

10. GLOCHIDION J. R. Forster & G. Forster, Char. Gen. Pl. 57. 1775, nom. cons.

算盘子属 suan pan zi shu

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*Agyneia* Linnaeus; *Bradleia* Banks ex Gaertner [“*Bradleja*”].

Trees or shrubs, monoecious, rarely dioecious; indumentum of simple hairs, often absent. Leaves alternate, distichous, or spiral; stipules thick, mostly persistent; petiole short; leaf blade simple, margin entire, venation pinnate. Flowers axillary or supra-axillary, fascicled or in short cymes or umbels, proximal axils with male flowers, distal axils usually with female flowers, usually distinctly pedicellate. Male flowers: pedicels slender or almost absent; sepals 5 or 6, imbricate; petals absent; disk absent; stamens 3–8, connate into an oblong or ellipsoid column, shorter than sepals; anthers 2-locular, extrorse, linear, longitudinally dehiscent, connectives prolonged into an erect acumen; pistillode absent. Female flowers: pedicels stout and short or subsessile; sepals as in male, but slightly thicker; ovary globose, 3–15-locular; ovules 2 per locule; styles connate into a short, thick, cylindric column, apex lobed or toothed, rarely free. Fruit a capsule, globose or depressed globose, ± prominently longitudinally grooved, sunken at apex, dehiscent into 3–15 2-valved cocci when mature, rarely unlobed; exocarp leathery or papery; endocarp crustaceous; styles usually persistent. Seeds not strophiolate, hemispheric or laterally compressed; endosperm fleshy; cotyledon flattened.

About 200 species: chiefly in tropical Asia, the Pacific islands, and Malaysia, a few in tropical America and Africa; 28 species (seven endemic, one introduced) in China.

*Glochidion* is noteworthy for its pollination mechanism, which involves a symbiotic relationship with moths of the genus *Epicephala* closely paralleling that found in *Yucca* (Kato et al., Proc. Natl. Acad. Sci. U.S.A. 100: 5264–5267. 2003).

*Glochidion cavaleriei* H. Léveillé (Repert. Spec. Nov. Regni Veg. 12: 183. 1913) is a synonym for *Illicium majus* J. D. Hooker & Thomson in the Illiciaceae (see Fl. China 7).

1a. Stamens 4–6.

2a. Branchlets and leaf blade glabrous.

3a. Leaf blade apex acuminate to caudate-acuminate, adaxially glaucous; stamens 4; sepals sparsely pubescent; style column long cylindric ..... 1. *G. lanceolatum*

3b. Leaf blade apex acute, obtuse, or rounded, adaxially green to dark green; stamens 5 or 6; sepals glabrous; style column ovoid or conical.

4a. Leaf blade base acute or broadly cuneate; flowers in axillary clusters; male sepals obovate or oblong-obovate; ovary densely pubescent ..... 2. *G. lanceolarium*

4b. Leaf blade base shallowly cordate, truncate, or rounded; flowers in supra-axillary cymes or umbels; male sepals ovate or broadly ovate; ovary glabrous ..... 3. *G. zeylanicum*

2b. Branchlets and leaf blade densely pubescent or tomentose.

5a. Flowers in axillary clusters.

6a. Leaf blade base symmetrical, both surfaces glabrous to sparsely pubescent only on veins, lateral veins prominent; ovary 10-locular ..... 4. *G. coccineum*

6b. Leaf blade base asymmetrical, adaxially glabrous, abaxially pubescent, lateral veins obscure; ovary 4- or 5-locular ..... 5. *G. oblatum*

5b. Flowers usually in supra-axillary cymes.

7a. Male sepals ca. 1 mm; female pedicels to 7 mm; capsules to 8.5 mm in diam., puberulent ..... 6. *G. arborescens*

7b. Male sepals 3–4 mm; female pedicels to 3 mm; capsules to 12 mm in diam., strongly pubescent ..... 7. *G. hirsutum*

1b. Stamens 3.

8a. Leaf blade hairy at least on veins.

9a. Leaf blade base asymmetrical.

10a. Sepals 6, ovary pubescent.

11a. Leaf blade abaxially puberulent only on veins; sepals abaxially glabrous ..... 8. *G. rubrum*

11b. Leaf blade abaxially white pubescent; sepals abaxially pubescent ..... 9. *G. triandrum*

10b. Sepals 5, ovary glabrous.

12a. Leaf blade with only midvein and lateral veins pubescent abaxially; male pedicels, sepals outside, and capsules glabrous ..... 10. *G. medogensense*

12b. Leaf blade sparsely pubescent on both surfaces; male pedicels, sepals outside, and capsules pubescent ..... 11. *G. nubigenum*

9b. Leaf blade base symmetrical.

13a. Leaves and capsules spreading villous, leaf blade base obtuse, truncate to rounded; style column ca.

3 × as long as ovary ..... 12. *G. eriocarpum*

- 13b. Leaves and capsules pubescent or tomentose; leaf blade base cuneate, acute, or obtuse; style column not longer than ovary.
- 14a. Sepals adaxially pubescent; style column shorter than ovary ..... 13. *G. heyneanum*
- 14b. Sepals adaxially glabrous; style column as long as ovary.
- 15a. Trees; leaf blade 3–7 cm wide; male sepals elliptic, female sepals ovate; style column cylindrical or subconical ..... 14. *G. lutescens*
- 15b. Shrubs; leaf blade 1–2.5 cm wide; male and female sepals narrowly oblong or oblong-obovate; styles connate into an annulus ..... 15. *G. puberum*
- 8b. Leaf blade glabrous.
- 16a. Leaf blade base asymmetrical.
- 17a. Outer male sepals larger than inner.
- 18a. Leaf blade oblong or obovate; male pedicels sparsely strongly hispid; anthers linear ..... 16. *G. chademenosocarpum*
- 18b. Leaf blade lanceolate; male pedicels glabrous; anthers not linear ..... 17. *G. kusukusense*
- 17b. Outer male sepals as large as inner.
- 19a. Young branches, ovary, and capsules pubescent ..... 18. *G. philippicum*
- 19b. Young branches, ovary, and capsules glabrous.
- 20a. Leaf blade abaxially greenish, gray-brown when dry; style column depressed globose, ca. 2 mm wide, ca. 2 × wider than ovary ..... 19. *G. sphaerogynum*
- 20b. Leaf blade abaxially white powdery to green, not gray-brown when dry; style column obovoid or cylindrical, less than ca. 1 mm wide, not wider than ovary.
- 21a. Leaf blade abaxially green-gray when dry; lateral veins reddish; male sepals elliptic; style column obovate; capsule 10–15 mm in diam. .... 20. *G. thomsonii*
- 21b. Leaf blade abaxially glaucous when dry; lateral veins not reddish; male sepals oblong; style column cylindrical; capsule 6–8 mm in diam. .... 21. *G. wrightii*
- 16b. Leaf blade base symmetrical.
- 22a. Male pedicels 13–20 mm, pubescent ..... 22. *G. ellipticum*
- 22b. Male pedicels less than 9 mm, glabrous.
- 23a. Branchlets angular; petiole pubescent; leaf blade abaxially gray-glaucous.
- 24a. Midrib of leaf not raised adaxially; ovary puberulent when young; style column clavate ..... 23. *G. daltonii*
- 24b. Midrib of leaf raised adaxially; ovary glabrous; style column cylindrical ..... 24. *G. wilsonii*
- 23b. Branchlets terete; petiole glabrous; leaf blade abaxially not gray-glaucous.
- 25a. Branches pubescent; leaf blade obovate or oblong-obovate; outer sepals equaling inner ones ..... 25. *G. obovatum*
- 25b. Branches glabrous; leaf blade usually ovate, elliptic, or oblong; outer sepals larger than inner ones.
- 26a. Leaf apex caudate-acuminate; male sepals broadly ovate; ovary 5- or 6-locular; style column cylindrical ..... 26. *G. ramiflorum*
- 26b. Leaf apex acuminate to acute; male sepals obovate or oblong-obovate; ovary 3- or 4-locular; style column obconical or subclavate.
- 27a. Leaf blade ovate, obovate, or oblong, apex acute; sepal margins minutely serrate or entire; style column obconical ..... 27. *G. suishaense*
- 27b. Leaf blade oblong or ovate-lanceolate, apex acuminate; sepal margins entire; style column subclavate, apex unequally 3-toothed ..... 28. *G. khasicum*

**1. *Glochidion lanceolatum*** Hayata, J. Coll. Sci. Imp. Univ. Tokyo 20(3): 16. 1904.

披针叶算盘子 pi zhen ye suan pan zi

*Glochidion kotoense* Hayata; *G. zeylanicum* (Gaertner) A. Jussieu var. *lanceolatum* (Hayata) M. J. Deng & J. C. Wang.

