

6. HELICTERES Linnaeus, Sp. Pl. 2: 963. 1753.

山芝麻属 shan zhi ma shu

Trees or shrubs. Branches or branchlets ± stellate. Leaves simple, entire or serrate. Flowers bisexual, solitary or cymose, axillary or rarely terminate. Epicalyx lobes minute. Calyx tube-shaped, 5-lobed, lobes usually unequal and 2-lipped. Petals 5, equal to each other or 2-lipped, clawed and usually with auriculate appendage. Anthers 10, on top of elongate androgynophore; filaments ± connate, enclosing pistil; staminodes 5, within stamens. Ovary 5-celled, 5-angular; ovules numerous in each locule; styles 5, linear, apically slightly swollen. Mature capsule straight or spirally twisted, usually densely hairy, often with soft setae which are themselves hairy. Seeds verrucose.

About 60 species: tropical America and Asia; ten species (one endemic) in China.

- 1a. Capsule spirally twisted, not setose; inflorescences several per axil, densely clustered; leaf blade broadly oblong-obovate, apex somewhat truncate and usually lobed 1. *H. isora*
- 1b. Capsule not twisted, sparsely to densely softly setose; inflorescences 1 per axil, often spikelike or with subtending leaves very reduced to form a terminal thyrses; leaf blade usually narrower, apex not truncate, often not lobed.
 - 2a. Leaf blade margin entire or rarely with a few minute teeth near apex.
 - 3a. Capsule apex obtuse; petiole ca. 12 mm, leaf blade 6–10 cm, apex obtuse 2. *H. obtusa*
 - 3b. Capsule apex pointed or beaked; petiole 3–9 mm, leaf blade 3.5–7.5 cm, apex usually acuminate, acute or obtuse with acumen (obtuse in *H. prostrata*).
 - 4a. Subshrubs to 0.45 m tall, stems prostrate; leaf blade 2–3.5 cm 10. *H. prostrata*
 - 4b. Shrubs 1–2 m tall, stems erect or ascending; leaf blade 3.5–7.5 cm.
 - 5a. Branchlets pilose with gray-green hairs; leaf blade margin entire to apex; capsule with dense mixed stellate and long simple hairs 3. *H. angustifolia*
 - 5b. Branchlets tomentose with yellow-brown hairs; leaf blade margin entire or denticulate near apex; capsule with dense long simple hairs 4. *H. lanceolata*
 - 2b. Leaf blade margin obviously serrate or dentate from base.
 - 6a. Calyx 12–18 mm; capsule 2.5–5 cm.
 - 7a. Leaf blade margin lobed; petals white 8. *H. viscida*
 - 7b. Leaf blade margin irregularly dentate; petals red or purplish red 9. *H. hirsuta*
 - 6b. Calyx 4–6 mm; capsule 1.5–2 cm.
 - 8a. Upper leaves of fertile shoots very reduced to a lax thyrses; petals yellow 5. *H. elongata*
 - 8b. Upper leaves of fertile shoots not or only slightly reduced; petals red-purple or blue-purple.
 - 9a. Leaf blade abaxially sparsely stellate pilose; petals with central line of hairs; stipules as long as petiole 6. *H. glabriuscula*
 - 9b. Leaf blade abaxially densely brown stellate tomentose; petals glabrous; stipules ca. 2 × as long as petiole 7. *H. plebeja*

1. *Helicteres isora* Linnaeus, Sp. Pl. 2: 963. 1753.

火索麻 huó suǒ má

Helicteres chrysocalyx Masters; *H. roxburghii* G. Don.

Shrubs or small trees, up to 2(–8) m tall. Branchlets stellate puberulent. Stipules linear, 7–10 mm, caducous; petiole 0.8–2.5 cm, puberulent; leaf blade broadly oblong-obovate, or almost circular, 10–12(–23) × 7–9(–17) cm, thinly leathery, abaxially densely puberulent to tomentose with mixture of stellate and simple hairs, adaxially stellate puberulent, base rounded or obliquely cordate, margin serrate, apex ± truncate with shortly acuminate tip and usually lateral lobes. Inflorescences axillary, usually 2 or 3 per axil, densely clustered, to 2 cm. Flowers 3.5–4 cm in diam. Epicalyx lobes subulate, to 7 mm. Sepals 17–20 mm, usually 4–5-lobed, lobes triangular, ± 2-lipped, densely stellate hairy. Petals red or purple, unequal in length, upper 2 larger, 1.2–1.5 cm, obliquely falcate. Androgynophore 3–4 cm, curved at tip. Stamens 10; staminodes 5, equal to filaments in length. Ovary slightly verrucose, spirally twisted after pollination. Capsule on ca. 2.5 cm stalk, cylindrical, conspicuously spirally twisted, black when mature, 4–8 × (0.5–)0.7–0.9(–1) cm, apex acute, with beak to 1 cm, densely

