

## 15. Tribe AESCHYNOMENEAE

合萌族 he meng zu

Sa Ren (萨仁); Alfonso Delgado Salinas

Herbs or shrubs, sometimes scandent, rarely small trees, sometimes glandular with pellucid punctate or with tuberculate-based hairs. Leaves pari- or imparipinnate; leaflets usually 5 to many, sometimes 1–4, alternate or opposite; stipules sometimes appendiculate below point of attachment, sometimes spinescent; stipels usually absent. Inflorescences racemose or sometimes paniculate, fasciculate, or subcymose, or flowers solitary, axillary or terminal; bracts similar to stipules or large and circular, often enclosing flowers and fruit; bracteoles paired. Calyx campanulate with subequal lobes or teeth, or bilabiate. Corolla papilionaceous. Stamens 10, usually monadelphous or diadelphous (5+5); anthers uniform or dimorphic. Legumes usually a loment or lomentaceous (except *Arachis* unjointed and geocarpic), usually straight or slightly curved, or sometimes coiled or plicate, enclosed in calyx. Seeds reniform; hilum short, lateral.

About 23 genera (*Arthrocarpum* I. B. Balfour and *Pachecoa* Standley & Steyermark have been merged into *Chapmannia* Torrey & A. Gray) and ca. 530 species: tropical, subtropical, and warm-temperate areas; seven genera (three introduced) and 14 species (five introduced) in China.

The circumscription adopted here follows V. E. Rudd's revision of Aeschynomeneae (in R. M. Polhill & P. H. Raven, *Advances Legume Syst.* 1: 347–354. 1981). Recently, all members of Aeschynomeneae have been included in an enlarged Dalbergieae sensu lato (Lavin & Klitgaard in Lewis et al., *Legumes World*, 307–335. 2005). However, the two elements are so disparate morphologically that a conservative treatment has been adopted here, i.e., maintaining both tribes.

The Aeschynomeneae contains members of economic importance. Notable among them is the worldwide crop *Arachis hypogaea* (peanut). Cultivars of two additional species of *Arachis* and two of *Stylosanthes* have been introduced and grown as fodder plants in China.

- 1a. Stipules not spurred, free or largely or partly adnate to petiole.
  - 2a. Stipules free, not adnate to petiole; leaflets 9–17 per leaf; flowers pedicellate, with a short hypanthium; calyx subequally 5-toothed; legume walls longitudinally parallel veined ..... 59. *Ormocarpum*
  - 2b. Stipules largely or partly adnate to petiole (pseudopetiole); leaflets 3 or 4 per leaf; flowers sessile, with a long hypanthium; calyx usually 2-lipped; legume walls reticulate veined.
    - 3a. Leaflets 4 per leaf; legume not a loment, geocarpic, subterete, apex not beaked ..... 57. *Arachis*
    - 3b. Leaflets 3 per leaf; legume a loment, not geocarpic, compressed, apex of apical article beaked ..... 61. *Stylosanthes*
- 1b. Stipules spurred below point of insertion, peltate or bilaterally auriculate.
  - 4a. Leaflets 8 to many per leaf; bracts small, shorter than flowers, not enclosing flowers and fruit; bracteoles present.
    - 5a. Inflorescences racemose, lax; bracts membranous, usually persistent; fruit with articles flattened, not plicate, not enclosed in calyx ..... 56. *Aeschynomene*
    - 5b. Inflorescences usually scorpioid-cymose, congested; bracts scarious, caducous; fruit with articles plicate, enclosed in calyx ..... 60. *Smithia*
  - 4b. Leaflets usually 2 or 4 per leaf; bracts enlarged, usually enclosing flowers and often fruit; bracteoles absent.
    - 6a. Leaves pinnate, with 4 leaflets; leaflet blades black punctate; leaf rachis swollen to shortly winged; bracts suborbicular to obliquely reniform; fruit with 1 or 2 articles ..... 58. *Geissaspis*
    - 6b. Leaves digitate, with 2 leaflets; leaflet blades pellucid punctate; leaf rachis not fleshy; bracts usually peltate, longer than broad; fruit with 2–7 articles ..... 62. *Zornia*

## 56. AESCHYNOMENE Linnaeus, Sp. Pl. 2: 713. 1753.

合萌属 he meng shu

Herbs or shrublets. Vegetative and reproductive parts covered usually with viscid tubercular-based trichomes. Stems erect or creeping, often hollow. Stipules spurred below point of insertion, peltate or unilaterally auriculate, caducous. Leaves paripinnate, 20- to many foliolate, often sensitive; leaflets opposite, subsessile, with 1 midvein or 2 to several primary veins. Inflorescences usually axillary, usually racemose, with several flowers; bracts paired, stipule-shaped, not spurred, persistent or caducous, margin denticulate. Flower small to medium-sized. Bracteoles present. Hypanthium short. Calyx membranous, usually 2-lipped, abaxial lip 3-lobed, adaxial lip 2-lobed. Corolla usually yellow; standard orbicular, large; wings without an auricle; keels curved, with a small beak. Stamens diadelphous (5+5) or basally connate; anthers uniform. Ovary linear, with numerous ovules; style filiform, inflexed; stigma terminal. Legume a loment, compressed, stipitate, divided into 4–8 articles, surface often muricate. Seed 1 per article.

