

## 7. TOXOCARPUS Wight & Arnott in Wight, Contr. Bot. India 61. 1834.

弓果藤属 *gong guo teng shu*

*Schistocodon* Schauer.

Shrubs or woody lianas, villous or rusty tomentose, rarely glabrous. Cymes axillary, umbel-like. Sepals small, sometimes with minute basal glands. Corolla usually yellow or yellowish, rotate or rarely campanulate; tube very short; lobes patent-reflexed, overlapping to left, rarely to right. Corona lobes 5, inserted at back of gynostegium, dorsally compressed, slightly exceeding stamens. Anthers small, retuse, sometimes with minute apical appendages appressed to stigma head; pollinia 4 on each pollinarium, erect or horizontal. Styles short; stigma head exerted beyond anthers, beaked or swollen. Follicles divaricate, terete, usually villous. Seeds flat, beaked; coma white.

About 40 species: tropical Asia, Africa, and Pacific Islands; ten species in China.

The separation of *Toxocarpus* from *Secamone* seems to be somewhat arbitrary, and some authorities favor combining them. *Goniostemma* and *Genianthus* are also closely related and also sometimes included (see Forster & Harold, *Austrobaileya* 3: 69–78. 1989).

- 1a. Corolla lobes ovate, ca. 2.5 mm; stigma head capitate ..... 10. *T. aurantiacus*
- 1b. Corolla lobes oblong or oblong-lanceolate, 5–10 mm; stigma head long beaked or fusiform.
  - 2a. Leaves reddish brown villous to tomentose, at least abaxially when young.
    - 3a. Leaf blade broadly ovate to ovate-elliptic; corolla glabrous ..... 7. *T. fuscus*
    - 3b. Leaf blade elliptic or elliptic-oblong; corolla tube villous inside.
      - 4a. Leaf blade elliptic, glabrescent, lateral veins 3–5 pairs ..... 8. *T. himalensis*
      - 4b. Leaf blade elliptic-oblong, densely rusty villous abaxially, lateral veins 6–8 pairs ..... 9. *T. villosus*
  - 2b. Leaves glabrous or puberulent.
    - 5a. Stigma head long beaked.
      - 6a. Inflorescences 7–10 cm; petiole 1.5–2 cm ..... 6. *T. patens*
      - 6b. Inflorescences 2–3 cm; petiole 0.8–1.2 cm.
        - 7a. Leaf blade 4–5.5 × 1–2.2 cm, lateral veins 3 or 4 pairs ..... 4. *T. paucinervius*
        - 7b. Leaf blade 11–15 × 5–7 cm, lateral veins 5–8 pairs ..... 5. *T. wangianus*
    - 5b. Stigma head fusiform or top-shaped.
      - 8a. Leaves drying brownish; stigma head hirsute; inflorescences longer than leaves, 8–10 cm ..... 3. *T. laevigatus*
      - 8b. Leaves drying green; stigma head glabrous; inflorescences shorter than leaves, less than 6 cm.
        - 9a. Leaf blade 6.5–8.5 × 3.5–5.2 cm; inflorescences 2–4 cm; flowers brown or deep yellow ..... 2. *T. hainanensis*
        - 9b. Leaf blade 3.5–6 × 1.5–4.5 cm; inflorescences up to 2 cm; flowers pale yellow ..... 1. *T. wightianus*

**1. *Toxocarpus wightianus*** Hooker & Arnott, Bot. Beechey Voy. 200. 1837.

弓果藤 *gong guo teng*

*Schistocodon meyenii* Schauer; *Secamone wightiana* (Hooker & Arnott) K. Schumann; *Toxocarpus ovalifolius* Tsiang.