Treelets ca. 6 m tall, monoecious; branchlets glabrous. Petiole ca. 4 mm; leaf blade lanceolate or oblong-ovate, 5–7 × 2–3 cm, papery or subleathery, glaucous adaxially, brownish green abaxially, glabrous on both surfaces, base acute or rounded, inequilateral, apex acuminate to caudate-acuminate; lateral veins 6 or 7 pairs. Flowers in axillary or supra-axillary cymes. Male flowers: sepals 6, oblong, imbricate; stamens 4(–6), connate; anthers oblong, connectives lanceolate. Female flowers: sepals 6, oblong, sparsely pubescent on both surfaces; ovary subglobose, pubescent, 5-locular; ovules 2 per locule;

styles connate into a long cylindrical column, exerted past sepals, 6-lobed at apex. Capsules depressed globose, 8–10 mm in diam., glabrous, 8–10-grooved. Fl. Apr–Jun, fr. Jun–Oct.

- Open forests at low altitudes. Taiwan.

**2. *Glochidion lanceolarium*** (Roxburgh) Voigt, Hort. Suburb. Calcutt. 153. 1845.

艾胶算盘子 ai jiao suan pan zi

*Bradleia lanceolaria* Roxburgh, Fl. Ind., ed. 1832, 3: 697. 1832; *Diasperus benthamianus* Kuntze; *D. lanceolaris* (Roxburgh) Kuntze; *Glochidion cantoniense* Hance; *G. macrophyllum* Benth; *G. subsessile* N. P. Balakrishnan & Chakrabarty var. *birmanicum* Chakrabarty & M. Gangopadhyay; *Glochisandra acuminata* Wight; *Phyllanthus lanceolaris* (Roxburgh) Müller Argoviensis.

Evergreen shrubs or trees, usually 1–3 m tall, rarely 7–12

m tall, monoecious, glabrous throughout except for hairy ovary and capsule. Stipules triangular-lanceolate, 2.5–3 mm; petiole 3–5 mm; leaf blade elliptic, oblong, or oblong-lanceolate, 6–16 × 2.5–6 cm, leathery, dark green adaxially, yellowish green when dry, base acute or broadly cuneate, slightly decurved, subequilateral; lateral veins 5–7 pairs. Flowers in axillary clusters. Male flowers: pedicels 8–10 mm; sepals 6, obovate or obovate-oblong, ca. 3 mm, yellow; stamens 5 or 6. Female flowers: pedicels 2–4 mm; sepals 6, biseriolate, outer larger than inner, outer ones ovate, inner narrowly ovate, 2.5–3 mm; ovary globose, 6–8-locular, densely pubescent; styles connate into an ovoid column, less than 1 mm, subtruncate at apex. Capsules subglobose, 12–18 × 7–10 mm, apex usually concave and puberulent to glabrous, 6–8-grooved. Fl. Apr–Sep, fr. Jul–Feb.

Open forests or scrub; 500–1200 m. Fujian, Guangdong, Guangxi, Hainan, Yunnan [Cambodia, India, Laos, Thailand, Vietnam].

**3. *Glochidion zeylanicum*** (Gaertner) A. Jussieu, Euphorb. Gen. 107. 1824.

香港算盘子 *xiang gang suan pan zi*

*Bradleya zeylanica* Gaertner, Fruct. Sem. Pl. 2: 128. 1791; *Agyneia flexuosa* B. Heyne ex Wallich; *A. obliqua* Willdenow; *B. nitida* Roxburgh; *B. obliqua* (Willdenow) Sprengel; *B. timoriensis* Steudel; *Diasperus brunneus* (J. D. Hooker) Kuntze; *D. hongkongensis* (Müller Argoviensis) Kuntze; *D. nitidus* (Roxburgh) Kuntze; *D. obliquus* (Willdenow) Kuntze; *D. perakensis* (J. D. Hooker) Kuntze; *D. subscandens* (Zollinger & Moritzi) Kuntze; *D. zeylanicus* (Gaertner) Kuntze; *Glochidion brunneum* J. D. Hooker; *G. canaranum* (Müller Argoviensis) Beddome; *G. glaberrimum* Ridley; *G. hongkongense* Müller Argoviensis; *G. lanceolatum* var. *liukuense* (Hayata) Hurusawa; *G. littorale* Benthams; *G. liukuense* Hayata; *G. nitidum* (Roxburgh) Voigt; *G. obliquum* (Willdenow) Decaisne; *G. pedunculatum* Merrill; *G. perakense* J. D. Hooker; *G. subscandens* Zollinger & Moritzi; *G. sumatranum* Miquel; *G. zeylanicum* var. *malayanum* J. J. Smith; *G. zeylanicum* var. *nitidum* (Roxburgh) Haines; *Phyllanthus canaranus* Müller Argoviensis; *P. hongkongensis* (Müller Argoviensis) Müller Argoviensis; *P. nitidus* (Roxburgh) Reinwardt ex Blume; *P. obliquus* (Willdenow) Müller Argoviensis; *P. subscandens* (Zollinger & Moritzi) Müller Argoviensis; *P. zeylanicus* Müller Argoviensis.

Shrubs or treelets, 1–6 m tall, monoecious, glabrous throughout. Stipules triangular, persistent; petioles 5–8 mm; leaf blade oblong, ovate-oblong, or ovate, sometimes oblong-elliptic, 6–18 × 4–8 cm, leathery, base cordate, subcordate, truncate, or rounded, slightly oblique; lateral veins 5–7 pairs. Flowers in axillary clusters or in short, supra-axillary, pedunculate cymes, usually female flowers inserted at upper part of branchlets, male flowers inserted at lower part of branchlets, or female inflorescence with 1–3 flowers. Male flowers: pedicels 6–9 mm; sepals 5 or 6, connate into a column. Female flowers: sepals as in male; ovary globose, 5- or 6-locular; styles very short, connate into a very brief column. Capsules depressed globose, 8–10 × ca. 5 mm, 8–12-grooved.

Seeds hemispheric, red. Fl. Mar–Aug, fr. Jul–Nov.

Humid valleys, scrub on stream banks; 100–600 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Bangladesh, India, Indonesia, Japan, Malaysia, Myanmar, Sri Lanka, Thailand, Vietnam; Australia, Pacific islands (Solomon Islands)].

The roots are used as medicine for coughs and pneumonia; the stem and leaves are used for treating abdominal pain and traumatic injury. The bark contains up to 6.4% tannin.