About 150 species: tropics and subtropics worldwide; two species (one introduced) in China.

- 1a. Stems viscid; leaflets with 2 to several primary veins; legume oblong, slightly curved, abaxial suture undulate and indented; articles rounded ..... 1. *A. americana*
- 1b. Stems not viscid; leaflets with 1 midvein; legume linear-oblong, straight, abaxial suture straight and slightly indented; articles quadrate ..... 2. *A. indica*

**1. Aeschynomene americana** Linnaeus, Sp. Pl. 2: 713. 1753.

敏感合萌 min gan he meng

Herbs or shrublets, (0.4–)1.5–2 m tall. Stems erect, many branched, glabrous, viscid. Stipules lanceolate, 10–12 × 1–3 mm, membranous, base auriculate, apex acute. Leaves 30–40-foliolate; leaflet blades linear-oblong, 8–10 × 2–4 mm, papery, primary veins 2–4, base oblique, apex obtuse and mucronate. Inflorescences axillary, racemose, laxly branched, 2–4-flowered; bracts cordate, membranous. Bracteoles linear-ovate, striate. Calyx deeply 2-lobed. Corolla yellow, ca. 7 mm. Legume oblong, 2.5–3 cm × 2.5–3 mm, herbaceous to leathery, slightly curved, abaxial suture undulate and indented; articles 4–7, rounded, slightly muricate. Seeds brown, reniform. Fl. and fr. Oct–Nov.

Roadsides. Naturalized in Taiwan [native to tropical America].

**2. Aeschynomene indica** Linnaeus, Sp. Pl. 2: 713. 1753.

合萌 he meng

Shrublets or annual herbs, (15–)30–100(–150) cm tall. Stems erect, many branched, cylindric, hollow, glabrous, corky at base, often with nodule-bearing adventitious roots. Stipules elliptic to lanceolate, 4–11 × 1–2 cm, membranous, caducous,

base auriculate, apex acuminate. Leaves 20–60-foliolate, often sensitive; petiole 2–4 mm; rachis with tuberculate-based trichomes; leaflet blades linear-oblong, 3–13 × 1–3 mm, papery, base oblique, apex obtuse and mucronate. Inflorescences axillary, racemose, sometimes short or reduced to a solitary flower; peduncle 4–7 mm, with tuberculate-based trichomes; bracts ovate, caducous, margin often denticulate. Bracteoles ovate-lanceolate, persistent. Calyx 3–4 mm, membranous, glabrous. Corolla pale yellow with purplish longitudinal striations. Legume linear-oblong, 2.2–3.4 cm × 3–5 mm, straight, herbaceous to leathery, abaxial suture straight, slightly indented; articles 2–8, quadrate, slightly muricate and with tuberculate-based trichomes. Seeds blackish brown, reniform, ca. 2 mm. Fl. Jul–Sep, fr. Jul–Oct.  $2n = 40$ .

Field margins, ditches, grasslands, trailsides and river margins in sunny places; 100–1300 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, India, Japan, Kashmir, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam; tropical Africa, SW Asia, Australia, Pacific islands, South America].

This species is used for green fertilizer, medicinal purposes, and as an industrial raw material.

**57. ARACHIS** Linnaeus, Sp. Pl. 2: 741. 1753.

落花生属 luo hua sheng shu

Herbs, annual. Stipules large, partly adnate with petiole, not spurred. Leaves paripinnate; leaflets opposite, sessile. Inflorescences axillary, usually reduced to a solitary flower or a cluster of flowers. Hypanthium long. Calyx membranous; tube slender, elongating with flower development, 5-lobed, adaxial 4 lobes connate. Corolla yellow; standard almost orbicular, without an auricle; wings oblong, auriculate; keel apex slightly beaked. Stamens monadelphous, 10 but usually one absent; anthers dimorphic, long and short ones alternate, long ones almost dorsifixed, short ones basifixed. Ovary sessile, base elongated and curved after fertilization, with 2 or 3(–6) ovules; style filiform; stigma terminal. Legume oblong, subtorulose, with thick walls, reticulated, 1–5(or 6)-seeded, not breaking into segments, indehiscent, apex not beaked.