stellate puberulent at first, glabrescent. Seeds many, to 2 mm, angular, wrinkled, tomentose. Fl. Apr–Oct, fr. Oct–Jan.

Dry deciduous forests, scrub, dry grasslands on slopes; below 100–600 m. SE Hainan, S Yunnan [?Bhutan, Cambodia, India, Indonesia, Malaysia, Nepal, Sri Lanka, Thailand, Vietnam; N Australia].

The bark fiber is good for making ropes and clothing. The roots are of medicinal use.

2. *Helicteres obtusa* Wallich ex Masters in J. D. Hooker, Fl. Brit. India 1: 366. 1874.

钝叶山芝麻 dùn yè shān zhī má

Shrubs or subshrubs. Branchlets yellow-brown puberulent. Petiole 0.6–1.2 cm, yellow-brown puberulent; leaf blade oblong, 6–10 × ca. 2.5 cm, densely yellow-brown stellate puberulent on both surfaces, particularly abaxially, basal veins 3, base rounded, margin entire, apex obtuse. Inflorescence cymose, spikelike, slightly longer than petiole. Flowers small, ca. 6 mm. Epicalyx lobes 3, acute, on pedicel; flower bud globose. Calyx cylindrical campanulate, apex irregularly 4- or 5-lobed. Petals purple. Capsule cylindrical, 2–2.5 cm, apex obtuse, densely villous-setose. Fl. throughout year.

S Yunnan [India (Andaman and Nicobar Islands), Myanmar, Thailand].

3. *Helicteres angustifolia* Linnaeus, Sp. Pl. 2: 963. 1753.

山芝麻 shan zhi ma

Small shrubs, up to 1 m tall. Branchlets gray greenish puberulent. Petiole 5–7 mm; leaf blade narrowly oblong or linear-lanceolate, 3.5–5 × 1.5–2.5 cm, glabrous or nearly so adaxially, gray or yellowish stellate tomentose, or sometimes also hirsute abaxially, base rounded, apex obtuse or acute. Inflorescence cymose, 2- or many-flowered. Pedicel usually with 4 pointed bracteoles. Calyx tube-shaped, ca. 6 mm, stellate puberulent, 5-lobed, lobes triangular. Petals 5, unequal in length, pale blue, pink, or purplish, darker at base of limb, slightly longer than calyx, reflexed at anthesis, uniformly pubescent, claws 2-auriculate. Staminodes linear, very short. Ovary 5-celled, hairy, slightly shorter than style; ovules ca. 10 in each locule. Capsule ovoid-oblong, 12–20 × 7–8 mm, densely setose, setae relatively slender, sparsely hairy, apex acute. Seeds small, brown, with elliptic spots. Fl. almost throughout year.

Sloping grasslands. S Fujian, Guangdong, C and S Guangxi, Hainan, Hunan, Jiangxi, Taiwan, S Yunnan [Cambodia, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam; Australia].

The bark is a source of useful fibers, and the roots and leaves are used medicinally.

4. *Helicteres lanceolata* Candolle, Prodr. 1: 476. 1824.

剑叶山芝麻 jian ye shan zhi ma

Shrubs, 1–2 m tall. Branchlets densely yellow-brown stellate puberulent. Petiole 3–9 mm; leaf blade lanceolate or oblong-lanceolate, 3.5–7.5 × 2–3 cm, both surfaces yellow-brown stellate puberulent, denser abaxially, base obtuse, margin entire or sparsely dentate toward apex, apex acute or acuminate. Inflorescence with flowers fascicled or in 1–2 cm cyme, axillary. Flowers small, ca. 12 mm. Calyx tube-shaped, 5-lobed, hairy. Petals 5, purple, unequal in length, claw and central part of limb hairy. Androgynophore tomentose at base. Staminodes linear-lanceolate. Ovary pilose; ovules ca. 12 per locule. Capsule cylindrical, 2–2.5 × ca. 0.8 cm, apex beaked, densely villous. Fl. Jul–Nov.

