AMARANTHACEAE

Herbs, clambering subshrubs, shrubs, or lianas. Leaves alternate or opposite, entire, exstipulate. Flowers small, bisexual or unisexual, or sterile and reduced, subtended by 1 membranous bract and 2 bracteoles, solitary or aggregated in cymes. Inflorescences elongated or condensed spikes (heads), racemes, or thyrsoid structures of varying complexity. Bracteoles membranous or scarious. Tepals 3–5, membranous, scarious or subleathery, 1-, 3-, 5-, or 7(–23)-veined. Stamens as many as tepals and opposite these, rarely fewer than tepals; filaments free, united into a cup at base or ± entirely into a tube, filament lobes present or absent, pseudostaminodes present or absent; anthers (1- or)2-loculed, dorsifixed, introrsely dehiscent. Ovary superior, 1-loculed; ovules 1 to many; style persistent, short and indistinct or long and slender; stigma capitate, penicillate, 2-lobed or forming 2 filiform branches. Fruit a dry utricle or a fleshy capsule, indehiscent, irregularly bursting, or circumscissile. Seeds lenticular, reniform, subglobose, or shortly cylindric, smooth or verruculose.

About 70 genera and 900 species: worldwide; 15 genera (one introduced) and 44 species (three endemic, 14 introduced) in China.

Morphology of the androecium, perianth (tepals), and the inflorescence has traditionally been used to circumscribe genera and tribes. Pseudostaminodia are interstaminal appendages with variously shaped apices. Filament appendages are the lateral appendages of filaments (one on each side). The basic structure of the inflorescence is the cyme (branchlets arising from the bracteole axils, the bracteoles serving as bracts for upper flowers), which can be reduced to one flower with two bracteoles and a bract. Units of dispersal vary considerably (capsules opening with lower part persistent, flower and bracteoles falling together, or cymose partial inflorescences breaking off above bract) and can be characteristic for genera. Several genera possess long trichomes serving dispersal at the base of the tepals.

Digera arvensis Forskål (Fl. Aegypt.-Arab. 65. 1775) has been reported from Anhui. However, we have seen no specimens and are therefore unable to treat it in this account.


1a. Leaves alternate.
   2a. Ovary with 2 to many ovules.
      3a. Fruit a red berry, indehiscent ................................................................. 1. Deeringia
      3b. Fruit a utricle or capsule, dehiscent by a lid .................................................. 2. Celosia
   2b. Ovary with 1 ovule.
      4a. Flowers bisexual; inflorescences heads; filaments at base connate into a cup; seed with aril ......................... 3. Allmania
      4b. Flowers unisexual; inflorescences complex thyrsoid structures; filaments free; seed without aril ........... 4. Amaranthus

1b. Leaves opposite.
   5a. Flowers 2 or more in cymous partial inflorescence, sterile flowers present ............................................................. 5. Cyathula
   5b. Flowers solitary, without any branching in axils of bracteoles, without sterile flowers.
   6a. Inflorescences heads or complex thyrsoid structures; anthers 1-localed.
      7a. Inflorescences complex thyrsoid structures, flowers unisexual ................................................................. 11. Iresine
      7b. Inflorescences condensed heads, flowers bisexual.
         8a. Stigma 1, capitate, pseudostaminodes present .................................................. 12. Alternanthera
         8b. Stigmas 2-lobed or forming 2 or 3 linear branches, pseudostaminodes absent.
            9a. Bracteoles with distal crest; filaments ± fused into a tube, lateral appendages absent .................. 13. Gomphrena
            9b. Bracteoles without crest; filaments united at base, lateral appendages absent ...................... 14. Philoxerus
   6b. Inflorescences spikes; anthers 2-localed.
      10a. Pseudostaminodes fringed or long fimbriate.
         11a. Midvein of bracteoles flexible, mucronate; a large woody climber ................................. 15. Stilbanthus
         11b. Midvein of bracteoles spiny, long excurrent; an herb or a shrub ................................. 9. Achyranthus
      10b. Pseudostaminodes triangular, subulate, oblong, or absent.
         12a. Fruit dehiscent by lid ............................................................................... 10. Trichuriella
         12b. Fruit indehiscent or irregularly circumscissile.
            13a. Tepals 1-veined, hairy ............................................................................. 6. Aerva
            13b. Tepals 3–7-veined, glabrous or hairy.
               14a. Pseudostaminodes absent (in Chinese species); utricles indehiscent, seeds smooth ........................................ 7. Psilotrichum

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14b. Pseudostaminodes present, triangular; utricles irregularly bursting, seeds tuberculate ................................................................. 8. Psilotrichopsis

1. DEERINGIA R. Brown, Prodr. 413. 1810.

浆果苋属 jiang guo xian shu

Cladostachys D. Don.

Herbs erect or scandent, or clambering shrubs. Leaves alternate, petiolate. Inflorescences racemes or spikes, axillary or terminal. Flowers bisexual or unisexual; each flower with 1 bract and 2 bracteoles. Tepals 5, rarely 4, scarious, glabrous. Stamens 5, rarely 4; filaments basally connate into a cup; anthers 2-loculed. Ovary ovoid or subglobose, 1-loculed; ovules few to many; stigmas 2 or 3, rarely 4, linear or terete, united at base; pseudostaminodes absent. Berry globose, broadly ellipsoid, or obovoid, thinly walled, indehiscent. Seeds few to many, shiny black or brownish black, circular or reniform, very finely verruculose or smooth.

About seven species: Africa (Madagascar), Asia, Australia; two species in China.

1a. Inflorescence a raceme; berry red; a clambering shrub ........................................................................................................... 1. D. amaranthoides
1b. Inflorescence a spike; berry white; an erect herb or subshrub ................................. 2. D. polysperma


浆果苋 jiang guo xian

Achyranthes amaranthoides Lamarck, Encycl. 1: 548. 1785; Cladostachys amaranthoides (Lamarck) K. C. Kuan; C. frutescens D. Don.

Shrubs climbing. Stem 2–6 m tall, often with pendulous branches, hairy when young. Petiole 1–4 cm, glabrous; leaf blade ovate or ovate-lanceolate, at first sparsely villous, glabrescent, base acute, obtuse, rounded, or ovate-subtruncate, apex acuminate or acute, often unequal. Racemes axillary and terminal, arranged into complex thyrsoid structures; rachis pubescent. Bracts narrowly triangular, ca. 1.5 mm; bracteoles ovate, ca. 1 mm. Pedicel 2–3 mm. Flowers broadly spreading or reflexed at anthesis, glabrous, apex obtuse. Tepals light green or somewhat yellowish, tinged red in fruit, 1.5–2.5 mm. Filaments connate into a cup at base; stigmas 3, terete, reflexed in fruit. Berry red, globose, 4–7 mm in diam. Seeds 1–6, black, shiny, compressed-reniform. Fl. and fr. Oct–Mar. 2n = 16.

Hillsides; 100–2200 m. Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Sikkim, Thailand, Vietnam; Australia].


白浆果苋 bai jiang guo xian

Celosia polysperma Roxburgh, Fl. Ind. 2: 511. 1824; Cladostachys polysperma (Roxburgh) K. C. Kuan; Deeringia indica Zollinger ex Muq-Muq-Tandon var. pubescens Schinz; D. polysperma var. pubescens (Schinz) Merrill.

Herbs erect or subshrubs, 1–2 m tall. Petiole glabrous; leaf blade ovate-lanceolate or oblong-lanceolate, 8–15 × 4–7 cm, apex acuminate or acute. Spikes axillary, solitary or paired, 3–12 cm. Tepals adnate to fruit. Filaments connate into a cup at base. Ovules more than 10; stigmas 2 or 3. Berry white, 4–5 mm in diam. Seeds reniform, ca. 0.7 mm in diam., finely verruculose. Fl. and fr. Jun–Dec.

Hillsides; low to medium elevations. Guangdong, Hainan, Taiwan [Malaysia, Philippines, Thailand, Vietnam].


