

CUCURBITACEAE

葫芦科 hu lu ke

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Herbs, annual or perennial, or weak, woody shrubs with watery sap, scandent or prostrate. Roots fibrous or tuberous. Stem often angular. Leaves alternate, undivided or variously palmately or pedately divided, often cordate; tendrils solitary, lateral, simple or branched, spirally twisted, rarely absent; stipules absent. Plants monoecious or dioecious; flowers unisexual, very rarely bisexual; flowers paniculate, racemose, or subumbellate, rarely solitary. Calyx tube (hypanthium) adnate to ovary; tube rotate, campanulate, or saucer-shaped, usually 5-lobed; segments imbricate. Corolla usually sympetalous, inserted on calyx tube; segments valvate or involute. Stamens inserted at base or mouth of calyx tube, usually 5 or 3, of which one often 1-celled and other two 2-celled; filaments separate or variously united into a column; anthers separate or coherent into a head; anther cells straight to conduplicate, extrorse; rudimentary ovary often present in male flowers; staminodes often in female flowers. Ovary inferior or nearly completely so, mostly composed of 3 carpels, 3-locular, rarely 1- or 2- or spuriously 4-6-locular; ovules usually numerous, rarely few or solitary, horizontal, pendulous, or ascending, often immersed in pulp; placentas parietal, fleshy, often confluent at middle of ovary; style terminal, simple or branched at apex or styles free; stigma enlarged or 2-fid. Fruit usually a fleshy berry or corky, indehiscent or rarely opening by valves or by an operculum, rarely fibrous. Seeds often numerous, rarely few or solitary, horizontal, pendulous, or ascending, often compressed, rarely winged; endosperm absent; embryo with leaflike cotyledons and short radicle.

About 123 genera and over 800 species: most in tropics and subtropics, very rare in temperate regions; 35 genera (one endemic, nine introduced) and 151 species (73 endemic, 14 introduced) in China.

Lu An-ming & Zhang Zhi-yun. 1986. Cucurbitaceae. In: Lu An-ming & Chen Shu-kun, eds., Fl. Reipubl. Popularis Sin. 73(1): 84–280.

- 1a. Corolla segments fimbriate at margin.
 - 2a. Ovules and seeds numerous; calyx tube less than 7 cm 21. *Trichosanthes*
 - 2b. Ovules 12, seeds usually 6, each with 1 abortive seed attached to its side; calyx tube 7–10 cm 20. *Hodgsonia*
- 1b. Corolla segments not fimbriate.
 - 3a. Stamens 5, anther cells ovoid and straight.
 - 4a. Leaves palmately compound, rarely simple.
 - 5a. Plants woody, scandent; leaflets almost entire, with 2 glands at base; seeds with membranous wing at apex 4. *Neoalsomitra*
 - 5b. Plants herbaceous, scandent; leaflets distinctly denticulate, eglandular at base; seeds without wing or rarely winged.
 - 6a. Fruit indehiscent; seeds horizontal 11. *Thladiantha*
 - 6b. Fruit 3-valved, dehiscent at apex or rarely not dehiscent but then smaller in size; seeds pendulous.
 - 7a. Corolla segments more than 5 mm; fruit clavate-cylindric, obovoid, or globose, more than 6-seeded 1. *Hemsleya*
 - 7b. Corolla segments less than 3 mm; fruit turbinate or globose, 1–3(–5)-seeded.
 - 8a. Plants monoecious; fruit turbinate, 3-valved, dehiscent at apex 2. *Gomphogyne*
 - 8b. Plants dioecious; fruit globose or campanulate, indehiscent or dehiscent along ventral suture 3. *Gynostemma*
 - 4b. Leaves simple.
 - 9a. Flowers with corolla segments less than 10 mm; fruit dehiscent, operculate or 3-valved.
 - 10a. Leaf blade entire; fruit 6–10 cm, truncate at apex, 3-valved; seeds surrounded by a membranous wing 5. *Zanonia*
 - 10b. Leaf blade divided; fruit 1–3.5 cm, operculate; seed not winged or with membranous wing at apex.
 - 11a. Plants monoecious; leaf blade cordate-hastate, eglandular at base; fruit dehiscent near middle; seeds not winged 7. *Actinostemma*
 - 11b. Plants dioecious; leaf blade with 1 or 2 pairs of glands at base; fruit dehiscent near apex; seeds with membranous wing at apex 6. *Bolbostemma*

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- 9b. Flowers with corolla segments ca. 2 cm, or if smaller then calyx longer than corolla; fruit baccate, indehiscent; seed not winged.
- 12a. Flowers with calyx longer than corolla; anthers reniform; fruit more than 10 cm 8. *Indofevillea*
- 12b. Flowers with corolla longer than calyx; anthers oblong; fruit less than 10 cm.
- 13a. Plants with black glandular scales 9. *Siraitia*
- 13b. Plants without glandular scales.
- 14a. Tendrils spiraling only above point of branching; anther cells straight 11. *Thladiantha*
- 14b. Tendrils spiraling also below point of branching; anther cells reniform-curved 10. *Sinobaijiana*
- 3b. Stamens 3 or 1, anther cells horizontal when only 1 stamen, or rarely 5 but then anther cells conduplicate.
- 15a. Stamens united into a central column and pollen sac fusing into ring; leaf blade pedatipartite 22. *Cyclanthera*
- 15b. Stamens 3, or rarely 5 but then anther cells conduplicate; leaves not pedately compound.
- 16a. Flowers less than 10 mm in diam.
- 17a. Plants dioecious or rarely flowers bisexual; fruit 3-valved from apex to base when mature; seeds 1–3, pendulous 14. *Schizopepon*
- 17b. Plants usually monoecious, rarely dioecious; fruit indehiscent; seeds often horizontal.
- 18a. Male flowers without pistillode; anther cells conduplicate; male and female flowers fasciculate in leaf axil 29. *Diplocyclos*
- 18b. Male flowers with globose or subulate pistillode; anther cells straight, curved or conduplicate.
- 19a. Anther cells incurved or reflexed 33. *Solena*
- 19b. Anther cells straight.
- 20a. Male flowers in sessile or subsessile fascicles; ovary hispid 27. *Mukia*
- 20b. Male flowers in pedunculate cymes, racemes, or umbels, or solitary; ovary glabrous or with fine hairs.
- 21a. Filaments as long as or longer than anthers, ca. 1 mm or more.
- 22a. Corolla yellow; filaments and staminodes glabrous except at very base; seeds scrobiculate 28. *Scopellaria*
- 22b. Corolla white or pale yellow; filaments and staminodes hairy above base; seeds smooth 25. *Zehneria*
- 21b. Filaments shorter than anthers, 0.5–1 mm.
- 23a. Anther connective not produced beyond thecae; stigmas glabrous, apically shortly 2-lobed; fruit black when ripe 24. *Melothria*
- 23b. Anther connective usually shortly produced beyond thecae; stigmas papillose, rounded; fruit white or red when ripe 25. *Zehneria*
- 16b. Flowers more than 10 mm in diam.
- 24a. Anther cells straight; calyx tube narrowly funnelform 17. *Edgaria*
- 24b. Anther cells conduplicate.
- 25a. Tendrils absent 13. *Ecballium*
- 25b. Tendrils present.
- 26a. Corolla campanulate.
- 27a. Leaf blade hirsute, eglandular at base; flowers yellow; fruit large 35. *Cucurbita*
- 27b. Leaf blade glabrous, with a few glands at base; flowers white; fruit ca. 5 cm 30. *Coccinia*
- 26b. Corolla rotate or rarely campanulate but then segments almost free.
- 28a. Calyx tube in male flower elongate, tubular or funnelform.
- 29a. Flowers white; petiole apex 2-glandular 31. *Lagenaria*
- 29b. Flowers yellow; leaf blade eglandular at base.
- 30a. Corolla rotate; leaf blade less than 10 cm 19. *Gymnopetalum*
- 30b. Corolla campanulate; leaf blade over 10 cm.
- 31a. Leaf blade deeply lobed; seeds many, horizontal 15. *Biswarea*
- 31b. Leaf blade undivided; seeds few, pendulous 16. *Herpetospermum*
- 28b. Calyx rotate.
- 32a. Flowers with leaflike bract on pedicel; fruit usually muriculate, often 3-valved when mature 12. *Momordica*
- 32b. Flowers without bract on pedicel.
- 33a. Male inflorescence racemose or subumbellate.
- 34a. Annual herb; fruit many seeded 18. *Luffa*
- 34b. Perennial climber; fruit 1-seeded; seed large 23. *Sechium*

- 33b. Flowers solitary or fascicled.
 35a. Calyx segments subleaflike, dentate, reflexed 34. *Benincasa*
 35b. Calyx segments subulate, entire, not reflexed.
 36a. Tendrils 2- or 3-fid; connective not produced 32. *Citrullus*
 36b. Tendrils simple; connective produced beyond
 anther cells 26. *Cucumis*

1. HEMSLEYA Cogniaux ex F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 23: 490. 1888.

雪胆属 xue dan shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, perennial, scandent. Roots enlarged, oblate or rarely cylindrical. Stem and branches slender or moderately robust. Tendrils filiform, 2-fid. Leaves pedately (3–)5–9(–11)-foliolate; leaflets narrowly oblong-lanceolate to obovate-lanceolate, membranous or papery. Plants dioecious. Inflorescence cymose-racemose to paniculate, axillary. Male flowers: calyx tube short; segments ovate to ovate-lanceolate, ascending, spreading, rotate, recurved, or reflexed; corolla pale yellow, yellow-green, or orange-red, rotate, discoid, turbinate, bowl-shaped, inverted bowl-shaped, Chinese lanternlike, or umbelliform; segments ovate-lanceolate to broadly ovoid, herbaceous or subsucculent; stamens 5; filaments exerted. Female flowers: calyx and corolla usually as in male flowers, sometimes slightly larger; ovary subglobose or conical, smooth or muriculate; styles 3; stigmas 2-lobed. Fruit globose, cylindrical, or tubular-cylindrical, longitudinally 9- or 10-striate or 9- or 10-angular, almost smooth or verrucose. Seeds elliptic or broadly ovate, usually with woody wings, sometimes wings membranous or absent.

About 27 species: subtropical or tropical Asia; 25 species (21 endemic) in China.

- 1a. Roots without tuber; seeds with broad membranous wing 1. *H. graciliflora*
 1b. Roots with tuber (except possibly for *H. heterosperma*); seeds without wing or with thin woody wing.
 2a. Flower smaller, corolla 3–7 mm in diam.
 3a. Corolla bowl-shaped, 5–7 mm in diam.; petals fleshy; fruit conical to cylindrical, 2.4–3.5 cm × 8–10 mm; seeds oblong-elliptic to ovate, with a corky wing 2. *H. delavayi*
 3b. Corolla laxly patelliform, 3–5 mm in diam.; petals membranous-herbaceous; fruit obconic, 2–4 cm × 12–15 mm; seeds lenticular, ± isodiametric, unwinged 3. *H. kunmingensis*
 2b. Flower larger, corolla 8–15 mm in diam.
 4a. Corolla segments spreading, explanate, or ascending, corolla bowl-shaped or rotate.
 5a. Seeds strongly biconvex, almost without wing, margin slightly broad, 1–1.3(–2) mm; fruit conical to terete-elliptic.
 6a. Corolla 15–20 cm, yellow-green, segments broadly ovate 6. *H. panlongqi*
 6b. Corolla 10–13 cm, green or pale green, segments strap-shaped; fruit conical or terete-conical.
 7a. Corolla segments ascending; flower buds obtuse at apex 4. *H. macrocarpa*
 7b. Corolla segments spreading or reflexed; flower buds acute at apex 5. *H. mitrata*
 5b. Seeds oblong, lenticular, or strongly biconvex, margin narrower, less than 1 mm in diam.; fruit globose, narrowly elliptic, or narrowly conical.
 8a. Seeds oblong, with thin corky wing; fruit narrowly elliptic to narrowly conical 7. *H. dipterygia*
 8b. Seeds biconvex, without wing; fruit globose or conical.
 9a. Seeds lenticular; corolla bowl-shaped 11. *H. sphaerocarpa*
 9b. Seeds ovate to orbicular; corolla rotate.
 10a. Fruit globose, pedicel with an articulation 8. *H. amabilis*
 10b. Fruit conical or cylindrical, pedicel without an articulation.
 11a. Fruit apex with distinct style; corolla segments lanceolate 9. *H. heterosperma*
 11b. Fruit apex without distinct style; corolla segments ovate-orbicular 10. *H. lijiangensis*
 4b. Corolla segments reflexed or revolute, corolla umbelliform or ± globose.
 12a. Seed margin narrower; corolla red-brown or pale red-brown, base often dark red-brown.
 13a. Leaflets 9–11; corolla bowl-shaped, 8–10 mm in diam. 25. *H. endecaphylla*
 13b. Leaflets (3–)5–9.
 14a. Corolla Chinese lanternlike.
 15a. Fruit elliptic; corolla 10–15 mm in diam. 20. *H. chinensis*
 15b. Fruit ovoid to globose; corolla 20–25 mm in diam. 21. *H. gigantea*
 14b. Corolla bowl-shaped (*H. dulongjiangensis* corolla unknown).
 16a. Fruit elliptic, 5–8 cm; seed margin erose 22. *H. dolichocarpa*
 16b. Fruit ovoid to globose, 3–4 cm.

- 17a. Seed margin smooth; fruiting pedicel with an articulation; leaflets 5–7, elliptic-lanceolate 23. *H. macrosperma*
- 17b. Seeds margin erose; fruiting pedicel without an articulation; leaflets 3–5, rhombic 24. *H. dulongjiangensis*
- 12b. Seed margin smooth; corolla pale yellow or yellow-green.
- 18a. Fruit globose or subglobose.
- 19a. Corolla umbelliform, 10–12 mm in diam.; fruiting pedicel with an articulation 12. *H. panacis-scandens*
- 19b. Corolla Chinese lanternlike or bowl-shaped, 6–12 mm in diam.
- 20a. Corolla Chinese lanternlike; fruit 2–2.5 cm in diam. 13. *H. emeiensis*
- 20b. Corolla bowl-shaped; fruit 3–3.5 cm in diam. 14. *H. pengxianensis*
- 18b. Fruit conical or elliptic to claviform-elliptic.
- 21a. Fruit elliptic or claviform, over 7 cm.
- 22a. Fruit narrowly elliptic-claviform, distinctly longitudinally costate, 7–8 cm, pedicel with indistinct articulation 18. *H. chengyihana*
- 22b. Fruit broadly to narrowly elliptic, indistinctly costate, (6–)11–17 cm, pedicel with distinct articulation 19. *H. zhejiangensis*
- 21b. Fruit conical to elliptic, 3.5–5 cm.
- 23a. Corolla bowl-shaped, segments carnose, 8–9 mm; fruit elliptic to ovoid 17. *H. carnosiflora*
- 23b. Corolla Chinese lanternlike, segments thinner.
- 24a. Fruit conical, base cuneate; corolla segments 14–17 mm 15. *H. turbinata*
- 24b. Fruit elliptic; base obtuse; corolla segments 10–15 mm 16. *H. ellipsoidea*

1. *Hemsleya graciliflora* (Harms) Cogniaux in Engler, Pflanzenz. 66(IV. 275. I): 24. 1916.

马铜铃 *ma tong ling*

Alsomitra graciliflora Harms, Bot. Jahrb. Syst. 29: 602. 1901; *Gomphogyne bonii* Gagnepain; *Hemsleya graciliflora* var. *tianmuensis* X. J. Xue & H. Yao; *H. longgangensis* X. X. Chen & D. R. Liang.

Root fibrous; tuber absent. Leaves pedately 7-foliolate; petiole 1.8–3 cm; leaflets oblong-lanceolate to obovate-lanceolate, 5–10 × 2–3.5 cm; petiolule 4–7 mm. Inflorescence largely cymose; peduncle 5–20 cm, densely pubescent. Male flowers: pedicel filiform, 1–2 mm; calyx segments spreading, triangular, ca. 2 × 1 mm; corolla spreading, yellowish to pale yellow-green, rotate, 5–6 mm; segments obovate, 3–4 × ca. 2 mm, thinly membranous; filaments short, ca. 1 mm. Female flowers: calyx and corolla as in male flowers; ovary narrowly cylindrical, base attenuate. Fruit conical, 2.5–3.5 × 1–1.5 cm; fruiting pedicel curved, 5–6 mm. Seeds oblong, compressed, 12–14 × 5–6 mm, with membranous wing, wing 3–4 mm at both ends of seed, seed body obovate. Fl. Jun–Sep, fr. Aug–Nov. *2n* = 28.

Mountain slopes; 500–2400 m. Guangdong, Guangxi, Hubei, Jiangxi, Sichuan, Zhejiang [Vietnam].

The fruit is used medicinally.

2. *Hemsleya delavayi* (Gagnepain) C. Jeffrey ex C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 134. 1985.

短柄雪胆 *duan bing xue dan*

Tuber obovate to conical. Stem and branchlets slender. Tendrils glabrous, 2-fid. Leaves pedately 5–7-foliolate; petiole 2–5 mm; leaflets lanceolate to elliptic-lanceolate, median leaflets 3–10 cm × 8–15 mm; petiolule 2–3 mm. Plants dioecious. Inflorescence dichotomous, to 30 cm; pedicels filiform, 2–5 mm. Male flowers: calyx segments ovate-lanceolate, 2–4 mm, gla-

brous, apex acute; corolla orange-yellow to pale yellow, bowl-shaped, 5–7 mm in diam.; segments ovate, revolute, 5–6 mm; filaments short, 0.5–1 mm. Female flowers: slightly larger than male flowers; ovary cylindrical to conical, 4–5 × 2–2.5 mm. Fruit conical to cylindrical, 2.4–3.5 cm × 8–10 mm, base attenuate, slightly curved; fruiting pedicel 4–7 mm. Seeds dark brown, narrowly elliptic, compressed, 10–12 × 4–6 mm, with corky wing; wing 3–4 mm at apex, ca. 1 mm wide on both sides; seed body broadly elliptic to ovate. Fl. Jul–Sep, fr. Aug–Oct.

• Forests, valleys, mountain slopes; 1600–2200 m. SW Sichuan, C and W Yunnan.

- 1a. Leaves subglabrous; corolla segments in male acute at apex 2a. var. *delavayi*
- 1b. Leaves densely pubescent; corolla segments in male rounded-obtuse at apex 2b. var. *yalungensis*

2a. *Hemsleya delavayi* var. *delavayi*

短柄雪胆(原变种) *duan bing xue dan* (*yuan bian zhong*)

Gomphogyne delavayi Gagnepain, Bull. Mus. Natl. Hist. Nat. 24: 373. 1918; *Hemsleya brevipediolata* Handel-Mazzetti.

Leaves subglabrous. Corolla segments in male flowers acute at apex.

• Forests, valleys; 1800–2000 m. SW Sichuan, C and W Yunnan.

2b. *Hemsleya delavayi* var. *yalungensis* (Handel-Mazzetti) C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 134. 1985.

雅砻雪胆 *ya long xue dan*

Hemsleya brevipediolata var. *yalungensis* Handel-Mazzetti, Symb. Sin. 7: 1059. 1936.

Leaves densely pubescent. Corolla segments in male flowers rounded-obtuse at apex.

• Mountain slopes; 1600–2200 m. SW Sichuan.

3. *Hemsleya kunmingensis* H. T. Li & D. Z. Li, *Ann. Bot. Fenn.* 44: 486. 2007.

昆明雪胆 kun ming xue dan

Tuber enlarged, ovoid. Stem slender, tomentose when young but smooth when older. Tendril glabrous, distally 2-fid. Leaves pedately 7–9-foliolate; petiole 2–4 cm; leaflets lanceolate to oblong; median leaflets 6–12 × 1–1.5 cm; petiolule 2–4 mm. Plants dioecious. Inflorescence dichasial, 5–30 cm, 10–30-flowered; pedicels 5–10 mm. Male flowers: calyx segments broadly triangular, 3–5 mm, revolute, shortly cuspidate at apex; corolla yellowish green, laxly patelliform, 3–5 mm in diam., herbaceous; segments elliptic, 3–5 mm, evaginate and revolute into an anchor shape at apex; filaments 1–2 mm; anthers whitish. Female flowers: calyx and corolla as in male flowers; ovary conical; styles 3, 1–2 mm. Fruit many, greenish, longitudinally 10-striate, obconic, 2–4 × 1.2–1.5 cm, almost smooth; fruiting pedicel 10–15 mm. Seeds many, blackish brown, lenticular, 5–8 mm in diam., 2–3 mm thick, verrucose, unwinged. Fl. Jun–Sep, fr. Aug–Nov.

- Damp valleys in secondary forests; ca. 2300 m. C Yunnan.

4. *Hemsleya macrocarpa* (Cogniaux) C. Y. Wu ex C. Jeffrey, *Kew Bull.* 36: 739. 1982.

圆锥果雪胆 yuan zhui guo xue dan

Tuber oblate or ovoid. Stem sometimes slightly thickened at nodes. Leaves pedately 7–9-foliolate; petiole 3–7 cm, sparsely puberulent or subglabrous; leaflets obovate-lanceolate to elliptic-lanceolate; median leaflets 6–10 × 2.5–4 cm; petiolule 2–6 mm. Inflorescence dichotomously cymose, 4–12 cm; peduncle and branches slightly flexuous. Male flowers: bud obtuse at apex; calyx segments spreading, ovate-lanceolate, 4–5 × 2–3 mm; corolla green to pale yellow-green, rotate, 7–15 mm in diam.; segments strap-shaped, 6–7 × 2–3 mm, fleshy, base with a pair of glands; filaments less than 1 mm. Female flowers: calyx and corolla as in male flowers; ovary conical, 5–7 × 3–4 mm. Fruit campanulate to conical, (3–)4–7 × 3–4 cm, with distinct ribs; fruiting pedicel 8–10 mm. Seeds dark brown, irregularly orbicular, 12–15 × 8–12 mm, 3–4 mm thick, with very narrow wing. Fl. Jul–Sep, fr. Sep–Nov. $2n = 28$.

Evergreen forests, thickets on mountain slopes; 1000–2300 m. NW and SW Yunnan [NE India].

- 1a. Fruit (3–)4.5(–6) cm, (1.3–)1.6(–1.85) × as long as broad 4a. var. *macrocarpa*
 1b. Fruit (4–)6.2(–6.5) cm, (1.5–)2.5(–3) × as long as broad.
 2a. Corolla 7–9 mm in diam. 4b. var. *clavata*
 2b. Corolla 12–15 mm in diam. 4c. var. *grandiflora*

4a. *Hemsleya macrocarpa* var. *macrocarpa*

圆锥果雪胆(原变种) yuan zhui guo xue dan (yuan bian zhong)

Gomphogyne macrocarpa Cogniaux in Engler, *Pflanzenr.* 66(IV. 275. 1): 40. 1916; *Hemsleya changningensis* C. Y. Wu & Z. L. Chen; *H. obconica* C. Y. Wu & Z. L. Chen.

- Fruit (3–)4.5(–6) cm, (1.3–)1.6(–1.85) × as long as broad.

Evergreen forests; 1000–2200 m. SW Yunnan [NE India].

4b. *Hemsleya macrocarpa* var. *clavata* (C. Y. Wu) D. Z. Li, *Syst. Evol. Hemsleya*, 76. 1993.

棒果雪胆 bang guo xue dan

Hemsleya clavata C. Y. Wu, *Acta Phytotax. Sin.* 23: 124. 1985.

Corolla 7–9 mm in diam. Fruit (4–)6.2(–6.5) cm, (1.5–)2.5(–3) × as long as broad.

- Broad-leaved forests; 1400–1500 m. SW Yunnan.

4c. *Hemsleya macrocarpa* var. *grandiflora* (C. Y. Wu) D. Z. Li, *Syst. Evol. Hemsleya*, 76. 1993.

大花雪胆 da hua xue dan

Hemsleya grandiflora C. Y. Wu, *Acta Phytotax. Sin.* 23: 130. 1985.

Corolla 12–15 mm in diam. Fruit (4–)6.2(–6.5) cm, (1.5–)2.5(–3) × as long as broad.

- Thickets on mountain slopes; ca. 2300 m. NW Yunnan.

5. *Hemsleya mitrata* C. Y. Wu & Z. L. Chen, *Acta Phytotax. Sin.* 23: 128. 1985.

帽果雪胆 mao guo xue dan

Tuber enlarged. Stem and branchlets stout, sparsely puberulent, ultimately glabrous; stem nodes thickened, densely pubescent. Leaves pedately 5–7-foliolate; petiole 5–8 cm; leaflets lanceolate to elliptic-lanceolate, margin serrate; median leaflets 5–11 × 2.5–4 cm; petiolule 2–5 mm. Plants dioecious. Inflorescence peduncle slightly reflexed, 5–11 cm. Male flowers: buds acute at apex; calyx segments lanceolate, ca. 6 × 3 mm; corolla pale yellow-green, rotate, 10–11 mm, fleshy; segments ± strap-shaped, base with 2 distinct glands. Female flower unknown. Fruit caplike, 4–5 × 3–3.6 cm. Seeds dark brown, broadly ovoid, 12–13 × 9–10 mm, 3–3.5 mm thick, almost unwinged. Fl. Jul–Oct, fr. Sep–Dec.

- Thickets on mountain slopes; 2400–2700 m. SW Yunnan.

6. *Hemsleya panlongqi* A. M. Lu & W. J. Chang, *Acta Phytotax. Sin.* 21: 183. 1983.

盘龙七 pan long qi

Tuber oblate-spheroid. Branches slender, sulcate-angular, densely pubescent at nodes. Tendrils 2-fid. Leaves pedately 7-foliolate; petiole 2–4 cm; leaflets elliptic-lanceolate to ovate-lanceolate, median leaflets 8–12 × 2–3.5 cm, lateral leaflets smaller, base cuneate, margin serrate, apex acuminate; petiolule 3–6 mm, densely pubescent. Inflorescence peduncle filiform; pedicel linear, 12–15 mm. Male flower unknown. Female flowers: bracts very small, subulate; calyx segments 5, ovate-lanceolate, ca. 10 × 3 mm, apex acuminate; corolla pale yellow to yellow-green, rotate, 15–20 mm in diam.; segments spreading, broadly ovate, ca. 12 × 8 mm; ovary ovoid-globose to narrowly ovoid, 8–11 × 4–6 mm. Fl. Sep.

- Broad-leaved forests; ca. 1800 m. S Sichuan.

7. *Hemsleya dipterygia* Kuang & A. M. Lu, Acta Phytotax. Sin. 20: 88. 1982 [*"dipterygia"*].

翼蛇莲 yi she lian

Hemsleya cissiformis C. Y. Wu.

Tuber enlarged. Stem usually thickened at nodes, densely pubescent, ultimately glabrous. Tendrils glabrous. Leaves pedately 5–7-foliolate; petiole 2–6 cm; leaflets broadly lanceolate to rhombic, margin serrate or crenate, median leaflets 7–11 × ca. 2.5 cm, lateral leaflets smaller; petiolule 2–4 mm. Inflorescence peduncle and branches filiform. Male flowers: pedicel 5–10 mm; calyx segments ovate, ca. 7 mm; corolla pale yellow to pale yellow-green, rotate to bowl-shaped, 12–13 mm in diam.; corolla segments spreading, broadly obovate, ca. 8 × 7.5 mm, apex obtuse; filaments less than 1 mm. Female flower unknown. Fruit oblong-claviform or claviform, 4–5.5 × 0.6–1.7 cm, densely pubescent when immature, glabrous when mature, with indistinct ribs. Seeds dark brown, oblong, ca. 14 × 15 mm, 3–4 mm thick. Fl. Jun–Oct, fr. Aug–Nov.

Broad-leaved forests; 100–1500 m. N Guangxi, S Guizhou, C and S Yunnan [N Vietnam].

8. *Hemsleya amabilis* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 206. 1912.

曲莲 qu lian

Tuber obovate-spheroid. Stem and branchlets very slender. Tendrils 8–12 cm. Leaves pedately 5–9-foliolate; petiole 2–4 cm; leaflets lanceolate to narrowly lanceolate, median leaflets 4–5 × 1–1.5 cm. Male flowers dichotomously cymose; peduncle slightly flexuous, 5–15 cm; calyx segments 5, ovate-triangular, 4–5 × ca. 2 mm; corolla pale yellow to pale yellow-green, rotate, 10–12 mm in diam.; segments spreading, broadly obovate, 5–6 × 4–5 mm; filaments ca. 2 mm, exerted. Female flowers in simple dichotomously cymose inflorescence, larger than male flowers, 11–12(–15) mm in diam.; ovary subglobose, 4–5 mm. Fruit spheroid, 12–20 mm; fruiting pedicel filiform, 2–3 mm. Seeds dark brown, broadly ovate-orbicular, 6–8 × 5–7 mm, 3–4 mm thick, unwinged. Fl. Jun–Oct, fr. Aug–Nov. $2n = 28^*$.

• Forests; 1800–3000 m. SW Sichuan, C and W Yunnan.

9. *Hemsleya heterosperma* (Wallich) C. Jeffrey, Kew Bull. 36: 739. 1982.

异子雪胆 yi zi xue dan

Zanonia heterosperma Wallich, Pl. Asiat. Rar. 2: 29. 1831; *Alsomitra heterosperma* (Wallich) M. Roemer; *Gomphogyne heterosperma* (Wallich) Kurz.

Tuber unknown. Stem slender, glabrous. Leaves pedately 3–5-foliolate; petiole 3–4 cm, glabrous; leaflets ovate-lanceolate, base attenuate, apex shortly acuminate; median leaflets 5–7 × ca. 1.5 cm; petiolule 3–6 mm. Plants dioecious. Inflorescence compound or simple; peduncle slender, slightly flexuous, glabrous. Male flowers: calyx segments subulate, ca. 1 mm, apex apiculate; corolla pale yellow to pale yellow-green, rotate, 3–4 mm in diam.; segments ovate-lanceolate, ca. 3 × 1 mm, glabrous, apex acuminate; filaments free, ca. 1 mm. Female flow-

ers similar to male flowers; peduncle 5–11 cm; ovary conical. Fruit pale yellow-green, narrowly campanulate or claviform, 12–35 × 6–12 mm, glabrous, with distinct ribs, dehiscent at apex, 3-seeded in each locule. Seeds small, irregularly ovate, ca. 3 × 2 mm, ca. 1 mm thick. Fl. Sep–Oct, fr. Oct–Nov. $2n = 28$.

Rain forests, evergreen broad-leaved forests; 100–2300 m. Yunnan [Myanmar, Thailand].

10. *Hemsleya lijiangensis* A. M. Lu ex C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 129. 1985.

丽江雪胆 li jiang xue dan

Tuber enlarged. Stem and branchlets filiform, sparsely pubescent, ultimately subglabrous. Tendrils apically 2-fid. Leaves pedately 5–7-foliolate; petiole 2–4 cm; leaflets oblong-lanceolate to narrowly lanceolate; median leaflets 6–12 × 2–2.2 cm; petiolule 2–4 mm. Male flowers: inflorescence peduncle and branchlets flexuous, 4–5 cm, densely pubescent; pedicel filiform; calyx segments 5, spreading, ovate-triangular, ca. 4 × 2 mm, apex acuminate; corolla pale yellow, rotate, 8–10 mm; segments spreading, obovate, ca. 5 × 4 mm; filaments ca. 2 mm. Female flowers solitary or few dichotomously cymose in leaf axils; pedicel 5–30 mm; ovary narrowly campanulate or conical, ca. 3 × 2 mm, densely white punctate. Fruit campanulate to conical, 2.2–4 cm × 13–18 mm. Seeds dark brown, irregularly orbicular, compressed, 4–6 × 4–5 mm, 2–3 mm thick. Fl. Jul–Sep, fr. Aug–Oct.

• Forests; 2000–3000 m. NW Yunnan.

11. *Hemsleya sphaerocarpa* Kuang & A. M. Lu, Acta Phytotax. Sin. 20: 87. 1982.

蛇莲 she lian

Tuber obovate-spheroid. Stem and branchlets slender, nodes densely pubescent. Tendrils 8–24 cm. Leaves pedately 5–9-foliolate; petiole 1.6–4 cm; leaflets oblong-lanceolate to broadly lanceolate; median leaflets 7–16 × 2.5–4 cm. Male flowers in a large dichotomous cyme, 5–25(–45) cm (varying in different subspecies); calyx segments ovate-triangular, ca. 4 × 3 mm; corolla pale yellow-green, bowl-shaped, 7–15 mm in diam.; segments broadly ovate, apex acuminate. Female flowers usually in a short inflorescence; ovary spheroid to ovoid, 3–5 mm. Fruit spheroid to ovoid, 2–3 cm in diam.; fruiting pedicel 1–9 mm, with distinct articulation. Seeds lenticular, 8–9 mm in diam., unwinged. Fl. May–Sep, fr. Jul–Nov. $2n = 28^*$.

• Broad-leaved forests; 400–2400 m. E and NE Guangxi, S and SE Guizhou, S Hunan, SE, SW, and WC Yunnan.

- 1a. Male inflorescence (14–)20(–44) cm 11b. subsp. *megathyrsa*
- 1b. Male inflorescence (5–)9(–15) cm.
 - 2a. Corolla (7–)8(–9) mm in diam.; fruiting pedicel 1–2 mm 11c. subsp. *wenshanensis*
 - 2b. Corolla (9–)12(–15) mm in diam.; fruiting pedicel 8–9 mm 11a. subsp. *sphaerocarpa*

11a. *Hemsleya sphaerocarpa* subsp. *sphaerocarpa*

蛇莲(原亚种) she lian (yuan ya zhong)

Inflorescence (5–)9(–15) cm. Corolla (9–)12(–15) mm in diam. Fruiting pedicel 8–9 mm.

• Broad-leaved forests; 400–1600 m. E and NE Guangxi, S and SE Guizhou, S Hunan, SE and SW Yunnan.

11b. *Hemsleya sphaerocarpa* subsp. *megathyrsa* (C. Y. Wu) D. Z. Li, Syst. Evol. *Hemsleya*, 84. 1993.

大序雪胆 da xu xue dan

Hemsleya megathyrsa C. Y. Wu, Acta Phytotax. Sin. 23: 131. 1985; *H. megathyrsa* var. *major* C. Y. Wu & Z. L. Chen.

Male inflorescence (14–)20(–44) cm. Corolla 8–12 mm in diam.

• Evergreen broad-leaved forests; 2200–2400 m. SW Yunnan.

11c. *Hemsleya sphaerocarpa* subsp. *wenshanensis* (A. M. Lu ex C. Y. Wu & Z. L. Chen) D. Z. Li, Syst. Evol. *Hemsleya*, 85. 1993.

文山雪胆 wen shan xue dan

Hemsleya wenshanensis A. M. Lu ex C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 130. 1985.

Inflorescence (5–)9(–15) cm. Corolla (7–)8(–9) mm in diam. Fruiting pedicel 1–2 mm.

• Evergreen forests; 1800–2300 m. SE and WC Yunnan (Jingdong, Wenshan).

12. *Hemsleya panacis-scandens* C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 135. 1985.

藤三七雪胆 teng san qi xue dan

Tuber oblate-spheroid. Stem and branchlets robust, stem nodes stout, sparsely pubescent. Tendrils 8–15 cm. Leaves pedately 7–9-foliolate; petiole 5–8 cm; leaflets obovate-lanceolate; median leaflets 6–10 × 2–3 cm; petiolule 4–8 mm. Male flowers dichotomously cymose or paniculate; peduncle usually filiform, 3–7 cm; calyx segments ovate-lanceolate, ca. 9 × 4 mm, apex reflexed; corolla pale yellow to yellow-green, umbelliform, 10–12 mm in diam.; segments obovate to ovate-oblong, fleshy, base thickened, apex obtuse; filaments ca. 1 mm. Female flowers: corolla 12–15 mm in diam., ovary subglobose, 5–8 × 4–7 mm. Fruit globose, 25–45 mm in diam., fruiting pedicel 4–8 mm, with articulation. Seeds dark brown, ovoid-spheroid, ca. 15 × 12–13 mm, almost unwinged, margin ca. 3 mm wide. Fl. Aug–Oct, fr. Oct–Dec. $2n = 42^*$.

• Evergreen broad-leaved forests; 1700–2400 m. SE Yunnan.

- 1a. Corolla pale yellow, segments involute (not reflexed), margin sinuate 12a. var. *panacis-scandens*
 1b. Corolla deep yellow, umbelliform, margin entire 12b. var. *pingbianensis*

12a. *Hemsleya panacis-scandens* var. *panacis-scandens*

藤三七雪胆(原变种) teng san qi xue dan (yuan bian zhong)

Corolla pale yellow, spheroid, 10–12 mm in diam.; segments sinuate at margin. Fruit smooth, 10-angular.

• Evergreen broad-leaved forests; 1700–2400 m. SE Yunnan.

12b. *Hemsleya panacis-scandens* var. *pingbianensis* C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 137. 1985.

屏边藤三七雪胆 ping bian teng san qi xue dan

Corolla deep yellow, umbelliform, ca. 15 mm in diam.; segments entire. Ovary and fruit densely white verrucose.

• Broad-leaved forests; ca. 1700 m. SE Yunnan (Pingbian).

13. *Hemsleya emeiensis* L. D. Shen & W. J. Chang, Acta Phytotax. Sin. 21: 191. 1983.

峨眉雪胆 e mei xue dan

Tuber enlarged, pale brown-yellow. Branchlets slender, sparsely pubescent when young. Leaves pedately 7–9-foliolate; petiole 4–6 cm; leaflets oblong-lanceolate to ovate-lanceolate; median leaflets 9–14 × 2–4.5 cm. Male flowers dichotomously cymose, peduncle 3–8 cm; calyx segments 5, lanceolate, ca. 4 × 2 mm, apex reflexed; corolla yellow-green, Chinese lanternlike, ca. 8 mm in diam.; segments 5, obovate-lanceolate, ca. 8 × 5 mm; filaments ca. 1 mm. Female inflorescence simple; ovary subglobose, 3–6 mm. Fruit globose, 20–25 mm in diam. Seeds ovoid, ca. 10 × 8 mm, ca. 3 mm thick, unwinged. Fl. Jul–Sep, fr. Sep–Nov. $2n = 28^*$.

• Broad-leaved forests; 1800–2000 m. Sichuan (Emei Shan).

14. *Hemsleya pengxianensis* W. J. Chang, Acta Phytotax. Sin. 17(4): 97. 1979.

彭县雪胆 peng xian xue dan

Tuber oblate-spheroid. Stem and branchlets slender. Leaves pedately 5–7-foliolate; petiole 4.5–7 cm, glabrous or pubescent; leaflets obovate-lanceolate to narrowly lanceolate, median leaflets 8–17 × 2–4 cm; petiolule 3–5 mm. Male flowers dichotomously cymose; peduncle 4–10 cm, slightly flexuous; calyx segments lanceolate, ca. 4 × 2–3 mm; corolla yellow-green, bowl-shaped or Chinese lanternlike, 6–12 mm in diam.; segments ovate, ca. 6 × 4 mm, apex reflexed. Female inflorescence reduced; ovary ovoid or subglobose, ca. 3 mm in diam. Fruit ovoid or ellipsoid, 3–4 × 3–3.5 cm. Seeds almost circular, compressed, 10–13 × 10–13 mm, almost unwinged, margin 2–3 mm wide. Fl. Jun–Sep, fr. Aug–Nov.

• Broad-leaved forests, forest margins; 700–2100 m. Chongqing, Sichuan.

- 1a. Fruit elliptic; corolla Chinese lanternlike, 10–12 mm in diam. 14c. var. *gulinensis*
 1b. Fruit ovate to ovoid or subglobose; corolla bowl-shaped, ca. 8 mm in diam.
 2a. Ovary ovoid; petiole, rachis, and corolla pubescent 14b. var. *junlianensis*
 2b. Ovary subglobose; petiole and corolla glabrous 14a. var. *pengxianensis*

14a. *Hemsleya pengxianensis* var. *pengxianensis*

彭县雪胆(原变种) peng xian xue dan (yuan bian zhong)

Hemsleya pengxianensis var. *jinfushanensis* L. D. Shen & W. J. Chang; *H. pengxianensis* var. *polycarpa* L. D. Shen & W. J. Chang.

