaliculate, 6–10 mm; leaf blade lanceolate or broadly so, 9–17 × 2–5 cm, papery, glabrous, inconspicuously pellucid punctate, glossy adaxially, dull abaxially, base obtuse or subrounded, margin entire to obscurely undulate, apex acuminate or caudate-acuminate; lateral veins 4–6 on each side of midrib, curved ascending. Inflorescences terminal or subterminal, paniculate, pyramidal, 5–8 cm; lower branches glabrous, glossy, up to 4 cm; bracteoles minute, lanceolate, near or at apex of pedicel. Flowers ca. 3 mm. Pedicel slender, 4–5 mm. Calyx lobes ovate, obtuse or acute, ca. 0.5 mm. Corolla lobes ovate, ca. as long as tube, irregularly crenulate at apex. Stamens reduced in pistillate flowers. Pistil included. Stigma scarcely lobed. Fruit globose or subovoid, ca. 3 mm in diam., enclosed by persistent calyx lobes or apex exposed, base ± conical. Fl. Jan–Feb, fr. Nov–Dec.

Evergreen broad-leaved forests, mountain slopes, stream banks, damp places; 100–600 m. Guangxi, Hainan, SE Yunnan [Vietnam].

19. *Maesa salicifolia* E. Walker, J. Wash. Acad. Sci. 21: 480. 1931.

柳叶杜荃山 liu ye du jing shan

Shrubs ca. 2 m tall. Branchlets terete, glandular granulose, early glabrescent, longitudinally striate; pith solid. Petiole deeply canaliculate, 5–12 mm, rugose; leaf blade narrowly linear-lanceolate, 10–20 × 1.5–2 cm, leathery, rugose, subbullate, inconspicuously pellucid punctate, base obtuse, margin entire, revolute, apex acute or acuminate; lateral veins 5–7 on each side of midrib. Inflorescences axillary, racemose or paniculate, 1.5–2 cm; bracteoles broadly ovate, apex obtuse or acute. Flowers white or yellowish, 3–4 mm. Pedicel 2.5–3.5 mm, glandular granulose, early glabrescent. Calyx lobes ovate to suborbicular, ca. 1 mm, punctate, margin sparsely ciliate, apex obtuse or rounded. Corolla tubular or tubular-campanulate; tube 3–4 mm, punctate-lineate; lobes broadly ovate, margin crenulate, apex rounded. Stamens of staminate flowers included, attached at or above middle of corolla tube, reduced in pistillate flowers; anthers oblong-ovate, ca. as long as filaments. Pistil included. Style persistent; stigma dilated or 3- or 4-lobed. Fruit reddish, globose or subovoid, ca. 4 mm in diam., punctate-lineate, wrinkled; persistent calyx lobes nearly meeting style. Fl. Jan–Feb, fr. Sep–Nov.

* Sparse mixed forest, limestone mountains, damp places; 100–600 m. Guangdong.

20. *Maesa japonica* (Thunberg) Moritz & Zollinger, Syst. Verz. Ind. Archip. 3: 61. 1855.

杜荃山 du jing shan

Doraena japonica Thunberg, Nov. Gen. Pl. 3: 59. 1783; *Baeobotrys japonica* (Thunberg) Zippelius ex Scheffer; *Maesa cavaleriei* H. Léveillé; *M. coriacea* Champion; *M. coriacea* var. *gracilis* Benth; *M. doraena* Blume ex Siebold & Zuccarini; *M. dunniana* H. Léveillé; *M. esquirolii* H.

L 関eill ; *M. japonica* f. *gracilis* (Benth) Nakai; *M. labordei* H. L 関eill ; *M. randaiensis* Hayata; *M. taiheizanensis* Sasaki; *Myrsine esquirolii* H. L 関eill ; *Pieris oligodonta* H. L 関eill .

Shrubs erect, sometimes decumbent or scandent, 1–3(–5) m tall. Branchlets terete, apex glandular granulose, early glabrescent; pith solid. Petiole canaliculate, 5–13 mm; leaf blade elliptic, lanceolate, to obovate, 5–16 × 2–5 cm, leathery, inconspicuously pellucid punctate, base cuneate or obtuse to rounded, smooth adaxially, margin entire toward base and subentire to serrate distally with mucronate teeth, apex acuminate to acute or obtuse; lateral veins 5–8 on each side of midrib. Inflorescences axillary, racemose or paniculate, 1–3(–4) cm, glabrous; bracteoles broadly ovate or reniform, to 1 mm, dark punctate-lineate, ciliate, encircling pedicel. Flowers white, 3.5–5 mm. Pedicel 2.5–3.5 mm, glandular granulose, glabrescent. Calyx ca. 2 mm; lobes ca. 1 mm, ovate to orbicular, punctate-lineate, margin entire, ciliate, apex obtuse or rounded. Corolla white, tubular-campanulate; tube 3–4 mm, prominently punctate-lineate; lobes reniform or ovate, ca. 1 mm, apex rounded or obtuse. Stamens included; anthers ovate, as long as filaments, glandular on back. Pistil included. Style slender, persistent, conical at base in fruit; stigma lobed. Fruit globose or ovoid, 4–5(–6) mm in diam., fleshy, punctate-lineate. Fl. Jan–Mar, fr. Oct–May.

Mixed forests, hillsides, limestone mountains; 300–2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, N Vietnam].

21. *Maesa hupehensis* Rehder in Sargent, Pl. Wilson. 2: 583. 1916.

湖北杜荃山 hu bei du jing shan

Maesa japonica (Thunberg) Moritz & Zollinger var. *elongata* Mez; *M. wilsonii* Rehder.

Shrubs 1–2(–4) m tall, glandular granulose, early glabrescent; pith hollow. Petiole canaliculate, 5–10 mm, glabrous; leaf blade lanceolate or oblong, rarely ovate, 10–15(–21) × 2–4(–4.5) cm, papery, prominently black punctate-lineate, base rounded or sometimes obtuse or broadly cuneate, margin entire or sinuate-dentate to rarely shallowly serrate, apex acuminate or rarely acute; lateral veins 8–10 on each side of midrib, not united into marginal vein. Inflorescences axillary, 4–8(–10) cm, racemose; bracts subulate; bracteoles minute, ovate, orange punctate-lineate. Flowers white, 3–4 mm. Pedicel 3–4 mm. Calyx lobes broadly ovate, ca. 1.5 mm, glabrous, margin entire, apex acute, densely orange punctate-lineate. Corolla 3–4 mm, densely orange punctate-lineate; lobes broadly ovate, subrounded, as long as tube. Stamens included; anthers ovate. Pistil included. Style conical, persistent, as long as ovary; stigma slightly 4-lobed. Fruit white or yellowish, globose or subovoid, ca. 5 mm in diam., orange punctate-lineate; persistent calyx lobes closed at fruit apex. Fl. May–Jun, fr. Oct–Dec.

* Forests, stream banks, damp places; 500–1700 m. Hubei, Sichuan.

22. *Maesa consanguinea* Merrill, Philipp. J. Sci. 23: 258. 1923.

拟杜茎山 ni du jing shan

Shrubs 1–1.5(–3) m tall. Branchlets terete, apex glandular granulose, early glabrescent, lenticellate; pith solid. Petiole canaliculate, 1–2.5 cm; leaf blade oblong to oblong-ovate, 7–12(–18.5) × 5–6(–8) cm, papery, glabrous, black punctate-lineate abaxially, base subcuneate or obtuse, margin slightly undulate or remotely denticulate, apex acuminate or subcordate-acuminate; lateral veins 5–7 on each side of midrib, marginal vein absent. Inflorescences axillary, pyramidal paniculate or sometimes racemose, (1–)4–10 cm, glabrous; bracteoles ovate, acute at apex. Flowers unknown. Fruit dark brown, globose, to 3 mm in diam., on pedicel ca. 2 mm, black punctate-lineate; persistent calyx lobes thin margined, red punctate-lineate, not reaching persistent style. Fl. Feb–Mar, fr. Jul–Sep.

* Sparse mixed forests, stream banks, hillsides; 500–1300 m. Hainan.

23. *Maesa ramentacea* (Roxburgh) A. de Candolle, Prodr. 8: 77. 1844.

称杆树 cheng gan shu

Baeobotrys ramentacea Roxburgh, Fl. Ind. 2: 231. 1824.

Shrubs or rarely trees, 1.5–3(–5) m tall. Branchlets angular, glabrous, minutely lenticellate; pith solid. Petiole ca. 1 cm; leaf blade ovate to elliptic-lanceolate, 8–16 × 2.5–5.5 cm, papery, glabrous, base rounded, obtuse, to broadly cuneate, margin entire or undulate, apex acute or long acuminate; lateral veins 5–8 on each side of midrib, not united into marginal vein. Inflorescences axillary or sometimes subterminal, paniculate, many branched, 4–10 cm, minutely glandular granulose; bracts subulate or ovate; bracteoles broadly ovate or triangular, sparsely ciliate. Flowers white, ca. 2 mm. Pedicel 1–2 mm. Calyx lobes united ca. 1/2 their length, ovate or broadly so, glabrous, ciliate, not punctate, apex obtuse or rounded. Corolla united into a short tube, ca. 1.5 mm, not punctate, glabrous; lobes as long as tube, reniform or orbicular, rounded, margin undulate. Stamens inserted on distal part of corolla tube, included, rudimentary in pistillate flowers; anthers orbicular or reniform. Style very short, thick; stigma minutely 4-lobed. Fruit yellowish, globose, 2–3 mm, orange punctate-lineate or veined. Fl. Jan–Mar, fr. Nov–Dec.

Sparse broad-leaved forests, mountain slopes, stream banks, shady places, along trails; 300–1700 m. Guangxi, Yunnan [Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Vietnam].

24. *Maesa confusa* (C. M. Hu) Pipoly & C. Chen, Novon 5: 357. 1995.

紊纹杜茎山 wen wen du jing shan

Maesa consanguinea Merrill var. *confusa* C. M. Hu, Bot. J. South China 1: 12. 1992.

Shrubs 2–4 m tall. Branchlets angular, apex glandular granulose, early glabrescent, sparsely lenticellate; pith solid. Petiole canaliculate, winged from decurrent leaf base, (2.8–)3–4 cm; leaf blade broadly elliptic to obovate, (10–)15–27 × (7–)8–10(–12) cm, membranous, glabrous, dull adaxially, densely black punctate-lineate abaxially in numerous parallel lines, base obtuse to broadly rounded, margin serrate with denticulate callose teeth, apex caudate or acuminate; lateral veins 6–12 on each side of midrib, marginal vein absent. Inflorescences axillary, pyramidal paniculate or sometimes racemose, (1–)4–10 cm, densely and minutely glandular granulose; bracteoles ovate, acute at apex. Flowers white, 2–2.2 mm. Pedicel 2–2.5 mm. Sepals united ca. 1/3 length, ovate, glabrous, margin entire, ciliate, apex broadly acute. Corolla 1–1.4 mm, lobes longer than tube, suborbicular, margin entire, glabrous, apex obtuse. Fruit dark brown, globose, to 3 mm in diam., black punctate-lineate; persistent calyx lobes thin margined, red punctate-lineate, not reaching persistent style.

* Along streams in montane mixed forests, 700–1200 m. Hainan.

25. *Maesa membranacea* A. de Candolle, Ann. Sci. Nat., Bot., ser. 2, 16: 80. 1841.

腺叶杜茎山 xian ye du jing shan

Maesa subrotunda C. Y. Wu & C. Chen.

Shrubs 2–5 m tall, glandular granulose, early glabrescent. Branchlets terete, flexuous, not lenticellate; pith solid. Petiole subterete or barely canaliculate, 2.5–3(–4) cm; leaf blade broadly ovate or broadly elliptic, 10–17(–24) × 5–11.5 cm, thin leathery, adaxially glossy, finely orange punctate-lineate, base broadly obtuse, rounded, to truncate, margin serrate-denticulate or with small, punctate teeth, apex caudate-acuminate; lateral veins 6–9(or 10) on each side of midrib, ending in teeth, submarginal vein absent. Inflorescences axillary and terminal, paniculate, (2–)7 cm, 4- or 5-branched, glabrous; bracteoles ovate, acute. Flowers white, ca. 2 mm. Pedicel 0.8–1.5(–2) mm. Calyx lobes broadly ovate, ca. 1 mm in fruit, obtuse or rounded, entire or irregularly crenulate, minutely ciliate or not, orange punctate-lineate. Corolla lobes as long as tube, broadly ovate, rounded at apex, crenulate at margin, orange punctate-lineate. Stamens included, minute, inserted on lower part of corolla tube; filaments shorter than anthers. Pistil included. Style thick; stigma obscurely lobed. Fruit globose, ca. 3 mm in diam., orange punctate-lineate. Fl. Dec–Feb, fr. Aug–Dec.

Dense mixed forests, hillsides, stream banks, open coastal areas, damp places; 200–1500 m. Guangxi, Hainan, Yunnan [Cambodia, Vietnam].

26. *Maesa indica* (Roxburgh) A. de Candolle, Trans. Linn. Soc., London 17: 134. 1834.

包疮叶 bao chuang ye

Baeobotrys indica Roxburgh, Fl. Ind. 2: 230. 1824.

Shrubs 1–3 m tall, scandent, glandular granulose, early glabrescent. Branchlets angular to obtusely ridged, pellucid punctate-lineate, striate, with dense lenticels; pith

solid. Petiole slightly canaliculate, 1–1.8 cm; leaf blade broadly ovate to oblong, 8–17(–21) 5–9(–11) cm, papery, punctate-lineate, base obtuse or subrounded, margin serrate-dentate or -denticulate, teeth not callose, apex acute or acuminate. Inflorescences axillary or subterminal, racemose or paniculate, 3–5 cm, glabrescent or glandular granulose; bracteoles broadly ovate, obtuse to rounded apically. Flowers white or light yellow-green, ca. 2 mm. Pedicel 1–2 mm, glandular granulose. Calyx lobes broadly ovate, pellucid punctate, margin entire, sparsely ciliate, apex obtuse to rounded. Corolla campanulate, orange punctate-lineate; lobes broadly ovate, as long as or longer than tube, margin subundulate, apex acute. Stamens inserted at middle of corolla tube, included; filaments as long as or longer than anthers; anthers rounded. Pistil included. Style short; stigma lobed. Fruit globose or subglobose, ca. 3 mm in diam., with longitudinal ribs; persistent calyx lobes closed at fruit apex. Fl. Apr–May, fr. Sep–Nov.

Evergreen broad-leaved forests, hillsides, stream banks, damp places; 500–2000 m. S Yunnan [India, Vietnam].

27. *Maesa tenera* Mez in Engler, Pflanzenr. IV. 236(Heft 9): 28. 1902.

软弱杜茎山 ruan ruo du jing shan

Shrubs 1–2(–4) m tall, glandular granulose, early glabrescent. Branchlets angular to obtusely ridged, lenticellate; pith hollow. Petiole canaliculate, 1–1.5 cm; leaf blade broadly elliptic to ovate, 7.5–11

3.5–5.5 cm, membranous, dull adaxially, inconspicuously pellucid punctate and sparsely glandular granulose abaxially, base cuneate, margin serrate, teeth not callose, apex caudate-acuminate; lateral veins 7–10 on each side of midrib, marginal vein absent. Inflorescences axillary, racemose or paniculate, 7–10 cm, glabrous; bracteoles ovate to lanceolate, margin ciliate, apex acute. Flowers 1.5–2 mm. Pedicel 1.5–2 mm, glabrous. Calyx lobes broadly ovate, margin entire, sometimes ciliate, apex acute. Corolla campanulate, twice as long as calyx lobes; lobes broadly ovate, as long as tube, orange punctate-lineate, margin crenulate, apex rounded. Stamens of pistillate flowers reduced, those of male flowers inserted on distal part of corolla tube; filaments longer than anthers; anthers oblong. Pistil and pistillode included. Style persistent; stigma 4-lobed. Fruit globose or subovoid, ca. 3 mm in diam., striate, 1/4–1/3 exposed above attachment of persistent calyx lobes. Fl. Feb, fr. Aug–Sep.

* Open edges of mixed forests; 100–600 m. C and S Guangdong.

28. *Maesa manipurensis* Mez in Engler, Pflanzenr. IV. 236(Heft 9): 30. 1902.

隐纹杜茎山 yin wen du jing shan

Shrubs 1.2–3 m tall. Branchlets glandular granulose, early glabrescent, shallowly canaliculate when young, cylindrical with ridges at maturity; pith hollow. Petiole slightly canaliculate, (1–)1.8 cm; leaf blade oblong to narrowly lanceolate, 11–21 × 3.5–7(–8) cm, papery, glandular granulose, early glabrescent, inconspicuously orange punctate-lineate, base subrounded or obtuse, margin coarsely serrate or serrate-denticulate with punctate and callose teeth, apex acute or short acuminate; lateral veins 9–12 on each side of midrib, ending in teeth, submarginal vein absent. Inflorescences axillary and terminal, paniculate, 2–4 cm, glabrous; bracteoles lanceolate, margin ciliate, apex acute. Flowers 2–3 mm. Calyx lobes ovate, obscurely orange punctate-lineate, margin ciliate, apex acute. Corolla white, campanulate, orange punctate-lineate; lobes ovate, margin minutely crenulate, as long as tube or longer, apex obtuse. Stamens inserted at middle of corolla tube; anthers ovate or reniform, ca. as long as filaments. Pistil included. Style slender, persistent; stigma sometimes 4-lobed. Fruit ovoid, ca. 2.5 mm in diam., slightly ribbed; persistent calyx lobes closed at fruit apex. Fl. Feb–Mar, fr. Oct.

Sparse broad-leaved forests, hillsides, valleys; 1600–2000 m. W Yunnan [Bangladesh, E India].

29. *Maesa densistriata* C. Chen & C. M. Hu in C. Chen, Novon 4: 322. 1994.

灰叶杜茎山 hui ye du jing shan

Shrubs 1–2 m tall. Branchlets angular, sparsely puberulent when young, glabrescent when mature. Petiole ca. 1.5 cm; leaf blade oblong, elliptic-lanceolate, to oblanceolate, 8.5–14 × 2.5–5.5 cm, papery, glabrous, densely and minutely longitudinally glandular striate, base cuneate, margin serrate, apex acute or abruptly acuminate; midrib and lateral veins prominent especially abaxially, lateral veins ca. 10 per side, ending in teeth. Flowers unknown. Inflorescences axillary, paniculate, 1.5–4 cm, many branched, glabrous, inserted at leaf axils of 2-year old branches; bracts lanceolate, ca. 0.5 mm; bracteoles ovate, glabrous. Fruiting pedicel 1–2 mm, glabrous. Fruit globose, 3–4 mm in diam., somewhat fleshy, glabrous, not glandular, persistent sepals ovate-triangular, glabrous, glandular at apex, ± ciliate.

* Sparse broad-leaved forests, shrubby areas, sunny hillsides; 900–2000 m. Yunnan.

2. AEGICERAS Gaertner, Fruct. & Sem. 1: 216. 1788.

蜡烛果属 la zhu guo shu

Shrubs or small trees. Leaves alternate or subopposite. Inflorescences terminal or rarely axillary, umbellate. Flowers bisexual, 5-merous. Corolla campanulate, united into a tube; lobes ovate or ovate-lanceolate, imbricate, overlapping to right in bud, recurved or reflexed at anthesis, not glandular. Basal part of filaments united into a tube as long as corolla tube, distal part free, exerted; anthers ovate, 2-celled, dehiscing longitudinally, transversely septate. Ovary superior; ovules numerous, within a globose placenta. Style elongated; stigma apiculate. Fruit elongated, terete, curved, 1-seeded capsules; exocarp dry, crustaceous, dehiscing by a

longitudinal fissure or separating into 2 fragments along back and front; endocarp somewhat fleshy; persistent calyx compactly enclosing fruit base. Seeds occupying whole cavity; embryo terete, curved.

Two species: India, Malaysia, Philippines, Sri Lanka, Vietnam, and Australia; one species in China.

1. *Aegiceras corniculatum* (Linnaeus) Blanco, Fl. Filip. 79. 1837.

蜡烛果 *la zhu guo*

Rhizophora corniculata Linnaeus, Amoen. Acad. 4: 123. 1759; *Aegiceras majus* Gaertner; *Umbraculum corniculatum* (Linnaeus) Kuntze.

Plants ca. 1.5 m tall. Branchlets reddish or blackish brown, glabrous. Petiole 5–10 mm; leaf blade elliptic or broadly obovate, 3–8 2–4.5 cm, leathery, base cuneate, margin entire, revolute, apex rounded or emarginate; lateral veins 7–11 on each side of midrib, densely puberulent abaxially. Inflorescences terminal, subsessile, ca. 10-flowered; bracts oblong-lanceolate,

deciduous. Pedicel ca. 1 cm, glandular. Flowers ca. 1 cm. Calyx lobes rhomboid, 5–6 3–4 mm, leathery, prominently veined, black glandular at base, asymmetric, entire, apex broadly rounded. Corolla white, ca. 9 mm; lobes ovate, ca. 5 mm, asymmetric, acuminate, reflexed; tube 3–4 mm, villous inside. Stamens longer than corolla tube; filaments villous basally on outside, glabrous inside; anthers ca. 3 mm. Style black glandular basally. Fruit 6(–8) cm, 5–6 mm in diam., glabrous, base clasped by twisted persistent sepals. Fl. Dec–Feb, fr. Oct–Dec.

Mangrove, muddy flats, coasts. Fujian, Guangdong, Guangxi, Hainan, Nanhai Zhudao [India, Malaysia, Philippines, Sri Lanka, Vietnam; Australia].

3. *ARDISIA* Swartz, Prodr. Veg. Ind. Occ. 3: 48. 1788.

紫金牛属 *zi jin niu shu*

Trees, shrubs, suffrutescent [or rarely herbs]. Leaves alternate or pseudovercillate, usually punctate or punctate-lineate. Inflorescences paniculate, cymose, corymbose, or umbellate, rarely racemose. Flowers bisexual, often punctate, 5- or rarely 4-merous. Calyx campanulate or cupular; sepals free or barely united at base, imbricate or quincuncial, usually punctate or punctate-lineate. Corolla campanulate, often punctate; lobes united at base, overlapping to right or very rarely to left, imbricate, or quincuncial, often conical in bud. Stamens attached at base or middle of corolla tube; filaments very short, broad at base; anthers dehiscent longitudinally or by apical pores. Ovary ovoid or subglobose, as long as or longer than petals; ovules 3 to many. Style base persistent; stigma minute, apiculate. Fruit drupaceous, 1-seeded, punctate, sometimes longitudinally ribbed, with somewhat fleshy exocarp and crusty or slightly bony endocarp. Seeds covered by membranous remnants of placenta.

About 400–500 species: primarily tropical E and SE Asia, Americas, Australia, and Pacific Islands; 65 species in China.

1a. Suffrutescent herbs or subwoody shrubs, if woody then mostly less than 1.5 tall, with creeping rhizomes, stolons, or tubers.

2a. Leaf blade margin serrate or pectinate-dentate.

3a. Leaf blade margin pectinate-dentate.

4a. Leaf blade papery, ovate or elliptic, 6–16 cm, base broadly rounded to subcordate, slightly asymmetric.

5a. Leaf blade bullate adaxially, veins densely villous-tomentose abaxially; inflorescences

ca. 3 cm 36. *A. pubivenula*

5b. Leaf blade smooth adaxially, veins minutely villous abaxially; inflorescences 5–7 cm 37. *A. replicata*

4b. Leaf blade membranous 16–50 cm, base cuneate or truncate, symmetric.

6a. Cataphylls absent; leaf secondary veins perpendicular from midrib to margin.

7a. Leaf blade oblanceolate, tomentose abaxially along veins, base truncate; petiole

4–6 cm 38. *A. scalarinervis*

7b. Leaf blade broadly elliptic, tomentose abaxially throughout, base broadly rounded;

petiole (6–)6.5–8.5 cm 39. *A. pingbienensis*

6b. Cataphylls present; leaf secondary veins arcuate, curving distally from midrib to margin.

8a. Inflorescences racemose panicles; flowers umbellate; branchlets and midrib

tomentose with simple, stramineous trichomes 42. *A. ramondiaeformis*

8b. Inflorescences bipinnate panicles; flowers corymbose; branchlets and midrib

tomentose with reddish, elongated, 2-celled capitate trichomes.

9a. Plant subsucculent; leaf blade margin somewhat revolute; inflorescences

columnar, not pyramidal 40. *A. dasyrhizomatica*

9b. Plant woody; leaf blade margin flat; inflorescences pyramidal 41. *A. gigantifolia*

3b. Leaf blade margin roughly to finely serrate.

10a. Inflorescences paniculate; petiole winged 43. *A. balansana*

10b. Inflorescences umbellate; petiole not winged.

11a. Leaf blade 15–22 cm 44. *A. purpureovillosa*

11b. Leaf blade 2.5–10 cm.

