

### 3. GYNOSTEMMA Blume, Bijdr. 23. 1825.

绞股蓝属 *jiao gu lan shu*

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*Enkylia* Griffith; *Pestalozzia* Zollinger & Moritzi; *Trirostellum* Z. P. Wang & Q. Z. Xie.

Herbs, perennial, scandent, glabrous or pubescent. Leaves alternate, pedate, with 3–9 leaflets, rarely simple; leaflet blade ovate-lanceolate. Tendrils bifurcate, rarely simple. Plants dioecious, rarely monoecious. Flowers unisexual, in racemes or panicles, axillary or terminal; pedicel articulate; bracteole basal. Male flower: calyx tube short, 5-lobed; segments narrowly lanceolate; corolla greenish or white, rotate, deeply 5-lobed; segments lanceolate or ovate-lanceolate, involute in bud; stamens 5, inserted at base of perianth tube; filaments short, connate; anthers erect, ovoid, 2-celled, dehiscence longitudinal; connective narrow, but not extended; pollen grains globose or elliptic, longitudinally striate or smooth, dehiscent by pores; rudimentary pistil absent. Female flowers: calyx and corolla as in male flower; staminodes present; ovary globose, 2–5-locular; styles 3, rarely 2, 4, or 5, free; stigmas 2 or 1 and crescent-shaped and irregularly incised-dentate; ovules 2, pendulous in each locule. Berry globose, in form and size like a pea, or capsule, 3-lobed from top, top umbonulate or with 3 persistent long styles. Seeds 2 or 3, broadly ovate, compressed, with papillae or spiniform papillae.

About 17 species: tropical Asia to E Asia, from the Himalaya to Japan, Malaysia, and New Guinea; 14 species (nine endemic) in China.

- 1a. Capsule campanulate, dehiscent when mature along ventral suture, 3-lobed; persistent styles 3(–5), long rostriform.
  - 2a. Female flowers solitary or paired, axillary, pedicel 3–4 cm; ovary 5-locular, styles 5 ..... 1. *G. pentagynum*
  - 2b. Female flowers numerous, in racemes or panicles, axillary or terminal, pedicel shorter than 5 mm; ovary 3-locular, styles 3.
    - 3a. Female flowers in lax panicle; fruit stalk 8–10 mm ..... 6. *G. laxiflorum*
    - 3b. Female flowers in spiciform racemes; fruit stalk shorter than 5 mm.
      - 4a. Stigma crescent-shaped and irregularly incised-dentate, style 2.5–3 mm, or thick and short, ca. 0.5 mm.
        - 5a. Styles thin and long, 2.5–3 mm; persistent styles up to 5 mm; side of seed not sulcate and without wing ..... 2. *G. yixingense*
        - 5b. Styles short and thick; persistent styles shortly rostriform; seed broadly cordate, margin sulcate and with narrow wing ..... 3. *G. cardiospermum*
      - 4b. Stigma 2-lobed, forked, never crescent-shaped, style shorter than 0.5 mm.
        - 6a. Fruit ca. 3 mm in diam., glabrous, dark punctate; leaves with 5 elliptic leaflets ..... 4. *G. microspermum*
        - 6b. Fruit 5–6 mm in diam., white villous, without dark spots; leaves with 5–7 obovate-elliptic leaflets ..... 5. *G. aggregatum*
  - 1b. Berry globose or depressed-globose, not dehiscent; persistent styles short, umbonate, never rostrate.
    - 7a. Leaves simple ..... 7. *G. simplicifolium*
    - 7b. Leaves compound, pedate.
      - 8a. Stem 3-angled, with narrow wings ..... 14. *G. caulopterum*
      - 8b. Stem cylindrical, with longitudinal striae, but without wings.
        - 9a. Leaves with 3–5 leaflets.
          - 10a. Leaf smooth, glabrous on both surfaces, or with hairs only along midrib; stem with only sparse hairs at nodes; corolla segments narrowly lanceolate, 2–3 mm ..... 8. *G. laxum*
          - 10b. Leaf blade and stem all densely pubescent; corolla segments oblong-elliptic, ca. 2 mm .... 9. *G. "burmanicum"*
        - 9b. Leaves with (3–)5–7(–9) leaflets.
          - 11a. Fruit densely hirsute-pubescent; stem stout ..... 10. *G. pentaphyllum*
          - 11b. Fruit glabrous; stem slender.
            - 12a. Fruit stalk shorter than 5 mm; leaves sparsely to densely pubescent ..... 10. *G. pentaphyllum*
            - 12b. Fruit stalk 7–25 mm.
              - 13a. Plants monoecious; fruit 3-angled-obovoid or 3-angled-oblate ..... 11. *G. guangxiense*
              - 13b. Plants dioecious; fruit globose or obtriangular.
                - 14a. Fruit obtriangular, compressed; leaflets 5–7, elliptic or elliptic-ovate ..... 12. *G. compressum*
                - 14b. Fruit globose; leaflets 7–9, rhombic-elliptic or obovate-lanceolate ..... 13. *G. longipes*