Petiole glabrous. Corolla bowl-shaped, ca. 8 mm in diam., glabrous.

• Broad-leaved forests; 700–2100 m. Chongqing, C and SW Sichuan.

14b. *Hemsleya pengxianensis* var. *junlianensis* L. D. Shen & W. J. Chang, Acta Phytotax. Sin. 21: 188. 1983.

筠连雪胆 jun lian xue dan

Petiole, peduncle, and corolla pubescent. Corolla bowl-shaped, ca. 8 mm in diam. Ovary ovoid. Fruit ovate to ovoid.

• Forest margins; ca. 1500 m. SW Sichuan.

14c. *Hemsleya pengxianensis* var. *gulinensis* L. D. Shen & W. J. Chang, Acta Phytotax. Sin. 21: 188. 1983.

古蔺雪胆 gu lin xue dan

Hemsleya gulinensis L. D. Shen & W. J. Chang.

Corolla Chinese lanternlike, 10–12 mm in diam. Fruit elliptic.

• Broad-leaved forests. Sichuan.

Hemsleya pengxianensis var. *gulinensis* is not a new combination based on *H. gulinensis* (L. D. Shen & W. J. Chang, Acta Acad. Med. Sichuan. 11(2): 103. 1980), although both names have the same type.

15. *Hemsleya turbinata* C. Y. Wu, Acta Phytotax. Sin. 23: 140. 1985.

陀罗果雪胆 tuo luo guo xue dan

Tuber oblate-spheroid. Stem and branchlets robust. Tendrils 12–20 cm. Leaves 5–7-foliolate; petiole 3–5 cm; leaflets obovate-lanceolate to elliptic-lanceolate, margin dentate; median leaflets 6–12 cm; petiolule 2–5 mm. Male flowers unknown. Female flowers 2 to more in a dichotomous cyme; peduncle 3–10 cm; calyx segments lanceolate, 11–13 × ca. 4 mm, apex reflexed; corolla pale yellow-green, Chinese lanternlike, 10–12 mm; segments oblong-lanceolate, 14–17 × 6–8 mm, base with 2 glands, revolute, acute at apex; ovary conical, ca. 9 × 3–4 mm. Fruit conical, 3.5–5 × 2–2.5 cm, base attenuate; fruiting pedicel only ca. 3 mm. Seeds dark brown, broadly ovate, compressed, 9–11 × 8–10 mm, 2–3 mm thick, unwinged, margin ca. 2 mm wide. Fl. Jul–Sep, fr. Sep–Nov.

• Evergreen broad-leaved forests; 1600–2400 m. SW Yunnan.

16. *Hemsleya ellipsoidea* L. D. Shen & W. J. Chang, Acta Phytotax. Sin. 21: 185. 1983.

椭圆果雪胆 tuo yuan guo xue dan

Tuber enlarged. Stem and branchlets slender, sulcate. Leaves pedately 3–5-foliolate; petiole 2–5 cm; leaflets ovate-lanceolate; median leaflets 9–15 × 4–5 cm; petiolule 3–5 cm. Male flowers sparsely dichotomously cymose; peduncle 10–12 cm; calyx segments lanceolate, ca. 10 × 3 mm, apex reflexed; corolla pale yellow-green, lantern-shaped, 9–11 mm; segments broadly ovate-lanceolate, 10–15 × 6–10 mm, apex reflexed; filaments ca. 1 mm. Female flowers: corolla larger than male flowers, 12–15 mm in diam.; ovary ovoid, ca. 10 × 5 mm. Fruit ellipsoid, 3.5–4 × ca. 2.5 cm, base obtuse-rounded; fruit wall

leathery. Seeds almost circular, compressed, ca. 15 mm in diam., ca. 3 mm thick, unwinged, margin 3–4 mm wide. Fl. Jul–Sep, fr. Sep–Nov.

• Broad-leaved forests; ca. 2000 m. Sichuan (Emei Shan).

17. *Hemsleya carnosiflora* C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 133. 1985.

肉花雪胆 rou hua xue dan

Tuber oblate-spheroid. Stem and branchlets rather robust, thickened at nodes, densely pubescent. Tendrils 7–16 cm. Leaves pedately 7–9-foliolate; petiole 5–8 cm; leaflets obovate-lanceolate, margin dentate; median leaflets 8–12 × 3–4 cm; petiolule 4–8 mm. Male flowers dichotomously cymose or paniculate; peduncle indistinctly flexuous, 3–7 cm; calyx segments ovate-lanceolate, ca. 7 × 4 mm, apex reflexed; corolla pale yellow-green, bowl-shaped, 8–10 mm. Female inflorescence simple; peduncle 2.5–5 cm; corolla larger than male, 11–12 mm in diam.; ovary ellipsoid, ca. 10 cm × 6–7 mm. Fruit ellipsoid to ovoid, 4–5 × 2.5–3 cm; fruiting pedicel 9–12 mm. Seeds obovate-elliptic to almost circular, compressed, 13–16 × 12–14 mm, 3–4 mm thick, almost unwinged, margin ca. 4 mm wide. Fl. Jun–Oct, fr. Aug–Nov. $2n = 42^*$.

• Forests; 1800–1900 m. SE Yunnan.

18. *Hemsleya chengyihana* D. Z. Li, Syst. Evol. *Hemsleya*, 91. 1993.

征镞雪胆 zheng yu xue dan

Hemsleya macrocarpa C. Y. Wu, Acta Phytotax. Sin. 23: 135. 1985, not (Cogniaux) C. Y. Wu ex C. Jeffrey, Kew Bull. 36: 739. 1982.

Tuber oblate-ovoid. Stem and branchlets slightly stout, distinctly sulcate. Tendrils 12–25 cm. Leaves pedately 5–7-foliolate; petiole 3–6 cm; leaflets lanceolate to obovate-lanceolate, margin crenate; median leaflets ca. 14 × 1.5–4 cm; petiolule 5–10 mm. Male inflorescence dichotomously cymose; peduncle flexuous, 5–12 cm, densely pubescent; calyx segments ovate-triangular, ca. 5 × 3 mm, apex reflexed; corolla pale yellow-green, bowl-like, ca. 10 mm in diam.; segments oblong, 7–8 × 3–4 mm; filaments ca. 1 mm. Female flowers unknown. Fruit clavate or clavate-elliptic, 7–8 × 2–2.5 cm, distinctly costate; fruiting pedicel 10–15 mm. Seeds dark brown, elliptic, ca. 12 × 7 mm, almost unwinged, margin 1–3 mm wide. Fl. Jul–Oct, fr. Sep–Nov.

• Broad-leaved forests, forest margins. SW Yunnan.

19. *Hemsleya zhejiangensis* C. Z. Zheng, Acta Phytotax. Sin. 23: 67. 1985.

浙江雪胆 zhe jiang xue dan

Tuber enlarged. Stem and branchlets slender, sulcate, nodes densely pubescent. Leaves pedately 5–9-foliolate; petiole 2.5–5 cm; leaflets elliptic-lanceolate, margin sparsely dentate; median leaflets 6–11 × 2–3.5 cm. Male inflorescence dichotomously cymose; peduncle flexuous, 13–17 cm; calyx segments ovate-lanceolate, 4–5 × 3–4 mm, apex reflexed; corolla pale

yellow-green, bowl-like, 8–10 mm; segments obovate, 7–8 × 4–5 mm, fleshy, apex reflexed; filaments ca. 1 mm. Female flower unknown. Fruit broadly to narrowly elliptic, (6–)11–17 × 2–3 cm, indistinctly costate; fruiting pedicel with distinct articulation, 1–2 cm. Seeds dark brown, oblong, almost unwinged, margin 2–4 mm. Fl. Jun–Sep, fr. Aug–Nov.

• Broad-leaved forests, bamboo forests; 800–1000 m. Anhui, Jiangxi, Zhejiang.

20. *Hemsleya chinensis* Cogniaux ex F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 23: 490. 1888.

雪胆 xue dan

Tuber ovoid or oblate. Stem and branchlets slender. Tendrils 8–14 cm. Leaves pedately 5–9-foliolate; petiole 4–8 cm; leaflets ovate-lanceolate, oblong-lanceolate, or broadly lanceolate, margin crenate; median leaflets 5–12 × 2–2.5 cm; petiolule 5–10 mm. Male inflorescence dichotomously cymose or paniculate; peduncle filiform, flexuous, 5–12 cm; calyx segments ovate, ca. 7 × 4–5 mm, apex acute, reflexed; corolla orange-red, Chinese lantern-shaped or rounded-globose, 8–15 mm in diam.; segments oblong, 10–13 × 8–9 mm, subglabrous; filaments ca. 1 mm. Female inflorescence simple; peduncle 2–4 cm; calyx and corolla as in male flowers; corolla ca. 15 mm in diam.; ovary cylindrical, 5–10 × 2–3 mm. Fruit ellipsoid, 3–7 × ca. 2 cm, base attenuate; fruiting pedicel slightly curved, with or without articulation, 8–10 mm. Seeds brown, suborbicular, 10–12 × ca. 10 mm, ca. 3 mm thick, unwinged, margin ca. 1 mm wide. Fl. Jul–Sep, fr. Sep–Nov. $2n = 28^*$.

• Evergreen broad-leaved forests, forest margins; 400–2800 m. Guizhou, Hubei, Sichuan, Yunnan.

- 1a. Fruit with white spiculiform hairs along longitudinal ribs; branchlets and petiole with dense spiculiform hairs 20d. var. *polytricha*
 1b. Fruit without spiculiform hairs along longitudinal ribs; branchlets and petiole without spiculiform hairs.
 2a. Corolla usually glabrous, 12–15 mm in diam.; fruit elliptic, 3–7 cm 20a. var. *chinensis*
 2b. Corolla densely white pubescent, 8–12 mm in diam.
 3a. Corolla 10–12 mm in diam.; fruit obovoid, pedicel with articulation 20b. var. *ningnanensis*
 3b. Corolla ca. 8 mm in diam.; fruit ovoid, pedicel without articulation 20c. var. *longevillosa*

20a. *Hemsleya chinensis* var. *chinensis*

雪胆(原变种) xue dan (yuan bian zhong)

Branchlets, petiole, and fruit without spiculiform hairs. Corolla 12–15 mm in diam., usually glabrous. Fruit elliptic, 3–7 cm.

• Evergreen broad-leaved forests, forest margins; 400–2800 m. Guizhou, Hubei, Sichuan, Yunnan.

20b. *Hemsleya chinensis* var. *ningnanensis* L. D. Shen & W. J. Chang, Acta Phytotax. Sin. 21: 185. 1983.

宁南雪胆 ning nan xue dan

Hemsleya ningnanensis L. D. Shen & W. J. Chang; *H. villosipetala* C. Y. Wu & Z. L. Chen.

Branchlets, petiole, and fruit without spiculiform hairs. Corolla 10–12 mm in diam., usually with dense white hairs. Fruit obovoid; pedicel with articulation.

• Evergreen broad-leaved forests. SW Sichuan, NE Yunnan.

Hemsleya chinensis var. *ningnanensis* is not a new combination based on *H. ningnanensis* (L. D. Shen & W. J. Chang, Acta Acad. Med. Sichuan. 11(1): 19. 1980), although both names have the same type.

20c. *Hemsleya chinensis* var. *longevillosa* (C. Y. Wu & Z. L. Chen) D. Z. Li, Syst. Evol. *Hemsleya*, 95. 1993 [*“longivillosa”*].

长毛雪胆 chang mao xue dan

Hemsleya longevillosa C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 140. 1985.

Branchlets, petiole, and fruit without spiculiform hairs. Corolla usually with dense white hairs, ca. 8 mm in diam. Fruit ovoid; pedicel without articulation.

• Evergreen broad-leaved forests; 1900–2100 m. Yunnan (Fuyuan).

20d. *Hemsleya chinensis* var. *polytricha* Kuang & A. M. Lu, Acta Phytotax. Sin. 20: 90. 1982.

毛雪胆 mao xue dan

Branchlets and petiole with dense spiculiform hairs. Fruit with dense spiculiform hairs along longitudinal ribs.

• Broad-leaved forests; 1300–1500 m. W Hubei.

21. *Hemsleya gigantea* W. J. Chang, Acta Phytotax. Sin. 21: 186. 1983.

巨花雪胆 ju hua xue dan

Tuber yellow-brown. Leaves pedately 7–9-foliolate; petiole 5–9 cm; leaflets broadly elliptic-lanceolate or ovate-lanceolate, base cuneate, margin crenate; median leaflets 7–12 × 3–5 cm. Male inflorescence dichotomously cymose; rachis 7–11 cm; calyx segments lanceolate, ca. 15 × 7 mm, apex reflexed; corolla orange-red, Chinese lanternlike, 1.5–2(–2.5) cm in diam.; segments broadly ovate, 20–25 × 15–18 mm, revolute, obtuse-rounded and apiculate at apex; filaments ca. 1 mm. Female inflorescence simple; ovary ellipsoid, 10–15 × 6–10 mm. Fruit subspheroid to ovoid, 2–3.5 cm in diam., fruit wall leathery. Seeds dark brown, broadly ovoid, 10–12 × 8–10 mm, 2–3 mm thick, almost unwinged; margin narrow, ca. 2 mm wide, slightly erose. Fl. Jun–Sep, fr. Aug–Nov.

• Broad-leaved or *Pinus* forests, forest margins. SW Sichuan.

22. *Hemsleya dolichocarpa* W. J. Chang, Acta Phytotax. Sin. 21: 190. 1983.

长果雪胆 chang guo xue dan

Tuber enlarged, yellow-brown. Stem and branchlets slender. Leaves pedately 5–7-foliolate; petiole 3.5–6.5 cm; leaflets obovate-lanceolate or elliptic-lanceolate, margin crenate; median leaflets 7–15 × 4–7 cm. Male inflorescence dichotomously cymose; rachis 3–8 cm; calyx segments lanceolate, 6–8 × 4–6 mm, apex apiculate, flexuous; filaments ca. 1 mm. Female inflorescence simple; ovary cylindrical, ca. 6 × 3 mm. Fruit elliptic, 5–8 × 2–3.5 cm. Seeds broadly ovate to suborbicular, compressed, 13–14 × ca. 11 mm, 2–3 mm thick, unwinged; margin ca. 1 mm wide, erose. Fl. Jun–Sep, fr. Aug–Nov.

- Broad-leaved forests; 1400–1800 m. C and SW Sichuan.

23. *Hemsleya macrosperma* C. Y. Wu, Acta Phytotax. Sin. 23: 139. 1985.

罗锅底 *luo guo di*

Tuber enlarged, obovate. Stem and branchlets slender. Tendrils 6–10 cm. Leaves pedately 5–7-foliolate; petiole 4–5 cm; leaflets oblong-lanceolate to obovate-lanceolate, margin crenate; median leaflets 4–9 × 1.5–3 cm; petiolule 2–4 mm. Male inflorescence dichotomously cymose; peduncle 2–8 cm; calyx segments ovate, 4–5 × ca. 3 mm, apex acute, reflexed; corolla orange-red, bowl-like, 8–10 mm in diam.; segments oblong, ca. 8 × 4 mm, sparsely white villous; filaments ca. 2 mm. Female inflorescence: peduncle 1–5 cm; ovary ellipsoid or subglobose, 5–7 × 4–5 mm. Fruit ovoid, 3.5–5 cm in diam. Seeds dark brown, ovoid, 9–11 × 8–9 mm, unwinged, margin smooth, ca. 1 mm wide. Fl. Jul–Sep, fr. Sep–Nov.

- Evergreen broad-leaved or *Pinus* forests; 1800–3200 m. SW Sichuan, C and NE Yunnan.

- 1a. Fruit ovoid, 3.5–4 cm 23a. var. *macrosperma*
1b. Fruit elliptic, to 5 cm 23b. var. *oblongicarpa*

23a. *Hemsleya macrosperma* var. *macrosperma*

罗锅底(原变种) *luo guo di* (*yuan bian zhong*)

- Fruit ovoid, 3.5–4 cm.

- Evergreen broad-leaved or *Pinus* forests; 1800–3200 m. SW Sichuan, C and NE Yunnan.

23b. *Hemsleya macrosperma* var. *oblongicarpa* C. Y. Wu & Z. L. Chen, Acta Phytotax. Sin. 23: 140. 1985.

长果罗锅底 *chang guo luo guo di*

- Fruit elliptic, to 5 cm.

- Evergreen broad-leaved forests; 1900–2000 m. SW Sichuan, NE Yunnan.

24. *Hemsleya dulongjiangensis* C. Y. Wu, Acta Phytotax. Sin. 23: 134. 1985.

独龙江雪胆 *du long jiang xue dan*

Tuber enlarged. Stem and branchlets slender, longitudinally sulcate, densely pubescent. Tendrils 6–9 cm, densely pubescent. Leaves pedately 3–7-foliolate; petiole 2–3 cm; leaflets broadly ovate-lanceolate to rhombic, margin sparsely serrate; median leaflets 3–6 × 3–3.5 cm. Flowers unknown. Fruit ovoid, 3.5–4.5 × 3–3.5 cm; fruiting pedicel curved, 5–8 cm. Seeds (immature) yellow-brown, broadly ovoid, ca. 13 mm in diam., unwinged; margin 1–2 mm wide, erose. Fr. Sep.

- Open forests in valleys; 1400–2700 m. NW Yunnan.

25. *Hemsleya endecaphylla* C. Y. Wu, Acta Phytotax. Sin. 23: 142. 1985.

十一叶雪胆 *shi yi ye xue dan*

Tuber enlarged. Stem slightly robust. Tendrils 8–12 cm. Leaves pedately 9–11-foliolate; petiole stout, 5–7 cm; leaflets obovate-lanceolate, margin irregularly crenate; median leaflets 5–7 × 2–2.5 cm; petiolule 3–5 mm. Male inflorescence paniculate; rachis indistinctly flexuous, 5–8 cm; calyx segments pale yellow-green, ovate-triangular, ca. 5 × 4 mm, apex reflexed; corolla orange-yellow, bowl-like, 8–10 mm in diam.; segments oblong, with dense squamose hairs, apex reflexed; filaments very short, ca. 0.5 mm. Female flower and fruit unknown. Fl. Jun–Jul.

- Broad-leaved forests; ca. 2400 m. NW Yunnan.

2. GOMPHOGYNE Griffith, Account Bot. Coll. Cantor, 26. 1845.

锥形果属 *zhui xing guo shu*

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, climbing; stems slender, angular. Leaves petiolate, pedately 7–9-foliolate; leaflet blade lanceolate or oblong, dentate. Tendrils 2-fid. Plants monoecious. Flowers small, pale green. Male flowers in racemes or panicles; calyx rotate, 5-partite; segments oblong-lanceolate, margins erose; corolla rotate, 5-partite; segments oblong-lanceolate, erose, caudate-acuminate; stamens 5; filaments short, united at base; anthers erect, subglobose, 1-celled, dehiscence longitudinal; rudimentary ovary absent. Female flowers in panicles or fascicles in axils of leaves; calyx and corolla as in male flowers; ovary clavate, 1-locular; styles 3; stigmas 2-lobed; ovules 3, pendulous from apex of locules; staminodes absent. Fruit capsular, turbinate, venose and ribbed, foveolate, truncate at apex, 3-valved, crowned by persistent styles. Seeds 3, black, oblong, testa thick, margin thickened, erose.

- Two species: Bhutan, China, India, Nepal; one species in China.

1. *Gomphogyne cissiformis* Griffith, Account Bot. Coll. Cantor, 26. 1845.

锥形果 *zhui xing guo*

Stem glabrous or slightly puberulent. Leaves membranous; petiole 3–6 cm, glabrous; leaflets obovate-oblong, glabrous, median leaflets 4–6 × 1.5–2 cm, lateral leaflets shorter, base attenuate, margin crenate-dentate, apex acuminate or acute; petio-

lules 3–9 cm. Tendrils slender, 2-fid. Plants monoecious. Male flowers in racemes or panicles; rachis slender, flexuous, 10–30 cm, glabrous; pedicels capillary-like, often fasciculate, 1–3 mm, with bracteoles at base; calyx segments narrowly ovate, 1–1.5 mm, acute; corolla segments ovate-lanceolate, 2.5–3 × ca. 1 mm, 3-veined, entire or indistinctly dentate. Female flowers in panicles 5–12 cm, or fascicled in axils of leaves; pedicels filiform, reflexed; bracteoles subulate; ovary funnellform. Fruit pale green, turbinate, 12–16 × 8–11 mm, apex truncate, 3-longitudinally dehiscent, 1–3-seeded. Seeds dark brown, oblong, 7(–12) × 3–4 mm, 1–2 mm thick, verrucose, base acute, margin dentate, apex truncate.

Forests on mountainsides; 2100–2800 m. S and SW Yunnan [Bhutan, India, Nepal].

- 1a. Fruit glabrous 1a. var. *cissiformis*
1b. Fruit tomentose 1b. var. *villosa*

1a. *Gomphogyne cissiformis* var. *cissiformis*

锥形果(原变种) zhui xing guo (yuan bian zhong)

Fruit glabrous.

Forests on mountainsides; 2100–2800 m. S and SW Yunnan [Bhutan, India, Nepal].

1b. *Gomphogyne cissiformis* var. *villosa* Cogniaux in A. Candolle & C. Candolle, Monogr. Phan. 3: 925. 1881.

毛锥形果 mao zhui xing guo

Gomphogyne cissiformis f. *villosa* (Cogniaux) M. Mizushima.

Fruit tomentose.

Forests on mountainsides; ca. 2300 m. S and SW Yunnan (Menghai, Yongde) [NE India (Sikkim), Nepal].

3. GYNOSTEMMA Blume, Bijdr. 23. 1825.

绞股蓝属 jiao gu lan shu

Chen Shukun (陈书坤), Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

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. 11: 165. 1989.

五柱绞股蓝 wu zhu jiao gu lan

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 × 0.5 mm, both surfaces glabrous, apex obtuse; corolla segments ovate, ca. 4 × 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; gynoeceum 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 guo 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 × 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 × 8 mm, glabrous, apex truncate. Seeds broadly cordate, ca. 3 × 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 × 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. 2.5×2 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 guo 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 $3\text{--}3.5 \times$ 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. 3×2 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 \times 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 \times 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. $3 \times 0.7\text{--}1$ 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

Zanonia 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 \times 2–3 cm, papery, base broadly cuneate, apex acute or shortly acuminate; lateral leaflets ovate, 4–7 \times 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 [“*Gymnostemma 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 \times 3–5.5 cm, base broadly cuneate, margin crenate, apex shortly acuminate; lateral leaflets 4–9 \times 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 \pm 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. $3(-5) \times 3$ 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 $3-12 \times 1.5-4$ 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, $2.5-3 \times$ 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 $3-4.5 \times 1.5-2.5$ 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 fili-

form, 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 triangular, ca. 0.8 × 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 × 0.4 mm; corolla segments linear-lanceolate, 2–3 × 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 × 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 × 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 × 0.5 mm, acute; corolla white; segments narrowly ovate-lanceolate, ca. 2.5 × 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 × 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 × 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 × 0.5 mm; corolla segments ovate-lanceolate, ca. 1.5 × 1 mm; filaments very short, connate; anthers ovoid. Female flowers in axillary or terminal panicles, 1.5–3.5 × 1.2–1.8 cm, glabrous; pedicel 1–1.5 mm; basal bract 1, linear; calyx 5-lobed; segments triangular, ca. 0.5 × 0.4 mm; corolla 5-parted; segments lanceolate, ca. 2 × 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 × 5.5–6 mm, glabrous, with persistent corolla and styles; fruit stalks filiform, 3–6 mm. Seeds 2, cream colored, broadly cordate, ca. 2 × 3 mm, spiniform-tuberculate. Fl. and fr. Sep–Nov.

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

4. NEOALSOMITRA Hutchinson, *Ann. Bot. (Oxford)*, n.s., 6: 97. 1942.

棒锤瓜属 *bang chui gua shu*

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs or shrubs, climbing. Leaves simple or often 3–5-foliolate, leaflets sometimes 2-glandular at base. Tendrils simple or 2-fid. Plants dioecious. Male flowers in paniculate or racemose inflorescences in axils of leaves; peduncle and pedicels filiform; calyx tube cupular, 5-partite; segments oblong or oblong-lanceolate; corolla rotate, 5-partite; segments oblong; stamens 5, free; filaments short,

united at base; anthers oblong, 1-celled. Female flowers in lax axillary panicles or racemes; ovary 1-locular or imperfectly 3-locular; ovules numerous, pendulous; styles 3, rarely 4; stigma semilunar. Fruit clavate or cylindrical, terete or slightly 3-angled, apex broadly truncate and 3-valved. Seeds imbricate, compressed, terminated by a very thin elongated wing, margins wavy-tuberculate, testa crustaceous.

Eleven species: India to Polynesia and Australia; one species in China.

1. *Neosalsomitra clavigera* (Wallich) Hutchinson, Ann. Bot. (Oxford), n.s., 6: 101. 1942.

棒锤瓜 *bang chui gua*

Zanonia clavigera Wallich, Pl. Asiat. Rar. 2: 28. 1831; *Alsomitra clavigera* (Wallich) M. Roemer; *A. integrifoliola* (Cogniaux) Hayata; *A. pubigera* Prain; *A. tonkinensis* Gagnepain; *Gynostemma elongatum* Merrill; *G. integrifoliolum* Cogniaux; *Hemsleya elongata* (Merrill) Cogniaux; *H. henryi* Cogniaux; *Neosalsomitra integrifoliola* (Cogniaux) Hutchinson; *N. tonkinensis* (Gagnepain) Hutchinson.

Herbs. Stem slender, much branched, pubescent or subglabrous. Leaf blade pedately 3–5-foliolate; petiole 1.5–2 cm, pubescent; leaflets abaxially pale green, adaxially green, oblong or oblong-lanceolate, median leaflet 7–14 × 3–7 cm, lateral leaflets smaller, 1- or 2-glandular, membranous or thinly papery, both surfaces pubescent along veins, lateral veins 4 or 5 pairs, base obtuse, apex acuminate; petiolule 0.5–1 cm, densely pubescent. Tendrils glabrous or pubescent, 2-fid. Male inflores-

cences paniculate, 12–30 cm, much branched; pedicel filiform, 4–8 mm, glabrous or pubescent; bracteole subulate-lanceolate, 1–2 mm, densely pubescent; calyx tube short; segments ovate-lanceolate to lanceolate-linear, ca. 2 × 1 mm, hirsute-pubescent; corolla white; segments ovate, 2–4 × 1.5–3 mm, abaxially densely pubescent, apex acute; filaments ca. 0.8 mm; anthers ovoid. Female flowers paniculate; calyx and corolla as in male flowers; ovary subcylindrical, ca. 10 mm, pubescent; styles 3; stigma 2-lobed. Fruit capsular, cylindrical, 4–8.5 × 1.5–2 cm, glabrous or pubescent, base obtuse, apex truncate, with numerous seeds. Seeds gray- or yellow-brown, substelliform, narrowly ovate, margin 4–7-dentate, 10–14 × 6–10 mm, both surfaces muriculate, apex with oblong, membranous, 15–22 × 6–8 mm wing. Fl. Sep–Nov, fr. Nov–Apr (following year).

Rain forests, broad-leaved forests, valleys, secondary forests. Guangdong, Guangxi, Taiwan, SE Xizang (Médog), Yunnan [Bhutan, Cambodia, NE India, Indonesia (Sumatra), Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam; Australia (Queensland), Pacific islands (Fiji, Solomon Islands)].

5. ZANONIA Linnaeus, Sp. Pl. 2: 1028. 1753.

翅子瓜属 *chi zi gua shu*

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Climbers, woody. Stem subglabrous. Leaves petiolate, undivided, margin entire. Tendrils simple or bifid. Plants dioecious; male flowers in lax pendulous panicles; female flowers in racemes. Male flower: calyx tube shortly cupular; segments 3, rarely 4, membranous, concave; corolla rotate; segments 5, apex narrow and inflexed in flower bud; stamens 5, free, all of same length, inserted on a fleshy disk; filaments short, thick; anthers oblong, 1-celled; pistillode absent. Female flowers: calyx as in male flowers; staminodes 5, very short, alternate with petals; ovary inferior, at first 3-loculed, ultimately 1-loculed; styles 3, spreading, apex bifid; ovules in each locule 2 or many, pendulous, attached in 2 series to a fleshy parietal placenta. Fruit a capsule, large, narrowly cylindrical, clavate, 3-valved at truncate apex. Seeds pendulous, large, oblong, compressed, surrounded by a large membranous wing.

One species: Bhutan, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam.

1. *Zanonia indica* Linnaeus, Syst. Nat., ed. 10, 2: 1292. 1759.

翅子瓜 *chi zi gua*

Stem robust, branched, ± sulcate, glabrous. Leaves glabrous; leaf blade ovate-oblong, 8–16 × 5–10 cm, leathery, abaxially with distinct reticulate veins, lateral veins 3 or 4 pairs, adaxially smooth, base rounded or slightly emarginate, margin entire, apex acute; petiole 1.5–3 cm, glabrous. Male peduncle slender; rachis ca. 16 cm, much branched; pedicel robust, 4–5 mm, with articulation; calyx segments ovate-triangular, ca. 2 mm, glabrous, apex acute; corolla pale yellow-brown; segments oblong, 3–3.5 × 1–1.5 mm, apex obtuse. Female peduncle 10–30 cm, sparsely 5–10-flowered; pedicels thick; calyx segments ca. 4 mm, apex obtuse; corolla segments 6–8 mm; ovary obconic-cylindrical, 10–12 mm. Fruit brownish, 6–10 × 2.5–5 cm, finely granulate, base obtuse, apex truncate. Seeds oblong, ca. 2 × 1–1.5 cm; wing yellowish or white, surrounding central seed, 5–8 × 1.3–2 cm, base and apex rounded.

Riversides, mountain slopes; 300–900 m. W Guangxi, S Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].

- 1a. Fruit 6–10 × 2.5–3 cm, glabrous; seed wing 5–6 × 1.3–1.5 cm 1a. var. *indica*
 1b. Fruit ca. 10 × 4.5–5 cm, densely pubescent; seed wing ca. 8 × 2 cm 1b. var. *pubescens*

1a. *Zanonia indica* var. *indica*

翅子瓜(原变种) *chi zi gua* (*yuan bian zhong*)

Alsomitra simplicifolia Merrill; *Jussiaea borneensis* Merrill; *Zanonia indica* subsp. *orientalis* W. J. de Wilde & Duyfjes.

Fruit 6–10 × 2.5–3 cm, glabrous. Seeds ca. 2 × 1 cm; wing 5–6 × 1.3–1.5 cm.

Riversides, mountain slopes; ca. 300 m. W Guangxi (Napo) [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].

1b. *Zanonia indica* var. *pubescens* Cogniaux in A. Candolle & C. Candolle, *Monogr. Phan.* 3: 927. 1881.

滇南翅子瓜 dian nan chi zi gua

Fruit ca. 10 × 4.5–5 cm, densely pubescent. Seeds ca. 2 × 1.5 cm; wing white, ca. 8 × 2 cm.

Open forests on mountain slopes and dry valley sides; ca. 800 m. S Yunnan (Mengla) [N India].

6. **BOLBOSTEMMA** Franquet, *Bull. Mus. Natl. Hist. Nat.*, sér. 2, 2: 325. 1930.

假贝母属 jia bei mu shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, climbing, with a multi-tuberous base. Stems slender. Leaves cordate, 5-lobed, glandular at base. Tendrils 2-fid. Plants dioecious; male flowers in panicle, female flowers often in panicle, sometimes solitary or fascicled. Male flowers: calyx rotate, 5-partite; segments linear-lanceolate; corolla rotate, 5-partite; segments narrowly lanceolate, caudate-acuminate; stamens 5; filaments free or connate at base in pairs; anthers subovoid, 1-celled; connective papillose on back. Female flowers: calyx and corolla as in male flowers; ovary subglobose, verrucose, 3-locular; style short; stigmas 3, 2-lobed; ovules 2 in each locule, pendulous. Fruit narrowly ovoid, conical at apex, with or without spines, circumscissile-dehiscent above middle. Seeds 4–6, subovate, with membranous wing at apex.

- Two species: disjunct between N China and SW China.

1a. Leaves palmately 5-fid, lobes 3–5-lobed; calyx segments and corolla segments ca. 2.5 mm; stamens free, connective not papillose; ovary rarely verrucose; fruit smooth 1. *B. paniculatum*

1b. Leaves suborbicular; calyx segments and corolla segments to 6–8 mm; stamens connate at base of filaments in pairs, connective elongate; ovary densely verrucose; fruit spinescent 2. *B. biglandulosum*

1. *Bolbostemma paniculatum* (Maximowicz) Franquet, *Bull. Mus. Natl. Hist. Nat.*, sér. 2, 2: 327. 1930.

假贝母 jia bei mu

Mitrosicyos paniculatus Maximowicz, *Mém. Acad. Imp. Sci. St.-Pétersbourg Divers Savans* 9 [Prim. Fl. Amur.]: 113. 1859; *Actinostemma multilobum* Harms; *A. paniculatum* (Maximowicz) Cogniaux; *Schizopepon fargesii* Gagnepain.

Stem herbaceous, glabrous. Petiole slender, 1.5–3.5 cm; leaf blade ovate-orbicular, 4–11 × 3–10 cm, palmately 5-partite; lateral lobes ovate-oblong, acute; central lobe oblong-lanceolate, acuminate; basal lobe with a gland at apex, glabrous or pilose on veins. Tendrils filiform, 2-fid. Inflorescence paniculate, 4–10 cm; pedicel filiform, 1.5–3.5 cm; calyx and corolla similar, yellow-green; segments ovate-lanceolate, ca. 2.5 cm; stamens free; filaments 0.3–0.5 mm; anthers ca. 0.5 mm; ovary ovoid, 3-locular; ovules 2 in each locule. Fruit cylindrical, 1.5–3 × 1–1.2 cm, circumscissile-dehiscent, conical at apex. Seeds 6, 8–10 × ca. 5 mm, testa rugose, margin denticulate, with a long membranous wing at apex, wing 8–10 mm. Fl. Jun–Aug, fr. Aug–Sep.

- Montane slopes. Gansu, Hebei, Henan, NW Hunan, Shaanxi, Shandong, Shanxi, E and S Sichuan.

This plant is used medicinally.

2. *Bolbostemma biglandulosum* (Hemsley) Franquet, *Bull. Mus. Natl. Hist. Nat.*, sér. 2, 2: 328. 1930.

刺儿瓜 ci er gua

Branches slender, slightly pilose when young, ultimately glabrous. Petiole slender, 2–5 cm; leaf blade broadly oblong or suborbicular, 2.5–7 × 3–7 cm, membranous, glabrous, 5-lobed, base broadly cordate, apex acute or obtuse, with a gland at apex of lowest 2 lobes. Tendrils filiform, 2-fid, pilose or glabrous. Male inflorescence paniculate, to 12 cm; rachis and pedicels filiform; pedicels 1–1.5 cm; calyx segments linear-lanceolate;

corolla segments pale yellow-green, narrowly lanceolate, 6–8 × 0.8–1.2 mm, glabrous, apex long caudate; stamens inserted at base of corolla tube, connate in pairs, 1 free; filaments ca. 0.8 mm; anthers yellow, ca. 1 mm; connective caudate at apex, 1–1.2 mm. Female flowers solitary; pedicels filiform, 10–15 mm; ovary densely verrucose. Fruit yellow-green, cylindrical, 3.5–4 cm, covered with slender spines, spines 5–7 mm, circumscissile when mature. Seeds irregularly ovate, margin irregularly dentate, ca. 10 × 7 mm, with membranous wing at apex, wing ca. 10 mm, apex lobate. Fl. Sep, fr. Oct.

- Forest margins, thickets under forests; 1000–1400 m. NW and SE Yunnan.

1a. Leaf blade suborbicular, ± as long as broad, 4–7 × 4–7 cm 2a. var. *biglandulosum*

1b. Leaf blade broadly oblong, shorter than broad, 2.5–3.5 × 3–4.5 cm 2b. var. *sinuatolobulatum*

2a. *Bolbostemma biglandulosum* var. *biglandulosum*

刺儿瓜(原变种) ci er gua (yuan bian zhong)

Actinostemma biglandulosum Hemsley, *Hooker's Icon. Pl.* 27: t. 2622. 1899; *Hemsleya esquirolii* H. Léveillé.

Leaf blade suborbicular, ± as long as broad, 4–7 × 4–7 cm. Calyx segments linear-lanceolate; corolla segments narrowly lanceolate, 6–8 × 1–1.2 mm.

- Forest margins; 1300–1400 m. SE Yunnan (Mengzi).

2b. *Bolbostemma biglandulosum* var. *sinuatolobulatum* C. Y. Wu, *Acta Phytotax. Sin.* 6: 238. 1957.

波裂叶刺儿瓜 bo lie ye ci er gua

Leaf blade broadly oblong, shorter than broad, 2.5–3.5 × 3–4.5 cm. Calyx- and corolla segments narrowly lanceolate, 6–8 × 0.8–1 mm.

- Thickets under forests; ca. 1000 m. NW Yunnan (Lijiang).

7. ACTINOSTEMMA Griffith, Account Bot. Coll. Cantor, 24. 1845.

盒子草属 he zi cao shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Mitrosicyos Maximowicz.

Herbs, scandent. Leaves petiolate; blade cordate-hastate, cordate-ovate, broadly ovate, or lanceolate-triangular, unlobed or 3–5-lobed, margins dentate. Tendrils 2-fid or rarely simple. Plants monoecious or rarely bisexual. Flowers unisexual. Male inflorescence racemose or paniculate, rarely flowers solitary or paired; calyx rotate, segments linear-lanceolate; corolla rotate, segments lanceolate, acuminate; stamens 5 (or 6), free; filaments short, filiform; anthers subovoid, extrorse, basifixed, 1-celled; anther cell oblong; connective papillose on back. Female flowers solitary or fasciculate; calyx and corolla as in male flowers; ovary ovoid, verrucose, 1-locular; style short; stigmas 3, reniform; ovules 2(–4), attached to wall near apex of locule, pendulous. Fruit ovoid, conical at apex, semi-superior, echinate, circumscissile-dehiscent near middle. Seeds 2–4, compressed, testa rugose, margin denticulate.

One species: E Asia and India.

1. Actinostemma tenerum Griffith, Account Bot. Coll. Cantor, 25. 1845.

盒子草 he zi cao

Branches slender, slightly pilose when young, ultimately glabrous. Petiole filiform, slightly puberulent, 2–6 cm; blade very variable, ovate or sagittate-ovate, 3–12 × 2–8 cm, abaxially slightly pilose, ultimately glabrous, adaxially indistinctly punctate-scabrid, 3-lobed, base deeply emarginate, margin minutely denticulate or coarsely serrate, apex long, acute-acuminate. Tendrils filiform, 2-fid. Male inflorescence racemose, sometimes paniculate, shortly villous, many flowered, main rachis 1–13 cm, shortly villous; bract linear, ca. 3 mm, villous; calyx segments linear-lanceolate, 2–3 × 0.5–1 mm, margin dentate; corolla segments lanceolate, 2–3 × 1–1.5 mm at base, scarcely villous, 1- or 3-veined, apex narrowly subulate; staminal filaments slightly dilated at apex, ca. 0.5 mm, pilose; anthers ca. 0.3 mm. Female flowers solitary or fasciculate; calyx and corolla as in male flowers; ovary ovoid, verrucose. Fruit ovoid or oblong-ellipsoid, 1.6–2.5 × 1–2 cm, verrucose, operculate, 2–4-seeded. Seed plano-convex, broadly ovoid, 11–13 × 8–9 mm, 3–4 mm thick, both surfaces reticulate, base slightly attenuate. Fl. Jul–Sep, fr. Sep–Nov.

Growing on watersides. Anhui, Fujian, Guangxi, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shandong, Sichuan, S Xizang, W Yunnan, Zhejiang [India, Japan, Korea, Laos, Thailand, Vietnam].

The whole plant and its seeds are used medicinally.

