

AIZOACEAE

番杏科 fan xing ke

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Herbs, annual or perennial, subshrubs, or shrubs, succulent. Stems erect or prostrate. Leaves simple, rarely pinnate, mostly opposite, sometimes alternate, in many species fleshy, margin entire, rarely with teeth; true stipules absent, sometimes a stipule-like sheath present at base of petiole. Inflorescences terminal or seemingly axillary cymes, or solitary flowers. Flowers bisexual, rarely unisexual, actinomorphic, perigynous or epigynous. Nectaries separate or in a ring around ovary. Tepals (4 or)5(-8), connate below into a tube. Petals absent or present. Stamens 3 to many, free or connate at base, outermost often as filamentous staminodes; anthers dehiscent by longitudinal slits. Ovary inferior, syncarpous; carpels 2 to many; ovules 1 to many, on long funicles, mostly campylotropous; placentation axile or parietal, sometimes basal-parietal. Stigmas as many as carpels. Fruit a hygroscopic or circumscissile capsule, more rarely a berry or nut. Seeds with slender embryo curved around perisperm, rarely with an aril; endosperm scanty or absent.

About 135 genera and 1800 species: mainly in arid, subtropical regions, most species in S Africa, some in Australia and W parts of the Americas, some pantropical; three genera and three species in China.

The family is divided into five subfamilies, of which two, Sesuvioideae and Tetragonioideae, are represented by native species in China.

Many members of the subfamilies Mesembryanthemoideae and Ruschioideae are ornamentals and are in cultivation worldwide. Until the early 20th century, these were nearly all included in the genus *Mesembryanthemum*. Since then, the majority of the members of that genus has been placed in a great number of smaller genera. Five species have been recorded as cultivated in China: *Aptenia cordifolia* (Linnaeus f.) Schwantes, *Carpobrotus edulis* (Linnaeus) L. Bolus, *Glottiphyllum longum* (Haworth) N. E. Brown, *Lampranthus spectabilis* (Haworth) N. E. Brown, and *Mesembryanthemum crystallinum* Linnaeus. Further species are likely to be introduced into China.

Tetragonia, together with the genus *Tetragonocarpus*, is sometimes treated as an independent family, the Tetragoniaceae. *Sesuvium* and *Trianthema*, together with *Cypselea* Turpin and *Zaleya* N. L. Burman, are sometimes treated as a separate family, the Sesuviaceae.

Lu Dequan. 1996. Aizoaceae (*Sesuvium-Tetragonia*). In: Tang Changlin, ed., Fl. Reipubl. Popularis Sin. 26: 30-36.

- 1a. Flowers epigynous; fruit a nut 1. *Tetragonia*
1b. Flowers perigynous; fruit a capsule.
 2a. Style 1 2. *Trianthema*
 2b. Styles 3-5 3. *Sesuvium*

1. TETRAGONIA Linnaeus, Sp. Pl. 1: 480. 1753.

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Herbs to shrubs, annual to perennial, rarely dioecious or monoecious, with shiny white bladder cells and sometimes hairs. Stems erect, ascending, or prostrate. Leaves mostly alternate, flat, folded, or with margin rolled downward, fleshy, entire or slightly undulate, not stipulate. Inflorescences of solitary flowers or cymes often resembling fascicles. Flowers bisexual or unisexual, sessile or pedicellate, perigone lobes (3 or)4(-7), inside yellow or green, basally united into a short tube, nut base often angled. Stamens 4 or more, fused basally with perigone tube. Ovary inferior, 2-8-loculed, each locule with one pendulous ovule. Stigmas as many as locules. Fruit a nut, perigone persistent, base turbinate or obovoid, angled or winged, mostly with 4 rows of ornaments, often apically as horns. Seeds subreniform or pear-shaped.

About 60 species: Africa, E Asia, Australia, New Zealand, South America; one species in China.

1. *Tetragonia tetragonioides* (Pallas) Kuntze, Revis. Gen. Pl. 1: 264. 1891.

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Demidovia tetragonioides Pallas, Enum. Hort. Demidof, 150. 1781; *Tetragonia expansa* Murray.

Herbs annual, erect when young, becoming decumbent, 40-60 cm tall. Stems with densely placed bladder cells when young. Petiole 5-30 mm, thick; leaf blade rhomboid-ovate or

deltoid-ovate, 0.4-10 × 2.5-8 cm. Pedicel to 2 mm. Flowers 1-3. Perigone tube 2-3 mm; lobes mostly 4, inside bright yellow to yellowish green. Stamens 10-13. Fruit turbinate, ca. 5 mm, 4- or 5-corniculate. Seeds as many as locules. Fl. and fr. Aug-Oct. $2n = 16^*$

Sandy shores, also cultivated. Fujian, Guangdong, Jiangsu, Taiwan, Yunnan, Zhejiang [Africa, E Asia, Australia, South America].