- 12a. Leaves alternate, base of blade cordate 49. *A. maclurei*
- 12b. Leaves opposite, whorled, or nearly so; base of blade cuneate, obtuse, or rounded.
- 13a. Sepals ovate or triangular-ovate, puberulent, tomentose, or ciliate; bracts 1–2 mm.
- 14a. Pedicel puberulent, ca. 5 mm; petiole canaliculate, 10–20 mm 45. *A. ordinata*
- 14b. Pedicel strigose, 7–10 mm; petiole not canaliculate, 6–10 mm 46. *A. japonica*
- 13b. Sepals linear- to subulate-lanceolate, villous or pilose; bracts 3–5 mm.
- 15a. Leaf blade elliptic or obovate, 2.5–6 cm; pedicel ca. 6 mm; flowers (3–)4 mm; fruit punctate 47. *A. pusilla*
- 15b. Leaf blade ovate to lanceolate-elliptic or oblanceolate, 5–10 cm; pedicel 7–10 mm; flowers 4–5(–6) mm; fruit not punctate 48. *A. fabri*
- 2b. Leaf blade margin entire, crenate, or undulate.
- 16a. Leaves and branchlets glandular villous-tomentose or glandular puberulent.
- 17a. Shrubs; leaf blade apex subacuminate to long acuminate, margin glabrous.
- 18a. Leaf blade margin crenate; branchlets long glandular villous 50. *A. villosa*
- 18b. Leaf blade margin entire; branchlets reddish glandular puberulent 51. *A. brevicaulis*
- 17b. Herbs; leaf blade apex rounded to acute; margin long glandular villous-tomentose.
- 19a. Petiole 0.2–0.4 cm; sepals glabrous; leaf blade apex rounded.
- 20a. Calyx lobe margin glandular ciliate 52. *A. primulifolia*
- 20b. Calyx lobe margin glabrous 53. *A. omissa*
- 19b. Petiole 2–4 cm; sepals long glandular villous; leaf blade apex acute.
- 21a. Leaf blade base truncate to broadly rounded, adaxial surface hispid 54. *A. verbascifolia*
- 21b. Leaf blade base acute, adaxial surface strigose and mamillate 55. *A. mamillata*
- 16b. Leaves and branchlets glandular papillose, scaly, or glabrous.
- 22a. Leaf blade 2–6 cm.
- 23a. Leaf blade margin crenulate.
- 24a. Leaf blade lanceolate, glossy above; branchlets and petioles densely and minutely reddish glandular papillose 56. *A. alyxiifolia*
- 24b. Leaf blade obovate, dull above; branchlets and petioles reddish brown scaly 57. *A. chinensis*
- 23b. Leaf blade margin minutely serrulate or entire.
- 25a. Leaf blade margin entire; branchlets brown scaly apically 58. *A. fordii*
- 25b. Leaf blade margin minutely serrulate; branchlets minutely reddish puberulent.
- 26a. Leaf blade base truncate to subcordate 59. *A. violacea*
- 26b. Leaf blade base cuneate 60. *A. sinoaustralis*
- 22b. Leaf blade 6.5–20 cm.
- 27a. Branchlets reddish brown scaly; leaf blade margin without marginal nitrogen-fixing nodules 61. *A. argenticaulis*
- 27b. Branchlets glandular papillate; leaf blade margin with conspicuous black nitrogen fixing nodules.
- 28a. Leaf blade apex caudate; branchlets reddish glandular papillose; petiole 0.3–0.6 cm.
- 29a. Leaf blade membranous, base obtuse to rounded, abaxially glaucous, inconspicuously pellucid punctate, sparsely reddish puberulent 62. *A. caudata*
- 29b. Leaf blade papery, base acutish to attenuate, abaxially dull, densely black punctate, sparsely reddish papillose 63. *A. pedalis*
- 28b. Leaf blade apex acute to acuminate; branchlets minutely rusty glandular papillose; petiole 0.8–2 cm.
- 30a. Leaf blade membranous; petals 4–5 mm, apex acute; plants with creeping rhizomes 64. *A. crispa*
- 30b. Leaf blade papery to subleathery; petals 7–8 mm, apex acuminate; plants with tubers 65. *A. carnosicaulis*
- 1b. Shrubs or trees, mostly over 1 m, without creeping rhizomes or stolons.
- 31a. Inflorescences strictly axillary or axillary and terminal.
- 32a. Branchlets and inflorescence rachis reddish tomentose or puberulent.
- 33a. Inflorescences cymose, ca. 1 cm; branchlets reddish puberulent 3. *A. aberrans*
- 33b. Inflorescences paniculate, 7–10 cm; branchlets reddish tomentose.
- 34a. Inflorescence branches umbellate, rarely cymose; leaf blade margin entire; petiole 0.3–0.5 cm 1. *A. nigropilosa*

- 34b. Inflorescence branches racemose; leaf blade margin subentire to crenulate; petiole 1.5–2.5 cm 2. *A. baotingensis*
- 32b. Branchlets and inflorescence rachis glabrous, minutely red papillate, or sparsely brown scaly.
- 35a. Branchlets and inflorescence rachis scaly.
- 36a. Leaf blade membranous; perianth membranous 6. *A. quinquegona*
- 36b. Leaf blade leathery; perianth papery.
- 37a. Leaf blade glossy adaxially, apex long acuminate, acumen 1–2 cm; secondary veins numerous, fine; calyx lobes broadly ovate to suborbicular 4. *A. waitakii*
- 37b. Leaf blade dull adaxially, apex acute; secondary veins 14–25 pairs; calyx lobes narrowly triangular 5. *A. sieboldii*
- 35b. Branchlets and inflorescence rachis glabrous or sparsely and minutely red glandular papillate.
- 38a. Petiole canaliculate; flowers in corymbs or racemes.
- 39a. Leaf blade elliptic or oblanceolate, conspicuously black punctate-lineate abaxially, not prominently black punctate adaxially 10. *A. solanacea*
- 39b. Leaf blade linear or narrowly lanceolate, black punctate abaxially, prominently black punctate adaxially 11. *A. filiformis*
- 38b. Petiole marginate; flowers in umbels.
- 40a. Sepals rugose basally; leaf blade margin revolute 7. *A. elliptica*
- 40b. Sepals smooth or verruculose basally; leaf blade margin flat.
- 41a. Sepals verruculose basally, margin hyaline, apex rounded to emarginate; leaf blade base acute; petals glabrous adaxially at base 8. *A. garrettii*
- 41b. Sepals smooth basally, margin opaque, apex broadly acute; leaf blade base cuneate; petals red glandular papillate adaxially at base 9. *A. brunnescens*
- 31b. Inflorescences terminal or subterminal.
- 42a. Leaf blade margin crenulate, serrate, or dentate, if subentire then with large vascularized nodules.
- 43a. Branchlets, abaxial leaf surface, and inflorescence rachis glabrous or rusty scaly.
- 44a. Branchlets, abaxial leaf surface, and inflorescence rachis rusty scaly; leaf blade membranous or papery, densely black punctate and punctate-lineate or inconspicuously pellucid punctate.
- 45a. Leaf blade membranous, densely and prominently black punctate and punctate-lineate; tertiary veins not conspicuous 32. *A. shweliensis*
- 45b. Leaf blade papery, inconspicuously pellucid punctate; tertiary veins prominently raised abaxially 33. *A. malipoensis*
- 44b. Branchlets, abaxial leaf surface, and inflorescences glabrous; leaf blade leathery, not punctate.
- 46a. Inflorescences corymbose panicles of umbels; sepals lanceolate; petiole 10–13 mm 34. *A. hanceana*
- 46b. Inflorescences simple or compound umbels; sepals broadly ovate to suborbicular; petiole 0.3–0.5 mm 35. *A. crassinervosa*
- 43b. Branchlets and inflorescence rachis sparsely glandular papillose-puberulent and early glabrescent, or strigose.
- 47a. Inflorescences simple umbels.
- 48a. Leaf blade margin sharply serrate; sepals as wide as or wider than long; petals glabrous within 24. *A. cornudentata*
- 48b. Leaf blade margin undulate, or crenulate, rarely distantly serrulate; sepals longer than wide; petals yellow glandular granulate adaxially at base.
- 49a. Abaxial leaf surface, branchlets, and inflorescence rachis densely and minutely reddish puberulent; sepals papery, margin sparsely glandular ciliolate 25. *A. lindleyana*
- 49b. Abaxial leaf surface glabrous, branchlet and inflorescences rachis minutely reddish glandular papillate, early glabrescent; sepals membranous, margin glabrous 26. *A. crenata*
- 47b. Inflorescences panicles of corymbs, umbels, or cymes.
- 50a. Panicles cymose or compound umbels; leaf blade apex acute or subacuminate.
- 51a. Leaf blade papery, dull, densely black punctate, sparsely glandular papillate abaxially; inflorescences compound umbels 30. *A. virens*
- 51b. Leaf blade leathery, glossy, inconspicuously pellucid punctate, with reddish bifurcate trichomes abaxially; inflorescences compound cymes 31. *A. alutacea*

- 50b. Panicles corymbose; leaf blade apex caudate-acuminate.
 52a. Leaf blade membranous; inflorescences compound corymbs 27. *A. conspersa*
 52b. Leaf blade subleathery to leathery; inflorescences corymbs of umbels.
 53a. Perianth membranous, hyaline, essentially epunctate; sepals
 and petals long attenuate 28. *A. merrillii*
 53b. Perianth papery, densely black punctate; sepals obtuse,
 petals acute 29. *A. corymbifera*
- 42b. Leaf blade margin subentire, undulate, or entire, without vascularized nodules.
 54a. Inflorescences umbellate, terminal on modified lateral branchlets.
 55a. Leaf blade linear or linear-lanceolate; branchlets 1.5–2.5(3.5) mm in diam.
 56a. Leaf blade leathery, densely and prominently black punctate and
 punctate-lineate; sepals elliptic 22. *A. ensifolia*
 56b. Leaf blade papery, inconspicuously red punctate; sepals deltate 23. *A. hypargyrea*
 55b. Leaf blade elliptic, broadly oblanceolate or obovate; branchlets (3.5–) 4–5 mm in
 diam.
 57a. Branchlets red puberulent; petiole up to 1 cm, leaf blade leathery or
 subleathery, dull adaxially, pale abaxially.
 58a. Leaf blade obscurely pellucid punctate; sepals ovate, acute apically,
 1.5–2 mm, inconspicuously red punctate medially, margin opaque,
 erose, densely red glandular ciliate; peduncle 0.5–1.2 cm 18. *A. porifera*
 58b. Leaf blade prominently black punctate; sepals suborbicular, broadly
 rounded and notched apically, 4–6 mm, densely black punctate medially,
 margin hyaline, irregular, with a few translucent glandular cilia;
 peduncle 1.3–2.5 cm 19. *A. perreticulata*
 57b. Branchlets glabrous; petiole 1–4 cm; leaf blade membranous, glossy adaxially.
 59a. Leaf blade densely and prominently red punctate, margin entire;
 petiole 1–2 cm 20. *A. olivacea*
 59b. Leaf blade densely and prominently black punctate and punctate-lineate,
 margin roughly crenate; petiole 3–4 cm 21. *A. hokouensis*
- 54b. Inflorescences pyramidal paniculate, terminal and/or subterminal on main branchlet axis.
 60a. Leaf blade leathery, thin leathery, or cartilaginous; branchlets 5–7 mm in diam.
 61a. Leaf blade thin leathery, smooth; sepals ovate 14. *A. obtusa*
 61b. Leaf blade cartilaginous or leathery, scrobiculate; sepals lanceolate.
 62a. Leaf blade cartilaginous; inflorescences and branchlets
 minutely scaly 12. *A. densilepidotula*
 62b. Leaf blade leathery; inflorescences and branchlets glabrous 13. *A. racemosa*
 60b. Leaves membranous to papery; branchlets 2–3 mm in diam.
 63a. Flowers in corymbs; pedicel erect; inflorescence rachis straight..... 5. *A. thyrsoiflora*
 63b. Flowers in umbels; pedicel recurved; inflorescence rachis geniculate.
 64a. Leaf blade bullate, elliptic to lanceolate; inflorescence rachis and
 branchlets reddish scaly and glandular papillate 16. *A. retroflexa*
 64b. Leaf blade smooth, obovate to oblanceolate; inflorescence rachis and
 branchlets reddish stellate and dendroid tomentose 17. *A. curvula*

1. *Ardisia nigropilosa* Pitard in Lecomte, Fl. Indo-Chine 3: 810. 1930.

星毛紫金牛 xing mao zi jin niu

Ardisia stellata E. Walker.

Shrubs ca. 3 m tall, densely reddish stellate tomentose throughout; stellate hairs stipitate. Branchlets terete, 2.5–3.5 mm in diam., strongly longitudinally ridged. Petiole canaliculate, 3–5 mm; leaf blade oblanceolate, 12–24 × 3.5–7 cm, papery, dull and glabrescent adaxially except for midrib, base subauriculate, margin flat, entire or obscurely undulate, apex acute or acuminate; lateral veins 15–20 on each side of midrib, prominent, raised, marginal vein absent. Inflorescences terminal or sublateral, paniculate, branches umbellate or cymose, 7–10

cm. Flowers papery, pink, ca. 3 mm. Pedicel (5–)7–10 mm. Sepals triangular lanceolate, 1.2–1.5 mm, densely tomentose, punctate, margin entire and glabrous, apex acute. Petals nearly free, broadly ovate, epunctate or sparsely punctate, sparsely pubescent abaxially, glabrescent, margin entire, apex obtuse or subacute. Stamens ca. 2/3 as long as petals; filaments obsolete; anthers ovate, punctate dorsally, dehiscent by longitudinal slits, apex caudate. Pistil ca. as long as petals; ovary globose, glabrous, punctate; ovules numerous, multiseriate. Stigma punctiform. Fruit globose, dull red or reddish black, 4–5 mm in diam., stellate tomentose. Fl. May, fr. Oct.

Evergreen broad-leaved forests, mountains, stream sides, damp places; ca. 500 m. S Yunnan [Vietnam].

2. *Ardisia baotingensis* C. M. Hu, Acta Bot. Austro-Sin. 6: 27. 1990.

保亭紫金牛 *bao ting zi jin niu*

Shrubs 2–3 m tall, reddish brown scaly on branchlets, petioles, and inflorescence rachis. Branchlets slightly angular to obtusely 4-angled, 3–5 mm in diam. Petiole canaliculate, 1.5–2.5 cm; leaf blade oblong or elliptic, 14–25 × 4–8.5 cm, papery, or thin leathery, base broadly cuneate, margin flat, entire to subrenate, apex acute to slightly acuminate, acumen to 5 mm, without a mucro; lateral veins numerous, prominently raised on both surfaces, marginal vein evident. Inflorescences axillary on long peduncles, paniculate, branches umbellate, rachis straight, glabrous. Flowers papery, pink, ca. 5 mm. Pedicel recurved, 0.8–1.5 cm. Sepals triangular, 0.8–1 mm, minutely punctate, margin entire, ciliate, apex acute. Petals united to 1/4 length, broadly ovate, margin entire, hyaline, glabrous, apex acute. Stamens subequal to petals; filaments short; anthers ovate, ca. 2 mm, apparently epunctate, apiculate. Pistil ca. as long as petals; ovary subglobose, glabrous; ovules numerous, multiseriate. Fruit subglobose, 6–7 mm in diam., longitudinally striate. Fl. Feb–Apr, fr. Oct–Nov.

* Dense broad-leaved forests, mountains. Hainan.

3. *Ardisia aberrans* (E. Walker) C. Y. Wu & C. Chen in C. Chen, Fl. Yunnan. 1: 337. 1977.

狗骨头 *gou gu tou*

Embelia aberrans E. Walker, Bull. Fan Mem. Inst. Biol. 9: 173. 1939.

Shrubs 1.2–2 m tall. Branchlets terete, 2–3 mm in diam., reddish puberulent, glabrescent. Petiole canaliculate, 6–10 mm; leaf blade narrowly elliptic or oblanceolate, 17–23 × 5–9 cm, papery, dull and glabrous adaxially, minutely puberulent and punctate abaxially, base cuneate or obtuse or sometimes rounded, margin flat, entire, apex acuminate; lateral veins 18–23 on each side of midrib, prominently raised adaxially, marginal vein present. Inflorescences axillary, cymose, ca. 1 cm, puberulent, usually pendulous. Flowers papery, ca. 3 mm. Pedicel 2–3 mm, puberulent. Sepals ovate, ca. 1 mm, minutely puberulent, red punctate, margin ciliate, apex acute. Petals united ca. 1/2 way to base; lobes broadly ovate, glabrous, minutely punctate, base auriculate, margin entire, apex obtuse. Stamens slightly shorter than petals; filaments subobsolete; anthers ovate or broadly lanceolate, punctate dorsally, dehiscent by longitudinal slits, apex acute. Pistil ca. as long as petals, glabrous; ovary conical; ovules numerous, in 3 series. Stigma punctiform. Fruit globose, ca. 5 mm in diam., punctate. Fl. Apr, fr. Sep.

* Evergreen broad-leaved forests, valleys, damp places; 1100–1400 m. Yunnan.

4. *Ardisia waitakii* C. M. Hu, Bot. J. South China 1: 2. 1992.

越南紫金牛 *yue nan zi jin niu*

Shrubs or trees to 4 m tall. Branchlets terete, 3–3.5 mm in diam., brown scaly, glabrescent. Petiole canaliculate, 7–12 mm;

leaf blade oblong or narrowly oblanceolate, 9–20 × 2.5–5.5 cm, leathery, densely pellucid punctate, glossy, and glabrous adaxially, pale and densely minute brown scaly abaxially, base cuneate, margin flat, entire, apex long acuminate or attenuate, acumen 1–2 cm; lateral veins numerous, marginal vein present. Inflorescences axillary or subterminal, corymbose. Flowers papery, white or pink, 3.5–4 mm. Pedicel 5–10 mm. Sepals broadly ovate to suborbicular, 1.5–1.8 mm, keeled and orange punctate medially, sparingly brown scaly basally, margin erose toward apex and ciliate, apex obtuse to rounded. Petals united 0.3–0.4 mm from base; lobes ovate, sparsely pellucid punctate, rusty papillate adaxially at base, margin entire, apex obtuse to acutish. Stamens subequalling petals; filaments ca. 0.5 mm; anthers narrowly ovate, ca. 2.5 mm, epunctate dorsally, dehiscent by subterminal pores opening into longitudinal slits, apex cuspidate. Pistil equaling petals; ovary ovoid, densely punctate; ovules numerous, multiseriate. Stigma punctiform. Fruit globose, 5.5–6 mm in diam., pellucid punctate. Fl. Apr–May, fr. Oct.

Evergreen broad-leaved forests, stream sides; 500–800 m. Guangdong, Guangxi, Hainan [Vietnam].

Plants reported in FRPS as *Ardisia oxyphylla* Wallich ex A. de Candolle var. *cochinchinensis* Pitard are misidentifications of *A. waitakii*. The former taxon is a synonym of *A. amherstiana* A. de Candolle, a species that does not occur in China.

5. *Ardisia sieboldii* Miquel, Ann. Mus. Bot. Lugduno-Batavi 3: 190. 1867.

多枝紫金牛 *duo zhi zi jin niu*

Ardisia formosana Rolfe; *Bladhia sieboldii* (Miquel) Nakai; *Tinus sieboldii* (Miquel) Kuntze.

Shrubs or rarely small trees to 10 m tall. Branchlets terete 2–3 mm in diam., sparsely brown scaly when young, finely wrinkled. Petiole marginate, 5–10 mm; leaf blade obovate to oblanceolate, 7–14 × 2–4 cm, leathery, dull adaxially, glabrous or sometimes minutely brown scaly abaxially, base cuneate, margin entire, usually revolute, apex broadly to narrowly acute; lateral veins 14–25 on each side of midrib, inconspicuous, marginal vein obscure. Inflorescences axillary, near ends of branches, paniculate, branches subumbellate or cymose, 3–4(–7) cm, glabrous. Flowers membranous, white, ca. 3 mm. Pedicel ca. 5 mm, brown scaly. Sepals ovate, 1–1.5 mm, sparsely punctate, margin entire, ciliate, apex acute. Petals nearly free, broadly ovate, inconspicuously punctate, glabrous, apex acute. Stamens ca. 3/4 as long as petals; filaments equal to anther length; anthers ovate, prominently black or inconspicuously pellucid punctate dorsally, dehiscent by pores opening into large longitudinal slits, apex apiculate. Pistil ca. as long as petals; ovary glabrous, punctate; ovules numerous, multiseriate. Fruit globose, red to blackish, ca. 7 mm in diam., somewhat fleshy. Fl. Mar–Jun, fr. Jan–Apr. $2n = 48$.

Mixed forests, thickets, mountains, hillsides; 100–600 m. Fujian, Taiwan, Zhejiang [S Japan].

6. *Ardisia quinquegona* Blume, Bijdr. 689. 1826.

罗伞树 *luo san shu*

Ardisia elliptisepala E. Walker; *A. jinyunensis* Z. Y. Zhu; *A. pauciflora* Heyne; *A. pentagona* A. de Candolle; *A. quinquegona* var. *hainanensis* E. Walker; *A. quinquegona* var. *oblonga* E. Walker; *Bladhia pseudoquinquegona* Masamune; *B. quinquegona* (Blume) Nakai.

Shrubs 2(–6) m tall, rarely rhizomatous. Branchlets angular, 2–3 mm in diam., brown scaly, glabrescent, longitudinally ridged. Petiole canaliculate, (3–)5–10 mm, brown scaly, glabrescent; leaf blade oblong, elliptic, or oblanceolate, 8–16 × 2–4 cm, membranous, dull and glabrous adaxially, inconspicuously punctate and scaly abaxially, base cuneate, margin flat, entire, apex narrowly acute to acuminate, acumen to 1 cm; lateral veins numerous, inconspicuous, marginal vein inconspicuous. Inflorescences axillary, paniculate, cymose, or subumbellate, ca. (1–)3–5(–8) cm, scaly. Flowers membranous, white or pink, to 3 mm. Pedicel 5–8 mm, scaly. Sepals ovate to lanceolate, ca. 1 mm, punctate, glabrous, margin sparsely and minutely ciliate, apex acute to obtuse. Petals nearly free, broadly elliptic, to 3 mm, punctate, glabrous except puberulent at base adaxially, apex acute or obtuse. Stamens subequalling petals; filaments obsolete; anthers ovate to reniform, punctate dorsally, dehiscent by terminal pores opening into large longitudinal slits, apex apiculate. Pistil longer than petals, even in bud; ovary glabrous, punctate; ovules numerous, multiseriate. Stigma punctiform. Fruit depressed, obtusely 5-angled, inconspicuously punctate. Fl. Mar–Jul, fr. Aug–Feb.

Damp seepage in mixed forests, valleys, stream banks, hillsides, damp places; 200–1300 m. Fujian, Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan [India, Indonesia, Japan (Ryukyu Islands), Malaysia, Vietnam].

7. *Ardisia elliptica* Thunberg, Nov. Gen. Pl. 8: 119. 1798.

东方紫金牛 *dong fang zi jin niu*

Ardisia kotoensis Hayata; *A. squamulosa* Presl; *Bladhia kotoensis* (Hayata) Nakai; *Tinus squamulosa* (Presl) Kuntze..

Shrubs 1–2 m tall, glabrous. Branchlets angular, 3–4.5 mm in diam., glabrous, conspicuously black punctate-lineate, longitudinally ridged. Petiole marginate, 5–10 mm; leaf blade oblanceolate or obovate, 6–12(–16) × 3–5(–7) cm, subleathery, dull and densely punctate abaxially, especially along margin, base cuneate, margin revolute, entire, apex obtuse or acute; lateral veins 12–34 on each side of midrib, marginal vein present. Inflorescences axillary or subterminal on basally thickened lateral branches, subumbellate or umbellate. Flowers leathery, pink or white, 6(–8) mm. Pedicel ca. 1–2 cm, minutely and densely white verruculose, densely punctate. Sepals broadly ovate, ca. 1 mm, densely black punctate, base rugose and subauriculate, margin subentire, scarious, minutely ciliate, apex rounded. Petals almost free, broadly ovate, densely punctate, glabrous, margin hyaline, scarious, entire, apex long attenuate. Stamens subequalling petals; anthers linear-lanceolate, punctate dorsally, longitudinally dehiscent, transversely septate-lobed, apex

apiculate. Pistil as long as petals; ovary glabrous, pellucid punctate; ovules numerous, multiseriate. Fruit subglobose, red or purplish black, ca. 8 mm in diam., minutely punctate, fleshy. Fl. Feb–Apr, fr. Sep–Nov. $2n = 48^*$

Roadsides, scrub, near villages, edges of fields, along coasts. Taiwan [India, Indonesia, Japan (Ryukyu Islands), Malaysia, Philippines, Sri Lanka, Vietnam; cultivated and naturalized throughout tropics].

8. *Ardisia garrettii* H. R. Fletcher, Bull. Misc. Inform. Kew 1937: 30. 1937.

小乔木紫金牛 *xiao qiao mu zi jin niu*

Shrubs or trees 2–5(–8) m tall, glabrous. Branchlets terete, 3–4 mm in diam., minutely glandular papillate, early glabrescent. Petiole marginate, 5–10 mm; leaf blade narrowly oblanceolate, 9–19 × 2–5 cm, papery, inconspicuously punctate, base acute, margin flat, entire, apex acuminate, acumen 1–1.5 cm; lateral veins 14–20 on each side of midrib, inconspicuous adaxially, slightly raised abaxially, marginal vein absent. Inflorescences axillary, paniculate, branches umbellate or subracemose, rarely cymose, 4–10 cm. Flowers papery, white, rarely red or pink, 5–7 mm. Pedicel 1.2–1.9 cm. Sepals broadly ovate, ca. 2 mm, reflexed in fruit, punctate, base subauriculate, verruculose, margin hyaline, ciliate, apex rounded or emarginate. Petals nearly free, broadly ovate, 5–7 mm, glabrous, purplish red punctate, apex acute. Stamens shorter than petals; anthers lanceolate, black punctate dorsally, dehiscent by longitudinal pores, apex acute or minutely apiculate. Pistil as long as petals; ovary glabrous; ovules numerous, in 3 or 4 series. Fruit reddish purple or blackish, oblate, ca. 7 mm in diam., densely punctate. Fl. Feb–Apr, fr. Sep–Nov.

Mixed forests, limestone hillsides, shrubby areas, mountains; 400–1400 m. Guizhou, Xizang, Yunnan [Myanmar, Thailand, Vietnam].

The species was reported in FRPS as *Ardisia arborescens*.

9. *Ardisia brunnescens* E. Walker, J. Wash. Acad. Sci. 27: 198. 1937.