**4. *Glochidion coccineum*** (Buchanan-Hamilton) Müller Argoviensis, Linnaea 32: 60. 1863.

红算盘子 *hong suan pan zi*

*Agyneia coccinea* Buchanan-Hamilton in Symes, Embassy Ava, 479. 1800; *Bradleya coccinea* (Buchanan-Hamilton) Wallich; *Diasperus coccineus* (Buchanan-Hamilton) Kuntze; *Epi-steira coccinea* (Buchanan-Hamilton) Rafinesque; *Phyllanthus coccineus* (Buchanan-Hamilton) Müller Argoviensis.

Evergreen shrubs or trees, usually 1–4(–10) m tall, monoecious; branches angular, pubescent; branchlets shortly rufous pubescent and sinuous when young. Stipules triangular-lanceolate, pubescent; petiole 3–5 mm, pubescent; leaf blade oblong, oblong-elliptic, or acuminate, leathery, green adaxially, glaucous-green abaxially, brown when dry, nerves sparsely pubescent to glabrous on both surfaces; lateral veins 6–8 pairs. Flowers in axillary clusters, usually male inserted at lower part of branchlets, female inserted at upper part of branchlets. Male flowers: pedicels 5–15 mm, pubescent; sepals 6, biseriolate, outer larger than inner, obovate or oblong-ovate, 2.5–4 mm, yellow, sparsely pubescent outside; stamens 4–6. Female flowers: pedicels very short or flowers sessile; sepals 6, obovate or obovate-lanceolate, slightly shorter than in male; connate styles subconical, ca. 1 mm. Capsules depressed globose, 6–7 × ca. 15 mm, puberulent, 10-grooved. Fl. Apr–Oct, fr. Aug–Dec.

Open forests or valley scrub, sometimes on limestone rocks; 400–1500 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Yunnan [Cambodia, India, Laos, Myanmar, Thailand, Vietnam].

**5. *Glochidion oblatum*** J. D. Hooker, Fl. Brit. India 5: 312. 1887.

宽果算盘子 *kuan guo suan pan zi*

Shrubs or treelets, 4–6 m tall; branchlets slender, tomentulose. Stipules lanceolate; petiole short, pubescent; leaf blade oblong or oblong-lanceolate, 5–10 × 2–4.5 cm, leathery, glaucous and glabrous adaxially, pubescent abaxially, brown when dry, base rounded or subacute, inequilateral, apex obtuse or acute; nerves very slender, nervules obscure. Flowers in axillary clusters. Male flowers: pedicels short; sepals 6, biseriolate, outer larger, obovate or subspatulate, pubescent outside, inner narrower, spatulate, pubescent outside; stamens 4–6, connate, connectives free. Female flowers subsessile; sepals as in male, but inner ones pubescent on both surfaces; ovary broadly ovoid, tomentulose, 4- or 5-locular; connate styles shortly conical. Capsules depressed, 13–17 mm in diam., pubescent, 4–6-grooved; styles persistent at apex; fruiting pedicels short. Fl. May–Aug, fr. Aug–Nov.

Broad-leaved forests, scrub; 1000–2000 m. Yunnan [India, Myan-

mar, N Thailand].

**6. *Glochidion arborescens*** Blume, Bijdr. 584. 1826.

白毛算盘子 bai mao suan pan zi

*Glochidion sclerophyllum* J. D. Hooker; *G. silheticum* (Müller Argoviensis) Croizat; *Phyllanthus arborescens* (Blume) Müller Argoviensis; *P. silheticus* Müller Argoviensis.

Trees ca. 8 m tall; branches, leaves abaxially, and flowers ferruginous tomentulose or pubescent. Stipules oblong; petiole 3–5 mm, robust; leaf blade obliquely ovate or oblong, 5–15 × 3–7.5 cm, leathery, adaxially green, greenish when dry, pubescent or only midvein pubescent, abaxially greenish, reddish brown when dry, base rounded to shallowly cordate, obliquely inequilateral, apex acute or shortly acuminate; midvein and 7–12-paired lateral veins robust. Flowers in pedunculate supra-axillary cymes. Male flowers golden, ca. 3 mm in diam.; pedicels 4–7 mm; sepals 6, oblong, ca. 1 mm; stamens 6, connate into a subcylindric column. Female flowers: pedicels and sepals as in male; ovary ovoid-globose, pubescent; style column shortly conical, ca. 0.5 mm; stigma 3–5-lobed, lobes conical or subulate, erect. Capsules depressed globose, 5–6 × 8–8.5 mm, minutely 8-grooved; fruiting pedicels 6–8.5 mm. Fl. Apr–Jun, fr. Jun–Oct.

Evergreen forests; 800–2200 m. Yunnan [India (Assam), Indonesia, Malaysia, Thailand].

**7. *Glochidion hirsutum*** (Roxburgh) Voigt, Hort. Suburb. Calcutt. 153. 1845.

厚叶算盘子 hou ye suan pan zi

*Bradleya hirsuta* Roxburgh, Fl. Ind., ed. 1832, 3: 699. 1832; *Agyneia hirsuta* Miquel; *Diasperus arnotianus* (Müller Argoviensis) Kuntze; *D. hirsutus* (Roxburgh) Kuntze; *D. mishmiensis* (J. D. Hooker) Kuntze; *D. tomentosus* (Dalzell) Kuntze; *Glochidion arnotianum* Müller Argoviensis; *G. dasyphyllum* K. Koch; *G. dasyphyllum* var. *iriomatense* Hurusawa; *G. hongkongense* Müller Argoviensis var. *puberulum* Chakrabarty & M. Gangopadhyay; *G. mishmiense* J. D. Hooker; *G. molle* Hooker & Arnott (1837), not Blume (1826); *G. sphaerostigmum* Hayata; *G. tomentosum* Dalzell; *G. tomentosum* var. *talbotii* J. D. Hooker; *G. zeylanicum* (Gaertner) A. Jussieu var. *talbotii* (J. D. Hooker) Haines; *G. zeylanicum* var. *tomentosum* Trimen; *G. zeylanicum* var. *tomentosum* (Dalzell) Chakrabarty & M. Gangopadhyay (1995), not Trimen (1885); *Phyllanthus arnotianus* (Müller Argoviensis) Müller Argoviensis; *P. hirsutus* (Roxburgh) Müller Argoviensis; *P. tomentosus* (Dalzell) Müller Argoviensis.

Shrubs or treelets, 1–8 m tall; branchlets densely villous. Stipules lanceolate, 3–4 mm; petiole 5–7 mm, pubescent; leaf blade ovate, oblong-ovate, or oblong, 7–15 × 4–7 cm, leathery, densely pubescent along nerves, adaxially glabrous at maturity, abaxially densely pubescent, base shallowly cordate, truncate, or rounded, obliquely inequilateral, apex obtuse or acute; lateral veins 6–10 pairs. Flowers usually in pedunculate supra-axillary cymes but apparently sometimes sessile and axillary; peduncle 5–7 mm, pubescent. Sepals 6, biseriate, pubescent outside,

outer broader than inner. Male flowers: pedicels 6–10 mm; sepals oblong or obovate; stamens 5–8. Female flowers: pedicels 2–3 mm; sepals ovate or broadly ovate, ca. 2.5 mm; ovary globose, ca. 2 mm in diam., pubescent, 5- or 6-locular; style column subconical, truncate at apex. Capsules depressed globose, 8–12 mm in diam., pubescent, 5- or 6-grooved; styles of fruiting pedicels inconspicuous. Fl. and fr. almost throughout year.

Open moist forests, scrub on stream banks; 100–1800 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Xizang, Yunnan [India].

This species is included within *Glochidion zeylanicum* (as var. *talbotii* Trimen) by some authors (Govaerts et al., World Checkl. Euphorbiaceae 3: 967. 2000).

The roots of *Glochidion hirsutum* are used as medicine for rheumatism and pneumonia; the leaves are used for treating toothaches.