青葙属 qing xiang shu

Herbs annual, 30–100 cm tall. Stem erect, green or red, glabrous, often branched. Leaves green, often tinged red; petiole absent to 1.5 cm; leaf blade oblong-lanceolate, lanceolate, or lanceolate-linear, rarely ovate-oblong, 5–8 × 1–3 cm, base

2a. Spikes long cylindric, not branched; perianth white or pink ................................................................................... 1. C. argentea
2b. Spikes cristate or feathery, much branched; perianth red, purple, or yellow ......................................................... 2. C. cristata


青葙 qing xiang

Celosia swinhoei Hemsley.

Herbs annual, 30–100 cm tall. Stem erect, green or red, glabrous, often branched. Leaves green, often tinged red; petiole absent to 1.5 cm; leaf blade oblong-lanceolate, lanceolate, or lanceolate-linear, rarely ovate-oblong, 5–8 × 1–3 cm, base
attenuate, apex acuminate or acute. Spikes narrowly cylindric or with a conic apex, 3–10 cm, not branched. Flowers dense. Bracts and bracteoles white, shiny, lanceolate, 3–4 mm, with midvein, apex acuminate. Tepals white, with a pink tip or nearly pink, then white, oblong-lanceolate, 6–10 mm, with midvein, apex acuminate. Filaments 5–6 mm, free part 2.5–3 mm; anthers purple. Ovary shortly stalked; style purple, 3–5 mm. Utricles ovoid, 3–3.5 mm, enveloped in persistent perianth. Seeds compressed-reniform, ca. 1.5 mm in diam. Fl. May–Aug, fr. Jun–Oct. 2n = 36, 72, 84*.

Hillsides, field margins, a common weed. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Bhutan, Cambodia, Japan, Korea, India, Laos, Malaysia, Myanmar, Nepal, Philippines, Russia, Sikkim, Thailand, Vietnam; tropical Africa].


Herbs annual. Stem erect or decumbent. Leaves alternate, petiolate, margin entire. Flowers unisexual, on same plant or not, composed of 3–7-flowered cymes, stalked or subsessile. Flowers bisexual; each flower with 1 bract and 2 bracteoles, scarious. Stamens 5; filaments basally connate into a short cup, pseudostaminodes absent; anthers 2-loculed. Ovary ovoid; ovule 1, erect; style filamentous; stigma slightly 2-lobed. Utricles ovate, dehiscent by lid. Seeds black, subglobe, lenticular, with aril.

One species: tropical Asia.


Herbs annual. Stem erect or ascending. Leaves alternate, petiolate, linear to obovate, margin entire. Heads terminal or axillary, composed of 3–7-flowered cymes, stalked or subsessile. Flowers bisexual; each flower with 1 bract and 2 bracteoles, scarious. Stamens 5; filaments basally connate into a short cup, pseudostaminodes absent; anthers 2-loculed. Ovary ovoid; ovule 1, erect; style filamentous; stigma slightly 2-lobed. Utricles ovate, dehiscent by lid. Seeds black, subglobe, lenticular, with aril. Globes, becoming somewhat lengthened, with 3–7-flowered cymes; rachis 0.2–3.5 cm, glabrous or pubescent. Bracts and bracteoles ovate-lanceolate, 3–5 mm, white on margin and with green or purple (?red) midvein, apex long acuminate. Tepals obliquely spreading at anthesis, later erect, ovate-lanceolate or oblong-lanceolate, 4–5 mm. Stamens 5; filaments connate at base. Ovary ovoid, glabrous, style nearly as long as filaments. Utricles enclosed in persistent perianth, pale green, ovoid, 3–3.5 mm in diam., dehiscent by lid. Seeds 1.5–2 mm in diam. Fl. May–Jun, fr. Jul–Aug. 2n = 32.

Sandy soils, sandy shores; below 200 m. Guangxi, Hainan [tropical Asia].


Herbs annual. Stem erect or decumbent. Leaves alternate, petiolate, margin entire. Flowers unisexual, on same plant or not, sessile, clustered at axils and at apex, in solitary or complex thyrsoid structures; each flower with 1 bract and 2 bracteoles, scarious. Tepals 5, rarely 1–4, erect or obliquely spreading, sometimes indurate at base after anthesis, green, equal or subequal, membranous. Stamens 5, rarely 1–4; filaments free, filiform, pseudostaminodes absent; anthers 2-loculed. Ovary with 1 erect ovule; style short or absent; stigmas 2 or 3, persistent, subulate or linear. Utricles globose or ovoid, laterally compressed, membranous, dehiscent by lid, dehiscing irregularly or falling off together with perianth and indehiscent. Seeds black or brown, globose or lenticular, without aril.

About 40 species: worldwide; 14 species (one endemic, at least eight introduced) in China.
1a. Tepals 3, rarely 2 or 4; stamens 3; utricles indehiscent.
   2a. Fruit indehiscent.
      3a. Stem erect, somewhat branched; utricles very rugose ................................................................. 13. *A. viridis*
      3b. Stem ascending, much branched (frequently at base); utricles smooth or slightly rugose .................. 14. *A. blitoides*

2b. Fruit circumsiccillose.
   4a. Tepals 4, rarely 5 ................................................................................................................................. 12. *A. blitoides*
   4b. Tepals 3, rarely 2.
      5a. Tepals conspicuously longer than fruit ........................................................................................... 9. *A. tricolor*
      5b. Tepals ca. as long as or shorter than fruit.
         6a. Stamens longer than perianth; bracts conspicuously longer than perianth ................................. 10. *A. albus*
         6b. Stamens shorter than perianth; bracts ca. as long as or shorter than perianth .............................. 11. *A. roxburghianus*

1b. Tepals 5; stamens 5, rarely 2 or 3; utricles usually dehiscent by lid.

7a. Stamens 2, rarely 3 ................................................................. 8. *A. taishanensis*
7b. Stamens 5.

8a. Armed at leaf axils; bract often becoming 2 spines, rarely 1 .............................................................. 7. *A. spinosus*
8b. Unarmed at leaf axils; bract not becoming spiny.

9a. Plants hairy.
   10a. Fruit enveloped in persistent perianth ................................................................. 5. *A. retroflexus*
   10b. Fruit longer than perianth .................................................................................................................. 6. *A. hybridus*
9b. Plants glabrous or nearly so.
   11a. Complex thyrsoid structures pendulous; bracts and bracteoles inconspicuously pointed at apex ................................................................. 1. *A. caudatus*
   11b. Complex thyrsoid structures erect; bracts and bracteoles conspicuously pointed at apex.
      12a. Herbs high, to 2 m tall; leaf blade paler and pubescent on abaxial veins ........................................ 2. *A. patulus*
      12b. Herbs short, 0.1–0.8 m tall; leaf blade not pale, glabrous.
         13a. Tepals ca. as long as or longer than fruit; bracts ca. 2 × as long as perianth ................................ 3. *A. hypochondriacus*
         13b. Tepals distinctly shorter than fruit; bracts ca. 1.5 × as long as perianth ................................. 4. *A. cruentus*

   老枪谷 lao qiang gu
   Stem erect, green, ca. 1.5 m tall, strong, angular, slightly branched or not, glabrous when mature. Petiole green, 1–15 cm, pilose; leaf blade green or red, rhombic-ovate or rhombic-lanceolate, 4–15 × 2–8 cm, both surfaces glabrous, base cuneate, margin entire or undulate, apex acuminate or obtuse. Complex thyrsoid structures terminal, pendulous, much branched, composed of many spikes. Bracts red, lanceolate, ca. 3 mm, transparent, with a midvein abaxially, apex acicular. Tepals red, shorter than fruit, 2–2.5 mm, transparent, at margins, with a midvein; male segments oblong; female segments oblong-lanceolate. Stamens 5; stigmas 3, shorter than 1 mm. Utricles red above, subglobose, ca. 3 mm in diam., longer than perianth, circumsiccillose. Seeds light yellowish brown, subglobose. Fl. Jul–Aug, fr. Sep–Oct. 2n = 32*, 64.

   Widely cultivated in China [native to neotropics; cultivated worldwide].