凹脉紫金牛 *ao mai zi jin niu*

Ardisia glauca Pitard (1930), not Mez (1920).

Shrubs 0.5–1(–3) m tall, glabrous. Branchlets somewhat angled, 2.5–3.5 mm in diam., glabrous. Petiole marginate, (5–)7–12 mm; leaf blade elliptic, 8–14 × 3.5–6 cm, papery, base broadly cuneate, margin entire, apex acute or broadly acuminate; lateral veins 10–15 on each side of midrib, marginal vein undulate, interrupted. Inflorescences subterminal, paniculate, on specialized lateral branches 5–9 cm, with 1 or 2 reduced apical leaves, branches umbellate. Flowers papery, pink, ca. 4 mm. Pedicel subclavate, ca. 1 cm, slender. Sepals ovate, ca. 1.5 mm, punctate, sometimes sparsely scaly, base smooth, margin opaque, minutely ciliate, apex broadly acute. Petals ovate, ca. 4 mm, united at base; lobes densely and finely punctate, glabrous abaxially, minutely red glandular papillate near base adaxially, margin entire, opaque, apex acute.

Stamens shorter than petals; filaments extremely short; anthers ovate, punctate or darkened dorsally, dehiscent by longitudinal slits, apex apiculate. Pistil as long as petals; ovary ovoid, glabrous; ovules numerous, multiseriate. Fruit dark reddish, globose, 6–7 mm in diam., pellucid punctate. Fl. Apr, fr. Oct–Jan.

Mixed forests, thickets, valleys, hillsides. Guangdong, Guangxi [Vietnam].

10. *Ardisia solanacea* Roxburgh, Pl. Coromandel 1: 27. 1795.

酸台菜 suan tai cai

Shrubs or trees to 6 m tall, glabrous. Branchlets prominently angular, 5–7 mm in diam. Petiole canaliculate, 1–2 cm; leaf blade elliptic or oblanceolate, 12–20 × 4–7 cm, papery, conspicuously black punctate and punctate-lineate abaxially, not prominently punctate adaxially, base cuneate or narrowly decurrent on petiole, margin subrevolute, entire, apex acute; lateral veins ca. 20 on each side of midrib, raised on both surfaces, marginal vein absent. Inflorescences at bases of new shoots, paniculate with racemose or rarely corymbose branches, 3–8 cm. Flowers leathery, pink, ca. 1 cm. Sepals broadly ovate to reniform, ca. 3 mm, densely black punctate, base subauriculate, margin subentire or crenulate, ciliate, scarious, apex rounded. Petals nearly free; lobes broadly ovate, ca. 9 mm, punctate, margin entire, hyaline, apex obtuse or acute. Stamens subequalling petals; filaments ca. 1/4 anther length; anthers linear-lanceolate, densely punctate dorsally, longitudinally dehiscent, apex acute. Pistil subequalling petals; ovary globose, densely punctate; ovules numerous, multiseriate. Fruit purplish red or blackish, oblate, 7–9 mm in diam., densely black punctate. Fl. Feb–Mar, fr. Aug–Nov. $2n = 46$.

Mixed forests, shrubby areas, mountains or hillsides; 400–1600 m. SW Guangxi, S and SE Yunnan [India, Nepal, Singapore, Sri Lanka, cultivated in Hawaii].

11. *Ardisia filiformis* E. Walker, J. Wash. Acad. Sci. 27: 198. 1937.

狭叶紫金牛 xia ye zi jin niu

Shrubs to 1.5 m tall. Branchlets terete, 1.5–2.5 mm in diam., glabrous. Petiole canaliculate, 3(–10) mm; leaf blade linear or narrowly lanceolate, 12–20(–32) × 1–2.5(–3.5) cm, membranous, glabrous black punctate adaxially, conspicuously punctate and minutely brown scaly abaxially, sparsely punctate, base broadly cuneate, margin entire or undulate, apex long acuminate to rarely acute; lateral veins 10–15 on each side of midrib, marginal vein conspicuous. Inflorescences paniculate, axillary, branches racemose or subcorymbose, 4–7(–12.5) cm, glabrous. Flowers membranous, pinkish or reddish, 3–4 mm. Pedicel 0.8–1.5 cm, slender, glabrous. Sepals ovate to long triangular, ca. 1 mm, glabrous, minutely punctate, margin entire, apex obtuse to acuminate. Petals nearly free, oblong or ovate, glabrous, minutely punctate, margin entire, apex acute to subobtuse. Stamens shorter than petals; filaments subobsolete; anthers lanceolate, dehiscent by longitudinal slits, apiculate. Pistil equal to petals; ovary glabrous, obscurely punctate; ovules numerous, multiseriate. Fruit reddish or

blue-black, globose, ca. 6 mm in diam., punctate. Fl. Mar–Apr, fr. Nov–Dec.

* Dense mixed forests, hillsides, damp places; 200–1000 m. Guangxi.

12. *Ardisia densilepidotula* Merrill, Lingnan Sci. J. 6: 284. 1928.

密鳞紫金牛 mi lin zi jin niu

Trees 3–8(–15) m tall, densely reddish brown scaly on branchlets, petioles and inflorescence rachis. Branchlets angular, 5–7 mm in diam. Petiole narrowly marginate, deeply canaliculate, ca. 1 cm; leaf blade obovate or broadly oblanceolate, 11–17(–24) × 4–6(–10) cm, cartilaginous, inconspicuously punctate, scrobiculate, base cuneate and narrowly decurrent, margin entire, revolute, apex broadly acute; lateral veins numerous, raised on both surfaces, marginal vein present. Inflorescences terminal or subterminal, pyramidal paniculate, branches subumbellate, 10–14 cm. Flowers leathery, pink or purplish red, ca. 3 mm. Pedicel 3–8 mm. Sepals lanceolate, 1–1.5 mm, inconspicuously pellucid punctate, glabrous, margin ciliate, apex acute. Petals nearly free, ovate, inconspicuously pellucid punctate, glabrous, margin entire, apex obtuse. Stamens subequalling petals; filaments to 1 mm; anthers ovate, not punctate dorsally, apiculate. Pistil as long as or longer than petals in bud; ovary ovoid, glabrous; ovules ca. 14, in 2 or 3 close series. Fruit purplish red to black, globose, ca. 6 mm in diam., inconspicuously pellucid punctate. Fl. Jun–Aug, fr. Oct–Nov.

* Dense broad-leaved forests, valleys, hillsides; 300–2000 m. Hainan.

13. *Ardisia humilis* Vahl, Symb. Bot. 3: 40. 1794.

矮紫金牛 ai zi jin niu

Ardisia hainanensis Mez; *A. pyrgina* Saint Lager; *A. pyrgus* Roemer & Schultes; *Tinus humilis* (Vahl) Kuntze.

Shrubs 1–2(–5) m tall, glabrous. Branchlets terete, 5–7 mm in diam., glabrous. Petiole canaliculate, 6–10 mm; leaf blade obovate, elliptic, or rarely oblanceolate, 15–18 × 5–7 cm, leathery, glabrous, inconspicuously pellucid punctate, scrobiculate, base cuneate and minutely decurrent, margin entire, apex broadly acute to obtuse; lateral veins ca. 12 on each side of midrib, marginal vein absent. Inflorescences terminal, rarely terminating lateral branchlets, subumbellate or cymose in pyramidal panicles, 8–17(–20) cm. Flowers leathery, pink or purplish red, 5–6 mm. Pedicel 6–10 mm, ca. 1.5 cm in fruit. Sepals broadly ovate, 1–2 mm, glabrous, punctate, base subauriculate, margin entire, apex acute. Petals nearly free, broadly ovate or ovate, glabrous, inconspicuously pellucid or orange punctate, glabrous. Stamens subequalling petals; filaments ca. 1/2 anther length; anthers oblong-lanceolate, punctate dorsally, apiculate. Pistil equaling petals; ovary punctate, glabrous; ovules numerous, in 3 series. Fruit dull red or purplish black, globose, ca. 6 mm in diam., densely punctate. Fl. Mar–Apr, fr. Nov–Dec.

Mixed forests, hillsides, open fields; 0–1100 m. Guangdong, Hainan [Philippines, Vietnam].

14. *Ardisia obtusa* Mez in Engler, Pflanz. IV. 236(Heft 9): 104. 1902.

铜盆花 tong pen hua

Shrubs or trees to 7 m tall, densely and minutely brown scaly on branchlets, petioles and inflorescence, glabrescent. Branchlets terete, 4–5(–6) mm in diam. Petiole marginate, canaliculate, 5–10 mm; leaf blade oblanceolate, elliptic or obovate, (5–)6–9(–10) × (1.4–)2–4(–5) cm, thin leathery, glabrous, base cuneate, margin entire or obscurely serrate, apex broadly acute, acuminate, or obtuse; lateral veins 8–15 on each side of midrib, obscure, marginal vein inconspicuous. Inflorescences terminal or subterminal, paniculate, branches corymbose or subumbellate, rarely racemose, 5–8 × 7–13 cm. Flowers papery, white to pink or lavender, 2–5(–6) mm. Pedicel 2–10(–17) mm, slender. Sepals ovate, 0.8–1.5 mm, pellucid or orange punctate, margin entire, minutely ciliate, apex acute. Petals nearly free, broadly ovate or ovate, 2–4(–6) mm, densely and minutely orange punctate, or inconspicuously pellucid punctate, margin entire, apex obtuse to acute. Stamens equalling petals; filaments short; anthers punctate dorsally, apex apiculate. Pistil as long as petals; ovary glabrous; ovules 15 to numerous, in 3 series. Fruit black, 4(–8) mm in diam., pellucid punctate, obscurely longitudinally ribbed.

Two subspecies: Guangdong, Guangxi, Hainan [Vietnam].

- 1a. Leaf blade oblanceolate to obovate; petiole broadly marginate, 12–15 mm; sepals 1.2–1.5 mm; petals 3–6 mm, inconspicuously pellucid punctate 14a. subsp. *obtusa*
- 1b. Leaf blade narrowly oblanceolate to elliptic; petiole marginate and canaliculate, 5–10 mm; sepals 0.8–1 mm; petals 2–2.5 mm, densely and minutely orange punctate 14b. subsp. *pachyphylla*

14a. *Ardisia obtusa* subsp. *obtusa*

铜盆花(原亚种) tong pen hua (yuan ya zhong)

Petiole broadly marginate, 1.2–1.5 cm; leaf blade oblanceolate to obovate, 6–10(–17.5) × 2–4(–5) cm. Flowers lavender or pink, 4–5(–6) mm. Pedicel 5–10(–17) mm. Sepals 1.2–1.5 mm. Petals 3–6 mm, pellucid punctate. Ovules ca. 15. Fruit black, 4(–8) mm in diam., obscurely longitudinally ribbed. Fl. Feb–Apr, fr. Apr–Jul.

* Bushes, broad-leaved forests, valleys, hilly areas, water edges; 0–100 m. Guangdong, Hainan.

14b. *Ardisia obtusa* subsp. *pachyphylla* (Dunn) Pipoly & C. Chen, Novon 5: 359. 1995.

厚叶铜盆花 hou ye tong pen hua

Ardisia pachyphylla Dunn, Bull. Misc. Inform. Kew 1912: 368. 1912.

Petiole marginate and canaliculate, 5–10 mm; leaf blade elliptic to narrowly oblanceolate, 5–9 × 1.4–2.3 cm. Flowers white to pinkish, 2–2.5 mm. Pedicel 2–5 mm, slender. Sepals

0.8–1 mm. Petals 2–2.5 mm, densely and minutely punctate. Ovules numerous. Fruit unknown. Fl. May–Jun.

Dense evergreen broad-leaved forests, valleys, damp places; 400–700 m. Guangxi [Vietnam].

15. *Ardisia thyrsoiflora* D. Don, Prodr. Fl. Nep. 148. 1825.

南方紫金牛 nan fang zi jin niu

Ardisia austroasiatica E. Walker; *A. depressa* C. B. Clarke; *A. floribunda* Wallich (1824), not Roemer & Schultes (1819); *A. meziana* H. Léveillé (1912), not King & Gamble (1906); *A. neriifolia* Wallich; *A. tenera* Mez; *A. yunnanensis* Mez; *Tinus depressa* (C. B. Clarke) Kuntze; *T. thyrsoiflora* (D. Don) Kuntze.

Shrubs or small trees 1.5–5(–9) m tall, densely brown scaly on branchlets, petioles, and inflorescences. Branchlets terete, 2–3 mm in diam. Petiole canaliculate, ca. 1 cm; leaf blade narrowly elliptic to oblanceolate, 12–20(–22) × 2–4.5(–6) cm, papery, glossy, densely and minutely scrobiculate adaxially, glabrous or minutely rusty brown scaly abaxially glabrescent, pellucid punctate, base cuneate or narrowly decurrent, margin entire, apex long acuminate, acumen 1.5–2 cm; lateral veins numerous, obscure abaxially, marginal vein absent. Inflorescences terminal or subterminal, paniculate, branches corymbose, 10–20 cm. Flowers papery, pink or purplish red, ca. 4 mm. Pedicel erect, ca. 5 mm. Sepals ovate to elliptic, 1.3–1.5 mm, orange punctate, brown scaly abaxially, pubescent adaxially, margin ciliate, apex acute. Petals nearly free, ovate, 3.8–4 mm, sparsely orange punctate, glabrous, margin entire, apex acute. Stamens subequal to petals; filaments ca. 1.5 mm; anthers ovate to lanceolate, ca. 1.5 mm, punctate dorsally, apiculate. Ovary glabrous; ovules numerous, multiserial. Fruit purplish red, globose, often 5-angled, ca. 4 mm in diam., minutely punctate. Fl. Jan–May, fr. Apr–Dec.

Broad-leaved forests, woody hillsides, valleys, damp places, thickets; 200–1500 m. Guangxi, Guizhou, Hainan, Sichuan, Xizang, Yunnan [India, Myanmar, Nepal, Vietnam].

16. *Ardisia retroflexa* E. Walker, Philipp. J. Sci. 73: 60. 1940.

弯梗紫金牛 wan geng zi jin niu

Shrubs 1–2 m tall. Branchlets slightly angular, 1.5–2 mm in diam., densely and minutely reddish brown scaly, glandular papillate, glabrescent. Petiole canaliculate, 4–12 mm; leaf blade elliptic, or lanceolate, 8–15 × 2–4 cm, papery, glabrous, bullate, base cuneate, margin revolute, entire, apex acute or acuminate; lateral veins 15–18 on each side of midrib, slightly raised abaxially, marginal vein present. Inflorescences terminal, 10–12 cm, paniculate, branches umbellate, rachis strongly flexuous to geniculate. Flowers papery, white, ca. 2 mm. Pedicel 3–6(–10) mm, recurved. Sepals ovate, 0.8–1 mm, glabrous, pellucid punctate, margin crenulate, ciliate, apex acute. Petals nearly free, ovate, glabrous, not punctate, apex acute. Stamens subequalling petals; anthers ovate, punctate dorsally, apex acute to subapiculate. Pistil as long as petals. Style as long as globose ovary, glabrous. Fruit red, globose, ca. 5 mm in diam., distinctly longitudinally ribbed, sparsely punctate. Fl. Apr, fr. Aug.

* Broad-leaved forests, damp places. Hainan.

17. *Ardisia curvula* C. Y. Wu & C. Chen in C. Chen, Fl. Yunnan. 1: 340. 1977.

折梗紫金牛 zhe geng zi jin niu

Shrubs or small trees, reddish stellate and dendroid tomentose on branchlets, petioles, and inflorescence rachis. Branchlets angular, densely villous when young, glabrescent. Petiole canaliculate, 0.8–1 cm; leaf blade obovate to oblanceolate, 12–19 4.5–5.5 cm, papery, smooth, glabrous adaxially, reddish stellate abaxially, inconspicuously pellucid punctate, base cuneate, margin entire and revolute at least basally, apex short acuminate, acumen 5–10 mm; lateral veins 15–20 on each side of midrib, marginal vein present. Inflorescences terminal on specialized lateral branches, paniculate, 6–7 cm, branches umbellate, rachis flexuous. Flowers unknown. Pedicel 3–5 cm, recurved, minutely stellate or puberulent. Fruiting calyx somewhat united at base, glabrescent, lobes broadly ovate, to 1 mm, puberulent inside, margin ciliate, apex acute. Fruit (immature) globose, glabrous; ovules numerous, multiseriate. Fl. Apr.

* Evergreen broad-leaved forests, hillsides; 200–300 m. Yunnan.

18. *Ardisia porifera* E. Walker, Philipp. J. Sci. 73: 70. 1940.

细孔紫金牛 xi kong zi jin niu

Subshrubs 20–30 cm tall, sometimes stoloniferous but without creeping rhizomes, glabrous. Branchlets terete, (3.5–) 4–5 mm in diam., red puberulent, glabrescent. Petiole marginate, 5–10 mm; leaf blade elliptic to obovate, 8–13 × 3–5.5 cm, leathery, dull adaxially, pale and obscurely pellucid punctate abaxially, base cuneate, margin entire, subrevolute, apex broadly acute or obtuse; lateral veins ca. 8 on each side of midrib, slightly raised on both surfaces, marginal vein absent. Inflorescences racemose or subumbellate, at tips of specialized lateral branches 3–7.5 cm and with 1(–3) reduced leaves. Flowers unknown. Pedicel ca. 1 cm. Fruiting sepals ovate, 1.5–2 mm, puberulent, inconspicuously red punctate, margin opaque, erose, densely red glandular ciliate, apex acute. Pistil obturbinate; ovary puberulent; ovules numerous, multiseriate. Fruit purple or black, globose, ca. 5 mm in diam., longitudinally punctate-lineate. Fl. Aug–Oct.

* Dense mixed forests. Hainan.

19. *Ardisia perreticulata* C. Chen, Fl. Reipubl. Popularis Sin. 58: 82. 1979.

花脉紫金牛 hua mai zi jin niu

Ardisia punctata Lindley var. *latifolia* E. Walker.

Shrubs to 1 m tall, without creeping rhizomes. Branchlets subterete, (3.5–)4–5 mm in diam., succulent, densely reddish papillose-tomentose, glabrescent. Petiole canaliculate, 5–7(–10) mm, densely black punctate; leaf blade oblanceolate to obovate, (7–)9–14 × 2–5.5 cm, leathery, dull adaxially, pale abaxially, glabrous, densely black punctate, base broadly cuneate, margin flat, entire, apex acuminate or acute, acumen

to 0.5 mm, mucronate, lateral veins 7–15 on each side of midrib, marginal vein absent. Inflorescences umbellate, terminal on modified lateral branchlets; 3–6 cm. Flowers unknown. Pedicel erect, 5–10 mm, accrescent in fruit to 20 mm. Sepals suborbicular, 4–6 mm, densely black punctate, margin hyaline, irregular, with a few translucent glandular cilia, apex rounded and notched. Fruit depressed globose, 5–6 mm in diam., densely black punctate and punctate-lineate. Fl. Jun–Jul, fr. Dec–Feb.

* Mixed forests. Guangdong, Guangxi.

20. *Ardisia olivacea* E. Walker, Philipp. J. Sci. 73: 127. 1940.

榄色紫金牛 lan se zi jin niu

Shrubs ca. 1 m tall. Branchlets angular, 2.5–3.5 mm in diam., glabrous. Petiole canaliculate, 1–2 cm; leaf blade oblanceolate or oblong-oblanceolate, 13–24 × 4–7 cm, membranous, densely red punctate, base cuneate, margin entire, apex acute to acuminate; lateral veins 10–12 on each side of midrib, sometimes ending in glands, marginal vein absent. Inflorescences simple, subumbellate, on curved ends of slender, leafless, brown scaly or minutely puberulent specialized lateral branches 5–9.5 cm. Flowers unknown. Pedicel slender, 1–1.5 cm, brown scaly or puberulent. Fruiting sepals broadly ovate, 1–1.5 mm, glabrous, densely black punctate, margin entire, glabrous, apex obtuse or broadly rounded. Fruit red, globose, ca. 6 mm in diam., inconspicuously pellucid punctate. Fr. Nov–Dec.

* Mixed forests, hillsides. Guangxi (Napo).

21. *Ardisia hokouensis* Yuen P. Yang, Bot. Bull. Acad. Sin., n. ser. 30: 297. 1989.

粗梗紫金牛 cu geng zi jin niu

Ardisia crassipes C. Y. Wu & C. Chen (1977), not Lundell (1968).

Shrubs or subshrubs ca. 1 m tall, without creeping rhizomes. Branchlets somewhat angular, 5–7 mm in diam., succulent, reddish glandular papillate, glabrescent. Petiole marginate, 3–4 cm; leaf blade oblong-obovate, ca. 28 × 10 cm, membranous, glabrous, densely black punctate-lineate and punctate, base cuneate, somewhat decurrent, margin repand-crenate distally and entire near base, apex acuminate; lateral veins ca. 21 on each side of midrib, raised on both surfaces, marginal vein evident. Inflorescences umbellate, simple, to 10-flowered, lateral or axillary, glabrous. Flowers membranous, pinkish, ca. 9 mm. Pedicel ca. 3 cm, glabrous, thickened at apex. Sepals ovate or broadly ovate, densely punctate, margin entire, glabrous, apex rounded. Petals nearly free, broadly ovate, ca. 9 × 6 mm, inconspicuously pellucid, margin entire, apex abruptly acuminate. Stamens shorter than petals; filaments shorter than anthers; anthers broadly ovate, longitudinally dehiscent, not punctate dorsally, apex acute. Pistil as long as petals, glabrous; ovary glabrous; ovules ca. 5, uniseriate. Fruit unknown. Fl. Apr.

* Hillsides, roadsides; 500 m. Yunnan (Hekou).

Ardisia kokouensis is very closely related to *A. rabilis* H. R. Fletcher and *A. translucida* H. R. Fletcher, and may prove to be conspecific upon further study.

22. *Ardisia ensifolia* E. Walker, Philipp. J. Sci. 73: 124. 1940.

剑叶紫金牛 jian ye zi jin niu

Ardisia linearifolia X. W. Wei & M. Y. Xiao.

Shrubs ca. 1 m tall, without creeping rhizomes. Branchlets 1.5–2.5 mm in diam., glabrous, wrinkled. Petiole canalliculate, 3–8 mm; leaf blade linear or linear-lanceolate, 10–12(–20) × 1(–2.5) cm, leathery, glabrous, densely black punctate and punctate-lineate, base cuneate, margin subentire, subrevolute, apex acuminate; lateral veins numerous, inconspicuous, marginal vein obscure. Inflorescences simple, subumbellate, on curved ends of specialized, leafless lateral branches 2–7 cm. Flowers papery, red, ca. 6 mm. Pedicel 1(–2) cm, sparsely brown scaly or minutely puberulent. Sepals elliptic, 2–3(–4) mm, densely punctate, glabrous, margin entire, apex obtuse. Petals nearly free, oblong-ovate, densely punctate, margin entire, apex obtuse. Stamens subequalling petals; filaments shorter than anthers; anthers linear-lanceolate, inconspicuously punctate dorsally, longitudinally dehiscent, apex apiculate. Pistil as long as or slightly longer than petals; ovary glabrous; ovules ca. 6, uniseriate. Fruit reddish, globose, ca. 6 mm in diam., black punctate. Fl. May–Jul, fr. Nov–Jan.

* Evergreen broad-leaved forests, hilly areas, deeply shaded damp places; ca. 700 m. Guangxi, Yunnan.

23. *Ardisia hypargyrea* C. Y. Wu & C. Chen in C. Chen, Fl. Yunnan. 1: 340. 1977.

柳叶紫金牛 liu ye zi jin niu

Ardisia quinquegona Blume var. *linearifolia* Pitard; *A. salicifolia* E. Walker (1939), not A. de Candolle (1844).

Shrubs ca. 1 m tall, without creeping rhizomes. Branchlets terete, 2.5–3.5 mm in diam., brown scaly when young, glabrescent. Petiole marginate, 5–7 mm; leaf blade narrowly lanceolate, 6–8(–10) × 1.2(–1.5) cm, papery, glabrous, reddish brown scaly abaxially, inconspicuously red punctate, base cuneate, margin entire, subrevolute, apex long acuminate, acumen 1–2 cm; lateral veins numerous, obscure, marginal vein obscure. Inflorescences axillary or subterminal on specialized lateral branches 4–13 cm, subumbellate or cymose. Flowers papery, pink or purple-red, ca. 3 mm. Pedicel slender, ca. 1 cm, accrescent to 2.5 cm in fruit, minutely puberulent or brown scaly when young, glabrescent. Sepals deltate, to 1 mm, sparsely red punctate, brown scaly, margin entire, ciliate, apex acute. Petals nearly free, ovate, obscurely punctate, glabrous, margin entire, apex acute. Stamens ca. 3/4 as long as petals; filaments shorter than anthers; anthers ovate, not punctate dorsally, apex abruptly acute to apiculate. Pistil as long as or longer than petals. Fruit reddish, globose, ca. 4 mm in diam., punctate, obscurely longitudinally ribbed. Fl. May, fr. Nov–Dec.

Mixed forests, hillsides, valleys, along streams, dark damp places; 700–1600 m. Guangxi, SE Yunnan [Vietnam].

24. *Ardisia cornudentata* Mez in Engler, Pflanzenr. IV. 236(Heft 9): 144. 1902.

腺齿紫金牛 xian chi zi jin niu

Ardisia morrisonensis Hayata; *A. remotiserrata* Hayata; *A. stenosepala* Hayata; *A. suishaensis* Hayata; *Bladhia cornudentata* (Mez) Nakai; *B. morrisonensis* (Hayata) Nakai; *B. stenosepala* (Hayata) Nakai.