About 22 species: tropics of America; one species (introduced) in China.

Two other species, *Arachis glabrata* Benth and *A. pintoi* Krapovickas & W. C. Gregory, have been experimentally introduced for fodder in S China.

**1. Arachis hypogaea** Linnaeus, Sp. Pl. 2: 741. 1753.

落花生 luo hua sheng

*Lathyrus esquirolii* H. Léveillé.

Herbs, annual, erect to decumbent. Stems erect or procumbent, (6–)30–80 cm tall, yellowish pubescent, glabrescent. Stipules 2–4 cm, pilose. Leaves usually 4-foliolate; petiole 3.7–10 cm, covered with long flexuous trichomes, basally adnate to stipule; petiolules 1–10 mm, velutinous; leaflet blades ovate-oblong to obovate, 1.1–5.9 × 0.5–3.4 cm, papery, both surfaces with long trichomes, veins ca. 10 on each side of midvein, base almost rounded, margin ciliate, apex obtuse or emarginate and mucronate. Bracts lanceolate, apex acuminate. Flowers 8–10 mm, sessile; bracteoles lanceolate, ca. 5 mm, velutinous. Calyx tube 4–6 mm, thin. Corolla yellow to golden yellow; standard

spreading, apex emarginate; wings distinct, oblong to obliquely ovate, slender; keels distinct, long ovate, shorter than wings, inflexed, apex acuminate to beaked. Ovary oblong; style longer than calyx; stigma terminal, small, sparsely pubescent. Legume geocarpic, oblong, inflated, 2–5 × 1–1.3 cm, thick-walled, reticulate veined, with 1–4(–6) seeds. Seeds light brown, oblong, 5–10 mm in diam. Fl. May–Aug, fr. Jul–Sep.  $4n = 40$ .

Grown in sandy warm areas. Cultivated in Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, and Zhejiang [native to tropical South America].

Peanuts are grown over much of China except for Heilongjiang, Qinghai-Xizang Plateau, and Xinjiang. In addition to being used for food, they are used as a source of oil, soap, cosmetics, green fertilizer, fodder, and paper.

**58. GEISSASPIS** Wight & Arnott, Prodr. Fl. Ind. Orient. 217. 1834.

睫苞豆属 jie bao dou shu

Herbs. Stipules membranous, spurred below point of insertion. Leaves paripinnate, 4-foliolate; leaflets opposite, sessile. In-

florescences axillary or terminal racemes; peduncle long; bracts large, reniform, imbricate, membranous, striate, persistent, margin ciliate. Flowers small. Bracteoles absent. Hypanthium short. Calyx tubular, membranous, deeply 2-lipped, abaxial lip with inconspicuous lobes, adaxial lip entire and often cucullate. Corolla purple or yellow, 2–3 × as long as calyx; standard almost orbicular, nearly fattened, without an auricle; wings shorter than standard, obliquely obovate, without an auricle; keel short. Stamens monadelphous; anthers uniform. Ovary sessile, with 1 or 2 ovules; style inflexed; stigma small, capitate. Legume a loment, small, inflated, shortly stipitate, indehiscent, reticulate veined, margin conspicuously flattened, with 1 or 2 articles. Seeds 1 per article.

Three species: tropical Asia and Africa; one species in China.

**1. Geissaspis cristata** Wight & Arnott, Prodr. Fl. Ind. Orient. 218. 1834.

睫苞豆 *jie bao dou*

Herbs, annual, 15–60 cm tall. Stems becoming somewhat woody at base, procumbent, many branched at base, with above-ground adventitious roots; branchlets sparse, slender. Stipules lanceolate, 3–4 mm, membranous, apically striate, margin long ciliate. Leaves 4-foliolate; petiole 3–4 mm; rachis swollen to shortly winged; leaflets subsessile; leaflet blades obovate to obovate, 4–7 × 3–4 mm, secondary veins 3–5 on each side of midvein, base cuneate and oblique, apex acute to slightly emar-

ginate and mucronate. Racemes axillary, congested, 1.5–1.6 cm; peduncle ca. 1.2 cm; bracts 6–12, almost orbicular to obliquely reniform, 0.7–1 × ca. 1.5 cm, with yellow setaceous cilia. Calyx 1.2–1.5 mm. Corolla yellow or purple; standard ca. 5 mm wide, creamy outside, with 2 purple-red spots inside near base; wings obovate, small; keels purplish black, small. Ovary linear; style filiform; stigma terminal. Legume oblong, ca. 4 mm, with conspicuous margin, with 1 or 2 articles, apex shortly beaked. Seeds chestnut-brown, reniform, ca. 2 mm in diam. Fl. and fr. May–Jan.

Beaches, sandy wetlands; below 100 m. Guangdong (Guangzhou) [Cambodia, India, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam].