1. *Gynostemma pentagynum* Z. P. Wang, Acta Bot. Yunnan. 五柱绞股蓝 *wu zhu jiao gu lan*

11: 165. 1989.

Plants with short and succulent rootstocks. Stem ca. 2 m or

more, ca. 4 mm in diam., angular, white villous. Tendrils filiform, villous below, gradually glabrescent above, apex bifid. Leaves pedate, with (5–)7 leaflets; petiole 9–13 cm, villous; leaflet blade elliptic, central leaflet ca. 10 cm, both surfaces sparsely pubescent, densely villous along veins, margin irregularly serrate, apex shortly acuminate; petiolule 3–5 mm; lateral leaflet blades gradually smaller and asymmetrical, petiolule shorter; outermost leaflet without petiolule. Plants dioecious. Male flowers numerous in panicle, 3–4 cm, villous; calyx segments narrowly elliptic, ca.  $0.9 \times 0.5$  mm, both surfaces glabrous, apex obtuse; corolla segments ovate, ca.  $4 \times 0.6$  mm, outside glabrous, inside glandular hairy, with obscure midrib, apex filiform-acuminate; filaments ca. 0.2 mm, connective cylindrical. Female flower(s) solitary or 2(or 3) in very short raceme; peduncles 2–3 mm; pedicels up to 4 cm; calyx and corolla as in male flowers; staminodes absent; gynoecium with (4 or)5 carpels; ovary densely pubescent and glandular pubescent, (4 or)5-locular, each locule with 1 ovule; styles (4 or)5, divaricate; stigmas 2, explanate. Fruit immature. Fl. Jul.

• Evergreen broad-leaved forests, moist mountains. NW Hunan (Dayong).

**2. *Gynostemma yixingense*** (Z. P. Wang & Q. Z. Xie) C. Y. Wu & S. K. Chen, Acta Phytotax. Sin. 21: 364. 1983.

喙果绞股蓝 hui gu jiao gu lan

*Trirostellum yixingense* Z. P. Wang & Q. Z. Xie, Acta Phytotax. Sin. 19: 483. 1981; *T. yixingense* var. *trichocarpum* J. N. Ding.

Plants to over 10 m. Stem slender, angular-sulcate, villous only at nodes. Leaves membranous, pedately 5–7-foliolate; petiole 3–6 cm; leaflets elliptic, median leaflets 4–8 cm, lateral leaflets smaller, veins pubescent, base cuneate, margin crenate, apex acuminate; petiolule ca. 5 mm. Tendrils filiform, simple. Male flowers in panicle; rachis 9–12 cm, sparsely pubescent; calyx segments elliptic-lanceolate,  $1-1.5 \times ca. 0.5$  mm, apex obtuse; corolla pale green; segments ovate-lanceolate, 2–2.5 mm, caudate-acuminate; filaments connected; anthers ca. 0.2 mm. Female flowers fasciculate in axils of leaves; calyx and corolla as in male flowers; ovary subglobose, 1.5–2 mm in diam., sparsely puberulent; styles 3, 2.5–3 mm; stigmas half-moon-shaped, margin dentate; staminodes 5, subulate. Capsule campanulate, ca.  $5 \times 8$  mm, glabrous, apex truncate. Seeds broadly cordate, ca.  $3 \times 4$  mm. Fl. Aug–Sep, fr. Sep–Oct.