Shrubs ca. 2 m tall, sparsely glandular papillose-puberulent on branchlets, petioles, and inflorescence rachis. Branchlets terete, 3–5 mm in diam. Petiole canalliculate, marginate, 5–7 mm; leaf blade elliptic-lanceolate or oblanceolate, 7–14(–20) × 2–3.5(–5.5) cm, papery, pellucid punctate, minutely brown scaly abaxially, base cuneate, decurrent, margin serrulate, punctate and with vascularized marginal nodules on teeth, apex acuminate or acute; lateral veins up to 18 on each side of midrib, prominent, marginal vein evident. Inflorescences terminal umbels, on specialized lateral branches. Flowers papery, white, 4–5 mm. Pedicel 1–1.5 cm, usually densely pubescent. Sepals broadly ovate to suborbicular, ca. 1.5 mm, densely punctate, margin entire, ciliate, apex rounded. Petals nearly free, ovate, 4–5 mm, glabrous, punctate, margin entire, apex acute. Stamens subequalling petals; filaments shorter than anthers; anthers narrowly lanceolate, longitudinally dehiscent, punctate dorsally, apex acute. Pistil equaling petals; ovary glabrous, punctate; ovules numerous, multiseriate. Fruit red, becoming black, globose, 6–8 mm in diam., punctate. Fl. Jan–Aug, fr. Aug–Mar.

* Mixed forests, hilly areas; 0–1700 m. Taiwan.

25. *Ardisia lindleyana* D. Dietrich, Syn. Pl. 1: 617. 1839.

山血丹 shan xue dan

Ardisia adenopes Miao, *A. kwangtungensis* E. Walker; *A. punctata* Lindley (Sep 1824), not Jack ex Wallich (Mar–Jun 1824); *A. tsangii* E. Walker; *Bladhia punctata* (Lindley) Nakai; *Tinus punctata* (Lindley) Kuntze.

Shrubs 1–2 m tall, without creeping rhizomes; densely and minutely reddish puberulent on branchlets, petioles, abaxial leaf surface, and inflorescence rachis. Branchlets terete, ca. 2.5 mm in diam. Petiole narrowly marginate, 1–1.5 cm; leaf blade oblong to lanceolate or oblanceolate, (7–)10–12(–18) × (1.5–)2–3.5(–4) cm, leathery or papery, glabrous, base cuneate, margin subentire or undulate, rarely serrate, slightly revolute, prominently punctate, with large vascularized marginal nodules, apex acute or acuminate, rarely obtuse; lateral veins 8–13 on each side of midrib, slightly raised adaxially, marginal vein conspicuous. Umbels on curved ends of specialized lateral branches 3–11 cm. Flowers papery, white, rarely pink, 5–6 mm. Pedicel 0.8–1.2 cm, to 2.5 cm in fruit. Sepals oblong to lanceolate or narrowly ovate, 2–3 mm, punctate, puberulent, margin entire, usually ciliate, apex broadly acute to obtuse. Petals nearly free, elliptic or ovate, punctate, glabrous abaxially, yellow

glandular granulose adaxially at base, apex obtuse. Stamens shorter than petals; filaments shorter than anthers; anthers lanceolate, punctate dorsally, longitudinally dehiscent, apex apiculate. Pistil subequalling petals; ovary minutely puberulent, punctate; ovules ca. 5, uniseriate. Fruit dark red, globose, ca. 6 mm in diam., sparsely punctate, somewhat fleshy. Fl. May–Jul, fr. Oct–Dec.

Dense mixed forests, hills, valleys, along streams, dark damp places; 300–1200 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang [N Vietnam].

26. *Ardisia crenata* Sims, Bot. Mag. 45: pl. 1950. 1817.

朱砂根 zhu sha gen

Ardisia bicolor E. Walker; *A. crenata* var. *bicolor* (E. Walker) C. Y. Wu & C. Chen; *A. crispa* (Thunberg) A. de Candolle var. *taquetii* H. Léveillé; *A. konishii* Hayata; *A. kusukusensis* Hayata; *A. labordei* H. Léveillé; *A. lentiginosa* Ker Gawler; *A. linangensis* C. M. Hu; *A. miaoliensis* S. Y. Lu; *Bladhia crenata* (Sims) H. Hara; *B. crispa* Thunberg var. *taquetii* (H. Léveillé) Nakai; *B. lentiginosa* (Ker Gawler) Nakai var. *lanceolata* Masamune.

Shrubs 1–1.5(–3) m tall, without creeping rhizomes, minutely reddish glandular papillate on branchlets, abaxial leaf surface, and inflorescence rachis, early glabrescent. Branchlets terete, 3–4 mm in diam. Petiole narrowly marginate, 6–10 mm, glabrous; leaf blade elliptic, narrowly lanceolate, or oblanceolate, 7–15 × 2–4 cm, leathery or papery, prominently punctate, base cuneate, margin subrevolute, crenate, or undulate, with large vascularized marginal nodules, apex acute or acuminate; lateral veins 12–18 on each side of midrib, marginal vein often hidden by reflexed margin. Inflorescences terminal, umbellate or cymose, on specialized, 2- or 3-leaved lateral branches 4–16(–40) cm. Flowers membranous, white or rarely pinkish, 4–6 mm. Pedicel 7–10 cm. Sepals oblong-ovate, 1–1.5(–2.5) mm, glabrous, punctate, margin entire, apex rounded or obtuse. Petals nearly free, ovate, punctate, glandular papillose adaxially near base, apex acute. Stamens shorter than petals; filaments nearly obsolete; anthers triangular-lanceolate, punctate dorsally, longitudinally dehiscent, acute. Pistil subequalling petals; ovary glabrous, punctate; ovules ca. 5, uniseriate. Fruit red, globose, 6–8 mm in diam., punctate. Fl. May–Jun, fr. Oct–Dec.

Forests, hillsides, valleys, shrubby areas, dark damp places; 100–2400 m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Taiwan, SW Xizang, Yunnan, Zhejiang [SW India, Japan, Malaysia, Philippines, Vietnam].

Ardisia crenata is closely related to *A. pseudocrispa* Pitard (= *A. corymbifera* Mez. var. *tubifera* C. Chen), from which it differs in having crenate leaves with a distinct marginal vein. *Ardisia pseudocrispa*, which occurs in Guangxi and Vietnam, has subentire leaves without a marginal vein.

27. *Ardisia conspersa* E. Walker, Bull. Fan Mem. Inst. Biol. 9: 160. 1939.

散花紫金牛 san hua zi jin niu

Ardisia undulata Mez (1902), not C. B. Clarke (1882).

Shrubs 2(–5) m tall, strigose on branchlets, abaxial leaf surface, and inflorescence branches. Branchlets terete, 3–4 mm in diam. Petiole marginate, 5–8 mm; leaf blade oblanceolate to narrowly oblong- or elliptic-lanceolate, 7–11 × 2–3 cm, membranous, sparsely punctate, base cuneate, margin entire or subcrenate, with vascularized marginal nodules, apex caudate-acuminate, acumen 1–2 cm; lateral veins ca. 15 on each side of midrib, inconspicuous, marginal vein absent. Inflorescences terminal panicles of corymbs on specialized lateral branches 30–50 cm. Flowers papery, pink, ca. 6 mm. Pedicel 1–1.5 cm. Sepals oblong-ovate, 2.5–3 mm, epunctate, somewhat puberulent at base, margin entire, apex acute or obtuse. Petals nearly free, oblong or ovate, epunctate, densely glandular papillose adaxially at base, margin entire, apex acute. Stamens ca. 2/3 as long as petals; filaments shorter than anthers; anthers lanceolate, longitudinally dehiscent, punctate dorsally, apex acute. Pistil subequalling petals; ovary glabrous; ovules 4 or 5, uniseriate. Fruit red, globose, ca. 6 mm in diam., glabrous, punctate.

Evergreen broad-leaved forests, dark damp places, valleys; 900–1400 m. Guangxi, Yunnan [Vietnam].

28. *Ardisia merrillii* E. Walker, J. Arnold Arbor. 23: 351. 1942.

白花紫金牛 bai hua zi jin niu

Shrubs ca. 2 m tall. Branchlets terete, 2.5–4 mm in diam., densely and minutely reddish glandular papillate, glabrescent. Petiole narrowly marginate, 5–8 mm; leaf blade elliptic or lanceolate, 7–10 × 2–4 cm, papery or subleathery, minutely reddish glandular papillate abaxially, base cuneate, margin subentire or crenulate and punctate, with marginal vascularized nodules, apex acute or acuminate, acumen to 0.5 mm; lateral veins 11–15 on each side of midrib, raised on both surfaces, marginal vein absent. Panicles terminal corymb of umbels, minutely puberulent, on specialized lateral branches 11–30 cm. Flowers membranous, hyaline, ca. 6 mm. Pedicel 6–13 mm, minutely puberulent. Sepals narrowly ovate, 2.5–3 mm, epunctate, glabrous outside, short puberulent inside, margin entire, glabrous, apex long attenuate. Petals nearly free, ovate, 5–6 mm, epunctate, glabrous, margin entire, glabrous, apex long attenuate. Stamens shorter than petals; filaments shorter than anthers; anthers lanceolate, not punctate dorsally, apex acute. Pistil subequalling petals; ovary glabrous; ovules ca. 5, uniseriate. Fruit reddish, globose, ca. 6 mm in diam., sparsely punctate. Fl. May–Jun, fr. Oct–Dec.

Dense mixed forests, shrubby areas, hillsides; 600–1200 m. Guangxi, Hainan [Vietnam].

29. *Ardisia corymbifera* Mez in Engler, Pflanzenr. IV. 236(Heft 9): 149. 1902.

伞型紫金牛 san xing zi jin niu

Shrubs 1–3(–5) m tall, without creeping rhizomes. Branchlets subterete, 3–5 mm in diam., reddish glandular papillate, early glabrescent. Petiole canaliculate, 5–8 mm, usually sparsely papillate; leaf blade elliptic to oblanceolate,

11–13 × 2–3 cm, papery, densely punctate, glabrous or puberulent to crisped, strigose abaxially, base broadly cuneate, margin entire to undulate or rarely crenate and punctate, with vascularized nodules, apex acuminate; lateral veins ca. 15 on each side of midrib, obscure, marginal vein absent. Inflorescences terminal panicles of corymbs, papillate, on specialized lateral branches 20–40(–50) cm. Flowers papery, white or pinkish to red, 6–8 mm. Pedicel 1–1.5 cm, papillate, glabrescent. Sepals ovate to elliptic, 2.5–3 mm, sparsely glandular papillate abaxially, glabrescent, densely black punctate, margin entire, glabrous, apex obtuse. Petals nearly free, broadly ovate, densely black punctate, sparsely glandular granulate adaxially at base, margin entire, apex acute. Stamens ca. 2/3 as long as petals; filaments shorter than anthers; anthers ovate or broadly lanceolate, longitudinally dehiscent, densely punctate dorsally, apex acute. Pistil subequal to petals; ovary punctate, glabrous; ovules ca. 5, uniseriate. Fruit reddish, globose, ca. 8 mm in diam., minutely punctate. Fl. Apr–May, fr. Nov–Jan.

Evergreen broad-leaf and mixed forests, hillsides and scrub; 300–1800 m. Guangxi, Yunnan [Vietnam].

30. *Ardisia virens* Kurz, For. Fl. Brit. Burma 2: 575. 1877.

钮子果 niu zi guo

Ardisia flaviflora C. Chen & D. Fang; *A. maculosa* Mez; *A. maculosa* var. *symplocifolia* C. Chen; *A. oldhamii* Mez; *A. patens* Mez; *A. radians* Hemsley & Mez; *A. rectangularis* Hayata; *A. stellifera* Pitard; *A. tonkinensis* Aug. de Candolle; *A. virens* var. *annamensis* Pitard; *Blahdia oldhamii* (Mez) Masamune; *B. radians* (Hemsley & Mez) Masamune; *Tinus virens* (Kurz) Kuntze.

Shrubs or small trees, 1–3 m tall. Branchlets subterete, 1–2 mm in diam., sparsely glandular papillate, early glabrescent. Petiole canaliculate, 1(–1.5) cm; leaf blade elliptic, lanceolate, or obovate, 9–26 × 2.5–5(–7) cm, papery, dull, glabrous or sometimes sparsely and minutely glandular papillate abaxially, base cuneate, margin crisped or undulate, with vascularized nodules, densely black punctate, apex acute to subacuminate; lateral veins 15–30 on each side of midrib, marginal vein evident. Inflorescences terminal compound umbels, glabrous, on specialized lateral branches (15–)30–50 cm. Flowers papery, white or pink, 7–8 mm. Pedicel 1.5–3 cm, sparsely glandular papillate in bud, early glabrescent. Sepals ovate to elliptic, subrounded, 2.5–3.5 mm, together with petals densely black punctate, glabrous abaxially, sparsely glandular granulate adaxially at base. Petals nearly free, ovate or broadly ovate, apex acute. Stamens subequalling petals; filaments shorter than anthers; anthers lanceolate or subovate, longitudinally dehiscent, punctate dorsally, apex apiculate. Pistil subequalling petals; ovary punctate, glabrous; ovules ca. 5, multiseriate. Fruit red or blackish red, globose, 7–9(–10) mm in diam., densely black punctate. Fl. May–Jul, fr. Oct–Mar.

Dense evergreen broad-leaved forests, hillsides, dark damp places, valleys, humus-rich soils; 300–2700 m. Guangxi, Guizhou, Hainan, Taiwan, Yunnan [India, Indonesia, Myanmar, Thailand, Vietnam].

Ardisia virens is extremely closely related to *A. hanceana* Mez. The separation of groups based on presence or absence of papillae on the inflorescence rachis and branchlets is tentative pending further study. *Ardisia maculosa* differs from *A. virens* only by minor quantitative characters.

31. *Ardisia alutacea* C. Y. Wu & C. Chen in C. Chen, Fl. Yunnan. 1: 346. 1977.

显脉紫金牛 xian mai zi jin niu

Shrubs 0.4–1.5 m tall. Branchlets terete, 1–2 mm in diam., very sparsely bifurcate glandular puberulent, early glabrescent. Petiole canaliculate, 8–10 mm; leaf blade elliptic, lanceolate, or obovate, 8–12.5 × 3–4.5 cm, leathery, glabrous, base cuneate, margin shallowly crenate, with vascularized nodules, abaxially with reddish bifurcate glandular trichomes, pellucid punctate, apex acute; lateral veins 7–9 on each side of midrib, prominent, marginal vein evident. Inflorescences compound cymose, at tips of specialized lateral branches 5–11 cm, subglabrous. Flowers papery, purplish red, 7–9 mm. Pedicel 1.5–2 cm, somewhat dilated at apex, punctate. Sepals broadly ovate, 1.3–1.5 mm, densely black punctate, margin entire, glabrous, apex obtuse. Petals nearly free, subdelatate, 8–9 mm, glabrous, densely black punctate, margin entire, apex acuminate. Stamens shorter than petals; filaments obsolete; anthers lanceolate-ovate, punctate especially dorsally. Pistil as long as petals, glabrous; ovary punctate; ovules ca. 6, uniseriate. Fruit purplish red, globose, ca. 8 mm in diam., sparsely punctate; persistent sepals covering base of fruit. Fl. May–Jun, fr. Dec.

* Dense mixed forests, valleys, dark damp places; 800–1700 m. SE Yunnan.

32. *Ardisia shweliensis* W. W. Smith, Not. Roy. Bot. Gard. Edinburgh 12: 194. 1920.

瑞丽紫金牛 rui li zi jin niu

Shrubs 1–2 m tall, without creeping rhizomes, rusty scaly on branchlets, abaxial leaf surface and inflorescence rachis. Branchlets semiterete, 5–7 mm in diam. Petiole canaliculate, 1–1.5 cm; leaf blade oblong or elliptic, 8–15 × 4–5 cm, membranous, densely black punctate and punctate-lineate, especially abaxially, base cuneate, margin undulate-crisped or subentire, punctate, with a few vascularized marginal nodules, apex acuminate; lateral veins ca. 15 on each side of midrib, marginal vein absent. Inflorescences terminal, paniculate, branches cymose, on specialized, 2- or 3-leaved lateral branches 7–11(–14) cm. Flowers membranous, white, ca. 7 mm. Pedicel 1–1.3 cm, clavate, glabrous. Sepals ovate or elliptic, 1.2–2 mm, punctate, margin entire, glabrous, apex broadly obtuse or rounded. Petals nearly free, ovate or narrowly ovate, margin entire, inconspicuously punctate, apex acute. Stamens ca. 3/4 as long as petals; filaments much shorter than anthers; anthers lanceolate, longitudinally dehiscent, not punctate dorsally, apex apiculate. Pistil subequalling petals; ovary glabrous; ovules ca. 6, uniseriate. Fruit red, globose, ca. 7 mm in diam., pellucid punctate. Fl. May–Jun, fr. Nov–Dec.

Mixed forests, hillsides, damp places; 1700–2300 m. SW Yunnan [India].

33. *Ardisia malipoensis* C. M. Hu, Bot. J. South China 1: 8. 1992.

麻栗坡罗伞 ma li po luo san

Shrubs ca. 40 cm, densely and minutely rusty scaly on branchlets, petioles, abaxial leaf surface, and inflorescence rachis. Branchlets subterete, 1–2 mm in diam. Petiole marginate, 5–8 mm; leaf blade elliptic or oblanceolate, 6–11 × 2.5–4 cm, papery, inconspicuously pellucid punctate, base cuneate, margin glabrous, crenulate to subentire, with vascularized nodules, apex acuminate, acumen to 0.6 cm; lateral veins 5–8 on each side of midrib, marginal vein prominently raised. Inflorescences cymose panicles of umbels, 3.5–6 cm, on 2- or 3-leaved lateral branches. Flowers papery, pinkish purple, 8–10 mm. Pedicel 5–9 mm. Sepals ovate or elliptic, 3.5–4 mm, densely black punctate, margin entire, opaque, glabrous, apex rounded. Petals nearly free, ovate, densely black punctate, glabrous, margin entire, opaque, glabrous, apex obtuse or rounded. Stamens ca. 2/3 as long as petals; filaments subobsolete; anthers lanceolate, 1.8–2 mm, longitudinally dehiscent, dorsally punctate, apex attenuate. Pistil subequalling petals; ovary ovoid, glabrous; ovules 6–8, uniseriate. Fruit globose, 4–6 mm in diam. Fl. May, fr. Dec.

* Mixed forests, hillsides; 1500–1700 m. SE Yunnan.

34. *Ardisia hanceana* Mez in Engler, Pflanzenr. IV 236(Heft 9): 149. 1902.

大罗伞树 da luo san shu

Ardisia elegantissima H. Léveillé; *A. impressa* H. R. Fletcher; *A. thorelii* Pitard.

Shrubs 1–3 m tall, glabrous. Branchlets terete, 3–5 mm in diam. Petiole canaliculate, narrowly winged, 1–1.3 cm; leaf blade elliptic, oblanceolate, or rarely ovate, 9–12(–15) × 2.5–4 cm, leathery, punctate, sometimes sparsely pitted abaxially, base cuneate and decurrent, margin crenate or subentire, with vascularized nodules, epunctate, apex acute or acuminate; lateral veins 12–15 on each side of midrib, marginal vein obscure. Inflorescences terminal corymbose panicles of umbels, on specialized lateral branches 30–50 cm. Flowers membranous, pink, rarely red or white, (5–)6–7(–8) mm. Pedicel 1–2 cm, glabrous. Sepals lanceolate, 2.3–2.5 mm, epunctate, margin glabrous, entire, apex acute or obtuse. Petals united at base, broadly ovate, epunctate, sparsely glandular granulose adaxially near base, margin entire, glabrous, apex acute or obtuse. Stamens ca. 2/3 as long as petals; filaments much shorter than anthers; anthers ovate or lanceolate, longitudinally dehiscent, not punctate, apex acute. Pistil subequalling petals; ovary glabrous; ovules ca. 5, uniseriate. Fruit dull red or black, globose, 8–10(–12) mm in diam., pellucid punctate. Fl. Jun–Jul, fr. Dec–Apr.

Mixed forests, hillsides, valleys, along streams, dark damp places; ca. 1300 m. Anhui, Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang [Vietnam].

35. *Ardisia crassinervosa* E. Walker, Philipp. J. Sci. 73: 86. 1940.

粗脉紫金牛 cu mai zi jin niu

Ardisia aquifolioides W. Z. Fang & K. Yao; *A. crassinervosa* Z. X. Li & F. W. Xing ex C. M. Hu; *A. nervosa* E. Walker (1940), not H. R. Fletcher (1937).

Shrubs ca. 2 m tall, glabrous. Branchlets angular, 1–1.5 mm in diam., reddish glandular papillate. Petiole canaliculate, 3–5 mm; leaf blade elliptic, oblanceolate, or rarely obovate, 10–17 × 3–6 cm, leathery, glabrous, base cuneate, margin somewhat undulate with vascularized nodules, apex acute or subacuminate; lateral veins numerous, raised on both surfaces, marginal vein conspicuous. Inflorescences terminal, simple or compound subumbellate, on specialized lateral branches 8–20 cm and with 2 or 3 subapical leaves. Flowers papery, pink, purplish, or white, 5–6 mm. Pedicel ca. 1 mm, punctate at least when young. Sepals broadly ovate to suborbicular, 3.8–4 mm, densely orange punctate, glabrous, base auriculate, margin entire, scarious, apex rounded or obtuse. Petals nearly free, ovate, densely punctate, densely glandular granulose adaxially, glabrous abaxially, margin entire, opaque, apex obtuse. Stamens subequalling petals; filaments much shorter than anthers; anthers lanceolate, longitudinally dehiscent, epunctate or inconspicuously punctate dorsally, apex apiculate. Pistil subequalling petals; ovary glabrous, punctate; ovules ca. 9, uniseriate. Fruit red, globose, ca. 9 mm in diam., densely punctate. Fl. Jan–Jul, fr. Jul–Jan.

* Dense broad-leaved forests, hillsides, scrub, open fields, valleys, damp places, along streams; 100–1800 m. Hainan.

36. *Ardisia pubivenula* E. Walker, Philipp. J. Sci. 73: 146. 1940.

毛脉紫金牛 mao mai zi jin niu

Subshrubs to 0.5 m, stoloniferous. Stems terete, 3–5 mm in diam., reddish villous-tomentose. Petiole canaliculate, 4–10 cm, densely reddish villous or villous-tomentose; leaf blade broadly ovate or elliptic, (6–)10–15 × 3–7.5 cm, papery, densely villous-tomentose abaxially, glabrescent, bullate adaxially, base broadly rounded or subcordate, margin finely serrate with apiculate reflexed teeth, apex broadly acute; lateral veins 8–12 on each side of midrib, at acute angles to midrib, marginal vein absent. Inflorescences lateral, in axils of bracts, racemose, ca. 3 cm, puberulent. Flowers unknown. Pedicel ca. 8 mm, slender, puberulent. Fruiting sepals broadly ovate, ca. 1.5 mm, puberulent, obscurely punctate, margin ciliate, apex obtuse. Fruit red, globose, 6–7 mm in diam., minutely puberulent, punctate. Fr. Dec–Feb.

* Broad-leaved forests, hillsides, moist places, along streams; ca. 800 m. Guangxi, Hainan.

37. *Ardisia replicata* E. Walker, Bull. Fan Mem. Inst. Biol. 9: 169. 1939.

卷边紫金牛 juan bian zi jin niu

Shrubs 20(–100) cm tall, stoloniferous. Stems terete, 3–4 mm in diam., densely reddish villous or villous-tomentose. Petiole canaliculate, 2–6 cm, densely villous; leaf blade ovate to elliptic, 10–16 × 5–8 cm, minutely rusty puberulent especially on veins when young, glabrescent adaxially, base rounded,

margin serrulate with apiculate teeth reflexed when dry, apex broadly acute; midrib blackish villous or pubescent abaxially; lateral veins 8–13(–15) on each side of midrib, marginal vein evident. Inflorescences subumbellate, grouped in racemes or panicles 5–7 cm; peduncle rusty pubescent; bracts subulate, ca. 8 mm. Flowers pinkish, ca. 4 mm. Pedicel ca. 6 mm. Sepals elliptic-ovate or ovate, 1–1.5 mm, ± punctate, glabrous or puberulent, margin ciliate, apex acute or obtuse. Petals ovate, glabrous, punctate, apex acute or obtuse. Stamens ca. 2/3 as long as petals; anthers lanceolate, apiculate, not punctate dorsally. Ovary pubescent. Fruit dull reddish, globose, ca. 6 mm in diam., without glands or obscurely punctate, pubescent. Fl. Jun–Jul.

Dense broad-leaved forests, hilly areas, shady damp places; 700–1400 m. SE Yunnan [Vietnam].

38. *Ardisia scalarinervis* E. Walker, J. Wash. Acad. Sci. 21: 477. 1931.

梯脉紫金牛 *ti mai zi jin niu*

Subshrubs stoloniferous, to 50 cm tall. Stems decumbent, somewhat angular, 3–4 mm in diam., densely reddish stramineous long villous-tomentose. Leaves clustered at stem apex; petiole marginate, 1–4 cm, densely blackish or rusty tomentose or villous; leaf blade obovate or oblanceolate, 20–30 × 7–8 cm, papery, sparsely raised punctate near margin and apex, glabrous adaxially, sparsely and minutely puberulent abaxially, densely hispid-villous and rusty crisped hairy along midrib, base obtuse, margin serrulate with apiculate teeth, apex acute or subacuminate; lateral veins 25 or more on each side of midrib, marginal vein present. Inflorescences axillary, compound umbellate, ca. 3 cm, villous; umbels ca. 7-flowered. Flowers ca. 4 mm. Pedicel ca. 1.5 cm. Sepals triangular-ovate, ca. 1.5 mm, rusty puberulent, not punctate, margin minutely ciliate, apex acute. Petals ovate or oblong-ovate, glabrous, punctate, apex acute. Stamens shorter than petals; anthers ovate, not punctate dorsally, apex acute or submucronate. Ovary hairy. Fruit red or blackish, globose, 5–7 mm in diam., not punctate, minutely puberulent or glabrous. Fr. Feb–Apr.