## 59. ORMOCARPUM P. Beauvois, Fl. Oware 1: 95. 1807, nom. cons.

链荚木属 *lian jia mu shu*

*Diphaca* Loureiro.

Shrubs. Stipules triangular-spiculiform, free, not spurred, slightly connate at base, persistent. Leaves subfasciculate on short lateral branches, imparipinnate; leaflets alternate, subsessile. Inflorescences sparse racemes or reduced to 1 or 2 flowers on lateral shoots; bracts paired, persistent. Flowers large. Bracteoles similar to bracts. Hypanthium short. Calyx campanulate, membranous, 5-lobed; abaxial 3 lobes lanceolate and ± as long as tube, adaxial 2 lobes triangular and short. Corolla yellow, longer than calyx; standard suborbicular, with 2 appendages at base, without auricles; keels conspicuously inflexed, without a beak. Stamens diadelphous (5+5); anthers uniform. Ovary linear, with many ovules; style filiform, inflexed; stigma terminal, small. Legume a loment (but articulations developing late), linear to oblong, inflated, shortly stipitate, rugose, glabrous or with coarse soft prickles, divided into several articles, indehiscent. Seeds 1 per article.

About 20 species: tropics of E Hemisphere; one species (introduced) in China.

**1. Ormocarpum cochinchinense** (Loureiro) Merrill, Philipp. J. Sci., C, 5: 76. 1910.

链荚木 *lian jia mu*

*Diphaca cochinchinensis* Loureiro, Fl. Cochinch. 2: 454. 1790; *Hedysarum sennoides* Willdenow; *Ormocarpum sennoides* (Willdenow) Candolle.

Shrubs, evergreen, 2–3 m tall. Stems and branchlets fissured at maturity, corky. Stipules lanceolate, 2–3 mm. Leaves alternate, imparipinnate, 9–17-foliolate; petiole 1.5–2.5 cm; rachis viscid, lustrous pitch-black when dry; leaflet blades elliptic, obovate, or oblong, 1.2–2.5 × 0.5–1 cm, papery, stained purple when dry, venation reticulate, midvein thick and raised, secondary veins 3 or 4 on each side, base rounded, apex obtuse and mucronate. Racemes axillary, ca. 3 cm, 2–6-flowered; pe-

duncle 7–8 mm, viscid, lustrous and sticky when dry; bracts triangular, small, spreading. Flowers 1.5–2 cm. Pedicel ca. 2 cm; bracteoles lanceolate, ca. 1 mm, persistent. Hypanthium 5–6 mm. Calyx ca. 1 cm, membranous, abaxial lobes ca. 5 mm. Corolla yellow or white. Ovary linear to slightly curved, sparsely pubescent; style filiform, glabrous; stigma terminal. Legume a loment, oblong, slightly falcate, 10–12 cm × 5–6 mm, inflated, shortly stipitate, with longitudinal slightly raised parallel veins, divided into 4 or 5 articles. Seeds brown, oblong, ca. 6 × 2.5 mm, compressed; hilum eccentric. Fl. Jun–Sep, fr. Sep–Oct. *2n* = 24.

Cultivated and naturalized in Guangdong, Hainan, and Taiwan [native and/or naturalized in India, Japan, Malaysia, Pacific islands, Philippines, Sri Lanka, Thailand, and Vietnam; introduced and often naturalized in many tropical areas].

## 60. SMITHIA Aiton, Hort. Kew. 3: 496. 1789, nom. cons., not Scopoli (1777).

坡油甘属 *po you gan shu*

*Damapana* Adanson.

Herbs or shrublets. Stems herbaceous or often slightly woody, bristly to glabrescent. Stipules spurred below point of insertion, scarious, persistent, basal portion 1- or 2-auriculate. Leaves opposite, paripinnate, subsessile, few to 12-foliolate, sensitive; rachis often ending in a spine; leaflet blades usually linear-oblong, bristly on abaxial side and margins, apex mucronate. Inflorescences axil-

lary, dense racemes or ± scorpioid cymes, sometimes reduced to a solitary flower; bracts stipule-shaped, scarious, striate, caducous. Flowers small. Bracteoles scarious, persistent. Hypanthium short, much reduced. Calyx membranous or scarious, persistent and often accrescent at fruit, 2-lipped, lips usually entire. Corolla white, purple, yellow, or blue, longer than calyx; standard orbicular to oblong; wings and keel almost as long as standard; keel inflexed, lateral appendages nearly as long as claws, apex blunt. Stamens usually diadelphous (5+5); anthers uniform. Intrastaminal disk present. Ovary linear, with numerous ovules; style filiform, inflexed, persistent to fruit; stigma terminal, small. Legume a loment, plicate within calyx, shortly stipitate, with few to many articles. Seeds orbicular or reniform, compressed; hilum eccentric.