**8. *Glochidion rubrum*** Blume, Bijdr. 586. 1826.

台闽算盘子 tai min suan pan zi

*Diasperus coronatus* (Müller Argoviensis) Kuntze; *D. leiostylus* (Kurz) Kuntze; *D. wightianus* Kuntze; *Glochidion coronatum* J. D. Hooker; *G. diversifolium* (Miquel) Merrill; *G. foliosum* S. Moore; *G. grave* S. Moore; *G. insulare* J. D. Hooker; *G. leiostylum* Kurz; *G. penangense* (Müller Argoviensis) Airy Shaw; *G. rubrum* f. *longistylis* J. J. Smith; *G. thorelii* Beille; *G. versicolor* S. Moore; *Phyllanthus diversifolius* Miquel; *P. penangensis* Müller Argoviensis.

Shrubs or treelets, 2–6 m tall; branches terete, gray, lenticellate; branchlets angular, glabrous or sparsely pubescent when young. Stipules triangular, ca. 1 mm; petiole 1.5–4 mm; leaf blade ovate, elliptic, oblong, or oblong-lanceolate, 5–13 × 2–4.5 cm, papery to submembranous, glabrous or only nerves puberulent on both surfaces, base acute to obtuse, inequilateral; lateral veins 5 or 6 pairs. Flowers in axillary glomerules, sessile, with linear bracts at base. Male flowers: pedicels 3–4 mm, slender, glabrous; sepals 6, ovate or oblong, ca. 2 mm, glabrous or sometimes sparsely pubescent at base inside; stamens 3, connate. Female flowers: pedicels very short or sessile; sepals 6, ovate-triangular, ca. 2 mm, glabrous on both surfaces; ovary ovoid, 3–4 mm, 3–5-locular, pubescent; style column conical, 1–3.5 mm, sometimes 3-fid at apex, glabrous. Capsules depressed globose, 3.5–4 × 6–10 mm, pubescent, 3–5-grooved. Fl. and fr. almost throughout year.

Broad-leaved evergreen forests; 200–600 m. Fujian, Taiwan [Cambodia, India, Indonesia, Japan, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam].

**9. *Glochidion triandrum*** (Blanco) C. B. Robinson, Philipp. J. Sci., C, 4: 92. 1909.

里白算盘子 li bai suan pan zi

Shrubs or treelets, 3–7 m tall, monoecious; branchlets angular, fulvous pubescent. Stipules ovate-triangular, 1–1.5 mm, fulvous pubescent; petiole 2–4 mm, sparsely pubescent; leaf blade oblong-elliptic or lanceolate, 4–13 × 2–4.5 cm, papery, membranous, or thickly papery, adaxially green, only midvein sparsely pubescent when young, glabrous at maturity, abaxially glaucous and white pubescent or densely so, base

broadly cuneate or obtuse, slightly inequilateral, apex acuminate, acute, or obtuse; midvein and 5–7-paired lateral veins slightly elevated adaxially, prominently elevated abaxially. Flowers in axillary clusters, 5 or 6 per cluster, male inserted at lower part of branchlets, female at upper part of branchlets. Male flowers: pedicels 6–7 mm, slender, with ovate-triangular ca. 1 mm bracteoles at base; sepals 6, biseriate, obovate, ca. 2 mm, pubescent; stamens 3, connate. Female flowers subsessile; sepals as in male, ca. 1.5 mm, concave inside; ovary ovoid, pubescent, 4- or 5-locular; style column cylindrical, dilated at apex. Capsules depressed globose, ca. 4 × 5–10 mm, sparsely pubescent, usually styles persistent, 8–10-grooved; fruiting pedicels 5–6 mm. Seeds triangular, ca. 3 mm, brown-red, lucid. Fl. Mar–Jul or Aug, fr. Jul–Dec.

Evergreen broad-leaved forests, open forests, valleys, stream banks; 500–2600 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Sichuan, Taiwan, Yunnan [Cambodia, India, Japan, Nepal, Philippines, N Thailand].

- 1a. Leaf blade papery or membranous, pubescent abaxially; capsules 5–7 mm in diam., fruiting pedicels 6–7 mm ..... 9a. var. *triandrum*
- 1b. Leaf blade thickly papery, densely pubescent abaxially; capsules ca. 10 mm in diam., fruiting pedicels robust, very short ..... 9b. var. *siamense*

**9a. Glochidion triandrum var. triandrum**

里白算盘子(原变种) li bai suan pan zi (yuan bian zhong)

*Kirganelia triandra* Blanco, Fl. Filip. 711. 1837; *Diasperus triandrus* (Blanco) Kuntze; *Glochidion acuminatum* Müller Argoviensis; *G. bicolor* (Müller Argoviensis) Hayata; *G. eleutherostylum* Müller Argoviensis; *G. hayatae* Croizat & H. Hara; *G. hypoleucum* Hayata (1920), not Boerlage (1900); *G. quinquestylum* Elmer; *Phyllanthus bicolor* Müller Argoviensis; *P. triandrus* (Blanco) Müller Argoviensis.

Leaf blade papery or membranous, pubescent abaxially. Capsules smaller, 5–7 mm in diam.; fruiting pedicels 6–7 mm, slender. Fl. Mar–Jul, fr. Jul–Dec.

Open forests, valleys, stream banks; 500–2600 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Sichuan, Taiwan, Yunnan [Cambodia, India, Japan, Nepal, Philippines].

**9b. Glochidion triandrum var. siamense** (Airy Shaw) P. T. Li, Acta Phytotax. Sin. 26: 62. 1988.

泰云算盘子 tai yun suan pan zi

*Glochidion acuminatum* Müller Argoviensis var. *siamense* Airy Shaw, Kew Bull. 26(2): 273. 1972.

Leaf blade thickly papery, densely pubescent abaxially. Capsules larger, ca. 10 mm in diam.; fruiting pedicels robust, very short. Fl. May–Aug, fr. Aug–Oct.

Evergreen broad-leaved forests; 1700–1800 m. Yunnan (Gengma, Simao) [N Thailand].

**10. Glochidion medogense** T. L. Chin, Acta Phytotax. Sin. 18: 251. 1980.

墨脱算盘子 mo tuo suan pan zi

Trees to 10 m tall, monoecious; branchlets terete and pubescent when young. Stipules ovate-subulate, ca. 5 mm, ciliate on margin; petiole ca. 5 mm; leaf blade oblong or ovate, 8–16 × 4–7.5 cm, thinly leathery, smooth and glabrous adaxially, only midvein and 7–9-paired lateral veins elevated and pubescent abaxially, base slightly obtuse or rotund, inequilateral, apex acute to acuminate or shortly so. Flowers axillary. Male flowers: pedicels filamentous, ca. 5 mm, glabrous; sepals 5, ovate, ca. 1.5 × 1 mm; stamens 3, connate. Female flowers: pedicels 6–12 mm; ovary globose, glabrous, 5-locular; styles 5-fid. Capsules depressed globose, 7–9 mm in diam., concave at apex, 10-grooved; style column cylindrical, persistent, 5-fid at apex, lobes linear; fruiting pedicels 1–2 cm. Fl. Jun–Aug, fr. Aug–Nov.

- Broad-leaved forests; 1500–1900 m. SE Xizang.

**11. Glochidion nubigenum** J. D. Hooker, Fl. Brit. India 5: 315. 1887.

云雾算盘子 yun wu suan pan zi

*Diasperus nubigenus* (J. D. Hooker) Kuntze; *Glochidion velutinum* Wight var. *nubigenum* (J. D. Hooker) Chakrabarty & M. Gangopadhyay; *G. metanubigenum* Hurusawa & Yu. Tanaka.