   台湾苋 tai wan xian
   Stem to 2 m tall, glabrous or somewhat soft pubescent. Petiole 3–8 cm; leaf blade ovate to rhombic-ovate, 6–12 × 4–7 cm, pale and soft pubescent on abaxial veins, adaxially glabrous, base cuneate, margin entire or slightly undulate, apex acute to subobtuse. Complex thyrsoid structures terminal and in apical axils, greenish, the terminal to 25 cm, much branched, composed of many lateral spikes. Bracts green, 2–4 mm, membranous near base, long pointed. Tepals 5, oblong-lanceolate, slightly shorter than utricle, 1.5–2 mm, apex obtuse or slightly mucronulate. Stamens 5. Utricles compressed, circumsiccillose. Seeds black, shiny, ca. 1 mm in diam.

   Waste places, roadsides. Taiwan [native to tropical America].

   One of us (Clemants) prefers to treat this as a synonym of *Amaranthus cruentus*.

   千穗谷 qian sui gu

   Stem green or purple, 10–80 cm tall, branched, glabrous or slightly pilose. Petiole 1–7.5 cm, glabrous; leaf blade rhombic-ovate or oblong-lanceolate, 3–10 × 1.5–3.5 cm, glabrous, base cuneate, margin entire or undulate, apex acute or acuminate. Complex thyrsoid structures terminal, erect, cylindric, ca. 25 cm, 1–2.5 cm in diam., branched or not, composed of many spikes; lateral spikes short, ca. 6 cm. Bracts green or purple, ovate, subulate, 4–5 mm, ca. 2 × as long as perianth, apex distinctly long pointed. Tepals green or purple, with a dark midvein, oblong, ca. as long as or longer than fruit, apex acute or acuminate. Stigmas 2 or 3. Utricles exceeding perianth, green, tinged purple above, rhomboid-ovoid, 3–4 mm, circumsiccillose. Seeds white, subglobose, ca. 1 mm in diam. Fl. Jul–Aug, fr. Aug–Sep. 2n = 32.
**AMARANTHACEAE**

Cultivated. Hebei, Jilin, Nei Mongol, Sichuan, Xinjiang, Yunnan [native to North America].


5. *Amaranthus retroflexus* Linnaeus


短苞反枝苋 duan bao fan zhi xian


Stem slender, less angulate, pilose. Leaves narrowing to petiole at base. Bracts 3–4 mm, slightly longer than perianth, apex obtuse.

Waste places. Hebei [probably native to North America; naturalized in S Africa, N Asia, and Europe].


绿穗苋 lü sui xian

Stem 30–50 cm tall, branched, pubescent. Petiole 1–2.5 cm, hairy; leaf blade ovate or ovate-rhombic, 3–4.5 × 1.5–2.5 cm, abaxially pilose, axially nearly glabrous, base cuneate, margin undulate, apex acute or notched, with a mucro. Complex thyrsoid structures terminal, slender, somewhat drooping at apex and in spikes. Bracts and bracteoles subulate, lanceolate, 3.5–4 mm, distinctly long pointed, longer than perianth. Tepals oblong-lanceolate, ca. 2 mm, apex acute, with a mucro. Stamens nearly as long as or slightly longer than perianth; stigmas 3. Utricles ovoid, longer than perianth, ca. 2 mm, circumscissile. Seeds black, subglobose, ca. 1 mm in diam. Fl. Jul–Aug, fr. Sep–Oct. 2n = 32*, 34*, 102*.

Waste places, field margins, roadsides. Anhui, Fujian, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Zhejiang [Bhutan, Japan, Laos, Nepal, Sikkim, Vietnam; Europe, North and South America].

Farms, waste places, hillsides. Anhui, Fujian, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Zhejiang [Bhutan, Japan, Laos, Nepal, Sikkim, Vietnam; Europe, North and South America].


刺苋 ci xian

Stem erect, green or somewhat tinged purple, 30–100 cm tall, terete or obtusely angulate, much branched, glabrous or slightly pubescent. Petiole 1–8 cm, glabrous, 2-armed at base; leaf blade ovate-rhombic or ovate-lanceolate, 3–12 × 1–6 cm, glabrous or slightly pubescent along veins when young, base cuneate, margin entire, apex obtuse, with a mucro. Complex thyrsoid structures terminal or axillary, 8–25 cm; terminal spike usually with all male flowers at or toward apex. Bracts becoming very sharply spiny in proximal part of spike. Tepals green, transparent at margin and with green or purple median band, apex acute, with a mucro; male flowers oblong, 2.1–2.5 mm; female flowers oblong-spatulate, ca. 1.5 mm. Filaments nearly as long as or slightly shorter than perianth. Stigmas 3(or 2). Utricles included in perianth, oblong, 1.1–1.2 mm, circumscissile slightly below middle. Seeds brownish black, subglobose, ca. 1 mm in diam. Fl. and fr. Jul–Nov. 2n = 34, 68.

Waste places, gardens. Anhui, Fujian, Guizhou, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Shandong, Shanxi, Xizang, Taiwan, Yunnan, Zhejiang [probably native to neotropics, now cosmopolitan in warm-temperate and tropical regions].

泰山苋 tai shan xian

Stem erect or decumbent, light green, sometimes light purple below, 10–30 cm tall, much branched, pubescent or nearly glabrous. Petiole 2–15 mm; leaf blade ovate-rhombic or elliptic, 0.5–3 cm × 3–15 mm, glabrous, abaxially greenish white, adaxially green, base cuneate, margin entire or slightly undulate, apex notched, with a mucro. Flowers unisexual, clustered at leaf axils. Bracts and bracteoles subulate, 1.2–1.5 mm, slightly longer than perianth. Petals 5, membranous. Stamens 2, rarely 3, slightly longer than perianth; stigmas 3. Utricles slightly longer than perianth. Tepals 5, membranous; male flowers oblong, apex acuminate; female flowers obovate, or oblong, 2–5 × 1–2.5 mm, base cuneate, margin undulate, apex notched, with a mucro. Flowers few, sparsely clustered at axils. Bracts and bracteoles subulate, ca. 2 mm, abaxially with a distinct midvein, apex long pointed. Tepals lanceolate, ca. 2.5 mm, apex acuminate, long pointed. Stamens shorter than perianth; stigmas 3. Utricles ovoid, subequal to perianth, ca. 3 mm, circumscissile. Seeds brownish black, subglobose, ca. 1 mm in diam. Fl. Jul–Aug, fr. Aug–Sep.

Field margins, waste places. Hebei, Henan, Gansu, Ningxia, Shaanxi, Shanxi, Sichuan, Xinjiang [India, Sri Lanka].

The names Amaranthus gracilis Desfontaines and A. viridis Desfontaines have been misapplied to this species. Further study is necessary to compare A. roxburghianus with A. gracilis Linnaeus.


北美苋 bei mei xian

Stem erect, light green, 30–65 cm, much branched, glabrous. Petiole 1–2.5 cm, slender; leaf blade ovate-rhombic, obovate, or oblong, 2–5 × 1–2.5 cm, base cuneate, margin undulate, apex notched, with a mucro. Flowers few, sparsely clustered at axils. Bracts and bracteoles subulate, ca. 2 mm, abaxially with a distinct midvein, apex long pointed. Tepals lanceolate, ca. 2.5 mm, apex acuminate, long pointed. Stamens shorter than perianth; stigmas 3. Utricles ovoid, subequal to perianth, ca. 3 mm, circumscissile. Seeds brownish black, subglobose, ca. 1 mm in diam. Fl. Aug–Sep, fr. Sep–Oct. 2n = 32.

Fields, roadsides. Beijing, Liaoning, Nei Mongol [native to North America].


皱果苋 zhou guo xian

Euxolus viridis (Linnaeus) Moquin-Tandon.

Stem erect, green or somewhat tinged purple, 40–80 cm tall, conspicuously angulate, slightly branched, glabrous. Petiole 3–6 cm, green or somewhat tinged purple; leaf blade obovate or spatulate to oblong-oblancoate, 0.5–2.5 cm × 3–10 mm, base cuneate, margin entire, apex obtuse or acute, with a mucro. Flowers clustered at axils, shorter than petioles. Bracts and bracteoles lanceolate, ca. 3 mm, apex acute. Tepals 4(5), green, ovate-lanceolate to oblong-lanceolate, 1–2.5 mm, apex acuminate and pointed. Stigmas 3. Utricles ellipsoid, longer than longest perianth segment, ca. 2 mm, circumscissile. Seeds black, slightly shiny, ovoid, ca. 1.5 mm in diam. Fl. Aug–Sep, fr. Sep–Oct. 2n = 32.