About 20 species: tropics of Asia and Africa; five species in China.

- 1a. Shrublets ..... 1. *S. blanda*  
 1b. Annual herbs.  
 2a. Calyx lips membranous, with reticulate veins.  
 3a. Leaflet blades 0.6–1.2 cm; inflorescences often with more than 12 flowers; corolla slightly longer than calyx; fruit divided into 6–8 articles ..... 2. *S. ciliata*  
 3b. Leaflet blades 1.5–2 cm; inflorescences with 5 or 6 flowers; corolla ca. 1.5 × as long as calyx; fruit divided into 10–12 articles ..... 4. *S. salsuginea*  
 2b. Calyx lips scarious, with parallel veins.  
 4a. Floral nodes congested apically on inflorescence axis; scorpioid cymes and leaves clustered at branch tips ..... 3. *S. conferta*  
 4b. Floral nodes not congested apically on inflorescence axis; racemes and leaves not clustered at branch tips ..... 5. *S. sensitiva*

**1. *Smithia blanda*** Wallich ex Wight & Arnott, Prodr. Fl. Ind. Orient. 221. 1834.

黄花合叶豆 huang hua he ye dou

*Smithia blanda* var. *paniculata* (Arnott) Baker; *S. blanda* var. *racemosa* (Wight & Arnott) Baker; *S. bodinieri* H. Léveillé; *S. paniculata* Arnott; *S. racemosa* Wight & Arnott; *S. yunnanensis* Franchet.

Shrublets, 40–60 cm tall. Stems densely golden setose. Stipules lanceolate, villous. Leaves 4–10-foliolate; petiolules less than 1 mm; leaflet blades oblong to obovate-lanceolate, 6–12 × 2.5–3 mm, papery, midvein setose, base oblique, margin setose, apex obtuse to rounded and with a spinelike mucro. Inflorescences axillary, scorpioid cymes, with flowers usually clustered at apical part; peduncle 1.5–4 cm, setose; bracts ovate-orbicular. Flowers ca. 1 cm. Pedicel 1–3 mm; bracteoles suborbicular, 2.5–3.5 mm, membranous. Corolla yellow; standard orbicular, with short claw, base acuminate, apex cuneate to slightly emarginate; wings smaller than standard, with an auricle; keels ± as long as wings, with an auricle. Stamens diadelphous. Ovary with trichomes; style filiform; stigma terminal. Legume a plicate loment, 2.5–3 mm wide, shortly stipitate, divided into 5 or 6 articles; articles with reticulate veins. Seeds not seen. Fl. Aug–Sep, fr. Sep–Oct.

Mountains, plains; 1000–2100 m. Guizhou, SW Sichuan, Yunnan [India, Laos, Sri Lanka, Thailand].

**2. *Smithia ciliata*** Royle, Ill. Bot. Himal. Mts. 201. 1835.

缘毛合叶豆 yuan mao he ye dou

*Smithia japonica* Maximowicz; *S. nagasawae* Hayata.

Herbs, annual, 15–60 cm tall. Stems and branchlets slender, glabrous. Stipules lanceolate, ca. 8 mm, membranous, glabrous. Leaves 10–14-foliolate; petiole 1.5–2 cm, glabrous; rachis 1.5–3 cm; petiolules less than 1 mm, glabrous; leaflet blades oblanceolate to linear-oblong, 6–12 × 2–4 mm, midvein and margin bristly, apex obtuse to rounded. Inflorescences

axillary or terminal, scorpioid cymes, often with 12 or more flowers in cluster; peduncle 1–2 mm; bracts stipule-shaped, almost as long as calyx, margin ciliate. Bracteoles lanceolate, 4–5 mm, with trichomes. Calyx 4–8 mm, membranous, with reticulate veins, margin densely setose. Corolla yellow or white, slightly longer than calyx; standard obovate, ca. 5 mm wide; wings and keels small, straight, auriculate. Stamens diadelphous. Ovary with a short stipe, with trichomes. Legume a plicate loment, shortly stipitate, divided into 6–8 articles; articles almost globose, 1–1.5 mm, densely papillate. Seeds not seen. Fl. Aug–Sep, fr. Oct–Nov.

Roadsides, mountains, wetlands; 100–2800 m. Fujian, N Guangdong, N Guangxi, SW Guizhou, Hunan, S Jiangxi, Taiwan, Yunnan, Zhejiang [Bhutan, India, Japan, Malaysia, Nepal, Philippines, Thailand, Vietnam].

This species has been reported to have staminodes alternate with stamens (P. K. Basu, Current Science 47(3): 94. 1978).

