

MALVACEAE

锦葵科 jin kui ke

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Herbs, shrubs, or less often trees; indumentum usually with peltate scales or stellate hairs. Leaves alternate, stipulate, petiolate; leaf blade usually palmately veined, entire or various lobed. Flowers solitary, less often in small cymes or clusters, axillary or subterminal, often aggregated into terminal racemes or panicles, usually conspicuous, actinomorphic, usually bisexual (unisexual in *Kydia*). Epicalyx often present, forming an involucre around calyx, 3- to many lobed. Sepals 5, valvate, free or connate. Petals 5, free, contorted, or imbricate, basally adnate to base of filament tube. Stamens usually very many, filaments connate into tube; anthers 1-celled. Pollen spiny. Ovary superior, with 2–25 carpels, often separating from one another and from axis; ovules 1 to many per locule; style as many or 2 × as many as pistils, apex branched or capitate. Fruit a loculicidal capsule or a schizocarp, separating into individual mericarps, rarely berrylike when mature (*Malvaviscus*); carpels sometimes with an endoglossum (a crosswise projection from back wall of carpel to make it almost completely septate). Seeds often reniform, glabrous or hairy, sometimes conspicuously so.

About 100 genera and ca. 1000 species: tropical and temperate regions of N and S Hemisphere; 19 genera (four introduced) and 81 species (24 endemic, 16 introduced) in China.

Molecular studies have shown that the members of the Bombacaceae, Malvaceae, Sterculiaceae, and Tiliaceae form a very well-defined monophyletic group that is divided into ten also rather well-defined clades, only two of which correspond to the traditional families Bombacaceae and Malvaceae. Some of the remaining groups are included entirely within either of the remaining families but others cut across the traditional divide between the Sterculiaceae and Tiliaceae. A majority of authors, most notably Bayer and Kubitzki (Fam. Gen. Vasc. Pl. 5: 225–311. 2003), has favored including everything within a greatly enlarged Malvaceae, and treating the individual clades as subfamilies. The alternative view is that the individual clades should be treated as a series of ten families: Bombacaceae (Bombacoideae), Brownlowiaceae (Brownlowioideae), Byttneriaceae (Byttnerioideae), Durionaceae (Durionoideae), Helicteraceae (Helicteroideae), Malvaceae (Malvoideae), Pentapetaceae (Dombeyoideae), Sparrmanniaceae (Grewioideae), Sterculiaceae (Sterculioideae), and Tiliaceae (Tilioideae) (Cheek in Heywood et al., Fl. Pl. Fam. World. 201–202. 2007). For the present treatment, we prefer to retain the familiar, traditional four families, so as to maintain continuity with the treatments in FRPS, and to await a consensus on the two alternative strategies for dealing with the very widely accepted clades.

The traditional Malvaceae coincides exactly with one of the major clades. The only possible problem is the relationship with the Bombacaceae, which also has primarily 1-loculed anthers, and some authorities have suggested that the Bombacaceae should be included within the Malvaceae.

Members of the Malvaceae are important as fiber crops (particularly cotton, *Gossypium*). Young leaves of many species can be used as vegetables, and species of *Abelmoschus* and *Hibiscus* are grown as minor food crops. Many species have attractive flowers and an ever-increasing selection is grown as ornamentals. Several have been cultivated for a very long time, particularly species of *Hibiscus*, and some of these are not known in the wild.

Feng Kuo-mei. 1984. Malvaceae. In: Feng Kuo-mei, ed., Fl. Reipubl. Popularis Sin. 49(2): 1–102.

- 1a. Fruit a loculicidal capsule; ovary with 3–5(or 10) fused carpels; style branches as many as ovary locules; filament tube with anthers inserted along length, apex 5-toothed or truncate, very rarely with anthers.
 - 2a. Ovary and capsule 6–10-loculed.
 - 3a. Epicalyx lobes 10–11, very slender; style branches 6–10; capsule valves both loculicidal and septical, falling off at maturity; seeds 1 per locule 16. *Decaschistia*
 - 3b. Epicalyx lobes 4, leaflike; style with 10 sessile stigmas; capsule valves loculicidal only, persistent; seeds several per locule 17. *Cenocentrum*
 - 2b. Ovary and capsule 3–5-loculed.
 - 4a. Style branched; epicalyx 5–12(–20)-lobed, rarely absent (*Hibiscus lobatus*); seeds reniform, rarely globose.
 - 5a. Calyx splitting asymmetrically at anthesis, caducous; capsule long and sharp-angled; seeds glabrous and smooth 14. *Abelmoschus*
 - 5b. Calyx symmetrically 5-lobed or 5-toothed, persistent; capsule usually cylindrical to globose, rarely winged (*H. yunnanensis*); seeds hairy or glandular verrucose 15. *Hibiscus*
 - 4b. Style not branched; epicalyx 3–5-lobed; seeds obovoid or angular.
 - 6a. Trees or shrubs, not gland-dotted; epicalyx lobes 0.2–1 cm, subulate to lanceolate, caducous 18. *Thespesia*
 - 6b. Herbs or shrubs, usually conspicuously gland-dotted; epicalyx lobes 2–5 cm, triangular to ovate-cordate in outline, persistent 19. *Gossypium*
 - 1b. Fruit a schizocarp, sometimes berrylike (*Malvaviscus*), carpels separating into separate mericarps; filament tube with anthers inserted along length or only at apex.
 - 7a. Filament tube with anthers inserted along sides, apex 5-dentate or truncate; style branches ca. 2 × as many as carpels.

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- 8a. Epicalyx 5-lobed; petals 1–2.5(–3.5) cm, pink or white; mature mericarps usually with barbed spines 12. *Urena*
- 8b. Epicalyx 7–12-lobed; petals 2.5–5 cm, crimson red; mature fruit smooth, berrylike, breaking up into mericarps when dry 13. *Malvaviscus*
- 7b. Filament tube with anthers inserted at apex; style branches as many as carpels.
- 9a. Epicalyx absent; corollas yellow, orange, or red; usually herbs or shrubs, to 3 m.
- 10a. Carpels (3–)5, divided into 2 locules by a constriction with a transverse septum, apex beaked 7. *Wissadula*
- 10b. Carpels (5–)7–20, not constricted, apex obtuse, acute, or 2-awned.
- 11a. Ovules 1 per locule; mericarps often indehiscent 6. *Sida*
- 11b. Ovules 2 or more per locule; mericarps eventually dehiscent.
- 12a. Mature mericarps not swollen, apex rounded, acute, or 2-fid, wall leathery; petals usually more than 1 cm (ca. 0.6 cm in *A. guineense* var. *forrestii*) 8. *Abutilon*
- 12b. Mature mericarps inflated, apex rounded, not beaked, wall thin, membranous; petals 0.6–1 cm 9. *Herissantia*
- 9b. Epicalyx present, 3–9-lobed; corollas often not yellow.
- 13a. Fruit indehiscent, with spreading persistent epicalyx lobes; carpels 2 or 3; trees or shrubs, 5–20 m.
- 14a. Panicles 20–30-flowered; flowers unisexual; petals reddish or light purple; style branches 3; fruit dehiscent 10. *Kydia*
- 14b. Panicles 2–5-flowered; flowers bisexual; petals white or yellow; style branches 2; fruit indehiscent 11. *Nayariophyton*
- 13b. Fruit dehiscent at least when old, epicalyx lobes not spreading; carpels (5–)8–25; herbs or subshrubs, 0.25–3 m.
- 15a. Epicalyx lobes 6–9.
- 16a. Epicalyx lobes 6 or 7; carpels 2-celled, distal cell sterile; corolla 5–10 cm wide 3. *Alcea*
- 16b. Epicalyx lobes 9; carpels 1-celled; corolla ca. 2.5 cm wide 4. *Althaea*
- 15b. Epicalyx lobes 3.
- 17a. Stigmas capitate; petals yellow 5. *Malvastrum*
- 17b. Stigmas filiform; petals pink, violet, purple, or red.
- 18a. Corolla 0.6–5 cm wide; mericarps with lateral edges angular, walls adhering to seed 1. *Malva*
- 18b. Corolla 6–8 cm wide; mericarps with lateral edges rounded, walls separating readily from seed 2. *Lavatera*

1. MALVA Linnaeus, Sp. Pl. 2: 687. 1753.

锦葵属 jin kui shu

Herbs annual or perennial, ascending or erect. Leaves alternate; stipule sessile, usually ciliate, persistent; leaf blade palmately lobed or sometimes deeply dissected. Flowers solitary or fascicled, axillary. Involucellar bracts usually 3, linear or foliaceous, usually free. Calyx cup-shaped, 5-lobed, often accrescent and spreading in fruit. Petals 5, usually purple, sometimes white, rose to dark red, apex usually emarginate or with a prominent notch. Anthers borne on staminal column apex. Ovary with 9–15 pistils; ovule 1 per locule, erect; style branches as many as pistils, adaxial surface stigmatic. Fruit a schizocarp, oblate, pubescent or glabrous; mericarps 9–15, indehiscent, mature carpels without spines. Seeds 1 per mericarp.

About 30 species: N Africa, Asia, Europe; three species (one introduced) in China.

Molecular data (Ray, Pl. Syst. Evol. 198: 29–53. 1995) indicate that a number of species, especially American and Australian, traditionally thought to belong to *Lavatera* are better considered species of *Malva*. Previously, the two genera were separated on the basis of the fusion or non-fusion of the epicalyx lobes, but this is an arbitrary division and, given current molecular evidence, untenable. The two genera are better separated on mericarp details.

Members of this genus are used as ornamental and medicinal plants; the young leaves are used as vegetables. Many species grow in disturbed situations.

Malva dendromorpha M. F. Ray (*Lavatera arborea* Linnaeus) is known in China only from botanical gardens.

- 1a. Mericarps 7; epicalyx lobes leaflike, ca. 10 × 14 mm *M. dendromorpha* (see note above)
- 1b. Mericarps 9–15; epicalyx lobes not leaflike, 3–6 × 1–2 mm.
- 2a. Corolla 3–5 cm in diam., purplish red or white; epicalyx lobes oblong, apex rounded; mericarp abaxially puberulent, reticulate 1. *M. cathayensis*
- 2b. Corolla 0.5–1.5 cm in diam., white to pinkish red; epicalyx lobes linear-lanceolate, apex pointed; mericarp abaxially glabrous, margin striate.
- 3a. Plant small, procumbent, 20–50 cm tall; basal leaf 2–5 cm in diam.; pedicel 2–5 cm; petals ca. 2 × as long as sepals, claw bearded 2. *M. pusilla*

- 3b. Plants large, erect, to 1 m tall; basal leaf 6–10 cm in diam.; pedicel 0.3–1.2 cm at anthesis; petals slightly longer than sepals, claw not bearded 3. *M. verticillata*

1. *Malva cathayensis* M. G. Gilbert, Y. Tang & Dorr, **nom. nov.**

锦葵 jin kui

Replaced synonym: *Malva sinensis* Cavanilles, Diss. 2: 77. 1786, not *Malva chinensis* Miller, Gard. Dict., ed. 8, *Malva* no. 6. 1768; *M. mauritiana* Linnaeus var. *sinensis* Candolle.

Herbs biennial or perennial, erect, many branched, 50–90 cm tall, strigose. Leaves alternate; stipule ovate-oblique, margin serrate, apex acuminate; petiole 4–8 cm, subglabrous, strigose adaxially; leaf blade cordate or reniform, 5–12 × 5–7 cm, papery, glabrous or sparsely strigose on veins, base subcordate to rounded, margin crenate, 5–7-lobed, lobes orbicular. Flowers 3–11-fascicled, axillary. Pedicel 1–2 cm, glabrous or strigose. Epicalyx lobes 3, oblong, 3–4 × 1–2 mm, apex rounded, pilose. Calyx cup-shaped, 6–7 mm, 5-lobed, broadly triangular, stellate pilose on both surfaces. Corolla purplish red or white, 3–5 cm in diam.; petals 5, spatulate, ca. 2 cm, apex slightly emarginate; claw barbed. Staminal column 8–10 mm, scabrous. Filaments glabrous. Style branches 9–11, minutely puberulent. Capsule flat globose, 5–7 mm in diam.; mericarps 9–11, reniform, pilose, abaxially puberulent, reticulate. Seeds dark brown, reniform, ca. 2 mm. Fl. May–Oct.

Mostly cultivated. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [native to India].

Malva cathayensis is very similar to the European *M. sylvestris* but has pilose instead of glabrous fruit. The ICBN requires the epithets “*chinensis*” and “*sinensis*” to be treated as homonyms (*Vienna Code*, Art. 53 Voted Ex. 9), hence a new epithet is needed for this species.

This species is cultivated as an ornamental; plants with white flowers are used medicinally.

2. *Malva pusilla* Smith in Smith & Sowerby, Engl. Bot. 4: t. 241. 1795.

圆叶锦葵 yuan ye jin kui

Malva lignescens Iljin; *M. rotundifolia* Linnaeus, **nom. utique rej.**

Herbs perennial, usually procumbent, many branched, 20–50 cm tall, scabrous. Stipule small, ovate-lanceolate, 4–6 × 2–3 mm; petiole 3–12 cm, stellate velutinous; leaf blade reniform, rarely 5–7-lobed, 1–3 × 1–4 cm, papery, abaxially sparsely stellate puberulent, adaxially sparsely velutinous, base cordate, margin minutely denticulate, apex rounded. Flowers usually 3–4-fascicled, axillary, rarely solitary on stem. Pedicel 2–5 cm, sparsely stellate puberulent. Epicalyx lobes lanceolate, 2–5 × 1–1.5 mm, stellate puberulent. Calyx campanulate, 5–6 mm, stellate puberulent, 5-lobed, lobes triangularly acuminate. Corolla white to pinkish, 10–12 mm in diam.; petals obovate, 9–15 × 3–5 mm, apex notched; claw bearded. Filament tube stellate puberulent. Style branches 13–15. Fruit flat globose, 5–6 mm in diam.; mericarps 12–15, abaxially smooth, angles rounded, pu-

berulent. Seeds reniform, ca. 1 mm in diam., reticulate or not. Fl. summer.

Grassy slopes, open areas. Anhui, Gansu, Guizhou, Hebei, Henan, Jiangsu, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Kazakhstan, Kyrgyzstan, Mongolia, Turkmenistan, Uzbekistan; Asia, Europe].

3. *Malva verticillata* Linnaeus, Sp. Pl. 2: 689. 1753.

野葵 ye kui

Herbs biennial, 50–100(–120) cm tall; stem sparsely stellate velutinous. Stipules ovate-lanceolate, 3–5 × 2–4 mm, stellate puberulent; petiole 2–8(–15) cm, puberulent in adaxial groove, glabrescent; leaf blade reniform or round, (3–)5–11 × (2–)5–11 cm, both surfaces very sparsely strigose or subglabrous, 5–7-lobed, lobes rounded or acute, margin crenate-serrate. Flowers 3- to many-fascicled, axillary. Pedicels 2–15(–40) mm. Epicalyx lobes filiform-lanceolate, (3–)5–6 mm, ciliate. Calyx cup-shaped, 5–8 mm, lobes broadly triangular, sparsely stellate strigose. Corolla whitish to reddish, slightly longer than sepals; petals 6–8 mm, apex retuse; claw glabrous or sparsely hairy. Filament tube 3–4 mm, glabrous or with a few simple hairs. Style branches 10–11. Schizocarp flat-globose, 5–7 mm in diam.; mericarps 10–12, abaxially smooth, ca. 1 mm thick, angles rounded and rugose, sides reticulate. Seeds purple-brown, reniform, ca. 1.5 mm in diam., glabrous. Fl. Mar–Nov.

Hills, plains, also cultivated and becoming weedy. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang [Bhutan, India, Korea, Mongolia, Myanmar, Pakistan; E Africa (Ethiopia), Europe; invasive weed in North America].

This species is similar to *Malva parviflora* but differs in having a glabrous staminal column and obviously reticulate mericarps.

- 1a. Leaves on distal part of stem with lobes rounded; flowers in looser fascicles; pedicels unequal, the long ones not obscured by flowers or fruits 3c. var. *rafiqii*
- 1b. Leaves on distal part of stem with lobes triangular; flowers in compact fascicles; pedicels uniformly short, obscured by flowers or fruit.
 - 2a. Herbs biennial or perennial; leaf margin not undulate; schizocarp 5–7 mm in diam. 3a. var. *verticillata*
 - 2b. Herbs annual; leaf margin strongly undulate; schizocarp ca. 8 mm in diam. 3b. var. *crispa*

3a. *Malva verticillata* var. *verticillata*

野葵(原变种) ye kui (yuan bian zhong)

Malva chinensis Miller (1768), not *Malva sinensis* Cavanilles (1786); *M. mohileviensis* Downar; *M. pulchella* Bernhardi; *M. verticillata* subsp. *chinensis* (Miller) Tzvelev; *M. verticillata* var. *chinensis* (Miller) S. Y. Hu.

Herbs biennial or perennial. Leaf blade margin not wrinkled; blades on distal part of stem with lobes triangular. Flowers in compact fascicles. Pedicels uniformly short or absent, concealed by flowers or fruits. Schizocarp 5–7 mm in diam.

Hills, plains. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang [?Bhutan, India, Korea, Myanmar; Africa (Ethiopia), Europe].

The seeds, roots, and leaves are used medicinally; the young leaves are edible.

3b. *Malva verticillata* var. *crispa* Linnaeus, Sp. Pl. 2: 689. 1753.

冬葵 dong kui

Malva crispa (Linnaeus) Linnaeus.

Herbs annual. Leaf blade margin strongly wrinkled; blades on distal part of stem with lobes bluntly triangular. Flowers solitary or fascicled. Pedicels uniformly short or absent. Schizocarp ca. 8 mm in diam. Fl. Jun–Sep.

Cultivated, often becoming weedy. Gansu, Guizhou, Hunan, Jiangxi, Sichuan, Yunnan [India, Pakistan; Europe; invasive weed in North America].

This taxon is cultivated as an ornamental and as a salad crop.

3c. *Malva verticillata* var. *rafiquii* Abedin, Fl. W. Pakistan 130: 45. 1979.

中华野葵 zhong hua ye kui

Herbs biennial or perennial. Leaf blade margin not wrinkled; blades on distal part of stem with lobes rounded. Flowers in looser fascicles. Pedicels very unequal, longest to 4 cm, easily seen. Schizocarp 5–7 mm in diam.

Anhui, Gansu, Guangdong, Guizhou, Hebei, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Yunnan, Zhejiang [N India, Korea, Pakistan].

This variety was misidentified as *Malva verticillata* var. *chinensis* by S. Y. Hu and subsequent Chinese authors, but the type of var. *chinensis* is typical of *M. verticillata* var. *verticillata*.

2. LAVATERA Linnaeus, Sp. Pl. 2: 690. 1753.

花葵属 hua kui shu

Herbs or shrubs. Leaves long petiolate; leaf blade deeply cordate, palmately 5–7-lobed. Flowers solitary, fascicled, or arranged in terminal racemes. Epicalyx lobes 3–6, connate basally. Calyx campanulate, 5-lobed. Corolla various colored, rarely yellow; petals 5, base clawed, apex emarginate or truncate. Filament tube with anthers near apex. Ovary 7–25-loculed; ovules 1 per locule, erect; style branches as many as locules; stigmas decurrent, filiform. Fruit a flattened-globose schizocarp, persistent style base swollen, conical or disk-shaped; mericarps 7–25, semicircular-wedge-shaped, lateral margins rounded, sides smooth or reticulate, abaxially smooth, glabrous or ± pubescent. Seeds reniform, glabrous, free from mericarp wall.

About 25 species: America, Asia, Australia, Europe; one species in China.

See the comments after *Malva* on the relationship of these two genera. Records of *Lavatera trimestris* Linnaeus from the Flora area were based on plants cultivated in Beijing. It is an annual with ovate stipules and a glabrous filament tube.

1. *Lavatera cachemiriana* Cambessèdes in Jacquemont, Voy. Inde 4(Bot.): 29. 1841.

新疆花葵 xin jiang hua kui

Althaea cachemiriana (Cambessèdes) Kuntze [“*kashmiriana*”]; *Lavatera cachemiriana* var. *haroonii* Abedin.

Herbs perennial, to 1 m tall, stellate pilose. Stipules filiform, ca. 8 mm, stellate tomentose; petiole 1–4 cm, stellate pilose; leaf blades dimorphic, basal leaf blades nearly orbicular, apical blades usually 3–5-lobed, 4–8 × 5–9 cm, lobes triangular, abaxially stellate tomentose, adaxially stellate pilose, base cordate, margin crenate, apex obtuse. Flowers in terminal subracemes or in axillary fascicles. Pedicel 4–8 cm, stellate pilose. Epicalyx lobes 3, broadly ovate, connate basally into cup ca. 1

cm, stellate tomentose, entire. Calyx campanulate, ca. 1.5 × 1.5 cm, 5-lobed, lobes ovate-lanceolate, stellate tomentose, apex acuminate. Corolla reddish purple, ca. 8 cm in diam.; petals obovate, ca. 4 × 2 cm, basally densely stellate hairy, base acuminate, apex 2-divided. Staminal column ca. 1.5 cm, sparsely hirsute. Mericarps 20–25, reniform, glabrous. Fl. Jun–Aug.

Sunny slopes, wet meadows; 500–2200 m. NW Xinjiang [India, Kashmir, Kyrgyzstan, Nepal, Pakistan, Russia, Tajikistan].

This species is grown frequently as an ornamental and garden plant. Most material belongs to *Lavatera cachemiriana* var. *cachemiriana*. *Lavatera cachemiriana* var. *haroonii* Abedin differs in having simple or 2- or 3-rayed hairs on the adaxial leaf surface, and it is endemic to Pakistan. *Lavatera cachemiriana* is closely related to *L. thuringiaca* Linnaeus and may only represent a minor variant of that species at the eastern edge of its range.

3. ALCEA Linnaeus, Sp. Pl. 2: 687. 1753.

蜀葵属 shu kui shu

Herbs annual, biennial, or perennial, usually erect, unbranched, most parts stellate pubescent, sometimes mixed with long simple hairs. Leaves long petiolate; leaf blade ovate to suborbicular, angled, weakly lobed, or deeply palmatifid, margin crenate or dentate, apex acute to obtuse. Flowers axillary, solitary or fascicled, often arranged into terminal racemes. Epicalyx lobes 6 or 7,

basally connate. Calyx 5-lobed, ± pubescent. Petals pink, white, purple, or yellow, usually more than 3 cm wide, apex notched. Staminal column glabrous with anthers clustered at apex; anthers yellow and compact. Ovary 15- or more loculed; ovules 1 per locule, erect; styles as many as locules; stigmas decurrent, filiform. Fruit a schizocarp, disk-shaped, fruit axis as long as or shorter than carpels; mericarps more than 15, laterally compressed and circular with a prominent ventral notch, glabrous or pubescent, 2-celled, proximal cell 1-seeded, distal cell sterile. Seed glabrous or pustulose.

About 60 species: C and SW Asia, E and S Europe; two species (one endemic) in China.

The large colorful flowers contribute to the popularity of the plants as cultivated ornamentals. The stems are used as firewood, and the roots are used medicinally.

- 1a. Leaves on proximal part of stem shallowly lobed, central lobe wider than long; pedicel ca. 5 mm at anthesis; corolla often colored, infrequently white; bracts foliaceous 1. *A. rosea*
 1b. Leaves on proximal part of stem deeply lobed, central lobe longer than wide; pedicel 10–20 mm at anthesis; corolla white; bracts absent 2. *A. nudiflora*

1. *Alcea rosea* Linnaeus, Sp. Pl. 2: 687. 1753.

蜀葵 shu kui

Althaea rosea (Linnaeus) Cavanilles; *A. rosea* var. *sinensis* (Cavanilles) S. Y. Hu; *A. sinensis* Cavanilles.

Herbs biennial, erect, to 2(–3) m tall; stem densely hirsute. Stipules ovate, ca. 8 mm, apically 3-lobed; petiole 5–15 cm, stellate hirsute; leaf blade nearly orbicular, palmately 5–7-lobed or crenate-angled, 6–16 cm in diam., papery, abaxially long stellate hirsute or stellate tomentose, adaxially sparsely stellate pilose, lobes triangular or rounded, central lobe ca. 3 × 4–6 cm. Flowers solitary or fascicled, aggregated into a terminal, spikelike inflorescence. Bracts foliaceous. Pedicel ca. 5 mm, 8–10 mm in fruit, stellate hirsute. Epicalyx cup-shaped, usually 6- or 7-lobed, 8–10 mm, densely stellate hirsute, lobes ovate-lanceolate. Calyx campanulate, 2–3 cm in diam., lobes ovate-triangular, 1.2–1.5 cm, densely stellate hirsute. Corolla red, purple, white, pink, yellow, or black-purple, 6–10 cm in diam., sometimes double; petals obovate-triangular, ca. 4 cm, base attenuate, claw tipped with long thin hairs, apex emarginate. Staminal column glabrous, ca. 2 cm; filaments ca. 2 mm. Style branches many, puberulent. Schizocarp disk-shaped, ca. 2 cm in diam., puberulent; mericarps many, nearly orbicular, longitudinally grooved. Fl. Feb–Aug.

• Cultivated. Throughout China [widely introduced throughout temperate regions].

Alcea rosea originated in the SW provinces of China and has been grown in Europe since at least the 15th century. It is cultivated as an

ornamental and is used medicinally. It is not known from any truly wild situations.

2. *Alcea nudiflora* (Lindley) Boissier, Fl. Orient. 1: 833. 1867.

裸花蜀葵 luo hua shu kui

Althaea nudiflora Lindley, Trans. Hort. Soc. London 7: 251. 1830; *A. leucantha* Fischer.

Herbs biennial, to 80 cm tall, stellate pilose. Petiole 4–10 cm, stellate hirsute; leaf blade ovate, both surfaces densely stellate hirsute, base cordate, margin crenate; blades on proximal part of stem 5–6-lobed, those on distal part of stem 3–5-lobed; lobes ovate-oblong, central lobe 8–9 × 4–6 cm. Flowers clustered into a terminal, racemelike inflorescence. Pedicel 10–20 mm, densely stellate hirsute. Foliaceous bracts absent. Epicalyx cup-shaped, 6- or 7-parted, ca. 8 mm in diam., lobes triangular to lanceolate, ca. 5 mm, densely stellate woolly. Calyx cup-shaped, ca. 2 × as long as epicalyx, densely stellate hirsute, lobes triangular-lanceolate. Corolla white, greenish yellow in center, 5–8 cm in diam.; petals obovate, ca. 4 cm, base attenuate into hairy claw, apex emarginate. Staminal column 1–1.5 cm. Style branches many. Schizocarp disk-shaped, ca. 1.5 cm in diam., puberulent. Fl. Jul.

Sunny slopes; 1000 m. NW Xinjiang (Toli) [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Uzbekistan].

This species is very similar to *Alcea rosea* but differs by the longer central lobe of the leaf blade, the absence of leafy bracts, longer pedicels, and the white or greenish yellow corolla.

4. *ALTHAEA* Linnaeus, Sp. Pl. 2: 686. 1753.

