

## PORTULACACEAE

马齿苋科 ma chi xian ke

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Herbs annual or perennial, rarely ± shrubby, usually succulent, usually glabrous except for nodal hairs and/or scales. Leaves alternate or opposite; true stipules absent, nodes sometimes with axillary scales and/or hairs; petiole usually poorly defined or absent; leaf blade simple, usually fleshy, margin entire. Inflorescences usually terminal, less often axillary, in cymes or racemelike panicles, forming heads of sessile flowers surrounded by an involucre of leaves, or reduced to solitary flowers. Bracts inconspicuous. Flowers bisexual, very rarely unisexual, actinomorphic. Sepals 2, free or basally connate, herbaceous or scarious. Petals 4–6 or seldom more, distinct or basally connate, imbricate, often brightly colored, usually short lived. Disk usually absent. Stamens 4–100, free, fascicled, or adnate to petals; filaments linear; anthers 2-loculed, introrse, dehiscence longitudinal. Ovary superior or half-inferior, 1-loculed, 2–5-carpellate; ovules 1 to many, campylotropous; placentation basal or free-central. Style linear; stigma 2–9-lobed. Fruit a thin-walled capsule, circumscissile or 2- or 3-valved, rarely a nut, often globose or subglobose, smooth. Seeds many, reniform or globose, caruncle present or not; endosperm mostly copious, surrounded by embryo.

About 19 genera and 500 species: mainly in more arid regions of S hemisphere, especially Africa, South America, and Australia, fewer species in Asia, Europe, and North America; two genera (one introduced) and six species (two endemic, two introduced) in China.

Lu Dequan. 1996. Portulacaceae. In: Tang Changlin, ed., Fl. Reipubl. Popularis Sin. 26: 36–42.

- 1a. Leaf axils with hairs, bristles, and/or slender scales, sometimes short and inconspicuous; flowers sessile, solitary or clustered; capsule circumscissile; seeds without caruncle ..... 1. *Portulaca*
- 1b. Leaf axils naked; flowers pedicellate, usually arranged in thyrse or panicle; capsule 3-valved; seeds with caruncle ..... 2. *Talinum*

### 1. PORTULACA Linnaeus, Sp. Pl. 1: 445. 1753.

马齿苋属 ma chi xian shu

Herbs annual or perennial. Stems prostrate or decumbent; nodes or leaf axils with scales, bristles, and/or hairs, sometimes short and inconspicuous. Leaves alternate or opposite, usually sessile, flat or terete. Inflorescence a terminal head of sessile, solitary or clustered flowers, subtended by an involucre of leaves. Sepals connate at base into tube, persistent but inconspicuous. Petals 4 or 5(–8+), free or shortly connate at base. Stamens 4–100, adnate to base of petals. Ovary half-inferior. Stigma 2–9-lobed. Capsule circumscissile, sessile, globose or nearly so. Seeds mostly glossy black or iridescent gray, less often brown, orbicular-reniform, minute, often tuberculate, without caruncle.

About 150 species: more arid tropical and subtropical regions, particularly Africa and South America, a few species extending into temperate regions; five species (two endemic, one introduced) in China.

*Portulaca grandiflora* Hooker, a native of South America, is cultivated in China as a popular garden flower. Outside the Flora area it is known to escape from cultivation. It is easily recognized by the terete leaves and large flowers, 2.5–4 cm wide, which often have more than five petals that can be red, purple, yellow, or white.

- 1a. Leaves opposite; stems readily disarticulating at nodes; petals 4 ..... 5. *P. quadrifida*
- 1b. Leaves alternate; stems not disarticulating; petals 5 or more.
  - 2a. Leaves terete-subulate; flowers more than 2 cm in diam. .... 1. *P. pilosa*
  - 2b. Leaves flat; flowers less than 1 cm in diam.
    - 3a. Leaf axils with a few inconspicuous stiff bristles; leaves 10–30 mm; flowers often in clusters of 3 or more; mature seeds glossy black, never iridescent ..... 2. *P. oleracea*
    - 3b. Leaf axils conspicuously hairy; leaves 3–10 mm; flowers mostly solitary, rarely as many as 3 together; mature seeds often ± iridescent.
      - 4a. Petals red; stigma 3-lobed; stamens 10 ..... 3. *P. insularis*
      - 4b. Petals yellow; stigma 5-lobed; stamens 25–30 ..... 4. *P. psammotrophia*

