

Flora of the Darwin Region

VOLUME 1

P.S. Short & I.D. Cowie (eds)



AIZOACEAE

P.S. Short

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AIZOACEAE

P.S. Short

Herbs or sometimes shrubs, succulent, unarmed or spiny (non-Australian). *Leaves* opposite or alternate, simple, entire or sometimes toothed, commonly succulent, sometimes much reduced; stipules absent or present. *Flowers* usually bisexual, actinomorphic, terminal or axillary, sessile or pedicellate, borne singularly or in small inflorescences. *Perianth* segments 4 or 5, equal or unequal, persistent, coloured. *Petals* absent. *Staminodes* absent to many, petaloid. *Stamens* 4, 5 or numerous; anthers tetrasporangiate and dithecal. *Gynoecium* of 2–5 or more carpels united to form a compound, superior, half-inferior or inferior ovary, the ovary usually with as many locules as carpels, seldom unilocular; ovules solitary to numerous in each locule, on axile, basal, apical or parietal placentas; styles as many as locules. *Fruit* a capsule, indehiscent or loculicidal, septicidal or circumscissile, sometimes fleshy. *Seeds* with a large, curved embryo.

A family with perhaps as many as 2,500 species. As few as 12 genera are sometimes recognised (*e.g.* Cronquist 1981) but Hartmann (1993) recognised 127, with 115 additional genera segregated from *Mesembryanthemum*. The main centre of diversity is in southern Africa. Genera include *Lithops* (Living-stones), *Carpobrotus* and *Tetragonia*. Eighteen genera and 60 species are recorded in Australia.

Taxonomic references: Jeffrey (1961); Cronquist (1981); Prescott & Venning (1984); Hartmann (1993); Stevenson (2004); Hassan *et al.* (2005).

- | | | |
|----|---|-------------------|
| 1 | Stipules present; flowers not subtended by bracts | Sesuvium |
| 1: | Stipules absent; flowers subtended by 1 or more scarious bracts | Trianthema |

SESUVIUM L.

Perennial *herbs*, succulent, glabrous, the stems rooting at nodes. *Stipules* present. *Leaves* entire, opposite, basally connate, fleshy. *Flowers* solitary, axillary, pedicellate, bracts absent. *Perianth* segments 5, triangular, with scarious margins, with a dorsal mucro near the apex. *Stamens* 5–many; staminodes absent. *Ovary* superior, locules 2–5; ovules several per locule, placentation axile. *Style* 2–5, as many as locules. *Fruit* a capsule, circumscissile, the operculum (or upper part) ovoid and smooth. *Seeds* several, subtriangular, comma-shaped or pea-shaped, smooth, black.

Hartmann (1993) indicated that there are about 12 species in the tropics and subtropics, with one pantropical.

Taxonomic references: Prescott (1984a); Hartmann (1993).

S. portulacastrum (L.) L.

Prostrate to suberect *herbs*, the longest branches to *c.* 1 m long, commonly reddish, often rooting at nodes. *Stipules* *c.* 1 mm long. *Leaves* sessile, linear-oblongate, 25–75 mm long, 3–5 mm wide, apex blunt. *Pedicels* 6–17 mm long. *Perianth* tube 2–4 mm long; lobes triangular, 6–8 mm long, outer surface green, inner surface pink or purple, margins scarious, each lobe with a mucro *c.* 0.5 mm long. *Stamens* many, free, unequal, to *c.* 3 mm long; anthers *c.* 0.8 mm long. *Ovary* ovoid; carpels 3 (4); styles to *c.* 4 mm long; ovules several per locule. *Capsule* with the operculum 4–8 mm long, smooth. *Seeds* subtriangular or comma-

shaped in outline, longest axis *c.* 1.5 mm. *Flowering & fruiting* recorded most months. **Sea Purslane.**

Fig. 1 (*McKey 86; Wightman 3886*); Pl. 1 (*Cowie 10629*).