药葵属 yao kui shu

Herbs annual to perennial, erect, ± stellate hirsute. Leaves simple; stipules subulate; leaf blade ovate-triangular or palmately 3–5-lobed or -parted. Flowers axillary, solitary or fascicled, sometimes grouped into terminal racemes. Epicalyx lobes 9, cup-shaped, connate basally, stellate hirsute. Calyx cup-shaped, 5-parted. Corolla lavender or pink, funnel-shaped; petals obovate, less than 2 cm, apex shallowly notched. Staminal column cylindric, pubescent; anthers grouped at apex, brownish purple. Ovary 8–25-loculed; ovules 1 per locule, erect; style branches as many as locules; stigma linear, decurrent. Fruit a schizocarp, obovate or disk-shaped, axis disk-shaped, not longer than carpels; mericarps 8–25, semicircular, abaxially channeled, 1-celled and 1-seeded.

About 12 species: C and SW Asia, Europe; one species in China.

1. *Althaea officinalis* Linnaeus, Sp. Pl. 2: 686. 1753.

药葵 yao kui

Althaea kragujevacensis Pančić ex N. Diklić & V. Stevanovic; *A. micrantha* Borbás; *A. sublobata* Stokes; *A. taurinensis* Candolle; *A. vulgaris* Bubani; *Malva althaea* E. H. L.

Krause; *M. maritima* Salisbury; *M. officinalis* (Linnaeus) Schimper & Spenner.

Herbs perennial, erect, ca. 1 m tall; stem densely stellate hirsute. Petiole 1–4 cm, stellate tomentose; leaf blade ovate-orbicular or cordate, 3-lobed or not lobed, 3–8 × 1.5–6 cm, papery, both surfaces densely stellate tomentose, base nearly cordate or rounded, margin bluntly dentate, apex acute. Epicalyx lobes 9, lanceolate, ca. 4 mm, densely stellate strigose. Calyx cup-shaped, persistent, 5-parted, longer than epicalyx, densely stellate hirsute, lobes lanceolate. Corolla pink, ca. 2.5

cm in diam.; petals ca. 1.5 cm, obovate-oblong. Staminal column ca. 8 mm. Ovary 15–25-loculed. Fruit a disk-shaped schizocarp, ca. 8 mm in diam., enclosed by calyx, puberulent. Seeds reniform. Fl. Jul.

Riverbanks. Native in Xinjiang (Tacheng); cultivated in Beijing, Jiangsu (Nanjing), Shaanxi (Xi'an), and Yunnan (Kunming) [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia, Europe].

The roots are used medicinally. They are also the source of mucilage used for confections.

5. MALVASTRUM A. Gray, Mem. Amer. Acad. Arts, n.s., 4: 21. 1849, nom. cons.

赛葵属 sai kui shu

Malveopsis C. Presl.

Herbs perennial (sometimes annual) or subshrubs, erect. Leaves simple; stipules lanceolate or falcate; leaf blade ovate or lanceolate, entire or sometimes obscurely 3-lobed, margin crenate or dentate; foliar nectaries lacking. Flowers axillary, solitary or in cymose clusters, sometimes aggregated into terminal spikes. Epicalyx lobes 3, free, subulate or filiform to lanceolate. Calyx cup-shaped, 5-lobed. Corolla yellow or ± orange, broadly campanulate; petals 5, scarcely longer than calyx. Filament tube included within corolla, glabrous or puberulent; anthers clustered at apex. Ovary 5–18-loculed; ovules 1 per locule; styles as many as carpels, slender; stigmas capitate. Fruit a schizocarp, obovate; mericarps 5–18, indehiscent, reddish brown, horseshoe-shaped with a prominent ventral notch, sometimes 2- or 3-cuspidate. Seeds solitary, reniform, glabrous.

Fourteen species: principally in North, Central, and South America, a few ± pantropical weeds; two species (both introduced) in China.

- 1a. Flowers axillary, solitary (or in few-flowered clusters); mericarps each with 3 prominent cusps, 2 abaxial and 1 apical; stipules lanceolate, 5–7 mm 1. *M. coromandelianum*
 1b. Flowers subterminal, congested into terminal spike; mericarps without cusps; stipules filiform, 4–5 mm 2. *M. americanum*

1. Malvastrum coromandelianum (Linnaeus) Garcke, Bonplandia (Hanover) 5: 297. 1857.

赛葵 sai kui

Malva coromandeliana Linnaeus, Sp. Pl. 2: 687. 1753; *M. tricuspidata* R. Brown; *Malvastrum ruderales* Hance ex Walpers; *M. tricuspidatum* (R. Brown) A. Gray.

Subshrubs, sometimes annual, to 1(–1.5) m tall, most parts pilose and appressed stellate pubescent. Stipules lanceolate, 5–7 mm; petiole 0.7–3 cm, densely pilose; leaf blade ovate-lanceolate or ovate, 3–7 × 0.8–4 cm, abaxially pilose and stellate pilose, adaxially sparsely hairy, base broadly cuneate to rounded, margin coarsely dentate, apex acute or obtuse. Flowers axillary, solitary. Pedicel 3–5(–10) mm, pilose. Epicalyx lobes filiform, ca. 5 × 1 mm, pilose. Calyx shallowly cup-shaped, 5–7 mm in flower, accrescent to 8–11 mm in fruit, lobes ovate, ca. 8 mm, abaxially sparsely pubescent with stellate hairs, adaxially nearly glabrous, apex acuminate. Corolla apricot-yellow, ca. 1.5 cm in diam.; petals obovate, 6–9 × ca. 4 mm. Filament tube ca. 6 mm, glabrous. Schizocarp ca. 6 mm in diam.; mericarps 8–12(–14), reniform, sparsely pubescent with simple hairs mixed with stellate hairs, ca. 2.5 mm in diam., 3-cusped (2 abaxial, 1 apical), endoglossum lacking. Seeds ca. 1 mm in diam.

Weed of fallow fields, dry and open wastelands, or roadsides; near sea level to 500 m. Fujian, Guangdong, Guangxi, Taiwan, Yunnan [India, Japan (Ryuku Islands), Myanmar, Pakistan, Sri Lanka, Vietnam; probably originating in America, now pantropical].

Chinese material can be referred to *Malvastrum coromandelianum* subsp. *coromandelianum*; two further subspecies are recorded from

South America.

The whole plant is used medicinally.

2. Malvastrum americanum (Linnaeus) Torrey, Rep. U. S. Mex. Bound. 2(1): 38. 1859.

穗花赛葵 sui hua sai kui

Malva americana Linnaeus, Sp. Pl. 2: 687. 1753; *M. spicata* Linnaeus; *Malvastrum spicatum* (Linnaeus) A. Gray; *Melochia spicata* (Linnaeus) Fryxell; *Sphaeralcea americana* (Linnaeus) Metz.

Herbs, perennial, or subshrubs, 0.5–1(–3) m, most parts principally stellate pubescent, also with some simple hairs. Stipules filiform, 4–5 mm; petiole 0.5–3.5 cm; leaf blade ovate to oblong, rarely slightly 3-lobed, 2–6(–7) × 1.2–4(–6) cm, both surfaces stellate pubescent, base acute, obtuse, or truncate to slightly cordate, margin serrate, apex acute to acuminate. Flowers congested into a dense short terminal spike, 1.5–3(–10) × ca. 1 cm, usually only 1 flower open at a time. Epicalyx lobes filiform to lanceolate, acuminate, 8–10 × 1.5–2.5 mm, abaxially hispid with simple or bifurcate hairs and minute stellate hairs, adaxially glabrous. Calyx shallowly cup-shaped, 5–6 mm in diam., accrescent to 6–10 mm in fruit, lobes triangular, ca. 4 × 3 mm, abaxially densely hirsute, adaxially minutely stellate pubescent, apex acuminate. Corolla yellow, 1.3–1.7 cm in diam.; petals obliquely obovate, claw stellate ciliate, apex asymmetrically emarginate. Filament tube 2–3 mm, stellate pubescent. Mericarps (5–)8–15(–18), nearly orbicular, (1–)2–2.5 × 1.5–3(–5) mm in diam., cusps absent, endoglossum usually present, minute. Seeds gray, reniform, 1.2–1.7 mm in diam., glabrous.

Weed of semi-arid areas. Fujian, Taiwan [India, Indonesia, Philippines]; Australia, North and South America; naturalized pantropical weed].

Chinese material can be referred to *Malvastrum americanum* var. *americanum*. *Malvastrum americanum* var. *stellatum* S. R. Hill is restricted to Australia.

6. SIDA Linnaeus, Sp. Pl. 2: 683. 1753.

黄花稔属 huang hua ren shu

Herbs perennial or annual, subshrubs or shrubs, to 2 m, most parts with stellate, simple and/or glandular hairs. Leaves simple; stipules threadlike to narrowly lanceolate; leaf blade entire (sometimes lobed), margin usually dentate, without foliar nectaries. Flowers solitary or paired, axillary or subterminal, often in axillary or terminal racemes or panicles, rarely in umbels or glomerules. Epicalyx absent. Calyx campanulate or cup-shaped, 5-lobed, often 10-ribbed basally and plicate in bud. Corolla mostly yellow, rarely white or ± orange [or rose or purplish], sometimes with a dark center. Petals 5, free, basally connate. Filament tube pubescent or glabrous, with many anthers at apex. Ovary 5–10-loculed; ovules 1 per locule, pendulous; style branches as many as carpels; stigma capitate. Schizocarp ± disk-shaped or globose; mericarps (4–)5–10(–14), sculptured or smooth, sometimes partly membranous, mostly beaked, often with 1 or 2 apical awns, often minutely stellate puberulent, dehiscent or indehiscent. Seeds 1 per mericarp, smooth, glabrous except sometimes for minute hairs around hilum.

Between 100 to 150 species: Africa, Asia, Australia, North and South America, Pacific islands; ca. 2/3 of the species American; 14 species (six endemic) in China.

Many species of this genus are used as fiber sources. Some species are widespread ruderals with sporadic distributions. Material with fully mature fruits is needed for reliable determinations. Studies of African material have demonstrated that there are superficially similar species that differ most obviously in details of mericarp morphology, and detailed studies have led to the recognition of more, rather than fewer, taxa. More information is needed on variation within populations, particularly in mericarp morphology, to assess the status of the awnless species of *Sida*, as there are indications that awned and awnless mericarps can occur on the same plant, thereby suggesting a possible reduction in species numbers.

Sida cavaleriei H. Léveillé is a synonym of *Alectra arvensis* (Benth) Merrill in the Scrophulariaceae (see Fl. China 18: 86. 1998).

- 1a. Calyx adaxially with long simple hairs at least along veins; mericarps smooth, thin-walled, not dehiscent.
 - 2a. Herbs erect; pedicel 2–6(–15) mm; live plants sticky, with inconspicuous glandular hairs as well as stellate and/or simple hairs 11. *S. mysorensis*
 - 2b. Herbs or subshrubs procumbent; pedicel (1–)2–4 cm; plants not sticky, without glandular hairs.
 - 3a. Stems both stellate puberulent and simple pilose, never rooting at nodes; mericarps without distinct awns 12. *S. cordata*
 - 3b. Stems subglabrous or stellate puberulent, rooting at nodes; mericarps with 2 short awns 13. *S. javensis*
- 1b. Calyx adaxially stellate pubescent or glabrous, sometimes with ciliate margins; mericarps smooth, vertically grooved or reticulately wrinkled, sometimes dehiscent.
 - 4a. Mericarp awns conspicuous, 3–8 mm, retrorsely barbed.
 - 5a. Leaf blade 5–10 cm; corolla 2–3.5 cm in diam.; filament tube glabrous 7. *S. subcordata*
 - 5b. Leaf blade 1–5 cm; corolla less than 1.5 cm in diam.; filament tube with long hairs 8. *S. cordifolia*
 - 4b. Mericarp awns absent or less than 2 mm, hairs if present ± spreading.
 - 6a. Flowers fascicled or in umbel-like or subpaniculate inflorescences.
 - 7a. Leaf blade ovate, base cordate 9. *S. cordifolioides*
 - 7b. Leaf blade obovate, broadly elliptic, or orbicular, base rounded or obtuse 10. *S. yunnanensis*
 - 6b. Flowers usually solitary, axillary or subterminal, sometimes in racemelike axillary shoots.
 - 8a. Leaves distichous; leaf blade base rounded or obtuse; stipules unequal, one filiform with a single vein, the other linear-lanceolate with 2 or more veins; calyx and mericarps often glabrous 3. *S. acuta*
 - 8b. Leaves spiral; leaf blade base cuneate to minutely rounded; stipules equal; calyx hairy; mericarps often with apex ± puberulent.
 - 9a. Mericarps without awns.
 - 10a. Leaf blade obovate, oblong, or suborbicular, 0.5–2 cm; petiole 2–4 mm 1. *S. chinensis*
 - 10b. Leaf blade ovate to linear-lanceolate, 2–7 cm; petiole 8–20 mm 2. *S. orientalis*
 - 9b. Mericarps with awns.
 - 11a. Petiole 5–11 mm.
 - 12a. Leaf margin irregularly sharply dentate to double dentate; calyx sparsely stellate pilose 4. *S. szechuensis*
 - 12b. Leaf margin entire near base, otherwise obtusely denticulate; calyx densely stellate pubescent 14. *S. quinquevalvacea*
 - 11b. Petiole 3–5(–8) mm.
 - 13a. Calyx stellate pubescent; filament tube glabrous; mericarps 7–10 5. *S. rhombifolia*
 - 13b. Calyx stellate tomentose; filament tube hairy; mericarps 6–8 6. *S. alnifolia*

1. *Sida chinensis* Retzius, *Observ. Bot.* 4: 29. 1786.

中华黄花稔 zhong hua huang hua ren

Shrubs erect, many branched, to 0.7 m tall, most parts densely stellate tomentose. Stipules subulate; petiole 2–4 cm, stellate tomentose; leaf blade obovate, oblong, or suborbicular, 5–20 × 3–10 mm, abaxially stellate tomentose, adaxially sparsely stellate hairy or subglabrous. Flower solitary, axillary. Pedicel ca. 1 cm, stellate tomentose, articulate at middle. Calyx campanulate, ca. 6 mm in diam., abaxially densely stellate tomentose, lobes triangular, ca. 2.5 mm. Corolla yellow, ca. 1.2 cm in diam.; petals obovate, ca. 6 mm. Filament tube ca. 4 mm, hirsute, filaments slender; anthers yellow. Schizocarp globose, ca. 4 mm in diam., upper surface broadly conical with prominent radial grooves; mericarps 7 or 8, enclosed by persistent calyx, smooth, pilose apically, apex not awned. Fl. winter–spring.

- Sunny slopes, streamsides. Hainan, Taiwan, Yunnan.

Some material named as *Sida chinensis* looks much like a hairy form of *S. acuta* with very acute but awnless sculptured mericarps.

2. *Sida orientalis* Cavanilles, *Diss.* 1: 21. 1785.

东方黄花稔 dong fang huang hua ren

Subshrubs erect, to 2 m tall; stems densely stellate woolly. Leaves dimorphic; stipules subulate, 3–5 mm, caducous; petiole of lower leaves ca. 2 mm, of upper leaves 8–10 mm, densely shortly stellate woolly; blades on proximal part of stem ovate, 4–7 × ca. 3 cm, both surfaces densely shortly stellate woolly, base nearly rounded, margin crenate, apex acute, those on distal part of stem linear-lanceolate to lanceolate, 2–4 × 0.5–1 cm. Flowers solitary, axillary or terminal. Pedicel 1.5–3 cm, densely shortly stellate woolly and with long silk hairs, articulate near apex. Calyx cup-shaped, ca. 8 mm, abaxially densely stellate woolly, lobes triangular, apices acute. Corolla yellow; petals ca. 14 mm. Filament tube ca. 6 mm, hirsute. Schizocarp ± disk-shaped, ca. 6 mm in diam.; mericarps 8 or 9, ca. 4 mm, wrinkled, minutely hairy, apex not awned. Fl. autumn–winter.

- Sunny dry slopes; 1000–2300 m. Taiwan, S Yunnan [?India].

The status of Chinese plants named as *Sida orientalis* needs more investigation. Borssum Waalkes (*Blumea* 14: 197. 1966) identified possible type material of *S. orientalis* as the following species, *S. acuta* N. L. Burman. The material identified by Hu (*Fl. China, Malvaceae* [Fam. 153], 14. 1955) as *S. orientalis* is much more closely related to *S. rhombifolia* Linnaeus, differing only by the absence of mericarp awns, a feature that is not as reliable as assumed by most authors, as specimens have been seen with both awned and awnless mericarps on the same plant.

3. *Sida acuta* N. L. Burman, *Fl. Indica*, 147. 1768.

黄花稔 huang hua ren

Malvastrum carpinifolium (Linnaeus f.) A. Gray; *Sida acuta* subsp. *carpinifolia* (Linnaeus f.) Borssum Waalkes; *S. acuta* var. *carpinifolia* (Linnaeus f.) K. Schumann; *S. acuta* var. *intermedia* S. Y. Hu; ?*S. bodinieri* Gandoger; *S. carpinifolia* Linnaeus f.; *S. carpinifolia* var. *acuta* (N. L. Burman) Kurz; ?*S. chanetii* Gandoger; *S. lanceolata* Retzius; *S. scoparia* Loureiro; *S. stauntoniana* Candolle.

Subshrubs or herbs erect, 1–2 m tall. Branchlets pilose or

subglabrous. Leaves ± distichous; stipules filiform, 4–6 mm, often longer than petiole, usually persistent; petiole 4–6 mm, sparsely pilose; leaf blade ovate, oblong, lanceolate, or linear-lanceolate, 2–5 × 0.4–1 cm, both surfaces glabrous or sparsely stellate pilose, rarely with simple hairs adaxially, base obtuse, margin dentate, sometimes partly entire toward its base, apex acute or acuminate. Flowers solitary or paired, axillary, sometimes congested at stem apex. Pedicel 4–12 mm, pilose, articulate at middle. Calyx shallowly cup-shaped, connate in basal 1/2, ca. 6 mm, mostly glabrous, margins often ciliate, lobes 5, caudate. Corolla yellow, less often white or yellow-orange, 8–10 mm in diam.; petals obovate, 6–7 mm, ciliate, base attenuate, apex rounded. Filament tube ca. 4 mm, sparsely hirsute. Schizocarp nearly globose; mericarps (4–)6(–9), segmentiform-tetrahedral, ca. 3.5 mm, basally transversely ridged, side walls reticulate-veined, glabrous, apex beaked, ± extending into 2 awns, apically dehiscent. Seed trigonous, ca. 2 mm, glabrous except around hilum. Fl. winter–spring.

Scrub, roadsides, wastelands. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Bhutan, Cambodia, India, Laos, Nepal, Thailand, Vietnam].

The glabrous calyx is usually diagnostic for *Sida acuta*. *Sida bodinieri* was described as glabrous and if correctly placed in *Sida* would most likely belong under *S. acuta*. *Sida chanetii* was related by the original author to *S. acuta* but it was based on a collection from near Beijing, well north of any other records for *Sida*, and so its identity needs confirmation.

The bark is a good fiber source, and the roots are used medicinally.

4. *Sida szechuensis* Matsuda, *Bot. Mag. (Tokyo)* 32: 165. 1918.

拔毒散 ba du san

Subshrubs erect, to 1 m tall. Branchlets stellate pubescent. Stipule subulate, shorter than petiole; petiole 5–10 mm, stellate pubescent; leaf blade broadly rhombic to flabellate to oblong-elliptic to oblong, 2–5 × 2.5–5 cm; blades on distal part of stem smaller and relatively narrower, abaxially densely gray stellate tomentose, adaxially sparsely stellate pubescent to subglabrous, base rounded to cuneate, margin irregularly dentate to double dentate, apex acute to obtuse, rounded. Flower solitary, axillary, often congested at shoot apex. Pedicel 0.6–1.5 cm, densely stellate pubescent and viscid-hairy, articulate above middle. Calyx cup-shaped, ca. 7 mm, lobes triangular, sparsely stellate pilose. Corolla yellow, 1–1.5 cm in diam.; petals obovate, ca. 8 mm. Filament tube ca. 5 mm, long hirsute. Schizocarp nearly globose, ca. 6 mm in diam.; mericarps 8 or 9, segmentiform, ca. 3 mm, obscurely transversely wrinkled to base, side walls veined, abaxially grooved near apex, upper surface stellate puberulent, beak acuminate, splitting from apex, each side merging into a flattened, ca. 0.7 mm awn. Seeds black-brown, ca. 2 mm, smooth, white pilose. Fl. Jun–Nov.

- Scrub, streamsides, roadsides; 300–1800 m. Guangxi, Guizhou, Sichuan, Yunnan.

The fibers are widely used, and the entire plant is of medicinal use.

5. *Sida rhombifolia* Linnaeus, *Sp. Pl.* 2: 684. 1753.

白背黄花稔 bai bei huang hua ren

Malva rhombifolia (Linnaeus) E. H. L. Krause; *Sida alba* Cavanilles (1785), not Linnaeus (1763); *S. insularis* Hatusima; *S. rhombifolia* subsp. *insularis* (Hatusima) Hatusima; *S. rhombifolia* var. *rhomboidea* (Roxburgh ex Fleming) Masters; *S. rhomboidea* Roxburgh ex Fleming.

Subshrubs erect or prostrate, many branched, to ca. 1 m tall. Branchlets stellate. Stipules spinelike, 3–5 mm; petiole 2–5(–8) mm, stellate puberulent; leaf blade rhombic to oblong-lanceolate or obovate, rarely linear-lanceolate, 1–4.5 × 0.6–2 cm, abaxially gray-white stellate pilose, adaxially sparsely stellate pilose to subglabrous, base broadly cuneate, margin dentate, apex obtuse to acute. Flowers solitary, axillary. Pedicel 1–2.5 cm, densely stellate tomentose, articulate above middle. Calyx cup-shaped, 4–5 mm, abaxially stellate pubescent, lobes triangular, apices acute. Corolla ca. 1 cm in diam.; petals yellow, obovate, ca. 8 mm, base attenuate, apex rounded. Filament tube 4–5 mm, glabrous. Style branches 8–10. Fruit semiglobose to broadly turbinate, 6–7 mm in diam.; mericarps 7–10, 2.5–3 mm excluding awn, shallowly grooved to near base, eventually dehiscent, side walls usually thin, not veined, stellate puberulent, apex usually (1 or)2-awned, awns to 1.5 mm. Seeds reniform, ca. 2 mm, blackish. Fl. autumn–winter.

Scrub, open slopes, streamsides. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Sichuan, Taiwan, Yunnan [Bhutan, Cambodia, India, Laos, Nepal, Thailand, Vietnam; pantropical].

The entire plant is used medicinally.

Sida rhombifolia is the type species of the genus *Sida*. The taxonomy of this species/species complex is controversial and is discussed by Verdcourt (Kew Bull. 59: 233–239. 2005). The lectotype of *S. rhombifolia* almost certainly came from Jamaica, not India as suggested by some authors, and is a match with neither African nor Asian material. Verdcourt recognized six varieties for East African material, differing most obviously in mericarp morphology: most notably the degree of dehiscence, which varies from completely indehiscent to dehiscing by an apical slit to breaking into two valves, the degree of sculpturing, and the presence or not of awns. Chinese material appears to have a comparable range of variation, though many collections lack fully mature mericarps, and more detailed studies could lead to the recognition of more, comparable taxa.

Hu (Fl. China, Malvaceae [Fam. 153], 20–21. 1955) recognized two varieties, var. *rhombifolia* and var. *corynocarpa* (Wallich ex Masters) S. Y. Hu (Fl. China, Malvaceae [Fam. 153], 20. 1955), differing only in minor quantitative characters. The validity of var. *corynocarpa* is open to question, as Masters (Fl. Brit. India 1: 324. 1874) only mentioned the supposed basionym "*Sida corynocarpa*" in a note under *S. rhombifolia* var. *retusa* and therefore cannot be said to have accepted it as a species. Plants with prostrate stems from Taiwan, Japan (Ryukyu Islands), and the Philippines have been placed in *S. rhombifolia* subsp. *insularis*. Their status needs more detailed investigation. Borssum Waalkes included *S. alnifolia* Linnaeus within *S. rhombifolia* as var. *retusa*.

Hu 12784, from Hong Kong, has 10 indehiscent mericarps per flower, each with a single awn, suggesting a relationship to *Sida rhombifolia* var. *maderensis* (Lowe) Lowe (*S. maderensis* Lowe; *S. unicornis* Marais). That taxon has rather more strongly sculptured mericarps than *Hu 12784*, which might represent a distinct taxon.

6. *Sida alnifolia* Linnaeus, Sp. Pl. 2: 684. 1753.

梣叶黄花稔 qi ye huang hua ren

Subshrub or shrubs erect, 1–2 m tall. Branchlets thin, stellate pilose. Stipules subulate, usually shorter than petiole; petiole 2–8 mm, stellate pilose; leaf blade obovate, ovate, ovate-lanceolate, or nearly orbicular, 2–5 × 0.3–3 cm, abaxially stellate velutinous, adaxially stellate pilose, base rounded to cuneate, margin regularly dentate to crenately serrulate, apex acute to rounded. Flowers solitary, axillary. Pedicel to 3 cm, articulate in distal 1/2, densely stellate tomentose. Calyx cup-shaped, 6–8 mm, stellate tomentose, lobes triangular. Corolla yellow, ca. 1 cm in diam.; petals obovate, ca. 1 cm. Filament tube 4–5 mm, hirsute. Schizocarp subglobose; mericarps 6–8, ca. 3 mm, hairy, apex 2-awned. Fl. Jul–Dec.

Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Taiwan, Yunnan [India, Thailand, Vietnam].

This species is very similar to *Sida rhombifolia*. It differs in having a hirsute filament tube and 6–8 mericarps per flower, while *S. rhombifolia* has a glabrous filament tube and 8–10 mericarps. It has been confused with *S. fallax* Walpers, described from Hawaii. The treatment of the taxa included within this species has varied greatly between all the accounts that have dealt with them. Four varieties are tentatively accepted here but as with *S. rhombifolia* there is a need for much more detailed studies.

- 1a. Leaf blade 2–5 cm; mericarps velutinous 6a. var. *alnifolia*
- 1b. Leaf blade less than ca. 2 cm; mericarps villous at apex or pubescent.
 - 2a. Pedicel to 3 cm; leaf blade orbicular 6d. var. *orbiculata*
 - 2b. Pedicel less than 1 cm; leaf blade ovate, oblong, or obovate.
 - 3a. Leaf blade ovate or oblong, margin dentate; mericarps villous at apex 6b. var. *microphylla*
 - 3b. Leaf blade oblong or obovate, margin crenately serrulate; mericarps pubescent 6c. var. *obovata*

6a. *Sida alnifolia* var. *alnifolia*

梣叶黄花稔(原变种) qi ye huang hua ren (yuan bian zhong)

Sida retusa Linnaeus; *S. rhombifolia* Linnaeus subsp. *retusa* (Linnaeus) Borssum Waalkes; *S. rhombifolia* var. *retusa* (Linnaeus) Masters.

Petiole to 8 mm; leaf blade 2–5 × 0.8–3 cm, margin dentate. Filament tube hirsute. Mericarps velutinous.

Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Taiwan, Yunnan [India, Thailand, Vietnam].

6b. *Sida alnifolia* var. *microphylla* (Cavanilles) S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 22. 1955.

小叶黄花稔 xiao ye huang hua ren

Sida microphylla Cavanilles, Diss. 1: 22. 1785; *S. rhombifolia* var. *microphylla* (Cavanilles) Masters.

Petiole 2–3 mm; leaf blade oblong to ovate, 0.5–2 × 0.3–1.5 cm, margin dentate. Pedicel less than 1 cm. Filament tube hirsute. Mericarps apically long hairy.

Fujian, Guangdong, Guangxi, Hainan, Yunnan [India].

6c. *Sida alnifolia* var. *obovata* (Wallich ex Masters) S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 22. 1955.