* Broad-leaved forests, valleys, dark and moist places; 1100–1600 m. S Yunnan.

39. *Ardisia pingbienensis* Yuen P. Yang in Yuen P. Yang & Dwyer, *Taiwania* 34: 270. 1989.

长穗紫金牛 *chang sui zi jin niu*

Ardisia longipedunculata C. Y. Wu & C. Chen (1977), not King & Gamble (1906).

Subshrubs stoloniferous, to 0.5 m. Stems decumbent; branchlets terete, 5–7 mm in diam., densely rusty villous, glabrescent. Petiole canaliculate, broadly marginate, 3.5–7.5 cm, densely rusty villous; leaf blade broadly elliptic, 15–18 × 7.5–8.5 cm, papery, glabrous or midrib hairy adaxially, densely rusty-villous, especially on veins abaxially, base broadly cuneate or subrounded, margin pectinate-dentate, teeth apiculate, punctate, apex acuminate; lateral veins ca. 28 on each side of midrib, usually at right angles to midrib, marginal vein obscure. Inflorescences axillary near stem apex, subumbellate

in panicles, 5.5–7.5 cm. Flowers pink, ca. 4 mm, pink. Pedicel 3–8 mm, rusty pubescent. Sepals ovate, ca. 2 mm, sparsely rusty puberulent, punctate, margin sparsely ciliate, apex acute. Petals broadly ovate, glabrous, all densely punctate, apex obtuse. Stamens shorter than petals; anthers ovate or broadly lanceolate, with or without glands dorsally. Ovary densely puberulent; ovules ca. 6, uniseriate. Fruit unknown. Fl. May.

* Broad-leaved forests, valleys; 900–1000 m. SE Yunnan.

40. *Ardisia dasyrhizomatica* C. Y. Wu & C. Chen in C. Chen, *Fl. Yunnan*. 1: 358. 1977.

粗茎紫金牛 *cu jing zi jin niu*

Shrubs subsucculent, ca. 50 cm tall, stoloniferous, glabrous. Stems terete, 7–10 mm in diam., minutely glandular granulose, early glabrescent. Leaves pseudovercillate; cataphylls present, 1.6–2.5 cm; petiole deeply marginate, ca. 2 cm, crisp winged; leaf blade broadly elliptic-obovate or obovate, 23–35 × 11–16 cm, membranous, minutely puberulent, sparsely punctate, base cuneate, decurrent, margin subrevolute, pectinate-dentate, teeth apiculate, apex obtuse; lateral veins ca. 15 on each side of midrib, arcuate, curving distally from midrib to margin, marginal vein inconspicuous. Inflorescences axillary, racemes or panicles of umbels, 8–9 cm. Flowers 3–4 mm. Pedicel 1 cm or longer, puberulent. Sepals ovate, ca. 1.5 mm, united 1/3 their length or less, glabrescent, ± punctate, margin sparsely ciliate, apex acute or obtuse. Petals nearly free, broadly elliptic or ovate, prominently black punctate, margin entire, apex obtuse or subrounded. Stamens shorter than petals; filaments obsolete; anthers lanceolate or ovate, minutely punctate, apex acute. Pistil slightly shorter than petals; ovary puberulent; ovules numerous, in 3 series. Fruit unknown. Fl. Apr–May.

* Dense evergreen broad-leaved forests; ca. 100 m. SE Yunnan (Hekou).

41. *Ardisia gigantifolia* Stapf, *Bull. Misc. Inform. Kew* 1906: 74. 1906.

走马胎 *zou ma tai*

Ardisia perpendicularis E. Walker; *A. pseudoverticillata* Merrill; *Chloranthus kiangsiensis* Metcalf.

Shrubs or subshrubs stoloniferous, 1–1.5(–3) m tall. Branchlets angular, ca. 5 mm in diam., papillose puberulent when young, glabrescent. Leaves pseudovercillate; petiole 2–4 cm, with narrow crisp wing; leaf blade elliptic to obovate or oblanceolate, 25–48 × 5–19 cm, membranous, prominently punctate, glabrous or minutely puberulent along veins abaxially, base cuneate, margin flat, pectinate-dentate, teeth apiculate, apex obtuse to subacuminate; lateral veins 15–20 on each side of midrib, marginal vein absent. Inflorescences terminal or rarely axillary, pyramidal, racemose-paniculate group of subumbels 20–35 × ca. 10 cm, glabrous or minutely puberulent. Flowers papery, white or pinkish, 4–5 mm. Pedicel 1–1.5 cm, slender. Sepals subdeltate or ovate, 1.5–2 mm, sparsely puberulent, prominently punctate, margin entire, glabrous, apex acute. Petals nearly free, ovate, sparsely punctate, margin entire, glabrous, apex acute. Stamens ca. 2/3 as long as petals; filaments obsolete; anthers

ovate, not punctate dorsally, apex apiculate. Pistil subequalling petals; ovary subglabrous or puberulent; ovules uniseriate. Fruit reddish, globose, ca. 6 mm in diam., glabrous, longitudinally striate, sparsely punctate. Fl. Apr–Jul, fr. Oct–Dec.

Broad-leaved forests, hillsides, valleys, moist ravines, stream banks, shady damp places; 1000–1500 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Jiangxi, Yunnan [Indonesia, Malaysia, Thailand, Vietnam].

Ardisia maingayi may belong here. While its type has smaller leaves, inflorescences, and petioles, no qualitative feature has been found to separate it from *A. gigantifolia*. It is possible that the type represents diminutive forms or individuals flowering precociously.

42. *Ardisia ramondiiformis* Pitard in Lecomte, Fl. Indo-Chine 3: 812. 1930.

梯脉紫金牛 *ti mai zi jin niu*

Subshrubs to shrubs, stoloniferous, 50–70 cm. Branchlets terete, succulent, 7–10 mm in diam., hirsute-tomentose with simple stramineous hairs. Leaves pseudovercillate; petiole deeply canaliculate, broadly winged by decurrent blade, up to 2 cm; leaf blade oblanceolate or obovate, rarely elliptic, 20–40 × 6–12.6 cm, papery, base attenuate or cuneate, margin pectinate-dentate, teeth apiculate, apex broadly acute or obtuse; midrib hirsute adaxially when young, glabrescent, stramineous hirsute abaxially; lateral veins ca. 25–35 on each side of midrib, marginal vein absent. Inflorescences axillary panicles, branches in umbels, ca. 10 cm, appressed long hirsute and puberulent. Flowers papery, pink or red, 3–4 mm. Pedicel 5–8(–10) mm, reddish hirsute. Sepals ovate, 1.3–1.5 mm, puberulent, punctate, margin ciliate, apex acute. Petals nearly free, broadly elliptic or ovate, black punctate, glabrous, margin entire, apex obtuse or rounded. Stamens subequalling petals; filaments obsolete; anthers ovate, not punctate dorsally, apex acute. Pistil subequalling petals; ovary puberulent; ovules 4–5(–7), uniseriate. Fruit red, globose, 7–8 mm in diam., pubescent, pellucid punctate. Fl. Apr, fr. Dec.

Dense broad-leaved forests, hillsides, valleys, dark damp places, along streams, rock crevices. Hainan [Vietnam].

Yang & Dwyer (Taiwania 34: 281. 1989) reported that *Ardisia silvestris* Pitard occurs in China, based on *How 72037*. An examination of type material of *A. ramondiiformis* and *A. silvestris* reveals that the entity in China belongs to the former species.

43. *Ardisia balansana* Yuen P. Yang in Yuen P. Yang & Dwyer, Taiwania 34: 245. 1989.

束花紫金牛 *shu hua zi jin niu*

Subshrubs 25–50(–100) cm, long stoloniferous. Stems glabrous or puberulent. Leaves alternate or pseudovercillate; petiole marginate, narrowly winged, 8–10 mm; leaf blade broadly elliptic to narrowly lanceolate, 8–11(–20) × 4–5.5 (–7) cm, papery, obscurely pellucid punctate, glabrous adaxially, sparsely minutely puberulent or reddish glandular papillate abaxially especially along midrib and lateral veins, base cuneate, decurrent, margin finely serrate, teeth apiculate,

apex acute to subacuminate apically; lateral veins 8–13 on each side of midrib, marginal vein obscure. Inflorescences axillary, paniculate, branches cymose, 5(–11) cm. Flowers papery, white, becoming pinkish, 4–5 mm. Pedicel 3–5 mm, to 1 cm in fruit, puberulent. Sepals ovate, 1.6–2 mm, minutely puberulent abaxially near base, prominently punctate, margin entire, glabrous, apex broadly acute to obtuse. Stamens subequalling petals; filaments obsolete; anthers lanceolate, punctate dorsally, apex apiculate. Pistil shorter than petals; ovary puberulent; ovules 4 or 5, uniseriate. Fruit red, globose, 4–8 mm in diam., long punctate, puberulent, glabrescent.

Dense evergreen broad-leaved forests, moist ravines, stream banks; 1000–1500 m. SE Yunnan [Vietnam].

44. *Ardisia purpureovillosa* C. Y. Wu & C. Chen ex C. M. Hu, Acta Bot. Austro-Sin. 6: 29. 1990.

紫脉紫金牛 *zi mai zi jin niu*

Shrubs 0.5–2 m tall. Branchlets angular, 3–3.5 mm in diam., subsucculent, densely crisped reddish hirtellous-tomentose, glandular trichomes uniseriate, multicellular. Leaves pseudovercillate; petiole marginate, 1–1.5 cm, not winged; leaf blade lanceolate or elliptic-lanceolate, rarely obovate, 15–22 (–25) 3.8–5(–8) cm, membranous, glossy adaxially, densely red punctate in areolae, subglabrous or sparsely puberulent especially abaxially, base cuneate, decurrent, margin serrate, apex acuminate; lateral veins ca. 18 on each side of midrib, marginal vein obscure. Inflorescences compound umbellate, densely tomentose, terminal on lateral branches 6–10(–12) cm and with 2 or 3 small lanceolate leaves. Flowers papery, pinkish or reddish purple, 5–7 mm. Pedicel 7–12 mm, densely tomentose. Sepals lanceolate, 2.3–2.5 mm, densely tomentose abaxially, glabrous adaxially, red punctate, margin entire, long ciliate. Petals nearly free, broadly ovate, minutely punctate, margin entire, glabrous, apex acute or obtuse. Stamens somewhat shorter than petals; filaments obsolete; anthers broadly ovate, longitudinally dehiscent, not punctate dorsally, apex apiculate. Pistil subequalling petals; ovary glabrous or puberulent; ovules 8–12, biseriolate. Fruit globose, ca. 6 mm in diam., tomentose, glabrescent, punctate. Fl. Apr–May, fr. Sep–Nov.

* Evergreen broad-leaved forests, limestone hillsides, valleys, moist places; 600–1800 m. Guangxi, Hainan, Yunnan.

45. *Ardisia ordinata* E. Walker, Philipp. J. Sci. 73: 137. 1940.

轮叶紫金牛 *lun ye zi jin niu*

Subshrubs to 50 cm, with creeping rhizome, appressed rusty tomentose on branchlets, petioles, leaf veins, sepals, and pedicels. Branchlets terete, 2–3 mm in diam. Leaves pseudovercillate; petiole canaliculate, 1–2 cm; leaf blade papery, 6–9 × 2.5–4.5 cm, base obtuse to rounded, progressively less tomentose from midrib to tertiaries, conspicuously punctate, dull adaxially, margin finely serrate, apiculate. Inflorescences lateral on internodes, subumbellate, few flowered, 0.8–2 cm, rusty strigose; bracts lanceolate to linear, 1–2 mm. Flowers unknown. Pedicel ca. 5 mm, strigose. Fruiting sepals ovate, ca.

1.5 mm, ciliate, punctate, apex acute. Immature fruit purple or reddish, puberulent. Fl. Jun, fr. Feb.

* Dense woods. Hainan (Loktung).

46. *Ardisia japonica* (Thunberg) Blume, Bijdr. 690. 1826.

紫金牛 *zi jin niu*

Bladhia japonica Thunberg, Nov. Gen. Pl. 1: 7. 1792;
Tinus japonica (Thunberg) Kuntze.

Subshrubs stoloniferous. Stems 20–30(–40) cm, minutely puberulent when young, glabrescent. Leaves opposite or subwhorled; petiole 6–10 mm, minutely puberulent; leaf blade elliptic to elliptic-obovate, or elliptic-lanceolate, 4–7 × 1.5–4 cm, papery to subleathery, base cuneate, margin serrulate, ± punctate, apex acute; lateral veins 5–8 on each side of midrib, veinlets prominently reticulate. Inflorescences axillary or subterminal, subumbellate, 3–5-flowered, puberulent; peduncle ca. 5 mm, slender; bracts lanceolate, ca. 1 mm, puberulent or ciliate. Flowers pink or white, 5(or 6)-merous, 4(–5) mm. Pedicel 7–10 mm, usually curved, puberulent. Sepals ovate, to 1.5 mm, sometimes punctate, glabrous, margin ciliate, apex obtuse or acute to acuminate. Petals broadly ovate, 4(–5) mm, densely punctate, apex acute. Stamens shorter than petals; anthers lanceolate-ovate or ovate, punctate dorsally, apex acute. Ovary glabrous; ovules ca. 15, in 3 series. Fruit red becoming blackish, globose, 5–6 mm in diam., ± punctate, glabrous, smooth. Fl. Apr–Jun, fr. Nov–Jan.

Mixed forests or bamboo woods, hillsides, dark damp places; to 1200 m. Anhui, Fujian, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea].

47. *Ardisia pusilla* A. de Candolle, Trans. Linn. Soc., London 17: 126. 1834.

九节龙 *jiu jie long*

Shrubs or subshrubs, stoloniferous. Stems 15–40 cm, 1.5–2(–3) mm in diam. Leaves opposite or whorled; petiole 3–8 mm, pubescent; leaf blade elliptic or obovate, 2.5–6 cm, papery, sparsely punctate, strigose adaxially, pubescent and villous abaxially, base cuneate or subrounded, margin serrate or denticulate, apex acuminate, acute, or obtuse; lateral veins 5–9 on each side of midrib, conspicuous, marginal vein obscure. Inflorescences simple, lateral, umbellate, pubescent and hirsute or villous; peduncle 1–3.5 cm. Flowers white or pinkish to reddish, (3–)4 mm. Pedicel slender, ca. 6 mm. Sepals linear- or subulate-lanceolate, pilose and villous, punctate. Petals broadly ovate, punctate, apex acute or obtuse. Stamens to subequalling petals; anthers ovate, punctate dorsally, acute and somewhat apiculate. Ovary glabrous; ovules 5 or 6, uniseriate. Fruit reddish, globose, 5–6 mm in diam., punctate, glabrous or puberulent. Fl. May–Jul, fr. Jul–Dec.

Dense mixed forests, hilly areas, roadsides, along streams, shady damp places, rock crevices; 200–700 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Taiwan [Japan, Korea, Malaysia, Philippines].

48. *Ardisia faberi* Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 64. 1889.

月月红 *yue yue hong*

Ardisia castaneifolia H. Léveillé (1911), not Mez (1902);
A. cavaleriei H. Léveillé; *A. faberi* var. *oblanceifolia* C. Chen;
Tinus faberi (Hemsley) Kuntze.

Shrubs or subshrubs, stoloniferous. Stems 15–30 cm, densely rusty crisped villous. Leaves opposite or whorled; petiole 3–8 mm, densely crisped villous; leaf blade ovate- to lanceolate-elliptic or oblanceolate, 5–10 × 1.8–4 cm, papery, not glandular, crisped villous, base cuneate, margin coarsely serrate, apex acute or acuminate; lateral veins 5–9 on each side; marginal veins absent. Inflorescences in axils of whorled leaves or alternate subulate bracts, subumbellate, few flowered, hirsute; peduncle 1.5–2.5 cm. Pedicel 7–10 mm, crisped villous. Flowers white to pinkish, 4–5(–6) mm. Sepals linear-lanceolate, ca. 5 mm, densely villous. Petals broadly ovate, ± glandular, glabrous, apex acute or obtuse. Stamens ca. 2/3 length of petals; anthers ovate, apiculate, not glandular on back. Ovary glabrous; ovules 5, in 1 series. Fruit red, globose, ca. 6 mm in diam., not punctate, glabrous or puberulent. Fl. May–Jul, fr. Nov–Jan.

* Mixed forests, valleys, along streams, roadsides, rock crevices, dark damp places; 1000–1300 m. Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Sichuan, Yunnan.

49. *Ardisia maclurei* Merrill, Philipp. J. Sci. 21: 351. 1922.

心叶紫金牛 *xin ye zi jin niu*

Ardisia sciophila T. Suzuki; *Bladhia sciophila* (T. Suzuki) Nakai.

Subshrubs stoloniferous. Stems 4–15 cm, densely rusty crisped villous when young, glabrescent. Leaves alternate, rarely almost whorled; petiole 0.5–2.5 cm, rusty pilose; leaf blade ovate- or oblong-elliptic, 4–6 × 2.5–4 cm, papery, densely pilose, base cordate, margin irregularly serrate, ciliate, apex acute to obtuse; lateral veins ca. 6 on each side of midrib, prominent, ending in teeth. Inflorescences subterminal, 1 or 2, subumbellate, rusty-villous, 4–6-flowered; peduncle 1.3–4 cm; bracts linear to narrowly lanceolate, 3–5 mm, ciliate or pilose. Flowers purplish or reddish, ca. 4 mm. Pedicel slender, 3–6 mm. Sepals lanceolate, as long as petals, rusty villous, not punctate, margin ciliate, apex acuminate. Petals ovate, glabrous, not punctate, apex acuminate. Stamens slightly shorter than petals; anthers ovate, not punctate dorsally, apex acute. Ovary glabrous; ovules 8–10, in 2 series. Fruit dark reddish, globose, ca. 6 mm in diam., not punctate, glabrous. Fl. May–Jun, fr. Dec–Mar.

* Dense broad-leaved forests, hillsides, valleys, along streams, rock crevices, dark damp places; 200–900 m. Guangdong, Guangxi, Guizhou, Hainan, Taiwan.

50. *Ardisia villosa* Roxburgh, Fl. Ind. 2: 274. 1824.

雪下红 *xue xia hong*

Ardisia dumetosa Tutcher; *A. trichocarpa* Merrill; *A. villosa* var. *ambovestita* E. Walker; *A. villosa* var. *latifolia* E. Walker; *A. villosa* var. *oblanceolata* E. Walker.

Shrubs 1(–3) m tall, stoloniferous, blackish or rusty villous or hirsute almost throughout, glabrescent. Petiole 5–10 mm; leaf blade elliptic-lanceolate to ovate or oblanceolate, 5–15 × 1.2–5 cm, papery, densely punctate especially abaxially, base cuneate, decurrent, margin subentire, undulate, crenate, or serrate, apex acute or acuminate; lateral veins ca. 15 on each side of midrib, raised on both sides, marginal vein interrupted. Inflorescences simple or compound umbellate, rusty villous, on leafy or leafless specialized branches 2–15 (–20) cm. Flowers lavender or pink, rarely white, to 8 mm. Pedicel 5–10 mm. Sepals oblong-lanceolate or ligulate, densely punctate, densely villous outside, pubescent inside, apex obtuse. Petals ovate to broadly lanceolate, glabrous, punctate, apex acute. Stamens nearly as long as petals; anthers lanceolate, acute, punctate dorsally. Ovary glabrescent or puberulent; ovules ca. 5, uniseriate. Fruit dark red or blackish, globose, 6–7 mm in diam., hirsute or villous, punctate. Fl. Apr–Jul, fr. Feb–Jul.

Evergreen broad-leaved forests, mountain slopes, roadsides, rock crevices, damp places; 500–1500 m. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Malaysia].

51. *Ardisia brevicaulis* Diels, Bot. Jahrb. Syst. 29: 519. 1900.

九管血 jiu guan xue

Ardisia bodinieri H. Léveillé; *A. citrifolia* Hayata; *Bladhia brevicaulis* (Diels) Migo; *B. citrifolia* (Hayata) Nakai.

Subshrubs stoloniferous. Stems 10–15 cm, puberulent when young. Petiole 1–1.5(–2) cm, puberulent; leaf blade narrowly ovate to elliptic or suboblong, 7–14(–18) × 2.5–4.8(–6) cm, papery, glabrous adaxially, puberulent abaxially, base cuneate, margin entire, reflexed, obscurely punctate, apex obtuse to rounded; lateral veins (7–)10–13 on each side of midrib, at almost right angles to midrib, marginal vein evident. Inflorescences terminal, umbellate, simple, on curved ends of specialized, puberulent, 1- or 2-leaved lateral branches 2–5 cm. Flowers pink, 4–5 mm. Pedicel 1–1.5 cm. Sepals lanceolate or ovate, ca. 2 mm, sometimes puberulent outside, ciliate, punctate. Petals ovate, ca. 5(–7) mm, glabrous, sparsely and minutely puberulent inside, prominently punctate, apex acute. Stamens shorter than petals; anthers lanceolate, acute or apiculate, punctate dorsally. Ovary glabrous, punctate; ovules ca. 6, uniseriate. Fruit red, globose, ca. 6 mm in diam., punctate. Fl. Jun–Jul, fr. Oct–Dec.

* Mixed forests, dark damp places; 400–1300 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan.

52. *Ardisia primulifolia* Gardner & Champion, Hooker's J. Bot. Kew Gard. Misc. 1: 324. 1849.

莲座紫金牛 lian zuo zi jin niu

Bladhia primulifolia (Gardner & Champion) Masamune; *Tinus primulifolia* (Gardner & Champion) Kuntze.

Subshrubs, rusty pilose throughout, with woody rhizomes. Leaves 4 or 5, alternate or forming a rosette; petiole 5–10 mm, densely pilose; leaf blade elliptic or oblong-obovate, 6–12(–17) × 3–5(–10) cm, papery, long ciliate, minutely punctate, base rounded, margin sparsely and obscurely crenate, apex broadly acute or obtuse; lateral veins ca. 6 on each side of midrib, conspicuous, ending in marginal glands. Inflorescences 1 or 2 in center of rosette, subumbellate or cymose, densely pilose; peduncle 3–5.5(–19) cm. Flowers reddish, 4–6 mm. Pedicel 6–8 cm, densely rusty pilose. Sepals oblong-lanceolate, subequalling petals, punctate, sparsely covered with long crisp hairs outside, glabrous within, margin ciliate, apex acute. Petals broadly ovate, sparsely punctate, glabrous. Stamens shorter than petals; anthers lanceolate, acute, sparsely punctate dorsally. Ovary sparsely puberulent; ovules 3 or 4, uniseriate. Fruit red, 4–6 mm in diam., somewhat fleshy, punctate, pubescent or glabrescent. Fl. Jun–Jul, fr. Nov–May.

Dense mixed forests, hillsides, dark damp places; 600–1400 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Yunnan [Vietnam].

53. *Ardisia omissa* C. M. Hu, J. Trop. Subtrop. Bot. 3(4): 13. 1995.

光萼紫金牛 guang e zi jin niu

Subshrubs evergreen. Stems often simple, 1.5–6(–10) cm, glabrous. Leaves spirally arranged, subrosulate; petiole 3–4 mm, pubescent; leaf blade oblong-elliptic, rarely obovate-elliptic, (6–)8–16.5 × 2.5–6 cm, papery, with appressed hairs ca. 0.6 mm chiefly near margin, base broadly cuneate to obtuse, margin sparsely crenate, glandular, apex obtuse to subrounded; lateral veins 6–10 per side, prominent abaxially, at ca. 60° to midrib. Inflorescences axillary, subumbellate, 2–4-flowered; peduncle scapelike, 2–4(–5) cm, rusty pubescent; bracts oblong, 5–6 mm, pubescent near base, obtuse to ± acute; bracteoles 1–2(–3) mm, red punctate. Calyx ca. 3 mm, divided to base; lobes oblong-lanceolate, glabrous, red punctate, apex obtuse. Corolla rose, tube ca. 0.6 mm; lobes narrowly ovate, ca. 4 × 1.6–2 mm, sparsely punctate. Filaments ca. 0.4 mm; anthers lanceolate, ca. 3 mm, apiculate. Ovary glabrous; ovules uniseriate, 4 or 5 per placenta. Style ca. 3 mm. Drupe globose, 4–5 mm in diam., red becoming black. Fl. Jul, fr. Nov–Apr.

* Thick forests near water; 200–700 m. Guangdong, Guangxi.

54. *Ardisia verbascifolia* Mez in Engler, Pflanzenr. IV. 236(Heft 9): 153. 1902.

长毛紫金牛 chang mao zi jin niu

Ardisia villosoides E. Walker.

Subshrubs 15–30 cm tall, villous almost throughout. Rhizome creeping. Stems densely villous and tomentose when young. Petiole 1.5–3.5 cm, villous and tomentose; leaf blade broadly elliptic to broadly elliptic-ovate, 12–15(–22) × 5–8(–10) cm, papery, densely punctate, base obtuse to rounded, margin crenate, apex acute or acuminate; lateral veins ca. 15 on each side of midrib, ending in

marginal glands, marginal vein present. Inflorescences terminal, axillary, or lateral, compound subumbellate or cymose bracts ca. 3 mm. Flowers pink, ca. 6 mm. Pedicel 6–10 mm. Sepals oblong-lanceolate to ligulate, ca. 6 mm, punctate and villous on both sides, apex acute. Petals ovate, punctate, glabrous, apex acute. Stamens somewhat shorter than petals; anthers narrowly lanceolate, punctate dorsally, apiculate. Pistil as long as or longer than petals; ovary glabrous; ovules ca. 5, uniseriate. Fruit red, ca. 6 mm in diam., glabrous, punctate. Fl. Jun–Jul, fr. Nov–Jan.