Fields, roadsides. Beijing, Liaoning, Nei Mongol [native to North America].

AMARANTHACEAE

Fields, waste places. All provinces except for NW China and Xizang [pantropical].


凹头苋 ao tou xian

*Amaranthus blitum* Loiseleur-Deslongchamps; *A. lividus* Linnaeus; *A. lividus* var. *ascendens* (Lois) Thellung-Blom; *Euxolus ascendens* (Loiseleur-Deslongchamps) H. Hara.

Stem ascending, light green or purple, 10–30 cm tall, branched from base, glabrous. Petiole 1–3.5 cm; leaf blade ovate or ovate-rhombic, 1.5–4.5 × 1–3 cm, base cuneate, margin entire or slightly undulate, apex notched, with a mucro. Flower clusters axillary, those of terminal clusters erect spikes or complex thyrois structures. Bracts and bracteoles oblong, shorter than 1 mm. Tepals light green, oblong or lanceolate, 1.2–1.5 mm, with a midvein adaxially, apex acute. Stamens slightly shorter than perianth; stigmas 3 or 2, falling off when utricles ripen. Utricles exceeding perianth, compressed-ovoid, ca. 3 mm, indehiscent, slightly rugose to nearly smooth. Seeds black to brownish black, circular, ca. 1.2 cm in diam. Fl. Jul–Aug. fr. Aug–Sep. $2n = 34$.


杯苋属 bei xian shu

Herbs or subshrubs. Stem erect or ascending. Leaves opposite, petiolate, margin entire. Flowers clustered in cymose partial inflorescences, 1–3 in each cluster, hermaphroditic, partly accompanied by sterile ones. Bracts ovate, membranous, often spiny. Tepals 5, nearly equal, membranous. Stamens 5; anther 2-loculed, oblong; filaments connate into a short cup at base, alternating with dentate or lacerate staminodes. Ovary obovoid; ovule 1, pendulous from a long funicle; style filiform, persistent; stigma capitulate. Utricles included in persistent perianth, globose, ellipsoid, or obovoid, membranous, indehiscent. Seeds oblong or ellipsoid.

About 27 species distributed in Asia, Pacific Islands, Africa, and North and South America; four species in China.

*Cyathula semirosulata* Masamune (Trans. Nat. Hist. Soc. Taiwan 33: 111. 1943) was described from Hainan, but we have seen no specimens and are therefore unable to treat it in this account. Further revisionary study is necessary.

1a. Subshrubs, 10–20 cm; leaves elliptic ................................................................. 4. *C. tomentosa*

1b. Herbs perennial; leaves rhombic-obovate, rhombic-oblong, broadly ovate, obovate-oblong, or elliptic.

2a. Stem ascending or erect; leaves rhombic-obovate or rhombic-oblong; flower clusters in racemes ................. 1. *C. prostrata*

2b. Stem erect; leaves not rhombic-obovate or rhombic-oblong; flower clusters in spikes.

3a. Leaves broadly ovate or obovate-oblong; flowers grayish black when dried; staminodes 0.6–1 mm ........... 2. *C. capitata*

3b. Leaves elliptic or narrowly elliptic, rarely obovate; flowers white when dried; staminodes 0.3–0.4 mm ... 3. *C. officinalis*

1. **Cyathula prostrata** (Linnaeus) Blume, Bijdr. Fl. Ned. Ind. 549. 1826.

杯苋 bei xian


Herbs perennial, 30–50 cm tall. Roots slender. Stem ascending or erect, tinged red, obtusely quadrangular, branched, inflated at nodes. Petiole 1–7 mm, long hairy; leaf blade ovate-rhombic or rhombic-oblong, 1.5–6 × 0.6–3 cm, both surfaces densely hairy and ciliate, base rounded, apex acuminate, narrowly cuneate, margin entire or slightly undulate, apex acuminate. Tepals of perfect flowers dark purple, lanceolate, 3–4 mm, abaxially hairy at base, apex acuminate; imperfect ones yellow, lanceolate-subulate, ca. 3 mm, rigid, apex hooked. Filaments ca. 3 mm, pilose at base; pseudostaminodes rectangular, 0.6–1 mm, parted and brown, shiny, ovoid-oblong, very small, smooth. Fl. and fr. Jun–Nov.

Hillsides, riverbanks, roadsides. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Bhutan, Cambodia, India, Laos, Malaysia, Myanmar, Nepal, Philippines, Sikkim, Thailand, Vietnam; Africa, Pacific Islands].


头花杯苋 tòu hua bei xian

Herbs perennial, 50–100 cm. Roots brownish gray or brownish red, stout. Stem erect, dark purple or yellowish brown, nearly quadrangular, branched, pilose. Petiole 0.5–1.5 cm, pilose; leaf blade broadly ovate or obovate-oblong, 5–14 × 3–7 cm, papery, both surfaces pilose and ciliate, base cuneate, apex cuneate. Bracts reflexed after anthesis, 1–2 mm, apex acuminate. Tepals of flowers light green, obovate-oblong, 2–3 mm, abaxially villous, adaxially glabrous, apex acuminate, with a mucro. Stamens 5; filaments 1–2 mm, united part only ca. 1 mm; pseudostaminodes rectangular, apex truncate. Tepals of imperfect flowers and bracts yellow, ca. 1.5 mm, base villous, apex hooked. Utricles globose, ca. 0.5 mm in diam., glabrous. Seeds

Hillsides; 1700–2300 m. Sichuan, Xizang, Yunnan [Bhutan, India, Nepal, Sikkim, Vietnam].


Herbs perennial, 50–100 cm tall. Stem erect, slightly quadrangular, much branched or strobilous. Petiole 0.5–1.5 cm, densely striose; leaf blade elliptic or narrowly elliptic, rarely ovate, 3–10 × 1.5–5.5 cm, axially long striose, base cuneate or broadly cuneate, margin entire, apex acuminate. Bracts, bracteoles and tepals densely white lanose or puberulous, 1.3–1.8 mm; style ca. 1.5 mm. Pseudostaminodes triangular. Utricles ovoid, ca. 2 mm, glabrous. Seeds reniform. Fl. Apr–Jun, fr. Aug–Sep.

Hillsides; 1100–2300 m. Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Xizang [Bhutan, India, Nepal, Sikkim, Vietnam].


Waste places; 1800–2300 m. Guizhou, Xizang [Bhutan, India, Myanmar, Nepal, Sikkim].

Further study is necessary to compare this taxon with *Cyathula capitata*, of which it may be no more than a cultivar.

About ten species: Africa, Asia; two species in China.

1a. Inflorescences gray lanose; bracts, bracteoles, and abaxial surface of tepals pilose ..................................................... 1. **Aerva glabrata**

1b. Inflorescences white or purple sericeous; bracts, bracteoles, and tepals densely white lanose or puberulous ............. 2.

**Aerva** Forsskål, Fl. Aegypt.-Arab. 170. 1775, nom. cons.


Herbs perennial, 1–2 m tall. Stem erect or slightly stoloniferous, simple or branched, gradually glabrous downward. Leaves opposite or alternate; petiole 2–10 mm, pubescent; leaf blade ovate, oblong, or lanceolate, 1–7 × 0.5–3 mm, base cuneate, both surfaces pubescent and ciliate, apex acute, with a mucro. Spikes terminal or axillary, 1–5 cm × 3–4 mm, lanose, in terminal complex thyrsoid structures. Flowers many, dense, ca. 2 mm. Bracts and bracteoles ovate, 1–1.5 mm, adaxially pilose. Tepals white, oblong, 2–2.5 mm, with a green midvein, adaxially glabrous, slightly hairy, apex acuminate. Stamens ca. 1 mm; pseudostaminodes triangular. Utricles ovate, ca. 2 mm, glabrous. Seeds black, reniform, ca. 1 mm. Fl. and fr. Apr–Oct.