倒卵叶黄花稔 *dao luan ye huang hua ren*

Sida rhombifolia Linnaeus var. *obovata* Wallich ex Masters, Fl. Brit. India 1: 324. 1874.

Leaf blade oblong to obovate, 0.5–2 × 0.4–1.2 cm, margin denticulate. Pedicel 8–10 mm. Filament tube long hirsute. Mericarps puberulent.

Guangdong, Guangxi, Hainan, Yunnan [India].

6d. *Sida alnifolia* var. *orbiculata* S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 22. 1955.

圆叶黄花稔 *yuan ye huang hua ren*

Petiole ca. 5 mm, densely stellate pilose; leaf blade orbicular, 0.5–1.3 cm in diam., both surfaces stellate hirsute, margin crenate. Flower solitary. Pedicel ca. 3 cm. Calyx stellate tomentose, lobes apically ciliate. Filament tube long hirsute.

• Guangdong.

7. *Sida subcordata* Spanoghe, Linnaea 15: 172. 1841.

榛叶黄花稔 *zhen ye huang hua ren*

Sida corylifolia Wallich ex Masters.

Subshrubs erect, 1–2 m tall; most parts sparsely stellate puberulent, simple hairs absent. Stipule filiform, 3–4 mm; petiole 2–6 cm; leaf blade orbicular or ovate, 5–10 × 3–7.5 cm, base rounded, margin minutely crenate, apex shortly acuminate. Flowers mostly subterminal, in umbel-like terminal clusters, often on reduced axillary, 2–7 cm shoots. Pedicel 0.6–2.5 cm, articulate at middle, sparsely stellate pilose. Calyx 8–11 mm, sparsely stellate pilose, lobes 5, triangular. Corolla yellow, 2–3.5 cm in diam.; petals 5, obovate, ca. 1.2 cm. Filament tube ca. 1 cm, glabrous, filaments numerous, slender, ca. 3 mm. Style branches 8–9. Schizocarp nearly globose; mericarps 8 or 9, with vertical grooves, apex 2-awned, exceeding calyx, awn 3–6 mm, retrorsely hispid. Seeds ovoid, apex densely brown puberulent. Fl. winter–spring.

Margins of open forests, grasslands, roadsides. Guangdong, Guangxi, Hainan, Yunnan [India, Indonesia, Laos, Myanmar, Thailand, Vietnam].

Sida subcordata is very variable in leaf shape and density of indumentum, but the combination of the large leaves and flowers and conspicuously retrorsely hispid mericarp awns is diagnostic. Borssum Waalkes (Blumea 14: 202. 1964) speculated that the species may have arisen through hybridization between *S. rhombifolia* Linnaeus and *S. cordifolia* Linnaeus, but this needs to be verified.

The entire plant is used medicinally.

8. *Sida cordifolia* Linnaeus, Sp. Pl. 2: 684. 1753.

心叶黄花稔 *xin ye huang hua ren*

Sida herbacea Cavanilles; *S. holosericea* Willdenow ex Sprengel; *S. hongkongensis* Gandoger; *S. rotundifolia* Lamarck ex Cavanilles.

Subshrubs erect, ca. 1 m tall. Branchlets, stipules, petioles, and leaves densely stellate strigose; branchlets and petioles velutinous, hairs ca. 3 mm. Stipule filiform, ca. 5 mm; petiole 1–2.5 cm; leaf blade ovate, 1.5–5 × 1–4 cm, abaxially velutinous on veins, base minutely cordate or rounded, margin crenate, apex obtuse to rounded. Flower solitary or fascicled, axillary or terminal. Pedicel 5–15 mm, densely stellate pilose and with long hairs, articulate in distal part. Calyx cup-shaped, lobes triangular, 5–6 mm, densely stellate pilose and with long hairs. Corolla yellow, ca. 1.5 cm in diam.; petals oblong, 6–8 mm. Filament tube ca. 6 mm, hirsute. Schizocarp 6–8 mm in diam.; mericarps 10, with vertical grooves, apex 2-awned, awn 3–4 mm, exceeding calyx, retrorsely barbed. Seeds long ovoid, apex hairy. Fl. year-round.

Scrub on slopes, grassy roadsides. Fujian, Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan [Bhutan, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand; Africa, South America; ± pantropical].

9. *Sida cordifolioides* K. M. Feng, Acta Bot. Yunnan. 4: 27. 1982.

湖南黄花稔 *hu nan huang hua ren*

Subshrublike herbs erect, many branched, to 40 cm tall. Stem and branchlets stellate pilose or subglabrous. Stipules filiform, ca. 6 mm, stellate pilose; petiole 6–20 mm, sparsely stellate pilose; leaf blade ovate, 1.4–4 × 0.6–2.2 cm, abaxially stellate pilose, adaxially subglabrous or sparsely stellate pilose, base cordate. Flower solitary or nearly fascicled, axillary. Pedicel 4–7 mm, sparsely stellate pilose, articulate near apex. Calyx campanulate, ca. 4 mm, stellate pilose. Corolla yellow, ca. 8 mm in diam.; petals obovate-lanceolate. Filament tube sparsely strigose. Mericarps 5, with vertical grooves, densely stellate pilose, apically 2-awned.

• Hunan (Yongshun).

Sida cordifolioides is very similar to *S. cordifolia* Linnaeus, but differs by the uniformly stellate pilose stems and fruits with five mericarps. *Sida cordifolia* has stems with prominent simple hairs as well as stellate hairs and fruits with 10 mericarps.

10. *Sida yunnanensis* S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 16. 1955.

云南黄花稔 *yun nan huang hua ren*

Sida yunnanensis var. *longistyla* J. L. Liu; *S. yunnanensis* var. *viridicaulis* J. L. Liu; *S. yunnanensis* var. *xichangensis* J. L. Liu.

Subshrubs erect, to 1 m tall. Branchlets stellate puberulent. Stipule filiform, ca. 5 mm; petiole 3–7 mm, stellate; leaf blade obovate, elliptic, or orbicular, 1–4 × 0.5–3 cm, abaxially stellate tomentose, adaxially sparsely minutely stellate puberulent to glabrous, base obtuse, margin dentate, apex obtuse to acute. Flowers subterminal, ± apically congested, mostly on reduced axillary shoots. Pedicel 3–4 mm at anthesis, to 1.5 cm in fruit, stellate puberulent, apically articulate. Calyx ca. 4 mm, minutely stellate puberulent, lobes triangular, acute to slightly acuminate. Corolla yellow, ca. 1 cm in diam.; petals obovate-lanceolate, ca. 8 mm. Filament tube usually hirsute. Mericarps

5–7, with vertical grooves, 3–4 mm, densely stellate, usually apically 2-awned. Fl. autumn–winter.

• Scrub on slopes, grassy roadsides. Guangdong, Guangxi, Guizhou, Sichuan, Yunnan.

The original author suggested that *Sida yunnanensis* was related to *S. spinosa* Linnaeus, but it is distinguished by the broadly elliptic or obovate leaf blades (ovate-lanceolate in *S. spinosa*), shorter petioles (3–7 mm as opposed to 2–20 mm in *S. spinosa*), and the absence of the short nodal spines characteristic of *S. spinosa*. Paul (Fl. India 3: 290. 1993) included *S. yunnanensis* within *S. rhombifolia* var. *rhombifolia*, while Abedin (Fl. W. Pakistan 130: 81. 1979) accepted it and extended it to include material from India, Kashmir, Myanmar, and Pakistan.

11. *Sida mysorensis* Wight & Arnott, Prodr. Fl. Ind. Orient. 1: 59. 1834.

粘毛黄花稔 nian mao huang hua ren

Sida glutinosa Roxburgh, Fl. Ind., ed. 1832, 3: 172. 1832, not Cavanilles (1785); *S. urticifolia* Wight & Arnott (1834), not A. St.-Hilaire (1829); *S. wightiana* D. Dietrich.

Herbs subshrublike, erect, to 1 m tall. Stem with minute stellate hairs, multicellular glandular hairs, and long simple hairs. Stipule filiform, ca. 5 mm; petiole 1–3 cm, pilose; leaf blade ovate-cordate, 3–6 × 2.5–4.5 cm, viscid-stellate on both surfaces with minute stellate hairs and multicellular glandular hairs, base cordate, margin crenate, apex acuminate. Flowers solitary or paired, axillary or subterminal, often on congested reduced axillary shoots. Pedicel slender, 2–6(–15) mm, articulate at or above middle. Calyx widely campanulate, 6–8 mm, sparsely pilose with long hairs, lobes 2.5–3 × ca. 2.5 mm, acute or acuminate. Corolla yellow, 1–1.2 cm in diam.; petals obtriangular, glabrous. Filament tube strigose. Schizocarp nearly globose, 3–4 mm in diam.; mericarps 5, ovoid-tetrahedral, ca. 2.5 mm, smooth, apex shortly hairy, not awned, shortly acute, enclosed in persistent calyx. Seeds ovoid, slightly 3-sided, ca. 2 mm, glabrous.

Forest margins, slopes, grassy roadsides. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Cambodia, India, Indonesia, Laos, Philippines, Thailand, Vietnam].

Sida mysorensis is often confused with the closely related species *S. javensis* Cavanilles and *S. cordata* (N. L. Burman) Borssum Waalkes but can usually be distinguished by the presence of glandular hairs and the erect habit.

12. *Sida cordata* (N. L. Burman) Borssum Waalkes, Blumea 14: 182. 1966.

长梗黄花稔 chang geng huang hua ren

Melochia cordata N. L. Burman, Fl. Indica, 143. 1768; *Sida humilis* Cavanilles; *S. humilis* var. *veronicifolia* (Lamarck) Masters; *S. multicaulis* Cavanilles; *S. veronicifolia* Lamarck; *S. veronicifolia* var. *humilis* (Cavanilles) K. Schumann; *S. veronicifolia* var. *multicaulis* (Cavanilles) E. G. Baker.

Subshrubs procumbent, to 1 m. Stems slender, with simple pilose hairs, stiffly stellate hairs, and sometimes small simple multicellular hairs. Stipule filiform, 2–3 mm, sparsely pilose; petiole 1–3 cm, with conspicuous long simple hairs; leaf blade broadly ovate, (1–)2–5 × 1.8–4.5 cm, both surfaces stellate pu-

berulent and ± appressed pilose, base cordate, margin crenate or dentate, apex acuminate. Flowers usually solitary, axillary, often on leafy, racemelike, axillary shoots. Pedicel slender, 1.5–4 cm, articulate on distal part, sparsely stellate and with long hairs. Calyx cup-shaped, 4–6 mm, sparsely pilose with long hairs, lobes 2–3 mm, acute. Corolla yellow, 8–9 mm in diam. Filament tube ca. 2 mm, glabrous or sparsely pilose. Schizocarp nearly globose, ca. 3 mm in diam.; mericarps 5, ovoid-tetrahedral, ca. 2.5 mm, smooth, glabrous or sparsely minutely hairy at apex, apex not beaked, not awned. Fl. Jul–Feb.

Scrub, grassy roadsides. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [India, Philippines, Sri Lanka, Thailand; pantropical species of unknown origin].

Sida cordata var. *nasirii* Abedin was erected for a group of specimens from Pakistan with distinctive, very slender, purple pedicels.

13. *Sida javensis* Cavanilles, Diss. 1: 10. 1785.

爪哇黄花稔 zhao wa huang hua ren

Sida veronicifolia Lamarck var. *javensis* (Cavanilles) E. G. Baker.

Herbs procumbent, 50–70 cm tall, rooting at nodes. Stems, petiole, and pedicels subglabrous or sparsely stellate strigose, sometimes sparsely pilose. Stipule subulate, ca. 2 mm; petiole 1–3 cm; leaf blade ovate or subcordate, sometimes obscurely 3-lobed, 1–3 × 1–2 cm, abaxially stellate strigose, adaxially sparsely strigose, base subcordate, margin dentate, apex obtuse. Flower solitary, axillary, mostly subterminal. Pedicel 2–2.5(–3.5) cm. Calyx 4–5 mm, sparsely pilose with long hairs. Corolla yellow; petals slightly longer than sepals. Filament tube glabrous. Schizocarp globose, ca. 3 mm in diam.; mericarps 5, segmentiform with sharp angles, ca. 2.5 mm, smooth, minutely hairy apically, with 2 tightly convergent awns to 1.5 mm, side walls thin, partly disintegrating.

Taiwan [Indonesia, Malaysia, Philippines; ?Africa].

This species is similar to *Sida cordata*; differences found in this species are the much sparser, not viscid, indumentum on the stems, stems that root adventitiously at the nodes, the glabrous filament tube, and the 2-awned mericarps.

Borssum Waalkes (Blumea 14: 184–186. 1964) recognized two subspecies, subsp. *javensis*, which is found in China, and subsp. *ex-pilosa* Borssum Waalkes, presumed to be native to the West Indies but also found in Indonesia and the Philippines. The latter subspecies is distinguished by its unlobed (vs. ± 3-lobed) leaf blades, shorter pedicels and calyx, and presence of simple hairs intermixed with the stellate hairs.

14. *Sida quinquevalvacea* J. L. Liu, Acta Bot. Yunnan. 14: 261. 1992.

五月黄花稔 wu pan huang hua ren

Shrubs erect or procumbent, many branched, to 1 m tall, most parts densely stellate tomentose. Stipules linear, 4–7 mm, caducous; petiole 8–11 mm, densely stellate pubescent; leaf blade elliptic, obovate-elliptic, to broadly obovate, (1–)2–5.6 × (0.4–)1.4–4.6 cm, papery, abaxially densely stellate pubescent, adaxially sparsely stellate pubescent or glabrescent, base broadly cuneate, obtuse or nearly rounded, margin entire near

base, otherwise obtusely denticulate, apex obtuse, rounded or emarginate. Flowers solitary or fascicled near twig tip, axillary. Pedicel (2.5–)4–7 mm, densely stellate pubescent. Calyx cup-shaped, densely stellate pubescent, lobes triangular, ca. 2 mm, apex acuminate or acute, persistent. Corolla yellow, 1.2–1.5 cm in diam.; petals obovate or obovate-triangular, 6–8 × 6–7 mm. Filament tube ca. 3 mm, sparsely hispid. Schizocarp 5-angled,

3.5–4 mm in diam.; mericarps 5(or 6), densely stellate pubescent, apex awned, awn 0.5–1 mm. Seeds triangular-obovoid, black. Fl. May–Oct, fr. Jul–Nov.

• Forest understories, wastelands, roadsides, growing with *Sida szechuensis*; 1100–1600 m. SW Sichuan.

This species is known to us only from the protologue.

7. WISSADULA Medikus, Malvenfam. 24. 1787.

隔蒴苘属 ge shuo qing shu

Herbs or subshrubs, annual or perennial, usually erect, stellate hairy or sometimes glabrate, sometimes with long simple hairs. Leaves simple; leaf blade ovate to narrowly triangular, without foliar nectaries, base cordate, margin entire or crenate-dentate, apex acuminate. Flowers axillary or subterminal, usually grouped into terminal panicles. Pedicels articulate. Epicalyx absent. Calyx shallowly cup-shaped to campanulate, lobes 5, longer than tube. Corolla yellow, cream, or white, small, ± rotate; petals 5, connate at base, adnate to filament tube. Filament tube shorter than free portions of filaments; anthers all terminal, not exserted. Ovary 3–5-loculed; ovules 3 per locule, usually erect; style arms as many as locules, filiform, longer than filaments; stigmas capitate. Fruit a schizocarp but septicial dehiscence often incomplete (i.e., pseudocapsular), obconical; mericarps 3–5, eventually dehiscent, transversely divided by an internal septum into an indehiscent proximal cell and a dehiscent terminal cell, apex beaked. Seeds 1–3 per mericarp, 1 in proximal cell and usually 2 in distal cell, pubescent (seed in proximal cell more densely so).

Between 25 to 30 species: mainly in tropical America with a few in tropical Asia and Africa; one species in China.

1. *Wissadula periplocifolia* (Linnaeus) C. Presl ex Thwaites, Enum. Pl. Zeyl. 27. 1858.

隔蒴苘 ge shuo qing

Sida periplocifolia Linnaeus, Sp. Pl. 2: 684. 1753; *Abutilon periplocifolium* (Linnaeus) Sweet; *S. periplocifolia* var. *zeylanica* Candolle; *Wissadula rostrata* (Schumacher & Thoning) J. D. Hooker var. *zeylanica* Masters; *W. zeylanica* Medikus, nom. illeg. superfl.

Subshrubs, ca. 1 m tall. Stems densely fawn stellate puberulent, with both stellate and simple hairs. Stipules subulate, ca. 3 mm; petiole 0.3–2 cm, stellate tomentose and with twisted hairs; leaf blade long triangular, ovate, or ovate-lanceolate, 3–7 × 1.5–2.5 cm, abaxially stellate tomentose, adaxially minutely stellate pubescent, base truncate to subcordate, margin entire or shallowly undulate, apex long acuminate to acute. Lower flow-

ers solitary, axillary, upper flowers in lax, terminal panicles to 80 cm. Pedicel 1–2 cm, to 4 cm in fruit, puberulent, articulate near tip. Calyx cup-shaped, ca. 3 mm, lobes ovate to triangular, acute. Corolla pale yellow, ca. 7 mm in diam.; petals obovate, ca. 4 mm. Staminal column glabrous, free filaments many, 1–2 mm. Style short. Pseudocapsule obconic, ca. 1 cm in diam., apically truncate; mericarps with a short mucro, abaxially rounded, subglabrous. Seeds black, ca. 3 mm, single proximal seed densely hairy with simple long hairs, 2 distal seeds stellate hairy or with simple hairs. Fl. Sep–Feb.

Thickets near sea level, dry slopes, roadsides. Hainan [Cambodia, India, Indonesia, Laos, Sri Lanka, Thailand].

The occurrence of this species in Africa and America has been questioned (e.g., by Vollesen, Fl. Ethiopia Eritrea 2(2): 239. 1995) with the African plants assigned to *Wissadula rostrata*, which has white stem hairs, leaves 3–12 cm wide, and filaments 4–5 mm.

8. ABUTILON Miller, Gard. Dict. Abr., ed. 4. 1754.

苘麻属 qing ma shu

Herbs, subshrubs, shrubs, or small trees. Stipules usually caducous; leaf blade usually entire (lobed in *A. pictum*), palmately veined, base cordate, margin crenate or serrate. Flowers axillary or subterminal, solitary, paired or in small cymes, often aggregated into terminal panicles. Epicalyx absent. Calyx campanulate, lobes 5. Corolla mostly yellow or orange (red in *A. roseum*), often with dark center, campanulate to wheel-shaped, rarely ± tubular (*A. pictum*); petals 5, basally connate and adnate to filament tube. Anthers many, clustered at filament tube apex. Ovary (5–)7–20-loculed; ovules 2–9 per carpel; style branches as many as carpels. Fruit a schizocarp, often blackish when mature, subglobose to hemispherical; mericarps (5–)7–20, eventually dehiscent, apex rounded or acute, sometimes 2-awned, pericarp leathery. Seeds reniform, glabrous or slightly pubescent.

About 200 species: mostly in tropics and subtropics; nine species (three endemic, one introduced) in China.

Several species have become widespread tropical weeds. One species, *Abutilon pictum*, is widely grown as an ornamental. Paul (Fl. India 3: 269–270. 1993) indicates that *A. persicum* (N. L. Burman) Merrill occurs in China but we have seen no material or other records. If this species should be found, it would be distinguished by the 5-loculed ovary and gland-tipped hairs on the stems.

1a. Leaf blade palmately deeply 3–5-lobed; pedicel 7–10 cm, very slender, pendulous from near base, glabrous; corolla orange with prominent darker veins 4. *A. pictum*

- 1b. Leaf blade orbicular-ovate or orbicular-cordate, at the most obscurely 3-cuspidate near apex; pedicel 1–7 cm, robust, often curved, hairy; corolla red, orange, or yellow, without darker veins, center sometimes purple-red.
- 2a. Styles and mericarps 14–25; petals 0.6–1.8 cm.
- 3a. Mericarp apex prominently 2-awned, awns 3–5 mm, usually spreading 7. *A. theophrasti*
- 3b. Mericarp apex acute or obscurely awned, awns to 2 mm.
- 4a. Stems, petioles, and pedicels with 3 hair types: long simple hairs, minute stellate hairs, and short gland-tipped hairs; pedicel shorter than petiole; petals orange with purple bases; mericarps 20–25 6. *A. hirtum*
- 4b. Stems, petioles, and pedicels with 1 or 2 hair types: stellate hairs, sometimes mixed with a few long simple hairs; pedicel 1–2 × as long as petiole; petals uniformly yellow or orange; mericarps 14–20.
- 5a. Calyx shorter than schizocarp, lobes 3–4 × 3–4 mm, finally spreading; leaf blade abaxially stellate velvety 8. *A. indicum*
- 5b. Calyx ca. as long as schizocarp, lobes 5–10 × 5–6 mm, usually appressed; leaf blade abaxially stellate pubescent 9. *A. guineense*
- 2b. Styles and mericarps (5–)7–10; petals (1.5–)2.5–6 cm.
- 6a. Petals 1.5–1.7 cm; calyx lobes ovate, 0.7–1 cm; flowers in an open, conical, terminal panicle 5. *A. paniculatum*
- 6b. Petals 2.5–6 cm; calyx lobes lanceolate, 1.5–4 cm; flowers axillary or in an irregular congested panicle.
- 7a. Mericarps 5, apices erect, long-acute; stems with gland-tipped hairs *A. persicum* (see note)
- 7b. Mericarps 7–10, apices ± spreading, more abruptly contracted into awn; stems not glandular.
- 8a. Styles and mericarps 7; petals red or pink, 2.5–2.8 cm, adaxially stellate hairy 1. *A. roseum*
- 8b. Styles and mericarps 8–10; petals mostly yellow or orange, sometimes with purple-red bases, 3.5–6 cm, adaxially glabrous.
- 9a. Leaf margin coarsely dentate or minutely crenate, adaxially sparsely stellate strigose and with long hairs; pedicel 3–5 cm; corolla yellow, often with purple-red center 2. *A. sinense*
- 9b. Leaf margin irregularly crenate, adaxially densely tomentose; pedicel 1–2 cm; corolla uniformly orange 3. *A. gebauerianum*

1. *Abutilon roseum* Handel-Mazzetti, Symb. Sin. 7: 607. 1933.

红花苘麻 hong hua qing ma

Herbs annual, to 1 m tall. Petiole as long as leaf blade; leaf blade orbicular to ovate, 7–20 × 7–20 cm, abaxially densely stellate velutinous, adaxially scabrous-strigose, base cordate, margin undulate, dentate, apex caudate-acuminate. Flowers aggregated into terminal or axillary panicles. Pedicel 4–7 cm, densely villous, articulate at middle. Calyx ca. 12 mm, lobes 5, ovate-lanceolate, densely villous. Corolla red or pink; petals obovate, 2.5–2.8 cm, adaxially stellate villous. Staminal column ca. 1 cm, hirsute. Mericarps 7, long hirsute, apex with 2 extending awns, pericarp leathery.

- Grasslands on slopes; ca. 2200 m. SW Sichuan, NW Yunnan.

Abutilon roseum is readily distinguished by its red or pink petals that are stellate pubescent on the inner surface.

2. *Abutilon sinense* Oliver, Hooker's Icon. Pl. 18: t. 1750. 1888.

华苘麻 hua qing ma

Shrubs to ca. 3.5(–6) m tall. Petiole 8–20 cm, silky villous; leaf blade nearly orbicular-ovate, 7–13 × 4–13 cm, abaxially stellate tomentose and villous, adaxially stellate strigose with long hairs, base cordate, margin sparsely dentate, apex caudate-acuminate. Flowers solitary or paired, axillary, large. Pedicel 3–5 cm, densely tomentose and villous. Sepals lanceolate, 1.5–2.5 × 0.5–0.8 mm, densely stellate tomentose, connate at base. Corolla yellow with purple-red center, campanulate; petals obovate, 3.5–5 cm. Staminal column 2.5–3 cm, glabrous. Ovary 8–10-loculed; stigmas capitate. Schizocarp 2–3 × 1.5–2.2 cm;

mericarps 8–10, apex pointed, stellate, pericarp leathery. Seeds 7–9 per mericarp, reniform, sparsely hispid. Fl. Jan–May.

Open forests on slopes, bamboo forests, scrub on slopes; 300–2000 m. Guangdong, Guangxi, Guizhou, Hubei, Sichuan, Yunnan [N Thailand].

- 1a. Leaf blade ovate, margin coarsely dentate 2a. var. *sinense*
- 1b. Leaf blade suborbicular, margin subentire or minutely crenate 2b. var. *edentatum*

2a. *Abutilon sinense* var. *sinense*

华苘麻(原变种) hua qing ma (yuan bian zhong)

Leaf blade ovate, margin coarsely dentate, apex caudate-acuminate.

Open forests on slopes, bamboo forests; 300–2000 m. Guangdong, Guangxi, Guizhou, Hubei, Sichuan, Yunnan [N Thailand].

2b. *Abutilon sinense* var. *edentatum* K. M. Feng in C. Y. Wu, Fl. Yunnan. 2: 202. 1979.

无齿华苘麻 wu chi hua qing ma

Leaf blade suborbicular, margin subentire or minutely sparsely crenate, apex long caudate-acuminate.

- Scrub on slopes; ca. 1200 m. W Yunnan (Luxi).

3. *Abutilon gebauerianum* Handel-Mazzetti, Symb. Sin. 7: 607. 1933.

滇西苘麻 dian xi qing ma

Abutilon sinense Oliver var. *yunnanense* Hochreutiner.

Shrubs, to 3 m tall. Branchlets gray stellate tomentose. Stipules subulate, ca. 5 mm, caducous; leaf blade ovate-cordate, 4–8 × 4–8 cm, both surfaces densely tomentose, base cordate, margin irregularly crenate, apex long caudate-acuminate. Flowers solitary, axillary, large. Pedicel 1–2 cm, densely tomentose, apically articulate. Sepals cup-shaped, 2–2.5 cm, densely tomentose, lobes 5, lanceolate. Corolla orange; petals cuneate-obovate, 4–6 cm. Staminal column ca. 5 cm, glabrous. Ovary 8–10-loculed. Schizocarp ca. 2 cm; mericarps 8–10, tomentose, apex pointed, pericarp leathery. Seeds reniform, ca. 2 mm in diam., sparsely hispid. Fl. Jan–Feb.

- Scrub in dry hot river valleys; 700–2500 m. SW Yunnan.

Abutilon gebauerianum is similar to *A. sinense*, but it can be distinguished by its densely tomentose and crenate leaves and even larger flowers.

4. *Abutilon pictum* (Gillies ex Hooker) Walpers, Repert. Bot. Syst. 1: 324. 1842.

金铃花 jin ling hua

Sida picta Gillies ex Hooker, Bot. Misc. 3: 154. 1833; *Abutilon striatum* Dickson ex Lindley; *S. striata* (Dickson ex Lindley) Dietrich.

Shrubs evergreen, to 1 m tall. Stipules subulate, ca. 8 mm, caducous; petiole 3–5 cm, glabrous; leaf blade palmately 3–5-lobed, 5–8 cm in diam., abaxially glabrous or sparsely stellate, margin serrate or dentate, apex long acuminate. Flowers solitary, axillary. Pedicel pendulous, 7–10 cm, glabrous. Calyx campanulate, ca. 2 cm, lobes 5, ovate-lanceolate, parted to 3/4 of calyx, densely brown stellate puberulent. Corolla orange, with purple veins, campanulate, ca. 3 cm in diam.; petals obovate, 3–5 cm, sparsely pilose abaxially. Filament tube ca. 3.5 cm. Ovary hairy, 10-loculed; style branches purple, longer than filament tube; stigma capitate. Fruit unknown. Fl. May–Jul.

