

## 2. GLYPTOPETALUM Thwaites, Hooker's J. Bot. Kew Gard. Misc. 8: 267. 1856.

沟瓣属 *gou ban shu*

Liu Quanru (刘全儒); A. Michele Funston

Evergreen shrubs or small trees, glabrous. Leaves opposite, entire or crenulate; stipulate. Inflorescences axillary, cymose, 1–4 × dichotomous. Flowers bisexual, 4-merous; petals green-yellow, green-white, red, or purple. Disk fleshy, annular, 4-angled or lobed; stamens on disk; anthers obliquely dehiscent, latrorse. Ovary immersed in disk, 4-locular; ovules pendulous, 1 per locule. Capsule subglobose, leathery, pallid, cinereous-luteous or cinereous-brunescens, surface usually with densely squarrose macula or smooth, loculicidally dehiscent. Seeds 1–4, ovoid or rounded, basal 1/3–1/2 covered by aril.

About 20 species: tropical and subtropical Asia; nine species (seven endemic) in China.

*Glyptopetalum reticulinerve* C. Y. Wu ex G. S. Fan & Y. J. Xu (Bull. Bot. Res., Harbin 27: 129. 2007) was recently described from evergreen forests at 600–800 m in SE Yunnan (Hekou, Honghe). We have not treated it here because we were unable to examine any specimens.

- 1a. Disk bowl-shaped, tightly invaginated and coalescent with ovary at base, emergence plane; filament apparent, 1–2 mm.
  - 2a. Leaf blade obovate or oblong-obovate, to 5 cm; petiole 2–3 mm; flowers yellow-green ..... 8. *G. fengii*
  - 2b. Leaf blade elliptic, rarely narrowly obovate-elliptic, to 12 cm; petiole ca. 5 mm; flowers white-green ..... 9. *G. geloniifolium*
- 1b. Disk disciform, not coalescent with ovary, most of ovary immersed in disk; filament very short, less than 1 mm or absent.
  - 3a. Leaf blade margin with coarse spiny teeth.
    - 4a. Leaf blade obovate or elliptic, rarely narrowly elliptic, base broadly cuneate, petiole 2–6 mm ..... 6. *G. ilicifolium*
    - 4b. Leaf blade ovate or oblong-ovate, base cordate, clasping stem, sessile ..... 7. *G. aquifolium*
  - 3b. Leaf blade margin dentate, denticulate, serrate, or nearly entire.
    - 5a. Leaf blade leathery or thickly leathery, adaxial surface plane or when dry with large irregular bullations present.
      - 6a. Capsule pallid, densely maculate, spots small, squarrose; aril crimson ..... 4. *G. longipedicellatum*
      - 6b. Capsule brown or fulvous, rough with minute tubercles; aril yellow ..... 5. *G. sclerocarpum*
    - 5b. Leaf blade papery, thickly papery, or thinly leathery, adaxial surface smooth or rugose due to impressed nerves.
      - 7a. Cymes 4–6 × ramified; peduncle 6–7 cm; petiole 10–20 mm; capsule pallid green, densely muricate, murications small ..... 2. *G. longepedunculatum*
      - 7b. Cymes 1–3 × ramified; peduncle 2–4 cm; petiole 5–12 mm; capsule pallid, maculate, macula squarrose.
        - 8a. Leaf blade oblong, oblong-ovate, or narrowly elliptic; lateral nerves 7–9 pairs ..... 1. *G. feddei*
        - 8b. Leaf blade narrowly oblong or oblong-lanceolate, rarely oblong-elliptic or narrowly obovate; lateral nerves 8–18 pairs ..... 3. *G. rhytidophyllum*

**1. *Glyptopetalum feddei*** (H. Léveillé) Ding Hou, Blumea 12: 59. 1963.

罗甸沟瓣 *luo dian gou ban*

*Euonymus feddei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 13: 260. 1914.