Lianas slender, to 8 m. Branchlets tawny brown puberulent, lenticellate. Petiole 1–1.5 cm, rusty tomentose; leaf blade elliptic or elliptic-oblong to ovate-orbicular, 2.5–6 × 1.5–4.5 cm, subleathery, glabrous, base rounded to subcordate, apex acute to rounded or submarginate, apiculate to cuspidate; lateral veins 5–8 pairs. Cymes umbel-like, to 10-flowered, much shorter than leaves; peduncle to ca. 6 mm, rusty pubescent. Pedicel ca. 3 mm, minutely villous. Sepals ovate-oblong, membranous, rusty tomentose. Corolla yellow-ish, rotate, glabrous; tube ca. 2 × 3 mm; lobes narrowly lanceolate, ca. 8 × 1–2 mm. Corona lobes triangular, ca. 2 mm, obtuse. Pollinia minute. Stigma head fusiform. Follicles narrow; lobes lanceolate, ca. 6 × 2 mm. Corona lobes 5, reddish, apex 2-cleft, with a short adaxial appendage. Anther appendages orbicular, pollinia elliptic. Stigma head fusiform, tapering to a slender point, twice as long as anthers. Fl. Apr-Jul.

rowly lanceolate in outline, 8–9 × ca. 1 cm, divaricate at 180–200°, densely rusty tomentose, pericarp thick. Seeds ovate-oblong, ca. 10 × 3–5 mm, not beaked; coma ca. 3 cm. Fl. Jun-Aug, fr. Oct-Dec.

Open forests, bushland; 100–600 m. Guangdong, Guangxi, Guizhou, Hainan, Yunnan [India, Vietnam].

All parts are used externally for the treatment of traumatic injury and boils.

**2. *Toxocarpus hainanensis*** Tsiang, *Sunyatsenia* 4: 69. 1939.

海南弓果藤 *hai nan gong guo teng*

Lianas to 6 m. Branchlets tawny brown, lenticellate. Petiole 1–3 cm, rusty pubescent; leaf blade elliptic, 6.5–8.5 × 3.4–5.2 cm, subleathery, adaxially glabrous, abaxially rusty puberulent, soon glabrescent, base cuneate, apex acuminate; lateral veins 5–7 pairs. Cymes shorter than leaves, 3–9-flowered, fragrant, rusty tomentose; peduncle 2–4 cm. Pedicel 3–5 mm. Calyx glands 5. Corolla yellow or brown; tube ca. 4 × 3

• Humid open woods along valleys; 100–600 m. Hainan.

**3. *Toxocarpus laevigatus*** Tsiang, *Sunyatsenia* 4: 70. 1939.

平滑弓果藤 ping hua gong guo teng

Lianas to 5 m. Branchlets glabrous, lenticellate. Petiole 1–1.5 cm, puberulent; leaf blade elliptic or oblong, 8–12.5 × 1.5–5.2 cm, base obliquely auriculate, apex short acuminate, glabrous, drying brownish; lateral veins 5–8 pairs. Cymes 8–10 × 5–15 cm, many flowered; peduncle yellow pubescent. Pedicel ca. 2 mm. Sepals puberulent, glands absent. Corolla yellowish white, ca. 5 mm, tube ca. 1/4 as long; lobes oblong. Corona lobes ovate-elliptic, apex retuse, with a short adaxial appendage. Anther appendages apiculate. Stigma head top-shaped, hirsute, twice as long as anthers. Fl. May.

- Dense woods. Hainan.

**4. *Toxocarpus paucinervius*** Tsiang, Sunyatsenia 6: 129. 1941.

凌云弓果藤 ling yun gong guo teng

Lianas to 5 m. Branchlets tawny brown, densely pubescent at nodes. Petiole 0.8–1.2 cm; leaf blade obovate to oblanceolate, 4–5.5 × 1–2.2 cm, glabrescent or abaxially puberulent, base cuneate-auriculate, apex apiculate; lateral veins 3 (or 4) pairs, at ± 90° to midvein. Cymes shorter than leaves, rusty tomentose. Flower buds acuminate. Pedicel 2–3 mm. Sepals lanceolate, 2.5–3 × ca. 1 mm. Corolla puberulent outside; tube ca. 3 mm; lobes oblong, ca. 6 × 3 mm. Corona lobes ovate, apex acute. Anther appendages acute. Stigma head long beaked. Follicles linear-lanceolate in outline, ca. 9 cm × 5 mm, rusty tomentose to glabrous. Seeds ovate-oblong, ca. 10 × 5 mm, apex short beaked; coma ca. 2 cm. Fl. Apr-Jun, fr. Aug-Nov.