- 1a. Flowers unisexual; stamens 5 1a. var. *tenerum*
1b. Flowers bisexual; stamens 6 1b. var. *yunnanense*

1a. Actinostemma tenerum var. **tenerum**

盒子草(原变种) he zi cao (yuan bian zhong)

Actinostemma japonicum (Miquel) Miquel; *A. lobatum* (Maximowicz) Franchet & Savatier; *A. lobatum* var. *japonicum* Maximowicz; *A. lobatum* f. *longilobum* Komarov; *A. lobatum* var. *palmatum* Makino; *A. lobatum* f. *subintegrum* Komarov; *A. palmatum* (Makino) Makino; *A. parvifolium* Cogniaux; *A. racemosum* (Maximowicz) Cogniaux; *Mitrosicyos lobatus* Maximowicz; *M. racemosus* Maximowicz; *Pomasterion japonicum* Miquel.

Flowers unisexual. Stamens 5.

Grasslands at watersides. Anhui, Fujian, Guangxi, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shandong, S Xizang, W Yunnan, Zhejiang [India, Japan, Korea, Laos, Thailand, Vietnam].

1b. Actinostemma tenerum var. **yunnanense** A. M. Lu & Zhi Y. Zhang, Bull. Bot. Res., Harbin 4(2): 127. 1984 [“*yunnanensis*”].

云南盒子草 yun nan he zi cao

Flowers bisexual. Stamens 6.

• W Yunnan.

8. INDOFEVILLEA Chatterjee, Nature 158: 345. 1946.

藏瓜属 zang gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Woody climbers, large. Stem angular-sulcate. Leaves petiolate; leaf blade ovate, cordate, entire, pedately veined at base. Tendrils 2-fid. Plants dioecious. Male flowers in panicle; rachis elongate; pedicels short; bracts linear, apex acuminate; calyx segments 5, 3- or 4-veined, acute; corolla segments 5, shorter than calyx segments, 3–5-veined; stamens 5, 4 in pairs, 1 free; filaments very short; anthers reniform, 1-celled, pubescent; staminodes and rudimentary ovary absent. Fruit oblong, indehiscent, in clusters of 3–6 on a very long peduncle, with a thick woody rind. Seeds many, large, ovate, compressed, faintly margined.

One species: SW China, NE India.

1. Indofevillea khasiana Chatterjee, Nature 158: 345. 1946.

藏瓜 zang gua

Stem branched, robust, pubescent at first, ultimately glabrous. Tendrils smooth, glabrous, to 20–30 cm. Petiole robust, 1.5–8 cm, pubescent at first, later glabrous; leaf blade broadly

ovate-cordate, 15–25 × 12–20 cm, leathery, margin entire or rarely in younger leaves distinctly and minutely toothed near base, scabrous on veins, otherwise glabrous on both surfaces, apex shortly acuminate. Male panicle to 17 cm; rachis and branches scabrous; bracts 5–9 mm; bracteoles 2–3 mm; calyx segments ovate-lanceolate, longer than corolla segments, ca. 6

mm; corolla segments ovate-lanceolate, ca. 4 mm, outside sparsely and minutely hairy, inside papillose. Fruit oblong, 3–6 in clusters on a long stalk, ca. 30 cm, indehiscent with a thick woody rind. Seeds 3.5–4 × ca. 2 cm, ca. 0.5 cm thick. Fl. and fr. Aug.

Open forests on mountain slopes; ca. 900 m. S Xizang [NE India].

9. *SIRAITIA* Merrill, Pap. Michigan Acad. Sci. 19: 200. 1934.

罗汉果属 *luo han guo shu*

Lu Anmin (路安民 *Lu An-ming*); Charles Jeffrey

Neoluffa Chakravarty.

Herbs, perennial, scandent, verrucose-glandular. Tuber spheroid, enlarged. Stems angular-sulcate. Leaf blade unlobed, margin sparsely dentate, abaxially pilose or densely tomentose. Tendrils spiralled above and below branch, 2-fid. Plants dioecious. Male flowers: inflorescence paniculate, bracteate; calyx segments 5, triangular, densely pubescent; corolla segments 5, lanceolate or obovate-lanceolate, base often with 5 scales; stamens 5, 4 connected in pairs, 1 free; anthers sigmoid. Female flowers solitary, paired, or 3 or 4 in raceme; staminodes 5, glanduliform; ovary ovoid; ovules numerous, horizontal; style stout, apex 3-lobed; stigma 2-lobed. Fruit subglobose or cylindrical. Seeds subovoid or ovoid, winged, wing corky. $2n = 28$.

Four species: China, India (Sikkim), Indonesia, Malaysia, Thailand, Vietnam; three species (one endemic) in China.

- 1a. Male inflorescence cymose-paniculate, many flowered 1. *S. sikkimensis*
 1b. Male inflorescence racemose or paniculate, 6–10-flowered.
 2a. Seeds with 3-layered wing, wing marginally obtusely dentate; calyx segments 3–5 × 7–9 mm 3. *S. siamensis*
 2b. Seeds with 2-layered wing, wing marginally only sparsely dentate; calyx segments 3–4 × 3–4 mm 2. *S. grosvenorii*

1. *Siraitia sikkimensis* (Chakravarty) C. Jeffrey, Kew Bull. 36: 737. 1982.

锡金罗汉果 *xi jin luo han guo*

Neoluffa sikkimensis Chakravarty, J. Bombay Nat. Hist. Soc. 50: 895. 1952.

Stem angular, tomentose. Petiole 5–8 cm, tomentose; leaf blade cordate, 7–15 × 7–15 cm, abaxially tomentose, adaxially glabrous, margin entire, lowest lateral veins running parallel with margin of basal lobes. Male flowers yellow, 20–35 crowded on 8–14 cm axillary peduncle; rachis 3–5 cm; pedicels 1–2 cm; bracts leaflike, 7–15 mm; calyx tube campanulate, 10–15 mm in diam., tomentose; segments acute, 3–5 mm; corolla segments oblong-ovate, 8–10 × 3–4 mm, entire, ± constricted at apex, apex acute; stamens free, inserted at base of calyx tube, 1–2 mm; filaments 0.5–1 mm; anthers 1-celled, sinuate; connective broad, granular. Female flowers and fruit unknown.

S Yunnan (Mengla) [India (Sikkim)].

2. *Siraitia grosvenorii* (Swingle) C. Jeffrey ex A. M. Lu & Zhi Y. Zhang, Guihaia 4: 29. 1984.

罗汉果 *luo han guo*

Momordica grosvenorii Swingle, J. Arnold Arbor. 22: 198. 1941; *Thladiantha grosvenorii* (Swingle) C. Jeffrey.

Plant: all parts with yellow-brown pubescence and black glandular scales. Root enlarged, fusiform or subglobose. Stem and branches slightly robust. Petiole 3–10 cm; leaf blade ovate-cordate, 12–23 × 5–17 cm, membranous, apex acuminate or long acuminate; sinus semicircular or broadly ovate-cordate. Male flowers: inflorescence racemose, 6–10-flowered; peduncle 7–13 cm; pedicels slender, 5–15 mm; calyx tube broadly campanulate, 4–5 × ca. 8 mm, usually with 3 membranous

scales; segments triangular, ca. 4.5 × 3 mm, 3-veined, apex long acuminate; corolla yellow; segments oblong, 10–15 × 7–8 mm, 5-veined, apex acute; filaments puberulent, ca. 4 mm; anthers ca. 3 mm. Female flowers solitary or 2–5 on 6–8 mm peduncle; calyx and corolla as in male flowers but slightly larger; staminodes 2–2.5 mm; ovary oblong, 10–12 × 5–6 mm, densely yellow-brown velvety, base obtuse-rounded; style ca. 2.5 mm; stigmas 3, enlarged, ca. 1.5 mm. Fruit globose or oblong, 6–11 × 4–8 cm, densely yellow-brown velvety and black glandular-scaly, ultimately glabrous. Seeds numerous, pale yellow, broadly ovate, compressed, 15–18 × 10–12 mm, base obtuse-rounded, with 2-layered wings, wings sinuate. Fl. May–Jul, fl. Jul–Sep.

• Forests on mountain slopes, riversides, thickets. Guangdong, Guangxi, Guizhou, S Hunan, Jiangxi.

The fruit is used medicinally.

3. *Siraitia siamensis* (Craib) C. Jeffrey ex S. Q. Zhong & D. Fang, Guihaia 4: 23. 1984.

翅子罗汉果 *chi zi luo han guo*

Thladiantha siamensis Craib, Bull. Misc. Inform. Kew 1914: 7. 1914; *Momordica tonkinensis* Gagnepain.

Plants to 20 m; all parts densely yellow-brown pubescent and red (black when dry) glandular-scaly. Roots enlarged. Petiole 3.5–10 cm; leaf blade ovate-cordate, 10–27 × 2–5.5 cm, membranous, palmately 5–7-veined. Male flowers: 5–15 (to many) in a raceme or panicle; peduncle 2–12 cm; pedicels 15–30 mm; calyx tube broadly campanulate, 12–15 mm in diam.; segments ovate-triangular, 3–5 × 7–9 mm, 3-veined, apex obtuse; corolla pale yellow, 3.4–4 cm in diam.; segments ovate-oblong, 15–20 × 9–13 mm, margin with glandular hairs, base with 3 membranous scales, 5-veined, apex obtuse; filaments

sparsely glandular hairy. Female flowers solitary or paired; calyx and corolla as in male flowers but smaller; staminodes (3–)5; corolla base with 3 scales; ovary ovoid, 12–15 × 9–10 mm, densely velvety and glandular-scaly, base obtuse-rounded, apex truncate; style 4–5 mm, glabrous, 3-lobed; stigma reniform. Fruit subglobose, ca. 6 cm in diam., velvety at first, glabrescent. Seeds numerous, pale brown, ovoid, 12–14 × 11–13

mm, ca. 4 mm thick, with 3-layered wings; wing corky, margin irregularly dentate, median 3–5 mm wide, lateral 1–2 mm wide. Fl. Apr–Jun, fr. Jul–Sep.

Forests on mountain slopes; 300–700 m. W Guangxi, SE Yunnan [Indonesia, Malaysia, Thailand, N Vietnam].

The tuber is used medicinally.

10. SINOBALJIANIA C. Jeffrey & W. J. de Wilde, Bot. Zhurn. 91: 769. 2006.

白兼果属 bai jian guo shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, perennial, scandent. Root spheroid, enlarged. Stem and branches sulcate and angular, without verrucose glands, sparsely puberulent. Leaf blade ovate-cordate or triangular-cordate, membranous, abaxially hispid on veins, adaxially strigose-punctate, margin entire or 2- or 3-lobed. Male inflorescence racemose, 5–8-flowered, bracteate; calyx segments triangular-ovate, valvate, sparsely pilose; corolla oblong or ovate; stamens 5; anthers curved. Female flowers 1–3, ovoid or cylindrical; ovules numerous, horizontal. Fruit subglobose or cylindrical. Seeds ovate or ovate-oblong, apex truncate or obtuse, unwinged. $2n = 32$.

Four species: S China, Laos, Thailand; three species (two endemic) in China.

One of us (Lu) does not recognize “micro-genera” such as this; however, for the purposes of this Flora, the treatment by the co-author (Jeffrey) is followed.

- 1a. Leaves 3–5-parted; fruit subglobose 3. *S. taiwaniana*
 1b. Leaves entire, undulate, crenate, or lobed; fruit cylindrical.
 2a. Leaves entire, undulate; seeds triangular-ovate, apex obtuse and apiculate 1. *S. decipiens*
 2b. Leaves crenate or lobed; seeds ovate, apex broadly truncate 2. *S. yunnanensis*

1. Sinobaljiania decipiens C. Jeffrey & W. J. de Wilde, Bot. Zhurn. 91: 769. 2006.

白兼果 bai jian guo

Stem and branches setose and pubescent at first, ultimately glabrous. Petiole 2–6 cm; leaf blade narrowly ovate-cordate, 8–15 × 5–10 cm, membranous or papery, abaxially sparsely puberulent or subglabrous, adaxially setose at first, ultimately strigose-punctate, pubescent on veins, base cordate, margin entire or callose-serrate, apex acuminate; sinus semicircular or suborbicular, 1.5–2.5 cm deep, 2–3 cm wide. Tendrils 2-fid. Plants dioecious. Male inflorescence racemose or paniculate; rachis 3–14 cm, pubescent, 7–15-flowered; pedicel 5–10 mm, pubescent, base with a lanceolate or narrowly ovate, 2–3 mm bract; calyx tube cupular, 2.5–3 mm, ± puberulent; segments lanceolate, 6–7.5 mm, base 2–3 mm wide, 3-veined, apex acuminate; corolla yellow; segments narrowly ovate, 6–6.5 mm, apex acute; stamens 4 in pairs and 1 free; filaments ca. 1 mm; anthers terete, 1-celled, ca. 3 mm, cells curved, puberulent. Female flowers solitary, or 2- or 3-flowered at apex of peduncle; pedicel ca. 5 mm, puberulent; calyx and corolla as in male flowers; ovary oblong, ca. 8 × 4 mm, densely hispid or pubescent; style ± long, filiform, ca. 7 mm, 3-fid; stigma 2-lobed, enlarged. Fruiting pedicel stout, sulcate-angular, 2–2.5 cm, densely pubescent and setose, ultimately glabrous; fruit red-brown when mature, oblong or subglobose, 5.5–6.5 × 4–5 cm, pubescent at first, ultimately glabrous. Seeds numerous, pale yellow-brown, triangular-ovate, ca. 8 × 7 cm, ca. 3 mm thick, both surfaces smooth, base obtuse-rounded, constricted above, apex truncate. Fl. Jun–Aug, fr. Sep–Dec.

• Forests, river valleys. Guangdong, SE Xizang (Médog), SE Yunnan (Xichou).

2. Sinobaljiania yunnanensis (A. M. Lu & Zhi Y. Zhang) C. Jeffrey & W. J. de Wilde, Bot. Zhurn. 91: 769. 2006.

云南白兼果 yun nan bai jian guo

Siraitia borneensis (Merrill) C. Jeffrey ex A. M. Lu & Zhi Y. Zhang var. *yunnanensis* A. M. Lu & Zhi Y. Zhang, Guihaia 4: 31. 1984; *Baljiania yunnanensis* (A. M. Lu & Zhi Y. Zhang) A. M. Lu & J. Q. Li; *S. borneensis* var. *lobophylla* A. M. Lu & Zhi Y. Zhang.

Tuber complanate-spheroid, 10–13 × 6–8 cm. Stem angular-sulcate, sparsely puberulent. Petiole 3–9 cm; leaf blade ovate-cordate, 5–13 × 4–10 cm, membranous, abaxially pilose, hispid on veins, adaxially scabrous, margin irregularly dentate or slightly 3-lobed, apex acute. Tendrils 2-fid. Male flowers: 8 in raceme; peduncle 4–6 cm; bracts broadly obovate, 5–6 × 3–4 mm, pubescent; calyx segments triangular-ovate or ovate, 5.5–8 × 3–5 mm, 3-veined, apex acuminate; corolla segments oblong, 10–13 × 7–8 mm, villous, 5-veined, base truncate, apex obtuse; filaments 3–3.5 mm; anthers curved, 3.5–5 mm. Female flowers solitary or paired; pedicel 1–1.5 cm, pubescent; ovary cylindrical, ca. 10 × 4 mm, densely villous. Fruit cylindrical, ca. 5 × 3.3 cm. Seeds numerous, ovoid or ovoid-oblong, 7–8.5 × 4.5–6 mm, ca. 1.5 mm thick.

Valley sides, forests; 1000–1800 m. S and SW Yunnan [N Laos].

De Wilde and Duyfjes (Blumea 51: 497. 2006) cited evidence suggesting that the type of *Siraitia borneensis* var. *lobophylla* may represent a species of *Sinobaljiania* distinct from *S. yunnanensis*.

3. Sinobaljiania taiwaniana (Hayata) C. Jeffrey & W. J. de Wilde, Bot. Zhurn. 91: 770. 2006.

台湾白兼果 tai wan bai jian guo

Thladiantha taiwaniana Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 119. 1911; *Baijiana taiwaniana* (Hayata) A. M. Lu & J. Q. Li; *Siraitia taiwaniana* (Hayata) C. Jeffrey ex A. M. Lu & Zhi Y. Zhang.

Stem and branches sulcate-angular, subglabrous. Petiole ca. 3 cm; leaf blade oblong-cordate or ovate-cordate, 5–12 × 5–10 cm, abaxially sparsely setose at first, ultimately glabrous, adaxially scabrous, punctate, 5-veined, base deeply cordate,

margin irregularly dentate, 3-lobed, apex acute; median lobe oblong, ca. 6 × 3.5 cm. Tendrils simple. Male flowers: inflorescence racemose, axillary, 6–7 cm; bracts broadly obovate, ca. 7 × 5 mm, pubescent; calyx tube ca. 4 mm in diam., pubescent; segments 5, triangular-ovate, ca. 4 × 2.5 mm, apex acuminate; corolla segments 5, oblong, apex obtuse. Fruit globose, ca. 2.5 cm in diam., pubescent.

• Taiwan.

11. THLADIANTHA Bunge, Enum. Pl. Chin. Bor. 29. 1833.

赤藤属 *chi bao shu*

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, perennial, climbing, scandent, or prostrate. Roots usually tuberous. Stems herbaceous, scabrous. Tendrils simple or 2-fid. Leaves mostly simple, vary rarely pedately 3–7-foliolate; leaf blade cordate, margin dentate. Plants dioecious. Male flowers in cymes-racemes or rarely solitary; calyx tube broadly campanulate or cupular; segments 5, linear, lanceolate, ovate-lanceolate, or oblong, 1–3-veined; corolla yellow, campanulate, 5-partite; segments oblong, broadly ovate, or obovate, usually 5–7-veined, entire; stamens 5, inserted on calyx tube, free, often 4 in pairs, other 1 free; filaments short; anthers oblong or ovoid, all 1-celled; anther cell erect; rudimentary ovary glandlike. Female flowers solitary or 2- or 3-fascicled on a short peduncle; calyx and corolla as in male flowers; ovary ovoid, oblong, or fusiform, smooth or verrucose; ovules numerous, horizontal; style 3-fid; stigmas 3, 2-lobed, reniform. Fruit fleshy, indehiscent, smooth or verrucose, many ribbed or not ribbed. Seeds numerous, horizontal.

Twenty-three species: Bhutan, China, India, Indonesia, Japan (introduced), Korea, Laos, Myanmar, Nepal, Thailand, Vietnam; 23 species (19 endemic) in China.

- 1a. Bracts in male flowers flabelliform, dentate.
- 2a. Calyx segments entire, 0.6–3 mm wide 1. *T. cordifolia*
- 2b. Calyx segments dentate or irregularly lobed, (3–)4–11 mm wide.
- 3a. Calyx segments (3–)4–6 mm wide, with 1–3 triangular lobes 2. *T. grandisepala*
- 3b. Calyx segments to 11 mm wide, flabelliform, margin irregularly lobed 3. *T. medogensis*
- 1b. Male flowers without flabelliform bracts.
- 4a. Ovary and fruit scaly or verrucose.
- 5a. Leaf blade ovate-lanceolate or narrowly ovate-triangular; ovary and fruit verrucose 23. *T. longifolia*
- 5b. Leaf blade ovate-cordate; fruit with thick scales.
- 6a. Ovary and fruit ovoid-globose, apex with a long rostrum, scales at base of fruit less than 5 mm, not adnate to pedicel 21. *T. pustulata*
- 6b. Ovary and fruit ovoid-oblong, apex without a rostrum, scales at base of fruit to 10 mm, adnate to pedicel 22. *T. henryi*
- 4b. Ovary and fruit not scaly or verrucose.
- 7a. Leaves palmately deeply 5-lobed 20. *T. palmatipartita*
- 7b. Leaves not palmately deeply 5-lobed.
- 8a. Male flowers congested at apex of rachis into pseudocapitulum.
- 9a. Calyx segments lanceolate, apex acute, 1-veined 18. *T. capitata*
- 9b. Calyx segments linear, apex obtuse, 3-veined 19. *T. davidii*
- 8b. Male flowers in cyme-panicle, panicle, raceme, or rarely solitary, but not capitellate.
- 10a. Plants sparsely hairy or subglabrous.
- 11a. Calyx segments 1-veined.
- 12a. Basal lateral vein along base of leaf blade; calyx segments linear, over 9 mm 13. *T. oliveri*
- 12b. Basal lateral vein not along base of leaf blade; calyx segments triangular-lanceolate, 4–5 mm 14. *T. montana*
- 11b. Calyx segments 3-veined.
- 13a. Tendrils 2-fid, leaves not lobed or lobed 17. *T. dentata*
- 13b. Tendrils simple, leaves not lobed.
- 14a. Leaf blade broadly ovate-cordate; tendrils filiform; pedicel in male flowers 1.2–2.5 cm; fruit with a long beak 15. *T. maculata*
- 14b. Leaf blade narrowly ovate or narrowly ovate-lanceolate; tendrils robust; pedicel 0.5–1 cm; fruit without beak 16. *T. punctata*
- 10b. Plants with dense multicellular setae, very rarely subglabrous.

- 15a. Leaves simple, unlobed or margin lobed or serrate, or pedately 3–5-foliolate 4. *T. hookeri*
 15b. Leaves unlobed, rarely irregularly lobed.
 16a. Tendrils simple.
 17a. Male flowers solitary or in a short raceme, bracts leaflike 5. *T. dubia*
 17b. Male flowers without bracts.
 18a. Petiole less than 1.5 cm, leaf blade lanceolate or narrowly ovate 6. *T. sessilifolia*
 18b. Petiole over 2 cm, leaf blade ovate-cordate 7. *T. villosula*
 16b. Tendrils 2-fid.
 19a. Male flowers dimorphic, solitary, and in raceme with (2 or)3(–5) flowers
 in axil of same leaf 8. *T. dimorphantha*
 19b. Male flowers in panicle or raceme.
 20a. Stem and leaves with pale yellow multicellular setae or very rarely
 subglabrous, sinus at base of leaf closed; fruit orange-red when
 mature 9. *T. nudiflora*
 20b. Stem and leaves with gray-white multicellular setae, sinus at base
 of leaf open; fruit whitish yellow when mature.
 21a. Calyx segments broadly lanceolate or obovate-oblong,
 10–15 mm 10. *T. longisepala*
 21b. Calyx segments triangular-lanceolate, less than 10 mm.
 22a. Ovary and fruit with dense yellow-brown spiniform setae;
 seeds 6.5–7 mm, sparsely irregularly verrucose on surface ... 11. *T. setispina*
 22b. Ovary and fruit with long setae; seeds 4.5–5 mm, not
 verrucose on surface 12. *T. lijiangensis*

1. *Thladiantha cordifolia* (Blume) Cogniaux in A. Candolle & C. Candolle, Monogr. Phan. 3: 424. 1881.

大苞赤爬 da bao chi bao

Luffa cordifolia Blume, Bijdr. 929. 1826; *Gymnopetalum piperifolium* Miquel; *Thladiantha calcarata* C. B. Clarke; *T. calcarata* var. *subglabra* Cogniaux; *T. calcarata* var. *tonkinensis* Cogniaux; *T. cordifolia* var. *tomentosa* A. M. Lu & Zhi Y. Zhang; *T. cordifolia* var. *tonkinensis* (Cogniaux) A. M. Lu & Zhi Y. Zhang; *T. globicarpa* A. M. Lu & Zhi Y. Zhang; *T. omeiensis* T. Y. Zhu; *T. tonkinensis* Gagnepain; *Trichosanthes javanica* Miquel.

Vines, climbing, herbaceous, pubescent. Stems much branched, robust, angular-sulcate. Petiole slender, 4–10(–12) cm; leaf blade ovate-cordate, 8–15 × 6–11 cm, membranous or papery, adaxially scabrous, pubescent, or with setae on an enlarged base, veins densely pubescent, both surfaces densely pale yellow pubescent, basal vein along margin of base of blade, base cordate, margin irregularly dentate, apex acuminate or shortly so; sinus at base often open, sometimes closed, 1–3 cm deep, 0.5–2 cm wide. Tendrils simple, pubescent at first, glabrescent. Male flowers: 3 to several in dense short raceme; peduncle robust, 4–15 cm, pubescent; bracts imbricate, flabelliform, 1.5–2 cm, both surfaces pubescent; pedicels slender, ca. 5 mm; calyx tube campanulate, 5–6 mm, 5-partite; segments linear, ca. 10 × 1 mm, 1-veined, apex caudate-acuminate; corolla segments ovate or elliptic, ca. 17 × 7 mm, apex shortly acuminate or acute; filaments ca. 4 mm; rudimentary ovary semiglobose. Female flowers solitary; calyx and corolla as in male flowers; ovary oblong, base obtuse, pubescent; styles 3-fid; stigmas enlarged, reniform, 2-lobed. Fruit oblong, 3–5 × 2–3 cm, with scabrous rind, slightly pubescent, with 10 longitudinal striae, obtuse at both ends. Seeds broadly ovate, 4–5 × 3–3.5 mm, ca. 2 mm thick, reticulate. Fl. and fr. May–Nov.

Streamsides, forests; 800–2600 m. Guangdong, Guangxi, Sichuan, Yunnan [India, Indonesia, Laos, Myanmar, Nepal, Thailand, Vietnam].

De Wilde and Duyfjes (Blumea 51: 513–514. 2006) considered *Thladiantha calcarata* var. *tonkinensis* (as *T. tonkinensis* Gagnepain) and *T. globicarpa* to be species distinct from *T. cordifolia*, differing in their smaller, non-fenestrate fruit and the latter from the former by its narrower calyx segments.

2. *Thladiantha grandisepala* A. M. Lu & Zhi Y. Zhang, Bull. Bot. Res., Harbin 1(1–2): 67. 1981.

大萼赤爬 da e chi bao

Vines, climbing, herbaceous. Stems and branches slender, angular-sulcate, at first densely pubescent, glabrescent. Petiole 4–8 cm; leaf blade narrowly ovate-cordate, 10–16 × 6–11 cm, membranous, adaxially scabrous, with setae on an enlarged base, veins densely pubescent, basal vein along margin of base of leaf, base cordate, margin dentate, apex shortly acuminate; sinus at base open, semicircular, 1–2 cm deep, 0.5–1 cm wide. Male flowers: 5–9 in pedunculate raceme; bracts flabelliform, 12–15 × 15–17 mm, both surfaces pubescent, margin irregularly dentate; pedicels slender, 5–10 mm, pubescent; calyx tube campanulate, ca. 4 mm; segments broadly lanceolate to narrowly ovate, slightly irregular, ca. 1.5 cm × 4–6 mm, distinctly 3-veined, apex usually irregularly 2- or 3-lobed; corolla segments narrowly oblong, ca. 2 × 1 cm, apex shortly acuminate; filaments pubescent; rudimentary ovary semiglobose. Female flowers solitary; pedicels 2–5 cm, pubescent; calyx segments broadly lanceolate or narrowly ovate, to 18 × ca. 6 mm, 3-veined, margin often 2- or 3-lobed, apex acuminate; corolla segments ca. 3 × 1.4 cm; ovary narrowly oblong, 15–18 × 4–6 mm, densely yellow villous, base narrow, apex subtruncate; style filiform, 3-fid; stigma enlarged, 2-lobed. Fruiting pedicel robust, 3–5 cm, subglabrous; fruit elliptic, 2.5–3 × ca. 1.5 cm, pubescent, obtuse at both ends. Fl. Jun–Aug, fr. Aug–Oct.

• Mountain slopes, forests; 2100–2400 m. Yunnan.

3. *Thladiantha medogensis* A. M. Lu & J. Q. Li, Acta Bot. Yunnan. 14: 133. 1992.

墨脱赤爬 mo tuo chi bao

Herbs, scandent. Stem slender, angular-sulcate, sparsely puberulent. Petiole 3.5–5 cm, pubescent and sparsely setose; leaf blade ovate-cordate, 8–11 × 5–5.6 cm, papery or submembranous, abaxially sparsely pubescent and setose, adaxially densely setose at first, ultimately punctate-scabrous, basal lateral veins along margin of sinus, base emarginate, margin callose-dentate, apex shortly acuminate. Tendrils simple, pubescent. Male flowers in a raceme; peduncle robust, 8–24 cm; bracts ca. 2 × 2.2 cm, margin irregularly 5- or 6- obtusely dentate; pedicel slender, 7–10 mm, sparsely pubescent; calyx tube campanulate, ca. 2.5 × 3.5 mm; segments ca. 10 × 11 mm, 3-veined, margin irregularly 3–5-dentate; corolla segments narrowly oblong, 8–9 × 3–3.5 mm, apex acuminate; filaments ca. 1.5 mm, sparsely pubescent; anthers oblong, ca. 3 mm; rudimentary ovary subglobose, ca. 2 mm in diam. Fruit solitary, subcylindric, ca. 3.2 × 2 cm, longitudinally striate, rounded at apex and base.

- About 1800 m. SE Xizang (Mêdog).

4. *Thladiantha hookeri* C. B. Clarke in J. D. Hooker, Fl. Brit. India 2: 631. 1879.

异叶赤爬 yi ye chi bao

Hemsleya tonkinensis Cogniaux; *H. trifoliolata* Cogniaux; *H. yunnanensis* Cogniaux; *Thladiantha digitata* H. Léveillé; *T. heptadactyla* Cogniaux; *T. hookeri* var. *heptadactyla* (Cogniaux) A. M. Lu & Zhi Y. Zhang; *T. hookeri* var. *palmatifolia* Chakravarty; *T. hookeri* var. *pentadactyla* (Cogniaux) A. M. Lu & Zhi Y. Zhang; *T. hookeri* f. *quinquefoliata* Chakravarty; *T. hookeri* f. *trifoliolata* (Cogniaux) Chakravarty; *T. pentadactyla* Cogniaux; *T. trifoliolata* (Cogniaux) Merrill.

Vines, climbing, herbaceous. Tuber olate-spheroid. Stems 2–4(–10) m, to 10 mm in diam., much branched, subglabrous. Petiole 3–6 cm, glabrous or puberulent; leaf blade pedately 3–7-foliolate or undivided; leaflets oblong-lanceolate, broadly lanceolate, lanceolate, or linear-lanceolate, median leaflet 6–15 × 1–3 cm, membranous, abaxially subglabrous, adaxially scabrous, margin dentate, apex acuminate. Tendrils filiform, simple, smooth. Male flowers in raceme or solitary; rachis filiform, 2–4 cm, glabrous, ebracteate; pedicel of solitary flowers to 2.5 cm; calyx tube broadly campanulate, 3–4 × 6–7 mm, sparsely pubescent; segments erect, narrowly triangular, ca. 4 × 1.5 mm, 3-veined; corolla segments ovate, 10–12 × ca. 5 mm; filaments 2–3 mm, glabrous; anthers oblong, ca. 2 mm. Female flowers solitary; pedicel filiform, 2–4 cm, at first puberulent, ultimately glabrous; calyx and corolla as in male flowers; calyx segments ca. 10 mm; corolla segments ca. 2 cm; ovary fusiform, 1–2 cm × 2–3 mm, densely yellow-brown pubescent, attenuate at both ends; style ca. 4 mm, 2-fid; stigmas enlarged, ca. 3 mm. Fruit oblong, 4–6 × 2–3 cm, smooth, rounded at both ends. Seeds broadly ovate, 6–7 × ca. 5 mm, smooth, base obtuse-rounded. Fl. and fr. Apr–Oct.

Forest margins on mountain slopes; 1200–1800 m. Yunnan [Bhutan, NE India, Laos, Myanmar, Thailand, Vietnam].

5. *Thladiantha dubia* Bunge, Enum. Pl. Chin. Bor. 29. 1833.

赤爬 chi bao

Plants climbing, herbaceous, pale yellow pubescent-hirsute. Roots tuberous. Stems robust, angular-sulcate. Petiole robust, 2–6 cm; leaf blade broadly ovate-cordate, 5–8 × 4–9 cm, both surfaces scabrous, hirsute on veins, basal lateral veins along margin of blade base, base cordate, margin irregularly dentate, apex acute or shortly acuminate; sinus deep, suborbicular or semicircular, 1–1.5 cm deep, 1.5–3 cm wide. Tendrils filiform, simple. Male flowers solitary or several congested on short rachis into pseudoraceme; pedicel filiform, 1.5–3.5 cm, pubescent; calyx tube very short, subrotate, 3–4 × 7–8 mm; segments reflexed, lanceolate, 12–13 × 2–3 mm; stamens 4 connected in pairs and 1 free, 2–2.5 mm, puberulent; anthers ovoid, ca. 2 mm; rudimentary ovary semiglobose. Female flowers solitary; pedicels slender, 1–2 cm, pubescent; calyx and corolla as in male flowers; staminodes 5; ovary oblong, 5–8 mm, densely pale yellow pubescent; style 3-fid; stigma enlarged, reniform, 2-lobed. Fruit orange-yellow, ovoid-oblong, 4–5 cm × ca. 28 mm, pubescent, with 10 longitudinal striae, base slightly attenuate. Seeds black, ovate, 4–4.3 × 2.5–3 mm, ca. 1.5 mm thick, smooth. Fl. Jun–Aug, fr. Aug–Oct.

Forest margins, valleys; 300–1800 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Ningxia, Shaanxi, Shandong, Shanxi, N Sichuan [Korea; introduced in Japan].

The fruit and roots are used medicinally.

6. *Thladiantha sessilifolia* Handel-Mazzetti, Symb. Sin. 7: 1061. 1936.

短柄赤爬 duan bing chi bao

Vines, herbaceous. Roots tuberous. Stem and branches slender, at first sparsely puberulent, glabrescent. Petiole very short, 5–15(–40) mm, pubescent or subglabrous; leaf blade lanceolate or ovate-lanceolate, 8–16 × 2–4.5 cm, papery, abaxially densely pubescent, adaxially scabrous, subglabrous, base cordate, margin sparsely dentate, apex acuminate; sinus closed, basal lateral veins not along blade base. Tendrils filiform, usually simple. Male flowers 2–5 in pedunculate short raceme, sometimes solitary; bract ovate, ca. 2 mm; pedicels slender, 5–10 mm, pubescent or subglabrous; calyx tube campanulate, ca. 3 × 5 mm, sparsely pubescent; segments lanceolate, ca. 5 × 1.5 mm, 3-veined, apex subulate-acuminate; corolla segments ovate, ca. 15 × 7–8 mm, often 5-veined, apex acuminate; stamens inserted on limb of calyx tube; filaments ca. 3 mm; anthers elliptic, 2–3 mm; rudimentary ovary yellow, semiglobose. Female flowers solitary; pedicel slender, 2–3 cm, puberulent or subglabrous; calyx and corolla as in male flowers; ovary oblong, 15–22 × 5–10 mm, densely yellow-brown villous, apex attenuate; style slender, 3-fid; stigma enlarged, reniform, 2-lobed; staminodes 2–3 mm. Fruit ovoid-oblong. Fl. May–Aug, fr. Aug–Nov.

• Thickets or forests on mountain slopes, wetlands on ditch sides. SW Sichuan, Yunnan.

The tuberous roots are used medicinally.

1a. Petiole very short, 5–15 mm, pubescent

..... 6a. var. *sessilifolia*

- 1b. Petiole longer, 20–40 mm, subglabrous
..... 6b. var. *longipes*

6a. *Thladiantha sessilifolia* var. *sessilifolia*

短柄赤虬(原变种) duan bing chi bao (yuan bian zhong)

Petiole very short, 5–15 mm, pubescent; leaf blade lanceolate or ovate-lanceolate. Tendrils simple.

• Thickets on mountain slopes, wetlands on ditch sides. SW Sichuan.

The tuberous roots are used medicinally.

6b. *Thladiantha sessilifolia* var. *longipes* A. M. Lu & Zhi Y. Zhang, Bull. Bot. Res., Harbin 1(1–2): 77. 1981.

沧源赤虬 cang yuan chi bao

Petiole longer, 20–40 mm, subglabrous. Tendrils simple or 2-fid.

• Forests; ca. 1000 m. Yunnan.

7. *Thladiantha villosula* Cogniaux in Engler, Pflanzenr. 66(IV. 275. I): 44. 1916.

长毛赤虬 chang mao chi bao

Thladiantha villosula var. *nigrita* A. M. Lu & Zhi Y. Zhang.

Vines, climbing, herbaceous, densely glandular-villous and sparsely multicellular-setose. Stem much branched; branches slender. Petiole slender, 3–6 cm; leaf blade adaxially dark green, ovate-cordate, broadly ovate-cordate, or suborbicular, 6–12 × 5–10 cm, membranous, abaxially pubescent, basal lateral veins along margin of blade base, base cordate, margin dentate, apex shortly acuminate; sinus rounded, 1–2 cm deep, 1–1.5 cm wide. Tendrils filiform, simple. Male flowers usually 2–7 in a raceme; peduncle 1–3 cm, usually bearing leaflike bract; bract 1–1.5 × ca. 1 cm, densely pubescent, margin dentate, apex acuminate; pedicel 1–2.5 cm; calyx tube broadly campanulate; segments yellow-green, narrowly lanceolate, 4–6 × ca. 1.5 mm, 3-veined; corolla segments ovate or narrowly ovate, 12–15 × 6–8 mm, 5-veined, apex obtuse; stamens 4 connected in pairs and 1 free; filaments filiform, 2–3 mm; anthers oblong, ca. 2 mm; rudimentary ovary semiglobose. Female flowers solitary; pedicels slightly robust; calyx segments narrowly lanceolate, 5–6 × ca. 1 mm, 3-veined, apex acuminate; corolla segments narrowly ovate, ca. 20 × 15 mm, 5-veined, apex acuminate; staminodes glandular; ovary narrowly oblong, 15–18 × 3–4 mm, densely pale yellow glandular villous; style stout, 3-fid; stigma enlarged, reniform, 2-lobed. Fruiting pedicel stout, 2–3 cm; fruit red-brown, oblong, to 7 × ca. 3.5 cm, both surfaces reticulate, base obtuse, apex attenuate. Fl. and fr. summer.

• Ditch sides in forests or thickets; 2000–2800 m. Gansu, Guizhou, S Henan, W Hubei, S Shaanxi, Sichuan.

8. *Thladiantha dimorphantha* Handel-Mazzetti, Oesterr. Bot. Z. 83: 235. 1934.

山西赤虬 shan xi chi bao

Vines, climbing, herbaceous. Stem and branches angular-

sulcate, pubescent and white setose at first, later glabrescent. Petiole 4–8 cm; leaf blade broadly ovate-cordate, 6–12 × 4–10 cm, undivided, abaxially pubescent, adaxially scabrous, densely setose, margin dentate, apex shortly acuminate or acute; basal sinus open, semicircular, 5–15 mm deep, 10–25 mm wide. Tendrils filiform, simple or 2-fid. Male flowers dimorphic, solitary one larger, smaller ones in a raceme; pedicel slender, 10–18 mm, pubescent; calyx pubescent; tube broadly campanulate, 3–4 mm; segments lanceolate, 4–6 mm, 3-veined, apex acuminate; corolla segments ovate, 10–12 × 5–6 mm, apex acute; filaments 2–2.5 mm; anthers elliptic, 3–3.5 mm. Female flowers solitary or binary; pedicels 5–10 mm; calyx and corolla as in male flowers; corolla segments obovate, 20–25 × ca. 10 mm, apex slightly obtuse; staminodes 5, sparsely puberulent, apex slightly enlarged; ovary fusiform, densely villous; style 3-fid, ca. 2 mm; stigma enlarged, 2-lobed.

• Mountain slopes, roadsides; 1800–2400 m. E Shaanxi, S Shaanxi.

9. *Thladiantha nudiflora* Hemsley, J. Linn. Soc., Bot. 23: 316. 1887.