Cultivated. Beijing, Fujian, Hubei, Jiangsu, Liaoning, Yunnan, Zhejiang [native to South America (Brazil, Uruguay); cultivated worldwide].

Abutilon pictum is widely grown as an ornamental. A variegated cultivar ('Thompsonii') is popular.

5. *Abutilon paniculatum* Handel-Mazzetti, Symb. Sin. 7: 606. 1933.

圆锥苘麻 yuan zhui qing ma

Shrubs, deciduous, to 2 m tall, most parts stellate tomentose. Branchlets slender, terete. Stipules filiform, 1–2 cm; petiole 3–5 cm, tomentose; leaf blade ovate-cordate, 4–9 × 4–7 cm, both surfaces densely stellate tomentose, base cordate, margin irregularly crenate, apex long caudate. Flowers in conical, terminal panicle. Pedicel 2–3 cm, articulate near apex. Calyx disk-shaped, lobes 5, ovate, 7–10 mm. Corolla yellow to orange, 1.5–2 cm in diam.; petals obovate, 1.5–1.7 cm, glabrous. Filament tube stellate hispid. Schizocarp nearly globose; mericarps 10, ovate, ca. 4 mm, apex rounded. Fl. Jun–Aug.

- Scrub on slopes, roadsides; 2300–3000 m. SW Sichuan (Muli), NW Yunnan.

6. *Abutilon hirtum* (Lamarck) Sweet, Hort. Brit. 1: 53. 1826.

恶味苘麻 e wei qing ma

Subshrublike herbs, ca. 80 cm tall. Branchlets, leaves, petioles, and pedicels densely hairy, with long hirsute and short gland-tipped hairs, or densely tomentose. Stipules filiform, ca. 5 mm, reflexed; petiole 2–9 cm; leaf blade orbicular-cordate, 3–8 × 3.5–7 cm, both surfaces stellate tomentose, base cordate, margin denticulate, apex cuspidate. Flowers solitary, axillary, large. Pedicel shorter than petiole, apically articulate. Calyx campanulate, lobes 5, ovate, 8–10 mm, densely tomentose. Corolla orange with purple center; petals obovate, ca. 1.5 cm, adaxially glabrous. Filament tube ca. 1 cm, stellate hairy at base. Schizocarp nearly globose, ca. 1 × 1.5 cm, apex truncate; mericarps 20–25, stellate hispid with long hairs. Seeds 3–5, nearly reniform, pilose. Fl. Apr–Jun.

Grasslands; 300–1300 m. Yunnan [India, Indonesia, Pakistan, Sri Lanka, Thailand, Vietnam; Africa, SW Asia (Arabia), Australia].

- 1a. Branchlets, petioles, leaves, and pedicels densely hairy with long hirsute and short glandular hairs 6a. var. *hirtum*
- 1b. Branchlets, petioles, leaves, and pedicels densely tomentose 6b. var. *yuanmouense*

6a. *Abutilon hirtum* var. *hirtum*

恶味苘麻(原变种) e wei qing ma (yuan bian zhong)

Sida hirta Lamarck, Encycl. 1: 7. 1783; *Abutilon graveolens* (Roxburgh ex Hornemann) Wight & Arnott; *A. graveolens* var. *hirtum* (Lamarck) Masters; *A. indicum* (Linnaeus) Sweet var. *hirtum* (Lamarck) Grisebach; *S. graveolens* Roxburgh ex Hornemann.

Branchlets, petioles, leaves, and pedicels densely hairy, both long hirsute and shortly glandular.

Grasslands; 300–400 m. SE Yunnan (Jinping) [India, Indonesia, Pakistan, Sri Lanka, Thailand, Vietnam; Africa, SW Asia (Arabia), Australia].

6b. *Abutilon hirtum* var. *yuanmouense* K. M. Feng in C. Y. Wu, Fl. Yunnan. 2: 204. 1979.

元谋恶味苘麻 yuan mou e wei qing ma

Branchlets, petioles, leaves, and pedicels densely tomentose, not long hirsute.

- Dry and hot grasslands; 1200–1300 m. Yunnan (Yuanmou).

7. *Abutilon theophrasti* Medikus, Malvenfam. 28. 1787.

苘麻 qing ma

Sida abutilon Linnaeus, Sp. Pl. 2: 685. 1753; *Abutilon avicennae* Gaertner, nom. illeg. superfl.; *A. avicennae* var. *chinense* Skvortsov; *A. avicennae* f. *nigrum* Skvortsov; *A. californicum* Benth; *A. pubescens* Moench; *A. theophrasti* var. *chinense* (Skvortsov) S. Y. Hu; *A. theophrasti* var. *nigrum* (Skvortsov) S. Y. Hu; *A. tiliifolium* (Fischer) Sweet; *S. tiliifolia* Fischer.

Herbs subshrublike, annual, 1–2 m tall. Petiole 3–12 cm, stellate hairy; leaf blade orbicular-cordate, 5–10 cm in diam.,

both surfaces densely stellate pubescent, base cordate, margin minutely crenate, apex long acuminate. Flowers solitary, axillary, yellow. Pedicel 1–3 cm, pubescent, articulate near apex. Calyx cup-shaped, densely puberulent, lobes 5, ovate, ca. 6 mm. Corolla uniformly yellow; petals obovate, ca. 1 cm. Filament tube glabrous. Ovary 15–20-loculed, 1–1.5 cm, densely pubescent, apex truncate. Capsule semiglobose, ca. 1.2 × 2 cm; mericarps 15–20, stellate pilose, apex 2-awned, awns spreading, 3–5 mm, hairy. Seed reniform, brown, stellate puberulent. Fl. Jul–Aug.

Disturbed areas, neglected fields, also cultivated. Anhui, Fujian, Gansu, Guangdong, Guangxi, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanghai, Sichuan, Taiwan, Xinjiang, Yunnan [India, Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Thailand, Turkmenistan, Uzbekistan, Vietnam; Africa, SW Asia, Australia, Europe, North America].

Abutilon theophrasti is extensively cultivated for its bast fibers, which are used to make string, rope, shoes, rugs, and countless other items; it is also used medicinally for fever, dysentery, and stomachaches. The fiber is known as “China Jute” or “Tientsin Jute.”

8. *Abutilon indicum* (Linnaeus) Sweet, Hort. Brit. 1: 54. 1826.

磨盘草 mo pan cao

Sida indica Linnaeus, Cent. Pl. 2: 26. 1756; *Abutilon asiaticum* (Linnaeus) Sweet; *Abutilon cavaleriei* H. Léveillé; *A. cysticarpum* Hance ex Walpers; *A. indicum* var. *populifolium* (Lamarck) Wight & Arnott; *A. populifolium* (Lamarck) G. Don; *S. asiatica* Linnaeus; *S. populifolia* Lamarck.

Herbs subshrublike, annual or perennial, erect, many branched, 1–2.5 m, entire plant gray puberulent. Stipules subulate, 1–2 mm, curved outward; petiole 2–4 cm, gray puberulent and sparsely hairy, hairs silklike, ca. 1 mm; leaf blade ovate-orbicular or nearly orbicular, 3–9 × 2.5–7 cm, densely gray stellate puberulent, base cordate, margin irregularly serrate, apex acute or acuminate. Flowers solitary, axillary, 2–2.5 cm in diam. Pedicel ca. 4 cm, articulate near apex, gray stellate puberulent. Calyx green, disk-shaped, 6–10 mm in diam., densely gray puberulent, lobes 5, broadly ovate, apex acute. Corolla uniformly yellow; petals 7–8 mm. Staminal column stellate scabrous. Ovary 15–20-loculed. Fruit black, flat topped, ca. 1.5 cm in diam.; mericarps 15–20, apex acute, slightly awned, long stellate scabrous. Seeds reniform, sparsely stellate. Fl. Jul–Oct.

Disturbed sites on sandy soils; below 800(–1500) m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam].

Some authors, such as Borssum Waalkes (Blumea 14: 175. 1966), include the following species within *Abutilon indicum*.

9. *Abutilon guineense* (Schumacher) E. G. Baker & Exell, J. Bot. 74(Suppl.): 22. 1936.

几内亚磨盘草 ji nei ya mo pan cao

Herbs erect, 0.5–2 m tall, whole plant gray stellate puberulent. Stipules filiform, 3–6 mm, reflexed; petiole shorter than leaf blade, pubescent; leaf blade cordate,

ovate, or nearly orbicular, sometimes obscurely 3-lobed, 1.5–8(–10) × 1–6(–10) cm, abaxially densely stellate puberulent or pubescent, adaxially sparsely stellate scabrous with long hairs or pubescent, base cordate, margin irregularly crenate or dentate, apex obtuse, acute, or acuminate. Flowers solitary, axillary. Pedicel 4–7 cm, pubescent, articulate near apex. Calyx campanulate or disk-shaped, ca. 1.2 × 1.7–2 cm, lobes rounded-ovate or ovate-acuminate, ca. 6 mm, densely stellate puberulent, apex acute. Petals yellow, obovate, ca. 0.6 or 1.8 cm, glabrous, bearded on claw. Staminal column glabrous or hairy. Schizocarp flattened-globose, ca. 0.7 × 1–1.5 cm in diam.; mericarps 14–20, stellate scabrous, apex acute, shortly awned, wall leathery, dehiscing on plant. Seeds reniform, glandular-hairy.

Grasslands, scrub-covered slopes. Hainan, Sichuan, Taiwan, Yunnan [Indonesia, Malaysia, New Guinea; Africa, Australia].

Verdcourt (in sched.) has commented on Asian material named as *Abutilon guineense* that he does not believe it is conspecific with the African type of this species. This obviously merits more detailed investigation.

- 1a. Calyx campanulate; petals ca. 1.8 cm;
staminal column glabrous 9a. var. *guineense*
1b. Calyx disk-shaped; petals ca. 0.6 cm;
staminal column stellate hairy 9b. var. *forrestii*

9a. *Abutilon guineense* var. *guineense*

几内亚磨盘草(原变种) ji nei ya mo pan cao (yuan bian zhong)

Sida guineensis Schumacher, Kongel. Danske Vidensk. Selsk., Naturvidensk. Math. Afh. 4: 81. 1829; *Abutilon indicum* (Linnaeus) Sweet subsp. *guineense* (Schumacher) Borssum Waalkes; *A. indicum* var. *guineense* (Schumacher) K. M. Feng; *A. taiwanense* S. Y. Hu.

Herbs ca. 0.5 m tall. Stipules ca. 3 mm; petiole usually shorter than leaf blade; leaf blade cordate, ovate, or nearly orbicular, 1.5–8 × 1–6 cm, abaxially densely stellate puberulent, adaxially sparsely stellate scabrous with long hairs, margin irregularly crenate, apex obtuse or acute. Calyx campanulate. Petals ca. 1.8 cm. Staminal column glabrous.

Hainan, Taiwan [Indonesia, Malaysia, New Guinea; Africa, Australia].

The identification of Asian material as the African *Abutilon guineense* is questioned by Verdcourt (in sched.).

9b. *Abutilon guineense* var. *forrestii* (S. Y. Hu) Y. Tang, comb. nov.

小花磨盘草 xiao hua mo pan cao

Basionym: *Abutilon forrestii* S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 34. 1955; *A. bidentatum* Hochstetter ex A. Richard var. *forrestii* (S. Y. Hu) Abedin; *A. indicum* var. *forrestii* (S. Y. Hu) K. M. Feng.

Herbs to 2 m tall. Stipules 5–6 mm; petiole as long as leaf blade or slightly longer; leaf blade orbicular-cordate, often 3-toothed near apex, 5–10 cm in diam., both surfaces pubescent, margin irregularly dentate, apex acuminate. Calyx disk-shaped. Petals ca. 0.6 cm. Staminal column stellate puberulent.

• Grasslands, scrub-covered slopes in dry hot valley of Jinsha Jiang; 1000–1500 m. Sichuan, Yunnan.

This variety differs from the typical variety by the much smaller

flowers and fruits and the shorter and more acute mericarp awns. These distinctions seem better defined than those between many of the accepted species.

9. HERISSANTIA Medikus, Vorles. Churfälz. Phys.-Ökon. Ges. 4: 244. 1788.

泡果苘属 pao guo qing shu

Bastardia [unranked] Gayoides Endlicher; *Beloere* Shuttleworth ex A. Gray; *Bogenhardia* Reichenbach; *Gayoides* (Endlicher) Small; *Pseudobastardia* Hassler.

Herbs, subshrubs, or shrubs, erect or decumbent, pubescent or hirsute, sometimes viscid. Leaves petiolate (sometimes subsessile); stipules minute, subulate, caducous; leaf blade ovate or cordate, margin dentate, without foliar nectaries. Flowers often solitary in leaf axils or on several-flowered peduncles; involucre absent. Calyx lobes lanceolate or ovate. Petals white. Filament tube antheriferous at apex, not exerted; anthers 1-thecate. Ovary 10–14-locular; styles 10–14; stigmas capitate. Fruit a schizocarp, obovate, inflated, pendulous; mericarps 10–14, pubescent or hispid, with fragile walls, dehiscent, 1–3-seeded. Seeds glabrous or minutely scabridulous. $x = 7$.

About six species: Neotropics, except for one pantropical weed; one species (introduced) in China.

1. *Herissantia crispa* (Linnaeus) Brizicky, J. Arnold Arbor. 49: 279. 1968.

泡果苘 pao guo qing

Sida crispa Linnaeus, Sp. Pl. 2: 685. 1753; *Abutilon crispum* (Linnaeus) Medikus; *Beloere crispa* (Linnaeus) Shuttleworth ex A. Gray; *Bogenhardia crispa* (Linnaeus) Kearney; *Gayoides crispa* (Linnaeus) Small; *Pseudobastardia crispa* (Linnaeus) Hassler.

Herbs perennial, to 1.5 m tall, sometimes procumbent; stem hairy with white, stellate hairs. Stipule filiform, 3–7 mm, pilose; petiole 0.2–5 cm, stellate pilose with long hairs; leaf

blade cordate, 2–7 × 2–7 cm, both surfaces stellate pilose, base cordate, margin crenate, apex acuminate. Pedicel slender, 2–4 cm, long pilose, articulate and becoming knee-shaped near tip. Calyx disk-shaped, 4–5 mm, densely long stellate pilose, lobes ovate, apex acuminate. Corolla pale yellow, ca. 1 cm in diam.; petals obovate, 6–10 mm. Schizocarp globose, 9–13 mm in diam., swollen, lantern-shaped, sparsely long pilose, apex short-beaked; mericarps 8–15, deciduous, loculicidal, walls membranous, persistent receptacle ca. 2 mm. Seeds black, reniform. Fl. year-round. $2n = 14$.

Open forests, moist meadows, coastal areas. Hainan, Taiwan [India, Indonesia, Vietnam; native to tropical America, now a pantropical weed].

10. KYDIA Roxburgh, Pl. Coromandel 3: 11. 1811 [“1819”].

翅果麻属 chi guo ma shu

Trees. Branchlets densely covered with minute stellate pubescence. Stipules inconspicuous, caducous; leaf blade usually lobed, palmately veined. Flowers in 20–30-flowered panicles, axillary or terminal, polygamous. Epicalyx lobes 4–6, foliaceous, connate at base, enlarged into spreading wings in fruit, persistent. Sepals 5, connate at base. Petals 5, pink or white, obovate, clawed, connate and bearded at base, apex fimbriate. Male flowers: filament tube cylindrical, 5–6-lobed to middle, each lobe with 3–5 sessile and reniform anthers; undeveloped ovary globose, sterile style enclosed. Female flowers: filament tube 5-lobed, with 5 sterile anthers. Ovary 2–3(–4)-loculed; ovules 2 per locule, usually erect; style branches 3; stigma peltate, verrucose. Schizocarp nearly globose, dehiscent into 3 mericarps. Seeds reniform, lacunose.

Two species: Bhutan, Cambodia, China, India, Myanmar, Vietnam; two species in China.

- 1a. Leaf blade adaxially stellate woolly; persistent epicalyx lobes on capsule obovate, 1–1.5 × 0.5–0.9 cm, densely stellate tomentose 1. *K. calycina*
 1b. Leaf blade adaxially glabrous or sparsely stellate; persistent epicalyx lobes on capsule oblanceolate, 1.5–2 × 0.25–0.5 cm, glabrous or sparsely stellate 2. *K. glabrescens*

1. *Kydia calycina* Roxburgh, Pl. Coromandel 3: 11. 1811 [“1819”].

翅果麻 chi guo ma

Kydia fraterna Roxburgh; *K. roxburghiana* Wight.

Trees 10–20 m tall. Branchlets terete, densely brownish stellate pubescent. Petiole 2–4 cm, stellate pilose; leaf blade nearly round, usually palmately 3–5-lobed, 6–14 × 5–11 cm, abaxially densely gray stellate woolly, adaxially stellate pilose, palmate veins 5–7, base rounded or nearly cordate, margin

sparsely denticulate, apex acute or obtuse. Inflorescences densely gray stellate puberulent. Flowers ca. 1.6 cm in diam. Epicalyx lobes 4(or 6), oblong, ca. 4 mm. Calyx shallowly cup-shaped, connate for 1/2 length, lobes 5, triangular, nearly as long as epicalyx. Petals reddish, obovate, apex glandularly fimbriate. Capsule globose, ca. 5 mm in diam., persistent epicalyx lobes obovate-oblong, 1–1.5 × 0.5–0.9 cm, stellate tomentose. Seeds reniform, glandularly veined, glabrous. Fl. Sep–Nov.

Sparse mixed forests in valleys; 500–1600 m. S Yunnan [Bhutan, India, Myanmar, Nepal, Pakistan, N Thailand, Vietnam].

2. *Kydia glabrescens* Masters in J. D. Hooker, Fl. Brit. India 1: 348. 1874.

光叶翅果麻 *guang ye chi guo ma*

Trees to 10 m tall. Branchlets terete, stellate puberulent. Petiole 2–4 cm, stellate pilose; leaf blade nearly rounded, ovate, or obovate, sometimes 3-lobed, 7–16 × 5–12 cm, abaxially glabrous or stellate pilose, adaxially stellate pilose, palmate veins 5–7, base rounded to cuneate, margin irregularly dentate, apex obtuse, rounded, or shortly acuminate. Flowers ca. 1.3 cm in diam. Pedicel 0.8–1 cm, to 1.5 cm in fruit, stellate puberulent. Epicalyx lobes oblong-elliptic, ca. 5 × 2–3 mm, glabrous or sparsely stellate. Calyx cup-shaped, longer or shorter than bracteoles, lobes 5, connate for 1/2 length, glabrous. Petals light purple, obcordate. Capsule globose, ca. 4 mm; persistent epicalyx lobes oblanceolate, 1.5–2 × 0.25–0.5 cm, glabrous or nearly so. Fruit unknown.

Sparse forests in valleys; 500–1100 m. S Yunnan [Bhutan, India, N Vietnam].

- 1a. Leaf blade abaxially and epicalyx glabrous 2a. var. *glabrescens*
 1b. Leaf blade abaxially and epicalyx stellate pilose 2b. var. *intermedia*

2a. *Kydia glabrescens* var. *glabrescens*

光叶翅果麻(原变种) *guang ye chi guo ma* (yuan bian zhong)

Kydia calycina Roxburgh var. *glabrescens* (Masters) Deb.

Leaf blade abaxially and epicalyx glabrous.

Sparse forests in valleys; 500–900 m. S Yunnan [Bhutan, India, N Vietnam].

2b. *Kydia glabrescens* var. *intermedia* S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 72. 1955.

毛叶翅果麻 *mao ye chi guo ma*

Leaf blade abaxially and epicalyx stellate pilose.

• Sparse forests in valleys; 700–1100 m. S Yunnan.

11. NAYARIOPHYTON T. K. Paul, Bot. Jahrb. Syst. 110: 43. 1988.

枣叶槿属 *zao ye jin shu*

Shrubs or trees, stellate tomentose throughout. Leaves simple; stipules deciduous; leaf blade ovate or suborbicular, sometimes shallowly 3-lobed, abaxially densely stellate pubescent, palmately veined. Flowers solitary or in short 2–5-flowered panicles, axillary, bisexual. Epicalyx lobes 4–6, oblong-lanceolate, subconnate at base, spreading, pubescent, spreading and accrescent in fruit. Calyx 5-lobed, connate to middle, lobes broadly triangular, much shorter than epicalyx. Corolla large, showy; petals 5, pink or white, oblong, ± equal to involucellar bracts, gland-fringed. Filament tube divided into many branches, each bearing 2 anthers, glabrous. Ovary globose, 2-loculed; ovules 2 or more per locule, usually erect; style branches 2-fid apically, exerted, pubescent; stigmas rugose, capitate. Fruit enveloped by accrescent calyx, dry, indehiscent, subglobose. Seeds 1 per locule, reniform.

One species: Bhutan, S China, India, Thailand.

The Asian genera *Dicellostyles* Bentham, *Julostylis* Thwaites, *Kydia*, and *Nayariophyton* are all very closely related.

1. *Nayariophyton zizyphifolium* (Griffith) D. G. Long & A. G. Miller, Edinburgh J. Bot. 47: 357. 1990.

枣叶槿 *zao ye jin*

Kydia zizyphifolia Griffith, Itin. Pl. Khasyah Mts. 108. 1848; *Dicellostyles jujubifolia* (Griffith) Bentham; *D. zizyphifolia* (Griffith) Phuphathanaphong; *K. jujubifolia* Griffith; *Nayariophyton jujubifolium* (Griffith) T. K. Paul.

Trees or small trees 5–8 m tall. Branches and branchlets densely stellate pubescent. Stipules subulate; petiole 1–3 cm, stellate pubescent; leaf blade ovate or suborbicular, sometimes obscurely 3-lobed, 7–15 × 4–9 cm, abaxially densely stellate pilose, adaxially sparsely stellate pubescent or glabrescent, basal veins 5–7, base subcordate or rounded, margin entire, apex acute to acuminate. Pedicel 0.5–1.5 cm, stellate pubescent. Epicalyx lobes (3–)4–6, oblong-lanceolate, 1–1.5 × ca. 0.5 cm,

accrescent, conspicuously striate and reticulate, abaxially densely stellate velutinous, adaxially sparsely stellate pubescent, apex rounded. Calyx lobes 5, triangular, ca. 1 × 0.4–0.5 cm, connate for 1/2 length, stellate hairy. Corolla ca. 2.5 cm in diam.; petals 5, white or yellow, oblong, 1–2.5 × 1–1.5 cm, abaxially densely stellate pubescent, adaxially with simple hairs at base. Filament tube 0.8–1 cm, hairy; anthers many, reniform. Ovary ovoid; style branches 2, ca. 2.5 cm, densely stellate hairy; stigma capitate, rugose. Fruit subglobose, ca. 8 mm in diam., densely stellate pubescent. Seeds ca. 4 × 3 mm, glabrous.

Broad-leaved forests; ca. 1600 m. SW Yunnan (Zhenkang) [Bhutan, India, Thailand].

The epithet of *Kydia jujubifolia* Griffith (Not. Pl. Asiat. 4: 534. 1854) is often used for this taxon but, as Long and Miller (loc. cit.) pointed out, Griffith used the epithet “*zizyphifolia*” in his earlier notes (loc. cit.), which include a validating description.

12. URENA Linnaeus, Sp. Pl. 2: 692. 1753.

梵天花属 *fan tian hua shu*

Herbs perennial or shrubs, stellate. Leaves alternate; leaf blade orbicular or ovate, palmately lobed or sinuate, with 1 or more prominent foliar nectaries on abaxial surface. Flowers solitary or nearly fascicled, rarely racemelike, axillary or rarely aggregated on twig tips. Epicalyx campanulate, 5-lobed. Calyx 5-parted. Petals 5, stellate puberulent abaxially. Staminal column truncate or slightly

incised; anthers numerous, on outside of staminal column only, nearly sessile. Ovary 5-loculed; ovule 1 per locule; style branches 10, reflexed; stigma discoid, apically ciliate. Fruit a schizocarp, subglobose; mericarps 5, ovoid, usually with spines, these each with a cluster of short barbs at tips. Seed 1, obovoid-trigonal or reniform, glabrous.

About six species: in tropical and subtropical regions; three species (one endemic) in China.

Some authorities have restricted *Urena* to the taxa with barb-tipped setae, sometimes treating these as a single, very variable, pantropical species, and placed other species, including *U. repanda*, in *Pavonia*. Some species of *Triumfetta* (Tiliaceae s.l.) are superficially rather similar and have been confused with this genus.

- 1a. Mericarps glabrous or striate; epicalyx lobes long acuminate separated by rounded sinuses; calyx persistent; flowers \pm aggregated into terminal inflorescences 3. *U. repanda*
 1b. Mericarps with prominent barb-tipped setae, puberulent; epicalyx lobes oblong-lanceolate to -ovate, acute, separated by acute sinuses; calyx caducous; flowers axillary, solitary or in small fascicles.
 2a. Epicalyx cupular in fruit, stiff, appressed to mericarps, lobes $4.5\text{--}5 \times 2.5\text{--}3$ mm; leaf blades on proximal part of stem angular or shallowly lobed 1. *U. lobata*
 2b. Epicalyx spreading or reflexed, flexible, lobes $3\text{--}4 \times 1\text{--}1.5$ mm; leaf blades on proximal part of stem angular or palmately lobed or mostly deeply and often doubly incised 2. *U. procumbens*

1. *Urena lobata* Linnaeus, Sp. Pl. 2: 692. 1753.

地桃花 di tao hua

Subshrublike herbs, erect, to 1 m tall. Branchlets stellate tomentose. Stipules filiform, ca. 2 mm, caducous; petiole 1–4 cm, gray-white stellate; leaf blades on proximal part of stem nearly orbicular, $4\text{--}5 \times 5\text{--}6$ cm, base rounded or nearly cordate, margin serrate, apex 3-lobed, blades on middle part of stem ovate, $5\text{--}7 \times 3\text{--}6.5$ cm, those on distal part of stem oblong to lanceolate, $4\text{--}7 \times 1.5\text{--}3$ cm, abaxially gray stellate puberulent, adaxially puberulent. Flowers solitary or slightly aggregated, axillary. Pedicel ca. 3 mm, woolly. Epicalyx lobes connate for ca. 1/3 length, ca. 6 mm, puberulent. Calyx cup-shaped, lobes 5, slightly shorter than bracteoles, stellate puberulent, caducous. Corolla reddish, ca. 15 mm in diam.; petals 5, obovate, ca. 1.5 cm, abaxially stellate puberulent. Staminal column ca. 15 mm, glabrous. Style branches 10, hirsute. Fruit flattened globose, ca. 1 cm in diam.; mericarps stellate puberulent and spiny with hooked spines. Fl. Jul–Oct.

Grasslands, scrub, roadsides; 500–2200 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bangladesh, Bhutan, Cambodia, India, Indonesia, Japan, Laos, Myanmar, Nepal, Thailand, Vietnam; pantropical].

This is a polymorphic species for which many infraspecific taxa have been described from throughout its range.

- 1a. Leaf blades on proximal part of stem suborbicular in outline, those on distal part of stem lanceolate to oblong; epicalyx nearly as long as sepals 1a. var. *lobata*
 1b. Leaf blades on proximal part of stem ovate in outline, those on distal part of stem ovate to elliptic or nearly orbicular; epicalyx shorter or longer than sepals.
 2a. Leaf blade abaxially densely rough puberulent and woolly; epicalyx densely yellow woolly 1b. var. *glauca*
 2b. Leaf blade abaxially tomentose and hirsute; epicalyx stellate pilose or stellate villous.