- Forests; 800 m. Guangxi, Yunnan.

**5. *Toxocarpus wangianus*** Tsiang, Sunyatsenia 4: 100. 1939.

澜沧弓果藤 lan cang gong guo teng

Lianas to 6 m. Branchlets glabrescent. Petiole ca. 1 cm; leaf blade ovate-oblong to subelliptic, 11–15 × 5–7 cm, papery, adaxially glabrous, abaxially rusty puberulent, base rounded and obscurely auriculate, apex acuminate; lateral veins 7 or 8 pairs. Cymes 2–3 cm, rusty tomentose. Sepals ovate-lanceolate, ca. 2 mm. Corolla ca. 1 cm, glabrous; lobes oblong, ca. 5 mm. Corona lobes flat. Anthers longer than corona, appendages ligulate. Stigma head long beaked. Follicles linear-lanceolate, ca. 12 cm × 5 mm, rusty pubescent. Fl. May, fr. Aug.

- Forests along valleys; 1500 m. Guizhou, Yunnan.

**6. *Toxocarpus patens*** Tsiang, Sunyatsenia 6: 128. 1941.

广花弓果藤 guang hua gong guo teng

Lianas to 5 m, glabrescent except for flowers. Branchlets slightly lenticellate. Petiole 1.5–2 cm; leaf blade elliptic, 9–10 × 4–4.5 cm, papery, drying brownish, both ends acute; lateral veins 5 or 6 pairs, arcuate ascending. Cymes dichotomous, lax, slightly shorter than leaves, rusty tomentose to glabrous.

Sepals ovate, ca. 2 × 1 mm. Corolla membranous, glabrous outside; tube ca. 4 × 3 mm, villous inside; lobes ligulate-falcate, ca. 5 × 1 mm. Corona lobes ovate, shorter than anthers, apex acuminate. Pollinia obovate. Stigma head long beaked. Fl. May.

- Mixed woods. Hainan.

Klackenberg (in litt.) suggests that *Toxocarpus patens* may not be separable from *T. hainanensis*.

**7. *Toxocarpus fuscus*** Tsiang, Sunyatsenia 4: 81. 1939.

锈毛弓果藤 xiu mao gong guo teng

Lianas to 5 m. Young branchlets rusty pubescent, glabrescent and lenticellate with age. Petiole ca. 2.5 cm, rusty tomentose; leaf blade broadly ovate-oblong, 9–15 × 5–5.8 cm, papery, adaxially glabrous except for rusty hairs along midvein, abaxially rusty pubescent, base rounded, apex acute or short acuminate; lateral veins 5–7 pairs. Cymes to 8.5 cm, shorter than leaves, few branched, 12–20-flowered, rusty pubescent; peduncle less than 1 cm. Flower buds long acuminate. Pedicel ca. 5 mm. Sepals lanceolate, ca. 3 mm. Corolla yellow, ca. 9 mm, glabrous; lobes oblong-lanceolate. Corona lobes ovate, longer than anthers, apex acute. Stigma head long beaked. Fl. May.

- Open montane woods. Guangdong, Guangxi, Yunnan.

**8. *Toxocarpus himalensis*** Falconer ex J. D. Hooker, Fl. Brit. India 4: 13. 1883.

西藏弓果藤 xi zang gong guo teng

Lianas to 6 m. Branchlets tawny brown, lenticellate, puberulent. Petiole ca. 1 cm; leaf blade elliptic-oblong, 5.5–9(–14) × 3–5(–8.5) cm, ± leathery, adaxially glabrous, abaxially glabrescent, base acute, apex acute or apiculate; lateral veins ca. 8 pairs. Cymes rusty pubescent. Corolla ca. 8 mm in diam.; lobes membranous, oblong, adaxially villous at base. Corona lobes slightly shorter than anther tips. Stigma head slender. Follicles oblong-lanceolate, 10–15 × 1.2–1.8 cm, rusty pubescent when young. Seeds ovate, ca. 1.8 mm, beaked; coma ca. 2 cm. Fl. May-Jun, fr. Aug-Dec.

Montane forests, bushland along valleys; 500–1000 m. Guangxi, Guizhou, Yunnan [India].