南赤虬 nan chi bao

Plants densely pubescent-hispid. Roots tuberous. Stems herbaceous, angular-sulcate. Petiole stout, 3–10 cm; leaf blade ovate-cordate, broadly ovate-cordate, or suborbicular-cordate, 5–15 × 4–12 cm, abaxially densely pale yellow pubescent, adaxially densely setose, basal lateral veins along blade base, margin serrate, apex acuminate or acute; basal sinus open or sometimes closed, 2–2.5 cm deep, 1–2 cm wide. Tendrils densely hispid, 2-fid. Male raceme many flowered; peduncle filiform, 4–8 cm, densely pubescent; pedicels filiform, 1–1.5 cm; calyx densely villous; tube broadly campanulate, 5–6 mm in diam.; segments ovate-lanceolate, 5–6 × ca. 2.5 mm, 3-veined, apex acute; corolla segments ovate-oblong, 12–16 × 6–7 mm, 5-veined, apex acute or obtuse; filaments puberulent, ca. 4 mm; anthers ovoid-oblong, ca. 2.5 mm. Female flowers solitary; pedicels slender, 1–2 cm, villous; calyx and corolla as in male flowers; ovary narrowly oblong, 12–15 × 4–5 mm, densely villous-hispid, base obtuse-rounded, apex attenuate; style 3-fid; stigma enlarged, reniform, 2-lobed; staminodes 5, ca. 1.5 mm. Fruiting pedicel robust, 2.5–5.5 cm; fruit red or red-brown when mature, oblong, 4–5 × 3–3.5 cm, glabrescent, apex obtuse. Seeds ovate or broadly so, ca. 5 × 3.5–4 mm, 1–1.5 mm thick, reticulate, base rounded, apex acute. Fl. May–Aug, fr. Aug–Nov.

Forest margins on mountain slopes. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Zhejiang [Philippines].

- 1a. Male flowers ebracteate 9a. var. *nudiflora*
1b. Male flowers with leaflike bracts 9b. var. *bracteata*

9a. *Thladiantha nudiflora* var. *nudiflora*

南赤虬(原变种) nan chi bao (yuan bian zhong)

Cucumis courtoisii H. Léveillé; *Thladiantha formosana* Hayata; *T. harmsii* Cogniaux; *T. nudiflora* var. *macrocarpa* Z. Zhang; *T. nudiflora* var. *membranacea* Z. Zhang.

Male flowers ebracteate.

Forest margins on mountain slopes. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Zhejiang [Philippines].

9b. *Thladiantha nudiflora* var. *bracteata* A. M. Lu & Zhi Y. Zhang, Bull. Bot. Res., Harbin 1(1–2): 84. 1981.

西固赤爬 xi gu chi bao

Male flowers with leaflike bracts; bracts broadly ovate-cordate, 10–12 × ca. 5 mm, pubescent, margin dentate.

• Gansu (Xigu).

10. *Thladiantha longisepala* C. Y. Wu, A. M. Lu & Zhi Y. Zhang, Bull. Bot. Res., Harbin 1(1–2): 86. 1981.

长萼赤爬 chang e chi bao

Herbs, climbing. Stem and branches angular-sulcate, at first puberulent and sparsely setose, glabrescent. Petiole slender, 4–7 cm, puberulent; leaf blade ovate-cordate or broadly ovate-cordate, 8–14 × 6–10 cm, membranous, abaxially puberulent, adaxially densely setose, base cordate, margin serrate, apex shortly acuminate; sinus 1–2 cm deep, 1.5–3 cm wide. Tendrils robust, elongate, 2-fid. Male panicle much branched, 5–13 cm, sparsely pubescent, usually with a leaflike bract at base of branch; bract ovate, 15–25 × 10–15 mm, apex acuminate or long acuminate. Male flowers: pedicel slender, 1–4 cm, pubescent; calyx tube campanulate; segments broadly lanceolate, 12–15 × 3–4 mm, distinctly 3-veined, apex acuminate, reflexed; corolla segments narrowly ovate, 20–22 × 8–9 mm, 5-veined, apex acuminate; filaments ca. 4 mm, puberulent; anthers ovoid, ca. 3 mm; rudimentary ovary semiglobose. Female flowers: 2–5 on a short peduncle; pedicels 3–6 cm; ovary densely setose and pubescent, oblong, ca. 1 cm. Fruiting peduncle robust, 3–6 cm, puberulent; fruit oblong, scabrous, yellow-brown pubescent and setose, apex and base obtuse. Fl. and fr. Jun–Oct.

• Thickets on mountain slopes and riversides; 2400–3500 m. NW Yunnan.

11. *Thladiantha setispina* A. M. Lu & Zhi Y. Zhang, Bull. Bot. Res., Harbin 1(1–2): 87. 1981.

刚毛赤爬 gang mao chi bao

Herbs, climbing. Stems and branches sparsely puberulent, ultimately glabrous, smooth, angular-sulcate. Petiole slender, 3.5–5.5 cm, glabrous; leaf blade ovate-cordate, 6–8(–14) × 4–6(–10) cm, membranous or papery, abaxially densely pale yellow pubescent, adaxially setose, basal lateral veins along blade base, base cordate, margin serrulate, apex acuminate; sinus open, semicircular, 1–1.5 cm deep, 1–2 cm wide. Tendrils filiform, glabrous, 2-fid. Male flowers numerous in a ca. 17 cm panicle; peduncle robust, sparsely pubescent, usually with a bract at base of branches; bract 2–2.5 × 1.5–2 cm; pedicel 1–1.5 cm; calyx tube campanulate; segments triangular-lanceolate, 5–6 × ca. 2.5 mm, 3-veined, apex acuminate; corolla segments oblong, 18–20 × 6–8 mm, glabrous, 5-veined, apex acuminate; filaments ca. 4 mm, puberulent; anthers elliptic, ca. 3 mm. Female flowers solitary, or 3–5 on a 3–4 cm peduncle; pedicel slender, 3–5 cm, sparsely puberulent; calyx tube campanulate; segments ca. 7.5 mm, ca. 2.5 mm wide at base, glabrous, 3-

veined, apex acuminate; corolla segments 4–4.5 × 1.8–2 cm; ovary oblong, 10–12 × 6–7 mm, densely yellow-brown setose; style 3-fid; stigma enlarged, reniform, 2–2.5 mm, 2-lobed. Fruiting peduncle robust, 3–6 cm, glabrescent; fruit black-brown, oblong, 3–3.5 × 2–2.5 cm, scabrous, yellow-brown setose, apex and base obtuse. Seeds yellow-brown when dry, narrowly ovate, 6–7 × 3–3.5 mm, ca. 1.5 mm thick, smooth, base subrounded, apex obtuse. Fl. and fr. Jun–Oct.

• Mountain slopes, roadsides; ca. 3000 m. W Sichuan, E Xizang.

12. *Thladiantha lijiangensis* A. M. Lu & Zhi Y. Zhang, Bull. Bot. Res., Harbin 1(1–2): 88. 1981.

丽江赤爬 li jiang chi bao

Thladiantha cinerascens C. Y. Wu ex A. M. Lu & Zhi Y. Zhang; *T. henryi* Hemsley var. *subtomentosa* Handel-Mazzetti; *T. lijiangensis* var. *latisepala* A. M. Lu & Zhi Y. Zhang.

Herbs, climbing. Root robust. Stem and branches distinctly angular-sulcate, at first pubescent, glabrescent. Petiole slender, 2–6 cm, pubescent and sparsely setose; leaf blade ovate-cordate, 4–11 × 3–7 cm, membranous, abaxially glaucous and setose, adaxially pale yellow pubescent, base cordate, margin dentate, apex acuminate; sinus 1–2 cm deep, 1–2.5 cm wide. Male panicle much branched, with many flowers; peduncle 7–16 cm, usually with a leaflike bract at base of branches; bract ovate, 1–2 cm; pedicels filiform, 1–2 cm, puberulent; calyx pubescent; tube campanulate; segments triangular-lanceolate, ca. 5 × 1.5–2 mm, 1-veined, apex shortly acuminate; corolla segments ovate, 12–15 × ca. 6 mm, 5-veined, apex acute; filaments ca. 2.5 mm; anthers narrowly ovoid, ca. 2.5 mm; rudimentary ovary semiglobose, ca. 1.5 mm in diam. Female flowers larger than male flowers, solitary or binary, sometimes 3 at apex of 15–25 mm peduncle; pedicels 4–6 cm; calyx segments lanceolate, ca. 6 × 1.5 mm, sparsely puberulent, 1-veined; corolla segments ovate, 30–35 × ca. 13 mm, puberulent, 5-veined, apex acuminate; ovary ellipsoid, 10–13 × 6–7 mm, densely yellow hispidulous, base subrounded, apex truncate; style ca. 4 mm, 3-fid; stigma reniform, 2–2.5 mm wide, 2-lobed. Fruiting peduncle 3–4 cm, puberulent; fruit 3–4 × 2–2.5 cm. Seeds gray-black, broadly ovate, ca. 5.5 × 4 mm, smooth. Fl. and fr. May–Oct.

• Forests, mountain slopes; 2400–3200 m. NW Yunnan.

13. *Thladiantha oliveri* Cogniaux ex Mottet, Rev. Hort. 75: 473. 1903.

鄂赤爬 e chi bao

Thladiantha glabra Cogniaux.

Herbs, climbing. Stem and branches slender, glabrous, angular-sulcate. Petiole 5–15 cm, subglabrous; leaf blade broadly ovate-cordate, 10–20 × 8–18 cm, membranous, abaxially sparsely setose, adaxially scabrous, basal lateral veins along base of sinus, margin dentate, apex acute or acuminate; sinus open, 1.5–3 cm deep. Tendrils glabrous, 2-fid. Male flowers numerous at apex of peduncle; peduncle over 20 cm; pedicels 5–10 mm, slender; calyx tube broadly campanulate; segments reflexed, linear, 7–9 mm, 1-veined, apex acuminate; corolla segments ovate-oblong, 18–22 × 7–9 mm, 5-veined, apex acuminate; filaments 2–3 mm, sparsely puberulent; anthers ovoid-

oblong, ca. 2 mm; rudimentary ovary globose. Female flowers solitary or 2–4 on a 10–15 mm peduncle; pedicels 2–4 cm, subglabrous; calyx segments reflexed, linear, 10–12 mm; corolla segments 2–4 × ca. 1.2 cm; staminodes linear, ca. 2 mm; ovary ovoid, 10–12 mm, base truncate, apex attenuate. Fruit ovoid, 3–4 × 2–2.5 cm, glabrous, smooth, base truncate, apex attenuate. Seeds ovate, compressed, 5–6 × 3–3.5 mm, ca. 1.5 mm thick, base obtuse, apex attenuate. Fl and fr. May–Oct.

• Thickets, roadsides, or wetlands in river valleys; 600–2100 m. Gansu, Guizhou, NW Hubei, S Shaanxi, E and S Sichuan.

14. *Thladiantha montana* Cogniaux in Engler, Pflanz. 66(IV. 275. I): 48. 1916.

山地赤爬 shan di chi bao

Herbs, climbing, glabrous. Stem and branches angular-sulcate. Petiole slender, 8–10 cm; leaf blade ovate-cordate or broadly ovate-cordate, 10–16 × 8–12 cm, submembranous or thickly papery, adaxially scabrous, base cordate, margin dentate, apex acuminate; sinus suborbicular. Tendrils 2-fid. Male flowers 5–10 in raceme or panicle, sometimes 3 or 4 inflorescences in same leaf axil; rachis slender, 6–10 cm; pedicels filiform, 5–10 mm; calyx tube cupular; segments triangular-lanceolate, ca. 4 × 1 mm, 1-veined, apex obtuse; corolla segments narrowly ovate, 8–12 × ca. 5 mm, 5-veined, apex acuminate; stamens inserted on tube; filaments 4 connected in pairs and 1 free, 2–3 mm, sparsely pubescent; anthers oblong, ca. 2 mm; rudimentary ovary subglobose, ca. 2 mm in diam. Female flowers solitary, or 2 or 3 on a 1–2.5 cm peduncle; pedicels slender, 1–4 cm, glabrous; calyx and corolla as in male flowers; staminodes 2.5–3 mm, glandular, with 3 membranous scales; scales oblong, 3–4 mm, apex obtuse; ovary narrowly oblong, 10–15 × 3–4 mm, smooth, subglabrous, base truncate, apex attenuate; style slender, 5–6 mm, 3-fid; stigma suborbicular, 4.5–5 mm wide, 2-lobed. Fruiting peduncle smooth; fruit oblong, 4–6 × 3–4 cm, both ends obtuse-rounded. Seeds narrowly ovate, 4–5 × 2–3 mm, ca. 1.5 mm thick, base rounded. Fl. Aug–Oct, fr. Oct–Nov.

• Forests, mountain slopes, valley sides; 800–3200 m. Yunnan.

15. *Thladiantha maculata* Cogniaux in Engler, Pflanz. 66(IV. 275. I): 49. 1916.

斑赤爬 ban chi bao

Herbs, climbing. Roots tuberous. Stem and branches slender, angular, puberulent or subglabrous. Petiole slender, 4–9 cm, puberulent; leaf blade broadly ovate-cordate, 7–13 × 5–10 cm, membranous, abaxially puberulent, adaxially setose, basal lateral veins along base of blade, base cordate, margin dentate or irregularly serrate, apex shortly acuminate; sinus open, semi-circular. Tendrils filiform, simple, subglabrous or sparsely puberulent. Male flowers in a raceme of 3–6(–8) flowers; rachis slender, 3–4 cm, puberulent; pedicels filiform, 12–25 mm, smooth; calyx tube broadly campanulate; segments narrowly triangular-lanceolate, ca. 4 mm, pubescent, 3-veined, apex acuminate; corolla segments ovate, 12–15 × ca. 7 mm, 5-veined, apex acute or shortly acuminate; filaments ca. 3 mm, puberulent; anthers oblong, ca. 2 mm; rudimentary ovary semiglobose. Female flowers solitary; pedicels filiform, 25–35 mm, pubescent; calyx segments linear-subulate, 7–8 mm, puberulent; co-

rolla segments as in male flowers; ovary oblong or narrowly fusiform, ca. 10 mm, densely pale yellow pubescent, base truncate, apex acuminate; style 3-fid; stigma enlarged, reniform, 2-lobed. Fruiting peduncle 3–4 cm, puberulent, glabrescent; fruit orange-red, fusiform, 5–7 × 2–2.8 cm, smooth, subglabrous, base attenuate, apex acuminate, rostrate. Seeds narrowly ovate, 4–5 × ca. 2.5 mm, ca. 1.5 mm thick, smooth. Fl. May–Aug, fr. Oct.

• Valleys, forests; 500–1800 m. Henan, W Hubei.

16. *Thladiantha punctata* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 119. 1911.

台湾赤爬 tai wan chi bao

Herbs, climbing; whole plant subglabrous. Stems and branches with obvious longitudinal striae. Petiole 3–12 cm, sometimes sparsely shortly setose in upper part; leaf blade abaxially pale green, adaxially dark green, narrowly ovate or narrowly ovate-lanceolate, 8–16(–20) × 6–10(–12) cm, membranous, glabrous, lateral veins at base not bordering sinus, margin dentate or sinuate-dentate, apex acuminate; basal sinus semicircular, 1–2 cm deep, 0.5–1.5 cm wide. Tendrils simple. Male flowers: inflorescences racemose or paniculate, rarely flowers solitary; peduncles slender, 4–8 cm; pedicels filiform, 0.5–1 cm; calyx tube broadly campanulate, 5–6 mm; segments lanceolate, ca. 8 mm, ca. 2 mm wide at base, 3–5-veined, acuminate at apex; stamens 4 in pairs and 1 free; filaments ca. 4 mm, base pubescent; anthers oblong, 2–3 mm; rudimentary ovary semiglobose, 2–3 mm in diam., with 3 membranous scales at base; scales yellow, ca. 3 mm. Female flowers usually solitary, rarely 2 at apex of peduncle; peduncles ca. 1 cm; pedicels 2–5 cm, glabrous; calyx and corolla as in male flowers but corolla usually larger than in male flowers; segments 2–2.5 × 1.1–1.2 cm, acuminate at apex; staminodes 4 in pairs and 1 free, ca. 1 mm; ovary ovoid, 1–1.3 × 0.4–0.6 cm, slightly pubescent, glabrescent, base rounded, apex attenuate; styles 2–3 mm, 3-fid; stigma reniform, expanded, 1.5–2 mm in diam. Fruiting pedicel 3–7 cm, glabrous; fruit ovoid or oblong, 3–5 × 2–3.5 cm, smooth, base obtuse-rounded, apex mucronate. Seeds brown, broadly ovoid, 5–6 × 3–4 mm, ca. 1 mm thick, base rounded, apex slightly narrowed. Fl. May–Jun, fr. Jul–Aug.

• Mountain slopes, forests, wet places; 600–900 m. Anhui, Fujian, Jiangxi, Taiwan, Zhejiang.

17. *Thladiantha dentata* Cogniaux in Engler, Pflanz. 66(IV. 275. I): 44. 1916.

齿叶赤爬 chi ye chi bao

Herbs, climbing, stout; whole plant almost glabrous. Stem and branches smooth, angular-sulcate. Petiole robust, 5–16 cm; leaf blade ovate-cordate or broadly ovate-cordate, 12–20 × 8–12 cm, abaxially glabrous, adaxially scabrous, basal lateral veins not along margin of blade, margin dentate, apex shortly acuminate; basal sinus open or sometimes closed. Tendrils 2-fid. Male flowers: inflorescence racemose or paniculate; rachis slender, 8–12 cm; pedicels filiform, 1–1.5 cm; calyx tube cupular; segments oblong-lanceolate, ca. 5 × 1.5 mm, 3-veined, apex obtuse; corolla segments ovate-oblong, ca. 12 × 5–6 mm, 3–5-veined, apex acute; stamens 4 in pairs and 1 free; filaments ca. 4 mm; anthers elliptic, ca. 2 mm; rudimentary ovary semi-

globose, ca. 2 mm in diam., with 3 scales at base; scales yellow, ca. 3 mm. Female flowers solitary, or 2–5 at apex of 1–1.5 cm peduncle; pedicels 3–6 cm, glabrous; calyx segments lanceolate, 4–5 × ca. 1.5 mm, 3-veined, apex acute; corolla segments ovate-oblong, ca. 15 × 7–8 mm, 5-veined, apex acute; staminodes 5, 4 in pairs, other free, ca. 2.5 mm; ovary narrowly oblong, 13–16 × 4–6 mm, smooth, base slightly rounded or truncate, apex attenuate; style 2–3 mm, 3-fid; stigma reniform, 2-lobed. Fruiting peduncle 2–3.5 cm; fruit narrowly ellipsoid or narrowly ovoid, 3.5–6 × 2.5–3.5 cm, smooth, rounded at both ends, apex mucronate. Seeds yellow-white, narrowly ovate, ca. 6 × 3.5 mm, smooth, base rounded, apex slightly attenuate. Fl. summer, fr. Oct–Nov.

• Roadsides, valley sides, thickets, mountain slopes; 500–2000 m. Guizhou, W Hubei, Hunan, Sichuan.

18. *Thladiantha capitata* Cogniaux in Engler, Pflanzenr. 66(IV. 275. I): 51. 1916.

头花赤廔 tou hua chi bao

Vines, climbing, herbaceous. Stem and branches angular-sulcate, subglabrous. Petiole slender, 7–9 cm, glabrous; leaf blade abaxially pale green, broadly ovate or broadly ovate-triangular, 10–15(–20) × 8–12(–15) cm, membranous, both surfaces glabrous, adaxially scabrous, basal lateral veins along margin of sinus, margin sparsely dentate, apex acuminate; basal sinus 1.5–3 cm deep, 2–3.5 cm wide. Tendrils glabrous, 2-fid. Male flowers at apex of peduncle in congested subumbel, umbelliform raceme, or pseudocapitulum, usually 8–15-flowered; peduncle (2–)5–11(–17) cm, glabrous, sometimes with a bract; bract ovate, 1.5–3 × 1–2.8 cm; pedicels filiform, 4–8 mm; calyx tube obconical, ca. 5 mm; segments linear-lanceolate, ca. 10 × 1.5 mm, abaxially puberulent, adaxially glabrous, 1-veined, apex acute; corolla segments narrowly ovate, 10–12 × 5–6 mm, adaxially pubescent, 5-veined, apex acute; filaments 4–4.5 mm, puberulent; anthers ovoid-oblong, 2–2.2 mm. Female flowers solitary, or 2 or 3 flowers at apex of peduncle; pedicels 3–5 cm when flowers solitary; calyx segments linear-lanceolate, 8–12 × 1.5–1.8 mm, 1-veined; corolla segments oblong, 15–28 × 1–12 mm, 5-veined, apex acuminate; ovary narrowly oblong, 15–18 mm, smooth, base subtruncate, apex attenuate; style slender, ca. 5 mm, 3-fid; stigma enlarged, reniform, ca. 2 mm wide. Fruit oblong, ca. 4 × 2.5 cm. Fl. and fr. May–Nov.

• Forest margins, thickets, mountain slopes; 1000–2700 m. W Sichuan.

19. *Thladiantha davidii* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 8: 243. 1885 [*“davidii”*].

川赤廔 chuan chi bao

Thladiantha legendrei Gagnepain.

Herbs, climbing. Stems and branches glabrous, longitudinally angular-sulcate. Petiole 6–8 cm, glabrous; leaf blade ovate-cordate, 10–20 × 6–12 cm, membranous, abaxially glabrous, adaxially densely setose, basal lateral veins along margin of sinus, margin dentate, apex acuminate; basal sinus rounded, sometimes closed. Tendrils 2-fid. Male flowers 10–20 at apex of peduncle in congested subumbelliform raceme; peduncle 10–20 cm, sometimes with a leaflike bract; bract 15–20 × 10–13

mm; pedicels slender, 3–6 mm or sometimes to 15 mm; calyx tube obconical; segments lanceolate-oblong, 10–12 × ca. 2.5 mm, abaxially puberulent, distinctly 3-veined, apex obtuse or acute; corolla segments ovate, ca. 15 × 9 mm, adaxially glandular pubescent, 5-veined, apex obtuse, base of corolla with 2 yellow scales; filaments 3–4 mm, sparsely puberulent; anthers elliptic, ca. 1.5 mm. Female flowers solitary, or 2 or 3 at apex of peduncle; peduncle ca. 1(–3) cm; pedicels 1.5–3 cm; calyx tube obconical; segments lanceolate-oblong, 10–15 × ca. 3 mm, distinctly 3-veined, base slightly narrowed, apex obtuse; corolla segments oblong, 2.5–2.7 × 1–1.2 cm, 5-veined, apex acuminate; ovary narrowly oblong, ca. 15 × 5–6 mm, smooth, subglabrous, base truncate, apex slightly attenuate; style 3-fid; stigma 2-lobed, reniform. Fruit oblong, 3–4.5 × 2–2.4 cm, base and apex obtuse. Seeds yellow-white, ovate, compressed, 3–4 × ca. 2.5 mm, smooth. Fl. and fr. May–Nov.

• Roadsides, valleys, thickets; 1100–2100 m. Guizhou, W Sichuan.

20. *Thladiantha palmatipartita* A. M. Lu & C. Jeffrey, Novon 10: 398. 2000.

掌叶赤廔 zhang ye chi bao

Herbs, scandent. Stems sulcate-angular, 1–3 m, puberulent or glabrescent. Tendrils simple, pubescent. Petiole 3–7 cm, puberulent; leaf blade broadly ovate or orbicular in outline, 8–17 × 9–16 cm, papery, abaxially densely pubescent, adaxially densely punctate, palmately deeply 5-lobed; lobes oblong, margin irregularly dentate, apex acute or acuminate. Flowers unisexual. Male flowers: panicle short, many flowered; peduncle 2.5–3 cm, robust, puberulent; pedicels slender, filiform, 5–12 mm; calyx tube cupular, pubescent; segments 5, broadly lanceolate, 1.2–1.5 × ca. 0.5 cm, 3-veined, apex acuminate; corolla campanulate; segments 5, narrowly oblong or lanceolate-oblong, 1.5–1.8 × ca. 0.6 cm, 3-veined, apex acuminate; filaments ca. 2 mm; anthers ca. 3 mm, 1-celled. Female flowers solitary or paired; calyx and corolla as in male flowers; ovary narrowly oblong, 1.5–2 cm, villous; style columnar, apically 3-fid; stigmas dilated, 2-lobed. Fruit oblong, ca. 7.5 × 3.5 cm, smooth, base attenuate, apex rounded. Seeds numerous, horizontal, ca. 6 × 3 mm, smooth. Fl. Jun, fr. Sep.

• Open situations in scrub; ca. 3000 m. Yunnan.

21. *Thladiantha pustulata* (H. Léveillé) C. Jeffrey ex A. M. Lu & Zhi Y. Zhang, Bull. Bot. Res., Harbin 1(1–2): 74. 1981.

云南赤廔 yun nan chi bao

Herbs, climbing. Roots tuberous. Stem and branches angular-sulcate, pubescent and villous. Petiole slender, 3–7 cm, pubescent and villous; leaf blade ovate-cordate, 6–11 × 4–9 cm, abaxially puberulent and setose on veins, adaxially densely setose, scabrous, basal lateral veins along margin of sinus, base cordate, margin irregularly serrate, apex shortly acuminate; sinus open, semicircular, 15–20 mm deep, 10–20 mm wide. Tendrils simple, pubescent. Male flowers 3–6 at apex of peduncle in sparse racemes; peduncle 2–5 cm, pubescent; pedicels filiform, 2–4 cm; calyx tube campanulate, ca. 4 × 4–5 mm; segments slightly reflexed, linear or linear-lanceolate, 4–12 mm, 3-veined, apex acuminate; corolla segments ovate-lanceolate, ca. 15 × 6 mm, apex acute; filaments filiform, 3–4 mm,

puberulent; anthers oblong, ca. 2 mm. Female flowers solitary, larger than male flowers; pedicel slender, pubescent; calyx segments linear, 8–9 mm; corolla segments ovate-lanceolate, ca. 20 × 7 mm, distinctly 3–5-veined, apex shortly acuminate; ovary ovoid, ca. 7 × 6 mm, pubescent and villous, apex shortly rostrate; style ca. 5 mm, 3-fid; stigma enlarged, 2-lobed, reniform. Fruiting pedicel 2–3 cm, sparsely pubescent; fruit ovoid, 2–3 cm in diam., verrucose. Seeds broadly ovate, 6–7 × ca. 3.5 mm, ca. 1.5 mm thick, punctate, base slightly obtuse. Fl. and fr. Apr–Nov.

• Valleys, thickets, forest margins; 1100–2600 m. Chongqing, Guizhou, Sichuan, Yunnan.

- 1a. Leaf blade lobed; calyx segments
4–8 mm 21a. var. *pustulata*
1b. Leaf blade dentate, undivided;
calyx segments 9–12 mm 21b. var. *jingfushanensis*

21a. *Thladiantha pustulata* var. *pustulata*

云南赤爬(原变种) yun nan chi bao (yuan bian zhong)

Melothria pustulata H. Léveillé, Cat. Pl. Yun-Nan, 65. 1916; *M. mairei* H. Léveillé; *Thladiantha yunnanensis* Gagnepain.

Leaf blade lobed. Calyx segments 4–8 mm.

• Valleys, thickets; 1500–2600 m. Guizhou, Yunnan.

21b. *Thladiantha pustulata* var. *jingfushanensis* A. M. Lu & J. Q. Li, Acta Bot. Yunnan. 14: 134. 1992.

金佛山赤爬 jin fo shan chi bao

Leaf blade margin dentate, undivided. Calyx segments 9–12 mm.

• Wetlands in valleys, forest margins; 1100–1800 m. Chongqing (Jinfo Shan), Sichuan.

22. *Thladiantha henryi* Hemsley, J. Linn. Soc., Bot. 23: 316. 1887.

皱果赤爬 zhou guo chi bao

Thladiantha dictyocarpa Handel-Mazzetti; *T. henryi* var. *verrucosa* (Cogniaux) A. M. Lu & Zhi Y. Zhang; *T. verrucosa* Cogniaux.

Vines, climbing. Roots tuberous, enlarged. Stem and branches longitudinally angular-sulcate, sparsely puberulent, glabrescent. Petiole slender, 4–12 cm, puberulent; leaf blade broadly ovate-cordate, 8–16 × 7–14 cm, membranous, abaxially puberulent, adaxially white setose, basal lateral veins along

base of blade, base cordate, margin dentate, sometimes irregularly triangular-serrate, apex acute or shortly acuminate; sinus open, semicircular, 1–3 cm deep, 1–2 cm wide. Tendrils filiform, 2-fid or simple. Male flowers 6–10 at apex of peduncle in raceme or panicle; peduncle 5–12 cm, puberulent; pedicel 1–3 cm, puberulent; calyx tube campanulate, 5–7 mm in diam.; segments lanceolate, 10–12 mm, puberulent, 1-veined, apex acuminate; corolla segments oblong-elliptic or oblong, ca. 20 × 6 mm, 5-veined, apex shortly acuminate or acute; stamens 4 connected at base in pairs and 1 free; filaments 4–5 mm, puberulent, with 3 scales at base; anthers oblong, ca. 4 mm; rudimentary ovary absent. Female flowers solitary, or 2 or 3 to many in a raceme; pedicels 2–6 cm; calyx and corolla as in male flowers; staminodes 5, ca. 2.5 mm; ovary narrowly ovoid or ovoid-oblong, verrucose-rugose; style 3–4 mm; stigma enlarged, reniform, 2-lobed. Fruiting pedicel 6–9 cm; fruit ellipsoid, 5–10 × 3–4 cm, rugose, base attenuate at pedicel to 10 mm. Seeds narrowly ovate, 5–6 × 2–2.5 mm, smooth. Fl. and fr. Jun–Nov.

• Thickets, forests, roadsides; 1100–2000 m. W Hubei, W Hunan, S Shaanxi, E Sichuan.

23. *Thladiantha longifolia* Cogniaux ex Oliver, Hooker's Icon. Pl. 23: t. 2222. 1892.

长叶赤爬 chang ye chi bao

Vines, climbing. Stems and branches slender, angular, glabrous or sparsely pubescent. Petiole 2–7 cm, glabrous or shortly pubescent; leaf blade ovate-lanceolate or narrowly ovate-triangular, 8–18 × 4–8 cm, membranous, abaxially subglabrous, adaxially white setose, basal lateral veins not along base of blade, base cordate, margin dentate, apex acute or shortly acuminate; sinus open, semicircular, 1.5–2 cm deep, 1.5–2.5 cm wide. Tendril filiform, simple, glabrous. Male flowers 3–9(–12) at apex of peduncle in a raceme; peduncle slender, 2–2.5 cm; pedicels 1–2 cm, sparsely pubescent, glabrescent; calyx tube shortly campanulate, ca. 0.6 cm wide at apex, pubescent on veins; segments triangular, 7–8 mm, 1-veined; corolla segments oblong or elliptic, 1.5–2 × 0.8–1 cm, 5-veined, apex slightly obtuse; stamens 4 connected in pairs at base and 1 free; filaments ca. 3 mm; anthers oblong, 2.5–3 mm. Female flowers solitary, or 2 or 3 flowers on short peduncle; pedicels 2–4 cm; calyx and corolla as in male flowers; staminodes 5, subulate, ca. 1.5 mm, 4 in pairs, 1 free; ovary ovoid, acuminate at both apex and base, base emarginate and with lobules, rugose; style 3-fid; stigma enlarged, reniform. Fruit broadly ovoid, ca. 4 cm, verrucose, base slightly emarginate. Seeds ovate, 6–8 × 3–4.5 mm, 1–1.5 mm thick, apex obtuse. Fl. Apr–Jul, fr. Aug–Oct.

• Mountain slopes, forests, valleys, thickets; 1000–2200 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan.

12. MOMORDICA Linnaeus, Sp. Pl. 2: 1009. 1753.

苦瓜属 ku gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, annual or perennial, scandent or creeping. Tendrils unbranched or 2-fid. Petiole usually glandular; leaf blade suborbicular or ovate-cordate, palmately 3–7-lobed, rarely undivided, entire or dentate. Plants dioecious or monoecious. Male flowers solitary or in a raceme; pedicel often with a large bract; bract orbicular-reniform; calyx tube short, campanulate or cupular; segments ovate, lanceolate, or oblong-lanceolate; corolla yellow or white, rotate or broadly campanulate, 5-lobed; segments obovate, oblong, or

ovate-oblong; stamens (2 or)3(or 5); filaments short, free; anthers coherent at first, one 1-celled, other 2-celled; anther cells reflexed, straight, or curved; connective not produced; rudimentary ovary glandular or absent. Female flowers: ovary oblong or fusiform; style elongate; stigmas 3, undivided or 2-lobed; ovules numerous, horizontal. Fruit ovoid, oblong, elliptic, or fusiform, undivided or 3-valved, usually verrucose or spinescent. Seeds few or numerous, ovate or oblong, smooth or reticulate.

Forty-five species: most in tropical Africa, some cultivated in tropical regions; three species (one introduced) in China.

- 1a. Plants monoecious; bract on middle of male pedicel; leaf blade 5–7-partite; stamens 3; fruit fusiform or cylindrical, verrucose 1. *M. charantia*
 1b. Plants dioecious; bract at apex of male pedicel.
 2a. Petiole eglandular; anther cells conduplicate; fruit smaller than 5 cm, ovoid or ovoid-oblong, verrucose or longitudinally sulcate 2. *M. subangulata*
 2b. Petiole with 2–5 median glands; anther cells reflexed; fruit larger than 5 cm, ovoid, densely spinescent 3. *M. cochinchinensis*

1. *Momordica charantia* Linnaeus, Sp. Pl. 2: 1009. 1753.

苦瓜 ku gua

Cucumis argyi H. Léveillé; *Momordica chinensis* Sprengel; *M. indica* Linnaeus; *M. sinensis* Sprengel; *Sicyos fauriei* H. Léveillé.

Plants annual, scandent, many branched; stem and branches pubescent. Tendrils to 20 cm, puberulent, simple. Petiole slender, 4–6 cm, white pubescent at first, glabrescent; leaf blade ovate-reniform or suborbicular, 4–12 × 4–12 cm, membranous, puberulent on veins, 5–7-partite; lobes ovate-oblong, veins palmate, margin crenate or irregularly lobed, apex obtuse or acute; sinus semicircular. Plants monoecious. Male flowers solitary in axils of leaves; pedicel slender, 3–7 cm, puberulent, with a median bract; bract reniform or orbicular, 5–15 mm, entire, both surfaces puberulent; calyx segments ovate-lanceolate, 4–6 × 2–3 mm, white pubescent, apex acute; corolla yellow; segments obovate, 15–20 × 8–12 mm, pubescent, obtuse or retuse; stamens 3, free; anther cells conduplicate. Female flowers solitary; pedicel 10–12 cm, with a bract at base; ovary fusiform, densely verrucose; stigmas expanded, 2-lobed. Fruit orange when mature, fusiform or cylindrical, 10–20 cm, verrucose, 3-valved from apex. Seeds numerous, oblong, 15–20 × 10–15 cm. Fl. and fr. May–Oct.

Commonly cultivated in China [pantropical, also cultivated in temperate and tropical regions].

The fruit is used as a vegetable; all parts of the plant are used medicinally.

2. *Momordica subangulata* Blume, Bijdr. 928. 1826.

凹萼木鳖 ao e mu bie

Plants scandent. Stem and branches sulcate-angular, glabrous or puberulent at nodes. Petiole slender, 3–8 cm, glabrous, eglandular; leaf blade ovate-cordate or broadly ovate-cordate, 6–13 × 4–11 cm, membranous, both surfaces puberulent at first, glabrescent, base cordate, sinus subquadrate, margin dentate, usually undivided or sometimes 3–5-lobed, apex acute or acuminate. Tendrils filiform, simple. Plants dioecious. Male flowers solitary in leaf axil; pedicel slender, 5–8(–14) cm, puberulent, apex bracteate; bract orbicular-reniform, 10–30 × 10–40 mm, both surfaces puberulent, glabrescent, base retuse, apex rounded to subacute; calyx segments ovate-oblong or lanceolate,

late, 7–9 × 4–5 mm, pubescent, apex obtuse, retuse, broadly rounded, or acute; corolla yellow; segments oblong or obovate, 20–30 × 15–25 mm, 5-veined, apex obtuse-rounded; stamens 3 or 5; filaments filiform, ca. 3 mm, glabrous; anthers 2.5–3 mm; anther cells conduplicate. Female flowers solitary; pedicel filiform, 5–10 cm, usually with a minute bract at base; calyx and corolla as in male flowers; ovary ovoid-oblong or fusiform, 8–12 × 2–4 mm, ridged or verrucose, base attenuate. Fruiting pedicel slender, glabrous; fruit ovoid or ovoid-oblong, 3–7 × 2.5–4 cm, longitudinally sulcate or with rows of tubercles, both ends attenuate. Seeds gray or yellow-brown, oblong, ovoid, or globose, 7–14 × 5–8 mm, both surfaces slightly sculptured. Fl. Jun–Aug, fr. Aug–Nov.

Mountain slopes, thickets, roadsides; 800–2500 m. Guangdong, Guangxi, Guizhou, Yunnan [Bangladesh, India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

- 1a. Plant slender; bract of male flower 10–20 × 10–20 mm; fruit 3–5 cm with irregularly undulate longitudinal ribs, glabrous or almost so 2a. subsp. *subangulata*
 1b. Plant more robust; bract of male flower 20–30 × 20–40 mm; fruit 5–7 cm, with longitudinal rows of flattened tubercles or undulate ridges, hispid-verrucose 2b. subsp. *renigera*

2a. *Momordica subangulata* subsp. *subangulata*

凹萼木鳖(原亚种) ao e mu bie (yuan ya zhong)

Momordica eberhardtii Gagnepain; *M. laotica* Gagnepain.

Stems slender. Leaf blade puberulent at first on both surfaces, glabrescent. Bract of male flower 10–20 × 10–20 mm. Calyx segments ovate-oblong, pubescent, apex obtuse, retuse. Fruit ovoid or ovoid-oblong, 3–5 cm, longitudinally sulcate, not verrucose, glabrous or almost so. Fl. Jun–Aug, fr. Aug–Oct.

Mountain slopes, roadsides; 800–1500 m. Guangdong, Guangxi, Guizhou, Yunnan [Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

2b. *Momordica subangulata* subsp. *renigera* (Wallich ex G. Don) W. J. de Wilde, Bot. Zhurn. 87: 147. 2002.

云南木鳖 yun nan mu bie

Momordica renigera Wallich ex G. Don, Gen. Hist. 3: 36. 1834.

Stem robust. Leaf blade abaxially puberulent, yellow-brown pubescent on veins or glabrescent. Bract of male flower 20–30 × 20–40 mm. Calyx segments lanceolate, apex acute. Fruit ovoid or broadly ovoid, 5–7 cm, with longitudinal rows of flattened tubercles or undulate ridges, verrucose. Fl. Jun–Aug, fr. Aug–Nov.

Roadsides on mountain slopes, thickets; 1400–2500 m. Yunnan [Bangladesh, India, Myanmar, Thailand].

The Chinese record of *Momordica dioica* Willdenow (FRPS 73(1): 192. 1986) is based on a misidentification of *M. subangulata* subsp. *renigera*.

3. *Momordica cochinchinensis* (Loureiro) Sprengel, Syst. Veg. 3: 14. 1826.

木鳖子 mu bie zi

Muricia cochinchinensis Loureiro, Fl. Cochinch. 2: 596. 1790; *Momordica macrophylla* Gage; *M. meloniflora* Handel-Mazzetti; *M. mixta* Roxburgh.

Climbers, strong, to 15 m. Root tuberous. Stem and branches glabrous or puberulent, sometimes tomentose at nodes. Tendrils robust, simple. Petiole robust, 5–10 cm, slightly yel-

low-brown pubescent or glabrescent, 2–4-glandular at base or middle; leaf blade cordate or broadly ovate-orbicular, 10–20 × 10–20 cm, 3–5-lobed; median lobe obovate or oblong-lanceolate, 6–10(–15) × 3–6(–9) cm, margin undulate-dentate, apex acute or acuminate; lateral lobes ovate or oblong-lanceolate, 3–7(–11) × 2–4(–7) cm, base cordate. Plants dioecious. Male flowers solitary or in a short raceme; pedicels robust, 3–5 cm, or 6–12 cm when solitary, bracteate at apex; bract orbicular-reniform, 3–5 × 5–8 cm, entire, retuse at apex; calyx tube funnelform; segments broadly lanceolate or oblong, 12–20 × 6–8 mm, apex acute or acuminate; corolla yellow; segments ovate-oblong, 5–6 × 2–3 cm, yellow glandular at base, apex acute or acuminate; stamens 3; anther cells reflexed. Female flower solitary; pedicel 5–10 cm, bracteate at middle; bract ca. 2 mm; calyx and corolla as in male flowers; ovary ovoid-oblong, ca. 1 cm, densely spinescent. Fruit red, ovoid, 12–15 cm in diam., fleshy, densely spinescent, apex rostellate. Seeds numerous, ash gray, ovoid or square, 26–28 × 18–20 mm, 5–6 mm thick, both surfaces sculptured, margin undulate-sublobulate. Fl. Jun–Aug, fr. Aug–Oct.