#### 1. *Portulaca pilosa* Linnaeus, Sp. Pl. 1: 445. 1753.

毛马齿苋 mao ma chi xian

Herbs annual or perennial, 5–20 cm. Stems not articulated, densely caespitose, diffuse, much branched; leaf axils densely pilose. Leaves alternate; petiole absent; leaf blade terete-linear

or subulate-lanceolate, 10–20 × 1–4 mm, apex acute. Flowers more than ca. 2 cm in diam., surrounded by involucre of 6–9 bracts and dense wool. Sepals oblong, apex acute or acuminate. Petals 5, red-purple, broadly obovate, connate at base, apex obtuse or slightly retuse. Stamens 20–30; filaments red, free. Style short; stigma 3–6-lobed. Capsule glossy straw colored

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apically, cylindrical-ovoid, ca.  $3 \times 2.5$  mm. Seeds black, with very slight purplish iridescence when mature, 0.5–0.7 mm; testa cells interlocking, domed to conic-tuberculate. Fl. and fr. May–Aug.

Dry open places near seashores. Fujian, Guangdong, Guangxi, Hainan (including Xisha Qundao), Taiwan, S Yunnan [Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam; Africa, America].

This name has been very widely misapplied, and much material so named belongs elsewhere. *Portulaca pilosa* was described from South American material but it is now a widespread weed of warm regions. Geesink (Blumea 17: 294. 1969) included virtually all species of *Portulaca* with linear to elliptic leaves within *P. pilosa*, dividing these among eight subspecies. We believe that Geesink's treatment was too inclusive and that the complex as defined by him includes a number of distinct species in our area, such as *P. insularis* and *P. psammotropa*. The exact identity of the Chinese material needs further investigation, particularly with respect to living populations.

The plants are used for medicinal purposes.

**2. *Portulaca oleracea*** Linnaeus, Sp. Pl. 1: 445. 1753.

马齿苋 ma chi xian

Herbs annual. Stems sometimes flushed red or purple, not articulated, prostrate or decumbent, less often  $\pm$  erect, diffuse, much branched; leaf axils with a few inconspicuous stiff bristles. Leaves alternate or occasionally subopposite; petiole short; leaf blade flat, obovate, 10–30  $\times$  5–15 mm, base cuneate, apex obtuse, rounded, truncate, or retuse. Flowers in clusters of 3–5, 0.4–0.5 cm in diam., surrounded by involucre of 2–6 bracts. Sepals green, helmeted, ca. 4 mm, apex acute, keeled. Petals 5, yellow, obovate, 3–5 mm, slightly connate at base, apex retuse. Stamens 7–12, ca. 12 mm; anthers yellow. Ovary glabrous. Stigma 4–6-lobed. Capsule ovoid, ca. 5 mm. Seeds glossy black when mature, never iridescent, obliquely globose-reniform, 0.6–1.2 mm; testa cells stellate, usually with central peglike tubercle, sometimes without and then surface  $\pm$  granular. Fl. May–Aug, fr. Jun–Sep.

Cultivation, disturbed urban sites. Throughout China [tropical and temperate regions worldwide].

Danin et al. (Israel J. Bot. 27: 177–211. 1978) recognized a series of eight subspecies, but they are rather poorly correlated with geography and their status needs re-evaluation. The Chinese material seems to belong to the most common and weedy form placed in subsp. *oleracea*. There has been some selection of more robust forms for use as a vegetable; these are sometimes placed in subsp. *sativa* (Haworth) Čelakovský.

The plants, which are common weeds of cultivation, are eaten as a vegetable and used for medicinal purposes.

**3. *Portulaca insularis*** Hosokawa, Trans. Nat. Hist. Soc. Formos. 22: 229. 1932.

小琉球马齿苋 xiao liu qiu ma chi xian

Herbs. Stems not articulated, ascending, diffuse, much branched, glabrous; leaf axils pilose. Leaves alternate; petiole very short, poorly defined; leaf blade obovate-orbicular or

elliptic-obovate, 3–7  $\times$  1–3 mm, base attenuate, apex obtuse. Flowers solitary, sometimes axillary, densely pilose at base. Sepals oblong-deltate, ca. 3 mm, membranous. Petals 5, red, subcuneate-oblong, ca. 4 mm, apex  $\pm$  retuse. Stamens 10. Stigma 3-lobed. Capsule subglobose, ca. 2.5 mm. Seeds minute.

- S Taiwan (Liuqiu Yu).

This species was treated as a synonym of *Portulaca pilosa* in Fl. Taiwan, ed. 2; however, in our view it is a good species.

**4. *Portulaca psammotropa*** Hance, Ann. Bot. Syst. 2: 660. 1851.

沙生马齿苋 sha sheng ma chi xian

*Portulaca hainanensis* Chun & How.