• Forests, thickets; below 100 m. Anhui, S Jiangsu, Zhejiang.

One of us (Jeffrey) treats *Gynostemma laxiflorum* as a synonym of this species.

**3. *Gynostemma cardiospermum*** Cogniaux ex Oliver, Hooker's Icon. Pl. 23: t. 2225. 1892 [*"cardiosperma"*].

心籽绞股蓝 xin zi jiao gu lan

*Trirostellum cardiospermum* (Cogniaux ex Oliver) Z. P. Wang & Q. Z. Xie.

Herbs, scandent. Stem slender, angular-sulcate, glabrous. Leaves pedately 3–7-foliolate; petiole 2.5–5 cm; leaflets lanceolate or oblong-elliptic, median leaflets 4–10 cm, lateral leaflets

shorter, glabrous or setose only on veins, base attenuate, margin irregularly crenate, apex acuminate. Tendrils slender, 2-fid. Male flowers in a panicle; rachis slender; calyx segments oblong-lanceolate, acute; corolla segments lanceolate, 1-veined, caudate-acuminate; anthers ovoid, 1-celled. Female flowers in a raceme; calyx and corolla as in male flowers; ovary globose, villous; ovules 2; styles 3, ca. 0.5 mm; stigmas half-moon-shaped, margin dentate. Capsule globose or subcampanulate, ca. 8 mm in diam., apex truncate. Seeds broadly cordate, 4.2–5 mm in diam., slightly compressed, both surfaces rugose-verrucose, margin narrowly winged. Fl. Jun–Aug, fr. Aug–Oct.

• Forests and thickets on mountain slopes; (1400–)1900–2300 m. W Hubei, S Shaanxi, Sichuan.

**4. *Gynostemma microspermum*** C. Y. Wu & S. K. Chen, Acta Phytotax. Sin. 21: 364. 1983 [*"microsperma"*].

小籽绞股蓝 xiao zi jiao gu lan

Stem slender, angular-sulcate, glabrous or pubescent at nodes. Leaves pedately 5-foliolate; petiole ca. 2 cm, glabrous; leaflets elliptic, median leaflets  $3-4 \times 1.5-2$  cm, lateral leaflets smaller, thinly papery, adaxially pubescent, base obtuse, margin irregularly crenate, apex obtuse, cuspidate. Tendrils filiform, 2-fid, glabrous. Flowers unknown. Infructescence racemose, dense. Capsule yellow-green, dark punctate, globose, ca. 3 mm in diam., glabrous, apex truncate, dehiscent, 1- or 2-seeded. Seeds brown, broadly cordate, compressed, ca.  $2.5 \times 2$  mm, less than 1 mm thick, papillose. Fr. Dec.

Dense forests; 800–1400 m. S Yunnan [N Thailand].

**5. *Gynostemma aggregatum*** C. Y. Wu & S. K. Chen, Acta Phytotax. Sin. 21: 365. 1983.

聚果绞股蓝 ju gu jiao gu lan

Stem slender, angular-sulcate, glabrous or pubescent at nodes. Leaves pedately 5–7-foliolate; petiole 2–2.5 cm, glabrous; leaflets obovate-elliptic, median leaflets  $3-3.5 \times ca. 1.5$  cm, lateral leaflets smaller, membranous, abaxially glabrous, adaxially sparsely pubescent, lateral veins 6–9 pairs, base obtuse, margin crenate, apex obtuse-rounded, cuspidate; petiolule 2–5 mm, glabrous. Tendrils filiform, 2-fid. Male flowers unknown. Female flowers in a small 3- or 4-flowered panicle; bracts capillary; calyx segments very small, subulate; corolla segments lanceolate, ca. 1 mm, apex shortly acuminate; ovary globose, ca. 1 mm in diam., villous; styles 3, free, ca. 0.75 mm; stigma 2-lobed. Capsules aggregated in a dense 1.5–2 cm spike; fruit broadly campanulate, ca. 5 mm in diam., white pubescent, apex truncate. Seeds gray-brown, ovoid, ca.  $3 \times 2$  mm, ca. 1 mm thick, verruculose, margin dentate. Fl. Jul–Aug, fr. Sep–Oct.