Forest margins and roadsides on mountain slopes; 400–1100 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bangladesh, India, Malaysia, Myanmar].

The seeds, roots, and leaves are used medicinally.

13. ECBALLIUM A. Richard in Bory, Dict. Class. Hist. Nat. 6: 19. 1824, nom. cons.

喷瓜属 pen gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Elaterium Miller.

Herbs, creeping. Roots perennial. Stem and branches setose. Tendrils absent. Leaf blade cordate. Plants monoecious or dioecious. Male inflorescence a raceme; calyx tube shortly campanulate; segments 5, linear-lanceolate; corolla yellow, broadly campanulate or almost rotate; segments ovate-oblong, apex acute; stamens 3, linear; filaments short, free; anthers: one 1-celled, two 2-celled; anther cells reflexed; connective broad, not produced; pistillode absent. Female flowers solitary; calyx and corolla as in male flowers; staminodes 3, ligulate; ovary oblong, hispid; ovules numerous, horizontal; style short; stigmas 3, 2-lobed. Fruit oblong, hispid, scabrous, watery inside, when mature separating from peduncle and contracting at base, dispersing seeds by elastic contraction (squirting seeds). Seeds numerous, brown or nearly black, oblong, compressed, narrowly marginate.

One species: Mediterranean region to SW Asia (east to Iran); introduced elsewhere, including China.

1. *Eballium elaterium* (Linnaeus) A. Richard in Bory, Dict. Class. Hist. Nat. 6: 19. 1824.

喷瓜 pen gua

Momordica elaterium Linnaeus, Sp. Pl. 2: 1010. 1753.

Roots elongate, robust. Stem ca. 1.5 m, scabrous. Petiole somewhat robust, 5–15 cm, densely setose; leaf blade ovate-oblong or hastate, 8–20 × 6–15 cm, scabrous, abaxially white pubescent, adaxially white setose, margin sinuous or slightly divi-

ded, apex slightly obtuse; sinus semicircular, sometimes truncate. Male flowers in a raceme; peduncle densely yellow-brown pubescent and setose; pedicels filiform, 1–3 cm; calyx segments lanceolate, 5–6 × 1.2–2 mm, densely pubescent and hispid; corolla yellow, ca. 3 cm in diam.; segments ovate-oblong; filaments ca. 3 mm, base villous. Fruit oblong or ovoid-oblong, 4–5 × 1.5–2.5 cm, scabrous, yellow-brown hispid, both ends obtuse. Seeds ca. 4 mm.

Dry mountain slopes, grasslands. Xinjiang [native to SW Asia and Mediterranean region].

14. SCHIZOPEPON Maximowicz, Mém. Acad. Imp. Sci. St.-Pétersbourg Divers Savans 9 [Prim. Fl. Amur.]: 110. 1859.

裂瓜属 lie gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, scandent. Stem and branches slender. Tendrils 2-fid. Leaves long petiolate; leaf blade ovate-cordate or broadly ovate-

cordate, rarely hastate, margin irregularly dentate, usually 5–7-lobed. Plants dioecious or monoecious; flowers small, unisexual or rarely bisexual. Male flowers usually in a raceme; female flowers solitary or few in a raceme; calyx tube cupular or campanulate; segments 5, lanceolate or subulate; corolla segments 5, white, ovate; stamens 3, free or connate; filaments short; anthers: one 1-celled, two 2-celled; anther cells erect; connective produced or not; ovary ovoid or conical, 3-locular or irregularly 3-locular, 1 ovule in each locule; ovule pendulous; style short, 3-fid or sometimes 5-fid; stigma slightly expanded, 2-lobed. Fruit small, ovoid or conical, smooth or punctate, apex acute or long acuminate, 3-valved or indehiscent, 1–3-seeded. Seeds pendulous, ovate, compressed, margin irregularly dentate.

Eight species: E Asia to the Himalaya; eight species (five endemic) in China.

- 1a. Fruit conical, apex acuminate, rostrate; connective produced, subulate, rarely not produced; ovary irregularly 3-locular, ovule pendulous from middle of locule.
- 2a. Connective not produced 6. *S. bomiensis*
- 2b. Connective produced, appendage subulate.
- 3a. Leaf blade ovate-cordate, usually unlobed, papery 7. *S. bicirrhosus*
- 3b. Leaf blade hastate, 5-lobed, membranous 8. *S. xizangensis*
- 1b. Fruit ovoid or ovate, apex acute; connective not produced; ovary 3-locular, ovule pendulous from apex of locule.
- 4a. Flowers bisexual; stamens free 1. *S. bryoniifolius*
- 4b. Flowers unisexual; plant monoecious or dioecious; stamens connate.
- 5a. Plants monoecious; male and female flowers in same inflorescence, with many male flowers above and 1 or 2 female flowers below; filaments connate, anthers free; ovary and fruit smooth 2. *S. monoicus*
- 5b. Plants dioecious.
- 6a. Filaments and anthers both connate; flowers larger; calyx segments ca. 3 mm; corolla segments ca. 9 mm 5. *S. macranthus*
- 6b. Filaments connate, anthers free or connate at base.
- 7a. Pedicels 2–5 mm; flowers small; calyx segments ca. 1 mm; corolla segments 2–3.5 mm; fruit punctate 3. *S. dioicus*
- 7b. Pedicels 5–10 mm; flowers slightly larger; calyx segments ca. 2 mm; corolla segments 3–5 mm 4. *S. longipes*

1. *Schizopepon bryoniifolius* Maximowicz, Mém. Acad. Imp. Sci. St.-Pétersbourg Divers Savans 9 [Prim. Fl. Amur.]: 111. 1859.

裂瓜 lie gua

Schizopepon bryoniifolius var. *japonicus* Cogniaux; *S. bryoniifolius* var. *paniculatus* Komarov.

Plants annual. Stem 2–3 m. Branches slender, subglabrous or slightly puberulent. Tendrils filiform, glabrous. Petiole slender, 4–13 cm, sometimes puberulent; leaf blade ovate or broadly ovate-cordate, 6–10 × 5–9 cm, membranous, puberulent, palmately 5–7-veined, 3–7-angular or -lobed, margin irregularly dentate, apex acuminate; sinus semicircular. Flowers very small, bisexual, solitary or in 3–5-flowered racemes; peduncle filiform, 1–1.5 cm, puberulent; calyx segments lanceolate, ca. 1.5 mm, 1-veined, entire; corolla rotate; segments white, ca. 2 × 0.8–1 mm, 3-veined; stamens inserted at base of calyx tube, free, ca. 1 mm, glabrous; filaments linear; anthers ca. 0.5 mm; anther cells erect, connective not produced; ovary ovoid, 3-locular; style short; stigmas 3. Fruit broadly ovoid, 10–15 mm, apex acute, 3-valved, 1–3-seeded. Seeds ovate, ca. 9 × 5.5 mm, compressed, margin irregularly dentate, apex truncate. Fl. and fl. Jun–Nov.

River valleys, forests; 500–1500 m. Hebei, Heilongjiang, Jilin, Liaoning [E Russia].

2. *Schizopepon monoicus* A. M. Lu & Zhi Y. Zhang, Acta Phytotax. Sin. 23: 112. 1985.

峨眉裂瓜 e mei lie gua

Plants slender. Stem and branches glabrous, angular-sul-

cate. Tendrils filiform. Petiole slender, 3–4 cm, glabrous; leaf blade ovate-cordate, 5–7 × 3–4 cm, membranous, palmately 5–7-lobed; median lobe triangular, apex long acuminate; lateral lobes acute, margin irregularly dentate, palmately 7-veined, both surfaces setose at first; sinus semicircular. Plants monoecious. Male and female flowers in same racemose inflorescence; peduncle slender, 2–4 cm, glabrous. Male flowers: pedicel filiform, 1–2 mm; calyx tube broadly campanulate; segments subulate, ca. 1.5 mm; corolla segments ovate, ca. 5 mm, 1-veined; filaments connate, ca. 0.3 mm; anthers free, ca. 0.4 mm; anther cells erect. Female flowers: pedicel ca. 2 mm; calyx segments ovate, ca. 0.8 mm; ovary ovoid, ca. 0.8 mm, glabrous; style 3-fid; stigma expanded. Fruiting pedicel ca. 1 cm, slender; fruit subglobose, 3-locular with 1 seed in each locule. Fl. and fr. May–Nov.

• Roadsides on mountain slopes. Sichuan (Emei Shan).

3. *Schizopepon dioicus* Cogniaux ex Oliver, Hooker's Icon. Pl. 23: t. 2224. 1892.

湖北裂瓜 hu bei lie gua

Plants annual. Stem and branches slender. Tendrils filiform. Petiole 3.5–7.5 cm; leaf blade broadly ovate-cordate, 5–9 × 3–7 cm, membranous, usually 2- or 3-angled on each side, both surfaces glabrous, palmately 5–7-veined, margin dentate, apex acuminate; sinus semicircular. Plants dioecious. Male flowers in a raceme; peduncle filiform, 5–10 cm; pedicels filiform, 2–3 mm; calyx segments linear-subulate or narrowly lanceolate, 1–1.2 × 0.5–0.8 mm; corolla white, rotate; segments lanceolate or oblong-lanceolate, 2–3.5 × 1.5–2 mm, 1-veined;

filaments connate, ca. 0.8 mm; anthers free or united only at base, ca. 0.5 mm; connective not produced. Female flowers solitary or a few aggregated at apex of a short peduncle; ovary ovoid, glabrous or pubescent, apex shortly acuminate, 3-locular, 1 ovule in each locule; styles 3-fid; stigma slightly expanded. Fruiting pedicel filiform, 1–2 cm; fruit pale brown to black-brown when mature, broadly ovoid, ca. 1.2 cm × 8 mm, glabrous or pubescent, smooth or verrucose, base rounded, apex acute, 3-valved from apex, usually with 2 seeds. Seeds pale brown when mature, ovoid, ca. 8 × 5 mm, base slightly wider, ca. 2 mm thick, irregularly dentate, contracted above, apex truncate.

• Grasslands, thickets, and roadsides on mountain slopes; 1000–2400 m. Guizhou, W Hubei, NW Hunan, S Shaanxi, E and W Sichuan.

- 1a. Ovary and fruit densely pubescent 3c. var. *trichogynus*
 1b. Ovary and fruit glabrous.
 2a. Leaf blade ovate-cordate, apex
 acuminate 3a. var. *dioicus*
 2b. Leaf blade narrowly ovate-cordate,
 apex caudate-acuminate 3b. var. *wilsonii*

3a. *Schizopepon dioicus* var. *dioicus*

湖北裂瓜(原变种) hu bei lie gua (yuan bian zhong)

Leaf blade ovate-cordate, apex acuminate. Ovary and fruit glabrous; fruit pale brown when mature, verrucose.

• Grasslands and roadsides on mountain slopes; 1000–2400 m. W Hubei, NW Hunan, S Shaanxi, E Sichuan.

3b. *Schizopepon dioicus* var. *wilsonii* (Gagnepain) A. M. Lu & Zhi Y. Zhang, Acta Phytotax. Sin. 23: 113. 1985.

四川裂瓜 si chuan lie gua

Schizopepon wilsonii Gagnepain, Bull. Mus. Natl. Hist. Nat. 24: 378. 1918.

Leaf blade narrowly ovate-cordate, 3–5 lobed, apex caudate-acuminate. Ovary and fruit glabrous; fruit black-brown, smooth.

• Roadsides and thickets on mountain slopes; 1500–2400 m. NW Guizhou, E and W Sichuan.

3c. *Schizopepon dioicus* var. *trichogynus* Handel-Mazzetti, Oesterr. Bot. Z. 85: 219. 1936.

毛蕊裂瓜 mao rui lie gua

Ovary and fruit densely pubescent.

• Guizhou, W Hubei.

4. *Schizopepon longipes* Gagnepain, Bull. Mus. Natl. Hist. Nat. 24: 378. 1918.

长柄裂瓜 chang bing lie gua

Stem and branches slender. Tendrils filiform. Petiole 4–7 cm, slightly puberulent; leaf blade ovate, 4–6 × 3–5 cm, irregularly 3–5-lobed; median lobe larger, triangular, apex acuminate; lateral lobes smaller, both surfaces puberulent, palmately 5-veined, margin dentate; sinus semicircular. Male flowers

many in a raceme, flowers on upper part of peduncle; rachis filiform, 10–15 cm; pedicels linear, 0.5–1 cm, glabrous or puberulent; calyx segments lanceolate, 1.8–2 mm; corolla segments narrowly ovate, 3–5 × 1.5–2.5 mm, 1-veined, apex acuminate; filaments united, ca. 0.5 mm; anthers free, 0.8–1 mm; connective not produced; cells erect, linear. Fl. Jul–Oct.

Valleys, roadsides; 2000–3000 m. W Sichuan, NW Yunnan [Bhutan, NE India (Darjeeling)].

This species was recorded from Bhutan and India in Fl. Bhutan (2(1): 260. 1991).

5. *Schizopepon macranthus* Handel-Mazzetti, Symb. Sin. 7: 1064. 1936.

大花裂瓜 da hua lie gua

Plants annual. Stem and branches slender, sulcate-angular. Tendrils filiform, glabrous. Petiole slender, 6–9 cm, subglabrous; leaf blade broadly ovate-cordate, 8–10 × 6–8 cm, membranous, both surfaces puberulent, palmately 7-veined, margin irregularly dentate, apex caudate-acuminate; sinus subquadrate, 1–1.5 cm deep, 1.5–2 cm wide. Plants dioecious. Male flowers in a raceme; peduncle slender, 6–8 cm; pedicels filiform, 2–5 cm; calyx segments lanceolate-subulate, ca. 3 mm; corolla pale yellow, rotate, glandular hairy at base; segments broadly lanceolate, ca. 9 mm, 1-veined, apex acuminate; filaments free, ca. 0.8 mm, glabrous; anthers connate at base, elliptic; cells erect, puberulent; rudimentary ovary absent. Fl. Jul–Sep.

• Roadsides on mountain slopes; 2300–3000 m. W Sichuan, NW Yunnan.

6. *Schizopepon bomiensis* A. M. Lu & Zhi Y. Zhang, Acta Phytotax. Sin. 18: 385. 1980.

喙裂瓜 hui lie gua

Stems and branches slender, sulcate-angular, puberulent at first or glabrescent. Tendrils slender. Petiole slender, 1–2(–3) cm, subglabrous; leaf blade ovate-hastate or ovate-triangular, 2.5–5 × 2–3.5 cm, membranous, usually 5-lobed, lobe margin dentate, both surfaces puberulent, apex shortly acuminate; sinus suborbicular, 6–8 mm deep. Plants dioecious. Male flowers in a raceme; peduncle pale yellow-green, 2.5–7 cm; pedicels ca. 3 mm; calyx tube cupular; segments linear, ca. 1.2 mm; corolla campanulate; segments narrowly ovate, ca. 2 mm; filaments nearly free, ca. 0.4 mm; anthers connate, one 1-celled, other 2-celled, ca. 0.4 mm. Female flowers solitary in leaf axil; pedicels filiform, 5–10 mm, glabrous; calyx segments subulate, 1.2–1.5 mm, apex acuminate; corolla yellow; segments narrowly ovate, ca. 2 × 1 mm, apex acuminate; staminodes glandular; ovary conical, ca. 3 mm, puberulent, base rounded, apex elongate; style filiform. Fruiting pedicel slender, ca. 1 cm; fruit ca. 1.5 × 0.5 cm, glabrous, base rounded, apex rostrate. Fl. and fr. Jul–Oct.

• Forests or thickets on mountain slopes; 2200–2600 m. E and SE Xizang.

7. *Schizopepon bicirrhosus* (C. B. Clarke) C. Jeffrey, Kew Bull. 34: 802. 1980.

新裂瓜 xin lie gua

Melothria bicirrhosa C. B. Clarke in J. D. Hooker, Fl. Brit. India 2: 627. 1879; *Schizopepon wardii* Chakravarty.

Branches ± slender, sulcate-angular, glabrous. Tendrils usually 2-fid, glabrous. Petiole slender, 2–4 cm, glabrous or puberulent; leaf blade 3–10 × 2–7 cm, membranous, both surfaces slightly pubescent, margin undulate or 1- or 2-angled on each side, irregularly dentate, apex caudate-acuminate; sinus semicircular. Plants dioecious. Male flowers 7–16 in a raceme; peduncle 3–7 cm; pedicels slender, 3–10 mm; calyx tube campanulate, 4–5 mm; segments subulate, ca. 2 mm, glandular pubescent; corolla segments lanceolate, ca. 2.5 mm; stamens connate, inserted on base of corolla tube; filaments ca. 1 mm, glabrous; anthers puberulent; anther cells erect, ca. 1.5 mm; connective produced; appendage ca. 1.5 mm. Female flowers solitary; pedicels slender, 2–4 cm; calyx segments subulate, ca. 3 mm; corolla segments lanceolate, 5–6 mm, 3-veined; ovary conical, ca. 8 × 3 mm, pubescent, base obtuse-rounded, apex attenuate; ovules 3, solitary in each locule, pendulous; styles ca. 2 mm, 3-fid, apex expanded. Fruiting pedicel slender, 8–10 cm,

glabrous; fruit narrowly conical, ca. 3 cm × 6 mm, white pubescent, apex attenuate, rostrate.

Thickets; 2700–2800 m. S Xizang [Bhutan, N India, Myanmar].

8. *Schizopepon xizangensis* A. M. Lu & Zhi Y. Zhang, Acta Phytotax. Sin. 23: 116. 1985.

西藏裂瓜 xi zang lie gua

Plants glabrous. Branches slender, filiform. Tendrils filiform. Petiole slender, 2–3 cm; leaf blade hastate, 4–6.5 × 3–4 cm, thin, membranous, 5-lobed, lobe margin dentate, apex caudate-acuminate; sinus subquadrate. Plants dioecious. Male flowers solitary, or 2–7 in a short raceme; calyx tube cupular, ca. 3 mm in diam.; segments subulate, ca. 2 mm; corolla yellow; segments triangular-ovate, ca. 6 mm; stamens connate; filaments short, ca. 1 mm; anthers ovoid, one 1-celled, other 2-celled; connective produced; appendage subulate, ca. 1 mm. Female flowers and fruit unknown.

• Herbage on mountain slopes; ca. 2100 m. SE Xizang (Mêdog).

15. *BISWAREA* Cogniaux, Bull. Soc. Roy. Bot. Belgique 21(2): 16. 1882.

三裂瓜属 san lie gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Warea C. B. Clarke, J. Linn. Soc., Bot. 15: 127. 1876, non Nuttall (1834).

Herbs, scandent. Tendrils 2-fid. Leaf blade 5–7-lobed. Plants dioecious; flowers yellow. Male flowers mostly racemose; calyx tube narrowly tubular below, dilated above and broadly campanulate, 5-partite; segments linear; corolla broadly campanulate, 5-partite; segments ovate, entire; stamens 3, inserted on calyx tube; filaments free; anthers connate, one 1-celled, others 2-celled; anther cells linear, triplicate; rudimentary ovary subulate. Female flowers: calyx and corolla as in male flowers; ovary oblong, with 3 placentas; styles filiform, elongate; stigmas 3, enlarged, ovules numerous, horizontal. Fruit oblong, 3-angled, 6-ribbed, fibrous, 3-valved nearly to base. Seeds compressed, smooth.

One species: SW China, NE India, Myanmar, Nepal.

1. *Biswarea tonglensis* (C. B. Clarke) Cogniaux, Bull. Soc. Roy. Bot. Belgique 21(2): 16. 1882.

三裂瓜 san lie gua

Warea tonglensis C. B. Clarke, J. Linn. Soc., Bot. 15: 129. 1876.

Stem and branches slender, puberulent or subglabrous. Petiole robust, 6–10 cm; leaf blade broadly ovate-cordate or suborbicular-cordate, 14–17 × 12–16 cm; lobes triangular-ovate, margin dentate, apex acute or acuminate. Male inflorescence usually 5–8-flowered; peduncle 8–10 cm; bracts 2–3 mm;

calyx tube ca. 3 cm, base ca. 3 mm in diam., apex ca. 15 mm in diam.; segments narrowly lanceolate, 6–7(–20) mm, puberulent, apex subulate; corolla segments ovate, 22–30 × ca. 11 mm; apex acute; filaments filiform, 4–5 mm, glabrous; anthers connected, ca. 7 mm; rudimentary ovary subulate, 8–9 mm. Female flower solitary; pedicel 25–30 mm; ovary densely tomentose, ca. 12 mm; calyx tube ca. 4.2 cm, apex ca. 11 mm in diam.; segments and corolla segments as in male flowers. Fruit 10–12 × 4–4.5 cm. Seeds numerous, pale brown, elliptic, 10–15 × 7–10 mm.

NW Yunnan [NE India (Darjeeling, Sikkim), Myanmar, Nepal].

16. *HERPETOSPERMUM* Wallich ex J. D. Hooker in Bentham & J. D. Hooker, Gen. Pl. 1: 834. 1867.

波棱瓜属 bo leng gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, climbing, annual. Roots spreading. Tendrils simple. Plants dioecious. Male flowers in raceme or rarely solitary; calyx tube elongate, funnel-shaped; segments subulate; corolla broadly campanulate, 5-partite; segments entire; stamens 3, included in calyx tube; filaments free; anthers connate, one 1-celled, two 2-celled; anther cells linear, conduplicate; rudimentary ovary subulate. Female flowers solitary; calyx and corolla as in male flowers; staminodes 3, subulate or absent; ovary oblong, 3-locular, 4–6 ovules

in each locule, pendulous; filaments filiform, elongate; stigmas 3, dilated. Fruit broadly oblong, 3-valved from apex nearly to base. Seeds pendulous, oblong or obovate, compressed, smooth, margins obtuse.

One species: Bhutan, SW China, India, Nepal.

1. *Herpetospermum pedunculatum* (Seringe) C. B. Clarke, J. Linn. Soc., Bot. 15: 115. 1876.

波棱瓜 bo leng gua

Bryonia pedunculata Seringe in Candolle, Prodr. 3: 306. 1828; *Herpetospermum caudigerum* Wallich ex Chakravarty; *H. grandiflorum* Cogniaux.

Stem and branches slender, puberulent at first. Petiole 4–8(–10) cm; leaf blade ovate-cordate, 6–12 × 4–9 cm, membranous, both surfaces scabrous, yellow-brown pubescent at first, base cordate, margin dentate, apex caudate-acuminate. Male

flowers usually in a raceme or solitary; inflorescence 12–40 cm, 5–10-flowered, puberulent; calyx tube 20–25 cm, apex 8–9 mm in diam.; segments linear, 8–9 mm; corolla yellow; segments elliptic, 20–22 × 12–15 mm; filaments 2–3 mm; anthers 5–6 mm; rudimentary ovary subulate, 4–5 mm. Female flowers: calyx tube narrowly tubular, ca. 15 mm, densely yellow pubescent; segments linear, ca. 9 mm; corolla segments oblong, 20–25 × 15–20 mm; ovary oblong-ovoid, densely yellow hispid. Fruit 7–8 × 3–4 cm, fibrous. Seeds pale gray, oblong, ca. 12 × 5 mm, 2–3 mm thick, base truncate. Fl. and fr. Jun–Oct.

Thickets and forest margins on mountain slopes; 2300–2500 m. Xizang, Yunnan [Bhutan, India, Nepal].

17. *EDGARIA* C. B. Clarke, J. Linn. Soc., Bot. 15: 113. 1876.

三棱瓜属 san leng gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, climbing. Stem and branches slender. Tendrils 2-fid. Petiole slender; leaf blade ovate-cordate, membranous, pubescent at first, ultimately glabrescent, scabrous, margin irregularly dentate. Plants dioecious. Male flowers in raceme or rarely solitary; calyx tube elongate, narrowly funnelform; segments 5, linear; corolla yellow, subrotate, 5-partite; segments obovate, entire; stamens 3, included, inserted on calyx tube; filaments free, short; anthers connate, one 1-celled, others 2-celled; anther cells straight; connective narrow; pistillode subulate. Female flowers solitary; calyx and corolla as in male flowers; staminodes absent; ovary narrowly ovoid, 3-locular, 1 or 2 ovules in each locule; ovules ± horizontal; style filiform, elongate; stigmas 3, oblong, apex 2-lobed. Fruit broadly fusiform, distinctly 3-angled, ribbed, dry, deeply 3-valved. Seeds subquadrate, compressed, slightly corrugate.

One species: Bhutan, SW China, N India, Nepal.

1. *Edgaria darjeelingensis* C. B. Clarke, J. Linn. Soc., Bot. 15: 114. 1876.

三棱瓜 san leng gua

Petiole 4–6 cm, pubescent at first, ultimately glabrous; leaf blade ovate-cordate, 8–12 × 6–10 cm, membranous, abaxially hispidulous on veins, adaxially sparsely puberulent at first, ultimately scabrous, margin sinuous-dentate, apex acute or shortly acuminate; basal sinus 2–2.5 cm deep. Male flowers usually 10–16 in a raceme or rarely solitary; peduncle slender, 12–15

cm; pedicel filiform, 5–8 mm; calyx tube 1.5–2 cm, apex 3–4 mm in diam.; segments 3–4 mm; corolla segments narrowly ovate, 10–15 × 3–5 mm, 3-veined, apex acuminate; filaments ca. 5 mm; pistillode 3–4 mm. Fruiting pedicel stout, 2–10 cm; fruit ovoid-3-angled, 6–7 cm, 3–4 cm in diam., glabrous or sparsely puberulent, apex 3-valved when mature. Seeds 13–14 × ca. 9 mm, ca. 2 mm thick. Fl. May–Aug.

Broad-leaved forests, grasslands; ca. 1700 m. Xizang [Bhutan, N India, Nepal].

18. *LUFFA* Miller, Gard. Dict. Abr., ed. 4, [806]. 1754.

丝瓜属 si gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, scandent, annual, glabrous or puberulent. Tendrils bi- or multifid. Petiole eglandular; leaf blade usually 5–7-lobed. Plants monoecious. Male flowers in a raceme; calyx tube obconical; segments 5, triangular or lanceolate; corolla segments 5, free, spreading, entire or erose; stamens 3 or 5, free; anthers: one 1-celled, other 2-celled or all 1-celled when stamens 5; anther cells linear, sigmoid-flexuous; connective usually dilated; pistillode glandular or absent. Female flowers solitary; calyx and corolla as in male flowers; staminodes 3, or rarely 4 or 5; ovary cylindrical; ovules numerous, horizontal; stigmas 3. Fruit oblong or cylindrical, terete or acutely costate, smooth or echinate, inside fibrous, apex operculately dehiscent. Seeds numerous, oblong, compressed.

Six species: tropical and subtropical regions throughout the world; two species (both introduced) in China.

- 1a. Stamens often 5, anther cells all 1-celled; fruit smooth, ecostate 1. *L. aegyptiaca*
 1b. Stamens 3, anthers: one 1-celled, others 2-celled; fruit with 8–10 acute ribs 2. *L. acutangula*

1. *Luffa aegyptiaca* Miller, Gard. Dict., ed. 8, *Luffa* no. 1. 1768.

丝瓜 si gua

Momordica luffa Linnaeus, Sp. Pl. 2: 1009. 1753; *Luffa cylindrica* (Linnaeus) M. Roemer; *M. cylindrica* Linnaeus.

Stem and branches scabrous, sulcate-angular, puberulent. Tendrils rather robust, usually 2–4-fid. Petiole 10–12 cm, scabrous, subglabrous; leaf blade triangular or suborbicular, 10–20 × 10–20 cm, often palmately 5–7-lobed; lobes triangular, median lobe 8–12 cm, base deeply cordate, margin dentate, apex acute or acuminate; sinus 2–3 cm deep, 2–2.5 cm wide. Male flowers usually 15–20 in a raceme; peduncle somewhat robust, 12–14 cm, pubescent; pedicels 1–2 cm; calyx broadly campanulate, 5–9 mm, puberulent; segments reflexed above, ovate-lanceolate or subtriangular, 8–13 × 4–7 mm, densely puberulent, 3-veined, apex acuminate; corolla yellow, rotate, 5–9 cm in diam.; segments oblong, 2–4 × 2–2.8 cm, inside densely yellow-white villous, base attenuate, apex rounded-obtuse. Stamens usually 5, rarely 3; filaments 6–8 mm, base white pubescent, connate at first, later free. Female flowers solitary; pedicel 2–10 cm; ovary narrowly cylindrical, puberulent; stigmas expanded. Fruit cylindrical, straight or slightly curved, 15–45 × 3–6 cm, smooth, ecostate, inside strongly fibrous when mature. Seeds usually black, ovate, smooth or very sparingly tuberculate, margin slightly winged. Fl. and fr. summer and autumn.

Commonly cultivated in China [widely cultivated throughout tropical and temperate regions].

The fruit is eaten as a vegetable.

2. *Luffa acutangula* (Linnaeus) Roxburgh, Hort. Bengal. 70. 1814.

广东丝瓜 guang dong si gua

Cucumis acutangulus Linnaeus, Sp. Pl. 2: 1011. 1753; *Luffa acutangula* var. *subangulata* (Miquel) Cogniaux; *L. subangulata* Miquel.

Stem rather robust, sulcate-angular, pubescent. Tendrils robust, often 3-fid, puberulent. Petiole 8–12 cm; leaf blade suborbicular, 15–20 × 15–20 cm, membranous, often 5–7-lobed; median lobe broadly triangular, lateral lobes smaller, both surfaces puberulent, margin dentate, apex acute or acuminate; sinus subrounded. Male flowers 17–20 in raceme at apex of peduncle; peduncle 10–15 cm; pedicels 1–4 cm, white puberulent; calyx tube campanulate, 5–8 × ca. 10 mm; segments lanceolate, 4–6 × 2–3 mm, densely white pubescent, 1-veined, apex acuminate, slightly reflexed; corolla yellow, rotate; segments obcordate, 15–25 × 10–20 mm, both surfaces subglabrous; stamens 3, free; filaments 4–5 mm; anthers puberulent. Female flowers solitary; ovary terete, longitudinally 8–10-angled; style short; stigmas expanded, 2-lobed. Fruit cylindrical or clavate-oblong, 8–10-angled, 15–40 × 6–10 cm, glabrous. Seeds black, ovoid, 11–12 × 7–8 mm, ca. 1.5 mm thick, margin without wing. Fl. and fr. summer and autumn.

Cultivated in S China [S and SW Asia; also cultivated in tropical regions].

The fruit is eaten as a vegetable.

19. GYMNOPETALUM Arnott, Madras J. Lit. Sci. 12: 52. 1840.

金瓜属 jin gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Scotanthus Naudin; *Tripodanthera* M. Roemer.

Herbs, climbing, slender. Tendrils simple or 2-fid. Leaf blade ovate-cordate, angularly 3–5-lobed. Plants monoecious or dioecious. Male flowers solitary or in a raceme, ebracteate or bracteate; calyx tube elongate, tubular; segments 5, subulate; corolla white or yellow, rotate, 5-partite; segments oblong or obovate; stamens 3, inserted on middle of calyx tube; filaments short, free; anthers connate, one 1-celled, others 2-celled; anther cells conduplicate; rudimentary ovary erect. Female flowers solitary; calyx and corolla as in male flowers; staminodes 3, linear; ovary ovoid or oblong; ovules numerous, horizontal; placentae 3; style filiform. Fruit oblong or subglobose, acute or obtuse at both ends, indehiscent. Seeds obovate or oblong, compressed, marginate.

Four species: S Asia; two species in China.

- 1a. Leaf blade membranous, both surfaces slightly setose, 5-angular or 3–5-lobed or -partite, apex acuminate, margin dentate; fruit oblong-ovoid, acute at both ends, 10-ribbed 1. *G. chinense*
 1b. Leaf blade papery, both surfaces densely setose and villous, undivided or undulate 3–5-lobed, apex obtuse, margin serrate; fruit subglobose, both ends obtuse, without ribs 2. *G. scabrum*

1. *Gymnopetalum chinense* (Loureiro) Merrill, Philipp. J. Sci. 15: 256. 1919.

金瓜 jin gua

Euonymus chinensis Loureiro, Fl. Cochinch. 1: 156. 1790; *Bryonia cochinchinensis* Loureiro; *Gymnopetalum cochinchinense* (Loureiro) Kurz; *G. heterophyllum* Kurz; *G. quinquelobatum* Merrill; *G. quinquelobum* Miquel; *Melothria touchanensis* H. Léveillé; *Momordica tubiflora* Roxburgh; *Scotanthus tubi-*

florus (Roxburgh) Naudin, nom. superfl.; *Tripodanthera cochinchinensis* (Loureiro) M. Roemer.

Plants perennial. Stem and branches slender, hispid or villous, glabrescent. Petiole 2–4 cm; leaf blade ovate-cordate, 4–8 × 4–8 cm, membranous, 5-angular or 3–5-lobed; middle lobe larger, triangular, both surfaces scabrous, base cordate, apex acuminate. Plants monoecious. Male flowers solitary, or 3–8 in a raceme; peduncle slender, 10–15 cm; bracts leaflike, 1–2.5 cm, yellow-brown villous, 3-lobed; calyx tube tubular,

elongate, ca. 2 cm; segments linear, ca. 7 mm; corolla white; segments oblong-ovate, 15–20 × 10–12 mm, ± villous; filaments ca. 0.5 mm; anthers ca. 7 mm. Female flowers solitary; pedicels 1–4 cm; ovary oblong, 10–12 × ca. 5 mm, yellow-brown villous, acute at both ends; style 5–8 mm; stigmas 3. Fruit orange, oblong-ovoid, 4–5 cm, smooth, 10-ribbed, acute at both ends. Seeds oblong, ca. 7 × 3–3.5 mm, both ends obtuse. Fl. Jul–Sep, fr. Sep–Dec.

Forests and thickets on mountain slopes; 400–900 m. Guangdong, Guangxi, Hainan, Yunnan [Bhutan, India, Indonesia, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam].

2. *Gymnopetalum scabrum* (Loureiro) W. J. de Wilde & Duyfjes, *Reinwardtia* 12: 268. 2008.

风瓜 feng gua

Trichosanthes scabra Loureiro, Fl. Cochinch. 2: 589. 1790; *Cucumis integrifolius* Roxburgh; *Gymnopetalum integrifolium* (Roxburgh) Kurz; *G. integrifolium* var. *penicaudii* (Gagnepain) W. J. de Wilde & Duyfjes; *G. leucostictum* Miquel; *G. monoicum* Gagnepain; *G. monoicum* var. *incisum* Gagnepain; *G. penicaudii* Gagnepain; *G. scabrum* var. *penicaudii* (Gagnepain)

W. J. de Wilde & Duyfjes; *Trichosanthes integrifolia* (Roxburgh) Kurz.

Plants annual. Stem and branches slender, villous. Petiole 1.5–3 cm, densely villous; leaf blade reniform or ovate-cordate, 6–8 × 6–8 cm, papery, undivided or undulate 3–5-lobed; lobes triangular, both surfaces scabrous, setose and villous, base cordate, margin serrate, apex obtuse. Plants monoecious. Male flowers solitary, or in a raceme; peduncle 4–6 cm, densely villous; bracts leaflike, divided, densely yellow-brown villous; calyx tube 1.5–2 cm; segments lanceolate, ca. 8 mm; corolla segments obovate, 18–20 × 10–12 mm; filaments ca. 0.4 mm. Female flowers solitary; pedicels 10–15 mm, densely villous; calyx and corolla as in male flowers; ovary ovoid-globose, ca. 10 mm, villous. Fruit orange-red when mature, subglobose, 2–3 cm in diam., smooth, not ribbed. Seeds narrowly oblong, ca. 9 × 3–3.5 mm, ca. 1.5 mm thick, both surfaces smooth, both ends obtuse. Fl. Jun–Sep, fr. Sep–Nov.

Mountain slopes and herbage; 400–800 m. Guangdong, Guangxi, Guizhou, Hainan, Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].

20. HODGSONIA J. D. Hooker & Thomson, Proc. Linn. Soc. London 2: 257. 1854.

油渣果属 you zha guo shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Climbers, woody, large. Stem and branches stout. Tendrils robust, 2–5-fid. Plants dioecious. Male flowers in a raceme; calyx tube elongate, campanulate; segments short; corolla rotate, 5-partite, lobes connate at base; segments obtuse, apex truncate, very long fimbriate; stamens 3; filaments inconspicuous; anthers connate, linear, one 1-celled, two 2-celled; anther cells conduplicate. Female flowers solitary; calyx and corolla as in male flowers; ovary globose, 1-locular; ovules 12, horizontal; placentae 3, parietal with pairs of ovules attached on each side; style long; stigma 3-lobed; lobes 2-fid, exserted. Fruit large, depressed, 12-grooved. Perfect seeds usually 6, each having a rudimentary or barren seed attached to its side. Seeds large, flat, ellipsoid.

Two species: tropical Asia; one species in China.

1. *Hodgsonia heteroclita* (Roxburgh) J. D. Hooker & Thomson, Proc. Linn. Soc. London 2: 257. 1854.

油渣果 you zha guo

Trichosanthes heteroclita Roxburgh, Fl. Ind., ed. 1832, 3: 705. 1832; *Hodgsonia heteroclita* subsp. *indochinensis* W. J. de Wilde & Duyfjes.

Plants to 20–30 m. Stem and branches glabrous. Petiole robust, 4–8 cm, striate, glabrous; leaf blade 15–24 × 15–24 cm, leathery, both surfaces glabrous, 3–5-lobed, mostly 5-lobed; lobes ovate-oblong, base truncate, apex acuminate. Male pe-

duncle thick, 15–30 cm, striate, glabrous or puberulent; bracts oblong-lanceolate, 5–10 mm, fleshy; pedicels short, thick, glabrous or puberulent; calyx tube yellowish, narrowly tubular, 7–10(–12) cm × 7–9 mm, dilated only at very apex; segments triangular-lanceolate, 2–4 mm; corolla yellow outside, white inside; segments ca. 5 cm, fimbriate fringes up to 15 cm. Female pedicels robust, short; ovary subglobose, 2–2.2 cm in diam. Fruit reddish brown, compressed globose, 10–16 × ca. 20 cm, smooth or shallowly grooved. Seeds oblong, ca. 7 × 3 mm, mostly compound. Fl. and fr. Jun–Oct.

Thickets, mountain slopes; 300–1500 m. Guangxi, SE Xizang, S Yunnan [Bhutan, Cambodia, India, Laos, Myanmar, Thailand, Vietnam].

21. TRICHOSANTHES Linnaeus, Sp. Pl. 2: 1008. 1753.

栝楼属 gua lou shu

Huang Luqi (黄璐琦), Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Anguina Miller; *Cucumeroides* Gaertner; *Involucraria* Seringe.

Herbs, climbing, annual or perennial. Leaf blade simple, unlobed or palmately 3–7(–9)-lobed, rarely compound and 3–5-foliate, margin usually denticulate. Tendrils usually 2–5-fid, rarely simple. Plants dioecious, rarely monoecious; flowers usually white, rarely pink or red. Male flowers usually in racemes, rarely solitary, sometimes male peduncles in axillary pairs, one 1-flowered, caducous, other bearing a raceme; bracts variable in size and form, rarely absent; calyx tube cylindrical, frequently dilated at apex;

segments 5, entire, serrate, or lacinate; corolla segments 5, usually long fimbriate; stamens 3, inserted on calyx tube; filaments very short, free; anthers connate, two 2-celled, other 1-celled, cells conduplicate. Female flowers solitary, very rarely in racemes; calyx and corolla as in male flowers; ovary inferior, ovoid or fusiform, 1-loculed with 3 parietal placentas; ovules usually many, generally horizontal, half pendulous; style slender; stigmas 3, entire or bifid. Fruit globose, ovoid, or fusiform, fleshy, usually glabrous and smooth, many seeded, indehiscent. Seeds packed in pulp, 1-loculed, oblong or ovate, and compressed, or 3-loculed, turgid, with 2 lateral locules empty.