Hillsides; above 2500 m. Guangdong, Guangxi, Guizhou, Yunnan [India, Myanmar].


Herbs or subshrubs. Stem erect, stoloniferous or climbing. Leaves alternate or opposite, margin entire. Flowers perfect, unisexual or dioecious, small or very small. Inflorescences spikes, terminal or axillary, simple or in complex thyrsoid structures. Bracts, bracteoles and tepals membranous, persistent or bracteoles falling off with perianth in fruit. Tepals 4 or 5, ovate, oblong, apex acuminate. Stamens 4 or 5; filaments subulate, unequal, united to short cup at base, alternating with pseudostaminodes, pseudostaminodes subulate to oblong; anthers 2-loculed. Ovary obovoid or subglobose, glabrous; style ca. 1 mm. Pseudostaminodes triangular. Utricles ovoid, 1.5–2 mm, adaxially pilose. Tepals white or pink. Pseudostaminodes ca. 0.5 mm, hairy at margin, apex fimbriate. Utricles yellow, ellipsoid or obvoid. Seeds ellipsoid, smooth. Fl. Jun–Jul, fr. Aug–Sep.

Waste places; above 1500 m. Guizhou, Hebei, Shanxi, Sichuan, Yunnan, Zhejiang [Nepal].

Further study is necessary to compare this taxon with *Cyathula capitata*, of which it may be no more than a cultivar.

林地苋属 *lin di xian shu*

Herbs or shrubs. Stem pubescent, lanose, or glabrous. Leaves opposite, petiolate. Flowers perfect, arranged in terminal or axillary heads or spikes, flower solitary in axil of a bract, subtended by 2 bracteoles. Tepals 5, erect, membranous, becoming rigid or not after anthesis. Stamens 5; filaments unequal, united to a short cup at base, pseudostaminodes absent or very small; anthers 2-located. Ovary ellipsoid or globose; ovule 1, pendulous; style slender; stigma capitate or 2-lobed. Utricles enclosed in perianth, ellipsoid, indehiscent. Seed erect, lenticular, smooth.

About 14 species: Africa, SE Asia; three species (one endemic) in China.

1a. Subshrubs, 70–100 cm tall ................................................................. 3. *P. yunnanense*
1b. Herbs, to 60 cm tall.

2a. Leaves lanceolate, elliptic, or obovate ........................................... 1. *P. ferrugineum*
2b. Leaves linear .................................................................................. 2. *P. erythrostachyum*


林地苋 *lin di xian*

Herbs annual, 5–60 cm tall. Stem branched from base, often tinged purple, with long internode, in leaf axils and young nodes often hairy. Petiole 3–12 mm; leaf blade lanceolate, elliptic, or obovate, 1.5–7.5 × 0.5–1.5 cm, glabrous, base acuminate, apex acute. Spikes terminal or axillary, often solitary, rarely paired; sessile or with thin rachis, 1–3 cm. Bracts ovate-lanceolate, ca. 1.5 mm; bracteoles ovate-triangular, ca. 0.5 mm, falling off with tepals and fruit. Flowers ca. 1 mm in diam. Tepals lanceolate, 2–2.5 mm, glabrous, with 3–5 strong veins abaxially, becoming rigid or not after anthesis. Stamens 0.5–0.75 mm. Styles persistent, ca. 0.5 mm. Utricles ellipsoid, 1–1.5 mm, compressed, transparent below. Seed black or blackish brown, shiny, ca. 1 mm. Fl. and fr. Jun–Aug.

Humid places, hillsides; 1000–2000 m. Hainan, Yunnan [Cambodia, India, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam; ?Africa].

*Psilotrichum ferrugineum var. hainanense* H. S. Kiu (Guihaia 13: 107. 1993) was described from Hainan, but we have seen no specimens and are therefore unable to treat it in this account. Further revisionary study is necessary.

1a. Leaves glabrous; petiole without wings;

- utricles ellipsoid ......................................... 1a. var. *ferrugineum*
1b. Leaves pubescent on both surfaces;

- petiole narrowly winged and pubescent;

- utricles ovoid ......................................... 1b. var. *ximengense*

1a. **Psilotrichum ferrugineum** var. *ferrugineum*

林地苋 (原变种) *lin di xian (yuan bian zhong)*

*Achyranthes ferruginea* Roxburgh, Fl. Ind. 2: 502. 1824; *Psilotrichum trichotomum* Blume.


西盟林地苋 *xi meng lin di xian*

Petiole narrowly winged, pubescent; leaf blade membranous, both surfaces pubescent and ciliate. Utricles ovoid.

- Hillsides; ca. 1200 m. Yunnan (Ximeng).

One of us (Clemants) questions whether this is the same as *Psilotrichum yunnanense*. Wu Zhengyi (editor's note) concurs.


苋叶林地苋 *xian ye lin di xian*

Herbs annual, 15–30 cm tall. Stems branched; branches slender, glabrous. Leaves linear, 1–6 cm × 1–2 mm, with conspicuous midvein, glabrous. Inflorescences spicate, ca. 4 cm; peduncle long, ca. 10 cm. Bracts ovate, 1.5–2 mm, glabrous, apex acuminate; bracteoles ovate, ca. 0.8 mm, scarious. Tepals linear, 3–3.5 mm, glabrous, 5-veined. Styles persistent, 1.5–2 mm. Utricles ovoid, ca. 1.2 mm, irregularly circumsiccile.

Hillsides, Hainan [Cambodia, Thailand, Vietnam].


云南林地苋 *yun nan lin di xian*

Subshrubs 70–100 cm high. Stems terete, usually densely pubescent or glabrous. Petiole 3–6 mm; leaf blade ovate-oblong or ovate-lanceolate, 3–5 × 1.5–2 cm, subleathery when dry, base cuneate, apex acute or subrounded. Inflorescence axillary or terminal spikes, 6–16 mm; peduncle minutely puberulent; bracts lanceolate. Tepals 4, yellowish green, lanceolate, puberulent, margin ciliate, apex acute. Stamens 5 or 6, ca. 2.5 mm. Styles glabrous. Utricle compressed lenticulate, ca. 1 × 0.8 mm. Seeds purple, orbicular, reniform. Fl. Jul.

- Near streams, in forests; 900–2200 m. Yunnan.


青花苋属 *qing hua xian shu*

1b. Leaves obovate, elliptic, or oblong; pseudostaminodes ciliate or serrulate at apex. Utricles ovoid, 2.5–3 mm. Seeds brown, 2.5–3.5 mm; pseudostaminodes truncate or crenate at apex, entire. Tepals lanceolate, 3.5–5 mm, with a vein. Stamens ca. 1 mm, rigid, base 2-winged; wings 1.5–2 mm, membranous, both surfaces strigose, base cuneate, apex obtuse and rounded, with a mucro. Spikes terminal, 0.8–2 cm, later arranged into short complex thyrsoid structures. Flowers small. Tepals 5, yellow, oblong, 2–2.5 mm, glabrous, with some veins extending to mucros. Stamens ca. 1 mm; filaments united to membranous cup below; pseudostaminodes triangular, very small. Ovary subglobose. Utricles compressed, 1 mm. Seeds dark purple, reniform. Fl. and fr. Jul.

- Hillsides, riverbanks. Hainan.

Psilotrichopsis curtisii var. curtisii occurs in Malaysia.


牛膝属  


Herbs or subshrubs. Stem with conspicuous nodes; branches opposite. Leaves opposite, petiolate. Flowers reflexed or spreading, perfect, with 3 bracts; midvein of bracteoles spiny, long, excurrent. Tepals 4 or 5, membranous, apex awn-pointed, rigid in fruit. Stamens 5, rarely 4 or 2, shorter than perianth; filaments connate into a short cup at base, pseudostaminodes fringed; anthers 2-lobe. Ovary oblong; style linear, persistent; stigma capitate. Utricles ovoid-oblong, ovoid, or subglobose, falling off with tepals and bracteoles. Seed oblong, lenticular.

About 15 species: tropical and subtropical regions; three species in China.

The two species Achyranthes aspera and A. bidentata are highly variable. Further study might show A. longifolia to be merely a variant of A. bidentata.