- 3a. Leaf blade abaxially with some hairs straight and erect 1e. var. *chinensis*
 3b. Leaf blade abaxially with hairs long and twisted with each other.
 4a. Leaf blade abaxially with hairs uniformly long and slender; petals ca. 1 cm 1c. var. *henryi*
 4b. Leaf blade abaxially with more than one type of hair, some slender, others long and robust, those on veins villous and tufted; petals 1.5–2.5 cm 1d. var. *yunnanensis*

1a. *Urena lobata* var. *lobata*

地桃花(原变种) di tao hua (yuan bian zhong)

Urena diversifolia Schumacher; *U. lobata* var. *tomentosa* (Blume) Walpers; *U. monopetala* Loureiro; *U. tomentosa* Blume.

Leaf blades on proximal part of stem suborbicular and lobed, those on distal part of stem lanceolate to oblong. Epicalyx nearly as long as sepals. Petals ca. 1.5 cm.

500–2200 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, Cambodia, India, Japan, Laos, Myanmar, Nepal, Thailand, Vietnam; pantropical].

1b. *Urena lobata* var. *glauca* (Blume) Borssum Waalkes, Blumea 14: 144. 1966.

粗叶地桃花 cu ye di tao hua

Urena lappago Smith var. *glauca* Blume, Bijdr. 65. 1825; *U. lobata* var. *scabriuscula* (Candolle) Walpers; *U. scabriuscula* Candolle.

Leaf blade densely rough puberulent and woolly; blades on proximal part of stem wider and rarely lobed, base subcordate, apex usually 3-lobed, those on distal part of stem ovate or suborbicular, margin serrate. Epicalyx lobes filiform, slightly longer than sepals, densely yellow woolly. Petals 1–1.3 cm.

Grasslands, scrub, roadsides; 500–1500 m. Fujian, Guangdong, Guizhou, Sichuan, Yunnan [Bangladesh, India, Indonesia, Myanmar].

1c. *Urena lobata* var. *henryi* S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 75. 1955.

湖北地桃花 hu bei di tao hua

Leaf blade membranous, abaxially gray puberulent, hairs uniform, twisted, adaxially minutely pilose; blades on proximal part of stem ovate, 6–8 × 4–5 cm, base rounded, those on distal part of stem elliptic, attenuate at both ends. Epicalyx and sepals puberulent. Petals ca. 1 cm.

• Hubei.

1d. *Urena lobata* var. *yunnanensis* S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 77. 1955.

云南地桃花 yun nan di tao hua

Leaf blade abaxially densely gray-white stellate puberulent, hairs twisted, some slender, others robust, adaxially scabrous and stellate; blades on proximal part of stem ovate, usually 3–5-lobed, those on distal part of stem ovate or elliptic, margin irregularly dentate. Epicalyx ca. 4 mm, shorter than sepals, stellate pilose. Petals pink, 1.5–2.5 cm. Capsule 7–8 mm in diam.

• Scrub on slopes, grasslands in valleys; 1300–2200 m. Guangxi, Guizhou, Sichuan, Yunnan.

1e. *Urena lobata* var. *chinensis* (Osbeck) S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 77. 1955.

中华地桃花 zhong hua di tao hua

Urena chinensis Osbeck, Dagb. Ostind. Resa, 225. 1757.

Herbs subshrublike, to 2 m tall. Petiole gray-yellow stellate; leaf blade abaxially gray-yellow villous and stellate puberulent, long scabrous along veins, adaxially sparsely long stellate hairy or subglabrous, margin serrate; blades on proximal part of stem ovate or suborbicular, usually 3–5-lobed, those on distal part of stem ovate. Epicalyx nearly as long as or slightly longer than sepals, stellate villous. Petals 1.2–1.5 cm.

• Anhui, Fujian, Guangdong, Hunan, Jiangxi, Sichuan, Yunnan.

2. *Urena procumbens* Linnaeus, Sp. Pl. 2: 692. 1753.

梵天花 fan tian hua

Subshrubs to 80 cm tall. Branches procumbent; branchlets stellate puberulent. Stipules subulate, ca. 1.5 mm, caducous; petiole 4–15 mm, hairy; leaf blades on proximal part of stem palmately 3–5-lobed to 1/2 blade, lobes rhomboid or obovate, gourd-shaped, 1–7 × 1–4 cm, both surfaces shortly stellate hirsute or densely woolly tomentose, base rounded to nearly cordate, margin serrate, apex obtuse. Flowers solitary or nearly fascicled, axillary. Pedicel 2–3 mm. Epicalyx ca. 7 mm, connate for ca. 1/3 length, sparsely stellate hairy. Calyx shorter than or nearly as long as epicalyx, lobes ovate, acute, stellate. Petals pink or white, 1–1.5 cm. Staminal column glabrous, as long as petals. Fruit globose, ca. 6 mm in diam., spiny and hirsute with long hairs and hooked spines. Seeds glabrous. Fl. Jun–Sep.

• Scrub; 500 m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Taiwan, Zhejiang.

The identity of *Urena procumbens* has been confused, with most authors including it within *U. sinuata* Linnaeus, and others, such as Guerke (Fl. Brasil. 12, 3: 457–596. 1892), suggesting that it might not belong to the Malvaceae. Hu (Fl. China, Malvaceae [Fam. 153], 178. 1955) typified this taxon as a close relative of the more widely distributed *U. sinuata*, distinguished by the relatively narrower leaf blades, not orbicular in outline, with uniform, not heterogeneous, hairs.

1a. Leaves 1.5–7 cm, shortly stellate

hirsute 2a. var. *procumbens*

1b. Leaves 1–2 cm, densely woolly

tomentose 2b. var. *microphylla*

2a. *Urena procumbens* var. *procumbens*

梵天花(原变种) fan tian hua (yuan bian zhong)

Leaves 1.5–7 cm, shortly stellate hirsute.

• Scrub. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Taiwan, Zhejiang.

2b. *Urena procumbens* var. *microphylla* K. M. Feng, Acta Bot. Yunnan. 4: 28. 1982.

小叶梵天花 xiao ye fan tian hua

Leaves smaller and thicker, 1–2 cm, densely tomentose and woolly on both surfaces.

• About 500 m. Zhejiang (Pingyang).

3. *Urena repanda* Roxburgh ex Smith in Rees, Cycl. 37: *Urena* no. 6. 1819.

波叶梵天花 bo ye fan tian hua

Abutilon esquirolii H. Léveillé; *Malache repanda* (Roxburgh ex Smith) Kuntze; *Pavonia repanda* (Roxburgh ex Smith) Sprengel; *Urena speciosa* Wallich.

Herbs perennial, 0.5–1 m tall. Branches terete, densely stellate puberulent. Stipules filiform, 4–5 mm; petiole 1–7 cm, stellate; leaf blade ovate, 4–8 × 1–7 cm; blades on proximal part of stem usually 3-lobed, base rounded to nearly cordate, margin serrate, apex obtuse, those on distal part of stem ovate-oblong to lanceolate, abaxially gray stellate puberulent, adaxially stellate strigose and hirsute. Flowers aggregated on twig tips. Pedicel 1–3 mm. Epicalyx campanulate, connate for ca. 1/2 length, ca. 8 mm, long stellate hirsute. Sepals longer than bracteoles, ovate, acute, persistent, long stellate hirsute. Petals 5, pink, 2.5–3.5 cm. Staminal column glabrous. Ovary glabrous; style verrucose. Fruit nearly globose, ca. 8 mm diam., glabrous; mericarps obtriangular, ca. 4 mm, glabrous or striate. Seeds black, glabrous. Fl. Aug–Nov.

Scrub on slopes; 300–1600 m. Guangxi, Guizhou, Yunnan [Cambodia, N India, Laos, Thailand, Vietnam].

13. MALVAVISCUS Fabricius, Enum. 155. 1759.

悬铃花属 xuan ling hua shu

Shrubs or small trees, sometimes scandent, pubescent or glabrous. Leaves simple; stipules subulate, caducous; leaf blade elliptic

or ovate, entire or 3–5-lobed, base truncate or cordate, margin crenate to dentate; foliar nectaries lacking. Flowers solitary, axillary, or sometimes in terminal cymelike clusters. Epicalyx lobes 5–10(–12), linear, lanceolate, or spatulate. Calyx campanulate or tubular, 5-lobed. Corolla tubular; petals 5, red or crimson-red, bases auriculate, remaining adpressed to staminal column. Filament tube longer than corolla, apex 5-toothed; anthers below teeth, on outside of staminal column only. Ovary 5-loculed; ovules 1 per locule; style branches 10; stigmas capitate. Fruit a fleshy schizocarp, usually red (sometimes white), broader than long, ultimately drying and separating into mericarps; mericarps 5, indehiscent. Seeds 1 per carpel.

About five species: native to tropical America, but several now widely cultivated; two species (both introduced) in China.

The genus is highly variable morphologically, with many populational forms that intergrade. This variation has led to widely differing opinions as to the number of species and subspecific taxa. The classification adopted here is a conservative one and follows the revision of Turner and Mendenhall (Ann. Missouri Bot. Gard. 80: 439–457. 1993).

- 1a. Leaf blade broadly cordate to ovate-cordate, often 3-lobed, basal veins 5; petiole 2–5 cm; flowers erect, ca. 2.5 cm; pedicel 3–4 mm 1. *M. arboreus*
 1b. Leaf blade lanceolate to narrowly ovate, basal veins 3; petiole 1–2 cm; flowers pendulous, ca. 5 cm; pedicel ca. 15 mm 2. *M. penduliflorus*

1. *Malvaviscus arboreus* Cavanilles, Diss. 3: 131. 1787.

小悬铃花 xiao xuan ling hua

Hibiscus malvaviscus Linnaeus, Sp. Pl. 2: 694. 1753;
Achania malvaviscus (Linnaeus) Swartz; *H. coccineus* Walter,
 nom. illeg. superfl.; *Malvaviscus coccineus* Medikus, nom. illeg.
 superfl.

Shrubs ca. 1 m tall. Branchlets sparsely villous to glabrate, rarely glabrous. Stipule filiform, ca. 4 mm, usually caducous; petiole 2–5 cm, puberulent; leaf blade broadly cordate to ovate-cordate, usually 3-lobed, sometimes entire, 6–12 × 2.5–10 cm, nearly glabrous or stellate pilose on both surfaces, basal veins 3 or 5, base broadly cuneate to nearly rounded or cordate, margin crenate, sometimes irregularly so, apex acuminate. Flowers solitary, axillary, pendulous, tube-shaped, slightly expanding only at top, 2.3–5 cm. Pedicel 3–15 mm, villous or puberulent. Epicalyx lobes spatulate, 8–15 mm, connate at base, hairy. Calyx campanulate, ca. 1 cm in diam., lobes 5, slightly longer or shorter than bracteoles, hirsute. Petals 5, scarlet-red, 2.5–5 cm. Staminal column 5–7 cm, exceeding corolla tube. Style branches 10. Ripe fruit bright red, usually 3- or 4-seeded.

Cultivated. Fujian (Xiamen), S Guangdong (Guangzhou), S Yunnan [native to Central and North America (SE United States); now widely planted in tropical and warm temperate regions, sometimes naturalized].

Chinese material is almost certainly to be referred to *Malvaviscus arboreus* var. *arboreus*. *Malvaviscus arboreus* var. *drummondii* (Torrey

& A. Gray) Schery, the name used by Feng (in FRPS 49(2): 50. 1984), is rarely cultivated. It differs from var. *arboreus* by the leaf blades being uniformly 3-lobed, with an obtuse (not acute) apex and strongly cordate (not truncate or cordate) base, and by the stem and petiole being diffusely pubescent with overlapping stellate hairs that form a velvety vestiture (not variously pubescent to glabrate).

2. *Malvaviscus penduliflorus* Candolle, Prodr. 1: 445. 1824.

垂花悬铃花 chui hua xuan ling hua

Malvaviscus arboreus Cavanilles subsp. *penduliflorus* (Candolle) Hadač; *M. arboreus* var. *penduliflorus* (Candolle) Schery.

Shrubs, to 2 m tall. Branchlets villous (hairs recurved) to glabrate. Stipule filiform, ca. 4 mm, caducous; petiole 1–2 cm, villous; leaf blade lanceolate to narrowly ovate, 6–12 × 2.5–6 cm, both surfaces nearly glabrous or stellate pilose, basal veins 3, base broadly cuneate to nearly rounded, margin crenate-seriate. Flowers solitary, axillary, pendulous, tubular, slightly expanded apically only, ca. 5 cm. Pedicel ca. 15 mm, villous. Epicalyx lobes ca. 8, spatulate, 1–1.5 cm, margins ciliate. Calyx slightly longer than epicalyx, hirsute. Petals red. Staminal column ca. 7 cm, exserted. Fruit unknown.

Cultivated. S Guangdong (Guangzhou), Taiwan, S Yunnan [cultivated in Bhutan, India, Indonesia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand; Africa (Egypt, Tanzania), Americas, Pacific islands; origin unknown but probably Mexico].

This very widely cultivated species is not known to occur in the wild. It rarely sets fruit.

14. ABELMOSCHUS Medikus, Malvenfam. 45. 1787.

秋葵属 qiu kui shu

Herbs annual, biennial, or perennial, often hispid or tomentose, hairs often mostly simple. Leaves entire or palmately lobed. Flowers solitary, axillary, yellow or red. Epicalyx lobes 5–15, filiform, very rarely lanceolate, persistent. Calyx spathaceous, splitting along 1 side at anthesis, apex 5-toothed, caducous with corolla. Corolla with a dark red center, funnel-shaped; petals 5. Staminal column shorter than corolla, 5-toothed at apex, with anthers at base. Ovary 5-loculed; ovule many per locule; style single with 5 sessile capitate stigmas. Capsule elongate, loculicidal, pubescent or hispid. Seeds reniform or globose, many, glabrous, smooth.

About 15 species: tropical and subtropical regions in E Hemisphere; six species (one endemic, one introduced) in China.

- 1a. Epicalyx lobes 4 or 5, oblong-lanceolate, 4–5 mm wide 1. *A. manihot*
 1b. Epicalyx lobes 6–20, filiform to linear, 1–3 mm wide.

- 2a. Epicalyx lobes 10–20; leaf blade cordate or palmately lobed.
 3a. Epicalyx lobes 10–20, 1–2 mm wide; petiole 4–12 cm; capsule subglobose, 3–4 cm 2. *A. crinitus*
 3b. Epicalyx lobes 12, 2–3 mm wide; petiole 1–4 cm; capsule ovoid-ellipsoid, 4.5–5.5 cm 3. *A. muliensis*
 2b. Epicalyx lobes 6–12; leaf blade ovate-hastate, sagittate, or palmately lobed.
 4a. Pedicel 1–2 cm; capsule 10–25 cm, cylindrical 4. *A. esculentus*
 4b. Pedicel 2–7 cm; capsule 2–6 cm, subglobose or ellipsoid.
 5a. Herbs annual or biennial, 1–2 m, indumentum mostly hispid, often without pubescence, root not swollen; epicalyx lobes incurved, enclosing fruit; corolla yellow with dark purple center, 7–12 cm wide; capsule 5–6 cm 5. *A. moschatus*
 5b. Herbs perennial, 0.4–1 m, indumentum mostly pubescent, setae sometimes restricted to epicalyx, root swollen, radish-shaped; epicalyx lobes spreading or reflexed; corolla uniformly red, yellow, white, or pink, 4–5 cm wide; capsule ca. 3 cm 6. *A. sagittifolius*

1. *Abelmoschus manihot* (Linnaeus) Medikus, Malvenfam. 46. 1787.

黄蜀葵 huang shu kui

Herbs annual or perennial, 1–2 m tall, most parts long simple-hispid and minutely simple- or few-rayed pubescent. Stipules linear-lanceolate, sometimes 2 on each side of petiole, 1–1.5 cm; petiole 6–18 cm; leaf blade palmately 5–9-lobed, 15–30 cm in diam., lobes oblong-lanceolate, sometimes ± pinnately lobed, 8–18 × 1–6 cm, sparsely long hispid on both surfaces, margin robustly, obtusely serrate. Flowers solitary, subapical and forming terminal raceme; pedicel 1.5–4 cm. Epicalyx lobes 4 or 5, ovate-lanceolate, 15–25 × 4–5 mm, sparsely long hispid. Calyx spathaceous, minutely 5-lobed, nearly entire, longer than epicalyx, puberulent only, not hispid, caducous at fruiting. Corolla yellow with purple center, ca. 12 cm in diam. Staminal column 1.5–2.5 cm; anthers nearly sessile. Stigma purple-black, spatulate-disk-shaped. Capsule ovoid-ellipsoid, 4–5 × 2.5–3 cm, densely hirsute. Seeds many, reniform, with several lines of hairs. Fl. Aug–Oct.

Grasslands, streamsides, margins of farms; 1000–2100 m. Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan [India, Nepal, Philippines, N Thailand].

Borssum Waalkes (Blumea 14: 96–100. 1966) recognized two subspecies: subsp. *manihot* and subsp. *tetraphyllus* (Roxburgh) Borssum Waalkes. The latter further divided into var. *pungens*, with prickly hairs on the epicalyx, and var. *tetraphyllus*, which is found in Indonesia and Philippines, without such hairs on the epicalyx.

- 1a. Stems without prickly hairs; pedicels sometimes with prickly hairs 1a. var. *manihot*
 1b. Plants with conspicuous yellow prickly hairs throughout including margins of epicalyx lobes 1b. var. *pungens*

1a. *Abelmoschus manihot* var. *manihot*

黄蜀葵(原变种) huang shu kui (yuan bian zhong)

Hibiscus manihot Linnaeus, Sp. Pl. 2: 696. 1753; *H. japonicus* Miquel.

Stems without prickly hairs. Pedicels sometimes with prickly hairs.

Grasslands, streamsides, margins of farms. Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Shaanxi, Shandong, Sichuan, Yunnan [India, Nepal].

Plants with few prickly hairs have been selected for cultivation and sometimes are found as escapes.

1b. *Abelmoschus manihot* var. *pungens* (Roxburgh) Hochreutiner, Candollea 2: 87. 1924.

刚毛黄蜀葵 gang mao huang shu kui

Hibiscus pungens Roxburgh, Fl. Ind., ed. 1832, 3: 213. 1832.

Plants with conspicuous yellow prickly hairs throughout including margins of epicalyx lobes.

1000–2100 m. Guangdong, Guangxi, Guizhou, Hubei, Sichuan, Taiwan, Yunnan [India, Nepal, Philippines, N Thailand].

Borssum Waalkes placed this variety in subsp. *tetraphylla* (Roxburgh) Borssum Waalkes.

2. *Abelmoschus crinitus* Wallich, Pl. Asiat. Rar. 1: 39. 1830.

长毛黄葵 chang mao huang kui

Abelmoschus cancellatus Voigt; *A. hainanensis* S. Y. Hu; *Hibiscus bodinieri* H. Léveillé; *H. cancellatus* Roxburgh ex G. Don (1831), not Linnaeus (1775); *H. cavaleriei* H. Léveillé; *H. crinitus* (Wallich) G. Don.

Herbs perennial, 0.5–2 m tall, entire plant long yellow setose (hairs 5–6 mm) and minutely gray puberulent. Stipules filiform, 1.5–4 cm; petiole 4–12 cm; leaf blades on proximal part of stem orbicular, ca. 9 cm in diam., 5-lobed, those on mid stem cordate, those on distal part of stem sagittate, 4–15 cm, hirsute with long hairs on both surfaces, sparsely hispid or stellate hispid with long hairs on veins. Inflorescences terminal or axillary, a 3–9-flowered raceme. Pedicel 1–1.5(–2.5) cm. Epicalyx lobes 10–20, filiform, 10–35 × 1–2 mm, densely yellow, long hirsute. Calyx spathaceous, longer than epicalyx, simple-pubescent, also yellow setose toward apex, lobes linear. Corolla yellow, ca. 13 cm in diam.; petals 5–8 cm. Staminal column ca. 2 cm. Style branches 5; stigma flat. Capsule subglobose, 3–4 × ca. 3 cm, densely hirsute with yellow and long hairs. Seeds many, reniform, verrucose. Fl. May–Sep.

Grassy slopes; 300–1300 m. Guangxi, Guizhou, Hainan, Yunnan [India, Laos, Myanmar, Nepal, Thailand, Vietnam].

This species is easily distinguished from other species by its long yellow hairs and many filiform epicalyx lobes.

3. *Abelmoschus muliensis* K. M. Feng, Acta Bot. Yunnan. 4: 28. 1982.

木里秋葵 mu li qiu kui

Herbs to 1 m tall, velutinous. Stem ca. 5 mm thick, densely hirsute with yellow and long hairs. Stipule silklike, 1–1.5 cm, densely hirsute; petiole 1–4 cm, densely yellow hirsute; leaf blades on proximal part of stem round-cordate, 6–9 cm in diam., margin broadly dentate, apex obtuse or acute, those on distal part of stem ovate-sagittate, 7–10 × 5–7 cm, densely yellow hirsute, margin broadly dentate, apex obtuse. Flowers unknown. Capsule solitary or racemelike, axillary, stipe 2–4.5 cm, densely hirsute with yellow hairs. Epicalyx lobes 12, filiform, 15–30 × 2–3 mm, densely yellow hirsute. Capsule ovoid-ellipsoid, 4.5–5.5 × 2.5–3 cm, densely yellow hirsute, shortly beaked, hirsute on adaxial surface. Seeds reniform, ca. 4 mm, glandularly striate.

- Grassy slopes; 1200–2100 m. SW Sichuan (Miyi, Muli).

Abelmoschus muliensis differs from the other Chinese members of the genus by the short petioles, not more than 4 cm. It is most likely to be confused with *A. crinitus* but has broader epicalyx lobes, 2–3 mm, not 1–2 mm, wide.

4. *Abelmoschus esculentus* (Linnaeus) Moench, Methodus 1: 617. 1794.

咖啡黄葵 ka fei huang kui

Hibiscus esculentus Linnaeus, Sp. Pl. 2: 696. 1753; *H. longifolius* Willdenow.

Herbs annual, 1–2 m tall, most parts with very sparse prickly hairs. Stem often hollow. Stipule filiform, 7–10 mm, sparsely hirsute; petiole 7–15(–35) cm, long hirsute, often with pubescent adaxial groove; leaf blade palmately 3–7-lobed, (5–)10–30 cm in diam., lobes broad to narrow, sparsely hirsute on both surfaces, margin sparsely dentate and emarginate. Flowers solitary, axillary. Pedicel (0.5–)1–2(–5) cm, sparsely strigose. Epicalyx lobes 7–10(–12), filiform, 5–18 × 1–2.5 mm, sparsely hirsute. Calyx campanulate, 2–3 cm, densely stellate puberulent. Corolla yellow or white with dark purple center, 5–7 cm in diam.; petals obovate, 3.5–5 × 3–4 cm. Filament tube 2–2.5 cm. Capsule cylindrical to tower-shaped, 10–25 × 1.5–2(–3) cm, long beaked, sparsely strigose. Seeds dark brown or gray, globose to reniform, 5–15 per locule, (3–)4–5(–6) mm, striate, minutely warty. Fl. May–Sep.

Cultivated. Guangdong, Hainan, Hebei, Hubei, Hunan, Jiangsu, Shandong, Yunnan, Zhejiang [native to India].

The young fruits are an important vegetable (okra) in S Asia.

5. *Abelmoschus moschatus* Medikus, Malvenfam. 46. 1787.

黄葵 huang kui

Hibiscus abelmoschus Linnaeus, Sp. Pl. 1: 696. 1753; *Abelmoschus moschatus* var. *betulifolius* (Masters) Hochreutiner; *H. abelmoschus* var. *betulifolius* Masters; *H. chinensis* Roxburgh ex Masters.

Herbs annual or perennial, (0.25–)1–2 m tall, most parts uniformly yellow hispid/setose, rarely glabrous or also pale pubescent, taproot tapered, not swollen. Stipules filiform, 7–8

mm; petiole 7–15 cm, sometimes densely pubescent along adaxial groove; leaf blade 6–15 cm in diam., very variable in form, usually palmately (3–)5–7-lobed, lobes lanceolate to triangular; blades on distal part of stem narrower, both surfaces sparsely hirsute, base cordate, margin irregularly serrate. Flowers solitary, axillary. Pedicel 2–3 cm, hirsute. Epicalyx lobes 6–10, linear to narrowly oblong, (8–)10–13 × 1.5–2 mm, incurved, appressed to capsule. Calyx spatulate, much longer than epicalyx, 2–3 cm, 5-parted, usually caducous, uniformly densely pubescent. Corolla 7–12 cm in diam., yellow with dark purple center; petals obovate. Staminal column ca. 2.5 cm, glabrous. Ovary hairy; style hairy, branches 5; stigma disk-shaped. Capsule oblong, 5–6 cm, apex acute, uniformly yellow hirsute. Seeds black-brown, reniform, concentrically ribbed, glandular-reticulate, with musk smell. Fl. Jun–Oct.

Scrub on slopes, valleys, streamsides, flat areas. Guangdong, Guangxi, Hunan, Jiangxi, Taiwan, Yunnan [Cambodia, India, Laos, Thailand, Vietnam].

Oil from the seed is economically valuable. Borssum Waalkes recognized three subspecies within *Abelmoschus moschatus*, one of which, subsp. *tuberosus*, is here included within *A. sagittifolius*. The Chinese material belongs to subsp. *moschatus* while the third subspecies, subsp. *biakensis*, is restricted to New Guinea.

6. *Abelmoschus sagittifolius* (Kurz) Merrill, Lingnaam Agric. Rev. 2: 40. 1924.

剑叶秋葵 jian ye qiu kui

Hibiscus sagittifolius Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 40: 46. 1871; *Abelmoschus coccineus* S. Y. Hu; *A. coccineus* var. *acerifolius* S. Y. Hu; *A. esquirolii* (H. Léveillé) S. Y. Hu; *A. moschatus* Medikus subsp. *tuberosus* (Spanoghe) Borssum Waalkes; *A. sagittifolius* var. *septentrionalis* (Gagnepain) Merrill; *H. bellicosus* H. Léveillé; *H. bodinieri* H. Léveillé var. *brevicalyculatus* H. Léveillé; *H. esquirolii* H. Léveillé; *H. longifolius* Willdenow var. *tuberosus* Spanoghe; *H. sagittifolius* var. *septentrionalis* Gagnepain.

Herbs perennial, 0.4–1(–2) m tall, most parts densely pubescent, sometimes also setose or stellate hairy; rootstock fleshy, radish-shaped, to 5 cm thick. Branchlets scabrous and hirsute with long hairs. Petiole 4–8 cm, sparsely long hirsute; leaf blades variable; blades on proximal part of stem ovate, those on middle and distal parts ovate-hastate, sagittate, or palmately 3–5-lobed or -parted, lobes broadly ovate or broadly lanceolate, 3–10 cm, abaxially long hirsute, adaxially sparsely spiny, base cordate or hastate, margin serrate or lobed, apex obtuse. Flowers solitary, axillary. Pedicel slender, 4–7 cm, densely scabrous hirsute. Epicalyx lobes 6–12, filiform, ca. 15 × 1–1.7 mm, sparsely hirsute, spreading or reflexed. Calyx spatulate, ca. 7 mm, apex 5-toothed, densely minutely puberulent. Corolla mostly white or pale yellow to dark pink, 4–5 cm in diam.; petals obovate-oblong, 3–4 cm. Staminal column ca. 2 cm, glabrous. Style branches 5; stigma flat. Capsule ellipsoid, ca. 3 × 2 cm, spiny, shortly beaked. Seeds reniform, glandularly reticulately striate. Fl. May–Sep.