This species is used medicinally and is cultivated as a vegetable worldwide.

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2. TRIANTHEMA Linnaeus, Sp. Pl. 1: 223. 1753.假海马齿属 *jia hai ma chi shu*

Herbs annual to perennial. Stems procumbent to ascending, often much branched. Leaves opposite, entire, those of a pair unequal, terete to flat, petiole broadening at base forming a sheath around stem. Inflorescences of solitary or clustered flowers subtended by scarious bracts and bracteoles. Flowers sessile or pedicellate. Perigone tube campanulate, short to long, smooth to hairy; lobes 5, inside white, green, or pink to purple, outside fleshy. Stamens 5 to many, adnate with perigone. Perigynous, ovary with a truncate or impressed apex, 1-loculed; stigma 1. Capsule terete or turbinate, operculum with 1 or 2 seeds falling off as a whole. Seeds globose-reniform to lentil-shaped.

About 28 species: Africa, tropical Asia, Australia, two species in tropical South America, two species pantropical; one species in China.

1. *Trianthema portulacastrum* Linnaeus, Sp. Pl. 1: 223. 1753.假海马齿 *jia hai ma chi**Trianthema monogyne* Linnaeus.

Herbs perennial. Stems procumbent, subterete or slightly angular, glabrous or sparsely hairy when young. Petiole 4–30 mm, base expanded into sheath 2–2.5 mm; leaf blade elliptic to ovate, obovate, or obcordate, 8–50 × 4–45 mm, thinly fleshy, base cuneate, apex obtuse, retuse, truncate, or slightly acute.

Flowers solitary, sessile. Perigone lobes usually 5, inside mostly pale pink, rarely white, 4–5 mm; perigone tube fused with basal sheath of pedicel, forming a funnel; lobes rather obtuse, with an apical spur. Stamens 10–25. Stigma 1, ca. 3 mm. Capsule truncate at apex, 2-lobed, operculum fleshy, base thinly walled. Seeds several, black, reniform, 1–2.5 mm, broad, with low crests. Fl. summer. $2n = 26, 28, 56$.

Open sunny dry sands, usually near sea or as weeds in fields. Guangdong, Hainan (including Nanhai Zhudao), Taiwan [pantropical].

3. SESUVIUM Linnaeus, Syst. Nat., ed. 10, 2: 1052. 1759.海马齿属 *hai ma chi shu*

Herbs or shrubs, most parts with white bladder cells. Stems ascending, rarely creeping. Leaves opposite; petiole broadening basally forming a papery sheath clasping stem; leaf blade cylindric to obovate, fleshy. Inflorescences cymose or flowers solitary. Flowers bisexual, sessile or pedicellate. Perigone 5-parted, lobes inside often pink to purple, rarely white, oblong, ending in protracted spurs. Stamens 5 to numerous, free or inserted in perigone tube. Perigynous, ovary free from perigone tube, 3–5-loculed, ovules numerous per locule; stigmas 3–5, linear. Capsule ellipsoid, thinly walled, membranous, circumscissile. Seeds many per locule, enveloped by a black smooth aril.

About 17 species: tropical and subtropical regions; one species in China.

1. *Sesuvium portulacastrum* (Linnaeus) Linnaeus, Syst. Nat., ed. 10, 2: 1058. 1759.海马齿 *hai ma chi**Portulaca portulacastrum* Linnaeus, Sp. Pl. 1: 446. 1753.

Herbs perennial. Stems prostrate or creeping, green or red, 20–50 cm, much branched, often rooting from nodes, with white bladder cells. Leaves linear-oblongate or elliptical, 1.5–5 cm × 2–10 mm, below middle attenuate, base broadened

into membranous margins clasping stem. Pedicel 5–20 mm. Flowers solitary. Perigone 6–8 mm; tube ca. 2 mm; lobes 5, ovate-lanceolate, outside green, inside pink. Stamens 15–20, connate with perigone tube below middle. Ovary obovate, glabrous; stigmas 3–5. Capsule obovate, shorter than perigone. Seeds shiny black. Fl. Apr–Jul. $2n = 36, 40, ca. 48$.

Sands of seashores. Fujian, Guangdong, Hainan (including Nanhai Zhudao), Taiwan [tropical and subtropical regions worldwide].

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