Evergreen shrubs, 1–2 m tall. Petiole slightly thick, 5–8 mm; leaf blade thickly papery or thinly leathery, oblong, oblong-ovate, or narrowly elliptic, 10–22 × 4–8 cm, base broadly cuneate, margin sparsely denticulate or serrate, apex often obliquely acuminate; lateral veins 7–9 pairs, anastomosing at margin, sometimes appearing rugose due to depressed veins. Cymes 1–3 × dichotomously branched; peduncle 2–4 cm, branches 1.5–3 cm; pedicels 4–10 mm; bract and bractlets 3–6 mm. Flowers white-green, 0.8–1 cm in diam.; petals orbicular. Stamens inserted on margin of disciform disk; filament less than 1 mm. Ovary partly immersed in disk. Capsule subglobose, pallid green or yellow-white when dry, 1–1.5 cm in diam., densely

squarrose maculate. Seeds brown, ca. 1.2 cm, ca. 1/2 covered by aril. Fl. Aug–Jun, fr. Sep–Nov.

• Valleys in dense forests; 500–800 m. NW Guangxi (Fengshan, Nandan, Tian'e), S Guizhou (Luodian).

**2. *Glyptopetalum longepedunculatum*** Tardieu, Notul. Syst. (Paris) 14: 47. 1950.

细梗沟瓣 *xi geng gou ban*

Small trees, ca. 5 m tall. Petiole 1–2 cm; leaf blade thickly papery or thinly leathery, oblong, oblong-ovate, or narrowly elliptic, 10–22 × 4–8 cm, base broadly cuneate, margin sparsely denticulate or serrate, apex often obliquely acuminate; lateral veins 7–9 pairs, thin and clear, often depressed adaxially. Cymes 3 or 4 × dichotomously branched; peduncle 6–7 cm, branches 2–3 cm; pedicels 0.8–1.2 cm; bract and bractlets ca. 3 mm. Flowers not seen. Capsule subglobose, 1.2–1.5 cm in diam., pallid, with densely small lamellate tubercles. Seeds crimson, ca. 1/2 covered by aril. Fl. unknown, fr. Oct–Dec.

Valleys in dense forests. Guangxi (Mubian) [Vietnam].

**3. *Glyptopetalum rhytidophyllum*** (Chun & F. C. How) C. Y. Cheng in C. Y. Cheng & P. H. Huang, *Fl. Reipubl. Popularis Sin.* 45(3): 89. 1999.

皱叶沟瓣 *zhou ye gou ban*

*Euonymus rhytidophyllus* Chun & F. C. How, *Acta Phytotax. Sin.* 7: 51. 1958.

Evergreen shrubs, 1.5–3 m tall; branches green, twigs 4-angled. Petiole sturdy, 5–12 mm; leaf blade green when dry, thinly leathery, narrowly oblong, oblong-lanceolate, or narrowly elliptic, 10–18 × 2.5–6.5 cm, base broadly cuneate, margin sparsely denticulate or serrate, apex long acuminate; lateral veins 8–18 pairs, appearing rugose due to depressed veins. Cymes 1 or 2 × dichotomously branched; peduncle 2–4 cm, branches 1.5–3 cm; pedicels 5–8 mm; bractlets subulate, ca. 1.2 cm, persistent. Flowers slightly green; petals broadly obovate. Stamens inserted on margin of disciform disk; filament short; anther diverging. Ovary without style; stigma disciform. Capsule globose, pallid or slightly brown, 1–1.4 cm in diam., squarrose maculate. Seeds brown-red; aril yellow when dry. Fl. Aug–Jun, fr. Sep–Dec.

• Dense forests, forest margins, mountain regions; 600–900 m. Guangxi (Longlin), Yunnan.

**4. *Glyptopetalum longipedicellatum*** (Merrill & Chun) C. Y. Cheng in C. Y. Cheng & P. H. Huang, *Fl. Reipubl. Popularis Sin.* 45(3): 90. 1999.

长梗沟瓣 *chang geng gou ban*

*Euonymus longipedicellatus* Merrill & Chun, *Sunyatsenia* 2: 36. 1934; *E. longipedicellatus* var. *continentalis* Chun & F. C. How; *Glyptopetalum continentalum* (Chun & F. C. How) C. Y. Cheng & Q. S. Ma.