**3. *Smithia conferta*** Smith in Rees, Cycl. 33: *Smithia* n. 2. 1816.

密节坡油甘 mi jie po you gan

*Smithia conferta* var. *geminiflora* (Roth) Cooke; *S. geminiflora* Roth; *S. geminiflora* var. *conferta* (Smith) Baker.

Herbs, annual, 15–90 cm tall. Stems slender, many branched, glabrous; nodes congested apically on stems. Stipules lanceolate, ca. 1 cm. Leaves 6–12-foliolate; petiole 2–4 mm; rachis sparsely long hirsute; leaflets sessile; leaflet blades linear-oblong, 6–12 × 2–3 mm, thickly papery, abaxially hirsute, adaxially glabrous, secondary veins 5 on each side of midvein, apex obtuse-rounded. Inflorescences axillary, scorpioid cymes, many flowered in a cluster; peduncle short; bracts ovate, 5–8 mm, membranous. Flowers 6–8 mm. Pedicel ca. 1 cm; bracteoles ovate, membranous. Calyx 6–8 mm, thickly papery, bristly, with parallel veins. Corolla yellow, ± as long as calyx; standard oblong-obovate; wings and keels ± equal, smaller than standard. Stamens diadelphous. Ovary with a short stipe,

pubescent. Legume a plicate loment, inflated, shortly stipitate, divided into 4–6 articles; articles papillate. Seeds not seen. Fl. Jul–Aug, fr. Sep–Dec.  $2n = 38$ .

Sandy areas, trailsides, mountain valleys; 200–400 m. Fujian, Guangdong, Guangxi [India, Indonesia, Laos, Malaysia, Nepal, Sri Lanka, Vietnam; N Australia].

**4. *Smithia salsuginea*** Hance, J. Bot. 7: 164. 1869.

盐碱土坡油甘 yan jian tu po you gan

*Smithia dichotoma* Dalzell ex Baker.

Herbs, annual, 30–45 cm tall. Stems slender, rarely branched, sparsely setose. Stipules ovate-lanceolate, ca. 3 mm. Leaves 2- or 4-foliolate; petiole ca. 1 mm; rachis 1–1.5 cm; leaflet blades oblong-oblongate, 1.5–2 × 0.6–0.7 cm, membranous, both surfaces glabrous, apex obtuse. Inflorescences shortly scorpioid cymes, with 5 or 6 flowers; peduncle upward spreading, 3–7 mm; bracts ovate-lanceolate. Bracteoles linear, 1/4–1/3 as long as calyx, membranous. Calyx 1–1.2 cm, membranous, dry, almost glabrous, with reticulate veins, abaxial lip apex acute, adaxial lip longer and apex acute to slightly emarginate. Corolla yellow, ca. 1.5 × as long as calyx. Stamens diadelphous. Ovary with a short stipe. Legume a plicate loment, shortly stipitate, divided into 10–12 articles; articles globose, outside smooth or papillate. Seeds not seen. Fl. and fr. Aug–Oct.

Beaches. Guangdong [India].

**5. *Smithia sensitiva*** Aiton, Hort. Kew. 3: 496. 1789.

坡油甘 po you gan

*Smithia javanica* Benth.

Herbs, annual, 15–100 cm tall, ascending to decumbent. Stems slender, many branched, glabrous; nodes congested apically on stems. Stipules membranous, dry, glabrous. Leaves 6–20-foliolate, sensitive; rachis 1–3 cm, with small spinelike trichomes; petiolules ca. 1 mm, glabrous; leaflet blades oblong, 4–10 × 1.5–3 mm, thinly papery, secondary veins 5 on each side of midvein, apex obtuse to rounded and with a spinelike micro. Inflorescences axillary racemes, with 1–6 or more flowers clustered near apex; peduncle short; bracts stipule-shaped, caducous. Flowers 8–10 mm. Pedicel 2–3 mm; bracteoles 2, ovate, ca. 1/3 as long as calyx, adnate to calyx, persistent, margin ciliate. Calyx 5–8 mm, thickly papery, sparsely setose, with parallel veins. Corolla yellow, slightly longer than calyx; standard obovate, ca. 5 mm wide, claw short, apex slightly emarginate; wings oblong, shorter than standard; keels ± as long as wings. Stamens diadelphous. Ovary linear, with numerous ovules. Legume a plicate loment, shortly stipitate, divided into 4–6 articles; articles densely papillate. Seeds not seen. Fl. Jul–Sep, fr. Sep–Nov.  $2n = 38$ .

Field margins, wetlands; near sea level to 1000 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan [Bhutan, India, Indonesia, Kashmir, Laos, Malaysia, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Africa, N Australia].

This species probably is introduced in some regions of its stated range. It is used for medicinal purposes and fodder.

