

## AIZOACEAE

Succulent herbs (our species), rarely shrubs or subshrubs, unarmed or spiny; leaves opposite to spirally arranged, usually succulent, rarely stipulate; flowers solitary or in small cymes, usually bisexual; sepals (3-)5(-8), mostly succulent; perianth (staminodes) often many, in 1-6 whorls, (the flowers superficially resembling Compositae), rarely absent; stamens 4-5, 8-10 or numerous, free or connate in bundles at the base; nectaries usually in a ring at the inner base of stamens; ovary superior or inferior; carpels 2- to 5 or numerous, many-locular, rarely 1-locular; ovules 1-many in each locule; fruit usually a capsule, often enclosed in the persistent calyx; seeds with large embryo, often arillate. 114 genera, 2400 species, tropical and subtropical, mostly South Africa and Australia.

- |   |                            |
|---|----------------------------|
| 1. Staminodes numerous, petaloid, linear;<br>flowers composite-like   | 1. <b>Mesembryanthemum</b> |
| + Staminodes absent   | 2                          |
| 2. Style 1  | 4. <b>Trianthema</b>       |
| + Styles 2-5  | 3                          |
| 3. Fruit a capsule dehiscent by 5 valves  | 2. <b>Aizoon</b>           |
| + Fruit a capsule dehiscent by a lid  | 4                          |
| 4. Flowers in axillary clusters; lid of capsule splitting into 2 valves; styles 2;<br>seeds not more than 4 | 5. <b>Zaleya</b>           |
| + Flowers solitary; lid of capsule 1 piece, not splitting; styles 2-5;<br>seeds usually more than 5         | 3. <b>Sesuvium</b>         |

## 1. *Mesembryanthemum* L., nom. conserv.

Annual or perennial succulent herbs, covered by glossy papillae; stems dichasially branching; leaves opposite, subopposite or alternate, succulent, stipules absent; flowers solitary, terminal or axillary; calyx of (4-)5 unequal succulent lobes; staminodes numerous, petaloid; stamens numerous, inserted on the calyx; ovary inferior, (4-)5-locular; stigmas 4-5, free or connate at the base; fruit a 5-celled capsule, opening by a stellate-shaped slit; seeds numerous, minute. 70 species, Mediterranean region, Atlantic Islands, Arabia, South Africa, South Australia, California.

1. Leaves flattened, obovate to spatulate, the basal petiolate

+ Leaves thick, terete or linear, all sessile

2. *M. crystallinum*

2

2. Leaves 0.5-2 cm thick; staminodes longer than the calyx

3. *M. forsskaolii*

+ Leaves 2-4 mm thick; staminodes shorter than or equalling the calyx 1. *M. nodiflorum*

1. *Mesembryanthemum nodiflorum* L., Sp. Pl., ed. 1, 481 (1753).

Annual succulent herb, minutely papillose; stems 10-20 cm, branched, ascending or procumbent; leaves 1.2-4 x 0.2-0.4 cm, the lower opposite, the upper alternate, sessile, terete to linear; flowers axillary, subsessile; calyx 1 cm; lobes linear, unequal; staminodes white or cream, shorter than or equalling the calyx; stigmas 5; capsule 0.8-1 cm.

M, N, S; sandy soils. Mediterranean region, Southwest Asia, South Africa.

2. *Mesembryanthemum crystallinum* L., Sp. Pl., ed. 1, 480 (1753).

Annual succulent herb, covered by crystalline vesicles; stems 25-80 cm, procumbent, branched, often making mats; leaves 3-8 x 2-5 cm; radical leaves opposite, spatulate, petiolate; the cauline alternate, obovate, undulate, shortly petiolate or sessile; flowers 1 cm diam., axillary, subsessile; calyx-lobes broadly-ovate; staminodes numerous, longer than the calyx; capsule 1 cm.

M, N, De, S; maritime sand and edges of salt marshes. Macaronesia, Europe, Mediterranean region, Sinai, South Africa.

3. *Mesembryanthemum forsskaolii* Hochst. ex Boiss., Fl. Orient. 2: 765 (1872).

Syn. *Opophytum forsskaolii* (Boiss.) N. E. Br., Gard. Chron., ser. 3, 84: 253 (1928).

Annual succulent papillose herb; stems 10-25 cm, erect or ascending, simple or branched from the base; leaves 2-5 x 1-2 cm, opposite, sessile, terete-conical; flowers axillary; calyx-lobes unequal; staminodes whitish-cream, longer than the calyx; capsule 1.2-1.5 cm.