• *Pinus* forests, mixed forests; 2300–2700 m. NW Yunnan.

**6. *Gynostemma laxiflorum*** C. Y. Wu & S. K. Chen, Acta Phytotax. Sin. 21: 366. 1983.

疏花绞股蓝 shu hua jiao gu lan

Stem slender, angular-sulcate, glabrous or puberulent at nodes. Leaves pedately 5-foliolate; petiole ca. 3 cm; leaflets

oblong-lanceolate, median leaflets ca. 4 × 1.5 cm, lateral leaflets smaller, membranous, abaxially glabrous, adaxially sparsely puberulent, base obtuse, margin dentate, apex acuminate. Tendrils simple, glabrous. Male flowers unknown. Female flowers: inflorescence a sparse panicle, axillary or terminal, 2–5 × 1.5–2.5 cm, rachis and branches glabrous; pedicel filiform, 4–5 mm; bracts linear; calyx segments oblong-lanceolate, ca. 1.75 × 0.5 mm, glabrous, apex shortly acuminate; corolla segments ovate-lanceolate, ca. 2.5 × 1 mm, puberulent or glabrescent, apex caudate-acuminate; staminodes 5, terete; ovary globose, ca. 2 mm in diam., pubescent; styles 3, ca. 1.5 mm, base puberulent; stigma luniform, irregularly 3–5-dentate. Fruiting pedicel 8–10 mm, glabrous; capsule campanulate, 6–7 mm, glabrous, apex truncate, 3-rostrate, beak 2–3 mm, dehiscent, 2- or 3-seeded. Seeds brown, broadly cordate, ca. 2 × 2.5 mm, ca. 1.5 mm thick, papillate. Fl. and fr. Nov–Dec.

- Mountain slopes; below 300 m. S Anhui.

One of us (Jeffrey) treats this taxon as a synonym of *Gynostemma yixingense*.

**7. *Gynostemma simplicifolium*** Blume, Bijdr. 24. 1825 [“*simplicifolia*”].

单叶绞股蓝 dan ye jiao gu lan

*Gynostemma pentaphyllum* (Thunberg) Makino f. *simplicifolium* (Blume) W. J. de Wilde & Duyfjes.

Stem slender, branched, angular-sulcate, pubescent. Leaves simple; leaf blade ovate, 10–15 × 8–9 cm, papery, abaxially glabrous, adaxially puberulent only on veins, basal veins 7–9, base rounded to slightly cordate, margin crenate, apex acuminate; petiole 4–6 cm, pubescent. Tendrils 2-fid. Male flowers: inflorescence paniculate; peduncle filiform, 10–25 cm, pubescent; pedicels filiform, 0.5–2 mm; calyx segments oblong-lanceolate, 0.5–1 mm, puberulent, apex obtuse; corolla pale green-white or pale green-yellow; segments oblong, ca. 3 × 0.7–1 mm, 1-veined, apex obtuse. Fruit pale yellow-green, black when mature, globose, 7–8 mm in diam. Seeds broadly ovate, ca. 4 × 3.5 mm, compressed, verrucose, base rounded, apex acute.

Forests; 1300–1400 m. Hainan, S Yunnan [India, Indonesia, Malaysia, Myanmar, Philippines].

One of us (Jeffrey) treats this taxon as a synonym of *Gynostemma pentaphyllum*.

**8. *Gynostemma laxum*** (Wallich) Cogniaux in A. Candolle & C. Candolle, Monogr. Phan. 3: 914. 1881.

光叶绞股蓝 guang ye jiao gu lan

*Zanonía laxa* Wallich, Pl. Asiat. Rar. 2: 29. 1831; *Alsomitra laxa* (Wallich) M. Roemer; *Gynostemma crenulatum* Ridley; *Pestalozzia laxa* (Wallich) Thwaites; *Z. wightiana* Arnott.