Pantropical, littoral species (Australia: W.A., N.T., Qld, N.S.W.). Common in the N.T. where it occurs along the landward margins of stands of mangroves, on mudflats and sandridges which are irregularly inundated by the sea. Associated species include the mangroves *Avicennia marina*, *Ceriops tagal* and *Lumnitzera racemosa*.

Flowering and fruiting occurs year round but peak flowering is from April to October (Wightman 2006). Flowers, which are closed at night, are

strongly protandrous (Primack *et al.* 1981). Bees have been observed pollinating flowers in Qld while moths have been observed visiting flowers in the N.T. (Wightman 2006).

This plant was consumed by members of Cook's expedition when at the Endeavour River, Qld but washing is generally required to remove salt (Cribb & Cribb 1976; Wightman 2006).

TRIANTHEMA L.

Herbs, prostrate or variously erect, sometimes woody at base, glabrous, papillose or hairy. *Stipules* absent. *Leaves* entire, opposite, unequal in size, the petiole basally dilated. *Flowers* solitary or clustered, axillary, sessile or pedicellate and each subtended by 1 or more scarious bracts. *Perianth* segments 5, shortly fused; lobes unequal and with scarious margins, sometimes with a dorsal mucro near the apex, coloured inside. *Stamens* 5–many, adnate to perianth tube; staminodes absent. *Ovary* superior, 1-locular; ovules 2–many, placentation basal. *Style* 1. *Fruit* a membranous or woody capsule, circumscissile; the operculum (or upper part) flat, ovoid or subglobular; perianth commonly persisting in fruit. *Seeds* 1–many, triangular, reniform or comma-shaped, smooth or variously ornate, black.

Genus of *c.* 20 species, with 12 species (ten endemic) in Australia. Ten are found in the N.T. but only *T. portulacastrum* and *T. rhynchocalyptra* are recorded for the D.R. *Trianthema megasperma* A. Prescott and *T. pilosa* F. Muell. occur to the east of the D.R. and may prove to be in this region. They are included in the key but not treated further.

Taxonomic references: Prescott (1984b); Koch (1992).

- | | | |
|----|--|---------------------------|
| 1 | Plants glabrous or sparsely hairy but stiff hairs absent | *T. portulacastrum |
| 1: | Plants beset with stiff hairs | 2 |
| 2 | Flowers with pedicels <i>c.</i> 6 mm long; operculum dish-shaped | T. megasperma |
| 2: | Flowers sessile or nearly so; operculum otherwise | 3 |
| 3 | Operculum cylindrical, truncate and centrally depressed | T. pilosa |
| 3: | Operculum gradually tapering into a persistent style | T. rhynchocalyptra |

***T. portulacastrum** L.

Herbs, annual, branches procumbent to ascending, somewhat succulent, to *c.* 50 cm long, glabrous or sparsely hairy, with a firm taproot. *Leaves* petiolate; lamina elliptic or obovate, 5–50 mm long, 5–45 mm wide, apically obtuse, retuse or apiculate; petiole 5–25 mm long, basally dilated and sheathing and forming a pouch with the petiole of the opposing leaf. *Flowers* solitary, sessile, partly hidden by sheathing leaf bases. *Perianth* lobes linear or narrowly triangular, 4–5 mm long, pink or white inside, detaching in fruit, with a near-apical mucro. *Stamens* 10–20; filaments *c.* 2 mm long. *Style* 2–3 mm long. *Operculum* of the capsule 2–3 mm long, apically with a raised 2-lobed rim.

Seeds 3–12, 1 or 2 being within the operculum, reniform, surface with wavy ribs. *Flowering & fruiting* mainly Feb.–Aug.

Fig. 1 (Cowie 4483; Fensham 1121); Pl. 2 (unvouchered).

Apparently native to tropical Africa and Asia and introduced to Australia (W.A., N.T., Qld, N.S.W.), primarily being a weed of disturbed or cultivated ground or roadsides but occasionally on floodplains. In the N.T. mostly found in the Top End, localities including Bathurst Island, Elcho Island, Cadell River settlement and seasonally flooded sandplains at Milingimbi. A single specimen has been collected from mangrove swamps on the East Alligator River.