M, D, O (Wadi Natrun), S; saline sandy soils. Libya, Egypt, Palestine, Arabia.

## 2. *Aizoon* L.

Annual or perennial herbs or small shrubs; leaves alternate or opposite, succulent, sessile

or petiolate, exstipulate; flowers bisexual, solitary or in clusters, axillary or on stem forks; perianth sepaloïd, 4- to 5-lobed; calyx-lobes united at the base into a tube; petals absent; stamens numerous, in 5 bundles, inserted on the calyx-tube; styles (4-)5, free; ovary superior, 4- to 10-locular; ovules 2-numerous per locule; fruit a many-seeded capsule, dehiscent by 5 valves. 11 species, Europe, Mediterranean region, Sinai, South Africa, Australia.

1. Stems procumbent or prostrate; leaves spatulate to suborbicular;  
perianth 2-5 mm 1. **A. canariense**  
+ Stems erect or ascending; leaves narrowly-oblong to oblong-lanceolate;  
flowers 1.2-1.6 cm 2. **A. hispanicum**

1. **Aizoon canariense** L., Sp. Pl., ed. 1, 488 (1753).  
Syn. *Glinus chrystallinus* Forssk., Fl. Aegypt.-Arab. 95 (1775).

Annual herb, papillose-pubescent or villose; stems 5-25 cm, procumbent or prostrate, branched; leaves 1-3.5 x 0.5-1.5 cm, alternate, petiolate, spatulate to suborbicular; flowers 4-6 mm, sessile; perianth 2-5 mm, broadly ovate to triangular, greenish outside, yellowish inside; stamens 15-25; capsule 4-6 mm, flattened; seeds 1 mm, reniform, black.

M, D, GE, S; sandy and stony soils. Macaronesia, tropical and North Africa, Sinai, Palestine, Arabia, Iraq, Iran, Pakistan.

2. **Aizoon hispanicum** L., Sp. Pl., ed. 1, 488 (1753).

Annual papillose herb; stems 5-25 cm, dichotomously branched, erect or ascending; leaves 1-5 x 0.1-1 cm, opposite, basal, sometimes alternate, narrowly oblong to oblong-lanceolate, obtuse; flowers 1.2-1.6 cm, white, sessile, in stem forks; perianth 1.2-1.6 cm, narrowly triangular; stamens numerous; capsule 5-8 mm, 5-angled, flattened at the apex, dehiscent when moistened; seeds 1 mm, reniform, brown.

N, M, D, S; desert wadis, borders of salt marshes. Mediterranean region, Sinai, Arabia, Iraq, Iran.

### 3. **Sesuvium** L.

Annual or perennial herbs; leaves opposite, exstipulate; flowers axillary, solitary or in clusters; perianth sepaloïd, 5-lobed; segments triangular, shortly aristate on the back near the tip; calyx-tube short, obconical; staminodes absent; stamens 5-many, free or fused into a basal ring; ovary 2- to 5-loculed; styles 2-5; fruit a lidded capsule, the lid not splitting; seeds several to many. 12 species, tropical coastal regions.

1. **Sesuvium sesuvioïdes** (Fenzl) Verdc., Kew Bull. 12: 349 (1957).  
Syns. *Diplochonium sesuvioïdes* Fenzl, Nov. Stirp. Dec. 7: 58 (1839).  
*Trianthema polysperma* Oliv., Fl. Trop. Afr. 2: 588 (1871).

Annual herb; stems 10-25 cm, ascending or prostrate, papillose; leaves succulent, 0.5-3 x 0.1-0.4 cm, narrowly oblong-elliptic, acute or obtuse, short-petiolate; flowers solitary or in clusters of 2-4, sessile, pink or yellow; perianth-lobes equal, narrowly triangular, acute, each with a dorsal arista 1-2 mm below the apex; stamens 5(-7), free; capsule 4-6



**Plate 11.** AIZOACEAE: *Mesembryanthemum nodiflorum* 1, flowering branch. *Mesembryanthemum crystallinum* 2, flowering and fruiting branch. *Mesembryanthemum forsskaolii* 3, flowering and fruiting branch. *Aizoon canariense* 4, flowering plant; 5, fruiting branch. *Aizoon hispanicum* 6, flowering and fruiting branch. *Sesuvium sesuioides* 7, flowering and fruiting branch. *Trianthema portulacastrum* 8, flowering branch. *Trianthema triquetra* 9, flowering and fruiting branch. *Zaleya pentandra* 10, flowering and fruiting branch. All drawings to the same scale.

mm; seeds to 10 per locule, black.