Stem slender, much branched, glabrous or sparsely puberulent. Leaves pedately 3-foliolate; petiole 1.5–4 cm, glabrous; median leaflet oblong-lanceolate, sometimes rhombic, 5–10 × 2–3 cm, papery, base broadly cuneate, apex acute or shortly acuminate; lateral leaflets ovate, 4–7 × 2–3.5 cm, glabrous, margin undulate-crenate; petiolule (2–)5–7 mm. Male

flowers: inflorescence paniculate, terminal or axillary, (5–)10–30 cm, pubescent; bracts subulate-lanceolate, ca. 1 mm; pedicels filiform, 3–7 mm; bracteole subulate, small; calyx segments narrowly triangular-ovate, ca. 0.5 mm; corolla yellow-green; segments narrowly ovate-lanceolate, ca. 1.5 × 0.5 mm, glabrous, 1-veined, entire, acuminate at apex. Female inflorescence as male flowers; corolla segments narrowly triangular; ovary globose, ca. 1 mm in diam.; styles 3, free, apex 2-fid. Fruit yellow-green, globose, 8–10 mm, glabrous, indehiscent. Seeds pale gray, broadly ovate, ca. 4 mm in diam., compressed, both surfaces papillate, base rounded, apex acute. Fl. Aug, fr. Aug–Sep.

Dense forests in valleys. Guangxi, Hainan, SE Yunnan [India, Indonesia, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam].

One of us (Jeffrey) would treat this taxon as a synonym of *Gynostemma pentaphyllum*.

**9. *Gynostemma “burmanicum”*** King ex Chakravarty, Indian J. Agric. Sci. 16(1): 86. 1946 [“*Gynostemma burmanica*”].

缅甸绞股蓝 mian dian jiao gu lan

Stem angular-sulcate, densely pubescent at nodes. Leaves papery, 3-foliolate, both surfaces hispidulous; petiole 3–6.5 cm, densely pubescent; median leaflet rhombic, (6–)8–12 × 3–5.5 cm, base broadly cuneate, margin crenate, apex shortly acuminate; lateral leaflets 4–9 × ca. 4 cm, outside subovate, base rounded, inside sublanceolate or oblanceolate, base attenuate, lateral veins 8 or 9; median petiolule 5–6 mm; lateral leaflets subsessile. Tendrils 2-fid. Male flowers in panicle; calyx segments oblong, ca. 0.75 × 0.3 mm, apex obtuse; corolla green; segments ± elliptic, apex acute or shortly acuminate; stamens ca. 1 mm, glabrous. Female flowers unknown. Fruit green, baccate, globose, 5–10 mm in diam., glabrous, 3-seeded. Seeds pale brown, broadly ovate, ca. 3(–5) × 3 mm, ca. 2 mm thick, compressed, both surfaces papillate, base subrounded, edges with furrow.

Open forests or thickets, forests in mountain valleys; 600–1300 m. S and SE Yunnan [Myanmar, Thailand].

One of us (Jeffrey) considers this species and its varieties, the names of which have never been validly published, to represent densely hairy variants of *Gynostemma pentaphyllum*. The name *G. “burmanicum”* was not validly published by Chakravarty (loc. cit.) because no Latin description or diagnosis was provided (*Vienna Code*, Art. 36.1); as a result, the name *G. “burmanicum var. molle”* was not validly published either (Art. 43.1). A subsequent publication of the species name (Chakravarty, Rec. Bot. Surv. India 17(1): 190. 1959) again failed to provide a Latin description or diagnosis and did not indicate a type.

- 1a. Fruit 5–6 mm in diam.; seeds 3(–3.5) mm ..... 9a. var. “*burmanicum*”
- 1b. Fruit 8–10 mm in diam.; seeds ca. 5 mm ..... 9b. var. “*molle*”

**9a. *Gynostemma “burmanicum var. burmanicum”***

缅甸绞股蓝(原变种) mian dian jiao gu lan (yuan bian zhong)

Fruit 5–6 mm in diam.; seeds 3(–3.5) mm.