**9. *Toxocarpus villosus*** (Blume) Decaisne in A. de Candolle, Prodr. 8: 506. 1844.

毛弓果藤 mao gong guo teng

Lianas to 10 m, rusty villous especially on young parts. Petiole 1–1.5 cm; leaf blade orbicular to elliptic-oblong, 4.5–12 × 2–7 cm, leathery, adaxially deeply lustrous green and glabrous except for midvein groove, abaxially densely rusty villous, apex acute or apiculate; lateral veins 6–8 pairs. Cymes irregularly dichotomous, rusty villous; peduncle 3–10 cm. Pedicel ca. 2 mm. Sepals oblong-lanceolate, ca. 3 mm. Corolla yellowish, subrotate; tube short; lobes oblong-lanceolate, 8–10 × ca. 2 mm, villous at base. Corona lobes with

subulate tips overtopping anthers. Stigma head beaked, longer than anthers. Follicles subcylindric, often solitary, divergent when paired, 8–18 cm × 5–10 mm. Seeds ca. 10 × 2 mm; coma to 2 cm. Fl. Apr–May, fr. Jun–Dec.

Dense montane forests, open woods; 500–1500 m. Fujian, Guangxi, Guizhou, Hubei, Sichuan, Yunnan [Cambodia, Indonesia, Laos, Vietnam].

- 1a. Stigma head included in corolla tube ..... 9c. var. *brevistylis*
- 1b. Stigma head exerted from corolla tube.
  - 2a. Stigma head puberulent ..... 9a. var. *villosus*
  - 2b. Stigma head glabrous ..... 9b. var. *thorelii*

**9a. *Toxocarpus villosus* var. *villosus***

毛弓果藤(原变种) mao gong guo teng (yuan bian zhong)

*Secamone villosa* Blume, Bijdr. 1050. 1826.

Stigma head exerted from corona tube, puberulent. Fl. Apr, fr. Jun–Aug.

Open woods. Fujian, Guangxi, Hubei, Sichuan, Yunnan [Indonesia, Vietnam].

**9b. *Toxocarpus villosus* var. *thorelii*** Costantin in Lecomte, Fl. Indo-Chine 4: 52. 1912.

小叶弓果藤 xiao ye gong guo teng

Leaf blade ovate, 4.5–5.5 × 2.8–3.2 cm, apex apiculate. Stigma head exerted from corolla tube, glabrous. Fl. May, fr. Jul–Dec.

Dense montane forests. Guangxi, Yunnan [Cambodia, Laos, Vietnam].

**9c. *Toxocarpus villosus* var. *brevistylis*** Costantin in Lecomte, Fl. Indo-Chine 4: 52. 1912.

短柱弓果藤 duan zhu gong guo teng

Leaf blade ovate, 4.5–7 × 3.2–5.6 cm. Stigma head very short, included in corolla tube. Fl. May.

Montane forests. Fujian [Cambodia, Laos, Vietnam].

**10. *Toxocarpus aurantiacus*** C. Y. Wu ex Tsiang & P. T. Li, Acta Phytotax. Sin. 12: 81. 1974.

云南弓果藤 yun nan gong guo teng

Lianas to 5 m. Young branchlets rusty tomentose, glabrescent. Petiole 1–1.5 cm, rusty tomentose; leaf blade ovate to subelliptic, 4.5–8 × 2.5–4 cm, base ± rounded, apex short acuminate, glabrous or puberulent when young; lateral veins 8–10 pairs, obliquely ascending. Cymes lax, many flowered, divaricate branched, 4–7 × 4–8 cm, rusty tomentose except for corolla. Sepals ovate, ca. 1.5 × 1 mm, basal glands 5. Corolla orange; lobes ovate, ca. 2.5 × 2 mm, glabrous outside, minutely pubescent inside. Corona lobes flat at back, apex short acuminate. Anthers without apical appendages; pollinia obovate, translator arms absent. Ovaries glabrous. Styles swollen; stigma head capitate. Fl. Mar.

• Dense woods; 1500 m. S Yunnan.

The small flowers and capitate stigma head are not typical for *Toxocarpus*.