Herbs perennial, 5–10 cm. Roots fleshy, 4–8 mm thick. Stems not articulated, diffuse, branched basally, 1–1.5 mm thick; leaf axils villous. Leaves alternate; petiole short; leaf blade flat, obovate or linear-spatulate, 5–10  $\times$  2–4 mm, base attenuate, apex obtuse. Flowers solitary, surrounded by involucre of 4–6 bracts. Sepals ovate-deltate, ca. 2.5 mm, veined. Petals 5, yellow or yellowish, elliptic, ca. 2.5 mm. Stamens 25–30. Ovary ovoid. Stigma 5-lobed. Capsule glossy straw colored apically, broadly ovate, compressed, 2.5–4  $\times$  2.5–3 mm. Seeds black, turning iridescent gray when fully mature, orbicular-reniform, ca. 0.7 mm; testa cells interlocking, slightly raised. Fl. and fr. summer.

- Seashores, coral sands, on rocks. Guangdong (Dongsha Dao), Hainan (Yaxian), Taiwan.

**5. *Portulaca quadrifida*** Linnaeus, Syst. Nat., ed. 12, 2: 328. 1767; Mant. Pl. 1: 73. 1767.

四瓣马齿苋 si ban ma chi xian

*Portulaca formosana* (Hayata) Hayata; *P. quadrifida* var. *formosana* Hayata.

Herbs annual. Stems articulated, prostrate, rooting at nodes; leaf axils patent pilose. Leaves opposite; petiole absent; leaf blade flat, ovate, obovate, or ovate-elliptic, 4–8  $\times$  2–5 mm, slightly narrowed toward base, apex obtuse or acute. Flowers solitary, surrounded by involucre of 4 or 5 bracts, white pilose. Sepals obovate-oblong, 2.5–3 mm, membranous, veined. Petals 4, yellow, oblong or broadly elliptic, 3–6 mm, connate at base, apex mucronate. Stamens 8–10. Ovary ovoid. Stigma (3- or)4-lobed. Capsule globose, ca. 2.5 mm, pericarp membranous. Seeds gray, subglobose, laterally compressed, minute, mucic. Fl. and fr. year-round.

Open disturbed grounds, sandy soils. Guangdong, Hainan (including Xisha Qundao), Taiwan, S Yunnan [probably native to Africa, now pantropical].

The plants are used for medicinal purposes. They are sometimes a troublesome weed of cultivation, as they break up very easily and small fragments can act as propagules.

**2. *TALINUM*** Adanson, Fam. Pl. 2: 245, 609. 1763, nom. cons.

土人参属 tu ren shen shu

Herbs annual or perennial, or subshrubs, often with thick roots. Stems erect, glabrous; axils naked. Leaves alternate or partly

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opposite, sessile or shortly petiolate, flat. Inflorescence terminal or rarely axillary, a thyrse or panicle, very rarely flowers solitary. Sepals free or shortly connate at base, caducous. Petals 5(–10), free. Stamens 5–30, usually adnate to base of petals. Ovary superior. Stigma (2- or)3-lobed. Capsule 3-valved, often recurved, globose, ovoid, or ellipsoid. Seeds glossy black-brown or black, subglobose or oblate, orbicular-reniform, tuberculate or ribbed, with pale caruncle.

About 50 species: mainly in warm regions of the Americas, a few species native to Africa and Arabia, mostly introduced in Asia; one species (introduced) in China.

**1. *Talinum paniculatum*** (Jacquin) Gaertner, Fruct. Sem. Pl. 2: 219. 1791.

土人參 tu ren shen

*Portulaca paniculata* Jacquin, Enum. Pl. Carib. 22. 1760; *P. patens* Linnaeus; *Talinum patens* (Linnaeus) Willdenow.

Herbs annual or perennial, 30–100 cm. Root few branched, obconic, thick, epidermis black-brown, flesh milky white. Stems branched basally, semiwoody. Leaf blade obovate or obovate-lanceolate, 5–10 × 2.5–5 cm, base narrowly cuneate, apex acute, sometimes retuse, mucronate. Panicle terminal or axillary, large, often dichotomous, long peduncled; bracts lanceolate, ca. 1 mm, membranous, apex acute. Pedicel 5–10 mm.

Flowers small, 6–10 mm wide. Sepals purple-red, ovate, caducous. Petals pink or reddish purple, obovate or elliptic, 6–12 mm, apex rounded, rarely retuse. Stamens (10–)15–20, shorter than petals. Ovary ovoid, ca. 2 mm. Style ca. 2 mm; stigma 3-lobed. Capsule subglobose, ca. 4 mm, papery. Seeds oblate, ca. 1 mm. Fl. Jun–Aug.

Cultivated, escaping to shaded wet places. C and S China [native to tropical America; cultivated and naturalized throughout SE Asia].

Records of *Talinum crassifolium* Willdenow and *T. triangulare* Willdenow in Chinese literature are based on misidentifications of this species.

The plants are used medicinally.

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