Open forests and thickets; 800–1200 m. S Yunnan [Myanmar, Thailand].

**9b. *Gynostemma "burmanicum" var. molle*** (C. Y. Wu, Acta Phytotax. Sin. 21: 360. 1983).

大果绞股蓝 da guo jiao gu lan

Fruit 8–10 mm in diam.; seeds ca. 5 mm.

• Forests in mountain valleys or open forests; 600–1300 m. S and SE Yunnan.

**10. *Gynostemma pentaphyllum*** (Thunberg) Makino, Bot. Mag. (Tokyo) 16: 179. 1902.

绞股蓝 jiao gu lan

Stem and branches slender, angular-sulcate, glabrous or sparsely pubescent. Leaves pedately 3–9-foliolate, usually 5–7-foliolate, membranous or papery, pubescent or glabrous; leaflets ovate-oblong or lanceolate, median leaflets 3–12 × 1.5–4 cm, lateral leaflets smaller, both surfaces sometimes hispid, lateral veins 6–8 pairs, base attenuate, margin crenate, apex acute or shortly acuminate; petiolule 1–5 mm. Tendrils filiform, 2-fid. Male flowers in panicle; peduncle filiform, 10–15(–30) cm, many branched; pedicels filiform, 1–4 mm; bracteole subulate; calyx tube very short; segments triangular, ca. 0.7 mm, apex acute; corolla pale green or white; segments ovate-lanceolate, 2.5–3 × ca. 1 cm, 1-veined, apex long acuminate. Female flowers: panicle shorter than that of male flowers; calyx and corolla as in male flowers; ovary globose, 2- or 3-loculed; styles 3; stigmas 2-lobed; staminodes 5, short. Fruit indehiscent, black when mature, globose, 5–6 mm in diam., 2-seeded, glabrous or densely hispid and pubescent. Seeds brown, ovate-cordate, ca. 4 mm in diam., compressed, both surfaces papillose, base cordate, apex obtuse. Fl. Mar–Nov, fr. Apr–Dec.

Forests, thickets or roadsides on mountain slopes; 300–3200 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Bangladesh, Bhutan, India, Indonesia, S Japan, S Korea, Laos, Malaysia, Myanmar, Nepal, New Guinea, Sri Lanka, Thailand, Vietnam].

1a. Fruit glabrous ..... 10a. var. *pentaphyllum*

1b. Fruit densely hispid and pubescent ..... 10b. var. *dasycarpum*

**10a. *Gynostemma pentaphyllum* var. *pentaphyllum***

绞股蓝(原变种) jiao gu lan (yuan bian zhong)

*Vitis pentaphylla* Thunberg in Murray, Syst. Veg., ed. 14, 244. 1784; *Alsomitra cissoides* M. Roemer; *Enkylia digyna* Griffith; *E. trigyna* Griffith; *Gomphogyne alleizettei* Gagnepain; *Gynostemma pallidinerve* Z. Zhang; *G. pedatum* Blume; *G. pedatum* var. *hupehense* Pampanini; *G. pedatum* var. *pubescens* Gagnepain; *G. pedatum* var. *trifoliatum* Hayata; *G. pubescens* (Gagnepain) C. Y. Wu; *G. siamicum* Craib; *G. zhejiangense* X. J. Xue; *Pestalozzia pedata* (Blume) Zollinger & Moritz; *V. mairei* H. Léveillé (1912), not H. Léveillé (1909); *V. martini* H. Léveillé & Vaniot; *Zanonia pedata* (Blume) Miquel.

Fruit glabrous.

Forests, thickets or roadsides on mountain slopes; 300–3200 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Bangladesh, India, Indonesia, S Japan, S Korea, Laos, Malaysia,

Myanmar, Nepal, New Guinea, Sri Lanka, Vietnam].

One of us (Jeffrey) would treat "*Gynostemma burmanicum*," *G. laxum*, and *G. longipes* as synonyms of *G. pentaphyllum* var. *pentaphyllum*.