Achyranthes megaphylla Y. H. Li (Guiahaia 9: 26. 1989, not Standley, 1917) was described from Yunnan and A. ogatae Yamamoto (Icon. Pl. Formosan., Suppl. 3: 23. 1927) was described from Taiwan. We have seen no specimens of either taxon and are therefore unable to treat them in this account. Further revisionary study is necessary.

1a. Leaves lanceolate or broadly lanceolate; pseudostaminodes inconspicuously dentate at apex ........................................ 3. A. longifolia  
1b. Leaves obovate, elliptic, or oblong; pseudostaminodes ciliate or serrulate at apex.

2a. Leaves obovate, broadly obovate, or elliptic-oblong, apex obtuse with a mucro; bracteoles spiny, 2-winged at base; pseudostaminode long fimbriate and ciliate at apex ................................................................. 1. A. aspera  
2b. Leaves elliptic or elliptic-lanceolate, apex ciliate; bracteoles spiny, 2-parted at base; pseudostaminode serrulate at apex .............................................................................................................. 2. A. bidentata


土牛膝  

Herbs perennial, 20–120 cm tall. Stem quadrangular, pubescent; nodes slightly inflated; branches opposite. Petiole 0.5–1.5 cm, somewhat hairy; leaf blade broadly obovate or elliptic-oblong, 1.5–7 × 0.4–4 mm, papery, both surfaces hairy, base cuneate or rounded, margin entire or undulate, apex obtuse, with a mucro. Spikes terminal, erect, reflexed after anthesis, 10–30 cm; rachis angular, stout, densely hairy. Bracts lanceolate, 3–4 mm, apex acuminate; bracteoles spiny, shiny, 2.5–4.5 mm, rigid, base 2-winged; wings 1.5–2 mm, membranous, margin entire. Tepals lanceolate, 3.5–5 mm, with a vein. Stamens 2.5–3.5 mm; pseudostaminodes truncate or crenate at apex, fimbriate and ciliate. Utricles ovoid, 2.5–3 mm. Seeds brown, ovoid, ca. 2 mm. Fl. Jun.–Aug., fr. Oct. 2n = 42, 48, 84, 96.

Hillsides, waste places, roadsides, riverbanks; 800–2300 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan. Thailand, Vietnam, Africa, SW Asia, Europe.

1a. Leaves abaxially silvery sericeous .......... 1d. var. argentea  
1b. Leaves pubescent or subglabrous.

2a. Leaves apically acute, brownish red when dried ........................................ 1c. var. rubrofusca  
2b. Leaves apically obtuse or mucronate, not brownish red when dried.

3a. Stem pubescent; leaves broadly obovate or elliptic-oblong, basally cuneate or rounded ............. 1a. var. aspera  
3b. Stem densely white or yellow villous; leaves obovate, basally broadly cuneate ..................... 1b. var. indica

1a. Achyranthes aspera var. aspera

土牛膝(原变种)  

Stem quadrangular, pubescent. Leaves broadly obovate or elliptic-oblong, densely pubescent or subglabrous, base cuneate or rounded, margin slightly undulate, apex obtuse or mucronate. 

Hillsides, waste places; 800–2300 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Thailand, Vietnam, Africa, SW Asia, Europe.

AMARANTHACEAE
Zhejiang [Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sikkim, Thailand, Vietnam].


钝叶土牛膝  dun ye tu niu xi

Achyranthes obtusifolia Lamarck.

Stem densely white or yellow villous. Leaves obovate, 1.5–6.5 × 2–4 cm, densely hairy, base cuneate, margin undulate, apex obtuse, often with a mucro.

Roadsides, riverbanks. Guangdong, Sichuan, Taiwan, Yunnan [India, Sri Lanka].


禾叶土牛膝  he ye tu niu xi


Leaves brownish red when dried, elliptic-ovate, 2–9 × 1–4 cm, both surfaces hairy, densely so abaxially, base cuneate, margin slightly undulate, apex acute.

Roadsides. Fujian, Hunan, Taiwan, Yunnan [India].


银毛土牛膝  yin mao tu niu xi

Achyranthes argentea Thwaites, Enum. 249. 1861, not Lamarck (1785).

Stem quadrangular, pilose or glabrescent. Leaves green, broadly obovate or elliptic-oblong, abaxially silvery sericeous, apex acute.

Hillsides. Sichuan [India; Africa, SW Asia, Europe].


牛膝  niu xi

Herbs perennial. Stem green or tinged purple, angulate or quadrangular; branches opposite. Petioles hairy; leaf blade lanceolate or broadly lanceolate, rarely oblanceolate, 4.5–12 × 2–7.5 cm, both surfaces annexed or spreading pubescent, base cuneate or broadly cuneate, caudate. Spikes terminal or axillary, 3–5 cm; rachis 1–2 cm, white hairy. Flowers dense. Bracteoles reflexed after anthesis, white, 2–3 mm, apex acuminate; bracteoles 2.5–3 mm, spiny, base 2-parted, apex curved. Tepals shiny, lanceolate, 3–5 mm, with a midvein, apex acute. Stamens 2–2.5 mm; pseudostaminodes slightly serrulate, apex rounded. Utricles yellowish brown, shiny, oblong, 2–2.5 mm, smooth. Seeds light brown, oblong, ca. 1 mm. Fl. Jul–Sep, fr. Sep–Oct. 2n = 42, 84*.

Hillsides; 200–1800 m. Anhui, Fujian, Hebei, Hunan, Guangxi, Guizhou, Hubei, Jiangsu, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Zhejiang [Bhutan, India, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Russia, Sikkim, Thailand, Vietnam].

1a. Plants sparsely hairy; flowers sparse in long spikes; tepals 3-veined .......................... 2b. var. japonica
1b. Plants hairy or subglabrous; flowers dense in spikes; tepals with a midvein ................ 2a. var. bidentata

2a. Achyranthes bidentata var. bidentata (原变种) niu xi (yuan bian zhong)

Plants hairy or subglabrous. Leaves elliptic or elliptic-lanceolate. Spikes terminal or axillary, densely flowered. Tepals with a midvein.

Hillsides; 200–1800 m. Fujian, Hebei, Guangxi, Guizhou, Hubei, Jiangsu, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Zhejiang [Bhutan, India, Indonesia, Korea, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Russia, Sikkim, Thailand, Vietnam].


少毛牛膝 shao mao niu xi

Achyranthes japonica (Miquel) Nakai.

Spikes longer; flowers laxly arranged; spines of bracts shorter than perianth. Tepals 3-veined. Pseudostaminodes irregularly dentate or slightly 2-lobed, apex truncate.

Anhui, Hunan, Taiwan, Zhejiang [Japan].


柳叶牛膝 liu ye niu xi


Herbs perennial. Stem green or tinged purple, angulate or quadrangular; branches opposite. Petioles hairy; leaf blade lanceolate or broadly lanceolate, 10–20 × 2–5 cm, apex caudate. Spikes terminal or axillary; rachis white hairy. Flowers dense. Bracteoles reflexed after anthesis, acerose, ca. 3.5 mm, ciliate. Tepals shiny, lanceolate, with a midvein, apex acute. Pseudostaminodes indistinctly dentate at apex. Utricles yellowish brown, shiny, oblong, smooth. Seeds light brown, oblong.

Hillsides; below 1200 m. Guangdong, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Laos, Thailand, Vietnam].

This species is similar to Achyranthes bidentata, but differs in having leaves lanceolate or broadly so, 10–20 × 2–5 cm, caudate at the apex; bracteoles acerose, ca. 3.5 mm, ciliate at the margin; and pseudostaminodes indistinctly dentate at the apex.


针叶苋属 zhen ye xian shu

AMARANTHACEAE

Herbs perennial. Leaves and branches opposite, rarely whorled. Flowers hermaphroditic, with 1 bract and 2 bracteoles, axillary or clustered into spikes. Bracts and bracteoles small, membranous. Tepals 4, persistent, lanceolate, subulate. Stamens 4 or 5, united at base; pseudostaminodes triangular or nearly quadrangular (subulate), alternate with stamens. Styles very short; stigma very short, 2-parted. Utricles dehiscent by lid. Seeds ovoid.