Scrub, grasslands. C Guangdong, SE Guangxi, SE Yunnan (Zhenyuan) [Cambodia, Indonesia, Laos, Myanmar, Thailand, Vietnam].

5. *Helicteres elongata* Wallich ex Masters in J. D. Hooker, Fl. Brit. India 1: 365. 1874.

长序山芝麻 chang xu shan zhi ma

Shrubs, ca. 1 m tall. Branchlets very slender, stellate puberulent; upper leaves of fertile shoots reduced to a lax thyrse. Stipules linear, ca. 5 mm, caducous; petiole 0.6–1.3 cm; leaf blade oblong-lanceolate or oblong-ovate, 5–11 × (2–)2.5–3.5(–4) cm, stellate puberulent and villous abaxially, sparsely stellate adaxially, base obliquely rounded, margin irregularly dentate, apex acuminate. Inflorescence racemelike, axillary or terminal, as long as or longer than leaves, many-flowered. Epicalyx lobes linear. Calyx tubelike campanulate, ca. 5 mm, 5-

lobed, lobes triangular, persistent, puberulent. Petals 5, yellow, 1 petal with auriculate appendix and central line of hairs. Androgynophore hairy. Stamens 10. Ovary 5-locular, hairy; ovules ca. 10 in each locule. Capsule long cylindrical, apex acute, 2–3.8 cm, densely gray-yellow shaggy. Fl. Jun–Oct.

Dry grasslands, roadsides; 200–1600 m. NW and W Guangxi, S and SE Yunnan [Bangladesh, ?Bhutan, India (Darjeeling, ?Sikkim), Myanmar, Thailand].

6. *Helicteres glabriuscula* Wallich ex Masters in J. D. Hooker, Fl. Brit. India 1: 366. 1874.

细齿山芝麻 xi chi shan zhi ma

Corchorus cavaleriei H. Léveillé; *Helicteres cavaleriei* (H. Léveillé) H. Léveillé.

Shrubs, up to 1.5 m tall. Branches slender, densely stellate hairy when young, glabrescent. Stipules pointed, ca. 0.3 cm; petiole ca. 3 mm, hairy; leaf blade obliquely lanceolate, 3.5–10 × 1.5–3 cm, sparsely stellate puberulent, base obliquely cordate, margin denticulate, apex acuminate. Inflorescence cymose, axillary, 2–3-flowered; peduncle ca. 1/2 as long as leaf blade. Calyx tube-shaped, 4–5 mm, 5-lobed, lobes acute, puberulent. Petals 5, purple or blue-purple, ca. 2 × as long as calyx, broad distal part hairy on central area. Stamens 10, on top of androgynophore. Ovary 5-locular, hairy; stigma 5-lobed. Capsule long terete, 1.5–2 × ca. 1.2 cm, densely villous, apex short-beaked. Seeds many, very small. Fl. almost throughout year.

Grassy slopes, bushlands. SW Guangxi, Guizhou, S Yunnan [Myanmar].

Helicteres glabriuscula is very similar to *H. elongata*, but it differs in having leaf blades abaxially much more sparsely hairy, with more coarsely denticulate margins, basal veins 5, inflorescences always axillary, and petals purple or bluish purple, not yellow.

7. *Helicteres plebeja* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 39: 67. 1870.

矮山芝麻 ai shan zhi ma

Shrubs, ca. 0.6 m tall. Branchlets erect, very slender, brown stellate when young, glabrescent. Stipules pointed, 6–8 mm, hairy, caducous; petiole 0.3–0.4 cm; leaf blade obliquely linear-lanceolate, 8–10.5 × 1.2–2.5(–3) cm, both surfaces densely brown tomentose when young, adaxially glabrescent, basal veins 3, lateral veins 3–5 on each side of midrib, fine and obscure, base rounded or cordate, margin dentate, apex acute. Inflorescence glomerulose, axillary, ca. 1 cm, few-flowered. Flowers small, red-purple; epicalyx lobes pointed. Calyx tube-shaped, 5–6 mm, teethlike lobes, stellate hirsute, teeth short triangular. Petals 5, apex rounded, glabrous, 4 petals with 2 or 1 auriculate appendices. Staminodes 5, broadly lanceolate, as long as filaments. Ovary ovoid, 5-locular, hairy; ovules 8–10 per locule. Capsule cylindrical, 1.5–1.7 × 0.6–0.7 cm, apex acute, yellow-brown stellate. Seeds small, dark brown.