GE; sandy saline soils. Tropical Africa, Arabia, Iran, Pakistan, India.

#### 4. *Trianthema* L.

Annual or perennial glabrous or pubescent herbs; leaves opposite, unequal, with membranous margins at the base, often connate in pairs; flowers axillary, solitary or in clusters, sessile or short-pedicellate; perianth sepals, 5-lobed, with a dorsal mucro; stamens 5-numerous, staminodes absent; ovary 1 carpel, 1-locular; style 1; ovules 2-numerous, placentation parietal; fruit a capsule. 17 species, tropical and warm regions.

1. Flowers solitary, partly hidden by the membranous base of the petiole;  
leaves to 5 cm; perianth 3.5-4.5 mm

1. **T. portulacastrum**

+ Flowers 2-6 in clusters, exposed; leaves to 1.8 cm; perianth 1 mm

2. **T. triquetra**

1. ***Trianthema portulacastrum* L.**, Sp. Pl., ed. 1, 223 (1753).

Syn. *Trianthema monogyna* L., Mant. 69 (1767).

Annual succulent glabrescent herb; stems 15-50 cm, prostrate or ascending; leaves 0.5-5 x 0.5-4 cm, rounded or apiculate; petiole 0.2-2 cm, expanding into a sheathing membrane and connate with that of the opposing leaf; flowers white or pink, sessile, solitary, partly hidden by the leaf-bases; perianth-lobes 3.5-4.5 mm, narrowly obovate, mucronate; stamens 10-20; capsule 3- to 10-seeded, the lid flattened.

GE; sandy soils. Tropical and subtropical regions.

2. ***Trianthema triquetra* Willd.**, Ges. Naturf. Freunde Berlin Neue Schriften 4: 181 (1803).

Syn. *Trianthema salsoloides*, sensu Täckh., Stud. Fl. Egypt, ed. 2, 75 (1974).

Annual or short-lived perennial succulent herb; stems 10-30 cm, prostrate, papillose, often reddish; leaves 0.5-1.8 x 0.1-0.4 cm, linear to narrowly elliptic, terete; petiole 0-5 mm; flowers sessile, 2-6 in axillary clusters; perianth-segments 1 mm, triangular, thickened at the tip by a mucro; capsule depressed in the centre; seeds 2.

De, R, GE; coastal sandy soils, borders of salt marshes. Tropical Africa and Asia, Australia.

#### 5. *Zaleya* Burm. f.

Annual or perennial prostrate herbs; leaves opposite, petiolate, exstipulate, slightly succulent; flowers subsessile, in axillary clusters; perianth sepals, 5-lobed, green outside, coloured inside, with a subapical mucro and membranous margins; stamens 5-15, free; staminodes absent; ovary 2-locular, ovules 2 in each locule; stigmas 2, free; fruit a 4-angled capsule, dehiscing with 2-valved lid. 3 species, Old World tropics.

1. Stamens 5

1. **Z. pentandra**

+ Stamens 10-15

2. **Z. decandra**

1. **Zaleya pentandra** (L.) C. Jeffrey, Kew Bull. 14: 238 (1960).

Syns. *Trianthema pentandra* L., Mant. 70 (1767).

*Rocama prostrata* Forssk., Fl. Aegypt.-Arab. CVIII, 71 (1775).

Annual succulent herb, sometimes woody at the base; stems 10-30 cm, prostrate or decumbent; leaves 0.5-2.5 x 0.2-2 cm, oblanceolate, elliptic to broadly ovate-orbicular, the apex obtuse to rounded; petiole 0.2-1.6 cm, membranous-winged and sheathing at the base; flowers in clusters of 5-15, sessile or subsessile; perianth-segments 2 mm, greenish-pink, with white margins; capsule 1.5-3.5 x 1.2-2 mm, rectangular, black; seeds 1.5 mm, ribbed, black.

N, De, R, GE, S; desert sandy and stony soils, edges of cultivation. Tropical Africa, Sinai, Palestine, Arabia, Madagascar.

2. **Zaleya decandra** (L.) Burm. f., Fl. Ind. 110, t. 31, f. 3 (1768).

Syn. *Trianthema decandra* L., Mant. 70 (1767).

Prostrate or decumbent annual herb; leaves 0.5-2 x 0.2-1.2 cm, elliptic-oblong to oblanceolate; flowers in axillary clusters, pinkish; stamens 10; capsule 3-4 mm, truncate at the apex; seeds orbicular or reniform, compressed, rugulose.

GE; sandy soil. Tropical Africa and Asia.