**61. STYLOSANTHES** Swartz, Prodr. 7, 108. 1788.

笔花豆属 bi hua dou shu

Shrublets or perennial herbs. Stems erect or spreading, with sparse glandular trichomes. Stipules sheathlike, adnate to petiole, not spurred, persistent. Leaves pinnately 3-foliolate; leaflets subsessile. Inflorescences terminal or axillary spikes, with small clustered flowers; bracts membranous, persistent. Bracteoles lanceolate, membranous, persistent. Hypanthium long. Calyx tubular, 5-lobed; abaxial lobe narrow and distinct, adaxial 4 lobes connate. Corolla yellowish orange; standard orbicular, broadly ovate, or obovate, without an auricle, base narrowly cuneate, apex emarginate; wings oblong to obovate, shorter than standard, distinct, auriculate; keels similar to wings. Stamens 10, monadelphous, basal part closed or tubular; anthers dimorphic, alternate with longer 5 almost basifixed and shorter 5 dorsifixed. Ovary linear, sessile, with 2 or 3 ovules; style thin and straight; stigma terminal, calyptiform, extremely small. Legume a loment, oblong to ellipsoid, small, depressed, without a stipe, with coarse reticulate veins, often tuberculate, with 1 or 2 articles, indehiscent, apex with a beak. Seeds ovoid or reniform; hilum usually oblique, with a prominent radicle lobe.

About 25 species: tropical and subtropical Africa, America, and Asia; two species (both introduced) in China.

- 1a. Inflorescences with each flower not subtended by a rudimentary axis; legume ovoid, 2–3 × ca. 1.8 mm, glabrous or near apex pubescent, with 1 article, beak 0.1–0.5 mm, inflexed ..... 1. *S. guianensis*  
 1b. Inflorescences with each flower subtended by a rudimentary axis; legume quadrate, 2–3.5 × ca. 2 mm, commonly pubescent, with 2 articles, beak 3–3.5 mm, uncinata ..... 2. *S. hamata*

**1. *Stylosanthes guianensis*** (Aublet) Swartz, Kongl. Vetensk. Acad. Nya Handl. 10: 301. 1789.

圭亚那笔花豆 gui ya na bi hua dou

*Trifolium guianense* Aublet, Hist. Pl. Guiane 2: 776. 1775; *Stylosanthes gracilis* Kunth.

Herbs or shrublets, 60–100 cm tall, erect or rarely climbing. Stems glabrous or sparsely pubescent. Stipules

sheathing, 0.4–2.5 cm. Leaves 3-foliolate; petiole short; petiolules ca. 1 mm; leaflet blades ovate, elliptic, or lanceolate, 0.5–3(–4.5) × 0.2–1(–2) cm, glabrous, sparsely villous, or setose, base cuneate, margin sometimes sinuate, apex acute to cuspidate. Inflorescences 1–1.5 cm, with 2–40 clustered flowers, each flower without a rudimentary axis; primary bracts 1–2.2 cm, densely long spreading setose; secondary bracts 2.5–5.5 × ca. 0.8 mm. Bracteoles 2–4.5 mm. Hypanthium 4–8 mm. Calyx tube ellipsoid to oblong, 3–5 × 1–1.5 mm. Corolla orangish

yellow, with red slender striations; standard 4–8 × 3–5 mm. Legume ovoid, 2–3 × ca. 1.8 mm, glabrous or near apex pubescent, with 1 article, beak 0.1–0.5 mm and inflexed. Seeds grayish brown, oblate-ellipsoid, ca. 2.2 × 1.5 mm.  $2n = 20$ .

Cultivated and naturalized in Guangdong and Taiwan [native range from Mexico to N Argentina].

This species is grown for fodder and green fertilizer and is naturalized in additional areas of SE Asia.

**2. *Stylosanthes hamata*** (Linnaeus) Taubert, Verh. Bot. Vereins Prov. Brandenburg 32: 22. 1890.

有钩柱花草 you gou zhu hua cao

*Hedysarum hamatum* Linnaeus, Syst. Nat., ed. 10, 2: 1170. 1759; *Stylosanthes procumbens* Swartz, nom. illeg. superfl.

Herbs or shrublets, 10–50 cm tall, prostrate or ascending.