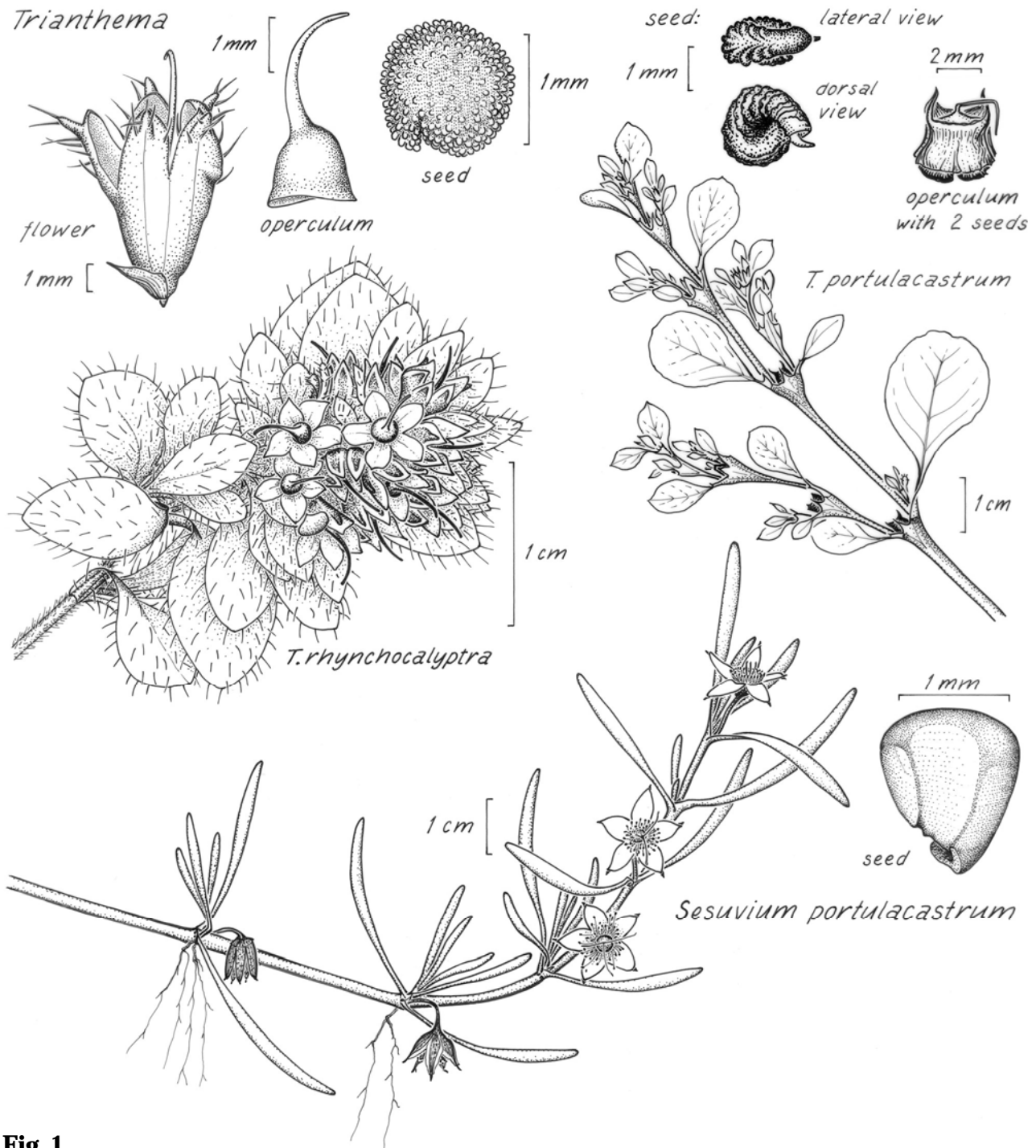


Fig. 1

T. rhynchocalyptra F. Muell.

Herbs with perennial, somewhat fleshy rootstock, stems mostly glabrous and somewhat woody. *Leaves* clustered, petiolate; lamina elliptic, ovate to lanceolate or obovate, 3–20 mm long, 1–10 mm wide; petiole 0.5–6 mm long, basally dilated and forming a sheath. *Flowers* sessile or nearly so, solitary but crowded; bracts solitary, ovate, c. 1.5 mm long, apiculate. *Perianth* tube 2.5–4 mm long; lobes triangular, 1.7–2.5 mm long, white or pink inside with some green markings outside, the near-apical mucro 0.7–1 mm long and often with several stiff hairs. *Stamens* c. 10; filaments 2–3 mm