About 100 species: Asia and N Australia; 33 species (14 endemic, one introduced) in China.

- 1a. Seeds subquadrangular, obovate-triangular, oblong, or 4-angled, 3-loculed, turgid, surrounded by thick ridges.
 - 2a. Seeds 4-angled, with narrow middle ridge, 2 lateral locules broad; leaf blade abaxially glabrous or puberulent on veins 33. *T. tetragonosperma*
- 2b. Seeds subquadrangular, obovate-triangular, or oblong, 2 lateral locules narrow; leaf blade abaxially densely pubescent.
 - 3a. Leaves unlobed or irregularly shortly 3-lobed.
 - 4a. Leaf blade ovate, thinly membranous, unlobed; fruit ovoid, smooth, glabrous 30. *T. baviensis*
 - 4b. Leaf blade broadly cordate, papery, unlobed or shortly 3-lobed; fruit ovoid-oblong or oblong, densely white villous 31. *T. trichocarpa*
 - 3b. Leaves usually 3–7-lobed.
 - 5a. Bracts lanceolate or oblanceolate, ca. 1.6 × 0.5–0.6 cm, margin triangular-dentate; leaves adaxially glabrous or puberulent 29. *T. pilosa*
 - 5b. Bracts linear-lanceolate, 2–3 mm, entire; leaves adaxially tomentose 32. *T. cucumeroides*
- 1b. Seeds elliptic, ovate-elliptic, or oblong, 1-loculed, compressed or turgid.
 - 6a. Plants monoecious or dioecious; male flowers in racemes, bract very small, less than 5 mm; seed margin undulate-dentate.
 - 7a. Plants dioecious; bracts absent or ca. 5 mm; fruit cylindrical, ca. 20 × 7 cm 3. *T. dafangensis*
 - 7b. Plants monoecious; bracts 1–3 mm or very small or absent; fruit cylindrical and 100–200 cm, or ovoid-oblong and 5–7 cm.
 - 8a. Bracts 1–3 mm; fruit cylindrical, 100–200 × 3–4 cm; leaf lobes obovate 1. *T. anguina*
 - 8b. Bracts absent or very small; fruit ovoid-oblong, 5–7 × 2.5–3.5 cm; leaf lobes rhombic or triangular 2. *T. cucumerina*
 - 6b. Plants dioecious; male flowers solitary or in racemes or rarely in a panicle; bracts 1–6.5 cm or rarely ca. 5 mm; seed margin crenellate.
 - 9a. Leaves simple, leaf blade smooth on both surfaces; bract in male flower spreading, margin entire or sinuate-dentate.
 - 10a. Male racemes densely villous.
 - 11a. Leaves leathery, unlobed, leaf blade pubescent on veins 13. *T. reticulineris*
 - 11b. Leaves papery, unlobed or 3–5-lobed.
 - 12a. Leaves unlobed; seeds subovate, 10–13 × 7–8 mm, margin undulate 11. *T. kerrii*
 - 12b. Leaves 3–5-lobed or deeply lobed.
 - 13a. Leaf blade abaxially densely white sericeous; male flowers solitary, densely white sericeous 12. *T. sericeifolia*
 - 13b. Leaf blade abaxially densely brownish villous; male raceme densely brownish villous 20. *T. villosa*
 - 10b. Male racemes slightly hairy or villous, one peduncle 1-flowered, other bearing a raceme.
 - 14a. Leaves ovate or ovate-oblong, subleathery or leathery, unlobed or rarely 3-lobed.
 - 15a. Leaf blade papery, base cordate; fruit oblong, 7–10 × 6–7 cm 10. *T. homophylla*
 - 15b. Leaf blade subleathery or leathery.
 - 16a. Leaf blade subleathery, unlobed, base rounded; fruit globose, ca. 7 cm in diam. 8. *T. smilacifolia*
 - 16b. Leaf blade leathery, unlobed or shortly to deeply 2- or 3-lobed, base truncate; fruit oblong, 12–18 × 5–10 cm 9. *T. truncata*
 - 14b. Leaves ovate-cordate or orbicular-cordate, papery, 3–9-lobed to middle or nearly to base.
 - 17a. Male flowers solitary, smaller than 3 cm in diam.; calyx tube narrowly campanulate 7. *T. hylonoma*
 - 17b. Male flowers in raceme; flowers larger than 3 cm in diam.; calyx tube narrowly funnelliform or cylindrical.
 - 18a. Leaves usually 3–5(–7)-lobed.
 - 19a. Bracts in male flowers ca. 3 cm, margin entire; calyx tube funnelliform, ca. 3 cm, segments linear-lanceolate, 10–15 × 1.5–2.5 mm; leaves ovate-cordate 4. *T. jinggangshanica*

- 19b. Bracts in male flowers less than 2.5 cm, margin sinuate-dentate; calyx tube cylindrical, dilated at apex, 20–40 × ca. 10 mm; leaves suborbicular 5. *T. kirilowii*
- 18b. Leaves deeply 3–7-lobed usually up to base.
- 20a. Leaf lobes rhombic; fruiting peduncle 12–16.5 cm 6. *T. mianyangensis*
- 20b. Leaf lobes linear-lanceolate or oblanceolate; fruiting peduncle 4.5–8 cm 14. *T. rosthornii*
- 9b. Leaves simple or 3–5-foliolate; leaf blade white punctate; bracts large, conspicuous, margin dentate.
- 21a. Leaves 3–5-foliolate; bracts rhombic-lanceolate.
- 22a. Leaflets remotely denticulate at margin 27. *T. pedata*
- 22b. Leaflets entire at margin 28. *T. quinquefolia*
- 21b. Leaves simple; bracts broadly ovate or oblong.
- 23a. Flowers red, pale red, or purple.
- 24a. Seeds ovoid, turgid 22. *T. dunniana*
- 24b. Seeds oblong or oblong-ovate, compressed.
- 25a. Seeds oblong, truncate at both ends, ca. 18 mm; flowers purple; calyx tube ca. 2.5 cm, segments linear; fruit orange-yellow 25. *T. rugatisemina*
- 25b. Seeds oblong-ovate, 10–15 mm; flowers pale red.
- 26a. Leaf blade deeply (3–)5(–7)-lobed; calyx tube 4–6 cm, segments ovate-lanceolate, denticulate; fruit red 23. *T. rubriflos*
- 26b. Leaf blade shortly 5–7-lobed or lobed to middle; calyx tube ca. 4 cm, segments narrowly lanceolate, entire; fruit orange-red 24. *T. subrosea*
- 23b. Flowers white.
- 27a. Bracts entire.
- 28a. Bracts ovate, 3.5–4.3 × ca. 2.5 cm, with 2 rows of brownish puncta beside main vein; calyx segments 2–3 cm, margin sharply 2- or 3-lobed; seeds triangular-ovate; leaves membranous, abaxially glabrous, adaxially punctate, petiole 5–11 cm 18. *T. quinquangulata*
- 28b. Bracts oblong, ca. 4 × 1–1.5 cm; calyx segments ca. 1 cm, entire; seeds subquadrangular; leaves papery, hirsute, petiole 14–17 cm 19. *T. cordata*
- 27b. Bract margin dentate or lacerate.
- 29a. Leaves leathery.
- 30a. Bracts suborbicular, margin lacerate; calyx segments narrowly ovate, margin lacinate; leaves suborbicular 17. *T. lepiniana*
- 30b. Bracts obovate-oblong, margin dentate; calyx segments narrowly lanceolate, margin dentate; leaves ovate-cordate 26. *T. tricuspidata*
- 29b. Leaves membranous or papery.
- 31a. Leaves papery 21. *T. laceribractea*
- 31b. Leaves membranous.
- 32a. Leaf blade suborbicular, deeply palmately 5–7-lobed; bract margin crenulate; calyx segments ca. 15 mm, entire 15. *T. wallichiana*
- 32b. Leaf blade orbicular-cordate or broadly ovate-cordate, unlobed or irregularly 2- or 3(–5)-lobed; bract margin lobulate with linear-lanceolate lobes; calyx segments ca. 10 mm, entire or serrate 16. *T. fissibractea*

1. *Trichosanthes anguina* Linnaeus, Sp. Pl. 2: 1008. 1753.

蛇瓜 she gua

Trichosanthes cucumerina Linnaeus var. *anguina* (Linnaeus) Haines.

Plants annual. Stems slender, branched, angular, puberulent. Petiole 3–7 cm; leaf blade suborbicular or orbicular-reniform, 8–16 × 6–18 cm, membranous, ± deeply 5(rarely 3–7)-lobed; lobes usually obovate, abaxially densely puberulent, adaxially subglabrous, margin finely denticulate. Plant monoecious. Male raceme usually 8–15-flowered; peduncle 10–18 cm, puberulent; pedicel erect, 5–12 cm, minutely spreading bracteate, bracts 3(–5) mm; calyx tube subcylindric, slightly dilated at apex, 2.5–3 × 4–5 mm, puberulent; segments re-

flexed, ca. 2 mm. Female flowers solitary; peduncle up to 1 cm; ovary narrowly fusiform, ± villous. Fruit very long, cylindrical, 100–200 × 3–4 cm, smooth, sometimes contorted. Seed oblong, 11–17 × 8–10 mm, finely rugulose, margin undulate. Fl. and fr. summer–autumn.

Cultivated in China [cultivated throughout the tropics].

The fruit is eaten as vegetable. The roots and seeds are used medicinally for treating diarrhea.

One of us (Jeffrey) treats this taxon as *Trichosanthes cucumerina* var. *anguina*.

2. *Trichosanthes cucumerina* Linnaeus, Sp. Pl. 2: 1008. 1753.

瓜叶栝楼 gua ye gua lou

Trichosanthes brevibracteata Kundu; *T. pachyrrhachis* Kundu.

Plants annual. Stems slender, profusely branched, ± pubescent. Leaf blade reniform or broadly ovate, (5–)7–10 × 8–11 cm, membranous, ± deeply 5–7-lobed; lobes triangular or rhombic. Plants monoecious. Male peduncles in pairs, earlier 1-flowered, later bearing a raceme; raceme few flowered; peduncle slender, 15–20 cm, puberulent; pedicel erect, 0.5–1.5 cm, puberulent; bracts absent or very small; calyx tube somewhat dilated at apex, 15–16 mm. Female flowers solitary or sometimes replacing earlier male flower; ovary oblong. Fruit ovoid-oblong, 5–7 × 2.5–3.5 cm, with 7–10 seeds. Seeds ovate-oblong, 9–12 × 5–6 mm, compressed, rugulose, margin thick with toothed projections from both surfaces. Fl and fr. autumn. $2n = 22$.

Forests or thickets along valleys, thickets on mountain slopes; 400–1600 m. Guangxi, S Yunnan [Bangladesh, India, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Sri Lanka; N Australia].

The roots, fruit, and seeds are used medicinally.

One of us (Jeffrey) treats this taxon as *Trichosanthes cucumerina* var. *cucumerina*.

3. *Trichosanthes dafangensis* N. G. Ye & S. J. Li, Acta Phytotax. Sin. 27: 153. 1989.

大方油栝楼 da fang you gua lou

Leaf blade abaxially pale green, adaxially deep green, cordate, 10–22 × 8–20 cm, membranous, ± deeply palmately 5–7-lobed; lobes elliptic-obovate, puberulent, margin distantly denticulate, apex acuminate. Male flowers solitary, fascicled, or in short racemes; peduncle ca. 5 cm; bracts absent or ca. 5 mm; calyx tube funnellform, ca. 1 cm; segments linear-lanceolate, ca. 1 cm; pistillodes 3, claviform, ca. 5 mm. Female flowers solitary; pedicel ca. 2 cm; calyx tube shortly tubular; ovary ca. 2.5 cm, villous; staminodes 3. Fruit cylindrical, ca. 20 × 7 cm, with ca. 80 seeds. Seeds ovate, ca. 1 cm, compressed, verrucose, margin sulcate, crenellate.

• Mountain slopes, thickets; 1000–1800 m. Guizhou.

4. *Trichosanthes jinggangshanica* C. H. Yueh, Acta Phytotax. Sin. 18: 342. 1980.

井冈栝楼 jing gang gua lou

Stems slender, angular, puberulent. Petiole 3–8 cm, villous; leaf blade abaxially pale green, adaxially deep green, narrowly ovate-cordate to broadly ovate-cordate, 14–20 × 10–15 cm, papery, usually ± 3–5-lobed, rarely unlobed; middle lobe ovate-triangular or ovate-lanceolate, abaxially glabrous or villous on veins, adaxially villous. Male peduncles in axillary pairs, one 1-flowered, other bearing a raceme; peduncle 4–11 cm, villous; bracts ovate or orbicular-cordate, 2–2.5 × 1.5–4 cm, base rounded, margin entire, apex acuminate, shortly stipitate; calyx tube narrowly funnellform, ca. 3 cm; segments linear-lanceolate, 10–15 × 1.5–2.5 mm. Female flowers solitary; pedicel ca. 1.5 cm; calyx tube ellipsoidal, ca. 2 cm; ovary oblong. Fruiting peduncle ca. 6 cm; fruit oblong, 8–10 cm, smooth. Fl. Mar–Jul, fr. Nov.

• Forests, thickets; 700–1500 m. SW Jiangxi.

Locally, the roots and fruit are used medicinally as “tian hua fen” and “gua lou.”

5. *Trichosanthes kirilowii* Maximowicz, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 9 [Prim. Fl. Amur.]: 482. 1859.

栝楼 gua lou

Trichosanthes obtusiloba C. Y. Wu ex C. Y. Cheng & C. H. Yueh.

Petiole 2–6 cm, striate, villous; leaf blade adaxially deep green, suborbicular, 5–20 × 5–20 cm, papery, usually 3–5(–7)-lobed up to middle, rarely deeply so (nearly up to base) or unlobed; lobes rhombic-obovate or oblong, adaxially rough, margin sometimes remotely shortly lobed, apex obtuse. Male raceme solitary or with solitary flowers in axillary pairs; peduncle 10–20 cm, robust, grooved, slightly hairy, 5–8-flowered at apex; bracts obovate or broadly ovate, 1.5–2.5(–3) × 1–2 cm, margin sinuate-dentate, shortly puberulent, stipitate; calyx tube cylindrical, dilated at apex, 2–4 × ca. 1 cm; segments lanceolate, 10–15 × 3–5 mm, entire. Female flowers solitary; pedicel ca. 7.5 cm, shortly puberulent; calyx tube cylindrical, ca. 2.5 × 1.2 cm; ovary oblong, 1.2–2 × ca. 1 cm. Fruiting peduncle 4–11 cm; fruit brown-yellow or orange-yellow, oblong or globose, 7–10.5 cm. Seeds sandy beige, oblong-ovate, 11–16 × 7–12 mm, marginate. Fl. May–Aug, fr. Aug–Oct. $2n = 88$.

Open forests, shrublands, grasslands and fields beside villages; 200–1800 m. Gansu, Hebei, Henan, Jiangsu, Jiangxi, Shandong, Shanxi, Zhejiang [Japan, Korea].

This plant is the source of “tian hua fen” (the roots), “gua lou zi” (the seeds), and “gua lou pi” (the fruit rind), which are official source drugs in traditional Chinese medicine.

6. *Trichosanthes mianyangensis* C. H. Yueh & R. G. Liao, Bull. Bot. Res., Harbin 2(1): 115. 1992.

绵阳栝楼 mian yang gua lou

Stems densely shortly hairy and sparsely villous. Petiole 6–9 cm, punctate, puberulent; leaf blade orbicular-cordate, 11–17 × 10–15 cm, papery, shortly 3–5-lobed or 7–9-lobed up to middle; lobes rhombic, both surfaces shortly puberulent, margin irregularly crenate-dentate, apex acuminate. Female flowers solitary; pedicel 5–7 cm, slightly villous; calyx segments linear, 10–12 × 1–1.5 mm, entire; ovary oblong, 15–20 × 8–9 mm. Fruiting peduncle 12–16.5 cm; fruit oblong, 10.5–11.5 × ca. 8.5 cm. Seeds up to 1.9 cm, smooth. Fl. May–Aug, fr. Aug–Oct. $2n = 88^*$.

• ?About 1000 m. Hubei, Sichuan.

7. *Trichosanthes hylonoma* Handel-Mazzetti, Symb. Sin. 7: 1066. 1936.

湘桂栝楼 xiang gui gua lou

Trichosanthes leishanensis C. Y. Cheng & C. H. Yueh; *T. parviflora* C. Y. Wu ex S. K. Chen.

Stems slender, with white lenticels. Petiole 3–9 cm; leaf blade broadly ovate or broadly cordate, 11–17 × 10–16 cm, papery, usually 3–5-lobed up to middle, sometimes irregularly 5–9-lobed; lobes oblong or rhombic-ovate, glabrous, margin re-

motely denticulate, apex acuminate. Male flowers solitary; pedicel setiform, 4–7 cm; calyx tube narrowly campanulate, 1.2–1.5 × ca. 0.4 cm, glabrous or remotely villous; segments erect or reflexed, linear, 6–7 mm. Female flowers unknown. Fruit orange-red, ovoid-oblong, ca. 9 × 5–6 cm, attenuate at both ends. Seeds brown, oblong, 1–1.3 × ca. 0.9 cm, base rounded, margin crenellate, apex truncate. Fl. May–Jun, fr. Sep–Oct.

• Thickets along valleys; 800–1000 m. NE Guangxi, SE Guizhou, S Hunan.

8. *Trichosanthes smilacifolia* C. Y. Wu ex C. H. Yueh & C. Y. Cheng, *Acta Phytotax. Sin.* 18: 347. 1980.

菝葜叶栝楼 ba qia ye gua lou

Petiole 2–3 cm; leaf blade abaxially pale green, adaxially deep green, ovate-oblong, 9–13 × 7–9 cm, subleathery, unlobed, both surfaces smooth, base rounded, margin reflexed, denticulate. Male flowers paniculate; peduncle 8–15 cm, slightly puberulent; bracts ovate-orbicular, ca. 1 × 0.8 cm, margin triangular-bidentate to middle, apex acuminate; calyx tube cylindrical, ca. 2 × 0.5 cm; segments ca. 7 mm, long acuminate. Female flowers unknown. Fruiting peduncle ca. 3 cm; fruit orange-yellow, globose, ca. 7 cm, smooth. Seeds brown, broadly oblong to suborbicular, ca. 1.8 × 1.5 cm, both surfaces densely rugose, margin undulate-crenate. Fl. autumn, fr. Nov–Dec.

• Evergreen broad-leaved forests; 600–1500 m. SE Xizang, S and SE Yunnan.

9. *Trichosanthes truncata* C. B. Clarke in J. D. Hooker, *Fl. Brit. India* 2: 608. 1879.

大子栝楼 da zi gua lou

Trichosanthes crispisepala C. Y. Wu ex S. K. Chen; *T. ovata* Cogniaux.

Stems robust, angular-striate, glabrous and punctate. Petiole 1.5–4(–6.5) cm; leaf blade ovate, narrowly ovate, or ovate-oblong, 7–12 × 4.5–9 cm, leathery, unlobed or shortly to deeply 2- or 3-lobed, both surfaces glabrous, base rounded or truncate, margin usually entire or rarely distantly denticulate, apex acuminate. Male raceme 8–20-flowered; peduncle 7–15 cm, striate, flowering at apex; bracts ovate, shortly stipitate, margin entire or more usually with a few teeth; calyx tube dilated at apex, 1.8–4 × ca. 1 cm, shortly tomentose; segments linear-lanceolate, 20–30 × 1–1.5 mm, entire. Female flowers solitary; ovary oblong, 1–2 × ca. 0.8 cm. Fruiting peduncle 4–5 cm; fruit oblong, 12–18 × 5–10 cm, glabrous. Seeds brown, oblong-obovate, 10–23 × 5–20 mm, base truncate, apex obtuse. Fl. Apr–May, fr. Jul–Aug. $2n = 22$.

Montane forests, thickets; 300–1000 m. Guangdong, Guangxi, S Yunnan [Bangladesh, Bhutan, India, Thailand, Vietnam].

10. *Trichosanthes homophylla* Hayata, *Icon. Pl. Formosan.* 10: 8. 1921.

芋叶栝楼 yu ye gua lou

Trichosanthes mushaensis Hayata.

Stems slender. Petiole 2–3 cm, hairy; leaf blade triangular-cordate, 6–10 × 4–6 cm, papery, unlobed, margin dentate, adaxially

scabrous, apex acuminate or acute. Male raceme 5–10-flowered; peduncle 8–9 cm; pedicel ca. 3 mm; bracts obovate, 1–1.5 × 0.7–1.1 cm, margin irregularly crenate-dentate; calyx tube cylindrical, dilated at apex, ca. 3 × 0.8 mm; segments linear, ca. 6 mm. Female flowers unknown. Fruit oblong, 7–10 × 6–7 cm. Seeds elliptic, flattened. Fl. Aug.

Taiwan [Japan].

11. *Trichosanthes kerrii* Craib, *Bull. Misc. Inform. Kew* 1914: 7. 1914.

长果栝楼 chang guo gua lou

Trichosanthes tomentosa Chakravarty.

Stems robust, brownish hirsute. Petiole 2–5 cm, tomentose; leaf blade adaxially deep green, ovate-cordate, 10–20 × 7–17 cm, papery, unlobed, abaxially densely felty-tomentose, adaxially sparsely and shortly hirsute, margin entire or remotely and obscurely serrate, apex long acuminate. Male peduncle ca. 2.5 cm; pedicel ca. 8 mm, tomentose; bracts linear, ca. 1.5 × 0.25 cm; calyx tube cylindrical, 2–3.5 × ca. 0.8 cm; segments oblanceolate, ca. 1.8 × 0.45 cm, tomentose, apex acute. Female peduncle robust, 2.5–3.5 cm, tomentose, 1-flowered; calyx tube cylindrical, ca. 1 cm, tomentose; segments narrowly triangular, ca. 1 cm, apex long acuminate; ovary oblong, 1.5–2 × ca. 1 cm, densely and softly tomentose. Fruiting peduncle robust, 2.5–5.5 cm, tomentose; fruit oblong, 8–10 × 4.5–6.5 cm. Seeds subovate, compressed, 10–13 × 7–8 mm, 1-veined at middle, base rounded or truncate, margin undulate and serrate, apex obtuse.

Forests along valleys or beside streams; 700–1900 m. SW Guangxi, SW Yunnan [India, Laos, Thailand, N Vietnam].

12. *Trichosanthes sericeifolia* C. Y. Cheng & C. H. Yueh, *Acta Phytotax. Sin.* 18: 346. 1980.

丝毛栝楼 si mao gua lou

Stems angular-striate, sparsely sericeous. Petiole slender, 3.5–7 cm, white sericeous; leaf blade adaxially deep green, ovate-cordate, 8–17 × 6–10 cm, papery, deeply 3–5-lobed; middle lobes narrowly lanceolate or ovate-lanceolate, abaxially densely white sericeous, adaxially sparsely sericeous, margin denticulate, apex acuminate. Male flowers solitary; pedicel and flowering bud densely white sericeous; mature flowers unknown. Female flowers solitary; pedicel 1.5–2.5 cm, densely white sericeous; calyx tube tubular, ca. 1 × 0.4 cm, densely white sericeous; segments linear-lanceolate, ca. 5 × 2 mm, entire; ovary oblong, ca. 1.5 × 0.7 mm, densely white sericeous. Fruit unknown. Fl. Apr–Jul.

• Thickets on mountain slopes or beside rivers; 700–1500 m. W Guangxi, SW Guizhou, SE Yunnan.

13. *Trichosanthes reticulineris* C. Y. Wu ex S. K. Chen, *Bull. Bot. Res., Harbin* 5(2): 114. 1985.

两广栝楼 liang guang gua lou

Stems moderately robust, grooved, striate, glabrous or pubescent at nodes. Petiole 4–6 cm, striate, densely pubescent; leaf blade ovate to broadly ovate-cordate, 1.5–2 × 1–1.8 cm, leathery, unlobed, both surfaces pubescent on veins, margin re-

motely denticulate, apex acuminate. Male flowers in racemes or narrow panicles, 5–6 cm; pedicels ca. 6 mm, densely chocolate-colored pubescent; bracts lanceolate, ca. 1.5 cm, densely chocolate-colored villous; calyx tube campanulate, ca. 1.5×1.5 cm, densely villous; segments triangular-ovate, ca. 1×0.6 cm. Female flowers solitary; pedicel stout, ca. 2 cm, densely villous; calyx tube ca. 1×0.7 cm; segments linear, ca. 1.2×0.2 – 0.3 cm, entire, densely villous; ovary ovoid, ca. 2.5×2 cm. Fruiting peduncle ca. 2.5 cm, stout, densely villous; fruit ovoid, ca. 6×5 cm, densely villous. Seeds pale brown, ovate, compressed, ca. 1.1×0.7 cm, base rounded, apex obtuse. Fl. May–Jun, fr. Jul–Aug.

- Forests of low elevations; 200–400 m. Guangdong, Guangxi.

14. *Trichosanthes rosthornii* Harms in Engler, Bot. Jahrb. Syst. 29: 603. 1901.

中华栝楼 *zhong hua gua lou*

Stems grooved, sparsely puberulent. Petiole 2.5–4 cm, striate, sparsely puberulent; leaf blade abaxially pale green, adaxially deep green, broadly ovate to suborbicular, (6–)8–12(–20) \times (5–)7–11(–16) cm, papery, deeply 3–7-lobed, usually deeply 5-lobed nearly to base; lobes linear-lanceolate, lanceolate, or oblanceolate, abaxially glabrous, adaxially shortly hairy, margin denticulate, apex acuminate. Male raceme solitary or with one 1-flowered peduncle in axillary pairs; peduncle 8–10 cm; pedicels up to ca. 7 cm; bracts rhombic-obovate, 6–14 \times 5–11 mm, puberulent, attenuate at base, margin irregularly sinuate-dentate; calyx tube narrowly cylindrical, dilated at apex, 2.5–3(–3.5) cm. Female flowers solitary; pedicel 5–8 cm, puberulent; calyx tube cylindrical, 20–25 \times 5–8 mm; ovary oblong, 10–20 \times 5–10 mm, puberulent. Fruiting peduncle 4.5–8 cm; fruit orange-yellow, globose or oblong, 8–16 \times 7–10 cm, smooth, glabrous. Seeds brown, ovate-oblong, compressed, 1.5–2.2 \times 0.8–1.4 cm, marginate. Fl. Jun–Aug, fr. Aug–Oct.

• Dense forests along valleys, thickets or grasslands on mountain slopes; 400–1900 m. S Anhui, N Guangdong, Guangxi, Guizhou, NE Jiangxi, Sichuan, Yunnan.

The roots and fruit are used medicinally as “tian hua fen” and “gua lou.”

- 1a. Leaf blade deeply 5-lobed 14d. var. *huangshanensis*
 1b. Leaf blade deeply 3–7-lobed.
 2a. Tendrils 4–6-fid 14c. var. *multicirrata*
 2b. Tendrils 2- or 3-fid.
 3a. Fruit 8–11 \times 7–10 cm; seeds
 1.5–1.8 \times 0.8–0.9 cm 14a. var. *rosthornii*
 3b. Fruit 12–16 \times 6.5–8.5 cm;
 seeds 2–2.2 \times 1.2–1.4 cm 14b. var. *scabrella*

14a. *Trichosanthes rosthornii* var. *rosthornii*

中华栝楼(原变种) *zhong hua gua lou (yuan bian zhong)*

Trichosanthes crenulata C. Y. Cheng & C. H. Yueh; *T. guizhouensis* C. Y. Cheng & C. H. Yueh; *T. stylopodifera* C. Y. Cheng & C. H. Yueh; *T. uniflora* K. S. Hao.

Leaf blade deeply 3–7-lobed. Fruit 8–11 \times 7–10 cm. Seeds 1.5–1.8 \times 0.8–0.9 cm.

- Guizhou, E Sichuan, Yunnan.

14b. *Trichosanthes rosthornii* var. *scabrella* (C. H. Yueh & D. F. Gao) S. K. Chen, Fl. Reipubl. Popularis Sin. 73(1): 244. 1986.

糙籽栝楼 *cao zi gua lou*

Trichosanthes scabrella C. H. Yueh & D. F. Gao in C. H. Yueh & C. Y. Cheng, Acta Phytotax. Sin. 18: 345. 1980.

Fruit large, 12–16 \times 6.5–8.5 cm. Seeds 20–22 \times 12–14 mm, both surfaces slightly rugose.

- W Sichuan.

14c. *Trichosanthes rosthornii* var. *multicirrata* (C. Y. Cheng & C. H. Yueh) S. K. Chen, Fl. Reipubl. Popularis Sin. 73(1): 244. 1986.

多卷须栝楼 *duo juan xu gua lou*

Trichosanthes multicirrata C. Y. Cheng & C. H. Yueh, Acta Phytotax. Sin. 12: 430. 1974; *T. damiaoshanensis* C. Y. Cheng & C. H. Yueh.

Leaf blade thick; lobes broad. Tendrils 4–6-fid, villous. Calyx tube ca. 2×1.3 cm, densely pubescent.

• Forests, thickets, grasslands; 600–1500 m. N Guangdong, Guangxi, Guizhou, Sichuan.

14d. *Trichosanthes rosthornii* var. *huangshanensis* S. K. Chen, Bull. Bot. Res., Harbin 5(2): 116. 1985.

黄山栝楼 *huang shan gua lou*

Leaf blade deeply 5-lobed near to base; lobes further dissected; lobules 1 or 2, linear.

- S Anhui, NE Jiangxi.

15. *Trichosanthes wallichiana* (Seringe) Wight, Madras J. Lit. Sci. 12: 52. 1840.

薄叶栝楼 *bao ye gua lou*

Involucraria wallichiana Seringe, Mém. Soc. Phys. Genève 3(1): 25. 1825; *Trichosanthes bracteata* (Lamarck) Voigt var. *scotanthus* (C. B. Clarke) Handel-Mazzetti; *T. grandibracteata* Kurz; *T. palmata* Roxburgh var. *scotanthus* C. B. Clarke.

Stems branched, angular-grooved, glabrous. Petiole robust, 6–10 cm, striate, puberulent; leaf blade suborbicular, 18–20 \times 18–20 cm, membranous or papery, deeply (nearly to base) palmately 5–7-lobed; lobes oblong, abaxially glabrous or slightly hairy on veins, adaxially glandular punctate and very rough, margin denticulate or irregularly crenate-dentate, apex acute or acuminate. Male raceme 6–15-flowered at apex; peduncle stout, 10–20(–30) cm, grooved, puberulent; bracts broadly ovate, 2–3 cm, crenulate, slightly puberulent, multiveined; calyx tube ca. 5×1 cm; segments ca. 1.5×0.4 cm, entire. Female flowers solitary; ovary ovoid-oblong, glabrous. Fruit ovoid or oblong, 5–10 \times ca. 7 cm, apex acute or subacute. Seeds brown, oblong, 1.5–1.8 \times 0.8–1.2 cm. Fl. Jul–Sep, fr. Oct–Nov.

Forests along valleys; 900–2200 m. Xizang, S Yunnan [Bhutan, India, Nepal].

16. *Trichosanthes fissibracteata* C. Y. Wu ex C. Y. Cheng & C. H. Yueh, *Acta Phytotax. Sin.* 12: 438. 1974.

裂苞栝楼 lie bao gua lou

Petiole 6–10 cm, glabrous, striate; leaf blade adaxially pale green, orbicular-cordate or broadly ovate-cordate, 11–25 × 9.5–20 cm, membranous to papery, unlobed or irregularly shortly 2- or 3-lobed or deeply 2- or 3-lobed, rarely 5-lobed; lobes broadly triangular-ovate, rarely ovate-oblong, adaxially glabrous, with large disk glands at base, margin subentire or remotely minutely denticulate, apex acuminate. Male raceme 9–20 cm; peduncle glabrous or very shortly puberulent, 2–5-flowered at apex; bracts ovate, 2.5–3 × 1.5–2 cm, cucullate, margin lobulate with 1.5–2 cm linear-lanceolate lobes; calyx tube ca. 3.5 cm; segments lanceolate, ca. 10 × 3–4 mm, entire or serrate. Female flowers unknown. Fruit subglobose, ca. 6 cm. Seeds brown, oblong, 1.1–1.5 × 0.5–0.6 cm, base retuse, apex truncate or obtuse. Fl. Aug–Sep, fr. Nov.

• Dense forests along valleys, thickets on mountain slopes; 1100–1300(–1500) m. SW Guangxi, SE Yunnan.

17. *Trichosanthes lepiniana* (Naudin) Cogniaux in A. Candolle & C. Candolle, *Monogr. Phan.* 3: 377. 1881.

马干铃栝楼 ma gan ling gua lou

Involucraria lepiniana Naudin in Huber, *Cat.* 11. 1868.

Stem robust, branched, glabrous. Petiole 4–7 cm, striate, glabrous or glandular-punctate; leaf blade adaxially deep green, suborbicular, 9–17(–20) cm, shortly 3–5-lobed up to middle, adaxially rough; lobe margin denticulate, apex acute or shortly acuminate. Male raceme 13–17 cm; peduncle robust, striate, glabrous; pedicels ca. 5 mm; bracts suborbicular, ca. 4 cm, cucullate, margin lacerate; calyx tube attenuate from apex toward base, ca. 7 cm, puberulent; segments narrowly ovate, ca. 1.5 × 0.4 cm, margin lacinate. Female flowers solitary; pedicel 2.5–3 cm, glabrous, striate; bracts ovate, ca. 1.5 × 1 cm, entire; calyx tube ca. 4 cm; ovary ovoid, ca. 1.5 × 1 cm, glabrous. Fruit red, ovoid, ca. 9 cm in diam., smooth. Seeds brown, broadly ovate, ca. 1.5 × 0.8–1 cm, base obtuse or attenuate, apex truncate. Fl. May–Jul, fr. Aug–Nov.

Evergreen broad-leaved forests along valleys, open forests and thickets on mountain slopes; 700–1200 m. SE Xizang, S and SE Yunnan [Bhutan, India].

De Wilde and Duyfjes (in Santisuk & Larsen, *Fl. Thailand* 9(4): 520. 2008) considered the Chinese material here treated as *Trichosanthes lepiniana* to represent a distinct species, *T. inthanonensis* Duyfjes & Pruesapan (*Thai Forest Bull., Bot.* 32: 86. 2004, type from N Thailand; the type of *T. lepiniana* is from peninsular India).

18. *Trichosanthes quinquangulata* A. Gray, *U.S. Expl. Exped., Phan.* 645. 1854.

五角栝楼 wu jiao gua lou

Petiole 5–11 cm, striate, punctate; leaf blade adaxially deep green, quinquangular or broadly ovate, 13–22 × 12–20 cm, membranous, shortly 5-lobed or up to middle; lobes broadly triangular or ovate-triangular, abaxially glabrous, adaxially glandular punctate and rough, margin denticulate, apex

long acuminate. Plants monoecious. Male raceme 17–30 cm; peduncle glabrous, striate, 8–10-flowered; bracts ovate, 3.5–4.3 × ca. 2.5 cm, with 2 rows of brownish puncta beside main vein, entire, apex long acuminate; calyx segments linear-lanceolate, 2–3 × 0.2–0.3 cm, margin sharply 2- or 3-lobed, apex long acuminate. Female flowers not seen. Fruiting peduncle 2–3 cm, glabrous; fruit red, globose, 5–7 cm, glabrous. Seeds brown, triangular-ovate, 1–1.2 × 0.4–0.5 cm, base attenuate, apex triangular. Fl. Jun–Oct, fr. Sep–Oct.

Low-elevation thickets, roadsides; 500–900 m. Taiwan, S Yunnan [Indonesia, Malaysia, Myanmar, New Guinea, Philippines, Thailand, Vietnam].

19. *Trichosanthes cordata* Roxburgh, *Fl. Ind.*, ed. 1832, 3: 703. 1832.

心叶栝楼 xin ye gua lou

Involucraria cordata (Roxburgh) M. Roemer; *Trichosanthes microsiphon* Kurz.

Stem robust, angular, grooved, glabrous or sparsely puberulent. Petiole 14–17 cm, striate, sparsely puberulent; leaf blade broadly ovate-cordate, 8–22 × 7–23 cm, papery, unlobed or rarely angular-sublobate, both surfaces scattered shortly hirsute, margin minutely denticulate, apex acute or shortly acuminate. Male raceme 4–8-flowered; peduncle 12–20 cm, stout, striate, sparsely puberulent; pedicels 1–2 mm, thick; bracts oblong, ca. 4 × 1–1.5 cm, entire, shortly hirsute; calyx tube attenuate from apex toward base, ca. 4.5 × 0.7 cm; segments erect or flexuous, linear-lanceolate, ca. 1.5 cm. Female flower solitary; pedicel ca. 1 cm; ovary oblong, slightly puberulent. Fruit red, globose, smooth. Seeds subquadrangular, 1–1.2 × 0.4–0.5 cm. Fl. Jul–Aug, fr. Aug.

Evergreen broad-leaved forests; ca. 1000 m. SE Xizang [Bhutan, India, Laos, Malaysia, Myanmar, Nepal, Singapore].

20. *Trichosanthes villosa* Blume, *Bijdr.* 934. 1826.

密毛栝楼 mi mao gua lou

Stems robust, long, densely brownish villous; petiole 10–12 cm, densely brownish villous; leaf blade adaxially deep green, broadly ovate, 11–18 × 11–17 cm, papery, unlobed or tricuspidate, abaxially densely villous-hirsute, adaxially densely and shortly brownish villous, margin denticulate, apex acuminate. Male raceme 10–20 cm, 15–20-flowered; peduncle densely brownish villous; bracts oblong, 3–5 × 2–4 cm, both surfaces brownish villous, margin irregularly dentate; calyx tube 2.5–3 × 0.6–1.2 cm, densely brownish villous; segments linear-lanceolate, ca. 2 × 0.3–0.4 cm, both surfaces villous, margin entire, apex long acuminate. Female flowers solitary; pedicel ca. 1.5 cm, densely long villous; calyx tube cylindrical, ca. 1.5 × 0.7 cm; ovary oblong, ca. 1.5 × 1 cm, densely villous. Fruit brown-red, subglobose, 8–13 cm. Seeds oblong or obovate-triangular, 1.7–2.8 × 1–1.7 cm, 1-veined at middle, base obtuse, apex truncate. Fl. Dec–next Jul, fr. Sep–Nov.

Thickets or open forests on mountain slopes; 300–1000 m. S and SW Guangxi, S Yunnan [Indonesia, Laos, Malaysia, Philippines, Vietnam].

21. *Trichosanthes laceribractea* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 117. 1911.

长萼栝楼 chang e gua lou

Trichosanthes hupehensis C. Y. Cheng & C. H. Yueh; *T. koshunensis* Hayata; *T. punctata* Hayata; *T. schizostroma* Hayata; *T. shikokiana* Makino; *T. sinopunctata* C. Y. Cheng & C. H. Yueh.

Stems angular, grooved, subglabrous. Petiole 1.5–9 cm, striate, hispidulous or white punctate; leaf blade abaxially pale green, adaxially deep green, suborbicular or broadly ovate, 5–16(–19) × 4–15(–18) cm, papery, 3–7-lobed shortly or nearly to base; lobes triangular, ovate, or rhombic-obovate, abaxially hispidulous on veins, adaxially densely hispidulous or white punctate, margin remotely mucronate-serrate, apex acuminate. Male peduncle robust, 10–23 cm, puberulent or sparsely hispidulous; bracts broadly ovate, 2.5–4 × 2.5–4 cm, cucullate, margin lacerate; calyx tube narrowly tubular, ca. 5 cm; segments erect, ovate, 1–1.3 × ca. 0.7 cm, margin lacinate, apex acuminate. Female flowers solitary; pedicel 1.5–2 cm, puberulent; calyx tube cylindric, ca. 4 × 5 cm; segments linear, 1–1.3 cm, entire; ovary ovoid, ca. 1 × 0.7 cm, smooth. Fruit globose to ovoid-globose, 5–8 cm in diam. Seeds oblong, 1–1.4 × 0.5–0.8 cm, both ends rounded or truncate. Fl. Jul–Aug, fr. Sep–Oct. *2n* = 22*.