Yunnan [?Bhutan, NE India, Laos, Myanmar, Thailand, Vietnam].

8. *Helicteres viscida* Blume, Bijdr. 79. 1825.

粘毛山芝麻 nian mao shan zhi ma

Shrubs, up to 2 m tall. Branchlets puberulent when young, glabrescent. Petiole 0.3–1 cm, hairy; leaf blade ovate or nearly circular, 6–15 × 4.5–8.5 cm, sparsely stellate adaxially, densely whitish stellate tomentose, basal veins 5–7, base cordate, margin irregularly dentate, apex long acuminate, usually shallowly lobed from middle. Flowers solitary or cymose, axillary. Pedicel articulate. Calyx tubular, 15–18 mm, densely pale stellate villous and puberulent, 5-lobed, lobes acute. Petals 5, white, unequal to each other in length, spatulate. Stamens 10; staminodes 5. Ovary verrucose, hairy; ovules ca. 8 per locule. Capsule cylindrical, 2.5–3.5 × 1–1.2 cm, apex acute, densely stellate villous and up to 4 mm long hairs. Seeds rhomboid, ca. 2 × 1 mm, with tiny longitudinal grooves. Fl. May–Jun.

Bushlands; 300–900 m. Hainan, Yunnan [Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

9. *Helicteres hirsuta* Loureiro, Fl. Cochinch. 2: 530. 1790.

雁婆麻 yan po ma

Helicteres spicata Colebrooke; *H. spicata* var. *hainanensis* Hance.

Shrubs, 1–3 m tall. Branchlets stellate. Petiole ca. 2 cm, densely tomentose; leaf blade ovate or ovate-oblong, 5–15 × 2.5–5 cm, both surfaces densely stellate puberulent, particularly abaxially, basal veins 5, base obliquely cordate or truncate, margin irregularly dentate, apex acuminate or acute. Inflorescence axillary, elongate, spikelike, one-sided, less than 1/2 as long as leaf blade, several-flowered. Pedicels shorter than flowers, articulate, with caducous epicalyx lobes at base. Calyx tubular, 12–15 mm, 4–5-lobed, puberulent. Petals red or red-purple, 2–2.5 cm, claw with pair of marginal teeth near apex. Androgynophore

glabrous. Stamens 10; staminodes 5, as long as filaments. Ovary verrucose; ovules 20–30 in each locule; style as long as ovary. Capsule long exserted on glabrous stalk, cylindrical, 3.5–4 × 1.1–1.2 cm, apex beaked, densely villous and verrucose. Seeds numerous, 1–2 mm in diam., surface rugose. Fl. Apr–Sep.

Open forests, bushlands. Guangdong, S Guangxi, Hainan [Cambodia, India, Laos, Malaysia, Philippines, Thailand, Vietnam].

Helicteres hirsuta is sometimes cultivated.

10. *Helicteres prostrata* S. Y. Liu, Acta Phytotax. Sin. 37: 601. 1999.

平卧山芝麻 ping wo shan zhi ma

Subshrub, ca. 0.45 m tall, stems many-branched, prostrate. Branchlets brown stellate pilose, glabrescent. Stipules linear, 3–4 mm, stellate pilose; petiole 2–4 mm, stellate pilose; leaf blade oblong or ovate-oblong, rarely circular, 2–3.5 × 1.1–3.5 cm, abaxially grayish white, densely brown stellate pilose, adaxially dark green, glabrous, basal veins 5, abaxially prominent, adaxially flat or slightly concave, base rounded or almost cordate, margin denticulate along apical half, ciliate, apex obtuse. Inflorescences 1 or 2 per axil, 2–5-flowered; bracts and epicalyx lobes linear. Calyx 5–7 mm, 5-lobed, densely stellate pilose, lobes triangular. Petals 5, purplish, slightly unequal, ca. 1 cm, fan-shaped with narrow claw, margin often 1- or 2-toothed at apex of claw, abaxially pilose, adaxially densely villous. Androgynophore ca. 5 mm, villous at base. Staminodes broadly lanceolate, scalelike. Ovary ovoid-globose, densely pilose; style ca. 1 mm. Capsule not seen. Fl. Jun–Jul.

• Guangxi (Tiandong).

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