One species: SE Asia.


针叶苋 zhen ye xian

Illecebrum monsoniae Linnaeus f., Suppl. Pl. 161. 1782; Achyranthes monsoniae (Linnaeus f.) Persoon; A. setacea Roth; Aerva monsoniae (Linnaeus f.) C. Martius; Celosia monsoniae (Linnaeus f.) Retzius; Trichurus monsoniae (Linnaeus f.) C. C. Townsend.

Herbs perennial, 5–50 cm tall. Stem branched from base; branches ascending or stoloniferous, white lanose. Leaves opposite or nearly whorled, sessile, grayish green, subulate, linear, 1–2.5 cm × ca. 1 mm, abaxially white lanose, adaxially glabrous, base attenuate, sometimes vaginate. Spikes terminal, narrowly ovate or terete, 0.5–2.5 cm, 3–5 mm in diam., white lanose; rachis very short or absent. Bracts and bracteoles lanceolate, 1–2 mm, abaxially white lanose. Tepals 4, light red, subulate-lanceolate, ca. 2 mm, white lanose. Stamens 4 or 5, shorter than perianth; pseudostaminodes subulate, membranous. Utricles ovoid, 1.5–2 mm, circumscissile at apex. Seeds brown, slightly shiny, ovoid, 1–1.5 mm, smooth. Fl. Apr–Aug, fr. Aug–Nov.

In sand at seashores; sea level. Hainan [India, Myanmar, Sri Lanka, Thailand, Vietnam].


血苋属 xue xian shu

Herbs erect or climbing subshrubs. Leaves opposite, margin entire or serrate. Flowers perfect or unisexual on different plants, very small, solitary or clustered in spikes and again arranged into complex thyrsoid structures. Bracts and bracteoles often shiny, membranous. Tepals 5, membranous, long hairy or nearly glabrous, base not rigid. Stamens 5; pseudostaminodes very small or absent in female flowers. Ovary compressed; style very short or absent; stigmas 2, rarely 3, subulate; ovule 1, pendulous. Utricles globose, compressed, indehiscent. Seeds shiny, lenticular or reniform.

About 70 species: tropical Asia, North and South America, Pacific Islands; one species (introduced) in China.


血苋 xue xian

Herbs perennial, 1–2 m tall. Stem often tinged red, stout, branched. Petiole 2–3 cm, annexed hairy or nearly glabrous; leaf blade purple with lighter bands along main veins, broadly ovate to suborbicular, 2–6 cm in diam., annexed hairy, base truncate, margin entire, apex retuse or 2-lobed. Complex thyroid structures terminal or axillary, composed of many spikes. Bracts and bracteoles persistent, greenish white or yellowish white, ovate, 1–1.5 mm, glabrous. Flowers small, unisexual on different plants. Tepals greenish white or yellowish white, oblong, ca. 1 mm. Ovary globose, compressed; style very short.

Widely cultivated. Guangdong, Guangxi, Hainan, Jiangsu, Shanghai, Yunnan [native to South America (Brazil)].

12. **ALTERNANTHERA** Forsskål, Fl. Aegypt.-Arab. 28. 1775.

莲子草属 lian zi cao shu

Herbs annual or perennial, ascending or creeping; stem much branched. Leaves opposite, margin entire. Flowers perfect, in sessile or pedunculed heads, solitary in axils of bracts. Bracts and bracteoles persistent, membranous. Stamens 2–5; filaments connate into a tube or a cup at base; anthers 1-loculed; pseudostaminodes entire, dentate, or laciniate. Ovary globose or ovoid; ovule 1, pendulous; style short or long; stigma capitate. Utricles globose or ovoid, indehiscent, falling off with perianth. Seeds lenticular, vertical.

About 200 species: mainly in North and South America, widely naturalized elsewhere; five species (four introduced) in China.

**Alternanthera purpurea** Y. T. Chang & M. J. Lai (Landscape Architecture [Taipei] [1] (4): 125. 1990, not Pynaert, 1879) was described from Taiwan. We have seen no specimens of this taxon and are therefore unable to treat it in this account. Further revisionary study is necessary.

1a. Heads with a peduncle, axillary .......................................................... 5. **A. philoxeroides**

1b. Heads all sessile, axillary, rarely terminal.

2a. Tepals abaxially glabrous.

3a. Stamens 3; midvein of tepals not spiny at apex .............................................. 1. **A. sessilis**

3b. Stamens 5; midvein of tepals becoming spiny at apex .............................................. 2. **A. pungens**

2b. Tepals abaxially hairy.
AMARANTHACEAE

4a. Stem ascending or erect; pseudostaminodes ca. as long as stamens .................................................. 3. A. bettzickiana
4b. Stem prostrate; staminodes ca. 1/2 as long as stamens .......................................................................... 4. A. paronychioides


莲子草 lian zi cao


Herbs perennial, 10–45 cm tall. Stem ascending or creeping, green or somewhat tinged purple, striped, hairy, across nodes with a transverse row of hairs. Petiole 1–4 mm, glabrous or pilose; leaf blade linear-lanceolate, oblong-ovate, or ovate-oblong, 1–8 × 0.2–2 cm, glabrous or pilose, base attenuate, margin entire or slightly serrate, apex acute or obtuse. Heads 1–4, axillary, sessile, at first globose, later cylindric, 3–6 mm in diam. Flowers dense; rachis densely white hairy. Bracts and bracteoles white, glabrous, apex acuminate; bracts ovate-lanceolate, ca. 1 mm; bracteoles subulate, 1–1.5 mm. Tepals white, ovate, 2–3 mm, glabrous, with a vein, apex acuminate or acute. Stamens 3; filaments ca. 0.7 mm, connate into a cup at base; anthers oblong; pseudostaminodes subulate, shorter than stamens, margin entire, apex acuminate. Style very short; stigma shortly parted. Utricles enclosed in perianth, dark brown, obvoid, 2–2.5 mm. Seeds ovoid. Fl. May–Jul, fr. Jul–Sep. 2n = 34, 40.

Roadsides, gardens, swamps. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang, Yunnan [Brutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sikkim, Thailand, Vietnam].


刺花莲子草 ci hua lian zi cao

Achyranthes repens Linnaeus; Alternanthera repens (Linnaeus) Link.

Herbs annual. Stem diffuse, creeping, much branched, 20–30 cm tall, densely rigidly hairy. Petiole 3–10 mm, glabrous or hairy; leaf blade ovate, obovate, or elliptic-ovobate, 1.5–4.5 × 0.5–1.5 cm, unequal in each pair, glabrous or annexed pilose, base acuminate, apex obtuse. Heads sessile, 1–3, axillary, white, globose or oblong, 5–10 mm. Bracts lanceolate, ca. 4 mm, spiny at apex; bracteoles lanceolate, 3–4 mm, apex acuminate, without spines. Tepals unequal, outer 2 lanceolate, ca. 5 mm, 3-veined below, rigid after anthesis, midvein stretching into spines; central segment elliptic, 3–3.5 mm, compressed; inner 2 small, enclosing ovary. Stamens 5; filaments 0.5–0.8 mm; pseudostaminodes shorter than filaments, entire or irregularly dentate. Style very short. Utricles brown, broadly elliptoid, 1–1.5 mm. Fl. May, fr. Jul.

Roadsides. Fujian, Sichuan [native to South America; naturalized in Bhutan, Myanmar, Thailand, ?other parts of Indo-China, Australia, and United States].

One of us (Clemants) notes that the name Alternanthera pungens has been misapplied here and that this taxon should instead be treated as A. coracasana Humboldt et al.


锦绣苋 jin xiu xian


Herbs perennial, 20–50 cm tall. Stem erect or creeping, much branched, apical part quadrangular, basal part cylindric, hairy at apex and nodes. Petiole 1–4 mm, slightly hairy; leaf blade green or red, or tinged red or yellow, oblong, oblong-ovate, or spatulate, 1–6 × 0.5–2 mm, hairy when young, glabrescent, base acuminate, margin undulate, apex acute or obtuse, with a mucro. Heads 2–5, terminal or axillary, 5–10 mm, sessile. Bracts and bracteoles ovate-lanceolate, 1.5–3 mm, abaxially glabrous or long hairy, apex acuminate. Tepals white, ovate-ovoblong; outer segments 3–4 mm, densely hairy; middle segment shorter, pilose or glabrous; inner segment short, narrow, pilose or glabrous. Stamens 5; filaments 1–2 mm; anthers linear; pseudostaminodes fasciated, 3–5-parted at apex. Ovary glabrous; style ca. 0.5 mm. Fruit undeveloped. Fl. Aug–Sep.