**10b. *Gynostemma pentaphyllum* var. *dasycarpum*** C. Y. Wu, Acta Phytotax. Sin. 21: 362. 1983.

毛果绞股蓝 mao guo jiao gu lan

*Gynostemma pentaphyllum* f. *dasycarpum* (C. Y. Wu) W. J. de Wilde & Duyfjes.

Fruit densely hispid and pubescent.

Forests; 1400–1700 m. S Yunnan [Indonesia (Borneo), Myanmar, Thailand].

**11. *Gynostemma guangxiense*** X. X. Chen & D. H. Qin, Acta Bot. Yunnan. 10: 495. 1988.

广西绞股蓝 guang xi jiao gu lan

Stems slender, glabrous, striate and sulcate. Tendrils filiform, apex bifid. Leaves alternate, pedate, with (3–)5–7 leaflets; petiole 4–8 cm, glabrous; leaflet blade ovate-elliptic or obovate, central leaflets 3–4.5 × 1.5–2.5 cm, lateral leaflets smaller, slightly oblique, membranous, glabrous or with sparse pubescence along midrib and lateral veins on both surfaces, base cuneate, margin serrate, apex shortly acuminate or obtuse; petiolule 3–5 mm. Plants monoecious. Male flowers greenish, ca. 2 m in diam., in axillary panicles 3–5 cm; peduncle filiform, 8–15 mm, glabrous; bracteoles subulate, ca. 1.5 mm; pedicels filiform, 2–3 mm; calyx segments deltoid, ca. 0.5 × 0.4 mm; corolla segments lanceolate, 1–1.5 × ca. 0.5 mm; filaments very short; anthers ovoid. Female flowers few, cymose; peduncle slender, 6–14 mm, glabrous; pedicels 7–15 mm; calyx segments lanceolate, ca. 1 × 0.3 mm; corolla segments lanceolate, ca. 2.5 × 0.5 mm, apex caudate-acuminate; ovary 2- or 3-locular, each locule with 1 ovule; styles 2 or 3, slightly connate at base; stigmas slightly bifid. Fruit greenish, obovate-triangular or 3-angled-oblate, 4–5 × 5–6 mm, apex truncate, with persistent perianth and styles, glabrous; fruit stalk filiform, 7–18 mm. Seeds 2 or 3, cream colored, oblong or subglobose, ca. 2.5 × 2.2 mm, verruculose. Fl. Oct, fr. Nov–Dec.

• Forests on limestone mountains. Guangxi (Daxin, Longzhou).

**12. *Gynostemma compressum*** X. X. Chen & D. R. Liang, Guihaia 11: 13. 1991.

扁果绞股蓝 bian guo jiao gu lan

Stems slender, sulcate, glabrous. Tendrils filiform, apex usually bifid. Leaves pedate, with 7 leaflets; petiole 5–12 cm, glabrous; leaflets abaxially gray-green, adaxially green, elliptic or elliptic-ovate, membranous, base cuneate, margin crenulate, apex acuminate or acute, abaxially sparsely puberulent along midrib and lateral veins, adaxially sparsely pilose, middle leaflets 3.6–6.5 × 2–2.25 cm, lateral leaflets smaller, outside oblique; petiolule 3–5 mm. Plants dioecious. Male flowers in panicles, axillary, 2–5 cm; peduncle filiform, 8–16 mm, glabrous; bracteoles subulate, ca. 1.5 mm; pedicels 2–5 mm; flowers greenish, ca. 1.5 mm in diam.; calyx segments trian-

gular, ca.  $0.8 \times 0.5$  mm; filaments very short, connate; anthers ovoid. Female flowers solitary or paired, axillary; peduncle filiform, 5–9 mm, glabrous; pedicels 5–10 mm; calyx segments ca.  $1.3 \times 0.4$  mm; corolla segments linear-lanceolate,  $2-3 \times$  ca. 0.4 mm, apex caudate-acuminate; ovary 2-locular, each locule with 1 ovule; styles 2, free; stigmas bifid. Fruit baccate, compressed, obtriangular,  $5-8 \times 5-7$  mm, glabrous, apex with persistent perianth and styles; fruit stalk filiform, 1.3–2.5 cm. Seeds brownish, obtriangular, ca. 3 mm, apex ca. 3.5 mm in diam., both surfaces tuberculate, margin crenate and sulcate. Fl. Mar–Apr, fr. Mar–May.