Trees to 10 m tall, monoecious; branchlets angular, brown, pubescent. Stipules ovate-triangular, ca. 3 × 2 mm; petiole 8–10 mm, pubescent; leaf blade broadly elliptic, ovate, oblong, or oblong-lanceolate, 12–20 × 4.5–7.5 cm, papery, abaxially puberulent on nerves, base obtuse or rounded, usually inequilateral, apex acuminate or caudate-acuminate; midvein and 8–11-paired lateral veins elevated on both surfaces. Flowers in sessile axillary clusters with 6–10 female and 2 male flowers. Male flowers: pedicels short; sepals 5, oblong, apex acute; stamens 3, connate. Female flowers: pedicels 1.5–2.3 cm; sepals 5, broadly ovate; ovary broadly ovoid, 6–8-lobed, concave at apex; styles persistent, apex lobed. Pericarp thinly crustaceous. Seeds ovoid or globose, red. Fl. Jul–Sep, fr. Sep–Dec.

Broad-leaved forests, slopes of steep rocky ridges; 900–2000 m. SE Xizang (Médog) [Bhutan, India (Sikkim), Nepal, N Thailand].

**12. Glochidion eriocarpum** Champion ex Bentham, Hooker’s J. Bot. Kew Gard. Misc. 6: 6. 1854.

毛果算盘子 mao guo suan pan zi

*Diasperus anamiticus* Kuntze; *D. eriocarpus* (Champion ex Bentham) Kuntze; *D. villicaulis* (J. D. Hooker) Kuntze; *Glochidion anamiticum* Kuntze; *G. annamense* Beille; *G. esquirolii* H. Lévillé; *G. villicaulis* J. D. Hooker; *Phyllanthus eriocarpus* (Champion ex Bentham) Müller Argoviensis.

Shrubs or treelets to 5 m tall, monoecious; branchlets densely spreading yellowish or gray-yellow villous. Stipules subulate, 3–4 mm; petiole 1–2 mm, villous; leaf blade ovate, narrowly ovate, or broadly ovate, 4–8 × 1.5–3.5 cm, papery,

densely yellowish or gray-villous, but denser abaxially, base obtuse, truncate, or rounded, zygomorphic, apex acuminate or acute; lateral veins 4 or 5 pairs. Flowers axillary, solitary or in 2–4-flowered clusters. Male flowers inserted along lower parts of branchlets; pedicels 4–6 mm; sepals 6, oblong-obovate, 2.5–4 mm, apex acute, sparsely pubescent outside; stamens 3, connate. Female flowers inserted at upper part of branchlets, subsessile; sepals 6, oblong, 2.5–3 mm, villous on both surfaces; ovary depressed globose, densely pubescent, 4- or 5-lobed. Capsules depressed globose, 8–10 mm in diam., densely yellowish or gray-villous, 4- or 5-grooved, with a cylindrical, persistent style column. Fl. and fr. almost throughout year.

Slopes, valley scrub, grassy areas, sometimes at forest margins; 100–1700 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Taiwan, Yunnan [Thailand, Vietnam].

All parts or roots and leaves are used as medicine for urticaria, mastitis, toothache, menorrhagia, dysentery, skin eczema, enteritis, etc.

**13. *Glochidion heyneanum*** (Wight & Arnott) Wight, *Icon. Pl. Ind. Orient.* 5(2): t. 1908. 1852.

绒毛算盘子 rong mao suan pan zi

*Gynoon heyneanum* Wight & Arnott, *Edinburgh New Philos. J.* 14: 300. 1833; *Diasperus asperus* (Müller Argoviensis) Kuntze; *D. heyneanus* (Wight & Arnott) Kuntze; *D. nepalensis* (Müller Argoviensis) Kuntze; *D. velutinus* (Wight) Kuntze; *Eriococcus glaucescens* Zollinger; *Glochidion asperum* (Müller Argoviensis) Beddome; *G. nepalense* (Müller Argoviensis) Kurz; *G. velutinum* Wight; *Phyllanthus asperus* Müller Argoviensis; *P. heyneanus* (Wight & Arnott) Müller Argoviensis; *P. nepalensis* Müller Argoviensis; *P. velutinus* (Wight) Müller Argoviensis.

Trees 6–10 m tall, monoecious, tomentose or pubescent except for glabrous adaxial leaf surface, stamens, and styles; branchlets angular. Stipules triangular, ca. 3 mm; petiole 3–4 mm; leaf blade orbicular, ovate, elliptic, oblong, or ovate-lanceolate, rarely obovate, 3.5–12 × 3–6 cm, papery or thinly leathery, base acute, apex obtuse or acute to acuminate, with a mucro; lateral veins 4–6 pairs. Flowers in bisexual axillary clusters. Male flowers: pedicels 2–6 mm; sepals 6, ovate or narrowly ovate, biseriate, outer 3 pubescent on both surfaces, inner 3 pubescent outside only; stamens 3, connate into a cone. Female flowers: pedicels ca. 1 mm; sepals as in male; ovary globose, 4–7-locular; style column obconical, shallowly 4-fid at apex. Fruiting pedicels ca. 1 cm; capsules depressed globose, ca. 4 × 8 mm, 4–7-locular, usually with persistent styles. Seeds triangular, red. Fl. Jun–Sep, fr. Sep–Nov.

Open forests; 1000–2500 m. Yunnan [Bhutan, Cambodia, India, Laos, Myanmar, Nepal, Thailand, Vietnam].

**14. *Glochidion lutescens*** Blume, *Bijdr.* 585. 1826.

山漆基 shan qi jing

*Anisonema hypoleucum* Miquel; *Bradleya laevigata* Wallich; *B. lutescens* (Blume) Steudel; *Diasperus glaucifolius* (Müller Argoviensis) Kuntze; *D. kollmannianus* (Müller

Argoviensis) Kuntze; *D. lutescens* (Blume) Kuntze; *Glochidion breynioides* C. B. Robinson; *G. glaucifolium* Müller Argoviensis; *G. hypoleucum* (Miquel) Boerlage; *G. kollmannianum* (Müller Argoviensis) J. J. Smith; *G. laevigatum* (Müller Argoviensis) J. D. Hooker; *Phyllanthus fraxinifolius* Loddiges; *P. hypoleucum* (Miquel) Müller Argoviensis; *P. kollmannianus* Müller Argoviensis; *P. laevigatus* Müller Argoviensis; *P. lutescens* (Blume) Müller Argoviensis.

Shrubs to trees to 10 m tall, monoecious, glabrous except for puberulent abaxial leaf surface and fruits; branches 1–1.5 mm thick. Petiole 3–5 mm; leaf blade elliptic, ovate-lanceolate, or obliquely ovate, 6–14 × 3–7 cm, papery to leathery, abaxially gray-white and puberulent to glabrous, adaxially green, base acute-obtuse to rounded, apex shortly acuminate to obtuse. Flowers in axillary, many-flowered, unisexual or bisexual clusters. Male flowers: pedicels ca. 5 mm; sepals 6, elliptic, ca. 2 mm; stamens 3, connate into a cylindrical column. Female flowers: pedicels 2–3 mm, or subsessile; sepals 6, ovate, outer ones 0.9–2.3 × 0.6–1.2 mm, inner ones 0.9–1.8 × 0.5–1.1 mm; ovary ovoid, 6-locular; style column cylindrical or subconical, apex truncate, as long as ovary. Fruiting pedicels 1.5–5 mm; capsules depressed globose, 5–6 × 10–18 mm in diam., reddish, 6-grooved, puberulent. Fl. Jun–Sep, fr. Aug–Dec.

Open forests; 700–1000 m. Guangdong, Guizhou, Sichuan, Yunnan [India (?Assam), Indonesia, Malaysia, Myanmar, New Guinea, Philippines, Thailand, Vietnam].