• Dense forests along valleys; 200–1100 m. Guangdong, Guangxi, Hubei, Jiangxi, Sichuan, Taiwan.

22. *Trichosanthes dunniana* H. Léveillé, Repert. Spec. Nov. Regni Veg. 10: 148. 1911.

糙点栝楼 cao dian gua lou

Trichosanthes prazeri Kundu; *T. rubriflos* Thorel ex Cayla f. *macroperma* C. Y. Cheng & C. H. Yueh; *T. tridentata* C. Y. Cheng & C. H. Yueh.

Stem moderately robust, grooved, punctate. Petiole slender, 4–5 cm, punctate; leaf blade abaxially pale green, adaxially green, suborbicular, 10–15 cm, papery, deeply palmately 5–7-lobed; lobes elliptic-obovate, abaxially glabrous, glandular punctate on veins, adaxially glandular punctate, narrowed toward base, cuspidate. Male racemes 8–10 cm; peduncle stout, striate, densely pubescent or punctate, 5–10-flowered; bracts brown, broadly ovate, ca. 5 × 4 cm, abaxially punctate, margin deeply serrate; calyx tube ca. 5 cm; segments pale red. Female flowers unknown. Fruit oblong, ca. 8 × 6 cm, smooth, apex acute. Seeds ovoid, turgid, ca. 1.2 × 0.8 cm. Fl. Jul–Sep, fr. Oct–Nov.

Dense forests along valleys or thickets; 900–1900 m. Guangxi, Guizhou, Sichuan, Yunnan [Laos, Myanmar, N Thailand].

23. *Trichosanthes rubriflos* Thorel ex Cayla, Bull. Mus. Natl. Hist. Nat. 14: 170. 1908.

红花栝楼 hong hua gua lou

Trichosanthes majuscula (C. B. Clarke) Kundu; *T. multi-loba* Miquel var. *majuscula* C. B. Clarke; *T. pubera* Blume subsp. *rubriflos* (Thorel ex Cayla) Duyfjes & Pruesapan.

Stems robust, branched, grooved, pubescent. Petiole 5–12(–18) cm, striate, pubescent; leaf blade adaxially deep green, broadly ovate or suborbicular, 7–20 cm, deeply palmately 3–7-lobed; lobes broadly ovate, oblong or lanceolate, abaxially pubescent, adaxially hispidulous or glandular punctate, margin denticulate or irregularly serrate, apex acuminate. Male raceme 10–20 cm; peduncle grooved, puberulent, (6–)11–14-flowered; bracts red, broadly ovate or obovate-rhombic, 2.5–4 × ca. 3 cm, puberulent, margin lacerate; calyx tube red, 4–6 cm; segments linear-lanceolate, 1.2–1.6 × 0.3–0.5 cm, margin entire or rarely denticulate, apex acuminate; corolla red or pale red. Female flowers solitary; pedicel ca. 2 cm, densely pubescent; calyx tube ca. 3 cm; ovary ovoid, ca. 2 × 1 cm. Fruiting peduncle robust, ca. 3 cm, striate, pubescent; fruit red, broadly ovoid or globose, 7–9.5 × 5.5–8 cm, smooth, apex acute. Seeds yellow-brown, oblong, ca. 1.2 × 0.4–0.5 cm, base truncate, apex attenuate. Fl. May–Nov, fr. Aug–Dec.

Dense forests along valleys, open forests or thickets on mountain slopes; (100–)400–1600 m. Guangdong, Guangxi, Guizhou, Xizang, Yunnan [Cambodia, NE India, Laos, Myanmar, Thailand, Vietnam].

24. *Trichosanthes subrosea* C. Y. Cheng & C. H. Yueh, Acta Phytotax. Sin. 18: 349. 1980.

粉花栝楼 fen hua gua lou

Stem glabrous, grooved. Petiole 4–6.5(–8) cm, striate, glabrous; leaf blade abaxially pale green, adaxially deep green, quinquangular-cordate or suborbicular, 11–15 cm, thinly papery, shortly 5–7-lobed or to middle; central lobe triangular or subrhombic, abaxially glabrous, adaxially hispidulous or glandular-punctate, margin triangular-dentate, apex long acute. Male peduncles occasionally in pairs, one early 1-flowered and other bearing a raceme; pedicel ca. 8 cm, striate, glabrous; bract ovate, 2.5–3 cm, cucullate, glabrous, subtire, apex obtuse; calyx segments narrowly lanceolate, 1.5–2 cm, entire; corolla pale red. Female flowers unknown. Fruiting peduncle stout, 2–2.5 cm; fruit orange-red, subglobose, 7–9 × 5–7.5 cm, smooth. Seeds oblong, base truncate, apex triangular. Fl. Jul–Aug, fr. Aug–Sep.

Forests; ca. 1700 m. S Guangxi, SW Yunnan [Myanmar].

25. *Trichosanthes rugatisemina* C. Y. Cheng & C. H. Yueh, Acta Phytotax. Sin. 12: 440. 1974.

皱籽栝楼 zhou zi gua lou

Stem grooved, densely villous. Petiole 3.5–5.5 cm, densely villous; leaf blade suborbicular, 10–15 cm, papery, 3–5-lobed up to middle; lobes ovate or obovate-elliptic, both surfaces pubescent, margin triangular-denticulate, apex acuminate. Male racemes 3–6 cm, densely brown villous, 3–5-flowered at apex; bracts ovate, 2.5–3.5 × 2–3 cm, cucullate, apex acuminate; calyx tube ca. 2.5 cm; segments ovate, ca. 15 mm, margin dentate; corolla red. Female flowers solitary; calyx tube cylindric, ca. 3 cm; segments linear, pubescent; ovary oblong, ca. 1.5 × 0.5 cm. Fruiting peduncle ca. 2 cm; fruit orange-yellow, ovoid, 8–9.5 × 5–6 cm, attenuate at apex. Seeds gray-green, ovate-oblong, ca. 1.5 × 0.7 cm, both ends truncate.

• Thickets. SE and SW Yunnan.

26. *Trichosanthes tricuspidata* Loureiro, Fl. Cochinch. 2: 589. 1790.

三尖栝楼 san jian gua lou

Modecca bracteata Lamarck; *Trichosanthes bracteata* (Lamarck) Voigt.

Stems robust, branched, angular-striate, grooved, glabrous. Petiole ca. 5 cm, striate, glabrous, punctate; leaf blade adaxially deep green, broadly ovate-cordate, 12–13 × 12–13 cm, thinly leathery, shortly 3-lobed; lobes ovate-triangular, abaxially glabrous, adaxially hispidulous or punctate, margin undulate-denticulate, apex acute or shortly acuminate. Male raceme 12–15 cm; peduncle stout, striate and grooved, glabrous; pedicel short; bracts obovate-oblong, ca. 4 × 2–2.5 cm, cucullate, both surfaces white squamose or pubescent, margin dentate, apex obtuse; calyx tube narrowly funnellform, ca. 6 × 1 cm; segments narrowly lanceolate, ca. 1 × 0.3 cm. Female flowers and fruit not seen.

Thickets on mountain slopes; ca. 900 m. Guizhou [Indonesia, Malaysia, Nepal, Thailand, Vietnam].

27. *Trichosanthes pedata* Merrill & Chun, Sunyatsenia 2: 20. 1934.

趾叶栝楼 zhi ye gua lou

Trichosanthes pedata var. *yunnanensis* C. Y. Cheng & C. H. Yueh.

Stem slender, striate, grooved, glabrous or pubescent at nodes. Leaves 3–5-foliolate; petiole 2.5–6 cm; leaflets abaxially pale green, lanceolate or oblong-oblancoate, 9–12 × 2.5–3.5 cm, membranous, abaxially glabrous, adaxially hispidulous or white punctate, remotely denticulate, acuminate; petiolule 2–5(–11) mm. Male raceme 14–19 cm; peduncle and pedicels brown pubescent; bracts obovate or rhombic-ovate, 1–1.5 × ca. 0.8 cm, pubescent, margin entire or dentate, apex acuminate. Female flowers solitary; calyx tube cylindrical, ca. 3 × 5 cm; ovary ovoid, ca. 1.5 × 0.8 cm, glabrous. Fruiting peduncle 1(–3) cm; fruit orange-yellow, globose, 5–6 cm, smooth. Seeds brown, ovoid, tumid, 1–1.2 × ca. 0.8 cm, base triangular, apex rounded. Fl. Jun–Aug, fr. Jul–Dec. $2n = 22$.

Open forests along valleys, thickets; 200–1500 m. Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Yunnan [Vietnam].

28. *Trichosanthes quinquefolia* C. Y. Wu ex C. Y. Cheng & C. H. Yueh, Acta Phytotax. Sin. 18: 351. 1980.

木基栝楼 mu ji gua lou

Stems striate, glabrous or pubescent at nodes. Petiole 3–4 cm, pubescent; leaf blade 3–5-foliolate; leaflets sessile; median leaflet abaxially pale green, lanceolate, 15–23 × 2–4 cm, membranous or thinly papery, abaxially glabrous, adaxially hispidulous or white punctate, base cuneate, margin entire, apex acuminate. Male raceme 11–26 cm; peduncle striate, pubescent, 5–15-flowered; bracts rhombic, 7–10 × ca. 5 mm, pubescent, margin crenate, apex obtuse; calyx tube narrowly funnellform, ca. 3 × 0.7 cm, densely pubescent; segments linear-lanceolate,

(3–)5–8 × ca. 3 mm, pubescent, margin entire, apex acuminate. Female flowers unknown. Fruit oblong, ca. 6 × 4 cm, smooth, apex acute. Seeds brown, ovoid-oblong, tumid, 12–15 × 8–10 mm, base rounded. Fl. Aug–Sep, fr. Oct–Nov.

Open forests; 900–1400 m. S Yunnan [Laos].

29. *Trichosanthes pilosa* Loureiro, Fl. Cochinch. 2: 588. 1790.

全缘栝楼 quan yuan gua lou

Trichosanthes chingiana Handel-Mazzetti; *T. himalensis* C. B. Clarke; *T. himalensis* var. *indivisa* Chakravarty; *T. okamotoi* Kitamura; *T. ovigera* Blume; *T. ovigera* var. *sikkimensis* Kundu.

Stems slender, grooved, pubescent. Petiole 4–12 cm, striate, densely pubescent; leaf blade ovate-cordate to suborbicular, 7–19 × 7–8 cm, papery, unlobed or very shortly 3-lobed or 3–5-lobed to middle or to base; median lobe ovate, oblong, or obovate-oblong, abaxially pubescent, adaxially glabrous or very shortly puberulent, margin distantly denticulate or dentate, apex acuminate. Male peduncle 10–26 cm, striate, densely pubescent; bracts lanceolate or oblanceolate, ca. 1.6 × 0.5–0.6 cm, attenuate to base, margin triangular-dentate, apex acuminate; calyx tube subcylindric, slightly dilated at apex, ca. 5 cm; segments triangular-ovate, 7–10 × 2–3 mm, entire. Female flowers solitary; pedicel 1–1.3 cm, striate, densely pubescent; calyx tube cylindrical, 2–5 × 0.2–0.3 cm, glabrous or pubescent; ovary ovoid, 1–1.5 × 0.3–0.5 cm. Fruit ovoid or oblong, 5–7 × 2.5–4 cm, smooth, base rounded, apex acuminate, beaked. Seeds subquadrangular, 7–9 × 7–8 mm, longitudinally surrounded by 2 thick ridges, thick near middle; 3-loculed with 2 lateral locules empty. Fl. May–Sep, fr. Sep–Dec. $2n = 22$.

Thickets along valleys, open forests on mountain slopes; 700–2500 m. Guangdong, Guangxi, Guizhou, Yunnan [India, Indonesia, Japan, Nepal, Thailand, Vietnam].

One of us (Jeffrey) treats the following three species (i.e., *Trichosanthes baviensis*, *T. trichocarpa*, and *T. cucumeroides*) as synonyms of *T. pilosa*.

30. *Trichosanthes baviensis* Gagnepain, Bull. Mus. Natl. Hist. Nat. 24: 379. 1918.

短序栝楼 duan xu gua lou

Stems slender, grooved, glabrous or pubescent. Petiole slender, 4–9 cm, striate, densely pubescent; leaf blade abaxially pale green, adaxially deep green, ovate, 5–20 × 5–13 cm, thinly membranous, unlobed, abaxially pubescent, adaxially puberulent, margin denticulate, apex acuminate. Male flowers in corymb, ca. 2 cm; pedicel 1–1.5 cm, pubescent; bracts absent; calyx tube dilated at apex, ca. 2 cm, pubescent; segments narrowly triangular, ca. 3 mm. Female flowers solitary; pedicel ca. 7 mm, pubescent; ovary oblong, 8–10 mm, densely pubescent. Fruit ovoid, 3.5–5 × ca. 3.5 cm, smooth, glabrous, beaked. Seeds unknown. Fl. Apr–May, fr. May–Sep.

• Evergreen broad-leaved forests or thickets; 600–1500 m. Guangxi, SW Guizhou, S and SE Yunnan.

One of us (Jeffrey) treats this taxon as a synonym of *Trichosanthes pilosa*.

31. *Trichosanthes trichocarpa* C. Y. Wu ex C. Y. Cheng & C. H. Yueh, *Acta Phytotax. Sin.* 18: 340. 1980.

杏籽栝楼 xing zi gua lou

Stems slender, grooved, puberulent. Petiole slender, 7–8 cm, striate, puberulent; leaf blade abaxially pale green, adaxially deep green, broadly cordate, 10–16 × 7–13 cm, papery, unlobed or irregularly shortly 3-lobed; lobes triangular, abaxially pubescent, adaxially sparsely hairy, margin entire or denticulate, apex acuminate to long acuminate. Flowers unknown. Fruiting peduncle 3–4 cm, striate, puberulent; fruit yellow or orange-red, ovoid-oblong or oblong, 7–9 × 7–8 cm, densely white villous, beaked. Seeds obovate-triangular, 1–1.1 × ca. 1 cm, 3-loculed with 2 lateral locules narrow. Fr. Oct–Nov.

• Forests on mountain slopes, roadsides; 2100–2400 m. S and SW Yunnan.

One of us (Jeffrey) treats this taxon as a synonym of *Trichosanthes pilosa*.

32. *Trichosanthes cucumeroides* (Seringe) Maximowicz in Franchet & Savatier, *Enum. Pl. Jap.* 1: 172. 1873.

王瓜 wang gua

Stems slender, branched, grooved, pubescent. Petiole 3–10 cm, striate, densely pubescent; leaf blade abaxially pale green, adaxially deep green, broadly ovate or orbicular, 5–13(–19) × 5–12(–18) cm, papery, usually shortly 3–5-lobed, sometimes unlobed; lobes triangular or ovate to obovate-oblong, abaxially densely shortly pubescent, adaxially tomentose, margin denticulate or serrate, apex obtuse or acuminate. Male peduncle 5–10 cm, striate, pubescent; bracts linear-lanceolate, 2–3 mm, pubescent, entire; calyx tube 6–7 cm, pubescent; segments linear-lanceolate, 3–6 × ca. 1.5 mm, entire, acuminate. Female flowers solitary; pedicel 0.5–1 cm; ovary oblong, densely pubescent. Fruiting peduncle 5–20 mm, pubescent; fruit orange-red, ovoid, ovoid-oblong, or globose, 6–7 × 4–5.5 cm, smooth, beaked. Seeds deep brown, oblong or triangular-ovate, 7–12 × 7–14 mm, 3-loculed; 2 lateral ones large, ca. 4.5 mm in diam. Fl. May–Aug, fr. Aug–Nov.

Dense forests along valleys, open forests on mountain slopes; (200–)600–1700 m. Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, SE Xizang, Zhejiang [India, Japan].

One of us (Jeffrey) treats this species and its varieties as synonyms of *Trichosanthes pilosa*.

- 1a. Fruit ovoid or ovoid-oblong.
 2a. Seeds oblong, middle ridge as broad as 2 lateral locules 32a. var. *cucumeroides*
 2b. Seeds triangular, 2 lateral locules narrow 32b. var. *hainanensis*
 1b. Fruit globose or narrowly oblong.
 3a. Fruit narrowly oblong 32c. var. *stenocarpa*
 3b. Fruit globose 32d. var. *dicaelosperma*

32a. *Trichosanthes cucumeroides* var. *cucumeroides*

王瓜(原变种) wang gua (yuan bian zhong)

Bryonia cucumeroides Seringe in Candolle, *Prodr.* 3: 308. 1828; *Trichosanthes cavaleriei* H. Lévillé; *T. chinensis* Seringe; *T. cucumeroides* var. *formosana* (Hayata) Kitamura; *T. formosana* Hayata; *T. ovigera* Blume subsp. *cucumeroides* (Seringe) C. Jeffrey.

Fruit ovoid or ovoid-oblong. Seeds oblong, middle ridge as broad as 2 lateral locules.

Guangdong, Guangxi, Jiangxi, Sichuan, Taiwan, Zhejiang [Japan].

32b. *Trichosanthes cucumeroides* var. *hainanensis* (Hayata) S. K. Chen, *Bull. Bot. Res., Harbin* 5(2): 117. 1985.

海南栝楼 hai nan gua lou

Trichosanthes hainanensis Hayata, *Icon. Pl. Formosan.* 10: 8. 1921.

Fruit ovoid or ovoid-oblong. Seeds triangular-ovate, with middle ridge broad; 2 lateral locules narrow, ca. 2.5 mm in diam.

• Guangdong, Guangxi, Hainan.

32c. *Trichosanthes cucumeroides* var. *stenocarpa* Honda, *Bot. Mag. (Tokyo)* 54: 223. 1941.

狭果草栝楼 xia guo cao gua lou

Trichosanthes matsudae Hayata.

Fruit narrowly oblong, 7–9 × 2.5–4 cm.

Taiwan [Japan].

32d. *Trichosanthes cucumeroides* var. *dicaelosperma* (C. B. Clarke) S. K. Chen, *Bull. Bot. Res., Harbin* 5(2): 118. 1985 [“*dicoelosperma*”].

波叶栝楼 bo ye gua lou

Trichosanthes dicaelosperma C. B. Clarke in J. D. Hooker, *Fl. Brit. India* 2: 609. 1879; *T. ascendens* C. Y. Cheng & C. H. Yueh.

Fruit globose or oblong. Seeds compressed; 2 lateral locules suboblong.

Dense forests; 600–1200 m. Guangxi, SE Xizang [India].

33. *Trichosanthes tetragonosperma* C. Y. Cheng & C. H. Yueh, *Acta Phytotax. Sin.* 12: 425. 1974.

方籽栝楼 fang zi gua lou

Stems slender, grooved, puberulent. Petiole 2–4 cm, twisted, striate, puberulent; leaf blade adaxially green, narrowly ovate, 8.5–11.5 × 4–5 cm, papery, abaxially glabrous or puberulent on veins, adaxially glabrous, apex shortly acuminate. Flowers unknown. Fruiting peduncle slender, 3–4 cm, striate, glabrous; fruit orange-yellow or red, ovoid, 6.5–11 × 4–5.5 cm, smooth, glabrous, base rounded or obtuse, apex acute. Seeds deep brown, 4-angled, ca. 1 × 1–1.2 cm, with narrow middle ridge, base concave, apex triangular, 3-loculed; 2 lateral locules broad, turgid and empty. Fr. Nov–Jan of next year.

• Forests; 1300–1600 m. SE Yunnan.

22. CYCLANTHERA Schrader, Index Sem. Hort. Acad. Goett. 1831: 2. 1831.

小雀瓜属 xiao que gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, climbing, annual or perennial. Tendrils simple or 2- to many fid. Leaves undivided, divided, or pedately 5–7-foliolate. Plants monoecious. Male flowers in raceme or panicle; calyx tube cup-shaped or cupular; segments 5, subulate, sometimes almost obsolete; corolla rotate, 5-partite; segments broadly ovate-oblong, usually acute; stamen 1; filament very short; anther horizontal, 1-celled, circular. Female flowers solitary, binary, or 3-fasciculate; calyx and corolla as in male flowers; ovary ovoid, 1-locular; style very short; stigma large, orbicular. Fruit ovoid or reniform, ± fleshy, setose or setiform, rarely glabrous. Seeds few to numerous, compressed, angled, 2-lobed at apex and base.

About 20 species: tropical America; one species (introduced) in China.

1. Cyclanthera pedata (Linnaeus) Schrader, Index Sem. Hort. Acad. Goett. 1831: 2. 1831.

小雀瓜 xiao que gua

Momordica pedata Linnaeus, Sp. Pl. 2: 1009. 1753.

Plants annual. Stem robust, multibranching, glabrous. Petiole 5–15 cm; leaf blade 5-pedatisect, leaflets elliptic or elliptic-lanceolate, median leaflet 7–16 × 2–6 cm, base cuneate, margin dentate, apex acuminate; lateral leaflets 5–14 × 2–4 cm. Tendrils 2-fid. Male flowers in a panicle; peduncle 10–23 cm, 20–50-flowered; pedicels filiform, 4–10 mm; calyx tube cupular,

ca. 2 × 3–4 mm; segments linear, ca. 2 mm; corolla yellow; segments ovate-triangular, 1.5–2 × 2–2.5 mm, puberulent; filaments connate; anthers circular, 1.5–2 mm. Female flowers: calyx and corolla as in male flowers; ovary 2–3 mm; style 0.5–0.7 mm. Fruit narrowly oblong to narrowly elliptic, 5–7 × 2.5–3 cm, setose, apex acuminate, 8–10-seeded. Seeds black, suboblong, 10–12 × 7–8 mm, margin dentate. Fl. and fr. May–Oct.

Cultivated. Xizang, Yunnan [cultivated in tropics of New and Old Worlds, not known wild].

The fruit is used as a vegetable.

23. SECHIUM P. Browne, Civ. Nat. Hist. Jamaica, 355. 1756, nom. cons.

佛手瓜属 fo shou gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Chayota Jacquin; *Chocho* Adanson.

Herbs, scandent, perennial. Roots tuberous. Tendrils 3–5-fid. Leaf blade cordate, membranous. Plants monoecious; flowers white. Male flowers in a raceme; calyx tube semiglobose; segments 5; corolla rotate, 5-partite; segments ovate-lanceolate, apex acute; stamens 3, inserted on base of calyx tube; filaments connate; anthers free, one 1-celled, two 2-celled; anther cells flexuous; pistillode absent. Female flowers solitary or binary, usually in same axil as male flowers; calyx and corolla as in male flowers; ovary fusiform, 1-locular, setose; style short; stigma 5-lobed; lobes reflexed, with only 1 pendulous ovule. Fruit obovoid, fleshy, sulcate at apex. Seed 1, large, ovate, compressed, woody, cotyledons large.

About five species: Mexico and Central America; one species (introduced) in China.

1. Sechium edule (Jacquin) Swartz, Fl. Ind. Occid. 2: 1150. 1800.

佛手瓜 fo shou gua

Sicyos edulis Jacquin, Enum. Syst. Pl. 32. 1760.

Stem angular-sulcate. Petiole slender, 5–15 cm, glabrous; leaf blade suborbicular, membranous, abaxially puberulent, adaxially slightly scabrous, base cordate, margin dentate, apex acuminate. Male flowers 10–30 on 8–30 cm peduncle, pedicels 1–6 mm; calyx tube short; segments explanate, 5–7 mm; corolla

rotate, 12–17 mm; segments ovate-lanceolate. Female pedicel 1–1.5 cm; calyx and corolla as in male flowers; ovary obovoid, 5-angled; style 2–3 mm; stigma ca. 2 mm wide. Fruit pale green, obovoid, 8–15 × 6–8 cm, 5-sulcate in upper part, slightly hispid. Seed ca. 10 × 7 cm, compressed. Fl. Jul–Sep, fr. Aug–Oct.

Commonly cultivated in S China [native to Mexico; commonly cultivated in warm parts of the world].

The fruit is used as a vegetable.

24. MELOTHRIA Linnaeus, Sp. Pl. 1: 35. 1753.

美洲马蔺儿属 mei zhou ma jiao er shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Landersia Macfadyen.

Herbs, climbing or trailing, annual. Leaves petiolate, usually palmately lobed. Tendrils simple. Plants monoecious. Male flowers shortly racemose or subcorymbose; calyx campanulate to cylindrical, 5-lobed; corolla yellow, rotate; segments 5; stamens 3, inserted

above middle of tube; anthers two 2-celled, one 1-celled; anther cells straight or slightly curved; connective not produced; rudimentary ovary subglobose. Female flowers solitary, usually coaxillary with male flowers; calyx and corolla as in male flowers; ovary globose to fusiform, 3-locular; ovules numerous, horizontal; style surrounded at base by an annular disk; stigmas 3. Fruit globose to oblong. Seeds numerous, compressed, smooth.

About 12 species: Neotropics; one species (introduced) in China.

1. *Melothria pendula* Linnaeus, Sp. Pl. 1: 35. 1753.

美洲马蔺儿 mei zhou ma jiao er

Stems slender, setulose to glabrous. Petiole slender, retrorsely hispid, 0.9–5 cm; leaf blade adaxially dark green, abaxially paler, ovate to pentagonal, membranous to herbaceous, abaxially shortly hispid or scabrid, adaxially hispid or scabrid-punctate, cordate, unlobed or shallowly to deeply 3–5-lobed, apex obtuse to acuminate, apiculate. Male flowers 3–12 in axillary fascicles, often with an accompanying solitary flower; peduncle slender, 0.5–3.5 cm; pedicels slender, 1.5–9 mm; ca-

lyx campanulate, 1.5–3.5 mm, shortly pubescent to glabrous; corolla yellow; segments spreading, obovate-oblong, 1.5–2.5 mm, emarginate, apiculate; stamens 3, two 2-celled, one 1-celled; filaments short, ca. 0.5 mm; anthers ellipsoid. Female flowers solitary, often coaxillary with male flowers; pedicel slender, 0.7–3.5 cm; calyx and corolla as in male flowers. Fruit black when ripe, subglobose to ellipsoid, 0.8–1.9 × 0.8–1.2 cm. Seeds pallid, ovate, compressed, minutely fimbriate, 4–5 × 2–2.8 mm, 0.6–0.9 mm thick. Fl. and fr. Jan–Dec.

Ruderal weeds; low elevations. Taiwan [native to the Americas (S United States to Argentina); introduced in SE Asia].

25. *ZEHNERIA* Endlicher, Prodr. Fl. Norfolk. 69. 1833.

马蔺儿属 ma jiao er shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Neochamandra W. J. de Wilde & Duyfjes; *Pilogyne* Ecklon ex Schrader.

Herbs, climbing or trailing, annual or perennial. Leaves petiolate, unlobed or 3–5-lobed or -partite. Tendrils slender, simple. Plants monoecious or dioecious. Male flowers axillary, solitary or few, long pedicellate, or in a raceme-cyme or subumbel; calyx campanulate, 5-lobed; corolla campanulate, white or yellow-white, often becoming cream colored with age; segments 5; stamens 3, inserted at bottom or on upper part of tube; filaments shorter to longer than anthers; anthers all 2-celled or sometimes two 2-celled and one 1-celled, oblong or ovoid-oblong; anther cells straight or slightly curved; connective produced or not produced; rudimentary ovary variable in form. Female flowers solitary or paired or a few in a cyme, often coaxillary with male flowers; calyx and corolla as in male flowers; ovary globose to ellipsoid-fusiform, 3-locular; ovules few to numerous, horizontal; style surrounded at base by an annular disk; stigmas 3. Fruit globose or ellipsoid to fusiform, indehiscent. Seeds few to numerous, ovate, compressed, not sculptured.

About 55 species: Old World tropics; four species in China.

1a. Stamens inserted at bottom of tube; filaments longer than anthers.

2a. Plants monoecious; fruit globose or ovoid, red 1. *Z. bodinieri*

2b. Plants dioecious; fruit oblong, purplish black 2. *Z. guamensis*

1b. Stamens inserted on upper part of tube; filaments not longer than anthers.

3a. Fruit globose or oblong, less than 1.8 cm 3. *Z. japonica*

3b. Fruit fusiform, attenuate, 3–4 cm, 1–1.5 cm in diam. 4. *Z. wallichii*

1. *Zehneria bodinieri* (H. Léveillé) W. J. de Wilde & Duyfjes, Thai Forest Bull., Bot. 32: 17. 2004.

钮子瓜 niu zi gua

Melothria bodinieri H. Léveillé, Fl. Kouy-Tchéou, 122. 1914–1915; *M. perpusilla* Cogniaux var. *subtruncata* Cogniaux; *Pilogyne bodinieri* (H. Léveillé) W. J. de Wilde & Duyfjes.

Plants scandent. Stem and branches slender, sulcate-angular, glabrous or sparsely pubescent. Petiole slender, 2–5 cm, glabrous; leaf blade broadly ovate or rarely triangular-ovate, 4–12 × 3–10 cm, membranous, abaxially subglabrous, adaxially scabrous, basal sinus semicircular, rarely subtruncate, margin undulate-denticulate, undivided or sometimes shortly 3–5-lobed, apex acute or shortly acuminate. Tendrils filiform, simple, gla-

brous. Plants monoecious. Male flowers often 3–9 in a subcapitate or cymose inflorescence; peduncle slender, 1–4 cm, glabrous; pedicels 1–4 mm; calyx tube campanulate, 2–3 × 1–2 mm, glabrous or puberulent; segments narrowly triangular, ca. 0.5 mm; corolla white; segments ovate or ovate-oblong, 2–2.5 mm, abaxially puberulent, apex subacute; stamens two 2-celled, one 1-celled, sometimes all 2-celled, inserted at base of calyx tube; filaments ca. 2 mm, puberulent; anthers ovoid, 0.6–0.7 mm. Female flowers solitary, rarely a few in an umbel; ovary ovoid. Fruiting pedicel slender, 0.5–1 cm, glabrous; fruit red when ripe, baccate, globose, 1–1.4 cm in diam., smooth. Seeds ovate-oblong, compressed, smooth, ca. 5 × 3–3.5 mm, marginate. Fl. Apr–Aug, fr. Aug–Nov.

Forest margins or roadsides on mountain slopes; 500–1000 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Jiangxi, Sichuan, Yunnan [India, Indonesia, Laos, Myanmar, Sri Lanka, Thailand, Vietnam].

The Chinese record of *Zehneria maysorensis* (Wight & Arnott) Arnott (FRPS 73(1): 173. 1986) is based on a misidentification of *Z. bodinieri*.

2. *Zehneria guamensis* (Merrill) Fosberg, Smithsonian Contr. Bot. 45: 15. 1980.

台湾马陵儿 tai wan ma jiao er

Melothria guamensis Merrill, Philipp. J. Sci., C, 9: 151. 1914; *M. kelungensis* (Hayata) Hayata ex Makino & Nemoto; *M. liukiensis* Nakai; *Zehneria kelungensis* Hayata; *Z. liukiensis* (Nakai) E. H. Walker.

Plants scandent. Stems and branches slender, elongate, sulcate-angular, glabrous or rarely puberulent. Tendrils filiform, simple. Petiole slender, 1.5–5 cm; leaf blade abaxially pale green, adaxially deep green, broadly ovate, 4–8 × 4–8 cm, membranous, scabrous, basal sinus semicircular, rarely hastate, undivided or somewhat 3–5-lobed, margin irregularly denticulate or crenate-dentate, apex acute and shortly mucronate or shortly acuminate. Plants dioecious. Male peduncle slender, 1.5–5 cm, apex 10–30-flowered; pedicels spreading, 3–6 mm; calyx tube broadly campanulate, ca. 3 mm, base acute; segments subulate, ca. 0.5 mm; corolla pale yellow, puberulent; segments ovate, ca. 2.5 mm, 3-veined, acute; filaments short, ca. 1 mm, puberulent; anthers ovoid, 0.8–1 mm. Female flowers solitary or sometimes in few-flowered fascicle; pedicels 1–1.5 cm; ovary oblong. Fruit purplish black when ripe, baccate, ovate-oblong, 1–1.5(–3) cm × 7–10 mm, smooth, glabrous, both ends obtuse. Seeds gray-white, ovate-oblong, 2–3 × ca. 2 mm, base slightly attenuate, marginate. Fl. and fr. Mar–Dec.

Forests; 400–1400 m. Guangdong, Taiwan, Yunnan [Japan; Pacific islands (Guam)].

De Wilde and Duyfjes (Blumea 51: 75. 2006) recorded *Zehneria repanda* (Blume) C. Simmons (*Pilogyne repanda* (Blume) W. J. de Wilde & Duyfjes) from Taiwan, on the basis of a single collection (*van Steenis 20752*), which we have not seen. It differs from *Z. guamensis* in its smaller, 0.5–0.8(–1) cm in diam., globose fruit. It is said to be a montane species of forest margins and scrub, at 1400–2700 m.

3. *Zehneria japonica* (Thunberg) H. Y. Liu, Bull. Natl. Mus. Nat. Sci., Taichung 1: 40. 1989.

马陵儿 ma jiao er

Bryonia japonica Thunberg in Murray, Syst. Veg., ed. 14, 870. 1784; *Melothria argyi* H. Léveillé; *M. formosana* Hayata; *M. indica* Loureiro; *M. japonica* (Thunberg) Maximowicz ex Cogniaux; *M. leucocarpa* (Blume) Cogniaux var. *rubella* Gagnepain; *Neochamandra indica* (Loureiro) W. J. de Wilde & Duyfjes; *N. japonica* (Thunberg) W. J. de Wilde & Duyfjes; *Zehneria indica* (Loureiro) Keraudren; *Z. omeiensis* Z. Y. Zhu.

Plants scandent. Stems and branches filiform, glabrous. Petiole slender, 2.5–3.5 cm, villous at first, glabrescent; leaf blade abaxially pale green, adaxially dark green, polymorphic,

triangular-ovate, ovate-cordate, or hastate, 3–5 × 2–4 cm, membranous, unlobed or 3–5-lobed, abaxially glabrous, adaxially scabrous, apex acute or rarely shortly acuminate. Plants monoecious. Male flowers solitary, or 2 or 3 in a raceme; peduncle slender, very short, glabrous; pedicels filiform, 3–5 mm, glabrous; calyx broadly campanulate, ca. 1.5 mm, base acute or obtuse; corolla pale yellow, puberulent; segments oblong or ovate-oblong, 2–2.5 × 1–1.5 mm; stamens 3, two 2-celled and one 1-celled, sometimes all 2-celled; filaments short, ca. 0.5 mm; anthers ovoid-oblong or oblong, ca. 1 mm, pubescent; anther cells curved, puberulent; connective broad, apex produced. Female flowers solitary or rarely paired in same axil as male flowers; pedicel filiform, 1–2 cm, glabrous; corolla broadly campanulate, ca. 2.5 mm in diam.; segments lanceolate, 2.5–5 × 1–1.5 mm, apex slightly obtuse; ovary narrowly ovoid, 3.5–4 × 1–2 mm; style short, ca. 1.5 mm; stigmas 3; staminodes glandular. Fruit orange or red, oblong or attenuately ovoid, 1–1.5 cm × 5–8(–10) mm, both ends obtuse. Seeds gray-white, ovate, 3–5 × 3–4 mm, base attenuate, margin obscure. Fl. Apr–Jul, fr. Jul–Oct.

Moist places in forests, roadsides, thickets; 500–1600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Indonesia, Japan, Korea, Nepal, Philippines, Vietnam].

4. *Zehneria wallichii* (C. B. Clarke) C. Jeffrey, Kew Bull. 34: 802. 1980.

锤果马陵儿 chui guo ma jiao er

Melothria wallichii C. B. Clarke in J. D. Hooker, Fl. Brit. India 2: 626. 1879; *Neochamandra wallichii* (C. B. Clarke) W. J. de Wilde & Duyfjes.

Plants slender. Stems and branches glabrous. Tendrils filiform, glabrous, simple. Petiole slender, 3–4 cm, sparsely white hirsute; leaf blade ovate or triangular, 6–7 × 6–7 cm, membranous, abaxially more scabrous, white punctate, adaxially sparsely hirsute on veins, base truncate or with ca. 5 mm deep sinus, margin sparsely dentate, apex acute. Plants dioecious. Male flowers usually 7–10 in a raceme, or solitary; rachis filiform, 1–2 cm, puberulent; pedicels slender, 0.5–1 cm; calyx tube campanulate, 1–2 × ca. 2 mm, glabrous; segments subulate, ca. 0.5 mm; corolla yellow-white; segments explanate, ovate or oblong, apex acute or slightly obtuse; stamens 3, two 2-celled, one 1-celled, inserted on base of calyx tube; filaments short; anthers oblong, 1–1.2 mm, glabrous; anther cells erect; connective narrow, not produced. Female flowers solitary; pedicels slender, 1–1.5 cm, puberulent; ovary fusiform, ca. 1 × 0.2 cm, subglabrous, both ends attenuate. Fruiting pedicel 1–2 cm, sparsely hirsute; fruit fusiform, 3–4 × 1–1.5 cm, both ends attenuate. Seeds gray-white, oblong or ovate, compressed, 5–7 × 3–4 mm, smooth, marginate. Fl. Jun–Aug, fr. Aug–Nov.

Mountain slopes; 800–1000 m. Yunnan [India, Myanmar, Thailand].

26. CUCUMIS Linnaeus, Sp. Pl. 2: 1011. 1753.

黄瓜属 huang gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, scandent or creeping, annual. Stem and branches scabrous, hispid. Tendrils slender, simple. Leaf blade almost orbicular,

reniform, or cordate-ovate, undivided or palmately 3–7-lobed. Plants monoecious, rarely dioecious, or flowers hermaphroditic. Male flowers fascicled or solitary; calyx tube campanulate, 5-lobed; segments subulate; corolla rotate or subcampanulate, 5-lobed; segments oblong or ovate; stamens 3, free, inserted on corolla tube; anthers oblong, one 1-celled, two 2-celled; anther cells linear, reflexed or curved; connective produced; rudimentary ovary glandular. Female flowers solitary or fascicled; calyx and corolla as in male flowers; staminodes 3, subulate; ovary cylindrical; ovules numerous, horizontal; style short; stigmas 3–5. Fruit polymorphic, fleshy, indehiscent, smooth or verrucose. Seeds numerous, compressed, emarginate.

About 32 species: tropical and temperate regions, most species in Africa; four species in China.

- 1a. Fruit smooth; ovary hairy 1. *C. melo*
 1b. Fruit and ovary muriculate or verrucose or sparsely tuberculate, not hairy.
 2a. Fruit oblong or cylindrical, (5–)10–50 cm 2. *C. sativus*
 2b. Fruit oblong, smaller than 5 cm.
 3a. Fruit oblong, at least twice as long as broad, muricate 3. *C. hystrix*
 3b. Fruit obovoid, only slightly longer than broad, sparsely obscurely tuberculate 4. *C. debilis*

1. *Cucumis melo* Linnaeus, Sp. Pl. 2: 1011. 1753.

甜瓜 tian gua

Plants creeping. Stems and branches scabrous, puberulent, or hispid. Tendrils filiform, puberulent. Petiole 7–12 cm, setose; leaf blade suborbicular or reniform, 6–15 × 6–15 cm, papery, abaxially hispid, adaxially scabrous, undivided or 3–7-lobed, dentate; sinus truncate or rounded. Plants monoecious or flowers bisexual. Male flowers 1 or 2 to several, fasciculate; pedicels filiform, 0.5–4 cm, pubescent; calyx tube narrowly campanulate, 3–8 mm, densely hispidulous to white villous; segments subulate or linear, 2–4 × 0.4–1.2 mm; corolla yellow; tube 1–2 mm; segments ovate-oblong to broadly ovate or obovate, 3–24 × 2.5–20 mm, obtuse; anther cells flexuous. Female flowers solitary; ovary ellipsoid or fusiform, 4–11 × 2–5 mm, densely white lanate, villous or puberulent; style 1–2 mm; stigmas 3, 2–2.5 mm. Fruit very variable in size, shape, color, odor, and taste. Seeds numerous, yellow-white, ovate-oblong, 4–8 × 2.4–4 mm, smooth, base rounded, apex acute, emarginate. Fl. and fr. May–Sep.

Farmlands, roadsides. Anhui, Jiangsu, Shandong, Xinjiang, C and E China; also cultivated throughout China [native to Old World tropics and subtropics; introduced in New World tropics; widely cultivated in tropical and temperate countries].