• Forests, moist limestone foothills; below 400 m. Guangxi (Longzhou).

This species is used in Chinese herbal medicine by the people of Guangxi.

**13. *Gynostemma longipes*** C. Y. Wu, Acta Phytotax. Sin. 21: 362. 1983.

长梗绞股蓝 chang geng jiao gu lan

Stem pubescent. Leaves papery, pedately 7–9-foliolate; petiole 4–8 cm; leaflets rhombic-elliptic or obovate-lanceolate, median leaflets  $5-12 \times 2-4.5$  cm, base attenuate, margin irregularly crenate, apex shortly acuminate; lateral leaflets smaller than median leaflets, apex obtuse, abaxially hispid-pubescent on veins, adaxially sparsely pubescent; petiolule ca. 1 cm. Tendrils slender, 2-fid. Male flowers: panicle 10–20 cm, rachis and branches pubescent; bracts linear, ca. 2 mm; pedicel filiform, ca. 4 mm; bracteole linear, ca. 0.7 mm; calyx segments ovate, ca.  $1 \times 0.5$  mm, acute; corolla white; segments narrowly ovate-lanceolate, ca.  $2.5 \times 1$  mm, pubescent, 1-veined, apex long acuminate. Female flowers unknown. Fruit yellow-green, globose, 6–7 mm in diam., glabrous; fruiting pedicel filiform, (8–)15–20 mm, glabrous. Seeds pale gray or brown, compressed cordate, ca.  $3 \times 3$  mm, ca. 1 mm thick.

• Forests on valley sides; 1400–3200 m. Guangxi, Guizhou, S Shaanxi, W Sichuan, NE and NW Yunnan.

One of us (Jeffrey) treats this taxon as a synonym of *Gynostemma pentaphyllum*.

**14. *Gynostemma caulopterum*** S. Z. He, Acta Phytotax. Sin. 34: 207. 1996.

翅茎绞股蓝 chi jing jiao gu lan

Stem stout, 4–10 m high, 5–10 mm in diam., branched, 3-angled, angles winged, wings 1.5–3 mm wide, glabrous or sparsely puberulent at nodes. Tendrils filiform, apex bifid. Leaves pedate, 7-foliolate; petiole 5–8 cm, glabrous; leaflets rhombic-elliptic or obovate-elliptic, papery, abaxially glabrous, adaxially pilose, base cuneate, margin serrate, apex acuminate, mucronate; central leaflet  $6-12 \times 2-4$  cm, lateral leaflets smaller. Plants dioecious. Male flowers in axillary panicles, 7–9 cm; bracteoles linear, ca. 1.5 mm; flowers ca. 2 mm in diam.; pedicels 2–2.5 mm; calyx segments triangular, ca.  $0.8 \times 0.5$  mm; corolla segments ovate-lanceolate, ca.  $1.5 \times 1$  mm; filaments very short, connate; anthers ovoid. Female flowers in axillary or terminal panicles,  $1.5-3.5 \times 1.2-1.8$  cm, glabrous; pedicel 1–1.5 mm; basal bract 1, linear; calyx 5-lobed; segments triangular, ca.  $0.5 \times 0.4$  mm; corolla 5-parted; segments lanceolate, ca.  $2 \times 0.5$  mm, apex acuminate; ovary compressed globose, ca. 1.5 mm in diam., 2-locular, each locule with 1 ovule; styles 2, free; stigmas 3-fid. Berry greenish, compressed globose,  $2.5-3 \times 5.5-6$  mm, glabrous, with persistent corolla and styles; fruit stalks filiform, 3–6 mm. Seeds 2, cream colored, broadly cordate, ca.  $2 \times 3$  mm, spiniform-tuberculate. Fl. and fr. Sep–Nov.

• Moist places along small stream valleys; 400–700 m. Guizhou (Renhuai, Ziyun).

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