**15. *Glochidion puberum*** (Linnaeus) Hutchinson in Sargent, *Pl. Wilson.* 2: 518. 1916.

算盘子 suan pan zi

*Agyneia pubera* Linnaeus, *Mant. Pl.* 2: 296. 1771; *A. impubes* Linnaeus; *A. pinnata* Miquel; *A. sinica* Miquel; *Bradleya pubera* (Linnaeus) Roxburgh; *B. sinica* Gaertner; *Glochidion bodinieri* H. Léveillé; *G. distichum* Hance; *G. fortunei* Hance; *G. fortunei* var. *megacarpum* H. Keng; *G. hayatae* Croizat & H. Hara var. *tsushimense* Hurusawa; *G. pseudo-obscurum* Pampanini; *G. pseudo-obscurum* var. *glabrum* Pampanini; *G. pseudo-obscurum* var. *lanceolatum* Pampanini; *G. sinicum* (Gaertner) Hooker & Arnott; *Nymphanthus chinensis* Loureiro; *Phyllanthus puberus* (Linnaeus) Müller Argoviensis; *P. puberus* var. *sinicus* (Gaertner) Müller Argoviensis; *P. villosus* Poir.

Erect shrubs 1–5 m tall, monoecious, much branched; branchlets gray-brown, densely pubescent. Stipules triangular, ca. 1 mm; petiole 1–3 mm; leaf blade oblong, oblong-ovate, or obovate-oblong, rarely lanceolate, 3–8 × 1–2.5 cm, papery or subleathery, gray-green and midvein sparsely pubescent or glabrescent adaxially, greenish and densely pubescent abaxially, base cuneate to obtuse, apex obtuse, acute, shortly acuminate, or rounded; lateral veins 4–8 pairs, elevated abaxially, reticulate nerves prominent. Flowers in axillary clusters, 2–5-flowered, proximal axils mostly to all male flowers, distal axils mostly to all female flowers. Male flowers: pedicels 4–15 mm; sepals 6, narrowly oblong or oblong-obovate, 2.5–3.5 mm, spreading, green to yellowish, densely pubescent outside; stamens 3, connate into a cylindrical column. Female flowers: pedicels ca. 1 mm; sepals 6, as in male, but

shorter and thicker, green; ovary globose, densely pubescent, 5–10-locular; ovules 2 per locule; style column annular, shortly lobed in summit. Capsules depressed-globose, 8–15 mm in diam., 8–10-grooved, densely pubescent, reddish when mature, apex with persistent annular styles. Seeds subreniform, 3-angled, ca. 4 mm, red. Fl. Apr–Aug, fr. Jul–Nov.

Slopes, scrub on stream banks, forest margins; 300–2200 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Japan].

All parts are used as medicine for dysentery, diarrhea, rupture, coughs, etc. The seeds contain up to 20% oil, which is used for the manufacture of soap and as a lubricant.

**16. *Glochidion chademenosocarpum*** Hayata, Icon. Pl. Formos. 9: 94. 1920.

线药算盘子 xian yao suan pan zi

Shrubs ca. 1 m tall, monoecious; branchlets slender, glabrous. Stipules triangular, ca.  $2.5 \times 1.5$  mm, slightly thick, glabrous; petiole 2–3 mm; leaf blade oblong to obovate,  $5-8 \times 2.5-4$  cm, papery, glabrous on both surfaces, base acute, inequilateral, apex obtuse. Flowers in bisexual axillary clusters. Male flowers: pedicels ca. 1 cm, slender, sparsely hispid; sepals 6, biseriate, outer obovate, ca.  $2.5 \times 1$  mm; stamens 3, connate; anthers linear. Female flowers subsessile; sepals 6, biseriate, oblanceolate, ca.  $1.5 \times 0.5$  mm, glabrous outside, sparsely hispid inside, apex obtuse; ovary depressed globose, ca.  $0.5 \times 1$  mm; style column cylindrical, ca. 1 mm, slightly thick, 8-grooved at apex. Fruits not seen. Fl. Oct.

• Taiwan.

**17. *Glochidion kusukusense*** Hayata, Icon. Pl. Formos. 9: 96. 1920.

台湾算盘子 tai wan suan pan zi

Shrubs ca. 3 m tall, glabrous throughout; branchlets slender. Petiole ca. 5 mm; leaf blade lanceolate,  $4-6.5 \times 1.5-2$  cm, papery, base acute, oblique, apex acuminate, mucronulate. Male flowers several in axillary clusters; pedicels slender, ca. 5 mm; sepals 6, biseriate, outer oblong, ca.  $1.5 \times 1$  mm, apex acute, inner smaller than outer; stamens 3, connate into a cone, ca. 0.7 mm. Female flowers and fruits not seen. Fl. May–Jul.

• Open forests; ca. 300 m. Taiwan.

**18. *Glochidion philippicum*** (Cavanilles) C. B. Robinson, Philipp. J. Sci., C, 4: 103. 1909.

甜叶算盘子 tian ye suan pan zi

*Bradleya philippica* Cavanilles, Icon. 3: 48. 1797; *Actinodaphne sieboldiana* Miquel; *B. philippensis* Willdenow; *Diosperus compressicaulis* (Kurz ex Teijsmann & Binnendijk) Kuntze; *D. kurzianus* (Müller Argoviensis) Kuntze; *D. philippinensis* (Müller Argoviensis) Kuntze; *D. quercinus* (Müller Argoviensis) Kuntze; *Glochidion album* (Blanco) Boerlage; *G. compressicaule* Kurz ex Teijsmann & Binnendijk; *G. ferdinandii* (Müller Argoviensis) F. M. Bailey var. *molle* (Bentham) F. M. Bailey; *G. formosanum* Hayata; *G. philippinense* Bentham;

*G. quercinum* (Müller Argoviensis) Boerlage; *Phyllanthus albus* (Blanco) Müller Argoviensis; *P. compressicaulis* (Kurz ex Teijsmann & Binnendijk) Müller Argoviensis; *P. ferdinandii* Müller Argoviensis var. *mollis* Bentham; *P. kurzianus* Müller Argoviensis; *P. philippinensis* (Bentham) Müller Argoviensis; *P. quercinus* Müller Argoviensis; *Zarcoa philippica* (Cavanilles) Llanos.

Trees to 12 m tall, monoecious; branchlets pubescent when young, glabrescent. Stipules ovate-triangular, 1–1.5 mm; petiole 4–6 mm; leaf blade ovate-lanceolate or oblong,  $5-15 \times 2.5-5.5$  cm, papery or subleathery, shining dark green adaxially, brown when dry, paler abaxially, glabrous on both surfaces, base acute or broadly cuneate, usually oblique, apex acuminate to obtuse; lateral veins 6–8 pairs. Inflorescence an axillary cluster, 4–10-flowered. Male flowers: pedicels 6–7 mm; sepals 6, oblong or obovate-oblong, 1.5–2.5 mm, glabrous, yellowish green; stamens 3, connate into a cylindrical column. Female flowers: pedicels 2–4 mm; sepals 6, as in male; ovary globose, pubescent, 5- or 6-locular; style column shortly conical, 5–7-fid at apex. Capsules depressed globose,  $4.5-5.5 \times 8-12$  mm, apex with much-impressed and persistent styles, deeply 10–14-grooved, densely to sparsely pubescent; fruiting pedicels 3–8 mm. Seeds red, hemispheric, 3–3.5 mm. Fl. Mar–Aug, fr. Jul–Dec.

Evergreen broad-leaved forests; 100–1500 m. Fujian, Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan [Indonesia, Malaysia, Philippines].