Trees or shrubs, 2–12 m tall, often scandent when growing in dark conditions; twigs sturdy, yellow-green, terete, smooth. Petiole very sturdy, (0.6–)1.2–1.8 cm × 2–3 mm; leaf blade leathery, usually narrowly elliptic, (6–)15–25(–30) cm, base cuneate or broadly cuneate, margin with very shallow teeth or entire, apex acuminate or acute; lateral veins (7–)10–18 pairs, smooth adaxially, slightly prominent and obvious abaxially. Cymes 2 or 3 × dichotomously branched; peduncle 2–5 cm, branches 1–3 cm; pedicels 2–3.5 cm; bract and bractlets subulate, often caducous. Flowers yellow-green, ca. 1.2 cm in diam.; petals broadly obovate. Filament nearly absent. Ovary nearly coalescent with disk; stigma small. Capsule pallid, subglobose or oblate, 1.5–1.8 × 1.8–2.5 cm, densely small squarrose maculate. Aril crimson, covering ca. 1/2 of seed.

• Valley forests, streamsides; 500–600 m. Guangdong, Hainan (Baoting, Lingshui).

**5. *Glyptopetalum sclerocarpum*** (Kurz) M. A. Lawson in J. D. Hooker, *Fl. Brit. India* 1: 613. 1875.

硬果沟瓣 *ying guo gou ban*

*Euonymus sclerocarpus* Kurz, *J. Asiat. Soc. Bengal*, Pt. 2,

*Nat. Hist.* 41: 299. 1872.

Evergreen trees or shrubs, 2–12 m tall, often scandent when growing in dense shade. Petiole sturdy, 8–10 mm, wider than 2 mm in diam.; leaf blade leathery or thickly leathery, narrowly oblong to elliptic, rarely obovate, 12–27 × 4.5–9 cm or smaller, base broadly cuneate to rounded, margin sparsely serrate or entire, apex acuminate or obtuse; lateral veins more than 10 pairs, dense, both surfaces plane, obvious. Cymes 1 or 2 × dichotomously branched, usually 3-flowered; peduncle 2–5 cm; pedicels 1–1.5 cm. Flowers yellow-white; petals slightly thick, obovate. Filament very short; anther diverging. Styles short and thick, elongating in bloom. Capsule subglobose, 1.2–2.2 cm in diam.; pericarp brown or fulvous, very thick and rigid, rough with minute tubercles. Seeds oblong, 1–1.5 × 0.8–1 cm; aril yellow, covering ca. 1/2 of seed. Fl. Aug–Jun, fr. Sep–Dec.

Dense forests, mountain slopes; 900–2500 m. Yunnan [India].

**6. *Glyptopetalum ilicifolium*** (Franchet) C. Y. Cheng & Q. S. Ma in C. Y. Cheng & P. H. Huang, *Fl. Reipubl. Popularis Sin.* 45(3): 92. 1999.

刺叶沟瓣 *ci ye gou ban*

*Euonymus ilicifolius* Franchet, *Bull. Bot. Soc. France* 33: 453. 1886 [“*ilicifolia*”]; *Pragmotessara ilicifolia* (Franchet) Pierre.

Shrubs, 1–4 m tall; branches green. Petioles 2–6 mm; leaf blade thickly leathery, usually pruinose, obovate, elliptic, or narrowly elliptic, 3.5–9 × 2–4 cm, base broadly cuneate, margin sparsely spiny denticulate, apex rounded or acute; lateral veins 5–7 pairs, reaching margin. Cymes usually 3-flowered; peduncle ca. 15 mm; pedicels 1–1.3 cm, median ones slightly longer; bractlets very small, shorter than 1 mm. Flowers slightly purple; calyx 4-lobed; petals broadly rounded. Filament short; anther with enlarged connective. Ovary without style; stigma disciform. Capsule subglobose, 1–1.5 mm in diam., pallid and pale yellowish brown, weakly squarrose maculate. Seeds brown-red, ca. 1 cm, ca. 1/2 covered by aril. Fl. Aug–Jun, fr. Jul–Dec.