Open *Pinus* forests, hills, grassy slopes, wastelands. Guangdong, Guangxi, Guizhou, Hainan, Yunnan [Cambodia, India, Laos, Malaysia, Myanmar, Thailand, Vietnam; Australia].

This species is grown as an ornamental.

15. HIBISCUS Linnaeus, Sp. Pl. 2: 693. 1753, nom. cons.

木槿属 mu jin shu

Bombycidendron Zollinger & Moritzi; *Fioria* Mattei; *Furcaria* (Candolle) Kosteletzky (1836), not Desvaux (1827); *Hibiscus* sect. *Furcaria* Candolle; *H.* sect. *Sabdariffa* Candolle; *Ketmia* Miller; *Sabdariffa* (Candolle) Kosteletzky; *Solandra* Murray (1785), not Linnaeus (1759), nor Swartz (1787), nom. cons.; *Talipariti* Fryxell.

Shrubs, subshrubs, trees, or herbs. Leaf blade palmately lobed or entire, basal veins 3 or more. Flowers axillary, usually solitary, sometimes subterminal and \pm congested into a terminal raceme, 5-merous, bisexual. Epicalyx lobes 5 to many, free or connate at base, rarely very short (*H. schizopetalus*) or absent (*H. lobatus*). Calyx campanulate, rarely shallowly cup-shaped or tubular, 5-lobed or 5-dentate, persistent. Corolla usually large and showy, variously colored, often with dark center; petals adnate at base to staminal tube. Filament tube well developed, apex truncate or 5-dentate; anthers throughout or only on upper half of tube. Ovary 5-loculed or, as a result of false partitions, 10-loculed; ovules 3 to many per locule; style branches 5; stigmas capitate. Fruit a capsule, cylindrical to globose, valves 5, dehiscence loculicidal and sometimes partially septicial or indehiscent (*H. vitifolius* Linnaeus). Seeds reniform, hairy or glandular verrucose.

About 200 species: tropical and subtropical regions; 25 species (12 endemic, four introduced) in China.

According to recent molecular studies (Pfeil et al., Syst. Bot. 27: 333–350. 2002), *Hibiscus* is paraphyletic, and as more taxa are sampled and a more robust phylogeny is constructed, the genus undoubtedly will be recast. Species of other genera of Hibisceae found in China, such as *Abelmoschus*, *Malvaviscus*, and *Urena*, fall within a monophyletic *Hibiscus* clade. *Decaschistia*, which is currently placed in the Decaschisteae, also falls within this clade, but only a single Australian species was sampled and this may not be representative of the genus as a whole. Given the unsettled taxonomy of *Hibiscus*, we are choosing to be conservative, recognizing the paraphyletic nature of *Abelmoschus*, *Malvaviscus*, *Urena*, and possibly *Decaschistia*, and refraining from recognizing additional segregates of *Hibiscus* such as *Fioria* and *Talipariti*, which themselves may not be monophyletic.

The large colorful flowers of many species mean that the genus is of great horticultural interest and several species are now widely distributed in China. *Hibiscus elatus* Swartz and *H. radiatus* Cavanilles were included in FRPS but they are cultivated species of limited occurrence and do not meet the criteria for inclusion in this Flora.

Hibiscus forrestii Diels (Notes Roy. Bot. Gard. Edinburgh 5: 252. 1912), described from Yunnan, could not be treated here because no material was seen by the authors.

- 1a. Herbs, annual or perennial, sometimes \pm scandent.
 - 2a. Epicalyx absent; calyx membranous, persistent and enclosing capsule 25. *H. lobatus*
 - 2b. Epicalyx present; calyx leafy, rarely \pm fleshy.
 - 3a. Ovary and capsule glabrous; perennial herbs 18. *H. moscheutos*
 - 3b. Ovary and capsule strigose or pilose; annual or perennial herbs.
 - 4a. Leaf blade cordate, ovate, or orbicular, not lobed; capsule margins winged 19. *H. yunnanensis*
 - 4b. Leaf blade palmately lobed; capsule margins without wings.
 - 5a. Stems with reflexed or retrorsely curved prickles; epicalyx lobes with foliaceous appendage at or above middle.
 - 6a. Perennial herbs or subshrubs; stipules filiform; pedicel 0.3–0.7 cm; corolla purple, petals ca. 7 cm (cultivated) *H. radiatus* (see note above)
 - 6b. Annual herbs, often prostrate or scandent; stipules leafy, narrowly lanceolate or auriculate; pedicel 1–5 cm; corolla pale yellow with dark purplish center, fading to dull pink, petals ca. 3.5 cm.
 - 7a. Stipules auriculate; stem prickles without basal tubercle, curved 20. *H. surattensis*
 - 7b. Stipules narrowly lanceolate; stem prickles with prominent basal tubercle, straight 21. *H. hispidissimus*
 - 5b. Stems usually without prickles; epicalyx lobes with or without appendages.
 - 8a. Herbs annual, stems slender, erect or procumbent, with long white hairs; leaf blade lobes obovate to oblong, irregular, pinnately lobed, sometimes leaf \pm compound; calyx papery, inflated, pale with purplish veins 22. *H. trionum*
 - 8b. Herbs annual or perennial, stems robust, erect; leaf blade lobes lanceolate; calyx leafy or fleshy, not inflated, uniformly colored.
 - 9a. Stems not spiny; epicalyx lobes lanceolate, with spiny appendage near apex, connate at base; calyx and epicalyx lobes red, thick and fleshy 23. *H. sabdariffa*
 - 9b. Stems sparsely prickly; epicalyx lobes filiform, spiny, without appendage, free; calyx and epicalyx lobes green, not thickened 24. *H. cannabinus*
- 1b. Shrubs or trees.
 - 10a. Leaf margin entire or nearly so; epicalyx cup-shaped, lobes 8–12, joined for more than ca. 1/4 of length.

- 11a. Leaf blade ovate-oblong to elliptic-oblong, 3(–5)-veined, abaxial surface glabrous, stipules filiform; calyx longer than capsule 4. *H. grewiiifolius*
- 11b. Leaf blade cordate, 7–11-veined, abaxial surface hairy, often tomentose, stipules foliaceous or spathaceous; calyx as long as capsule.
- 12a. Branchlets glabrous; leaf blade 8–20 cm; seeds glabrous.
- 13a. Petals yellow with dark purple basal spot, 4–4.5 cm; calyx persistent 2. *H. tiliaceus*
- 13b. Petals red, 8–10 cm; calyx caducous (cultivated) *H. elatus* (see note above)
- 12b. Branchlets hairy; seeds hairy or minutely papillate.
- 14a. Branchlets with fascicled, long and silklike hairs; leaf blade 15–35 cm wide, stipules 2–4 cm wide; evergreen forest 1. *H. macrophyllus*
- 14b. Branchlets softly stellate pubescent, stellate hairs 0.5 mm or less; leaf blade 4–8 cm wide, stipules 0.3–1 cm wide; coastal sand 3. *H. hamabo*
- 10b. Leaf margin serrate or dentate; epicalyx lobes almost free, joined only at base, sometimes absent.
- 15a. Flowers in panicles, terminal or axillary; leaf blade cordate or ovate-cordate, not lobed; plant a climber 5. *H. austroyunnanensis*
- 15b. Flowers solitary, axillary, sometimes ± congested into a terminal raceme; leaf blade elliptic, oblong, or ovate to orbicular-ovate, often lobed; plant an erect shrub or tree, rarely climbing (*H. fragrans*).
- 16a. Epicalyx lobes spatulate, apex rounded, rarely lobed; leaf blade leathery, densely stellate tomentose 6. *H. aridicola*
- 16b. Epicalyx lobes filiform to ovate, apex obtuse or acute; leaf blade papery, indumentum sparser.
- 17a. Flowers pendulous; pedicel glabrous; staminal column longer than corolla; leaf blade not lobed.
- 18a. Petals deeply pinnatifid, reflexed; epicalyx lobes 1–2 mm 7. *H. schizopetalus*
- 18b. Petals entire or only slightly incised, spreading but not reflexed; epicalyx lobes 8–15 mm 8. *H. rosa-sinensis*
- 17b. Flowers erect or patent; pedicel hairy; staminal column shorter than or equaling corolla; leaf blade usually lobed (not lobed in *H. fragrans*).
- 19a. Leaf blade base cuneate or broadly cuneate, 3–5-veined; style glabrous or hairy.
- 20a. Epicalyx lobes 4–6 mm, connate for 1/3–1/2 length; seed glabrous 17. *H. leviseminus*
- 20b. Epicalyx lobes 6–25 mm, connate at base only; seed glabrous or hairy (ornamental deciduous shrubs).
- 21a. Leaf blade cuneate, ovate, or orbicular; epicalyx lobes lanceolate-oblong, 3–5 mm wide 16. *H. sinosyriacus*
- 21b. Leaf blade ovate, orbicular, or rhomboid; epicalyx lobes linear, 0.5–2 mm wide 15. *H. syriacus*
- 19b. Leaf blade base cordate, truncate, or rounded, 5–11-veined; style hairy.
- 22a. Epicalyx lobes ovate, 5–12 mm wide.
- 23a. Leaf blade ovate, not lobed; corolla ca. 3 cm in diam. 9. *H. fragrans*
- 23b. Leaf blade palmately 3–7-lobed; corolla 7–12 cm in diam.
- 24a. Pedicel and epicalyx lobes strigose with long ferruginous hairs ca. 3 mm 10. *H. paramutabilis*
- 24b. Pedicel and epicalyx lobes densely pale stellate pubescent 11. *H. indicus*
- 22b. Epicalyx lobes linear or linear-lanceolate, 1.5–5 mm wide.
- 25a. Epicalyx lobes 5 or 6, 16–25 × 3–5 mm; pedicel 1–3 cm 14. *H. labordei*
- 25b. Epicalyx lobes 8, 8–16 × 1.5–2 mm; pedicel 4–13 cm.
- 26a. Pedicels and epicalyx lobes strigose, hairs ca. 3 mm; leaf blade suborbicular, lobes 3–5 12. *H. taiwanensis*
- 26b. Pedicels and epicalyx lobes densely woolly pubescent; leaf blade ovate or cordate, lobes 5–7 13. *H. mutabilis*

1. *Hibiscus macrophyllus* Roxburgh ex Hornemann, Suppl. Hort. Bot. Hafn. 149. 1819.

大叶木槿 *da ye mu jin*

Pariti macrophyllum (Roxburgh ex Hornemann) G. Don; *Talipariti macrophyllum* (Roxburgh ex Hornemann) Fryxell.

Trees 6–9 m tall, to 30 cm d.b.h.; trunk erect, bark gray-white. Branchlets, bud, leaves, petioles, stipules, epicalyx lobes, and inflorescences densely hairy, hairs usually 6–8-fascicled, brown, silklike, ca. 8 mm. Bud terminal, 7–9 cm. Stipules foliaceous, oblong, large, caducous; petiole 15–30 cm; leaf blade nearly orbicular-cordate, not lobed, 20–36 cm in diam., both surfaces densely stellate velutinous, basal veins 7–9, promi-

nently raised abaxially, lateral veins and veinlets prominent, prominently raised abaxially, slightly impressed adaxially, base cordate, margin entire or serrate, apex acuminate. Inflorescences terminal, multi-flowered cymes, to 30 cm. Pedicel 2.5–3 cm, bracts spatulate and connate at base, large, caducous. Epicalyx lobes 10–12, filiform, ca. 2.5 cm, nearly as long as sepals, connate at base. Calyx campanulate, lobes 5, lanceolate. Corolla yellow with purple center, ca. 6 cm in diam.; petals villous abaxially. Staminal column ca. 3 cm. Ovary hairy; style branches 5, hairy; stigma capitate. Capsule oblong, 2.5–3 cm, densely scabrous hirsute. Fl. Mar–May, fr. Jul.

Evergreen broad-leaved forests, near villages; 400–1000 m. S Yunnan (Xishuangbanna) [Cambodia, India, Indonesia, Malaysia, Myanmar, Pakistan, Thailand, Vietnam].

2. *Hibiscus tiliaceus* Linnaeus, Sp. Pl. 2: 694. 1753.

黄槿 huang jin

Hibiscus boninensis Nakai; *H. tiliaceus* var. *heterophyllum* Nakai; *H. tiliaceus* var. *tortuosus* (Roxburgh) Masters; *H. tortuosus* Roxburgh; *Pariti boninense* (Nakai) Nakai; *P. tiliaceum* (Linnaeus) A. Jussieu; *P. tiliaceum* var. *heterophyllum* (Nakai) Nakai; *Talipariti tiliaceum* (Linnaeus) Fryxell.

Shrubs evergreen or trees, 4–10 m tall, to 60 cm d.b.h.; bark gray-white. Branchlets glabrous or nearly so, rarely stellate puberulent or stellate. Stipules foliaceous, oblong, ca. 2 × 1.2 cm, stellate pilose, apex rounded, caducous; petiole 3–8 cm; leaf blade nearly orbicular to broadly ovate, 8–15 × 8–15 cm, leathery, green, abaxially densely gray-white stellate puberulent, adaxially very sparsely stellate scaly, glabrescent, basal veins 7 or 9, base cordate, margin entire or obscurely crenate, apex abruptly acuminate. Inflorescence a 1- to few-flowered racemelike cyme, terminal or axillary; peduncle 4–5 cm. Pedicel 1–3 cm, with 1 pair of stipulelike bracteoles at base. Epicalyx lobes 7–10, joined for 1/3–1/2 of length, free lobes 2–2.5 mm, triangular-acuminate with slightly rounded sinuses, densely gray-white stellate puberulent. Calyx 1.5–2.5 cm, connate proximally for 1/4–1/3 of length, lobes 5, lanceolate, stellate puberulent, persistent. Corolla yellow with dark purple center, campanulate, 6–7.5 cm in diam.; petals obovate, 4–4.5 cm, yellow stellate puberulent abaxially. Filament tube ca. 3 cm, glabrous. Style branches 5, slender, with glandular hairs. Capsule subglobose to ovoid, ca. 2 cm, obscurely beaked, densely fascicled-hirsute, valves 5, woody. Seeds reniform, smooth, glabrous. Fl. Jun–Aug.

Sea shores, along streams, sandy soil; near sea level to 300 m. Fujian, Guangdong, Hainan, Taiwan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam; pantropical].

Borssum Waalkes (Blumea 14: 30–38. 1966) recognized a series of six subspecies. Chinese material belongs to the nominate subspecies, *Hibiscus tiliaceus* subsp. *tiliaceus*.

Fiber from the bast of *Hibiscus tiliaceus* is used on Hainan to make fishing nets.

3. *Hibiscus hamabo* Siebold & Zuccarini, Fl. Jap. 1: 176. 1841.

海滨木槿 hai bin mu jin

Hibiscus tiliaceus Linnaeus var. *hamabo* (Siebold & Zuccarini) Maximowicz; *Talipariti hamabo* (Siebold & Zuccarini) Fryxell.

Trees or shrubs, deciduous, 1–5 m tall, young stems softly stellate pubescent, stellate hairs 0.5 mm or less. Stipules foliaceous, oblong-ovate, ca. 1.5 × 1 cm, deciduous; petiole 1–2.5 cm; leaf blade orbicular to broadly obovate, not lobed, 3–6(–7) × 3.5–7(–8) cm, abaxially densely whitish puberulent, adaxially sparsely and minutely stellate pubescent, basal veins 5–7, base cordate, margin irregularly crenulate to subentire, apex abruptly acuminate; abaxial nectary at base of midrib. Flowers solitary, axillary, or by abortion or reduction of upper leaves in a few-flowered terminal raceme. Pedicel 3–10 mm, with densely mixed simple and stellate hairs, accrescent in fruit. Epicalyx cup-shaped, ca. 1 cm, lobes 8–10, connate for 1/2 of length, narrowly triangular. Calyx campanulate, 1.8–2.1 cm, deeply 5-lobed, longer than epicalyx; nectaries present, obscure. Corolla showy, yellow later turning orange-red, with dark red spots in center, 5–12 cm in diam.; petals obovate, 4–5 cm, stellate pubescent abaxially. Staminal column 1.5–2 cm, glabrous, apical 2/3 antheriferous, ca. 1/2 as long as petals. Style branches longer than staminal column; stigma capitate. Capsule ovoid, 2.5–3.5 cm, densely brownish hirsute. Seeds reniform, ca. 4.5 mm, minutely papillate (appearing glabrous).

Coastal sands; near sea level. Zhejiang [Japan (Bonin and Ryukyu Islands), Korea; cultivated in India and Pacific islands (Hawaii)].

This species is easily recognized by its obovate leaf blades.

4. *Hibiscus grewiifolius* Hasskarl, Cat. Hort. Bot. Bogor. 197. 1844.

樟叶槿 zhang ye jin

Bombycidendron grewiifolium (Hasskarl) Zollinger & Moritz; *Hibiscus bantamensis* Miquel; *H. cinnamomifolius* Chun & Tsang; *H. praeclarus* Gagnepain.

Trees evergreen, to 7 m tall. Branchlets terete, light gray-white, glabrous or very minutely hairy. Stipules filiform, minute, caducous; petiole 2–4.5 cm, pilose; leaf blade ovate-oblong to elliptic-oblong, not lobed, 8–15 × 6–7 cm, papery or nearly leathery, glabrous, basal veins 3(–5), prominently raised abaxially, base obtuse or broadly cuneate, margin entire, apex shortly acuminate. Flowers unknown. Epicalyx lobes 9, filiform, 1–1.5 cm, glabrous. Epicalyx cup-shaped, 8–12-dentate. Sepals 5, oblong-lanceolate, campanulate, connate for 1/5 of length, longer than capsule, glabrous, persistent. Capsule solitary, axillary, fruit stalk ca. 4.5 cm, glabrous, ovoid, ca. 2 cm in diam.; mericarps 5, glabrous. Seeds 4 or 5 per mericarp, reniform, ca. 5 × 3 mm, densely woolly abaxially. Fr. Jan–Feb.

Hill forests; ca. 2000 m. Hainan [Indonesia, Laos, Myanmar, Thailand, Vietnam].

5. *Hibiscus austroyunnanensis* C. Y. Wu & K. M. Feng, Fl. Yunnan. 2: 223. 1979 [“*austro-yunnanensis*”].

滇南芙蓉 dian nan fu rong

Shrubs climbing, 3–5 m tall. Branchlets terete, densely

stellate puberulent. Stipules lanceolate, needle-shaped, caducous; petiole 2–4 cm, stellate puberulent; leaf blade cordate or ovate-cordate, not lobed, 6–10 × 5–8 cm, densely stellate puberulent when young, glabrescent, densely stellate puberulent abaxially, verrucose adaxially, basal veins 5, base cordate, margin serrate, apex acute to acuminate. Inflorescences terminal or axillary, 2–3-flowered panicles, fascicled, or flowers solitary, densely stellate puberulent. Pedicel 3–5 cm. Epicalyx lobes 5, connate at base, much shorter than calyx. Calyx campanulate, connate for 1/2 length, ca. 1.8 × 3 cm, densely stellate puberulent, lobes 5, ovate-triangular. Corolla white, flushed purplish abaxially, campanulate, ca. 5 cm in diam.; petals obovate, 2.5–3 cm, bearded at base. Staminal column ca. 1.5 cm, glabrous; filaments free for ca. 4 mm. Style branches 5, glabrous or minutely hairy. Capsule ellipsoid, ca. 3.5 × 1.5 cm, densely stellate tomentose, apex acute; mericarps 5; persistent sepals foliaceous, ca. 2 cm. Seeds reniform, villous, hairs white, ca. 8 mm. Fl. Dec.

- Mixed forests in valleys, streamsides; 500–1300 m. S Yunnan.

Hibiscus austroyunnanensis is similar to *H. fragrans* Roxburgh, but differs in having shorter petioles (5–7 cm in *H. fragrans*) and a larger corolla (ca. 3 cm wide in *H. fragrans*). It is also similar to the Indian species *H. scandens* Roxburgh, which differs in having 3-lobed leaf blades, the epicalyx as long as or longer than the calyx, and the corolla white or yellow, with a crimson center.

6. *Hibiscus aridicola* J. Anthony, Notes Roy. Bot. Gard. Edinburgh 15: 241. 1927.

旱地木槿 han di mu jin

Hibiscus aridicola var. *glabratus* K. M. Feng.

Shrubs deciduous, erect, 1–2 m tall; most parts densely yellow stellate tomentose, hairs of 2 sizes, more scalelike on veins. Branchlets terete or angular. Stipules filiform, 5–8 mm; petiole 1–6 cm; leaf blade ovate or orbicular-ovate, not lobed, 5–8 × 5–10 cm, thickly or thinly leathery, base truncate or cordate, margin dentate, apex acute to obtuse. Flowers solitary, subterminal. Pedicel 2.5–6 cm, articulate at end. Epicalyx lobes 6, linear-spatulate to oblanceolate, 8–12 × 2–4.5 mm, stellate scaly, apex rounded. Calyx cup-shaped, 2–2.2 × ca. 2 cm, lobes joined for more than 1/2 length, triangular-acuminate, 2.5–3 cm, abaxially densely yellow to brown stellate floccose interspersed with larger, paler stellate scales, adaxially sparsely villous near margins, barbate at base. Corolla white, sometimes tinged yellow in center, ± reflexed; petals obovate, 4–4.5 × ca. 4 cm. Staminal column 2–2.5 cm; anthers very dense, brick-red. Style exerted from filament tube by ca. 1 cm, curved, branches 5, not spreading, sometimes sparsely ciliate toward apex. Capsule ovoid, ca. 2.3 cm. Seeds reniform, woolly, hairs white, ca. 5 mm. Fl. Oct–Nov.

- Scrub, slopes, hot and dry river valleys; 1300–2100 m. SW Sichuan, NW Yunnan.

Hibiscus aridicola var. *glabratus*, with thinner textured leaf blades and glabrous styles, seems better regarded as just a shade form. *G Forrest 16931* is a distinctive form possibly worthy of formal recognition: it is much more robust, with a darker indumentum, leaf blades to 20 × 20 cm with irregularly coarsely dentate margins, pedicels to 9 cm, and very distinctive epicalyx lobes that are broadly spatulate, to 20 × 14 mm, and irregularly 3-lobed.

7. *Hibiscus schizopetalus* (Dyer ex Masters) J. D. Hooker, Bot. Mag. 106: t. 6524. 1880.

吊灯芙蓉 diao deng fu sang

Hibiscus rosa-sinensis Linnaeus var. *schizopetalus* Dyer ex Masters, Gard. Chron., n.s., 11: 272. 1879.

Shrubs evergreen, erect, to 3 m tall. Branchlets slender, usually pendulous, glabrous. Stipules subulate, ca. 2 mm, usually caducous; petiole 1–2 cm, stellate; leaf blade elliptic or oblong, not lobed, 4–7 × 1.5–4 cm, papery, glabrous, base obtuse or broadly cuneate, margin dentate, apex acute or shortly acuminate. Flowers solitary, axillary on upper branchlets, pendulous. Pedicel slender, 8–14 cm, glabrous or slightly hairy, articulate in middle. Epicalyx lobes 5, lanceolate, 1–2 mm, ciliate, apex obtuse or acute. Calyx tubular, ca. 1.5 cm, sparsely hairy, 5-lobed, usually dehiscent on 1 side. Petals 5, red, ca. 5 cm, deeply pinnatifid, strongly reflexed. Staminal column longer than corolla, 9–10 cm, glabrous, curved upward toward tip; anthers restricted to upper part. Style branches 5, glabrous. Capsule oblong-cylindric, ca. 4 × 1 cm. Fl. year-round.

Cultivated. Fujian, Guangdong, Guangxi, Hainan, Taiwan, S Yunnan [native to E Africa; now widely cultivated as an ornamental].

Though clearly most closely related to *Hibiscus rosa-sinensis*, there is no reason to doubt that *H. schizopetalus* is indigenous to East Africa.

8. *Hibiscus rosa-sinensis* Linnaeus, Sp. Pl. 2: 649. 1753.

朱槿 zhu jin

Shrubs evergreen, 1–3 m tall. Branchlets terete, sparsely stellate pilose. Stipules filiform, 5–12 mm, hairy; petiole 5–20 mm, villous; leaf blade broadly or narrowly ovate, not lobed, 4–9 × 2–5 cm, papery, pilose on veins abaxially only, base rounded or cuneate, margin dentate or lobed, apex acuminate. Flowers solitary, axillary on upper branches, usually pendulous, simple or double. Pedicel 3–7 cm, sparsely stellate pilose or nearly glabrous, articulate near apex. Epicalyx lobes 6–7, filiform, connate at base, 8–15 mm, sparsely stellate, apex obtuse or acute. Calyx campanulate, ca. 2 cm, stellate puberulent, lobes 5, ovate to lanceolate. Corolla rosy red, reddish, or orange-yellow, funnel-shaped, 6–10 cm in diam., often double; petals obovate, pilose abaxially, apex rounded. Staminal column 4–8 cm, glabrous. Style branches 5. Capsule ovoid, ca. 2.5 cm, glabrous, apex beaked. Fl. year-round.

- Cultivated as an ornamental. Fujian, Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan [not known in the wild but believed to have originated in China; now widely cultivated].

Hibiscus rosa-sinensis is a very popular flowering shrub or houseplant with a great many cultivars. Plants with double flowers have been named as var. *rubroplenus* Sweet (重瓣朱槿 chong ban zhu jin).

9. *Hibiscus fragrans* Roxburgh, Fl. Ind., ed. 1832, 3: 195. 1832.

香芙蓉 xiang fu rong

Scandent shrubs, robust climbers, or trees, trunk to 20 cm d.b.h.; stems, petioles, and pedicels stellate pubescent. Stipules linear to lanceolate, ca. 1 × 0.3 cm, stellate tomentose; petiole 5–7 cm; leaf blade ovate, not lobed, 5–15 × 4–12 cm, thickly

papery, both surfaces stellate hairy, denser abaxially, glabrescent, basal veins 5–7, base cordate, margin repand or dentate, apex acuminate. Flowers solitary, axillary, ± congested into a terminal raceme, fragrant. Pedicel 3–7 cm, with subapical articulation. Epicalyx lobes 5, ovate, joined at base, 4–14 × 5–10 mm, stellate pubescent, apex acuminate. Calyx lobes joined for ca. 1/2 length, ovate, 1–2 × 0.3–1 cm, abaxially with mixed stellate and club-shaped hairs, adaxially stellate tomentose, apices acuminate. Corolla white to pale pink with pale yellow center, ± spreading, ca. 3 cm in diam.; petals 2–4 × 2–3 cm, abaxially sparsely stellate pilose, adaxially glabrous. Filament tube ca. 1 cm, purplish. Capsule ovoid, 3–4 × 1.5–2 cm, densely stellate hairy. Seeds small, reniform, white or brown hirsute.

Tropical and subtropical evergreen forests; below 1400 m. ?Yunnan [Bangladesh, NE India, Myanmar].

Handel-Mazzetti (Oesterr. Bot. Z. 87: 124. 1938) identified a gathering by Wissman, probably no longer extant, as *Hibiscus fragrans*. It has not been possible to confirm the presence of this species within China, but it does seem quite likely that it extends into our area.

10. *Hibiscus paramutabilis* L. H. Bailey, Gentes Herb. 1: 109. 1922.