Dense evergreen broad-leaved forests, edges of forests, along streams, moist places, roadsides, bamboo woods. Hainan, Yunnan [Vietnam].

55. *Ardisia mamillata* Hance, J. Bot. 22: 290. 1884.

虎舌红 hu she hong

Tinus mamillata (Hance) Kuntze.

Subshrubs to 15 cm tall, with creeping woody rhizomes. Stems densely rusty crisped-pilose when young, glabrescent. Petiole 0.5–1.5 cm; leaf blade oblong-oblancheolate to obovate, 7–14 × 3–4(–5) cm, papery, punctate, rusty strigose and mamillate adaxially, crisped hairy abaxially, base obtuse or rounded, margin obscurely crenate with marginal glands hidden by hairs, apex acute or obtuse; lateral veins 6–8 on each side of midrib, marginal vein absent. Inflorescences simple, umbellate, 10–15-flowered, densely pilose, on curved ends of pilose, specialized branches 3–9 cm, with 1 or 2(–4) reduced subapical leaves. Flowers pinkish or rarely whitish, 5–7 mm. Pedicel 4–8 mm; pilose. Sepals narrowly oblong-lanceolate or lanceolate, as long as or shorter than petals, punctate, pilose on both surfaces or glabrescent inside, apex acuminate. Petals ovate, punctate, apex acute. Stamens subequalling petals; anthers lanceolate, punctate dorsally, acute. Ovary pilose or glabrescent; ovules ca. 5, uniseriate. Fruit reddish, ca. 6 mm in diam., slightly fleshy, ± punctate, pilose or glabrescent. Fl. Jun–Jul, fr. Nov–Jan.

Dense evergreen broad-leaved forests, valleys, shady damp places; 500–1600 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Sichuan, Yunnan [Vietnam].

56. *Ardisia alyxiifolia* Tsiang ex C. Chen, Acta Phytotax. Sin. 16(3): 80. 1978.

少年红 shao nian hong

Ardisia beibeinenses Z. Y. Zhu

Shrubs ca. 50 cm tall, possibly stoloniferous. Branchlets terete, 1–2 mm in diam., reddish glandular papillate, glabrescent. Petiole canaliculate, 5–8 mm; leaf blade ovate, lanceolate to oblong-lanceolate, 3.5–6(–9.5) × 1.5–2.3(–3.2) cm, thick papery to leathery, sparsely puberulent or minutely brown scaly especially on midrib abaxially, punctate, base obtuse to rounded, margin crenulate, apex acuminate; lateral veins inconspicuous, sparsely glandular, marginal vein absent. Inflorescences simple, subumbellate or corymbose, sometimes compound, lateral or rarely axillary, densely puberulent; peduncle 1–3(–6) cm. Flowers white or rarely pinkish, ca. 4 mm. Pedicel 6–10 mm. Sepals triangular-ovate, 1–1.5 mm, minutely puberulent on tube, punctate, apex obtuse or acute.

Petals ovate or ovate-lanceolate, ca. 4 mm, glabrous, ± papillate below middle inside, sparsely punctate. Stamens shorter than petals; anthers lanceolate, ± punctate dorsally. Ovary glabrous; ovules ca. 5, uniseriate. Fruit red, globose, ca. 5 mm in diam., somewhat fleshy, punctate. Fl. Jun–Jul, fr. Oct–Dec.

* Mixed forests, hillsides, valleys; 600–1200 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan.

57. *Ardisia chinensis* Bentham, Fl. Hongk. 207. 1861.

小紫金牛 xiao zi jin niu

Ardisia jiajiangensis Z. Y. Zhu; *A. triflora* Hemsley; *Bladhia chinensis* (Bentham) Nakai; *B. chinensis* var. *minor* Nakai; *Tinus chinensis* (Bentham) Kuntze; *T. triflora* (Hemsley) Kuntze.

Shrubs or subshrubs with creeping rhizomes. Stems to 45 cm, minutely blackish brown scaly when young, glabrescent. Petiole 3–8(–10) mm, brown scaly; leaf blade obovate or elliptic, 3–8 × 1.5–3 cm, papery, glabrous adaxially, brown scaly abaxially, base cuneate, margin undulate or repand to subentire, slightly revolute, apex obtuse to acute; lateral veins numerous, marginal vein present. Inflorescences axillary, simple, subumbellate, 3–10-flowered; peduncle 1–3 cm. Flowers white or sometimes pinkish, ca. 3 mm. Pedicel 5–8 mm, slender, blackish brown scaly. Sepals triangular-ovate, ca. 1 mm, brown scaly, punctate or not, margin ciliate, apex acute. Petals free or nearly so, ovate, glabrous, not punctate, apex acute or acuminate. Stamens ca. 2/3 as long as petals; anthers ovate, punctate or not dorsally, apex acute, apiculate. Ovary glabrous, ovules 5 or 6, uniseriate. Fruit red becoming blackish, globose, ca. 5 mm in diam., not punctate, glabrous. Fl. Apr–Jun, fr. Oct–Dec.

Mixed forests, hillsides, valleys, along streams, dark damp places; 300–800 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Sichuan, Taiwan, Zhejiang [Japan, Malaysia, Vietnam].

58. *Ardisia fordii* Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 64. 1889.

灰色紫金牛 hui she zi jin niu

Embelia fordii (Hemsley) Mez.

Shrubs 30–60 cm tall, stoloniferous. Stems rusty scaly and puberulent when young. Petiole ca. 3 mm; leaf blade elliptic-lanceolate or oblanceolate, 2.4–5.5 × 1–1.6 cm, papery, glabrous, rusty scaly abaxially, base cuneate to subrounded, margin entire, apex obtuse or acuminate; lateral veins numerous, marginal vein evident. Inflorescences terminal on specialized lateral branches 6–9 cm, umbellate, few flowered, rusty scaly; bracts 2, lanceolate, minute, inserted at base of pedicel. Flowers pink, ca. 4 mm. Pedicel slender, ca. 7 mm. Sepals ovate, ca. 1.5 mm, punctate, ± minutely scaly, margin ciliate, apex acute or subrounded. Petals broadly ovate, ca. 4 mm, glabrous, punctate, apex acute. Stamens ca. 1.5 mm; anthers ovate, acute, apiculate, not punctate on back. Pistil shorter than petals; ovary glabrous, punctate; ovules ca. 5, uniseriate. Fruit dark red, globose, ca. 5–7(–9) mm in diam.,

sparsely scaly, punctate, smooth, not ribbed. Fl. Jun–Aug, fr. Oct–Dec.

* Evergreen broad-leaved forests, hillsides, valleys, along streams, damp and dark places; 100–800 m. Guangdong, Guangxi.

It is possible that specimens of *A. fordii* actually represent seedlings of *A. quinquegona* with precocious flowers, but because no field data are available, they are treated as distinct pending further studies.

59. *Ardisia violacea* (T. Suzuki) W. Z. Fang & K. Yao, Acta Phytotax. Sin. 17: 99. 1979.

锦花紫金牛 jin hua zi jin niu

Bladhia violacea T. Suzuki, Trans. Nat. Hist. Soc. Formos. 5: 41. 1935; *Ardisia brevicaulis* Diels var. *violacea* (T. Suzuki) E. Walker.

Subshrubs, with long creeping rhizomes. Stems 10–30 cm, minutely puberulent. Petiole 2–3 mm, ± minutely puberulent or brown scaly, canaliculate; leaf blade ovate- or oblong-lanceolate, rarely lanceolate, 2–6.5 × 0.6–1.9 cm, papery, glabrous, minutely punctate abaxially, base rounded or subcordate, margin irregularly serrate, reflexed, apex acute or obtuse; lateral veins slightly raised adaxially, 3–5(–8) on each side of and at right angles to midrib, marginal vein evident. Inflorescences axillary or subapical, umbellate, simple, minutely and densely puberulent or brown scaly; peduncle 0.8–1.5 cm. Flowers unknown. Pedicel 3–4 mm. Fruit red, globose, ca. 6 mm in diam., not punctate, glabrous, 2 or 3 per infructescence. Fr. Mar.

* Dense broad-leaved forests, valleys, rock crevices, damp places; 700–1100 m. Taiwan.

60. *Ardisia sinoaustralis* C. Chen, Guihaia 13: 202. 1993.

细罗伞 xi luo san

Ardisia affinis Hemsley (1889), not Blume ex A. de Candolle (1844); *A. sinoaustralis* var. *longicalyx* C. Chen & D. Fang; *Tinus affinis* (Hemsley) Kuntze.

Subshrubs 30–40 cm tall, stoloniferous. Stems rusty puberulent especially when young. Petiole 2–5 mm; leaf blade elliptic to oblong-ob lanceolate, 1.5–7 × 1–3 cm, sparsely punctate, base cuneate, margin crisped undulate, subentire, or crenulate, apex acute or obtuse; lateral veins 4–7 on each side of midrib, punctate puberulent, marginal vein absent. Inflorescences terminal, umbellate, simple, on curved ends of specialized lateral branches 2–13 cm, these with 2 or 3 reduced subapical leaves, rusty puberulent. Flowers tinged pinkish, 4–6 mm. Pedicel ca. 8 mm, rusty puberulent. Sepals ovate, ca. 1 mm, puberulent, punctate, margin sometimes ciliate, apex acute or obtuse. Petals ovate, 4–6 mm, sparsely punctate, glabrous outside, sparsely puberulent or glabrous inside, apex acute. Stamens somewhat shorter than petals; anthers lanceolate, acute, punctate dorsally. Ovary glabrous, sparsely punctate; ovules ca. 5, uniseriate. Fruit red, globose, ca. 7 mm in diam., slightly fleshy, not punctate. Fl. May–Jul, fr. Oct–Dec.

* Mixed forests, limestone hillsides, roadsides, along streams, dark damp places; 100–600 m. Guangdong, Guangxi, Hainan, Hunan, Jiangxi.

61. *Ardisia argenticaulis* Yuen P. Yang in Yuen P. Yang & Dwyer, Taiwania 34: 287. 1989.

五花紫金牛 wu hua zi jin niu

Shrubs to 43 cm tall, with creeping rhizomes, pubescent with irregular peltate scales on young parts. Branchlets terete, 2.5–3 mm in diam., brown scaly, silvery-gray basally. Petiole 3–10 mm; leaf blade obovate, 6–12 × (2.3–)3–4 cm, membranous, glabrous adaxially, covered with brown scales and short hairs abaxially, base cuneate and slightly decurrent, margin entire or subundulate, apex acute or acuminate; lateral veins to 12 on each side of midrib, marginal vein absent. Inflorescences axillary, subumbellate, 8–12-flowered, to 4 cm, rusty brown scaly throughout at least when young; peduncle ca. 3 cm, slender. Flowers white, ca. 3 mm. Pedicel ca. 1 cm, slender. Sepals triangular-ovate, ca. 2 mm, obscurely punctate, base rusty brown scaly, margin ciliate, apex acute. Petals ovate, ca. 3 mm, glabrous, sparsely punctate, apex acute. Stamens ca. 3 mm; anthers lanceolate-ovate, not punctate dorsally, apex acute or acuminate. Ovary glabrous; ovules ca. 12, in 2 series. Fruit ovoid, 5–7 mm in diam., not punctate, glabrous. Fl. May.

* Sparse mixed forests, bamboo woods, dense broad-leaved forests, along streams, shady places, hilly area. Guangdong.

62. *Ardisia caudata* Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 63. 1889.

尾叶紫金牛 wei ye zi jin niu

Tinus caudata (Hemsley) Kuntze.

Shrubs 50–100 cm tall. Branchlets puberulent when young. Petiole 5–8 mm, puberulent; leaf blade oblong- or elliptic-lanceolate, rarely elliptic, 6–13 × 2–3(–4.5) cm, membranous, glabrous, sparsely brown scaly abaxially, not punctate, base rounded or obtuse, margin crisped-undulate or crenate, apex acuminate to caudate-acuminate; lateral veins ca. 8 on each side of midrib, marginal vein absent. Inflorescences terminal, compound subcorymbose or umbellate, many flowered, puberulent, on specialized, slender, 3- or 4-leaved lateral branches 5–20 cm; primary rays to 1.5 cm. Flowers pinkish, 6(–8) mm. Pedicel 7–12 mm, to 2 cm in fruit, slender, puberulent. Sepals ovate, 3–4 mm, punctate, glabrous except for base, apex acute. Petals broadly ovate, sparsely punctate, minutely puberulent inside near base or glabrous, apex acute. Stamens ca. 2/3 as long as petals; anthers ovate, sparsely punctate dorsally. Ovary glabrous; ovules ca. 5, uniseriate. Fruit reddish, ca. 6 mm in diam., with small glands. Fl. May–Jul, fr. Nov–Dec.

* Mixed forests, valleys, hillsides, along streams, dark damp places; 1000–2200 m. Guangdong, Guangxi, Guizhou, Sichuan, Yunnan.

63. *Ardisia pedalis* E. Walker, J. Arnold Arbor. 23: 351. 1942.

矮短紫金牛 ai duan zi jin niu

Subshrubs to 50 cm tall, stoloniferous. Branchlets angular, 1–2 mm in diam., densely and minutely reddish papillose-tomentose, glabrescent. Petiole canaliculate, 0.8–1.5 cm, puberulent; leaf blade elliptic, oblanceolate, or obovate, 8–13 (–14) × 3–5.5 (–7) cm, papery, puberulent especially on veins abaxially, densely punctate, base cuneate, decurrent, margin subentire to sparsely and shallowly crenate, apex acuminate or acute; lateral veins ca. 12 on each side of midrib, marginal vein absent. Inflorescences subumbellate, simple, axillary or lateral, densely puberulent; peduncle ca. 1 cm, 2 cm in fruit. Flowers white or red, 5–6 mm. Pedicel ca. 1 cm, puberulent or glabrescent. Sepals ovate or oblong-ovate, ca. 1.5 mm, sparsely puberulent or glabrescent, punctate, margin entire or ciliate, apex obtuse or acute. Petals narrowly ovate, 5–6 mm, densely punctate, glabrous, apex subobtusate. Stamens shorter than petals; anthers lanceolate, punctate or not dorsally. Ovary glabrous; ovules ca. 7, uniseriate. Fruit red, globose, 8–10 mm in diam., punctate, sparsely fleshy.

Dense broad-leaved forests, hilly areas, rocky crevices, shady places, along streams; 100–1000 m. Guangxi [Vietnam].

64. *Ardisia crispa* (Thunberg) A. de Candolle, Trans. Linn. Soc., London 17: 124. 1834.

百两金 bai liang jin

Bladhia crispa Thunberg, Fl. Jap. 97. 1784; *Ardisia crispa* var. *amplifolia* E. Walker; *A. crispa* var. *dielsii* (H. Léveillé) E. Walker; *A. dielsii* H. Léveillé; *A. henryi* Hemsley; *A. henryi* var. *dielsii* (H. Léveillé) E. Walker; *A. hortorum* Maximowicz ex Regel; *A. hortorum* var. *brachysepala* Handel-Mazzetti; *A. multicaulis* Z. Y. Zhu; *A. penduliflora* Mez; *A. simplicicaulis* Hayata; *Bladhia crispa* var. *dielsii* (H. Léveillé) Nakai; *Tinus crispa* (Thunberg) Kuntze; *T. henryi* (Hemsley) Kuntze.

Shrubs or subshrubs 0.6–1.5 m tall, with creeping rhizomes. Stems usually minutely puberulent or sparsely brown scaly when young. Petiole 5–8 mm; leaf blade elliptic-lanceolate to narrowly lanceolate, 7–25 × 1–5.8 cm, membranous or subpapery, glabrous adaxially, usually ± finely brown scaly abaxially, base cuneate, margin entire or shallowly crenulate,

recurved, punctate, apex long acuminate or rarely acute; lateral veins ca. 8 on each side of midrib, marginal vein obscure. Inflorescences terminal, subumbellate, simple, on curved specialized lateral branches 5–10 cm. Flowers white or pink, 4–5 mm. Pedicel 1–1.5 cm, puberulent. Sepals oblong-ovate or lanceolate, ca. 1.5 mm, ± sparsely punctate, glabrous, apex acute or narrowly rounded. Petals ovate, 4–5 mm, punctate, glabrous outside, ± minutely puberulent inside, apex acute. Stamens subequalling petals; anthers narrowly oblong-lanceolate, with or without glands dorsally. Ovary glabrous; ovules ca. 5, uniseriate. Fruit reddish, globose, 5–6 mm in diam., punctate. Fl. Apr–Jun, fr. Oct–Jan. $2n = 24, 46$.

Mixed or broad-leaved forests, damp places, bamboo woods, hillsides, valleys; 100–2500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Indonesia, Japan, Korea, Vietnam].

The name *Ardisia crispa* was misapplied by de Candolle to *A. crenata*, (see Walker, J. Wash. Acad. Sci. 29: 256. 1939).

65. *Ardisia carnosicaulis* C. Chen & D. Fang, Guihaia 13: 199. 1993.

肉茎紫金牛 rou jing zi jin niu

Shrubs to 1 m tall, sometimes tuberous. Branchlets 5–7 mm in diam., minutely glandular papillate, early glabrescent. Petiole marginate, to 2 cm; leaf blade elliptic, obovate, or oblanceolate, 9–14.5 × 3–5 cm, glabrous, sometimes minutely punctate abaxially, base cuneate, margin crenulate, vascularized nodules present, apex acuminate; lateral veins 16–18 on each side of midrib, raised on both surfaces, marginal vein evident. Inflorescences terminal, corymbose, on 3–5-leaved specialized lateral branches 4.5–16 cm. Flowers papery, pinkish or yellowish, ca. 8 mm. Pedicel 0.7–2 cm. Sepals oblong-ovate, 2.5–3 mm, glabrous, densely glandular, apex obtuse to subrounded. Petals nearly free, ovate, 6–8 mm, glabrous, puberulent inside, glandular, apex acuminate. Stamens shorter than petals; filaments obsolete; anthers lanceolate, acute, glandular on back. Pistil as long as or slightly longer than petals; ovary glabrous. Fruit unknown. Fl. Jun–Oct.

* Evergreen broad-leaved forests, hillsides, valleys, dark damp places; 400 m. Guangxi.

4. EMBELIA N. L. Burman, Fl. Ind. 62. pl. 23. 1768.

酸藤子属 suan teng zi shu

Shrubs, becoming lianous at maturity, or lianas. Leaves alternate, distichous, or pseudovercillate. Inflorescences racemose, paniculate, umbellate or corymbose, bracteate at base. Pedicel subtended by one persistent floral bract. Flowers 4- or 5-merous, bisexual or functionally unisexual and plants dioecious, polygamous, or monoecious. Sepals united at base. Petals free or united at base, glandular granulose inside and often along margin. Stamens adnate to base of petals, rarely free, normally exerted in staminate flowers, reduced in pistillate ones; filaments free; anthers dehiscing longitudinally, connectives usually punctate abaxially. Pistillode reduced and style included in staminate flowers; ovary globose or ovoid; ovules ca. 4, uniseriate. Style exerted; stigma discoid or capitate, sometimes slightly lobed. Fruit drupes, prominently punctate, 1-seeded; endocarp crusty or rarely bony. Seeds subglobose, covered by membranous remnants of placenta; endosperm ruminant; embryo terete, transverse.

About 140 species: Africa, SE Asia, Australia, Pacific Islands; 14 species in China.

1a. Inflorescences pendent, corymbose umbellate.

2a. Leaf margin entire.

3a. Leaf blade oblanceolate or obovate, base cuneate; petiole 5–7 mm 5. *E. laeta*

- 3b. Leaf blade broadly ovate or ovate, base truncate or subcordate; petiole 0.5–1 mm 6. *E. parviflora*
- 2b. Leaf margin sharply serrate or crenate, with spiny or acute to obtuse teeth.
- 4a. Leaf apex mucronate, obtuse or acute.
- 5a. Leaf blade glossy, base cordate; petiole subterete, (2–)2.5–3.5(–5) mm 1. *E. polyodioides*
- 5b. Leaf blade dull, base obtuse or acute; petiole deeply canaliculate, 4–5 mm 2. *E. procumbens*
- 4b. Leaf apex not mucronate, caudate to acuminate.
- 6a. Branchlets glandular papillose-tomentose; leaf blade teeth spinose; perianth leathery; sepals broadly ovate, apex acute or obtuse; petals involute, margin glabrous 3. *E. pauciflora*
- 6b. Branchlets glandular puberulent; leaf blade teeth obtuse to acute; perianth papery; sepals narrowly ovate, apex acuminate or attenuate; petals flat, margin glandular granulose 4. *E. henryi*
- 1b. Inflorescences erect, racemose or paniculate.
- 7a. Inflorescences paniculate; petiole marginate.
- 8a. Branchlets and inflorescence rachis reddish glandular papillose-puberulent, early glabrescent; sepals prominently black punctate, margin glabrous, acute to obtuse; petals prominently pellucid punctate-lineate, margin glandular granulose 9. *E. floribunda*
- 8b. Branchlets and inflorescence rachis tawny papillose-tomentose; perianth inconspicuously pellucid punctate, margin long glandular papillose; sepals acuminate.
- 9a. Inflorescence branches spicate; leaf margin prominently black punctate 7. *E. sessiliflora*
- 9b. Inflorescence branches racemose; leaf margin punctate 8. *E. ribes*
- 7b. Inflorescences racemose; petiole canaliculate.
- 10a. Branchlets 5–7 mm in diam.; leaf blade leathery to cartilaginous, margin entire.
- 11a. Branchlets and leaf midrib rusty stellate tomentose; abaxial leaf surface with numerous small reddish scales, prominently red and black punctate 13. *E. gamblei*
- 11b. Branchlets and leaf midrib glabrous; abaxial leaf surface glabrous, sparsely and inconspicuously black punctate 14. *E. carnosisperma*
- 10b. Branchlets 2–4.5 mm in diam.; leaf blade papery to subleathery, margin serrate or subentire.
- 12a. Leaf blade glossy, margin regular, serrate or serrulate throughout; sepals erose, inconspicuously pellucid or brown punctate, apex obtuse to acutish 10. *E. vestita*
- 12b. Leaf blade dull, margin irregular, subentire or roughly serrulate-dentate distally; sepals entire, prominently black punctate, apex acuminate.
- 13a. Branchlets glabrous; leaf base cuneate; fruit longitudinally ribbed, 1–1.5 cm in diam. 11. *E. undulata*
- 13b. Branchlets minutely reddish papillate-puberulent; leaf base obtuse to rounded; fruit smooth, 0.3–0.5 cm in diam. 12. *E. scandens*

1. *Embelia polyodioides* Hemsley & Mez. in Mez, Notizbl. Königl. Bot. Gart. Berlin 3: 108. 1901.

龙骨酸藤子 long gu suan teng zi

Vines or shrubs, reddish hirtellous-tomentose on branchlets, petioles, and inflorescences. Branchlets terete, 2–3 mm in diam. Petiole subterete, somewhat canaliculate at blade, (2–)2.5–3.5(–5) mm; leaf blade oblong or lanceolate, (1.2–)2–3.5(–4.4) × (0.8–)1–1.2(–1.8) cm, membranous, glossy, sparsely glandular papillate and red-black punctate toward apex, base subcordate or truncate, margin crenate with spinose teeth, apex mucronulate, acute to acuminate, sometimes emarginate; midrib prominent at both surfaces, reddish hirsute; lateral veins below, (12–)14–20 on each side of midrib, submarginal vein present. Inflorescences axillary, umbellate, subsessile, 8–10 mm, 1–3-flowered, pendulous; bracts oblong, 0.8–1 × 0.3–0.5 mm, margin entire, regular, glandular ciliate. Flowers pink, 5-merous, staminate and bisexual, 3–4 mm, pistillate unknown. Pedicel 1–2.5 mm. Sepals triangular-ovate or ovate, red and black punctate, glabrous, margin entire, glandular ciliate, apex acute. Petals free, oblong or oblanceolate, papery, glabrous outside, densely yellow glandular granulose inside except near filaments, black punctate and punctate-lineate, margin entire, glandular ciliate,

apex rounded or obtuse. Stamens slightly longer than petals in staminate flowers, subequal to petals in bisexual; anthers in staminate lanceolate, in bisexual ovate, base deeply cordate, apex apiculate, black punctate. Style glabrous; stigma punctiform. Fruit red, globose, 3–5 mm in diam., densely red and black punctate. Fl. Dec–Feb, fr. Jan–Mar.

Mixed forests, hillsides, valleys; 1000–2400 m. Guangxi, Yunnan [Vietnam].

2. *Embelia procumbens* Hemsley in Hooker, Icon. Pl. 28: t. 2724. 1901.

葡萄酸藤子 pu fu suan teng zi

Embelia saxatilis Hemsley.

Vines, reddish glandular villous-tomentose on branchlets and petioles, glandular granulose on leaf blades, peduncles, pedicels, and perianth. Branchlets terete, 1–2 mm in diam., glabrescent. Petiole deeply canaliculate, 4–5 mm; leaf blade elliptic, ovate, or obovate, 1.3–3 × 0.5–1.2(–1.7) cm, membranous, dull, sparsely red and black punctate and punctate-lineate, base cuneate or obtuse, margin crenate-serrate with spinose teeth, densely red punctate, apex mucronate, acute or obtuse; midrib flat or slightly raised and glabrous adaxially, prominent abaxially; lateral veins 4–8 on each side of midrib, submarginal vein present. Inflorescences

axillary, subcorymbose or subumbellate, 1–2 cm, 5–10-flowered, pendulous; peduncle 4–10 mm, red punctate; bracts linear or rarely subulate, 1–1.5 mm, apex attenuate, glandular ciliate. Flowers unisexual or bisexual, white or greenish, 5-merous, staminate 4.5–5 mm, pistillate 2.5–3 mm, bisexual 3–3.5 mm. Pedicel 3–6 mm, minutely glandular granulose. Sepals lanceolate or narrowly ovate, densely red or black punctate medially, margin erose-fimbriate, glandular ciliate, apex acuminate. Petals oblong or ovate, free or united to ca. 1/2 length, papery, glabrous inside, red punctate apically, margin entire, apex obtuse to acute. Stamens exerted 1–2 mm in staminate flowers, ca. 2/3 petal length in bisexual, ca. 1/2 petal length in pistillate; anthers narrowly lanceolate in staminate, ovate in bisexual, deltate in pistillate, base truncate, apex acutely rounded, connective red punctate. Style sparsely red punctate-lineate; stigma subcapitate, 3- or 4-lobed. Fruit red, globose, 4–5 mm in diam., densely red punctate. Fl. Oct–Jan, fr. Dec–Apr.