Cultivated in nearly all the large cities of China [native to South America; cultivated throughout SE Asia].

One of us (Clemants) indicates that this is best treated as Alternanthera ficoidea var. bettzickiana.


华莲子草 hua lian zi cao


Herbs perennial. Stem densely barbellate hairy, glabrescent. Leaf blade oblong-lanceolate, 1.5–2 × 0.3–0.5 cm, abaxially barbellate hairy, apex obtuse to rounded. Heads sessile, ovoid to globose, often hairy at base. Tepals white, oblong-oblong, scarious, hairy along veins, outer 3 segments: 3-veined in proximal half, inner 2 somewhat laterally compressed, 1-veined, apex acute to mucronate. Stamens 5; anthers yellow, ellipsoid; staminodes 3- or 4-toothed, ca. 1/2 as long as stamens; stigma capitulate. Utricle brown, obcordate.

Guangdong, Hainan, Taiwan [native to tropical America].


喜旱莲子草 xi han lian zi cao


Herbs perennial. Stem ascending from a creeping base, 55–120 cm, branched; young stem and leaf axil white hairy; old ones glabrous. Petiole 3–10 mm, glabrous or slightly hairy; leaf
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blade oblong, oblong-ovate, or ovate-lanceolate, 2.5–5 × 0.7–2 cm, glabrous or ciliate, adaxially muricate, base attenuate, margin entire, apex acute or obtuse, with a mucro. Heads with a peduncle, solitary at leaf axil, globose, 0.8–1.5 cm in diam. Bracts and bracteoles white, 1-veined, apiculate; bracts ovate, 2–2.5 mm; bracteoles lanceolate, ca. 2 mm. Tepals white, shiny, oblong, 5–6 mm, glabrous, apex acute. Filaments 2.5–3 mm, connate into a cup at base; pseudostaminodes oblong-linear, ca. as long as stamens. Ovary obovoid, compressed, with short stalk. Fruit not known. Fl. May–Oct. 2n = 100*.

Cultivated, waste places. Beijing, Fujian, Guanxi, Hebei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang [native to South America (Brazil)].


千日红属 qian ri hong shu

Herbs or subshrubs. Leaves opposite, rarely alternate. Flowers perfect, clustered in heads. Bracteoles with distal crest. Tepals 5, equal or not, long hairy or glabrous. Stamens 5; filaments united into a tube or cup at base, lateral appendages present, 3-parted at apex, pseudostaminodes absent; anthers 1-loculed. Ovary 1-loculed, with a pendulous ovule; stigmas 2 or 3, linear, or stigma 2-parted. Utricles globose or oblong, compressed, indehiscent. Seeds shiny, lenticular.

About 100 species: mainly in North and South America and Pacific Islands, naturalized elsewhere; two species (one introduced) in China.

1a. Stem gray strigose; tepals not rigid after anthesis; inflorescences purplish red, light purple, or white 1. G. globosa
1b. Stem white villous; tepals rigid after anthesis; inflorescences silvery 2. G. celosioides


千日红 qian ri hong

Herbs annual, erect, 20–60 cm tall. Stem stout, branched; branches slightly quadrangular, gray strigose, slightly inflated at nodes. Petiole 1–1.5 cm, long gray hairy; leaf blade oblong or oblong-ovate, 3.5–13 × 1.5–5 cm, papery, long white hairy and ciliate, narrowing toward base, margin undulate, apex acute or obtuse. Heads terminal, 1–3, usually purple, sometimes light purple or white, 2–2.5 cm in diam. Bracts 2, opposite, green, ovate or cordate, 1–1.5 cm, gray hairy; bracts white, purple at apex, ovate, 3–5 mm; bracteoles purple, triangular-lanceolate, much longer than bracts, 1–1.2 cm. Tepals not rigid after anthesis, lanceolate, 5–6 mm, outside densely white lanose, apex acuminate. Filaments connate into a tube, 5-parted at apex. Styles linear, shorter than tube of stamens; stigmas 2, furcate. Utricles subglobose, 2–2.5 mm in diam. Seeds brown, shiny, reniform. Fl. and fr. Jun–Sep.

Widely cultivated. Fujian, Guangxi, Guizhou, Hebei, Hubei, Shanxi, Sichuan, Xinjiang, Zhejiang [native to neotropics; cultivated and naturalized throughout tropical Asia].


银花苋 yin hua xian


Roadsides, waste places. Hainan, Taiwan [pantropical].

One of us (Clemants) questions whether this is the same as Gomphrena serrata Linnaeus.


安旱苋属 an han xian shu

Herbs creeping, glabrous or slightly tomentose. Leaves opposite, margin entire. Flowers perfect, densely clustered in heads. Heads terminal or axillary, globose or terete. Bracteoles papery; bracteoles keeled, without distal crest. Tepals 5; with short claw at base. Stamens 5; filaments subulate, connate into a cup at base, lateral appendages absent, pseudostaminodes absent; anthers 1-loculed. Ovary ovoid, compressed; style very short; stigma 2-parted; ovule 1, pendulous. Seeds shiny, lenticular.

About 15 species: W Africa, E Asia, E North and South America, Pacific Islands; one species in China.


安旱苋 an han xian

Blutaparon wrightii (J. D. Hooker) J. A. Mears.

Herbs dwarf, 2–5 cm tall. Stem caespitose, much branched, glabrous. Petiole 2–3 mm, glabrous; leaf blade obovate-spatulate, 4–8 × 2–3 mm, glabrous, base attenuate, apex obtuse.

Heads terminal, small, 5–7 mm, with a short rachis. Bracts and bracteoles ovate, 1.5–1.7 mm, with 1 or 3 veins, apex obtuse. Filaments connate into a tube at base, united part ca. as long as free part. Style persistent, slender; stigma subulate. Utricles enclosed in perianth, ovoid, compressed, membranous. Seeds brown. Fl. May–Aug.

Rocky shores; sea level. Taiwan [Japan].

巨苋藤属  ju xian teng shu

Climbers large, woody, with pendulous branches. Leaves opposite. Spikes terminal or axillary from uppermost nodes, often panicked, on pendulous peduncles; midvein of bracteoles flexible, mucronate. Tepals 5, rigid. Stamens 5; filaments shortly connate at base, alternating with pseudostaminodes, pseudostaminodes oblong, long fimbriate; anthers 2-loculed. Ovary oblong, compressed; style slender; stigma minute. Fruit oblong, 1-seeded, indehiscent.

One species: Asia.

1. **Stilbanthus scandens** J. D. Hooker, Hooker’s Icon. Pl. 13: 67. 1879.

巨苋藤  ju xian teng

Branchlets soft, sparsely tomentose. Leaves opposite; petiole 1.2–2.5 cm; leaf blade broadly elliptic, 4–7 × 2.5–4.5 cm, sparsely tomentose especially at margin, apex acuminate. Flowers perfect, large. Inflorescences terminal or axillary spikes, 3–5 cm, less branched; rachis hairy. Bracts persistent, ovate, ca. 2.6 mm, bracteoles equaling bracts, falling off with perianth in fruit. Tepals straight, ovate-lanceolate, ca. 4.5 mm, enlarging to 9 mm in fruit, hairy at apex. Stamens 5; filaments linear, hairy, shortly connate at base, alternating with oblong, fimbriate pseudostaminodes; anthers 2-loculed. Ovary oblong, compressed, ca. 4.5 × 3 mm; style ca. 3.5 mm, slender, hairy at base; stigmas minute. Utricles oblong, ca. 3.5 mm, hairy at apex. Seeds shiny.

Forest; 900–2300 m. Guangxi, Yunnan [Bhutan, India, Myanmar, Sikkim].
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