庐山芙蓉 lu shan fu rong

Shrubs deciduous or small trees, erect, 1–4 m tall. Branchlets, stipules, and petioles stellate puberulent. Stipules filiform, ca. 6 mm, caducous; petiole 3–14 cm; leaf blade palmately 5–7-lobed or sometimes 3-lobed, 5–14 × 6–15 cm, papery, palmate veins 5, stellate on both surfaces, base truncate or nearly cordate, lobe margin sinuately dentate, apex acuminate. Flowers solitary, axillary on upper branches and branchlets. Pedicel 2–12 cm, articulate near apex, densely puberulent and strigose with long hairs ca. 3 mm. Epicalyx lobes ovate, 8–12 mm wide, apex obtuse or acute. Calyx campanulate, lobes 5, ovate-lanceolate, connate for 1/4 of length, densely yellow-ferruginous stellate tomentose. Corolla white with purple-red center, 10–12 cm in diam.; petals obovate, 5–7 cm, stellate abaxially, veined, white barbate at base, apex rounded or emarginate. Staminal column ca. 3.5 cm. Style branches 5, villous. Capsule oblong-ovoid, ca. 2.5 × 2 cm; mericarps 5, densely yellow-ferruginous stellate tomentose and long hirsute. Seeds reniform, villous, hairs red-brown, ca. 3 mm. Fl. Jul–Aug.

• Scrub, slopes, valleys; 500–1100 m. Guangxi, Hunan, Jiangxi.

- 1a. Pedicel 2–4 cm 10a. var. *paramutabilis*
1b. Pedicel 4–12 cm 10b. var. *longipedicellatus*

10a. *Hibiscus paramutabilis* var. *paramutabilis*

庐山芙蓉(原变种) lu shan fu rong (yuan bian zhong)

Hibiscus saltuarius Handel-Mazzetti.

Pedicel 2–4 cm.

• Slopes; 800–1100 m. Guangxi, Hunan, Jiangxi.

10b. *Hibiscus paramutabilis* var. *longipedicellatus* K. M. Feng, Acta Bot. Yunnan. 4: 29. 1982.

长梗庐山芙蓉 chang geng lu shan fu rong

Pedicels very long, 4–12 cm, articulated near apex.

• Valleys; ca. 500 m. Guangxi (Jinxu).

11. *Hibiscus indicus* (N. L. Burman) Hochreutiner, Mém. Soc. Hist. Nat. Afrique N. 2: 163. 1949.

美丽芙蓉 mei li fu rong

Shrubs deciduous, erect, to 3 m tall, entire plant densely stellate puberulent. Stipules lanceolate, ca. 5 mm, caducous; petiole terete, 6–11 cm; leaf blade cordate, 8–12 × 10–15 cm, papery, palmately 5–11-veined, usually 7-lobed proximally, usually 3–5-lobed distally, lobe margins irregularly dentate or entire, apices acuminate or obtuse. Flowers solitary, axillary on upper branchlets. Pedicel 6–15 cm, articulate at apex. Epicalyx lobes 4 or 5, ovate, connate at base, ca. 20 × 8–12 mm, densely stellate tomentose, apex obtuse or acute. Calyx cup-shaped, ca. 2.5 cm, lobes 5, ovate, connate for 1/3 of length, densely stellate tomentose. Corolla pink to white, 7–10 cm in diam.; petals obovate, ca. 6.5 cm, barbate at base, abaxially stellate hairy. Staminal column 3.5–4 cm. Style sparsely villous. Capsule nearly globose, ca. 3 cm in diam., hirsute; mericarps 5–6. Seeds reniform, ca. 3 mm, densely ferruginous puberulent. Fl. Jul–Dec.

• Scrub in valleys, coral limestone; 700–2000 m. Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan.

Hibiscus indicus, despite its name, seems to be a Chinese endemic that was brought into cultivation and introduced to India and Indonesia more than 200 years ago (Borssum Waalkes, Blumea 14: 67. 1966).

- 1a. Leaf blade lobes broadly triangular, irregularly dentate; petals ca. 6.5 cm 11a. var. *indicus*
1b. Leaf blade lobes obtuse, entire; petals ca. 3.5 cm 11b. var. *integrilobus*

11a. *Hibiscus indicus* var. *indicus*

美丽芙蓉(原变种) mei li fu rong (yuan bian zhong)

Alcea indica N. L. Burman, Fl. Indica, 149. 1768; *Hibiscus platystegius* Turczaninow; *H. venustus* Blume.

Leaf blade lobes broadly triangular, irregularly dentate, apices acuminate. Petals ca. 6.5 cm.

• Scrub in valleys; 700–2000 m. Guangdong, Guangxi, Sichuan, Yunnan.

11b. *Hibiscus indicus* var. *integrilobus* (S. Y. Hu) K. M. Feng, Fl. Reipubl. Popularis Sin. 49(2): 73. 1984.

全缘叶美丽芙蓉 quan yuan ye mei li fu rong

Hibiscus venustus var. *integrilobus* S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 49. 1955.

Leaf blade lobes entire, apices obtuse. Petals ca. 3.5 cm.

• Coral limestone. S Taiwan (Hengchun).

This taxon has been overlooked in recent accounts of the plants of Taiwan.

12. *Hibiscus taiwanensis* S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 48. 1955.

台湾芙蓉 tai wan fu rong

Trees or shrubs, erect, 3–8 m tall, deciduous, entire plant densely strigose and scabrous, not stellate, hairs ca. 3 mm. Petiole 14–17 cm; leaf blade suborbicular, papery, lobes 3–5, broadly triangular, serrate or dentate. Flowers solitary, axillary on upper branches. Pedicel 11–13 cm. Epicalyx lobes 8, filiform, 8–12 × 1.5–2 mm, stellate puberulent, apex acute. Corolla white, sometimes with purple center, very broadly funnel-shaped, 6–9 cm; petals nearly orbicular, 4–5 cm in diam., connate at base, villous, claw bearded.

- Taiwan (Alishan).

Hibiscus taiwanensis is very similar to *H. mutabilis* and differs only in having a hispid and scabrous, not stellate tomentose, indumentum. It has been suggested that the two might not be specifically distinct.

13. *Hibiscus mutabilis* Linnaeus, Sp. Pl. 2: 694. 1753.

木芙蓉 mu fu rong

Abelmoschus mutabilis (Linnaeus) Wallich ex Hasskarl; *Hibiscus mutabilis* f. *plenus* S. Y. Hu; *H. sinensis* Miller; *Ketmia mutabilis* (Linnaeus) Moench.

Shrubs or small trees, erect, 2–5 m tall, deciduous. Branchlets, petioles, pedicel, epicalyx, and calyx densely stellate and woolly pubescent. Stipules lanceolate, 5–8 mm, usually caducous; petiole 5–20 cm; leaf blade broadly ovate to round-ovate or cordate, 5–7-lobed, 10–15 cm in diam., papery, abaxially densely stellate minutely tomentose, adaxially sparsely stellate minutely hairy, lobes triangular, basal veins 7–11, margin obtusely serrate, apex acuminate. Flowers solitary, axillary on upper branches. Pedicel 5–8 cm, articulate near end. Epicalyx lobes 8, filiform, connate at base, 10–16 × ca. 2 mm. Calyx campanulate, 2.5–3 cm, lobes 5, ovate, acuminate. Corolla white or reddish, becoming dark red, ca. 8 cm in diam.; petals nearly orbicular, 4–5 cm in diam., hairy abaxially, barbate at base. Staminal column 2.5–3 cm, glabrous. Styles 5, pilose. Capsule flattened globose, ca. 2.5 cm in diam., yellowish hispid and woolly; mericarps 5. Seeds reniform, villous abaxially. Fl. Aug–Oct.

- Thickets along streams. Native in Fujian, Guangdong, Hunan, Taiwan, and Yunnan; cultivated in Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shandong, Sichuan, Taiwan, Yunnan, and Zhejiang [cultivated and occasionally naturalized elsewhere].

Hibiscus mutabilis is almost certainly native to SE China but was domesticated a long time ago. It is now cultivated throughout the world and has occasionally become naturalized elsewhere, e.g., in Japan. Cultivars with double flowers have been called *H. mutabilis* f. *plemus* (重瓣木芙蓉 chong ban mu fu rong).

14. *Hibiscus labordei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 12: 184. 1913.

贵州芙蓉 gui zhou fu rong

Shrubs deciduous, erect, 3–6 m tall. Branchlets stellate woolly. Stipules filiform, 5–6 mm, caducous; petiole 3–11 cm, densely stellate woolly; leaf blade palmately 3-lobed, 8–12 × 7–11 cm, papery, both surfaces sparsely stellate hirsute, basal veins 5, lobes triangular, central lobe longer, apex acuminate, lateral lobes shorter, base rounded, truncate or slightly cordate, margin obtusely serrate, apex obtuse or shortly acuminate.

Flowers solitary, axillary on upper branches. Pedicel 1–3 cm, densely stellate woolly. Epicalyx lobes 5 or 6, linear-lanceolate, 16–25 × 3–5 mm, densely stellate and hispid, apex obtuse to acute. Calyx campanulate, ca. 2.2 cm, lobes 5, ovate, densely golden stellate tomentose. Corolla white or pinkish with purple center, campanulate, 6–8 cm in diam.; petals obovate, ca. 6 cm, stellate and hirsute with long hairs abaxially, barbate at base. Staminal column ca. 3 cm. Style hirsute. Fl. Jun.

- Moist valleys; ca. 1300 m. N Guangxi, S Guizhou.

15. *Hibiscus syriacus* Linnaeus, Sp. Pl. 2: 695. 1753.

木槿 mu jin

Ketmia arborea Moench, nom. illeg. superfl.; *K. syriaca* (Linnaeus) Scopoli; *K. syrorum* Moench, nom. illeg. superfl..

Shrubs deciduous, erect, 1.5–4 m tall. Branchlets yellow stellate puberulent. Stipules filiform-subulate, ca. 6 mm, pilose; petiole 5–25 mm, stellate pubescent adaxially; leaf blade rhomboid to triangular-ovate or broadly lanceolate, variously 3-lobed or entire, 3–10 × 2–4 cm, papery, abaxially puberulent along veins or glabrous, adaxially glabrous, basal veins 3–5, base cuneate, margin irregularly incised, apex obtuse to subacute. Flowers solitary, axillary on upper branches. Pedicel 4–14 mm, stellate puberulent. Epicalyx lobes 6–8, filiform, 6–20 × 0.5–2 mm, ± free, connate at base only, densely stellate puberulent, apex obtuse or acute. Calyx campanulate, 14–20 mm, densely stellate puberulent, lobes 5, triangular. Corolla blue-purple, violet, white, pink, or reddish, sometimes with darker center, campanulate, sometimes double, 5–6 cm in diam.; petals obovate, 3.5–4.5 cm, pilose and stellate villous abaxially. Staminal column ca. 3 cm. Style glabrous. Capsule ovoid-globose, ca. 12 mm in diam., densely yellow stellate puberulent. Seeds reniform, with yellow-white hairs abaxially. Fl. Jul–Oct.

- Sea cliffs, hillsides, along streams, roadsides, also extensively cultivated; below 1200 m. Native in Anhui, Guangdong, Guangxi, Jiangsu, Sichuan, Taiwan, Yunnan, and Zhejiang; cultivated in Fujian, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Shandong, and Xizang [cultivated in most tropical and temperate regions].

Despite the specific epithet, *Hibiscus syriacus* originated in China but was taken into cultivation very early and was distributed to the Middle East along early trade routes. It is a very popular frost-hardy flowering shrub from which many named cultivars have been developed, some of which have been given formal scientific names. These include:

H. syriacus var. *alboplemus* Loudon (白花重瓣木槿 bai hua chong ban mu jin): Flowers double, white, 6–10 cm in diam.

H. syriacus var. *amplissimus* L. F. Gagnepain (粉紫重瓣木槿 fen zi chong ban mu jin): Flowers double, pink-purple with red center.

H. syriacus var. *brevibracteatus* S. Y. Hu (短苞木槿 duan bao mu jin): Leaf blade rhomboid, base cuneate. Flowers single, purplish. Epicalyx lobes very small, 3–5 × 0.5–1 mm, silky.

H. syriacus var. *elegantissimus* L. F. Gagnepain (雅致木槿 ya zhi mu jin): Flowers double, pink, 6–7 cm in diam.

H. syriacus var. *grandiflorus* Rehder (大花木槿 da hua mu jin): Flowers single, peach or red.

H. syriacus var. *longibracteatus* S. Y. Hu (长苞木槿 chang bao mu jin): Flowers single, purplish. Epicalyx lobes nearly as long as sepals, 15–20 × 1–2 mm.

H. syriacus var. *paeoniiflorus* L. F. Gagnepain (牡丹木槿 mu dan mu jin): Flowers double, pink or purplish, 7–9 cm in diam.

H. syriacus var. *totoalbus* T. Moore (白花牡丹木槿 bai hua dan ban mu jin): Flowers single, white.

H. syriacus var. *violaceus* L. F. Gagnepain (紫花重瓣木槿 zi hua chong ban mu jin): Flowers double, greenish purple.

16. *Hibiscus sinosyriacus* L. H. Bailey, Gentes Herb. 1: 109. 1922.

华木槿 hua mu jin

Shrubs deciduous, erect, 2–4 m tall. Branchlets stellate puberulent when young. Stipules filiform, ca. 12 mm, stellate pilose; petiole 3–6 cm, stellate puberulent; leaf blade cuneate, ovate, or orbicular, usually 3-lobed, 7–12 × 7–12 cm, papery, basal veins 3–5, both surfaces sparsely stellate puberulent, lobes usually triangular, central lobe larger, base cuneate, broadly cuneate, or nearly rounded, margin acutely serrate. Flowers solitary, axillary on upper branches. Pedicel 1–2.5 cm, densely yellow stellate puberulent. Epicalyx lobes 6 or 7, lanceolate-oblong, free, connate at base only, 17–25 × 3–5 mm, densely stellate puberulent, apex obtuse or acute. Calyx campanulate, longer or shorter than epicalyx, lobes 5, ovate-triangular, densely golden stellate puberulent. Corolla purplish, 7–9 cm in diam.; petals obovate, 6–7 cm, stellate villous abaxially. Staminal column 4–5 cm. Style branches 5, glabrous. Fruit unknown. Fl. Jun–Jul.

• Scrub in valleys; 500–1000 m. Guangxi, Guizhou, Hunan (Hengshan, Qianyang), Jiangxi (Lushan).

Hibiscus sinosyriacus is very similar to *H. syriacus*. The main differences are the broader epicalyx lobes (3–5 mm, not 0.5–2 mm, wide), larger petals (6–7 cm, not 3.5–4.5 cm), and wider leaves (7–12 cm, not 2–4 cm, wide). It is also similar to *H. labordei* but differs from that species in having the leaf base cuneate to nearly rounded, not rounded to slightly cordate, and the style branches glabrous, not hirsute.

17. *Hibiscus leviseminus* M. G. Gilbert, Y. Tang & Dorr, **nom. nov.**

光籽木槿 guang zi mu jin

Replaced synonym: *Hibiscus leiospermus* K. T. Fu & C. C. Fu in K. T. Fu & C. W. Chang, Fl. Tsinling. 1(3): 454. 1981, not *Hibiscus leiospermus* Harvey in Harvey & Sonder, Fl. Capensis 1: 173. 1860.

Shrubs erect, 0.5–2 cm tall. Branchlets stellate puberulent when young. Stipules filiform, 3–4 mm; petiole 1–2.5 cm, puberulent; leaf blade ovate-orbicular, sometimes 3-lobed, 3–6 × 2–4.5 cm, papery, abaxially stellate puberulent, adaxially stellate puberulent or nearly glabrous, basal veins 3, base broadly cuneate or slightly rounded, margin sparsely denate (teeth large), apex obtuse. Flowers solitary, axillary on upper twigs. Pedicel 2–5 mm, golden yellow stellate tomentose; involucre campanulate, 7–10 mm, connate in proximal 1/3–1/2, densely stellate puberulent, segments 6(or 7), triangular, 3–4 mm wide. Epicalyx lobes 4–6 mm. Calyx campanulate, 2–2.5 cm, segments 5, triangular, acute, densely golden yellow stellate tomentose. Corolla white to purple-red, nearly campanulate, 7–8 cm in diam.; petals obovate, obtuse, veined, stellate villous abaxially. Staminal column ca. 4 cm. Style branches 5, densely villous. Capsule oblong-ellipsoid, ca. 2.5 × 1.2 cm, densely

golden yellow stellate tomentose and long hispid, 5-angular, apex beaked; mericarps 5. Seeds reniform, glabrous. Fl. Jul–Oct.

• Scrub on riverbanks or rocky mountains; 600–1300 m. Gansu, Shaanxi.

Hibiscus leviseminus is very similar to *H. mutabilis*; it differs in having a campanulate epicalyx with short and broad segments, a very short pedicel, 0.2–0.5 cm, not 5–8 cm, and glabrous, not villous, seeds.

18. *Hibiscus moscheutos* Linnaeus, Sp. Pl. 2: 693. 1753.

芙蓉葵 fu rong kui

Herbs perennial, erect, 1–2.5 m tall; stem stellate pubescent or nearly glabrous. Stipules silklike, caducous; petiole 4–10 cm, puberulent; leaf blade ovate to ovate-lanceolate, sometimes with 2 lateral lobes, 10–18 × 4–8 cm, abaxially gray-white tomentose, adaxially nearly glabrous or minutely puberulent, base cuneate or nearly rounded, margin bluntly dentate, apex caudate. Flowers solitary, axillary. Pedicel 4–8 cm, very sparsely stellate puberulent, articulate near apex. Epicalyx lobes 10–12, filiform, ca. 18 × 1.5 mm, densely stellate puberulent. Calyx 1/2 as long as epicalyx, lobes rounded, connate for more than 1/2 of length. Corolla white, pink, red, or purple, with dark red center, 10–14 cm in diam.; petals obovate, ca. 10 cm, abaxially sparsely pilose, adaxially bearded on margin. Staminal column ca. 4 cm. Ovary glabrous; style branches 5, sparsely scabrous. Capsule conic-ovoid, 2.5–3 cm; mericarps 5. Seeds reniform, 2–3 mm in diam., apex pointed. Fl. Jul–Sep.

Wet situations, also cultivated. Beijing, Jiangsu, Shandong, Shanghai, Yunnan, Zhejiang [native to North America (SE United States)].

Hibiscus moscheutos is a commonly grown garden ornamental.

19. *Hibiscus yunnanensis* S. Y. Hu, Fl. China, Malvaceae [Fam. 153], 56. 1955.

云南芙蓉 yun nan fu rong

Fioria yunnanensis (S. Y. Hu) Abedin.

Herbs perennial, subshrublike, to 2.1 m tall, entire plant stellate tomentose. Branchlets slender, terete. Stipules short, filiform, caducous; petiole 2–6 cm; leaf blade cordate, ovate, or orbicular, sometimes obscurely 3-lobed, 6–10 × 2.5–9 cm, basal veins 5–7, base cordate, margin sparsely serrate, apex obtuse or acuminate; blades on distal part of stem smaller, base rounded, apex acuminate. Flowers solitary or in cymes, axillary on twig tips. Pedicel 6–28 mm. Epicalyx lobes 8–10, filiform, 6–10 mm. Calyx shallowly cup-shaped, ca. 1 × 1 cm, lobes 5, triangular, 1/2 as long as calyx. Corolla yellow with purple-red center, campanulate, ca. 2.5 cm in diam.; petals obovate, ca. 1.5 cm. Staminal column ca. 8 mm. Capsule nearly globose, ca. 1.2 cm in diam., long hirsute, 5-angular, winged along margins, apex beaked. Persistent sepals foliaceous, ca. 2 × 1 cm. Seeds reniform, glabrous, verrucose. Fl. Jul–Aug.

• Dry and hot grassy slopes; 500–600 m. S Yunnan (Yuanjiang).

Hibiscus yunnanensis is closely related to the widespread *H. vitifolius* Linnaeus, differing only in leaf shape, which in *H. vitifolius* is prominently 3–7-lobed.

20. *Hibiscus surattensis* Linnaeus, Sp. Pl. 2: 696. 1753.

刺芙蓉 ci fu rong

Furcaria surattensis (Linnaeus) Kosteletzky.

Herbs annual, subshrublike, 0.5–2(–4) m tall, usually procumbent, sometimes scandent, most parts sparsely villous and aculeate, prickles retrorsely curved. Stipules auriculate, foliaceous, ca. 5 mm, sparsely long hirsute; petiole 2–7 cm, abaxially sparsely aculeate, adaxially densely long hirsute; leaf blade palmately 3–5-lobed, 5–10 × 5–11 cm, lobes ovate-lanceolate, 3–7 × 1.5–3 cm, sparsely strigose on both surfaces, margin irregularly serrate; basal veins 5, sparsely aculeate. Flowers solitary, axillary. Pedicel 1–5 cm, sparsely aculeate and villous. Epicalyx lobes 8–10, base terete, 5–7 mm, inner branch erect, linear-lanceolate to filiform, 1–2 cm, aculeate, outer branch/abaxial appendage ovate to elliptic, 0.7–1 cm. Calyx turning reddish in fruit, shallowly cup-shaped, lobes 5, ovate-lanceolate, apex long acuminate, ca. 2.5 cm, aculeate. Corolla pale yellow with dark red center; petals ca. 3.5 cm. Capsule ovate-globose, ca. 1.2 × 1 cm, densely scabrous and hirsute with long hairs, shortly beaked. Seeds reniform, sparsely strigose with white minute hairs. Fl. Sep–Mar.

Forest margins, open slopes, valleys, streambanks; 300–1200 m. Hainan, Hong Kong, S Yunnan [Bhutan, Cambodia, India, Laos, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia].

The auriculate stipules and ovate epicalyx lobe appendages of this species are instantly diagnostic.

21. *Hibiscus hispidissimus* Griffith, Not. Pl. Asiat. 4: 521. 1854.

思茅芙蓉 si mao fu rong

Hibiscus aculeatus Roxburgh (1832), not Walter (1788), nor F. Dietrich (1817), nor G. Don (1831); *H. furcatus* Roxburgh ex Candolle (1824), not Willdenow (1809); *H. surattensis* Linnaeus var. *furcatus* Roxburgh ex Hochreutiner.

Herbs, to 1.5 m tall, trailing or suberect, most parts simple-pubescent and aculeate, prickles with prominent basal tubercles, retrorsely reflexed, straight. Stipules lanceolate, 5–14 × 2–3 mm, margins setose; petiole 2–8 cm, abaxially aculeate, adaxially densely pubescent; leaf blade broadly ovate or palmately 3–5(–7)-lobed, 2.5–10 × 3–8 cm, both surfaces with tubercle-based prickly hairs on veins. Flowers solitary, axillary. Pedicel 1.5–7 cm. Epicalyx lobes 8–12, 1–2 cm long overall, inner branch erect, linear-lanceolate, outer branch oblong-ovate, slightly shorter. Calyx deeply divided, shorter than epicalyx, lobes adaxially densely white puberulent. Corolla yellow with purple center, 5–10 cm wide. Capsule ovoid, ca. 1.5 cm, enclosed in enlarged calyx, densely hairy. Seeds brownish, ± reniform, 4–5 mm, sparsely white scaly.

About 1500 m. Yunnan (Simao) [Bangladesh, India, Myanmar, Sri Lanka, Thailand; Africa].

Hibiscus hispidissimus is apparently known in China only by a single 19th-century collection, *A. Henry 13566*. See Pradeep and Sivaraajan (Taxon 40: 634–637. 1991) for a discussion of the nomenclature of this species.

22. *Hibiscus trionum* Linnaeus, Sp. Pl. 2: 697. 1753.

野西瓜苗 ye xi gua miao

Trionum annuum Medikus.

Herbs annual, erect or procumbent, 25–70 cm tall; stems slender, white stellate hirsute. Stipules filiform, ca. 7 mm, stellate coarsely hirsute; petiole 2–4 cm, stellate hirsute and stellate puberulent; leaf blade 3–6 cm in diam., dimorphic; blades on proximal part of stem orbicular, those on distal part of stem palmately 3–5-lobed, central lobe longer, lateral lobes shorter, lobes obovate to oblong, usually pinnate, sparsely stellate spiny hairy abaxially, sparsely hirsute or glabrous adaxially. Flowers solitary, axillary. Pedicel ca. 2.5 cm, elongated to 4 cm in fruiting, stellate hirsute. Epicalyx lobes 12, filiform, connate at base, ca. 8 mm, hirsute. Calyx greenish, campanulate, swollen, connate for ca. 1/2 length, 1.5–2 cm, membranous, long hirsute or stellate hirsute, lobes 5, triangular, longitudinally purple-veined. Corolla very pale yellow with purple center, 2–3 cm in diam.; petals 5, obovate, ca. 2 cm, abaxially sparsely very minutely puberulent. Staminal column ca. 5 mm; filaments slender, free for ca. 3 mm; anthers yellow. Styles 5, glabrous. Capsule oblong-globose, ca. 1 cm in diam., coarsely hirsute; mericarps 5, endocarp black, thin, exocarp papery. Seeds black, reniform, glandularly verrucose. Fl. Jul–Oct.

Ruderal weed. Throughout China [Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan, Uzbekistan; pantropical].

23. *Hibiscus sabdariffa* Linnaeus, Sp. Pl. 2: 695. 1753, nom. cons.

玫瑰茄 mei gui jie

Sabdariffa rubra Kosteletzky.

Herbs annual, erect, to 2 m tall; stems purplish, robust, glabrous. Stipules filiform, ca. 1 cm, sparsely villous; petiole 2–8 cm, sparsely villous; leaf blade dimorphic; blades on proximal part of stem ovate, those on distal part of stem palmately 3-lobed, lobes lanceolate, 2–8 × 0.5–1.5 cm, base rounded or broadly cuneate, margin serrate, apex obtuse or acuminate, glabrous; basal veins 3–5, glanduliferous along midrib on abaxial surface. Flowers solitary, axillary, subsessile. Epicalyx lobes 8–12, red, lanceolate, connate at base, 5–15 × 2–3 mm, sparsely long hirsute, with spiny appendix near apex. Calyx purplish, cup-shaped, connate for ca. 1/3 length, ca. 1 cm in diam., fleshy, sparsely spiny and coarsely hairy, lobes 5, triangular, 1–2 cm, acuminate. Corolla yellow with dark red center, 6–7 cm in diam. Capsule ovoid-globose, ca. 1.5 cm in diam., densely coarsely hairy. Seeds reniform, glabrous. Fl. summer–autumn.

Cultivated. Fujian, Guangdong, Hainan, Taiwan, Yunnan [probably originating in Africa, now cultivated throughout the tropics].

The fleshy calyx and epicalyx are edible, both fresh as a vegetable and dried as a tea.

24. *Hibiscus cannabinus* Linnaeus, Syst. Nat., ed. 10, 2: 1149. 1759.

大麻槿 da ma jin

Abelmoschus verrucosus (Guillemin & Perrottet) Walpers; *Furcaria cavanillesii* Kosteletzky; *Hibiscus unidens* Lindley; *H. verrucosus* Guillemin & Perrottet; *Ketmia glandulosa* Moench.