* Dense broad-leaved forests, bamboo woods, hillsides; 1300–2600 m. Sichuan, Yunnan.

3. *Embelia pauciflora* Diels, Bot. Jahrb. Syst. 29: 517. 1900.

疏花酸藤子 shu hua suan teng zi

Embelia blinii H. Léveillé; *E. dielsii* H. Léveillé; *E. kaopoensis* H. Léveillé; *E. pauciflora* var. *blinii* (H. Léveillé) E. Walker; *E. schlechteri* H. Léveillé.

Shrubs scandent, reddish glandular papillose-tomentose on branchlets, petioles, inflorescences, and sepals. Branchlets straight, terete, 1–1.5 mm in diam., glabrescent. Petiole subterete, somewhat canaliculate at blade, 2–2.5 mm; leaf blade ovate to linear-lanceolate, 3–9 × 0.8–2 cm, papery, glabrous above, sparsely glandular papillate and densely black punctate-lineate abaxially, base rounded, margin revolute, crenate-serrate with spinose teeth, apex acuminate or caudate; midrib impressed above, prominently raised below, lateral veins inconspicuous. Inflorescences axillary, subumbellate, 8–10 mm, 3–5(–7)-flowered, pendulous; bracts lanceolate, 0.8–1 × 0.2–0.3 mm, prominently red punctate, glandular ciliate. Flowers unisexual and plants dioecious, 5-merous, staminate 3–3.5 mm, pistillate 2.5–3 mm. Pedicel 3–5 mm, densely glandular papillose-puberulent. Sepals broadly ovate, densely red and black punctate, rugose basally, margin entire, glandular ciliate, apex obtuse or acute. Petals free, oblong or lanceolate, leathery, glabrous outside, yellow glandular granulose inside, densely black punctate-lineate, margin irregular, scarious, glabrous, apex obtuse to acute. Stamens as long as petals or ca. 0.5 mm longer; anthers lanceolate, base cordate, apex apiculate, in pistillate ovate, base truncate, apex apiculate, connective black punctate dorsally. Ovary glabrous. Style slender, exerted, red punctate-lineate; stigma subcapitate, sometimes 2–4-lobed. Fruit red, globose, ca. 5 mm in diam., red punctate. Fl. Sep–Oct.

* Mixed forests, valleys, hillsides, moist places, stony soil; 1300–1500 m. Guizhou, Sichuan.

4. *Embelia henryi* E. Walker, J. Wash. Acad. Sci. 27: 200. 1939.

毛果酸藤子 mao guo suan teng zi

Shrubs scandent, reddish glandular puberulent on branchlets, petioles, and inflorescences. Branchlets straight, terete, 1–1.5 mm in diam., glabrescent. Petiole deeply canaliculate, 3–5 mm; leaf blade ovate or lanceolate, 1.5–3 × 1–3 cm, membranous, glabrous and glossy, sparsely red punctate and punctate-lineate, base broadly rounded and often slightly asymmetrical, margin flat, crenate-serrate with obtuse to acute teeth, apex acuminate or caudate; midrib impressed and minutely reddish puberulent adaxially; lateral veins numerous, conspicuous. Inflorescences axillary, subcorymbose, 0.5–1.9 cm, 2–5(–9)-flowered, pendulous; peduncle 0.5–2 mm; bracts linear, 0.6–1 × 0.1–0.2 mm, black punctate, margin entire, glandular ciliate. Flowers unisexual, 5-merous, staminate unknown, pistillate 1.4–1.9 mm. Pedicel 2–3 mm, densely glandular puberulent. Sepals narrowly ovate, densely black punctate, rugose basally, essentially glabrous, margin entire, glandular ciliate, apex acuminate or attenuate. Petals free, oblong or ovate, papery, glabrous outside, densely yellow glandular granulose inside, densely black punctate, margin regular, apex obtuse to acute. Stamens unknown; staminodes subequalling base of style; anthers ovate, base truncate, apex apiculate, connective black punctate dorsally. Ovary densely glandular granulose. Style slender, exerted; stigma subcapitate. Fruit purple, globose, 3–4 mm in diam., ribbed and black punctate-lineate. Fl. Nov–Feb, fr. Sep–Dec.

Mixed forests, hillsides; 800–1700 m. Guangxi, Yunnan [Vietnam].

5. *Embelia laeta* (Linnaeus) Mez in Engler, Pflanzenr. IV. 236(Heft 9): 326. 1902.

酸藤子 suan teng zi

Shrubs scandent. Branchlets straight, flexuous, or geniculate, terete, 1.5–2 mm in diam., glabrous or densely reddish glandular papillose-tomentose. Petiole canaliculate and marginate, 5–9 mm, indument as in branchlets; leaf blade obovate or oblanceolate, (1.7–)3–6(–7.5) × (0.6–)1.5–2(–3) cm, papery, dull, glabrous, base cuneate, margin flat or revolute, entire, apex acute or rounded to obtuse, usually minutely emarginate; midrib impressed adaxially; lateral veins inconspicuous, 6–10 on each side of midrib. Inflorescences axillary, subcorymbose subumbellate, to puberulent, 3–15-flowered, with 1 or 2 series of scales at base; bracts ovate, cucullate, subulate or oblong, 1–1.3 mm, sparsely glandular granulose, margin entire, glandular ciliate, apex obtuse. Flowers white or yellowish, 4-merous, staminate 2–2.5(–3) mm, pistillate 1.5–2 mm. Pedicel 2–4 mm in staminate, 1.5–2 in pistillate, glabrous or glandular puberulent. Sepals ovate or triangular, glabrous or glandular puberulent, red punctate, margin subentire, apex acute. Petals free, ovate or oblong, membranous, glabrous outside, densely glandular granulose inside, entire, glandular ciliate, apex obtuse or rounded.

Stamens exerted 1–1.5 mm in staminate flowers, ca. 1/3 petal length in pistillate; anthers broadly cordate, apex acute. Ovary glabrous. Style straight, punctate; stigma subcapitate, 2- or 3-lobed. Fruit globose, 5–8 mm in diam., densely pellucid punctate.

Two subspecies: 100–2000(–3000) m. Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Taiwan, Yunnan [Cambodia, Laos, Thailand, Vietnam].

- 1a. Branchlets straight to somewhat flexuous, glabrous; pedicels and calyx glabrous; petals glandular ciliate along margin 5a. subsp. *laeta*
1b. Branchlets geniculate, minutely and densely reddish glandular papillose-tomentose; pedicels and calyx glandular puberulent; petals glabrous along margin 5b. subsp. *papilligera*

5a. *Embelia laeta* subsp. *laeta*

酸藤子 (原亚种) suan teng zi (yuan ya zhong)

Samara laeta Linnaeus, Mant. Pl. ed. 2: 199. 1771; *Choripetalum obovatum* Benth; *Embelia obovata* (Benth) Hemsley; *Myrsine laeta* (Linnaeus) A. de Candolle; *Ribesiodes obovatum* (Benth) Kuntze; *S. obovata* Benth.

Branchlets straight to somewhat flexuous, glabrous. Leaf blade papery, margin flat. Pedicel and calyx glabrous. Petals glandular ciliate along margin. Fl. Dec–Mar, fr. Apr–Jun.

Mixed forests, open slopes of grasslands, shrubby areas, hillsides; 100–1900 m. Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Taiwan, Yunnan [Cambodia, Laos, Thailand, Vietnam].

5b. *Embelia laeta* (Linnaeus) Mez subsp. *papilligera* (Nakai) Pipoly & C. Chen, Novon 5: 358. 1995.

腺毛酸藤子 xian mao suan teng zi

Samara laeta var. *papilligera* Nakai in Nakai & Honda, Nov. Fl. Formos. 5: 84. 1943; *Embelia laeta* var. *papilligera* (Nakai) E. Walker; *Embelia penduliramula* Hayata.

Branchlets geniculate, minutely and densely reddish glandular papillose-tomentose. Pedicel and calyx glandular puberulent. Petals glabrous along margin. Fr. May.

* Margins of mixed forests and swamps; 800–2000(–3000) m. Jiangxi, Taiwan.

6. *Embelia parviflora* Wallich ex A. de Candolle, Trans. Linn. Soc. London 17: 130. 1834.

当归藤 dang gui teng

Embelia myrtifolia Hemsley & Mez; *Embelia pulchella* Mez; *Ribesiodes parviflorum* (Wallich ex A. de Candolle) Kuntze; *Samara parviflora* (Wallich ex A. de Candolle) Kurz.

Shrubs scandent, villous-tomentose on branchlets, petioles, pedicels, and inflorescences, otherwise villous. Branchlets terete, 2.5–3 mm in diam., sparsely lenticellate, glandular. Petiole canaliculate, 0.5–1 mm; leaf blade ovate or broadly so, 1–1.5(–2.5) × 0.6–1(–1.3) cm, papery, glossy, glabrous,

sparsely red punctate near apex, villous or scaly abaxially, base broadly rounded to truncate or cordate, margin entire, apex obtuse or rounded; midrib impressed adaxially; lateral veins inconspicuous. Inflorescences axillary, staminate usually cymose, 7–10(–15) mm, (1–)2–4(–6)-flowered; pistillate usually subumbellate, 4–7(–10) mm, (2–)3–5-flowered; bisexual fascicled, 3–5(–7) mm, 3–8-flowered, pendulous; bracts lanceolate to subulate, 0.6–1 mm, red punctate, densely villous. Flowers white or greenish white, 5-merous, membranous, staminate 2.5–3 mm, pistillate 1.8–2.3 mm, bisexual 2–2.5 mm. Pedicel 3–8 mm in staminate, 2–5 in pistillate, 0.5–1.5 mm in bisexual. Sepals ovate, subdeltate, or oblong, densely red punctate, glabrous except sparsely villous basally, margin entire, glandular ciliate. Petals free, ovate, lanceolate, or oblong, papery, glabrous outside, red or black punctate, densely red glandular granulose inside, margin glandular ciliate, apex obtuse or emarginate. Stamens slightly longer than petals in staminate flowers, ca. 3/4 petal length in bisexual flowers; anthers broadly ovate in staminate, ovate in bisexual, and lanceolate in pistillate flowers, base cordate, apex acute or slightly emarginate, connective densely black punctate. Style sparsely glandular papillate basally; stigma capitate, 4-lobed. Fruit dull red, globose, 3–5 mm in diam., red punctate-lineate. Fl. Dec–May, fr. Jan–Nov.

Dense mixed forests, evergreen broad-leaved forests, shrubby areas, hillsides, humus-rich soil, shady places; 300–1800(–2200) m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Xizang, Yunnan, Zhejiang [India, Indonesia, Malaysia, Myanmar, Thailand, Vietnam].

Embelia pulchella is tentatively placed in the synonymy of *E. parviflora*. It differs in being red punctate and hairy on the petals, ovary, and fruit, and in having hirsute leaf midrib. It might represent an infraspecific taxon of *E. parviflora*.

7. *Embelia sessiliflora* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 40: 66. 1871.

短梗酸藤子 duan geng suan teng zi

Embelia stricta Craib; *Ribesiodes sessiliflorum* (Kurz) Kuntze; *Samara sessiliflora* (Kurz) Kurz.

Shrubs scandent, glandular papillose-tomentose on branchlets, inflorescences, and petals. Branchlets angled, longitudinally sharply ridged, 2–3(–4) mm in diam. Petiole 5–10 mm, narrowly marginate, glabrous; leaf blade elliptic or oblong, 5–12 × 2.2–4.5 cm, papery, glabrous, inconspicuously pellucid punctate below, base rounded and decurrent on petiole, margin entire, apex subacuminate, rarely acute; midrib impressed adaxially, red punctate-lineate abaxially; lateral veins 18–27 on each side of midrib, inconspicuous. Inflorescences terminal, pinnately pyramidal paniculate, 5–15(–30) cm, branches spicate; peduncle 1.3–2.5 cm; bracts ovate to subulate, 0.8–1.2 mm, sparsely papillose-puberulent abaxially, margin entire, ciliate, apex acute or attenuate. Flowers greenish or white, (4 or)5-merous, papery, staminate 2.7–3.5 mm, pistillate 1.5–2 mm. Pedicel obsolete or conic to 0.5 mm. Sepals deltate, prominently black punctate, moderately papillose puberulent, margin long glandular papillose, apex acuminate. Petals free, elliptic or oblong, papery, pellucid punctate-lineate medially,

margin long glandular papillose, apex obtuse to rounded. Stamens subequalling petals; anthers oblong, base sagittate, apex obtuse or acute, connective red punctate or pellucid punctate. Ovary globose, glabrous. Stigma subcapitate, 2- or 3-lobed. Fruit red, globose, 3–4 mm in diam. Fl. Feb–Apr, fr. May.

Sparse mixed forests, scrub, hillsides, wasteland, roadsides; 1400–2800 m. Guizhou, Yunnan [India, Myanmar, Thailand].

8. *Embelia ribes* N. L. Burman, Fl. Indica 62. pl. 23. 1768.

白花酸藤果 bai hua suan teng guo

Shrubs scandent. Branchlets angled, longitudinally ridged, densely tawny or rusty papillose-tomentose. Petiole 5–10 mm, marginate to base; leaf blade elliptic, oblong, or narrowly obovate, (3.5–)5–8(–10) × (1.5–)3–3.5 cm, papery, leathery or rarely cartilaginous, glabrous, pellucid or black punctate, base cuneate or rounded, margin revolute, entire, apex acuminate, rarely subacute; lateral veins inconspicuous. Inflorescences terminal, pinnately pyramidal paniculate, (6–) 10–15(–30) cm; bracts subulate or lanceolate, 1–1.5 mm, sparsely puberulent abaxially, black punctate-lineate, margin entire, sparsely glandular puberulent, apex subulate. Flowers greenish or white, (4 or)5-merous, papery, staminate 2–2.5 mm, pistillate 1.5–2 mm. Pedicel (2–)3–3.5 mm in staminate, 1.5–2.5 mm in pistillate, sparsely to densely papillose puberulent. Sepals deltate, pellucid-punctate, glandular papillose adaxially and on margin, apex acuminate. Petals free, elliptic or oblong, papery, pellucid punctate, densely glandular granulate inside, margin entire, long glandular papillose, apex acute to obtuse. Stamens subequalling petals or slightly exerted to 1 mm in staminate and 2/3 petal length in pistillate; anthers ovate or oblong, base sagittate, apex rounded, connective black punctate. Ovary glabrous. Stigma capitate or 2- or 3-lobed. Fruit red or scarlet, globose or ovoid, (2–)3–4 (–5) mm in diam., smooth, wrinkled when dry, densely black punctate.

Two subspecies: Below 100–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Xizang, Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam].

- 1a. Branchlets lenticellate; leaf blade papery, dull adaxially; petals erect at anthesis; anthers longer than wide; fruit 3–4(–5) mm in diam. 8a. subsp. *ribes*
- 1b. Branchlets without lenticels; leaf blade leathery to cartilaginous, glossy adaxially; petals reflexed at anthesis; anthers wider than long; fruit 2–3 mm in diam. 8b. subsp. *pachyphylla*

8a. *Embelia ribes* subsp. *ribes*

白花酸藤果(原亚种) bai hua suan teng guo (yuan ya zhong)

Ribesiodes ribes (N. L. Burman) Kuntze; *Samara ribes* (N. L. Burman) Kurz.

Branchlets lenticellate. Leaf blade papery, dull adaxially. Bracts subulate. Petals erect at anthesis. Stamens and stami-

nodes equal in size, subequalling petals; anthers longer than wide. Fruit 3–4(–5) mm in diam. Fl. Jan–Jul, fr. May–Dec.

Mixed forests, bushes, roadsides, scrub, on well-drained soils, sand, sandy loam; below 100–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Xizang, Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, New Guinea, Sri Lanka, Thailand, Vietnam].

8b. *Embelia ribes* subsp. *pachyphylla* (Chun ex C. Y. Wu & C. Chen) Pipoly & C. Chen, Novon 5: 358. 1995.

厚叶白花酸藤果 hou ye bai hua suan teng guo

Embelia ribes var. *pachyphylla* Chun ex C. Y. Wu & C. Chen in C. Chen, Fl. Yunnan. 1: 364. 1977; *Embelia tenuis* Mez.

Branchlets without lenticels. Leaf blade leathery to cartilaginous, glossy adaxially. Bracts lanceolate. Petals reflexed at anthesis. Stamens slightly exerted ca. 1 mm, staminodes ca. 2/3 petal length; anthers wider than long. Fruit 2–3 mm in diam. Fl. Mar–Apr, fr. Oct–Dec.

Sparse or dense forests, shrubby areas, in poorly drained areas, swamps, clay soils; 700–1800 m. Guangdong, Guangxi, Hainan, Yunnan [Indonesia, Philippines, Vietnam].

9. *Embelia floribunda* Wallich in Roxburgh, Fl. Ind. 2: 291. 1824.

多花酸藤子 duo hua suan teng zi

Ribesiodes floribundum (Wallich) Kuntze; *Samara floribunda* (Wallich) Kurz.

Shrubs scandent, glabrous. Branchlets slightly flexuous, terete, 2–3 mm in diam., lenticellate. Petiole (0.3–)1–1.2 (–1.5) cm, narrowly marginate; leaf blade lanceolate or oblong, (6–)7–13(–17) × 2–3.5(–5) cm, papery to subleathery, black punctate-lineate abaxially, glossy adaxially, dull below, base rounded, margin entire, slightly revolute and black punctate, apex long acuminate; lateral veins numerous, inconspicuous. Inflorescences axillary or rarely terminal, pinnately pyramidal paniculate, (6–)7–11(–18) cm; bracts subulate, 0.8–1 mm, black punctate medially, margin erose, apex long acuminate. Flowers green or greenish yellow, 5-merous, staminate 2.7–3.2 mm, pistillate 2–2.5 mm. Pedicel ca. 1.5–3(–4) mm, black punctate-lineate, sparsely puberulent, glabrescent. Sepals deltate to subdeltate, rugose basally, black punctate medially, margin erose, glandular ciliate, apex acute. Petals free, papery, lanceolate or oblanceolate, pellucid punctate-lineate, densely glandular granulate inside and along thickened margin, apex acute. Stamens exerted ca. 0.5 mm in staminate, ca. 3/4 petal length in pistillate; anthers ovate, base deeply cordate, apex truncate to emarginate. Stigma subcapitate to capitate, sometimes 2-lobed. Fruit red, globose, 4–5 mm in diam., somewhat fleshy, reticulate-wrinkled when dry, pellucid-punctate. Fl. Feb–Mar, fr. Oct–Dec.

Broad-leaved forests, shrubby areas, hillsides, roadsides; 1500–2800 m. Xizang, Yunnan [Bhutan, India, Myanmar, Nepal].

10. *Embelia vestita* Roxburgh, Fl. Ind. 2: 288. 1824.

密齿酸藤子 mi chi suan teng zi

Calispermum oblongifolium (Hemsley) Nakai; *C. rude* (Handel-Mazzetti) Nakai; *Embelia bodinieri* H. Léveillé; *E. lenticellata* Hayata; *E. nigroviridis* C. Chen; *E. oblongifolia* Hemsley; *E. prunifolia* Mez; *E. rudis* Handel-Mazzetti; *E. vestita* var. *lenticellata* (Hayata) C. Y. Wu & C. Chen; *Ribesoides oblongifolium* (Hemsley) Kuntze; *R. vestitum* (Roxburgh) Kuntze; *Samara vestita* (Roxburgh) Kurz.

Shrubs scandent, glandular granulose on branchlets, bracts, sepals bases, and petals inside. Branchlets flexuous, terete, 1.5–2(–2.5) mm in diam., lenticellate, glabrescent. Petiole canaliculate and marginate, margin often developing cork warts, 4–8 mm; leaf blade oblong or lanceolate to ovate, (3.5–)7–11(–18) × (1.3–)2–4(–7.5) cm, papery to thin leathery, glossy, glabrous, red or black punctate, base obtuse, rounded or truncate, margin serrate or serrulate, apex acute to acuminate; lateral veins numerous. Inflorescences racemose or rarely panicle of 2 racemes, (1–)2–4 cm, densely glandular papillate; bracts subulate, 1–1.5 mm, glabrous, red punctate, margin roughly serrulate. Flowers unisexual or bisexual, white or pinkish, 5-merous, 1.8–3 mm. Pedicel cylindrical, 2–5 mm, sparsely papillate. Sepals ovate, pellucid or brown punctate, margin erose, glandular ciliate; apex obtuse to acutish. Petals narrowly oblong, elliptic, ligulate, or spatulate, glabrous outside, orange punctate, apex rounded or emarginate. Stamens ca. as long as or longer than petals in staminate flowers, ca. 2/3 as long as petals in bisexual flowers; anthers connective pellucid to red-punctate. Style usually curved; stigma subcapitate. Fruit red, globose 5–10 mm in diam., red punctate. Fl. Oct–Dec, fr. Oct–Jul.

Mixed forests, evergreen, broad-leaved forests, shrubby areas, limestone hillsides; 200–1900(–2300) m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Myanmar, Nepal, Vietnam].

11. *Embelia undulata* (Wallich) Mez in Engler, Pflanzenr. IV. 236(Heft 9): 327. 1902.

平叶酸藤子 ping ye suan teng zi

Myrsine undulata Wallich in Roxburgh, Fl. Ind. 2: 299. 1824; *Choripetalum undulatum* (Wallich) A. de Candolle; *Embelia longifolia* (Benth) Hemsley; *E. nagushia* D. Don var. *subcoriacea* C. B. Clarke; *Embelia subcoriacea* (C. B. Clarke) Mez; *Ribesiodes longifolium* (Benth) Kuntze; *Samara longifolia* Benth; *S. undulata* (Wallich) Arnott.

Shrubs scandent, glabrous. Branchlets straight, often twisted, terete, 2–4.5 cm in diam., lenticellate. Petiole (0.8–) 1–1.5(–2) cm, deeply canaliculate, black punctate; leaf blade elliptic, oblong, or rarely obovate (4–)7.5–11.5(–18) × (1.8–) 3–5(–8) cm, papery to subleathery, black punctate-lineate, base acute or cuneate, decurrent on petiole, margin entire, apex acute or acuminate, rarely rounded; midrib prominent at both surfaces, black and red punctate-lineate abaxially; lateral veins numerous, prominent. Inflorescences lateral or axillary racemes 1–2(–6) cm, black punctate-lineate,

glabrous; bracts deltate, 0.8–1.1 mm, sparsely glandular ciliate, apex acute. Flowers yellowish or greenish, 4-merous, staminate 2.5–3; pistillate 1–1.5 mm. Pedicel 1.5–3 mm, puberulent. Sepals subdeltate, glandular granulose, black punctate-lineate, margin entire, glandular ciliate, apex acute. Petals free, elliptic to ovate, red punctate outside, glandular granulose inside, margin entire, reflexed at anthesis, apex obtuse or acute. Stamens exerted up to 1 mm, staminodes ca. 2/3 petal length; anthers narrowly oblong, ca. 1 mm, base subcordate, apex truncate, connective black punctate. Ovary globose, glabrous. Style straight, epunctate; stigma capitate. Fruit globose or subglobose, (8–)1–1.5 cm in diam., longitudinally ribbed, black punctate. Fl. Apr–Aug, fr. Nov–Jan.

Dense evergreen broad-leaved forests, mixed forests, damp places, shrubby areas, valleys, hillsides; (300–)1200–2500(–2800) m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Yunnan [Cambodia, India, Laos, Nepal, Thailand, Vietnam].

12. *Embelia scandens* (Loureiro) Mez in Engler, Pflanzenr. IV. 236(Heft 9): 317. 1902.

瘤皮孔酸藤子 liu pi kong suan teng zi

Calispermum scandens Loureiro, Fl. Cochinch. 1: 156. 1790; *Embelia hainanensis* Merrill.

Shrubs scandent. Branchlets terete, 1.5–3 mm in diam., puberulent, glabrescent. Petiole deeply canaliculate, (5–)7–9 mm, glabrous; leaf blade elliptic or ovate, (4–)5–9(–12) × 2.5–4(–5) cm, papery to subleathery, pellucid punctate, base obtuse to rounded, margin entire or obscurely serrate distally, apex rounded, obtuse, or rarely acute; midrib impressed adaxially, red punctate-lineate abaxially; lateral veins 7–9 on each side of midrib, slightly raised on both surfaces. Inflorescences axillary, racemose, 1–3(–5) cm, reddish glandular puberulent; bracts subulate, staminate 1.5–2 mm, pistillate 0.8–1.2 mm, puberulent abaxially, margin entire, densely glandular ciliate, apex subulate. Flowers white or greenish, (4 or)5-merous, staminate 1.5–2 mm, pistillate ca. 1 mm. Pedicel 1.5–2.5 mm in staminate flowers, 0.8–1.2 mm in pistillate, puberulent. Sepals ovate, puberulent basally outside, red punctate medially, margin erose apically. Petals elliptic or oblong to obovate, free, erect, red and black punctate, glabrous outside, glandular granulose inside, margin entire, glabrous, apex obtuse to rounded. Stamens exerted to 0.7 mm, staminodes ca. 3/4 petal length; filaments puberulent at base; anthers ± square, base subcordate, apex truncate, red punctate dorsally. Style persistent; stigma capitate or 2-lobed. Fruit red, globose, ca. 5 mm in diam., black punctate. Fl. Nov–Jan, fr. Mar–May.