**19. *Glochidion sphaerogynum*** (Müller Argoviensis) Kurz, Prelim. Rep. Forest Pegu, App. A, cv; App. B, 77. 1875.

圆果算盘子 yuan guo suan pan zi

*Phyllanthus sphaerogynus* Müller Argoviensis, Flora 48: 375. 1865; *Glochidion fagifolium* (Müller Argoviensis) Miquel ex Beddome; *P. fagifolius* Müller Argoviensis.

Trees to 15 m tall, monoecious; bark gray-white; branchlets angular, glabrous. Stipules subtriangular, 2–3 mm; petiole 5–8 mm; leaf blade ovate-lanceolate, lanceolate, or oblong-lanceolate, often slightly falcate,  $7-10 \times 1.5-3.5$  cm, papery or thinly leathery, abaxially greenish, gray-brown when dry, glabrous or glabrescent on both surfaces, adaxially green, base acute, usually inequilateral; lateral veins 6–8 pairs. Flowers monoecious, in axillary clusters, male in proximal axils, female in distal axils, male and female mixed in central axils. Male flowers: pedicels 6–8 mm; sepals 5 or 6, obovate or elliptic, ca. 2 mm, yellowish; stamens 3, connate, connectives acute. Female flowers: pedicels 2–3 mm; sepals 6, ovate or ovate-triangular, outer larger than inner, ca. 1 mm; ovary ovoid, 4–6-locular, glabrous, ca. 1 mm in diam.; style column depressed globose, ca. 2 mm wide. Capsules depressed globose, ca.  $4 \times 8-10$  mm, apex concave and with a persistent depressed globose style column, 8–12-grooved. Fl. Dec–Apr, fr. Apr–Oct.

Mixed forests; 100–1600 m. Guangdong, Guangxi, Hainan, Yunnan [Bhutan, India, Myanmar, N Thailand, Vietnam].

The branches and leaves are used as medicine for influenza, eczema, etc.

**20. *Glochidion thomsonii*** (Müller Argoviensis) J. D. Hooker, Fl. Brit. India 5: 318. 1887.

青背叶算盘子 qing bei ye suan pan zi

*Phyllanthus thomsonii* Müller Argoviensis, Flora 48: 375. 1865; *Diasperus thomsonii* (Müller Argoviensis) Kuntze; *Glochidion rubidulum* T. L. Chin.

Shrubs ca. 3 m tall, monoecious, glabrous throughout; branchlets terete, ± angular. Stipules ovate-triangular, ca. 3 mm, thick, hard when dry; petiole 2–3 mm; leaf blade oblong or elliptic, 5–13 × 2.5–4 cm, leathery, green and smooth adaxially, bluish glaucous abaxially when dry, base obtuse, inequilateral, apex acuminate to obtuse; midvein and 6–9-paired lateral veins slightly elevated and reddish. Flowers in bisexual clusters, male 1–3 and female many mixed in axils. Male flowers: pedicels slender; sepals 6, elliptic, equal; stamens 3, connate. Female flowers: pedicels shorter; sepals 6, elliptic-ovate; ovary depressed globose, 3- or 4-locular; style column obovate, ca. 2 mm. Fruiting pedicels ca. 5 mm; capsules depressed globose, 1–1.5 cm in diam., apex depressed and with a persistent obovate style column; style columns shallowly 4- or 5-fid at apex. Seeds red. Fl. Aug–Oct, fr. Oct–Dec.

Secondary forests, roadside scrub; 1200–1700 m. SE Xizang [NE India].

**21. *Glochidion wrightii*** Bentham, Fl. Hongk. 313. 1861.

白背算盘子 bai bei suan pan zi

*Diasperus wrightii* (Bentham) Kuntze; *Phyllanthus wrightii* (Bentham) Müller Argoviensis.

Shrubs or treelets 1–8 m tall, monoecious, glabrous throughout. Petiole 3–5 mm; leaf blade oblong or oblong-lanceolate, often obliquely falcate, 2.5–5.5 × 1.5–2.5 cm, papery, green adaxially, farinose-greenish abaxially, gray-glaucous when dry, base acute, inequilateral, apex acuminate; lateral veins 5 or 6 pairs. Flowers in bisexual clusters. Female flowers subsessile; sepals 6, biseriate, outer wider and thicker than inner, ovate, elliptic, or oblong, ca. 1 mm; ovary globose, 3- or 4-locular; style columns cylindrical, less than 1 mm. Capsules triangular, depressed globose, 6–8 mm in diam., red, with a persistent style column. Fl. May–Sep, fr. Jul–Nov.

• Open forests or scrub; 200–1000 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Yunnan.

**22. *Glochidion ellipticum*** Wight, Icon. Pl. Ind. Orient. 5: t. 1906. 1852.

四裂算盘子 si lie suan pan zi

*Phyllanthus assamicus* Müller Argoviensis, Flora 48: 378. 1865; *Diasperus ellipticus* (Müller Argoviensis) Kuntze; *D. malabaricus* (Müller Argoviensis) Kuntze; *D. wightianus* Kuntze; *Glochidion assamicum* (Müller Argoviensis) J. D. Hooker; *G. assamicum* var. *magnicapsulum* Croizat & H. Hara; *G. balakrishnanii* Jothi et al.; *G. diversifolium* (Miquel) Merrill var. *wightianum* (Müller Argoviensis) Beddome; *G. ellipticum* var. *wightianum* (Müller Argoviensis) J. D. Hooker;

*G. malabaricum* (Müller Argoviensis) Beddome; *P. andersonii* Müller Argoviensis; *P. diversifolius* Miquel var. *wightianus* Müller Argoviensis; *P. malabaricus* Müller Argoviensis.

Trees to 10 m tall, monoecious; branches glabrous. Stipules triangular, ca. 2 mm; petiole 2–3 mm; leaf blade broadly elliptic, ovate to lanceolate, 9–15 × 3.5–4.5 cm, papery or subleathery, both surfaces glabrous, abaxially brownish when dried, base obtuse, apex acuminate or shortly so; lateral veins 6–8 pairs. Flowers in bisexual axillary clusters, with many male flowers and few female flowers. Male flowers ca. 3 mm in diam.; pedicels slender, 13–20 mm, pubescent; sepals 6, oblong or obovate-oblong, pubescent outside; stamens 3; connate anthers oblong-ovoid, connectives cuspidate. Female flowers subsessile; sepals as in male; ovary globose, 3- or 4-locular, pubescent to glabrous; style column conical, glabrous. Fruiting pedicels short; capsules depressed globose, 2–3 × 6–8 mm, usually 4-locular, pericarp thinner. Seeds hemispheric, red. Fl. May–Aug, fr. Jul–Nov.

Evergreen broad-leaved forests, scrub on stream banks; 100–1700 m. Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [Bhutan, India, Myanmar, Nepal, Thailand, Vietnam].

**23. *Glochidion daltonii*** (Müller Argoviensis) Kurz, Prelim. Rep. Forest Pegu, App. A, cv; App. B, 77. 1875.

革叶算盘子 ge ye suan pan zi

*Phyllanthus daltonii* Müller Argoviensis in A. Candolle, Prodr. 15(2): 310. 1866; *Diasperus daltonii* (Müller Argoviensis) Kuntze.

Shrubs or trees 3–10 m tall, monoecious, glabrous except for petioles and ovary pubescent to glabrous; branches angular, brown when dry; branchlets slender, spreading. Stipules triangular, ca. 1 mm; petiole 2–4 mm, puberulent to glabrous; leaf blade lanceolate or elliptic, sometimes falcate, 3–12 × 1.5–3 cm, papery or subleathery, abaxially gray-white, adaxially gray-green, base broadly cuneate, apex acuminate or shortly so; lateral veins 5–7 pairs, elevated below. Flowers in axillary clusters, with 2 bracts at base, male in proximal axils, female in distal axils. Male flowers: pedicels 5–8 mm, connate. Female flowers subsessile; sepals as in male; ovary depressed globose, puberulent to glabrous, 4–6-locular; style column prominently clavate, 3–6-fid at apex. Capsules depressed globose, 1–1.5 cm in diam., brown when dry, 4–6-grooved, with persistent sepals at base. Fl. Mar–May, fr. Apr–Oct.