Herbs annual or perennial, erect, robust, to 3 m tall, glabrous, sparsely sharply spiny. Stipules silklike, 6–8 mm; petiole 6–20 cm, sparsely spiny; leaf blade dimorphic; blades on proximal part of stem cordate, those on distal part of stem palmately 3–7-lobed, lobes lanceolate, 2–12 × 0.6–2 cm, base cordate or nearly rounded, margin serrate, glabrous on both surfaces, apex acuminate; basal veins 5–7, glandular near base of midrib. Flowers solitary, axillary, nearly sessile. Epicalyx lobes 7–10, not red, filiform, free, 6–8 mm, sparsely spiny. Calyx nearly campanulate, connate for ca. 1/2 length, ca. 3 cm, spiny and white tomentose, lobes 5, lanceolate, 1–2 cm, long caudate. Corolla yellow with red center; petals oblong-obovate, ca. 6 cm. Staminal column 1.5–2 cm, glabrous. Styles 5, glabrous. Capsule globose, ca. 1.5 cm in diam., densely spiny, apex shortly beaked. Seeds reniform, subglabrous. Fl. autumn.

Cultivated. Guangdong, Hebei, Heilongjiang, Jiangsu, Liaoning, Yunnan, Zhejiang [native to Africa and India].

Hibiscus cannabimus is cultivated as a fiber crop (“kenaf”). The seed oil is considered inedible but is used industrially and in oil-lamps.

25. *Hibiscus lobatus* (Murray) Kuntze, Revis. Gen. Pl. 3(2): 19. 1898 [“*lobata*”].

草木槿 *cao mu jin*

Solandra lobata Murray, Commentat. Soc. Regiae Sci. Gott. 6: 20. 1785; *Hibiscus solandra* L’Héritier.

Herbs annual, erect, 50–70 cm tall. Branchlets puberulent (hairs simple) and rarely sparsely stellate hairy. Stipules lanceolate, ca. 3(–8) mm, villous; petiole as long as or slightly longer than leaf blade, stellate, puberulent and villous; leaf blade membranous, dimorphic; blades on proximal part of stem ovate-orbicular, 1.5–3 cm, those in middle 3-parted, ca. 5 cm, on distal part of stem nearly divided or 3-foliolate, margin roundly dentate, stellate pilose and puberulent abaxially, pilose adaxially. Flowers solitary or arranged in sparse racemes, axillary. Pedicel 2–2.5 cm, pilose, articulate near end. Epicalyx absent. Calyx cup-shaped, ca. 4 mm, membranous, lobes 5, lanceolate, abaxially pilose and strigose, persistent. Corolla yellow; petals 0.6–0.7 cm. Staminal column ca. 0.4 cm. Styles 5, extending. Capsule broadly ovoid, ca. 7 mm, apex beaked; mericarps 5, endocarp thin, villous along ventral suture. Seeds with scalelike hairs. Fl. Oct–Dec.

Moist open forests. Hainan [Bhutan, India, Malaysia, Myanmar, Nepal, Pakistan, Sri Lanka; Africa, Madagascar].

Hibiscus lobatus is the only species of *Hibiscus* in China that lacks an epicalyx.

16. *DECASCHISTIA* Wight & Arnott, Prodr. Fl. Ind. Orient. 1: 52. 1834.

十裂葵属 *shi lie kui shu*

Herbs or shrubs. Leaves stipulate, petiolate; leaf blade entire or lobed. Flowers axillary or aggregated on twig tips, shortly pedicellate. Epicalyx lobes 10. Calyx 5-lobed, connate at base, coherent with staminal column at base. Staminal column with many anthers, apically 5-lobed. Ovary 6–10-loculed; ovules 1 per locule; style branches 6–10, connate at base; stigma capitate. Capsule loculicidally and septicidally dehiscent, breaking up into separate valves. Seeds reniform.

About ten species: tropical Asia; one species in China.

Decaschistia has been placed in a separate tribe from the rest of the Hibisceae on the basis of the distinctive capsule with 6–10 1-seeded locules that is both loculicidal and septicidal and breaks up into separate valves when mature. Preliminary molecular data (Pfeil & Crisp, Austral. Syst. Bot. 18(1): 49–60. 2005) indicate that *Decaschistia* is nested within *Hibiscus* (q.v.).

1. *Decaschistia mouretii* Gagnepain, Notul. Syst. (Paris) 1: 79. 1909.

中越十裂葵 *zhong yue shi lie kui*

Shrubs or subshrubs, perennial, to ca. 0.3 m tall, taproot conic, to 1.5 cm thick; entire plant yellow-brown stellate tomentose or densely gray-yellow stellate puberulent. Stipule filiform or subulate, 2–6 mm, densely stellate tomentose, usually caducous; petiole 0.5–1 cm; leaf blades on proximal part of stem ovate or ovate-elliptic, base broadly cuneate to rounded, margin shallowly sinuate, sparsely serrate, apex obtuse, those on distal part of stem oblong or elliptic. Flowers axillary on upper twigs, solitary or aggregated. Pedicel 3–5 mm. Epicalyx lobes filiform, 10–11, connate at base, 5–8 mm. Calyx cup-shaped or campanulate, ca. 1 cm, lobes long triangular, ca. 6 mm. Corolla campanulate, ca. 3 cm in diam.; petals yellow, reddish when dry, 2–3 cm, abaxially stellate pilose. Filament tube 0.7–2 cm; anthers on distal 1/2, dense, with short filaments. Ovary 6–10-loculed; style branches 6–10, exceeding staminal column, 4–9 mm; stigma capitate. Capsule flattened-globose, ca. 1 cm in diam., tomentose. Fl. Apr–May.

Savannas, sandy soils. Guangdong, Hainan [N Vietnam].

- 1a. Petals ca. 2 cm; style branches 9–10, ca. 4 mm 1a. var. *mouretii*
 1b. Petals 2.5–3 cm; style branches 6–9, 8–9 mm 1b. var. *nervifolia*

1a. *Decaschistia mouretii* var. *mouretii*

中越十裂葵(原变种) *zhong yue shi lie kui* (*yuan bian zhong*)

Shrubs; entire plant yellow-brown stellate tomentose. Stipule subulate, ca. 2 mm; blades on distal part of stem ovate. Flowers solitary. Pedicel 3–5 mm. Epicalyx lobes 7–8 mm. Calyx cup-shaped. Petals yellow, reddish when dry, ca. 2 cm. Filament tube 0.7–0.8 cm. Ovary 9–10-loculed; style branches 9–10, ca. 4 mm.

Savannas. Guangdong (Haikang) [N Vietnam].

This taxon is represented by a very small population.

1b. *Decaschistia mouretii* var. *nervifolia* (Masamune) H. S. Kiu, Guihaia 14: 304. 1994.

十裂葵 *shi lie kui*

Decaschistia nervifolia Masamune, Trans. Nat. Hist. Soc. Taiwan 33: 252. 1943.

Subshrubs to 0.2 m tall; most parts densely gray-yellow stellate puberulent. Stipule filiform, ca. 6 mm; leaf blade ovate-elliptic, 1.5–3.5 × 1–2 cm, adaxially stellate pilose. Flowers fascicled. Pedicel ca. 3 mm. Epicalyx lobes ca. 5 mm. Calyx campanulate, densely stellate puberulent and villous, lobes lanceo-

late, 1/2 as long as calyx. Petals red, 2.5–3 cm. Filament tube ca. 2 cm. Ovary 6–9-loculed; style branches 6–9, 8–9 mm, connate at base. Fruit unknown. Fl. Apr–May.

- Sandy soils. Hainan.

Decaschistia mouretii var. *nervifolia* has been described as endangered but lacks any recent assessment of its conservation status.

17. CENOCENTRUM Gagnepain, Notul. Syst. (Paris) 1: 78. 1909.

大萼葵属 da e kui shu

Shrubs; entire plant yellow stellate scabrously spiny. Stipule ovate; leaf blade orbicular, palmately 5–9-lobed. Flowers solitary or arranged in broad corymbs, axillary. Epicalyx lobes 4, leaflike, connate at base, persistent. Calyx campanulate, 5-lobed. Corolla large; petals 5, obovate. Staminal column villous. Ovary 10-loculed; ovules several per locule; style pilose, 10-branched at apex; stigmas capitate. Capsule loculicidally dehiscent. Seeds reniform, glabrous, with minute spots.

One species: S China, Laos, Thailand, Vietnam.

1. Cenocentrum tonkinense Gagnepain, Notul. Syst. (Paris) 1: 79. 1909.

大萼葵 da e kui

Hibiscus wangianus S. Y. Hu.

Shrubs deciduous, 2–4 m tall, densely stellate long spiny hairy or simple hairy, hairs ca. 4 mm. Stipule ca. 6 mm, caducous; petiole 6–18 cm, densely stellate long spiny and simple hairy; leaf blade 7–20 cm in diam., palmate veins 5–9, stellate long spiny and simple hairy, lobes broadly triangular, base cordate, margin roughly dentate, apex acute. Flowers solitary.

Pedicel 5–10 cm, densely stellate long spiny and simple hairy. Epicalyx lobes ovate, ca. 2.5 cm, densely white stellate puberulent and brown-yellow stellate scabrous hairy, margin white spiny hairy. Calyx swollen, 3–4 × ca. 5 cm, lobes broadly triangular-ovate, densely stellate puberulent long spiny, apex long acuminate. Corolla yellow, purple in center, ca. 10 cm in diam.; petals ca. 8 cm. Staminal column ca. 3.5 cm. Capsule nearly globose, 3.5–4 cm in diam., 10-valved. Seeds ca. 3 × 2 mm, verrucose. Fl. Sep–Nov.

Open forests, grassy slopes, valleys; 700–1600 m. S Yunnan [Laos, Thailand, Vietnam].

18. THESPESIA Solander ex Corrêa, Ann. Mus. Natl. Hist. Nat. 9: 290. 1807, nom. cons.

桐棉属 tong mian shu

Azanza Alefeld; *Bupariti* Duhamel du Monceau; *Parita* Scopoli; *Pariti* Adanson.

Trees or shrubs; plants glabrous or pubescent, with an indumentum of scales or stellate hairs. Leaves simple; stipules very slender; leaf blade ovate, entire or lobed, margin entire, often with abaxial foliar nectaries. Flowers solitary (rarely in small cymes), axillary, large and showy. Epicalyx lobes 3–5, minute, caducous after flowering, sometimes subtended by 3-merous nectaries. Calyx cup-shaped, truncate to 5-lobed. Corolla campanulate; petals 5, yellow [or white or pink], with or without dark purple basal spot. Staminal column antheriferous throughout; apex 5-toothed, usually included. Ovary 5-loculed; ovules several per locule; style rod-shaped, 5-grooved; stigma 3–5-sulcate or rarely 3–5-lobed, decurrent. Capsule 3–5-locular, globose or pyriform, leathery or woody, dehiscent or indehiscent, sometimes slightly fleshy. Seeds 3 to many per locule, obovoid, glabrous or hairy.

About 17 species: tropical Africa, America, Asia, Australia; two species in China.

Molecular data (Seelanan et al., Syst. Bot. 22: 259–290. 1997) suggest that *Thespesia* may not be monophyletic and reinforce the morphologically based observation of Fryxell (Nat. Hist. Cotton Tribe, 1979) that there are significant discontinuities between the two sections currently recognized: *T.* sect. *Thespesia* and *T.* sect. *Lampas* (Ulbrich) Borssum Waalkes. A representative of each section occurs in China.

- 1a. Plants stellate tomentose; leaf blade palmately 3-lobed; capsule slightly 5-angular, ellipsoid; seeds ca. 5 mm, with 1 series of hairs near hilum 1. *T. lampas*
 1b. Plants with peltate scales at least abaxially, stellate hairs absent; leaf blade cordate, entire; capsule subglobose or pyriform; seeds uniformly hairy or glabrous 2. *T. populnea*

1. Thespesia lampas (Cavanilles) Dalzell & A. Gibson, Bombay Fl. 19. 1861.

白脚桐棉 bai jiao tong mian

Hibiscus lampas Cavanilles, Diss. 3: 154. 1787; *Azanza lampas* (Cavanilles) Alefeld; *Bupariti lampas* (Cavanilles) Rothmaler.

Shrubs evergreen, 1–2 m tall. Branchlets stellate tomentose. Stipule filiform, 5–7 mm; petiole 1–4 cm, stellate puberulent; leaf blade ovate or palmately 3-lobed, 8–13 × 6–13 cm, abaxially densely ferruginous stellate tomentose, adaxially sparsely stellate pilose, base rounded or nearly cordate, apex acuminate, lateral lobes with margin shallowly crenate, apex acuminate or rounded. Flowers solitary or in cymes, axillary;

peduncle 3–8 cm. Pedicel 0.5–1 cm, stellate puberulent. Epicalyx lobes 5, subulate, 2–3 mm. Calyx shallowly cup-shaped, subtruncate with 5 subulate 4–8 mm teeth, stellate puberulent. Corolla yellow, campanulate, ca. 6 cm; petals abaxially densely ferruginous puberulent. Capsule ellipsoid, 5-angular, ca. 2 cm in diam., stellate puberulent, loculicidally dehiscent. Seeds black, ovoid, ca. 5 mm, smooth, with a ring of hairs near hilum. Fl. Sep–Jan.

Scrub. Guangdong, Guangxi, Hainan, Yunnan [India, Indonesia, Laos, Nepal, Philippines, Thailand, Vietnam; E Africa].

Cotton from the seeds of *Thespesia lampas* has been used to make clothing.

2. *Thespesia populnea* (Linnaeus) Solander ex Corrêa, Ann. Mus. Natl. Hist. Nat. 9: 290. 1807.

桐棉 tong mian

Hibiscus populneus Linnaeus, Sp. Pl. 2: 694. 1753; *Burpariti populnea* (Linnaeus) Rothmaler; *H. populneoides* Roxburgh; *Malvaviscus populneus* (Linnaeus) Gaertner; *Parita populnea* (Linnaeus) Scopoli; *Thespesia howii* S. Y. Hu; *T. populneoides* (Roxburgh) Kosteletzky.

Trees or shrubs, evergreen, 3–6 m tall. Branchlets with minute brown peltate scales, sometimes dense. Stipules filiform-lanceolate, 2–7 mm, usually caducous; petiole 4–10 cm, scaly; leaf blade ovate-cordate to triangular, 7–18 × 4.5–12 cm, abaxially with scales, adaxially glabrous or with scales, base truncate to cordate, margin entire, apex long caudate. Flowers solitary, axillary. Pedicel 2.5–6 cm, densely scaly. Epicalyx lobes 3–4, filiform-lanceolate, 8–10 mm, usually caducous, scaly. Calyx cup-shaped, 1–1.5 cm in diam., subtruncate with 5 ca. 0.5 mm teeth, densely scaly. Corolla yellow, adaxially purple at base, campanulate, ca. 5 cm. Staminal column ca. 25 mm. Fruit stipe 6–8 cm. Capsule globose to pyriform, ca. 5 × 2 cm in diam., slightly fleshy, ± indehiscent. Seeds triangular-ovoid, 8–9 mm, brown hairy or glabrous, veined. Fl. year-round.

Sea coasts, open situations; near sea level. Guangdong, Hainan, Taiwan [Cambodia, India, Japan (Okinawa, Ryukyu Islands), Philippines, Sri Lanka, Thailand, Vietnam; Africa; widely distributed in the tropics].

The wide distribution of this species is due to the capacity of its fruits to float in seawater and stay alive for months. It is often cultivated as a shade tree.

19. GOSSYPIUM Linnaeus, Sp. Pl. 2: 693. 1753.

棉属 mian shu

Herbs annual or perennial, sometimes shrubs; all parts irregularly dotted with dark oil glands. Leaf blades usually palmately 3–9-lobed, rarely entire. Flowers solitary, subterminal. Pedicel not articulated, usually with glands below insertion of epicalyx lobes. Epicalyx lobes 3(–7), foliaceous, glandular, free or connate at base, entire or toothed to deeply lacinate. Calyx cup-shaped, nearly truncate to 5-lobed. Corolla white or yellow, sometimes with purple center, large; petals 5, apex rounded. Staminal column with many anthers along entire length, apex truncate. Ovary 3–5-loculed; ovules 2 to many per locule; style short, rod-shaped, stigma clavate, 5-grooved. Capsule globose or ellipsoid, loculicidally dehiscent. Seeds globose, densely white long woolly, mixed with short hairs or without short hairs.

About 20 species: tropical and subtropical regions; four species (all introduced) in China.

No wild species of *Gossypium* have been recorded from China. The genus is economically very important as the source of cotton and cotton seed oil, and all the taxa recorded from China have been very widely cultivated throughout tropical and warm temperate regions. Many taxa of cultivated cotton have been described, some from Chinese material, but these are all now included within the four species recognized below.

- 1a. Epicalyx lobes connate at base, entire or 3–7-toothed, teeth 1–2 × as long as wide or wider than long; calyx shallowly cup-shaped, entire or nearly truncate, rarely lobed; filaments ± equal in length.
 - 2a. Leaf blade palmately 3–5-lobed; epicalyx lobes longer than wide, entire or 3–4-toothed near apex; capsule conical, apex tapering 1. *G. arboreum*
 - 2b. Leaf blade palmately (3 or)5(or 7)-lobed; epicalyx lobes wider than long, 6–8-toothed near apex; capsule ovoid, apex beaked 2. *G. herbaceum*
- 1b. Epicalyx lobes free at base, toothed, teeth 3–4 × as long as wide; calyx 5-toothed, sometimes lobed or truncate; filaments unequal in length, the upper ones longer.
 - 3a. Leaf blade lobes broadly triangular to ovate-orbicular; epicalyx lobes 3, margin 7–9-toothed near apex; staminal column 1–2 cm, filaments spreading; capsule ovoid; seeds with long wool and persistent short wool 3. *G. hirsutum*
 - 3b. Leaf blade lobes ovate to oblong; epicalyx lobes 5 or more, margin 10–15-toothed; staminal column 3.5–4 cm, filaments erect; capsule oblong-ovoid; seeds with long wool and easily detached short wool 4. *G. barbadense*

1. *Gossypium arboreum* Linnaeus, Sp. Pl. 2: 693. 1753.

树棉 shu mian

Subshrubs or shrubs, perennial, 2–3 m tall. Young branchlets villous. Stipules filiform, caducous; petiole 2–4 cm, puberulent and villous; leaf blade 3–5-lobed, 4–8 cm in diam., lobes oblong-lanceolate, oblong, ovate, or obovate, ca. 1/2 as long as

leaf blade, abaxially stellate puberulent, villous along veins, adaxially stellate pilose. Flowers solitary, axillary. Pedicel 1.5–2.5 cm, villous. Epicalyx lobes 3, connate for basal 1/3, ovate-cordate or triangular, ca. 2.5 cm, stellate villous on veins, 3- or 4-toothed, teeth less than 3 × as long as wide. Calyx shallowly cup-shaped, nearly truncate. Corolla yellowish, often dark purple in center, campanulate; petals 3–5 cm. Staminal column

1.5–2 cm; filaments uniform in length. Capsule 3(or 4 or 5)-loculed, cone-shaped, usually pendulous, ca. 3 cm, glabrous, with numerous oily and glandular minute spots, apex tapering, beaked. Seeds 5–8 per cell, free, ovoid, 5–8 mm in diam., with white wool and moderately persistent short fuzz. Fl. Jun–Sep.

Cultivated. Guangdong, Guangxi, Sichuan, Taiwan, Yunnan [cultivated in tropical and subtropical regions of the Old World; origin in India and Sri Lanka].

- 1a. Leaf blade lobes oblong-lanceolate; epicalyx lobes triangular, ca. 2.5 cm; capsule ca. 3 cm 1a. var. *arboreum*
 1b. Leaf blade lobes ovate, obovate, or oblong; epicalyx lobes ovate-cordate, 1.5–2 cm; capsule ca. 2.5 cm 1b. var. *obtusifolium*

1a. *Gossypium arboreum* var. *arboreum*

树棉(原变种) shu mian (yuan bian zhong)

Leaf blade lobes oblong-lanceolate. Epicalyx lobes triangular, ca. 2.5 cm. Capsule ca. 3 cm.

Widely cultivated in Chang Jiang and Huang He basins [cultivated in tropical and subtropical regions of the Old World; origin in India].

1b. *Gossypium arboreum* var. *obtusifolium* (Roxburgh) Roberty, Candollea 13: 38. 1950.

钝叶树棉 dun ye shu mian

Gossypium obtusifolium Roxburgh, Fl. Ind., ed. 1832, 3: 183. 1832; *G. anomalum* Watt (1926), not Wawra & Peyritsch (1860); *G. arboreum* var. *nanking* (Meyen) Roberty; *G. arboreum* var. *paradoxum* Prokhanov; *G. herbaceum* Linnaeus var. *obtusifolium* (Roxburgh) Masters; *G. indicum* Lamarck; *G. nanking* Meyen; *G. wattianum* S. Y. Hu.

Leaf blade lobes oblong, ovate, or obovate. Epicalyx lobes ovate-cordate, 1.5–2 cm. Capsule ca. 2.5 cm.

Cultivated. Guangdong, Guangxi, Sichuan, Taiwan, Yunnan [origin in India and Sri Lanka].

In some literature, this taxon is treated as a synonym of *Gossypium arboreum* s.s.

2. *Gossypium herbaceum* Linnaeus, Sp. Pl. 2: 683. 1753.

草棉 cao mian

Gossypium zaitzevii Prokhanov.

Herbs or subshrubs, annual, to 1.5 m tall, pilose. Stipules filiform, 5–10 mm, caducous; petiole 2.5–8 cm, villous; leaf blade usually 5-lobed, 5–10 cm in diam., usually wider than long, lobes broadly ovate, less than 1/2 as long as leaf blade, abaxially minutely puberulent and villous on veins, adaxially stellate hirsute, base cordate, apex acute. Flowers solitary, axillary. Pedicel 1–2 cm, villous. Epicalyx lobes connate at base, broadly triangular, 2–3 cm, wider than long, sparsely villous on veins, 6–8-toothed. Calyx cup-shaped, 5-lobed. Corolla yellow, purple in center, 5–7 cm in diam.; petals 2.5–3 × 3–4 cm. Filaments uniform in length. Capsule usually 3–4-celled, ovoid, ca. 3 cm, apex beaked. Seeds free, obliquely cone-shaped, ca. 10 mm, with white wool and persistent short fuzz. Fl. Jul–Sep.

Cultivated. Gansu, Guangdong, Sichuan, Xinjiang, Yunnan [cultivated in India; origin in SW Asia].

Among the races recognized by Hutchinson (Emp. Cotton Gr. Rev. 27: 12. 1950) is "*kuljianum*," which is found in "Chinese Central Asia."

3. *Gossypium hirsutum* Linnaeus, Sp. Pl., ed. 2, 2: 975. 1763.

陆地棉 lu di mian

Gossypium hirsutum f. *mexicanum* (Todaro) Roberty; *G. mexicanum* Todaro; *G. religiosum* Linnaeus.

Herbs, annual, 0.6–1.5 m tall. Branchlets sparsely villous. Stipules ovate-falcate, 5–8 mm, caducous; petiole 3–14 cm, pilose; leaf blade broadly ovate, 3(–5)-lobed, 5–12 cm in diam., lobes broadly triangular to ovate-orbicular, base broad, central lobe usually 1/2 as long as leaf blade, abaxially sparsely villous, adaxially nearly glabrous, scabrously hairy on veins, base cordate or cordate-truncate, apex acuminate. Flowers solitary, axillary. Pedicel usually slightly shorter than petiole. Epicalyx lobes 3, free, to 4 × 2.5 cm (including teeth), hirsute and ciliate with long hairs, base cordate, with 1 gland, 7–9-toothed near apex, teeth 3 or 4 × as long as wide. Calyx cup-shaped, 5-lobed, lobes triangular, ciliate. Corolla white or yellowish, fading to reddish or purple, funnel-form; petals 4–5.5 × 3.5–4.5 cm. Staminal column 1–2 cm; filaments lax, upper ones longer. Capsule 3- or 4-celled, ovoid, 3.5–5 cm, apex beaked. Seeds free, ovoid, with white wool and gray-white moderately persistent short fuzz. Fl. summer–autumn.

Widely cultivated in China [probably of American origin (?Mexico), now cultivated throughout warmer parts of the world].

Gossypium hirsutum has replaced *G. arboreum* and *G. herbaceum* in the cotton-producing areas of China.

4. *Gossypium barbadense* Linnaeus, Sp. Pl. 2: 693. 1753.

海岛棉 hai dao mian

Subshrubs or shrubs, perennial, 2–3 m tall, hairy or only hairy on petiole and veins on abaxial surface. Branchlets dark purple, angular. Stipules lanceolate-falcate, ca. 10 mm, usually caducous; petiole longer than leaf blade, with black glandular spots; leaf blade 3–5-lobed, 7–12 cm in diam., lobes ovate, oblong, oblong-lanceolate, or obovate, more than 1/2 as long as blade, central lobe longer, lateral lobes usually extending, base cordate, apex long acuminate. Flowers terminal or axillary. Pedicel usually shorter than petiole, stellate villous, with black glandular spots. Epicalyx lobes 5 or more, free, broadly ovate, 3.5–5 cm, base rounded-cordate, 10–15-toothed, teeth 3–4 × as long as wide. Calyx cup-shaped, truncate, with black glandular spots. Corolla pale yellow, purple or crimson in center, funnel-form; petals 5–8 cm, stellate villous abaxially. Staminal column 3.5–4 cm, glabrous; filaments closely appressed, upper ones longer. Capsule 3(or 4)-celled, oblong to oblong-ovoid, 3–7 cm, with obvious glandular spots abaxially, base larger, apex acute to beaked. Seeds black and smooth when hair fallen, free or aggregated, ovoid, ca. 8 mm, beaked, with white wool and easily detached short fuzz on one or both tips. Fl. summer–autumn.

Cultivated; below 1500 m. Guangdong, Guangxi, Hainan, Yunnan [India; Africa (Egypt), tropical Asia, North America (United States), Pacific islands, tropical South America].

- 1a. Capsule oblong-ovoid, 3–5 cm, apex acute; seeds free from each other 4a. var. *barbadense*
 1b. Capsule oblong-ellipsoid, 5–7 cm, apex beaked; seeds aggregated into groups 4b. var. *acuminatum*

4a. *Gossypium barbadense* var. *barbadense*

海島棉(原变种) hai dao mian (yuan bian zhong)

Gossypium peruvianum Cavanilles.

Leaf blade 3–5-lobed, lobes ovate or oblong. Corolla purple in center. Capsule oblong-ovoid, 3–5 cm, apex acute. Seeds free.

Cultivated in frost-free areas; below 800 m. Guangdong, Guangxi, Hainan, Yunnan [India; Africa (Egypt), tropical Asia, North America (United States), Pacific islands, tropical South America].

The origin of this variety is in South America or the West Indies.

4b. *Gossypium barbadense* var. *acuminatum* (Roxburgh ex G. Don) Triana & Planchon, Ann. Sci. Nat., Bot., sér. 4, 17: 171. 1862.

巴西海島棉 ba xi hai dao mian

Gossypium acuminatum Roxburgh ex G. Don, Gen. Hist. 1: 487. 1831; *G. barbadense* var. *brasiliense* (Macfadyen) Mauer; *G. brasiliense* Macfadyen; *G. guyanense* Rafinesque var. *brasiliense* (Macfadyen) Rafinesque; ?*G. peruvianum* var. *brasiliense* (Macfadyen) Prokhanov.

Leaf blade 5-lobed. Corolla crimson in center, fading to pink, 6–7 cm. Capsule oblong-ellipsoid, 5–7 cm, beak to 1 cm. Seeds aggregated, shortly ciliate at apex.

Cultivated; below 1500 m. Guangdong, Hainan, Yunnan [tropical America].

The origin of this variety is in tropical America.