Mixed forests, shrubby areas, hillsides, valleys; 200–900 m. Guangdong, Guangxi, Hainan, Yunnan [Cambodia, Laos, Thailand, Vietnam].

13. *Embelia gamblei* Kurz ex C. B. Clarke in J. D. Hooker, Fl. Brit. India 3: 516. 1882.

皱叶酸藤子 zhou ye suan teng zi

Ribesiodes gamblei (Kurz ex C. B. Clarke) Kuntze.

Shrubs scandent, rusty stellate tomentose on branchlets and leaves abaxially. Branchlets angled, 5–7 mm in diam., glabrescent. Petiole deeply canaliculate, (1.5–)2–3 cm, glabrescent; leaf blade elliptic, lanceolate, or obovate, (7–) 15–30 × (3–)5.5–9 cm, leathery, black punctate abaxially, glabrescent, base subrounded or obtuse, margin entire, apex acute, rarely acuminate or rounded; lateral veins 15–25 on each side of midrib, impressed adaxially. Inflorescences racemose, (2–) 2.5–4(–5) cm, puberulent, glabrescent; bracts narrowly lanceolate, 2–3.5 mm. Flowers dull yellowish green, (4 or)5-merous, staminate 3.5–4 mm, pistillate 2–3 mm. Pedicel (1.8–) 2–4(–6) mm, puberulent. Sepals ovate to oblong, glandular, black punctate, margin subentire, minutely ciliate apically. Petals free, elliptic or obovate, papery, glabrous outside, glandular granulate inside, margin entire, glandular ciliate, apex obtuse to rounded. Stamens exerted to 0.5 mm, staminodes equaling petal length; anthers lanceolate, base sagittate, apex apiculate. Ovary glabrous. Style curved, pellucid punctate-lineate, persistent; stigma 2- or 3-lobed. Fruit red, globose, 3–4 mm in diam., black punctate and punctate-lineate. Fl. May–Jun, fr. Oct–Dec.

Evergreen broad-leaved forests, shrubby areas, valleys, hillsides; 2000–2700 m. Xizang, Yunnan [Myanmar, Sikkim].

14. *Embelia carnosisperma* C. Y. Wu & C. Chen in C. Chen, Fl. Yunnan. 1: 374. 1977.

肉果酸藤子 rou guo suan teng zi

Shrubs, lianous at maturity. Branchlets terete, straight, 5–6 mm in diam., glabrous. Petiole canaliculate, 1.7–2.8 cm, red punctate, glabrous; leaf blade elliptic to oblanceolate, rarely obovate, 8–10.5(–14) × 3.5–6.3 cm, leathery, glabrous, black punctate-lineate especially toward apex, base cuneate, margin entire, apex short acute; midrib somewhat impressed above; lateral veins 18–28 on each side of midrib, raised at both surfaces. Inflorescences racemose, 2–3 mm, glandular granulate. Flowers 4-merous, staminate ca. 3 mm, pistillate unknown. Pedicel 2–2.5 mm in staminate flowers, to 1 cm and ca. 3 mm thick in fruit. Sepals subdeltate, glabrous, rugose basally, prominently but sparsely black punctate, margin entire, glabrous, apex acute. Fruit subglobose, ca. 2.7 cm in diam. (immature), fleshy, densely black punctate-lineate, glabrous. Fl. May, fr. Jul–Aug.

* Evergreen broad-leaved forests, valleys, shady damp places; 1200–1400 m. SE Yunnan.

5. MYRSINE Linnaeus, Sp. Pl. 1: 196. 1753.

铁仔属 tie zai shu

Rapanea Aublet.

Shrubs or small trees. Inflorescences axillary, umbellate or fascicled, on short scaly branchlets or spurs, bracteate. Flowers bisexual or unisexual and plants monoecious, dioecious, or polygamous, 4- or 5(or 6)-merous. Sepals nearly free or united to 1/2 length, imbricate, usually ciliate, punctate, persistent. Petals nearly free or rarely united to 1/2 their length, usually ciliate, glandular granulate, punctate. Filaments free or united at base, adnate to corolla, with apical free portions minute or absent; anthers ovate or reniform, rarely sagittate, 2-celled, dehiscing by longitudinal slits. Ovary glabrous or glabrescent; ovules few, in 1 series. Fruit a globose or subovoid drupe, with somewhat fleshy exocarp and crusty or leathery endocarp, 1-seeded. Seeds occupying cavity; endosperm horny, ruminate; embryo cylindrical, transverse.

About 300 species: pantropical; 11 species in China.

Myrsine and *Rapanea* have traditionally been regarded as separate genera, especially in regional and local floras. However, when the two genera are examined on worldwide basis, the alleged differences between them do not hold. *Myrsine* and *Rapanea* are poorly represented in China, as evidenced by the presence of only 11 out of the approximately 300 species in the entire world. The Chinese species are easily assigned to *Myrsine* and *Rapanea* as traditionally circumscribed. For that reason, most Chinese authors prefer to maintain both genera.

1a. Leaf blade up to 3.3 × 1.2 cm; petiole less than 5 mm.

2a. Branchlets angular or verruculose, reddish glandular granulate apically, without lenticels.

3a. Branchlets angular, smooth; leaf blade apex emarginate; calyx epunctate 1. *M. cicatricosa*

3b. Branchlets terete, densely verruculose; leaf blade apex obtuse to rounded; calyx red punctate-lineate 2. *M. verruculosa*

2a. Branchlets subterete, smooth, glandular puberulent, with branched or capitate trichomes, lenticellate.

4a. Branchlet trichomes 2- or 3-branched; leaf blade linear or elliptic, margin entire 3. *M. affinis*

4b. Branchlet trichomes capitate; leaf blade obovate to orbicular, rarely oblanceolate, margin serrate-dentate 4. *M. africana*

1b. Leaf blade 3.4–18 × 1.4–8 cm; petiole 6–25 mm.

5a. Branchlets (2.6–)3–7 mm in diam.

6a. Branchlets smooth, glandular granulate; leaf blade apex broadly rounded to truncate; petiole 6–8 mm 11. *M. linearis*

6b. Branchlets rugose, glabrous or reddish puberulent; leaf blade apex acute; petiole 9–25 mm.

7a. Terminal bud glabrous; petiole 2–2.5 cm; leaf blade broadly oblanceolate or obovate, secondary

- veins conspicuous abaxially; calyx lobes not ciliate 9. *M. kwangsiensis*
- 7b. Terminal bud reddish puberulent, early glabrescent; petiole 0.9–1.5 cm; leaf blade narrowly linear-lanceolate or elliptic, secondary veins inconspicuous abaxially; calyx lobes ciliate 10. *M. sequinii*
- 5b. Branchlets 1.5–2.5 mm in diam.
- 8a. Leaf blade margin subentire to sharply toothed.
- 9a. Calyx cupular, lobes ovate, keeled, apex acuminate; leaf blade slightly asymmetric, glossy on both sides 5. *M. semiserrata*
- 9b. Calyx disc-shaped, lobes oblong, flat, apex obtuse; leaf blade symmetric, glossy adaxially 6. *M. stolonifera*
- 8b. Leaf blade margin entire.
- 10a. Leaf blade very narrowly lanceolate or oblanceolate, apex caudate or long acuminate, base cuneate, margin flat; calyx papery, lobes ovate 7. *M. faberi*
- 10b. Leaf blade oblong or elliptic, apex abruptly short acuminate, base obtuse, margin revolute; calyx leathery, lobes linear-oblong 8. *M. elliptica*

1. *Myrsine cicatricosa* (C. Y. Wu & C. Chen) Pipoly & C. Chen, *Novon* 5: 360. 1995.

多痕密花树 duo hen mi hua shu

Rapanea cicatricosa C. Y. Wu & C. Chen in C. Chen, *Fl. Yunnan*. 1: 381. 1977.

Shrubs ca. 2 m tall. Branchlets angular, 2–3 mm in diam., smooth, reddish glandular granulose apically, without lenticels. Petiole marginate, 3–5 mm; leaf blade obovate, 1–2.5 cm × 7–9 mm, leathery, glabrous, punctate in areoles, base cuneate, decurrent, margin scarios, entire, apex obtuse and emarginate; midrib impressed; lateral veins and veinlets inconspicuous adaxially, raised abaxially, marginal vein evident. Bracts ovate or broadly so, ciliate. Flowers (3–)5-merous, ca. 2 mm. Pedicel 1–1.5(–2) mm, glabrous. Calyx lobes spreading, nearly free, ovate, 0.8–1 mm, glabrous, flat, margin entire, ciliate, sparsely punctate, apex acute. Corolla lobes oblong to ovate, ca. 2 mm, reflexed, glabrous except for densely glandular granulose margin, apex obtuse. Anthers puberulent at apex, inconspicuously punctate dorsally. Style short conical, obtusely angular; stigma ligulate, apiculate. Fruit globose (immature); persistent sepals united at base. Fl. Dec, fr. Aug–Sep.

Shrubby areas, limestone hillsides; ca. 2000 m. Yunnan [Vietnam].

2. *Myrsine verruculosa* (C. Y. Wu & C. Chen) Pipoly & C. Chen, *Novon* 5: 360. 1995.

瘤枝密花树 liu zhi mi hua shu

Rapanea verruculosa C. Y. Wu & C. Chen in C. Chen, *Fl. Yunnan*. 1: 381. 1977.

Shrubs 1–2.5 m tall. Branchlets terete, 3–4 mm in diam., minutely glandular granulose, densely verrucose. Petiole marginate, 2–3 mm; leaf blade obovate, 1–1.5 cm × 5–7 mm, leathery to subleathery, glabrous, sparsely punctate abaxially, base cuneate, margin opaque, entire, apex obtuse to rounded; midrib impressed; lateral veins raised adaxially, inconspicuous abaxially, marginal vein absent. Bracts broadly ovate, ciliate. Flowers unknown. Fruiting pedicel ca. 2 mm, glandular granulose. Persistent calyx 4-merous; lobes spreading, nearly free, ovate, 0.8–1 mm, flat, minutely puberulent, densely red punctate-lineate, margin entire, ciliate,

apex acute. Fruit ovate-globose, 3–4 mm in diam. (immature), glabrous, densely punctate. Fr. Oct–Nov.

* Sparse evergreen broad-leaved forests, limestone hillsides; 900–1500 m. Guizhou, Yunnan.

3. *Myrsine affinis* A. de Candolle, *Prodr.* 8: 96. 1844.

拟密花树 ni mi hua shu

Rapanea affinis (A. de Candolle) Mez.

Shrubs or trees 0.8–6 m tall. Branchlets subterete, 4–5 mm in diam., smooth, reddish glandular puberulent, trichomes 2- or 3-fid, glabrescent, lenticellate. Leaves subsessile; petiole marginate, 2–3 mm; leaf blade linear or narrowly elliptic, 2–4(–5.8) cm × 7–11 mm, leathery, densely areolate and punctate abaxially, base acute and decurrent, margin entire, apex acute to a blunt tip; lateral veins numerous, raised on both surfaces, marginal vein evident. Inflorescences 1–3-flowered; bracts ovate, ciliate. Flowers yellow, 4-merous, ca. 1 mm. Calyx lobes spreading, nearly free, ovate, ca. 0.5 mm, flat, glabrous, sparsely punctate, margin entire, ciliate, apex acute. Petals united at base, elliptic, 0.8–1 mm, glabrous, sparsely punctate, margin densely glandular granulose, apex rounded. Anthers ovate, puberulent. Ovary glabrous. Stigma terete or sausage-shaped. Fruit dull purplish red to black, globose, ca. 5 mm in diam., densely punctate, glabrous. Fl. Feb–Jun, fr. Jan–Feb.

Dense evergreen broad-leaved forests, shrubby areas, limestone hillside; 1000–1300 m. Hainan, Yunnan [Indonesia].

4. *Myrsine africana* Linnaeus, *Sp. Pl.* 1: 196. 1753.

铁仔 tie zai

Myrsine africana var. *acuminata* C. Y. Wu & C. Chen; *M. africana* var. *bifaria* (Wallich) Franchet; *M. africana* var. *glandulosa* J. M. Zhang; *M. africana* var. *retusa* A. de Candolle; *M. bifaria* Wallich; *M. microphylla* Hayata; *M. potama* D. Don; *M. vacciniifolia* Hayata; *Rhamnus myrtilus* H. Léveillé.

Shrubs 50–100 cm tall. Branchlets terete, 0.5–2 mm in diam., reddish glandular granulose and puberulent, with capitate trichomes, often glabrescent. Petiole marginate, 1–2.5 mm, strongly decurrent; leaf blade obovate, to orbicular,

1–5 × 0.7–1.6 cm, papery or leathery, glabrous, minutely punctate abaxially, base cuneate, margin serrate, apex obtuse, to rounded; lateral veins inconspicuous, marginal vein absent. Inflorescences axillary, subumbellate or fascicled; basal scales in 1 series. Flowers yellowish white, 2–2.5 mm, 4-merous. Pedicel 0.5–1.5 mm, glabrous or glandular puberulent. Calyx lobes spreading, nearly free, broadly ovate to elliptic, 0.3–0.5 mm, flat, glabrous, margin entire, ciliate, apex acute to obtuse. Corolla 0.8–1 mm, united to at least 1/2 length, glabrous outside, puberulent inside; lobes lanceolate, 0.8–1 mm, densely punctate, margin entire, glandular granuose, apex obtuse to acute. Stamens longer than petals; filaments united basally into a tube adnate to corolla tube, puberulent in staminate flowers. Pistil globose. Style short; stigma discoid, margin lobed. Fruit red or purple-black, globose, ca. 5 mm in diam., smooth. Fl. Feb–Jun, fr. Nov–Jan.

Sparse mixed forests, open mountain slopes, sunny dry places, scrub, fields, roadsides; 1000–3600 m. Gansu, Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan [India; Azores, Africa, SW Asia].

5. *Myrsine semiserrata* Wallich in Roxburgh, Fl. Ind. 2: 293. 1824.

针齿铁仔 zhen chi tie zai

Celastrus cavaleriei H. Léveillé; *C. seguinii* H. Léveillé; *Myrsine semiserrata* var. *brachypoda* Z. Y. Zhu.

Shrubs or trees 3–7 m tall. Branchlets slightly angular, 1.5–2 mm in diam., glabrous. Petiole marginate, 6–8 mm, decurrent at base; leaf blade elliptic to lanceolate, sometimes rhomboid, 5–9(–14) × 2–2.5(–4) cm, papery to subleathery, slightly asymmetric, glossy, glabrous, base cuneate, margin remotely serrulate to middle, teeth callose, apex acute to acuminate; lateral veins slightly raised, sparsely punctate, marginal vein evident. Inflorescences axillary, umbellate or fascicled, sessile; bracts ovate, ciliate, punctate. Flowers white to yellowish, ca. 2 mm, 4-merous. Pedicel ca. 2 mm, glabrous or puberulent, subtended by 1 bract. Calyx cupular; lobes ovate, keeled, sparsely puberulent outside, margin entire, ciliate, punctate, apex acuminate. Petals free or united to 1/3 length, long elliptic, oblong, or ligulate, glabrous, prominently punctate to middle, margin entire, ciliate, apex obtuse. Pistil puberulent. Stigma 2-cleft, fimbriate. Fruit red becoming purple-black, globose, 5–7 mm in diam., densely punctate. Fl. Feb–Apr, fr. Oct–Dec.

Broad-leaved forests, limestone hillsides, mountain slopes, roadsides, stream banks, sunny places; 500–2700 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Xizang, Yunnan [India, Myanmar, Nepal].

6. *Myrsine stolonifera* (Koidzumi) E. Walker, Philipp. J. Sci. 73: 247. 1940.

光叶铁仔 guang ye tie zai

Anamtia stolonifera Koidzumi, Bot. Mag. (Tokyo) 37: 40. 1923; *A. marginata* Masamune; *A. mezii* Masamune; *Myrsine marginata* Mez (1902), not Hooker & Arnott (1834); *Rapanea stolonifera* (Koidzumi) Nakai.

Shrubs ca. 2 m tall. Branchlets terete, 1–1.5(–2) mm in diam., glabrous. Petiole canaliculate, 5–8 mm; leaf blade elliptic or lanceolate, 6–8(–10) × 1.5–2.5(–3) cm, papery or subleathery, glabrous, base cuneate, margin entire or sometimes with 1 or 2 pairs of teeth beyond middle, punctate, apex acuminate; lateral veins inconspicuous, densely and minutely areolate, marginal vein absent. Inflorescences axillary or on leafless branchlets, umbellate or fascicled, sessile, 3- or 4-flowered; bracts hastate or lanceolate, glabrous. Flowers 5-merous, 1.8–2 mm. Pedicel 2–3 mm, glabrous, subtended by 1 bract. Calyx lobes spreading, nearly free, narrowly elliptic or oblong, 0.8–1 mm, flat, glabrous, prominently punctate, apex acute or obtuse. Petals united into a very short tube, glabrous outside, densely glandular granuose inside except for tube; lobes oblong, punctate, apex obtuse. Stamens ca. 1/2 as long as petals; filaments free, adnate to base of petals; anthers broadly ovate or reniform, apex apiculate. Ovary glabrous, punctate. Stigma apiculate or lobed. Fruit red becoming bluish black, globose, ca. 5 mm in diam., glabrous. Fl. Apr–Jun, fr. Dec–Jan.

Mixed forests, damp places; 300–2100 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan].

7. *Myrsine faberi* (Mez) Pipoly & C. Chen, Novon 5: 360. 1995.

平叶密花树 ping ye mi hua shu

Rapanea faberi Mez in Engler, Pflanzenr. IV. 236(Heft 9): 358. 1902.

Trees 6 m or more. Branchlets terete, 1.5–2 mm in diam., glabrous. Petiole subterete, 7–10 mm; leaf blade elliptic to lanceolate, 7–11 × 1.5–3 cm, papery or subleathery, glabrous, base cuneate, glossy above, pale below, margin entire, apex caudate or long acuminate, acumen 1–2 cm; midrib impressed adaxially; lateral veins inconspicuous, marginal vein obscure. Bracts ovate, glabrous, margin sparsely glandular granuose, apex obtuse. Flowers papery, greenish, 5-merous, ca. 5 mm. Pedicel 1–2 mm, glabrous. Calyx lobes spreading, nearly free, ovate, 0.8–1 mm, flat, punctate, margin entire, glandular ciliate, apex obtuse. Petals oblong or ovate, ca. 3 mm, united to 1/3 their length, punctate, glandular granuose inside and along margin. Anthers sometimes puberulent at apex. Ovary glabrous. Stigma elongated, ligulate, apiculate at apex, as long as ovary. Fruit black, globose or ovoid, 5–6 mm in diam., glabrous, somewhat wrinkled when dry, not punctate. Fl. Apr–May, fr. Oct–Dec.

* Evergreen broad-leaved forests, stream banks, moist places; 500–1200 m. Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Yunnan.

8. *Myrsine elliptica* E. Walker, Philipp. J. Sci. 73: 189. 1940.

广西铁仔 guang xi tie zai

Shrubs 1 m or more. Branchlets terete, 1.5–2.5 mm in diam., minutely puberulent when young, glabrescent. Petiole canaliculate, 6–8 mm, not decurrent at base; leaf blade broadly elliptic to oblong, 3–5 × 1.5–3 cm, papery or leathery, not punctate, glabrous, base obtuse, margin entire, revolute, apex abruptly short acuminate, apiculate; lateral veins inconspicuous. Inflorescences axillary, umbellate or fascicled, sessile; bracts broadly ovate. Flowers leathery, white, 2.7–3 mm, 5-merous. Pedicel 4–5 mm, glabrous, subtended by a scaly bract. Calyx lobes spreading, nearly free, linear-oblong, 1.5–2 mm, glabrous outside, sparsely puberulent inside, punctate, margin entire, glabrous, apex obtuse or rounded. Petals free or somewhat united, narrowly lanceolate or oblong, 2.8–3 mm, glabrous outside, sparsely and minutely glandular granulose inside, punctate, apex obtuse. Stamens shorter than petals; filaments basal 1/3 adnate to petals; anthers small, reniform, not punctate on back. Stigma apiculate. Fruit red, 3–5 mm in diam., usually longitudinally wrinkled, pellucid punctate. Fl. Jun, fr. Nov.

* Dense mixed forests, shrubby areas, limestone hillsides. Guangxi.

9. *Myrsine kwangsiensis* (E. Walker) Pipoly & C. Chen, *Novon* 5: 361. 1995.

广西密花树 *guang xi mi hua shu*

Rapanea kwangsiensis E. Walker, *J. Wash. Acad. Sci.* 21: 479. 1931; *R. kwangsiensis* var. *lanceolata* C. Y. Wu & C. Chen.

Trees 5–6 m tall. Branchlets terete, 5–7 mm in diam., rugose, glabrous. Petiole marginate, 1–2.5 cm; leaf blade obovate or broadly oblanceolate, 14–24 × 3.5–8 cm, leathery, glabrous, base cuneate, margin entire, slightly revolute, apex broadly acute; midrib and lateral veins flattened adaxially, lateral veins raised abaxially, marginal vein obscure. Bracts broadly ovate, glabrous, sparsely ciliate. Flowers 5(or 6)-merous, 3.5–4 mm. Pedicel 4–6(–8) mm, glabrous. Calyx lobes spreading, nearly free, ovate 1–2 mm, glabrous, obscurely punctate, margin entire, without cilia, apex acute. Petals oblong or lanceolate, 3.5–4 mm, punctate, glabrous or glandular granulose inside and on margin entire. Staminate flowers unknown. Ovary glabrous. Stigma lobed or subligulate, usually punctate near apex. Fruit purple or purplish red, globose or ovoid, 4–5 mm in diam., longitudinally ribbed, punctate. Fl. and fr. May.

* Evergreen broad-leaved forests, mixed forests, valleys, limestone hillsides; 700–1500 m. Guangxi, Guizhou, Xizang (Linzhi), Yunnan.

10. *Myrsine seguinii* H. Léveillé, *Fl. Kouy-Tcheou* 288. 1915.

密花树 *mi hua shu*

Athruphyllum neriifolium H. Hara; *A. seguinii* (H. Léveillé) Nakai; *A. taiwanianum* Nakai; *A. yunnanensis* (Mez) Nakai; *Myrsine neriifolia* Siebold & Zuccarini (1846), not

Casaratto (1843); *Rapanea neriifolia* Mez; *R. neriifolia* var. *yunnanensis* (Mez) E. Walker; *R. walkeriana* Handel-Mazzetti; *R. yunnanensis* Mez.

Shrubs or trees 2–7(–12) m tall. Branchlets terete, 3–5 mm in diam., white lenticellate, rugose, reddish puberulent, early glabrescent. Petiole subterete, 0.9–1.5 cm; leaf blade elliptic to narrowly linear-oblanceolate 7–17 × 1.3–6 cm, leathery, glabrous, base cuneate, decurrent, margin entire, apex acute; lateral veins numerous, obscure, marginal vein absent. Inflorescences 3–10-flowered; bracts broadly ovate, sparsely ciliate. Flowers white, greenish, or sometimes purplish red, (2–)3–4 mm. Pedicel 2–4 mm, to 7 mm in fruit, glabrous, thick. Calyx disc-shaped, lobes nearly free, ovate, 0.8–1 mm, sometimes punctate, ciliate, apex broadly acute or rarely rounded. Petals united to 1/4 length, ovate or elliptic, (2–)3–4 mm, reflexed, punctate, glabrous outside, densely glandular granulose inside and along margin, apex acute or obtuse. Anthers ovate, not punctate on back, usually glandular granulose at apex. Ovary glabrous. Stigma elongated, flattened at base, ca. 2 × as long as ovary. Fruit grayish green or purplish black, globose or subovate, 4–5 mm in diam., sometimes longitudinally punctate, striate or ribbed. Fl. Apr–May, fr. Oct–Dec. $2n = 46^*$.

Mixed forests, shrubby areas, roadsides; 700–2400 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [Japan, Myanmar, Vietnam].

11. *Myrsine linearis* (Loureiro) Poir. *Encycl. Suppl.* 3: 709. 1813.

打铁树 *da tie shu*

Athruphyllum lineare Loureiro, *Fl. Cochinch.* 1: 120. 1790; *M. playfairii* Hemsley; *Rapanea linearis* (Loureiro) S. Moore; *R. playfairii* (Hemsley) Mez.

Shrubs or trees 1–8(–30?) m tall. Branchlets essentially terete, with longitudinal ridges, (2.6–)3–4 mm in diam., glandular granulose, glabrescent. Petiole marginate, 6–8 mm; leaf blade obovate spatulate, 3–7 × 1.2–2.5 cm, leathery to subleathery, glabrous, densely punctate on veins, base cuneate, margin entire, apex rounded or truncate, sometimes retuse; midrib flattened adaxially, lateral veins 8–10 on each side of midrib, marginal vein absent. Bracts broadly ovate, margin sparsely glandular granulose, apex obtuse. Flowers white or greenish, 4(–6)-merous, 2–2.5 mm. Pedicel (2–)4 mm, glabrous. Calyx disc-shaped; lobes nearly free, ovate, 0.8–1 mm, pellucid punctate, margin glandular granulose, apex obtuse. Petals united ca. 1/3 their length, elliptic or ovate, 2–2.2 mm, glandular granulose inside and along margin, sparsely punctate, tube glabrous. Stamens inserted at corolla throat; anthers puberulent at apex. Ovary glabrous. Stigma ligulate or lobed. Fruit purplish black, globose, 3–4 mm in diam., wrinkled, pellucid punctate. Fl. Dec–Jan, fr. Jul–Nov.

Mixed forests, scrub, hillsides, fields, limestone hillsides. Guangdong, Guangxi, Guizhou, Hainan [Vietnam].