Stems sparsely pubescent. Stipules sheathing, 4–12 mm. Leaves 3-foliolate; petiole short; petiolules ca. 0.5 mm; leaflet blades ovate, elliptic, or lanceolate, 8–14 × 3–5 mm, commonly glabrous, base cuneate, margin setose, apex acute and mucronate. Inflorescences 1–1.5 cm, with 2–10 clustered flowers, each flower subtended by a rudimentary axis; primary bracts 1–1.2 cm, spreading setose; secondary bracts 2–3.5 × ca. 0.5 mm. Bracteoles ca. 2 mm. Hypanthium 2–2.5 mm. Calyx tube oblong, ca. 2 × 1 mm. Corolla yellow, with red slender striations; standard ca. 4 × 3 mm. Legume quadrate, 2–3.5 × ca. 2 mm, commonly pubescent, with 2 articles, beak 3–3.5 mm and unciniate. Seeds light brown, ellipsoid, ca. 2 × 1 mm.  $2n = 20$ .

Reported as cultivated in Hainan [native to Caribbean, Central America, SE North America, and South America].

No material of this species has been seen by the present authors.

The species is cultivated for fodder.

## 62. ZORNIA J. F. Gmelin, Syst. Nat. 2: 1076, 1096. 1792.

丁癸草属 ding gui cao shu

Herbs, annual or perennial, usually prostrate or decumbent. Stems slender. Stipules leaflike, spurred basally to point of insertion, basal portion usually divided. Leaves paripinnate, 2[–4]-foliolate; leaflets opposite, subsessile; leaflet blades usually pellucid punctate. Inflorescences axillary or terminal, sparse spikes; bracts usually peltate, stipulelike. Flowers small, usually enclosed in a pair of bracts. Bracteoles absent. Hypanthium short. Calyx small, 2-lipped, adaxial lobes short. Corolla usually yellow; petals ± equal. Stamens monadelphous; anthers dimorphic. Ovary linear, undulate, with 5–8 ovules; style filiform; stigma terminal. Legume a loment, compressed, not stipitate, smooth or surface echinate-setose, indehiscent, divided into few to many subglobose-oblate articles, abaxial suture straight, adaxial suture sinuate, apex usually without a beak. Seeds 1 to several, ovoid or reniform, compressed.

About 75 species: tropics and temperate regions worldwide; two species in China.

- 1a. Leaflet blades ovate-oblong, obovate, or lanceolate, abaxially with brown and black glands; fruit surface echinate-setose ..... 1. *Z. gibbosa*  
 1b. Leaflet blades ovate-lanceolate, abaxially without brown and black glands; fruit surface smooth ..... 2. *Z. intecta*

**1. *Zornia gibbosa*** Spanoghe, Linnaea 15: 192. 1841.

丁癸草 ding gui cao

*Zornia cantoniensis* Mohlenbrock; *Z. gibbosa* var. *cantoniensis* (Mohlenbrock) H. Ohashi; *Z. graminea* Spanoghe.

Herbs, perennial, 20–50 cm tall, sometimes with a thick tuber. Stems slender, many branched, glabrous. Stipules lanceolate, ca. 1 mm, glabrous, with a long auricle at base. Leaves 2-foliolate; leaflet blades ovate-oblong, obovate, or lanceolate, 0.8–2.5 × 0.3–0.9 cm, glabrous but abaxially with brown and black glands, base oblique, apex acute and mucronate. Inflorescences axillary spikes, 2–6 cm, sparsely 3–6(–10)-flowered; bracts 2, ovate, 6–7(–10) mm, peltately inserted, margin ciliate. Calyx ca. 3 mm. Corolla yellow; standard with longitudinal striations; wings and keels small. Legume usually longer to rarely shorter than bracts, divided into 2–7 articles; articles subglobose, 2–4 × 2–4 mm, echinate-setose, with conspicuous reticulate veins. Seeds not seen. Fl. Apr–Jul, fr. Jul–Sep.

Sandy places, floodplains; 100–1200 m. Fujian, Guangdong, Guangxi, Hainan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang

[Bhutan, India, Japan, Malaysia, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand; Australia].

This species is used for medicinal purposes.

**2. *Zornia intecta*** Mohlenbrock, Webbia 16: 84. 1961.

台东癸草 tai dong gui cao

*Zornia diphylla* (Linnaeus) Persoon var. *ciliaris* Ohwi.

Herbs, perennial, to 40 cm tall, erect. Stems glabrous or pubescent. Stipules glabrous, 5-veined. Leaves 2-foliolate; petiole and petiolules pubescent; leaflet blades ovate-lanceolate, 1.4–2 × 0.4–0.6 cm, not glandular punctate, secondary veins 5–9 on either side of midvein, apex acute and mucronate. Inflorescences spikes, many flowered; bracts ovate-lanceolate, ca. 8 × 5 mm, apex abruptly acute. Calyx ca. 3.5 mm, strigose. Corolla pale yellow, ca. 1 cm. Legume divided into 5 or 6 articles; articles 2–2.2 × 2–2.2 mm, surface smooth. Seeds not seen.

Sunny places in mountains; 500–1500 m. Taiwan [India, Sri Lanka, Vietnam].