• Dense forests, mountain slopes. Guizhou, Sichuan (Puge), NW Yunnan (Lijiang).

**7. *Glyptopetalum aquifolium*** (Loesener & Rehder) C. Y. Cheng & Q. S. Ma in C. Y. Cheng & P. H. Huang, *Fl. Reipubl. Popularis Sin.* 45(3): 93. 1999.

冬青沟瓣 *dong qing gou ban*

*Euonymus aquifolium* Loesener & Rehder in Sargent, *Pl. Wilson.* 1: 484. 1913.

Shrubs, ca. 3 m tall; branches yellow-brown. Leaf blade leathery, ovate or oblong-ovate, 4–7 × 2.5–4.5 cm, base cordate, amplexicaul, margin with clear and irregular large spiny teeth, apex acute or shortly acuminate; lateral veins 6 or 7 pairs, curved. Cymes 1- to several flowered; peduncle 1.8–2.2 cm (infructescent); pedicels 1–1.2 cm, up to 2.5 cm  
only

Fl. China 11: 463–465. 2008.

1-flowered. Flowers not seen. Capsule globose, 6–8 mm in diam., green-white, squarrose maculate. Seeds oblong, brown-purple, ca. 10 mm, more than 1/2 covered by aril. Fl. unknown, fr. Sep–Dec.

• Rocky mountains, cliffs; ca. 2200 m. Sichuan (Ebian, Wa Shan).

**8. *Glyptopetalum fengii*** (Chun & F. C. How) Ding Hou, Fl. Males., Ser. 1, Spermat. 6: 256. 1963.

海南沟瓣 hai nan gou ban

*Euonymus fengii* Chun & F. C. How, Acta Phytotax. Sin. 7: 44. 1958.

Shrubs, to 4 m tall. Petioles short, 2–3 mm; leaf blade thickly papery, obovate or oblong-obovate, 4–7 × 2.5–4.5 cm, base narrowly cuneate, margin entire, apex obtuse, often emarginate; lateral veins not obvious. Cymes usually 3-flowered; peduncle 2–4 cm; branches ca. 1 cm. Flowers yellow-green, 6–8 mm in diam.; petals broadly elliptic, slightly carnose. Stamens inserted on margin of cupuliform disk; filament longer than styles; anther introrse, dorsifixed. Ovary coalescent with thin disk; style absent; stigma capitate. Capsule unknown. Fl. Dec–Feb.

• Lowland forests. Hainan.

**9. *Glyptopetalum geloniifolium*** (Chun & F. C. How) C. Y. Cheng in C. Y. Cheng & P. H. Huang, Fl. Reipubl. Popularis Sin. 45(3): 94. 1999.

白树沟瓣 bai shu gou ban

*Euonymus geloniifolius* Chun & F. C. How, Acta Phytotax. Sin. 7: 45. 1958; *E. geloniifolius* var. *robustus* Chun & F. C. How; *Glyptopetalum geloniifolium* var. *robustum* (Chun & F. C. How) C. Y. Cheng; *G. occultonervatum* R. H. Miao.

Evergreen shrubs, 1–3 m tall. Petioles ca. 5 mm; leaf blade leathery, elliptic, narrowly elliptic, or narrowly obovate-elliptic, 5–12 × 2.5–6 cm, base broadly cuneate, margin crispate, apex obtuse or often emarginate. Cymes 1 or 2 × dichotomously branched; peduncle 2–3 cm, branches 1–1.5 cm; pedicels 1–2 mm. Flowers white-green, ca. 8 mm in diam.; calyx lobes membranous; petals with erose margins. Stamens inserted on margin of cupuliform disk; filament ca. 1.5 mm. Ovary coalescent with disk; style very short; stigma small. Capsule oblate, red, ca. 1.5 cm in diam., squarrose maculate. Seeds brown-purple, ca. 8 mm; aril slightly yellow, partially covering seed. Fl. Jul–Aug, fr. Dec–Feb.

• Sparse forests, mountain slopes, seacoasts, riversides. Guangdong, Guangxi, Hainan.

Fl. China 11: 463–465. 2008.