- 1a. Ovary densely villous or white lanate, with spreading hairs; (cultivated) fruit sweet 1a. subsp. *melo*
 1b. Ovary very shortly and densely puberulent, hairs appressed; (cultivated) fruit not sweet 1b. subsp. *agrestis*

1a. *Cucumis melo* subsp. *melo*

甜瓜(原亚种) tian gua (yuan ya zhong)

Cucumis bisexualis A. M. Lu & G. C. Wang.

Ovary and young fruit pilose or lanate, with spreading hairs; fruit in cultivated forms fragrant and sweet.

Farmlands, roadsides. Anhui, Jiangsu, Shandong, Xinjiang; also cultivated throughout China [native to Old World tropics and subtropics; introduced in New World tropics; widely cultivated in tropical and temperate countries].

The fruit is used as a refreshing dessert in summer; the plants are used medicinally.

1b. *Cucumis melo* subsp. *agrestis* (Naudin) Pangalo in Zhukovskii, Zemledeľ'ch. Turtsiya, 534. 1933.

菜瓜 cai gua

Cucumis melo var. *agrestis* Naudin, Ann. Sci. Nat., Bot., sér. 4, 11: 73. 1859; *Bryonia callosa* Rottler; *C. acidus* Jacquin; *C. callosus* (Rottler) Cogniaux & Harms.

Ovary and young fruit sericeous with short appressed hairs; fruit in cultivated forms mostly not fragrant and not sweet.

Farmlands, roadsides. C and E China; commonly cultivated in China [throughout Old World tropics; introduced in New World tropics; also commonly cultivated in E and SE Asia, rarely cultivated elsewhere].

The fruit is used as a vegetable (菜瓜 cai gua).

The forms cultivated in China belong to the 'Conomon' cultivar group (*Cucumis conomon* Thunberg, Nova Acta Regiae Soc. Sci. Upsal. 3: 208. 1780; *C. melo* var. *conomon* (Thunberg) Makino, Bot. Mag. (Tokyo) 16: 16. 1902).

2. *Cucumis sativus* Linnaeus, Sp. Pl. 2: 1012. 1753.

黄瓜 huang gua

Plants scandent or creeping. Stem and branches angular, white hispid. Tendrils slender, simple. Petiole 10–16(–20) cm; leaf blade broadly ovate-cordate, 7–20 × 7–20 cm, membranous, margin 3–5-angular or -lobed; lobes triangular, dentate, apex acute or acuminate; sinus half-orbicular. Plants monoecious. Male flowers fasciculate; pedicel filiform, 5–15 mm, puberulent; calyx tube narrowly campanulate, 8–10 mm, densely white pubescent; segments subulate; corolla yellow-white, ca. 2 cm; segments oblong-lanceolate, acute; anthers 3–4 mm; connective ca. 1 mm. Female flowers solitary or fascicled; pedicels pubescent, 1–2 cm; ovary fusiform, muricate. Fruit yellow-green, oblong or cylindrical, (5–)10–30(–50) cm, muricate, usually verrucose. Seeds white, small, narrowly ovate, 5–10 mm, emarginate, both ends acute. Fl. and fr. summer.

Forests, thickets, mountain slopes; 700–2000 m. Guangxi, Guizhou, Yunnan; also commonly cultivated in China [NE India, Myanmar, Nepal, Thailand; cultivated in all tropical and temperate countries].

- 1a. Fruit oblong or cylindrical, 10–30(–50) cm, muricate, usually verrucose 2a. var. *sativus*

- 1b. Fruit oblong or subglobose, 5–6 cm, smooth 2b. var. *hardwickii*

2a. *Cucumis sativus* var. *sativus*

黄瓜(原变种) huang gua (yuan bian zhong)

Fruit oblong or cylindric, 10–30(–50) cm, muricate, usually verrucose.

Commonly cultivated in China [cultivated in all tropical and temperate countries].

2b. *Cucumis sativus* var. *hardwickii* (Royle) Gabaev, Ogorstys, 47. 1932.

西南野黄瓜 xi nan ye huang gua

Cucumis hardwickii Royle, Ill. Bot. Himal. Mts. 1: 220. 1835; *C. sativus* f. *hardwickii* (Royle) W. J. de Wilde & Duyfjes; *C. sativus* [unranked] *hardwickii* (Royle) Alefeld.

Fruit oblong or subglobose, 5–6 cm, smooth.

Forests, thickets, mountain slopes; 700–2000 m. Guangxi, Guizhou, Yunnan [NE India, Myanmar, Nepal, Thailand].

3. *Cucumis hystrix* Chakravarty, J. Bombay Nat. Hist. Soc. 50: 896. 1952.

野黄瓜 ye huang gua

Cucumis muriculatus Chakravarty.

Plants scandent. Stem and branches angular-sulcate, scabrous, white hirsute. Tendrils filiform, simple. Petiole 6–10 cm; leaf blade broadly ovate or triangular-ovate, 6–13 × 6–10(–12) cm, irregularly 3–5-lobed; lobes triangular, base cordate, mar-

gin dentate, apex acute. Plants monoecious. Male flowers solitary or subfasciculate; calyx tube narrowly campanulate, ca. 6 mm; segments linear, 1–2 mm; corolla yellow; segments ovate-oblong, 5–6 × 3–4 mm; filaments ca. 1 mm; anthers ca. 2 mm. Female flowers solitary; pedicels ca. 5 mm; calyx and corolla as in male flowers; corolla 8–10 mm; ovary oblong-ovoid, ca. 10 × 4 mm, densely yellow-brown hispid; style 2–3 mm; stigma 3-lobed. Fruit oblong, 4–5 × 1.5–2.3 cm, muricate, verrucose. Seeds narrowly ovate, 3–4 mm, both surfaces smooth, emarginate. Fl. Jun–Aug, fr. Aug–Sep.

Forests, thickets; 800–1500 m. W Yunnan [NE India, Myanmar, Thailand].

4. *Cucumis debilis* W. J. de Wilde & Duyfjes, Adansonia, sér. 3, 29: 241. 2007.

滇黄瓜 dian huang gua

Plants slender, probably annual, scandent. Stems and branches sparsely to densely minutely aculeate-hispid. Tendrils simple, sparsely aculeate. Petiole 3–5 cm; leaf blade subcircular in outline, 4–7 × 4–7 cm, 3–5-angular or -lobed, margin coarsely serrate-dentate; lobes broadly triangular, base deeply cordate, apex acute. Plants monoecious. Male flowers solitary or paired; calyx tube turbinate-campanulate, 5.5–6 mm; segments linear, ca. 3 mm; corolla yellow; segments elliptic 4–6 × ca. 3 mm; filaments slender, ca. 0.5 mm; anthers 2.5–3 mm. Female flowers solitary, sometimes axillary with male flowers; pedicels 30–35 mm; calyx and corolla probably similar to male flowers, details unknown. Fruit green, obovoid, sparsely obscurely tuberculate. Seeds unknown. Fl. and fr. Sep.

Yunnan [N Vietnam (ca. 1400 m)].

27. MUKIA Arnott, Madras J. Lit. Sci. 12: 50. 1840.

帽儿瓜属 mao er gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, scandent, annual, slender, setose. Petiole very short, subglabrous; leaf blade usually 3–7-lobed, base cordate. Tendrils simple. Plants monoecious; flowers small, male flowers fascicled; female flowers usually solitary or in a few-flowered fascicle in same axil as male flowers. Male flowers: calyx campanulate; segments 5, subulate; corolla rotate; segments 5; stamens 3, free, inserted on calyx tube; filaments short; anthers oblong, two 2-celled, one 1-celled; anther cells erect; connective slightly produced; rudimentary ovary glandular. Female flowers: calyx and corolla as in male flowers; staminodes absent or very small; ovary ovoid, hispid; style terete; stigma 2- or 3-lobed, ovules few, horizontal. Berry oblong or globose, small, indehiscent. Seeds horizontal, ovate, compressed, both surfaces scabrous or smooth, marginate.

Three species: tropical and subtropical Africa, Asia, Australia; two species in China.

Renner et al. (BMC Evol. Biol. 7: 58. 2007; doi:10.1186/1471-2148-7-58) presented molecular evidence to show that *Mukia* is an ingroup of *Cucumis*.

- 1a. Fruit globose, fruit coat thickening; seed surfaces scrobiculate, indistinctly marginate 1. *M. maderaspatana*
1b. Fruit oblong, fruit coat not thickening; seed surfaces indistinctly scrobiculate, marginate 2. *M. javanica*

1. *Mukia maderaspatana* (Linnaeus) M. Roemer, Fam. Nat. Syn. Monogr. 2: 47. 1846.

帽儿瓜 mao er gua

Cucumis maderaspatanus Linnaeus, Sp. Pl. 2: 1012. 1753; *Bryonia althaeoides* Seringe; *B. cordifolia* Linnaeus; *B. scab-*

rella Linnaeus f.; *Coccinia cordifolia* (Linnaeus) Cogniaux; *Melothria althaeoides* (Seringe) Nakai; *M. maderaspatana* (Linnaeus) Cogniaux; *Mukia althaeoides* (Seringe) M. Roemer; *M. scabrella* (Linnaeus f.) Arnott.

Plants scandent or prostrate, all parts densely yellow-brown hispid. Stems many branched, robust, sulcate. Leaf blade

somewhat rigid, ovate or ovate-cordate, 5–9 × 5–9 cm, usually 3–5-lobed, median lobe ovate-triangular, both surfaces scabrous, base cordate, margin irregularly denticulate, apex slightly obtuse. Tendrils moderately robust. Male flowers fascicled; pedicels short or absent; calyx tube campanulate, ca. 2 × 1.5 mm; segments reflexed, subulate, 1–1.5 × ca. 1 mm; corolla yellow; segments ovate-oblong, ca. 2 × 0.5 mm, apex obtuse; filaments short, ca. 0.5 mm, slightly pilose; anthers oblong, ca. 1 mm, ciliate; connective distinct; rudimentary ovary globose. Female flowers solitary or 3–5-fasciculate. Fruiting pedicels extremely short; fruit dark red, globose, ca. 1 cm in diam., smooth. Seeds ovate, ca. 4 × 2.5 mm, ca. 2.5 mm thick, both surfaces scrobiculate, indistinctly marginate. Fl. Apr–Aug, fr. Aug–Dec.

Rocky mountain slopes, thickets; 400–1700 m. Guangdong, Guangxi, Guizhou, Taiwan, Yunnan [tropical Africa and Asia, Australia].

2. *Mukia javanica* (Miquel) C. Jeffrey, Hooker's Icon. Pl. 37: t. 3661. 1969.

爪哇帽儿瓜 *zhua wa mao er gua*

Karivia javanica Miquel, Fl. Ned. Ind. 1(1): 661. 1856; *Cucumis javanicus* (Miquel) Ghebretinsae & Thulin; *Melothria*

assamica Chakravarty; *M. assamica* var. *scabra* Chakravarty; *M. javanica* (Miquel) Cogniaux.

Plants scandent. Stem and branches slender, hispid. Petiole shortly hispid; leaf blade ovate-cordate, 4–6 × 3–5(–7) cm, usually 3–5-lobed, median lobe ovate-triangular, both surfaces shortly hispid, margin dentate, apex acuminate. Tendrils slender, hispid. Male flowers 2 to several, fasciculate, in leaf axils; pedicel very short, 2–3 mm, shortly hispid; calyx tube cupular, 2–2.5 mm; segments erect, subulate, 1.5–2.5 mm; corolla yellow; segments ovate-oblong, 3–4 mm, apex obtuse; stamens inserted on calyx tube; filaments ca. 0.5 mm, puberulent; anthers 1.5–2 mm; connective produced. Female flowers fasciculate in same axil as male flowers; calyx tube cupular; segments triangular, ca. 0.5 × 0.3 mm; corolla segments ovate-oblong, ca. 2.5 × 1.5 mm, 3-veined; ovary ovoid, 3–4 × 1.5–2.5 mm, densely hispid; style ca. 1 mm, apex 3-lobed; staminodes glandular. Fruiting pedicel 2–4 mm, densely hispid; fruit red, oblong, 1–1.5 × ca. 1 cm. Seeds ovate, ca. 4 × 2.5 mm, margin prominent. Fl. Apr–Jul, fr. Jul–Oct.

Forests, grasslands on mountain slopes; 500–1200 m. Guangdong, Guangxi, Taiwan, Yunnan [India, Indonesia, Philippines, Thailand, Vietnam].

28. SCOPELLARIA W. J. de Wilde & Duyfjes, Blumea 51: 297. 2006.

云南马陵儿属 *yun nan ma jiao er shu*

Lu Anmin (路安民 *Lu An-ming*); Charles Jeffrey

Scopella W. J. de Wilde & Duyfjes, Blumea 51: 34. 2006, not Mains (1939) [Fungi].

Herbs, climbing, annual or perennial. Leaves petiolate, unlobed or lobed. Tendrils simple, hairy. Plants monoecious. Male flowers shortly racemose; calyx campanulate, 5-lobed; corolla yellow; segments 5; stamens 3, inserted on throat of tube; filaments longer than anthers; anthers all 2-celled, anther cells straight; connectives not produced; rudimentary ovary subglobose. Female flowers 1 or 2, often coaxillary with male flowers; calyx and corolla as in male flowers; ovary ellipsoid-globose, 3-locular; ovules numerous, horizontal; style surrounded at base by an annular disk; stigmas 3. Fruit globose to fusiform, indehiscent. Seeds numerous, ovoid-ellipsoid, somewhat compressed, faces scrobiculate.

Two species: SE Asia and W Malaysia; one species in China.

One of us (Lu) does not recognize “micro-genera” such as this; however, for the purposes of this Flora, the treatment by the co-author (Jeffrey) is followed.

1. *Scopellaria marginata* (Blume) W. J. de Wilde & Duyfjes, Blumea 51: 297. 2006.

云南马陵儿 *yun nan ma jiao er*

Bryonia marginata Blume, Bijdr. 924. 1826; *Melothria marginata* (Blume) Cogniaux; *Scopella marginata* (Blume) W. J. de Wilde & Duyfjes; *Zehneria marginata* (Blume) Kerandren.

Plants scandent, annual. Stem and branches glabrous, angular-sulcate. Petiole slender, 2–3.5 cm, white hirsute; leaf blade ovate-cordate or oblong-hastate, 6–10 × 4–10 cm, membranous, usually 3-lobed; median lobe larger, narrowly triangular or lanceolate-triangular, 5–7 × 1.5–2.5 cm, apex acute; lateral lobes smaller, triangular, 2.5–3.5 × 2–2.5 cm, scabrous on both surfaces, white setose, base truncate or slightly concave, mar-

gin callous-dentate, apex obtuse. Tendrils slender. Male flowers usually 5–15 in a 4–6 cm raceme; pedicels only 2–6 mm, puberulent; calyx tube narrowly campanulate, ca. 1 mm, hirsute; segments subulate, 0.3–0.5 mm; corolla yellow, pubescent; segments ovate-triangular, ca. 1 mm; anthers attenuate, glabrous; connective not produced; pistillodes glandular. Female flowers solitary in axils; pedicels filiform, 3–4 cm; calyx and corolla as in male flowers; ovary narrowly oblong, puberulent; styles short; stigmas enlarged. Fruiting pedicel slender, 3–4 cm, glabrous; fruit ovoid or subglobose, 1.5–1.8 cm × 5–12 mm, base slightly obtuse or attenuate. Seeds ovate, ca. 4 × 2.2 mm, ca. 1 mm thick, base obtuse-rounded, both surfaces scrobiculate, margin prominent.

Sparse forests or roadsides on mountain slopes; 600–800 m. Yunnan [Cambodia, Indonesia, Laos, Myanmar, Philippines, Thailand, Vietnam].

29. DIPLOCYCLOS (Endlicher) T. Post & Kuntze, Lex. Gen. Phan. 178. 1903 [*"Diplocyclus"*].

毒瓜属 du gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Bryonia [unranked] *Diplocyclus* Endlicher, Prodr. Fl. Norfolk. 68. 1833.

Herbs, scandent. Tendrils 2-fid. Leaf blade palmately 5-lobed. Plants monoecious. Flowers small, fasciculate, often male and female flowers together in axils. Male flowers: calyx tube broadly campanulate; segments short; corolla broadly campanulate; segments ovate; stamens 3, free, inserted on calyx tube; filaments short; anthers ovoid, one 1-celled, other 2-celled; anther cells linear, slightly flexuous. Female flowers: calyx and corolla as in male flowers; staminodes 3; ovary globose or ovoid, with 3 placentas; ovules few, horizontal; style slender; stigmas 3, 2-lobed. Fruit baccate, globose or ovoid. Seeds strongly margined, surfaces slightly scrobiculate at middle.

Four species: tropical Africa, Asia, Australia; one species in China.

1. *Diplocyclus palmatus* (Linnaeus) C. Jeffrey, Kew Bull. 15: 352. 1962.

毒瓜 du gua

Bryonia palmata Linnaeus, Sp. Pl. 2: 1012. 1753; *B. affinis* Endlicher; *Bryonopsis affinis* (Endlicher) Cogniaux; *B. laciniosa* (Linnaeus) Naudin var. *erythrocarpa* Naudin; *B. laciniosa* var. *walkeri* Chakravarty; *Ilocania pedata* Merrill.

Root tuberous. Stems slender, glabrous. Tendrils glabrous. Petiole 4–6 cm, slightly puberulent; leaf blade broadly ovate, 8–12 × 8–12 cm, membranous, palmately 5-lobed; middle lobe oblong-lanceolate, 8–10 × 2–3.5 cm, apex acuminate or obtuse; lateral lobes short, lanceolate or oblong-lanceolate, both surfaces subglabrous, sinus rounded. Male and female flowers

usually fasciculate in same axil. Male flowers: pedicel slender, 5–15 mm; calyx tube ca. 2 × 5–6 mm; segments subulate, 0.5–1 mm; corolla green-yellow, ca. 7 mm in diam.; segments ovate, ca. 2 × 0.5–1 mm; stamens 3; filaments 1–1.5 mm; anthers ovoid, ca. 2 mm; anther cells reflexed. Female flowers: calyx and corolla as in male flowers; ovary ovoid, smooth. Fruit yellow-green to red, narrowly white striped, globose, indehiscent, 14–18 mm in diam., smooth. Seeds few, brown, ovate, ca. 5 × 3 mm. Fl. Mar–Aug, fr. Sep–Dec.

Forests, thickets; ca. 1000 m. Guangdong, Guangxi, Hainan, Taiwan [Bhutan, Cambodia, India, Japan (Ryukyu Islands), Malaysia, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, Australia].

The fruit and roots contain toxin.

30. COCCINIA Wight & Arnott, Prodr. Fl. Ind. Orient. 1: 347. 1834.

红瓜属 hong gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Cephalandra Schrader.

Herbs, climbing. Roots tuberous. Branches glabrous or slightly scabrous. Tendrils simple, rarely 2-fid. Leaf blade angled or divided. Plants dioecious or rarely monoecious. Male flowers solitary or in a cyme or raceme; calyx tube short, campanulate or turbinate; segments 5; corolla campanulate; segments 5; stamens 3, inserted at base of calyx tube; filaments connate; anthers connivent, one 1-celled, two 2-celled; anther cells reflexed; connective not produced. Female flowers solitary; calyx and corolla as in male flowers; staminodes 3, oblong or subulate; ovary ovoid, oblong, or linear; placentas 3; ovules numerous, horizontal; style filiform; stigma 3-lobed. Fruit ovoid or oblong, baccate, indehiscent. Seeds numerous, compressed, marginate.

About 20 species: mainly distributed in tropical Africa; one species in China.

1. *Coccinia grandis* (Linnaeus) Voigt, Hort. Suburb. Calcutt. 59. 1845.

红瓜 hong gua

Bryonia grandis Linnaeus, Syst. Nat., ed. 12, 2: 640; Mant. Pl. 1: 126. 1767; *Cephalandra indica* Naudin, nom. illeg. superfl.; *Coccinia indica* Wight & Arnott, nom. illeg. superfl.

Roots robust. Stem slender, slightly woody, many branched, angular, glabrous. Tendrils filiform, glabrous, simple. Petiole slender, 2–5 cm; leaf blade broadly cordate, 5–10 × 5–10 cm, usually 5-angled or 5-lobed, base with several glands, apex obtuse. Plants dioecious; flowers solitary. Male pedicel

slender, 2–4 cm, glabrous; calyx tube broadly campanulate, 4–5 mm; segments linear-lanceolate, ca. 3 mm; corolla white or slightly yellow, 2.5–3.5 cm; segments ovate, outside glabrous, inside pubescent; filaments and anthers connate; filaments 2–3 mm; anthers subglobose, 6–7 mm. Female pedicel slender, 1–3 cm; staminodes 3, 1–3 mm, nearly subulate, villous at base; ovary fusiform, 12–15 mm; style 6–7 mm; stigmas 3, 5–6 mm. Fruit red when mature, fusiform, ca. 5 × 2.5 cm. Seeds yellow, oblong, 6–7 × 2.5–4 mm, ca. 1.5 mm thick, both surfaces densely punctate, apex rounded. Fl. and fr. summer.

Thickets on mountain slopes and in forests; 100–1100 m. Guangdong, Guangxi, Yunnan [tropical Africa and Asia].

31. LAGENARIA Seringe, Mém. Soc. Phys. Genève 3(1): 25, t. 2. 1825.

葫芦属 hu lu shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, scandent, softly pubescent. Tendrils 2-fid. Petiole apex 2-glandular; leaf blade ovate-cordate or reniform. Plants dioecious or monoecious; flowers solitary or male flowers in racemes, white. Male flowers: pedicels elongate; calyx tube narrowly campanulate or funnelform; segments 5; corolla segments 5, oblong-obovate, apex retuse; stamens 3; filaments free; anthers included, slightly coalescent or free, oblong, one 1-celled, others 2-celled; anther cells sigmoid-flexuous; connective not produced; pistillode glandular. Female flowers: pedicels short; calyx tube cupular; calyx and corolla as in male flowers; ovary ovoid or cylindrical; ovules numerous, horizontal; placentas 3; styles short; stigmas 3, 2-lobed. Fruit polymorphic, indehiscent, fleshy, woody when mature. Seeds numerous, obovate, compressed, distinctly marginate.

Six species: mainly distributed in tropical Africa; one species (introduced) in China.

1. *Lagenaria siceraria* (Molina) Standley, Publ. Field Mus. Nat. Hist., Bot. Ser. 3: 435. 1930.

葫芦 hu lu

Cucurbita siceraria Molina, Sag. Stor. Nat. Chili, 133. 1782; *Cucumis mairei* H. Léveillé; *Cucurbita lagenaria* Linnaeus; *C. leucantha* Duchesne, nom. illeg. superfl.; *Lagenaria leucantha* Rusby; *L. leucantha* var. *clavata* Makino; *L. leucantha* var. *depressa* (Seringe) Makino; *L. leucantha* var. *makinoidi* Nakai; *L. leucantha* var. *microcarpa* (Naudin) Nakai; *L. microcarpa* Naudin; *L. siceraria* var. *depressa* (Seringe) H. Hara; *L. siceraria* var. *microcarpa* (Naudin) H. Hara; *L. vulgaris* Seringe; *L. vulgaris* subsp. *asiatica* Kobjakova; *L. vulgaris* var. *depressa* Seringe; *L. vulgaris* var. *microcarpa* Matsu-mura & Nakai.

Plants annual. Stem and branches sulcate-angular, pubes-

cent. Tendrils filiform, puberulent. Petiole 16–20 cm, with 2 glands at apex; leaf blade ovate-cordate or reniform-ovate, 10–35 × 10–35 cm, undivided or 3–5-lobed, both surfaces puberulent, palmately 5–7-veined, base cordate, margin irregularly dentate. Plants monoecious; flowers solitary. Male flowers: pedicels slender; calyx tube funnelform, ca. 2 cm; segments lanceolate, ca. 5 mm; corolla yellow; segments 3–4 × 2–3 cm; filaments 3–4 mm; anthers oblong, 8–10 mm. Female flowers: calyx segments and corolla as in male flowers; ovary densely pubescent; stigma enlarged, 2-lobed. Fruit various in size and shape, woody when mature. Seeds white, obovate or triangular, ca. 20 mm, apex truncate. Fl. summer, fr. autumn.

Commonly cultivated in China [cultivated in all warmer areas of the world].

The fruit is used as a vegetable when young; woody when mature, it is used as various vessels.

32. CITRULLUS Schrader ex Ecklon & Zeyher, Enum. Pl. Afric. Austral. 2: 279. 1836, nom. cons.

西瓜属 xi gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Anguria Miller.

Herbs, climbing, annual or perennial. Stem and branches scabrous, robust. Tendrils 2- or 3-fid, rarely simple. Leaves orbicular or triangular-ovate, deeply 3–5-partite; segments lobulate or dissected. Plants monoecious; flowers solitary, rarely fasciculate. Male flowers: calyx tube broadly campanulate, 5-lobed; corolla rotate or broadly campanulate, deeply 5-partite; segments ovate-oblong; stamens 3, inserted on base of calyx tube; filaments free, short; anthers free or slightly coherent, one 1-celled, others 2-celled; anther cells linear, sigmoid-flexuous; connective dilated, not produced; rudimentary ovary glandlike. Female flowers: calyx and corolla as in male flowers; staminodes 3, setiform or ligulate; ovary ovoid, with 3 placentas; ovules numerous, horizontal; style short, columnar; stigmas 3, thick, reniform, nearly 3-lobed. Fruit globose or oblong, fleshy or dry, indehiscent, many seeded. Seeds oblong, compressed, smooth, marginate or emarginate.

Four species: tropical and S Africa, SW Asia, E Mediterranean region; one species (introduced) in China.

1. *Citrullus lanatus* (Thunberg) Matsumura & Nakai, Cat. Sem. Spor. Hort. Bot. Univ. Imp. Tokyo 30: no. 854. 1916.

西瓜 xi gua

Momordica lanata Thunberg, Prodr. Pl. Cap. 13. 1794; *Citrullus colocynthis* Schrader var. *lanatus* (Thunberg) Matsumura & Nakai; *C. edulis* Spach; *C. vulgaris* Schrader ex Ecklon & Zeyher; *Colocynthis citrullus* (Linnaeus) Kuntze; *Cucumis citrullus* (Linnaeus) Seringe; *Cucurbita citrullus* Linnaeus.

Plants annual. Stem and branches robust, sulcate-angular, villous. Tendrils puberulent, 2-fid. Petiole 3–12 cm, densely pubescent; leaf blade white-green, triangulate-ovate, 8–20 × 5–15 cm, both surfaces hispid, 3-partite; segments lobulate, base cordate, sinus semicircular, apex acute or acuminate. Flowers solitary. Male flowers: pedicel 3–4 cm, villous; calyx tube densely villous; segments narrowly lanceolate, 2–3 mm; corolla pale yellow, 2.5–3 cm in diam.; segments ovate-oblong, 1–1.5 × 0.5–0.8 cm; stamens nearly free. Female flowers: calyx and

corolla as in male flowers; ovary 5–8 mm, densely villous; stigmas 3, reniform. Fruit globose or oblong, smooth. Seeds numerous, color various, ovate, 1–1.5 × 0.5–0.8 cm. Fl. and fr. Apr–Oct.

Commonly cultivated in China [native to S Africa; cultivated in all warmer areas of the world].

The fruit are important “water fruit” in summer; the seeds contain edible oil; the fruit coat is used medicinally.

33. *SOLENA* Loureiro, Fl. Cochinch. 2: 477, 514. 1790.

茅瓜属 mao gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Herbs, scandent, perennial. Roots tuberous. Stem and branches slender, subglabrous. Tendrils simple, glabrous. Petiole very short or almost obsolete; leaf blade polymorphic, very variable, base cordate or hastate. Plants dioecious or monoecious. Male flowers in umbelliform or cymose inflorescence; calyx tube campanulate; segments 5, ± subulate; corolla yellow or yellow-white; segments triangular; stamens 3, two 2-celled, one 1-celled; filaments short; anthers oblong; anther cells conduplicate or curved. Female flowers solitary; ovary oblong; ovules few, horizontal; staminodes 3. Fruit oblong or ovoid, indehiscent. Seeds few, globose.

Three species: S and SE Asia; one species in China.

1. *Solena heterophylla* Loureiro, Fl. Cochinch. 2: 514. 1790.

茅瓜 mao gua

Roots fusiform, 1.5–2 cm in diam. Stem and branches glabrous. Petiole slender, 4–10 mm, puberulent at first, glabrescent; leaf blade very variable, ovate, oblong, ovate-triangular, or hastate, undivided or 3–5-lobed, leathery; lobes oblong-lanceolate, lanceolate, or triangular, 8–12 × 1–5 cm, abaxially densely setose or almost glabrous, adaxially densely setose or scabrous, base cordate, margin entire or dentate, apex obtuse or acuminate. Tendrils slender. Male flowers umbellate or subumbellate; peduncle very short, apically 10–20-flowered; pedicels 2–8 mm; calyx tube 3–5 mm, ca. 3 mm in diam.; segments subulate, 0.2–0.4 mm; corolla yellow or yellow-white; segments triangular, 1–1.5 mm, apex obtuse or acute; filaments filiform, ca. 3 mm; anther cells curved or conduplicate, puberulent. Female flowers usually solitary; pedicel 2–10 mm, puberulent; calyx and corolla as in male flowers; ovary ovoid, 2.5–3.5 × 2–3 mm; stigmas 3. Fruit red-brown, broadly ovoid, oblong, or subglobose, 2–6 × 2–5 cm. Seeds gray-white or gray-brown, suborbicular or obovate, 5–7 × 5–6.5 mm, smooth or slightly tuberculate. Fl. May–Aug, fr. Jun–Nov.

Mixed forests, thickets, grasslands, roadsides, mountain slopes; 600–2600 m. Fujian, Guangdong, Guangxi, Guizhou, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan [NE Afghanistan, Bhutan, India, Indonesia (Java), Malaysia, Myanmar, Nepal, Pakistan, Thailand, Vietnam].

The roots are used medicinally.

- 1a. Plants dioecious; leaves polymorphic; anther cells curved 1a. subsp. *heterophylla*

- 1b. Plants monoecious; leaves palmately 5-lobed, segments lanceolate; anther cells conduplicate 1b. subsp. *napaulensis*

1a. *Solena heterophylla* subsp. *heterophylla*

茅瓜(原亚种) mao gua (yuan ya zhong)

Bryonia hastata Loureiro; *Melothria delavayi* Cogniaux; *Solena delavayi* (Cogniaux) C. Y. Wu.

Plants dioecious. Anther cells curved. Fruit oblong or subglobose, 2–6 × 2–5 cm. Fl. May–Aug, fr. Aug–Nov.

Mixed forests, thickets, grasslands, roadsides on mountain slopes; 600–2600 m. Fujian, Guangdong, Guangxi, Guizhou, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan [NE Afghanistan, India, Indonesia (Java), Malaysia, Myanmar, Nepal, Thailand, Vietnam].

The roots are used medicinally.

- 1b. *Solena heterophylla* subsp. *napaulensis* (Seringe) W. J. de Wilde & Duyfjes, Blumea 49: 75. 2004.

西藏茅瓜 xi zang mao gua

Bryonia napaulensis Seringe in Candolle, Prodr. 3: 307. 1828.

Plants monoecious. Anther cells conduplicate. Fruit broadly ovoid, 2.5–3 × ca. 2.5 cm, glabrous, apex and base obtuse. Fl. May–Jun, fr. Jun–Aug.

Mountain slopes, grasslands, thickets; 2000–2300 m. SE Xizang, Yunnan [N India, Myanmar, Nepal].

34. *BENINCASA* Savi, Bibliot. Ital. Giorn. Lett. 9: 158. 1818.

冬瓜属 dong gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Camolenga Post & Kuntze.

Herbs, creeping, annual, all parts densely hispid. Leaves palmately 5-lobed; petiole eglandular. Tendrils 2- or 3-fid. Plants usually monoecious; flowers solitary. Male flowers: calyx tube broadly campanulate; segments reflexed, almost leaflike, dentate; corolla rotate, usually 5-lobed; segments obovate, entire; stamens 3, free, inserted on corolla tube; filaments short; anthers one 1-celled, two 2-celled; anther cells very sigmoid-flexuous; connective margined; pistillode glandlike. Female flowers: calyx and corolla as in male

flowers; staminodes 3; ovary ovoid; ovules numerous, horizontal; style inserted on disk; stigmas 3, expanded, 2-lobed. Fruit large, oblong, baccate, terete, hispid, glaucous, indehiscent. Seeds numerous, ovoid-oblong, compressed, margin tumid.

One species: cultivated in tropical and subtropical regions of the world, including China.

1. Benincasa hispida (Thunberg) Cogniaux in A. Candolle & C. Candolle, *Monogr. Phan.* 3: 513. 1881.

冬瓜 dong gua

Cucurbita hispida Thunberg, *Nova Acta Regiae Soc. Sci. Upsal.* 4: 38. 1783; *Benincasa cerifera* Savi; *B. hispida* var. *chieh-qua* F. C. How; *B. pruriens* (Solander ex Seemann) W. J. de Wilde & Duyfjes; *B. pruriens* f. *hispida* (Thunberg) W. J. de Wilde & Duyfjes; *C. pruriens* Solander ex Seemann; *Lagenaria leucantha* Rusby var. *hispida* (Thunberg) Nakai; *L. siceraria* (Molina) Standley var. *hispida* (Thunberg) H. Hara; *L. vulgaris* Seringe var. *hispida* (Thunberg) Nakai.

Plants creeping or scandent. Stem and branches yellow-brown hispid and villous, sulcate-angular. Petiole robust, 5–20 cm, yellow-brown hispid and villous; leaf blade reniform-orbicular, 15–30 cm wide, 5–7-lobed; lobes broadly triangular

or ovate, both surfaces scabrous, abaxially densely pubescent, adaxially puberulent, base deeply cordate, sinus almost rounded, margin dentate, apex acute. Male flowers: pedicel 5–15 cm, densely hispid and villous; bract ovate or broadly oblong, 6–10 mm, apex acute; calyx tube 12–15 mm in diam., densely hispid-villous; segments 8–12 mm; corolla yellow; segments 3–6 × 2.5–3.5 cm, both surfaces pubescent; filaments 2–3 mm, base expanded; anthers ca. 5 mm. Female flowers: pedicel less than 5 cm, densely yellow-brown hispid and villous; ovary ovoid or cylindrical, 2–4 cm, densely hispid; style 2–3 mm; stigmas 12–15 mm. Fruit 50–60 × 10–25 cm. Seeds white or pale yellow, 10–11 × 5–7 mm, ca. 2 mm thick, marginate. Fl. Jun–Sep, fr. Jul–Nov.

Commonly cultivated in China [native origin uncertain; cultivated throughout the tropics, especially in Asia].

The fruit is eaten as a vegetable; the seeds are used medicinally.

35. CUCURBITA Linnaeus, Sp. Pl. 2: 1010. 1753.

南瓜属 nan gua shu

Lu Anmin (路安民 Lu An-ming); Charles Jeffrey

Pepo Miller.

Herbs, climbing or prostrate, annual. Stem and branches robust. Tendrils 2- to many fid. Leaf blade lobed, base cordate. Plants monoecious; flowers solitary, yellow. Male flowers: calyx tube campanulate, rarely elongate; segments 5, lanceolate or leaflike at apex; corolla campanulate, 5-lobed; stamens 3; filaments free; anthers connected into a head, one 1-celled, two 2-celled; anther cells linear, reflexed; connective not produced; pistillode absent. Female peduncle short; calyx and corolla as in male flowers; staminodes 3, broadly triangular; ovary oblong or globose, with 3–5-placentas; ovules numerous, horizontal; style short; stigmas 3–5-lobed or bifurcate. Fruit large, fleshy, indehiscent. Seeds numerous, compressed, smooth.

About 15 species: warm regions of the Americas, also cultivated in tropical, subtropical, and temperate regions; three species (all introduced) in China.

1a. Calyx segments linear, apex leaflike; fruiting pedicel conspicuously enlarged at apex; seed margin thickened 3. *C. moschata*
1b. Calyx segments linear or linear-lanceolate, apex not leaflike; fruiting pedicel not strongly enlarged at apex.

2a. Leaf blade triangular or ovate-triangular, irregularly 5–7-lobed; calyx segments linear-lanceolate; fruiting pedicel angular-sulcate, slightly thickened at apex; seed marginate and obtuse 1. *C. pepo*

2b. Leaf blade reniform or orbicular, almost entire or dentate; calyx segments lanceolate; fruiting pedicel not angular-sulcate, not thickened at apex; seed margin obtuse or ± marginate 2. *C. maxima*

1. Cucurbita pepo Linnaeus, Sp. Pl. 2: 1010. 1753.

西葫芦 xi hu lu

Plants climbing. Stem setose and scabrous-hairy. Petiole setose, 6–9 cm; leaf blade triangular or ovate-triangular, both surfaces scabrous-hairy, base cordate, margin irregularly dentate, apex acute. Tendrils many fid. Plants monoecious; flowers solitary; pedicel angular, 3–6 cm, yellow-brown setose; calyx tube 5-angled; segments linear-lanceolate; corolla campanulate, ca. 5 × 3 cm; segments erect, apex acute; stamens 3; filaments ca. 15 mm; anthers connivent, ca. 10 mm; ovary ovoid, 1-locular. Fruiting pedicel robust, conspicuously angular-sulcate, apex slightly thickened; fruit variable in shape and size. Seeds numerous, white, ovate, ca. 20 mm, marginate and obtuse. Fl. and fr. May–Nov.

Commonly cultivated throughout China [native to North America; cultivated in tropical and temperate regions].

The fruit is used as a vegetable.

2. Cucurbita maxima Duchesne, *Essai Hist. Nat. Courges*, 7, 12. 1786.

笋瓜 sun gua

Cucurbita pepo Linnaeus var. *maxima* (Duchesne) Delile.

Plants climbing. Stem robust, white setose. Petiole 15–20 cm, densely setose; leaf blade reniform or orbicular-reniform, 15–25 cm, both surfaces setose, base cordate, margin almost entire or dentate, apex obtuse. Tendrils usually many fid, slightly setose. Male pedicel 10–20 cm, puberulent; calyx tube campanulate; segments linear-lanceolate, 18–20 mm, densely

white setose; corolla tubular; segments reflexed, ovate-orbicular, 2–3 cm, margin rugose, apex obtuse; stamens 3; filaments connivent, 5–7 mm, almost glabrous or puberulent at base; anthers connivent. Ovary ovoid; style short; stigmas 2-lobed. Fruiting pedicel short, cylindric, not angular-sulcate, apex not enlarged; fruit variable in shape, size, and color. Seeds compressed, margin obtuse or marginate. Fl. and fr. Apr–Nov.

Commonly cultivated in China [native to South America; cultivated in tropical and temperate regions].

The fruit is used as a vegetable; the seeds contain oil.

3. *Cucurbita moschata* Duchesne, Essai Hist. Nat. Courges, 7, 15–16. 1786.

南瓜 nan gua

Cucurbita pepo Linnaeus var. *moschata* (Duchesne) Duchesne.

Plants prostrate. Stem to 2–5 m, densely white setose. Petiole robust, 8–19 cm, setose; leaf blade broadly ovate or ovate-orbicular, 12–25 × 20–30 cm, 5-angled or 5-lobed; lobes triangular, adaxially yellow-white setose and velvety. Male calyx tube campanulate, 5–6 mm; segments linear, 1–1.5 cm, pubescent, enlarged or leaflike at apex; corolla campanulate, ca. 8 × 6 cm; segments with revolute margin, rugose, apex acute; stamens 3; filaments 5–8 mm, glandular; anthers connivent, ca. 15 mm. Ovary 1-locular; style short; stigma enlarged, 2-lobed. Fruiting pedicel robust, 5–7 cm, angular-sulcate, strongly enlarged at apex; fruit variable in shape, size, and color. Seeds numerous, gray-white, ovate or oblong, 10–15 × 7–10 mm, margin thickened. Fl. and fr. Apr–Nov.

Commonly cultivated throughout China [native to Central America; cultivated worldwide].

The fruit is used as a vegetable; the seeds are edible.