Open forests, scrub on slopes; 200–1700 m. Anhui, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Yunnan, Zhejiang [India, Malaysia, Myanmar, Thailand, Vietnam].

The bark, leaves, and fruits contain copious tannins.

**24. *Glochidion wilsonii*** Hutchinson in Sargent, Pl. Wilson. 2: 518. 1916.

湖北算盘子 hu bei suan pan zi

Shrubs 1–4 m tall, monoecious, glabrous throughout except sometimes for pubescent petiole; branches angular,



gray-brown; branchlets spreading. Stipules ovate-lanceolate, 2–2.5 mm; petiole 2–5 mm, puberulent to glabrous; leaf blade lanceolate or obliquely lanceolate, 3–10 × 1.5–4 cm, papery, green adaxially, gray-white abaxially, base obtuse or broadly cuneate, apex acute or shortly acuminate; midvein elevated on both surfaces, lateral veins 5 or 6 pairs, raised abaxially. Flowers green, in axillary clusters, male in proximal axils, female in distal axils. Male flowers: pedicels ca. 8 mm; sepals 6, oblong or obovate, 2.5–3 × ca. 1 mm, apex obtuse, margin thinly membranous; stamens 3, connate. Female flowers: pedicels short; sepals as in male; ovary globose, 6–8-locular; style column cylindrical, lobed at apex. Capsules depressed globose, ca. 1.5 cm in diam., 6–8-grooved, usually with persistent sepals at base. Seeds obscurely 3-angular, red lucid. Fl. Apr–Jul, fr. Jun–Sep.

• Scrub on slopes; 600–1600 m. Anhui, Fujian, Guangxi, Guizhou, Hubei, Jiangxi, Sichuan, Zhejiang.

The bark, leaves, and fruits contain copious tannins.

**25. *Glochidion obovatum*** Siebold & Zuccarini, *Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss.* 4(2): 143. 1845.

倒卵叶算盘子 *dao luan ye suan pan zi*

*Bradleya sinensis* Siebold ex Miquel; *Diasperus obovatus* (Siebold & Zuccarini) Kuntze; *Phyllanthus obovatus* (Siebold & Zuccarini) Müller Argoviensis (1865), not Muhlenberg ex Willdenow (1805).

Shrubs or shrublets 0.5–1 m tall; branches pubescent. Stipules ovate-triangular; petiole 1.5–2 mm; leaf blade obovate or oblong-obovate, 3.5–8 × 2–2.5 cm, thinly leathery, base cuneate, apex obtuse or shortly acuminate. Flowers in cymes. Male flowers: pedicels 6–9 mm; sepals 6, obovate, 1.5–2 mm; stamens 3, connate. Female flowers: pedicels 3–6 mm; sepals as in male; ovary ovoid, 4–6-locular, glabrous; style column cylindrical, 6-lobed at apex. Capsules depressed globose, ca. 4.5 × 7 mm, 8–12-grooved. Fl. May–Jul, fr. Jul–Oct.

Montane scrub on slopes; 300–600 m. Fujian, Taiwan, Zhejiang [Japan].

**26. *Glochidion ramiflorum*** J. R. Forster & G. Forster, *Char. Gen. Pl.* 114. 1776.

茎花算盘子 *jing hua suan pan zi*

*Phyllanthus ramiflorus* (J. R. Forster & G. Forster) Müller Argoviensis.

Shrubs or treelets 1–6 m tall, monoecious; branches gray; branchlets green at apex, usually purplish in lower 1/2, glabrous. Stipules broadly triangular, midrib elevated abaxially; petiole 4–5 mm, glabrous; leaf blade oblong, elliptic to oblong-ovate, 10–15 × 4–5 cm, papery, dark green adaxially, green abaxially, brown-black when dry, glabrous on both surfaces, base obtuse, apex caudate-acuminate; midvein elevated on both surfaces, lateral veins 6–9 pairs. Flowers yellowish, in axillary clusters, 4–9 flowers per cluster, branchlets with proximal clusters male, distal clusters female, sometimes male and female mixed. Male flowers: pedicels 4–6 mm, glabrous; sepals

6, biseriate, broadly ovate, ca. 2 × 1.2 mm, glabrous; stamens 3, connate into a cylinder. Female flowers: pedicels short; sepals as in male, but smaller, ca. 1 × 0.7 mm; ovary ovoid, 5- or 6-locular, glabrous. Capsules depressed globose, ca. 6 mm in diam., 10–12-grooved. Fl. Apr–Jun, Aug–Dec, fr. Jul–Feb.

Cultivated for medicine. C Guangdong [native to Fiji].

The leaves are used as a contraceptive.

**27. *Glochidion suishaense*** Hayata, *Icon. Pl. Formos.* 9: 97. 1920.

水社算盘子 *shui she suan pan zi*

Shrubs ca. 1 m tall, monoecious, glabrous throughout; branchlets slender. Petiole ca. 3 mm; leaf blade ovate or obovate to oblong, 4.5–8.5 × 3–4.5 cm, thinly leathery, base cuneate, obtuse, or rounded, apex acute. Flowers in axillary clusters. Male flowers: pedicels slender; sepals 6, obovate, biseriate, outer ca. 3 × 1.5 mm, apex very obtuse, inner ca. 2.5 × 1 mm; stamens

3, connate. Female flowers: pedicels 1–1.5 mm; sepals 6, oblong, biseriate, outer ca.  $2 \times 1.5$  mm, apex obtuse, entire or obscurely dentate, inner ca.  $2 \times 0.6$  mm, entire or dentate; ovary depressed globose, 4-locular, ca.  $0.6 \times 1$  mm; style column obconical, lobed at apex. Capsules depressed globose, ca.  $8 \times 15$  mm, 8-grooved. Seeds red. Fl. Apr–Jul, fr. Aug–Sep.

- Scrub on slopes; ca. 300 m. Taiwan (Nantou: Shuishe).

**28. *Glochidion khasicum*** (Müller Argoviensis) J. D. Hooker, Fl. Brit. India 5: 324. 1887.

长柱算盘子 chang zhu suan pan zi

*Phyllanthus khasicus* Müller Argoviensis, Flora 48: 389. 1865.

Shrubs or treelets 1–6 m tall, monoecious, glabrous throughout; branchlets angular. Stipules ovate-triangular, ca. 2.5 mm; petiole 4–6 mm, stout; leaf blade oblong, elliptic-ovate, or ovate-lanceolate,  $7\text{--}10 \times 2.5\text{--}4$  cm, leathery, greenish when dry, base acute, decurrent into petiole; lateral veins 5 or 6 pairs. Male flowers in few-flowered axillary clusters; pedicels short; sepals 6, oblanceolate, unequal, 3–3.5 mm; stamens 3, connate, connectives umbonate. Female flowers subsessile; sepals 6, ovate-oblong, unequal, 3.5–4 mm; ovary globose, 3- or 4-locular; style column elongate, stout, subclavate, unequally 3-toothed at apex. Fruiting pedicels short; capsules depressed globose, ca. 8 mm in diam., intruded at apex and base, 3–6-locular, lobes rounded. Seeds hemispheric. Fl. Jun–Sep, fr. Sep–Nov.

Open forests, valley scrub; 900–1300 m. Guangxi, Yunnan [Bhutan, India, Thailand].