long; anthers c. 0.5 mm long. *Style* 2–3 mm long. *Operculum* of the capsule gradually tapering into a persistent style. *Seeds* compressed, pea-shaped, longest axis c. 1.5 mm, initially minutely papillate but apparently shiny and finely striate at maturity. *Flowering & fruiting*. Jan.–Aug.

Fig. 1 (Byrnes 46; Michell 3399); Pl. 3 (unvouchered).

Endemic to northern Australia (W.A., N.T., Qld) and widespread in the N.T. north of c. 17° S but with few collections from the D.R., e.g. from open eucalypt woodland near Emerald Springs, Noonamah and in Litchfield N.P.

REFERENCES

- Cribb, A.B. & Cribb, J.W. (1976). *Wild Food in Australia*. (Fontana/Collins Australia: Sydney).
- Cronquist, A. (1981). *An Integrated System of Classification of Flowering Plants*. (Columbia University Press: New York).
- Hartmann, H.E.K. (1993). Aizoaceae. In Kubitzki, K., Rohwer, J.G. & Bittrich, V. (eds), *The Families and Genera of Vascular Plants*. (Springer-Verlag: Berlin). Vol. 2, pp. 37–69.
- Hassan, N.M.S., Meve, U. & Liede-Schumann, S. (2005). Seed coat morphology of Aizoaceae–Sesuvioideae, Gisekiaceae and Molluginaceae and its systematic significance. *Botanical Journal of the Linnean Society* 148: 189–206.
- Jeffrey, C. (1961). Aizoaceae. In Hubbard, C.E. & Milne-Redhead, E. (eds). *Flora of Tropical East Africa*. (Crown Agents for Overseas Governments and Administrations: London).
- Koch, B.L. (1992). Aizoaceae. In Wheeler, J.R. (ed.), *Flora of the Kimberley Region*. (Dept Conservation & Land Management: Como). pp. 91–97.
- Prescott, A. (1984a). *Sesuvium* L. In George, A.S. (ed.), *Flora of Australia*. (Australian Government Publishing Service: Canberra). Vol. 4, p. 61.
- Prescott, A. (1984b). *Trianthema* L. In George, A.S. (ed.), *Flora of Australia*. (Australian Government Publishing Service: Canberra). Vol. 4, pp. 52–60.
- Prescott, A. & Venning, J. (1984). Aizoaceae. In George, A.S. (ed.), *Flora of Australia*. (Australian Government Publishing Service: Canberra). Vol. 4, pp. 19–62.
- Primack, R.B., Duke, N.C. & Tomlinson, P.B. (1981). Floral morphology in relation to pollination ecology in five Queensland coastal plants. *Austrobaileya* 1: 346–355.
- Stevenson, D.W. (2004). Aizoaceae. In Smith, N., Mori, S.A., Henderson, A., Stevenson, D.W. & Heald, S.V. (eds), *Flowering Plants of the Neotropics*. (Princeton University Press: Princeton, New Jersey). pp. 10–11.
- Wightman, G.M. (2006). Mangroves of the Northern Territory, Australia: identification and traditional use. *Northern Territory Botanical Bulletin* 31: 1–168.



Pl. 1 *Sesuvium portulacastrum* (Photos: I.D. Cowie)



Pl. 3 *Trianthema rhynchocalyptra*
(Photos: B.M. Stuckey)



Pl. 2 *Trianthema portulacastrum*
(Photo: B.M. Stuckey)