



97 AMARANTHACEAE ¹

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Annual or perennial herbs, shrubs, or rarely trees; stems sometimes succulent and articulate; monoecious or dioecious. Leaves opposite or alternate, exstipulate, simple, usually entire, sometimes \pm succulent, frequently much reduced. Inflorescence axillary or terminal, cymose or a modified cyme or a spike or panicle, flowers sometimes solitary; bracts or bracteoles absent or present. Flowers often small, generally actinomorphic, bisexual or unisexual; sometimes sterile flowers present and modified as hooks or bristles subtending fertile flowers. Tepals in a single whorl, 0–5(–6), scarious or membranous or herbaceous, free or fused at the base. Stamens usually as many as and opposite to the tepals; filaments free or united in a short tube at the base, the tube sometimes producing pseudostaminodes alternating with the stamens; anthers tetrasporangiate, dithecal, opening by longitudinal slits. Carpels 2–3(–6); ovary superior or half-inferior, unilocular; ovules 1-several. Fruit usually dry, indehiscent or irregularly dehiscent or circumscissile, or a berry, sometimes with a succulent pericarp, often surrounded by persistent perianth. Seeds laterally compressed.

A family of 174 genera and 2100–2500 species; widespread in tropical, subtropical and, to a lesser extent, temperate regions of the world. The family is an important component of arid and semi-arid floras, especially of Australia and North America, and often found in saline habitats. In Australia there are about 43 genera and about 450 species. Australia is a centre of diversity for the family with many endemic genera and species, particularly in arid and semi-arid regions and south-western Western Australia (see Wilson 1984; Shepherd & Wilson 2007; Cabrera *et al.* 2009).

The Amaranthaceae are placed in the large order Caryophyllales near Caryophyllaceae (almost cosmopolitan) and Achatocarpaceae (SW USA to S America) (see Stevens 2009 & references therein). Amaranthaceae and Chenopodiaceae have for some time been considered to be closely related (see Kühn *et al.* 1993; Townsend 1993). Recent advances in systematics, in particular molecular systematics, have shown that it is not possible to maintain the families as distinct (see Downie *et al.* 1997; APG 1998; Cuénoud *et al.* 2002; APG II 2003; Kadereit *et al.* 2003; Haston *et al.* 2007; Stevens 2009; APG III 2009; and references therein) and so they have been combined. There are also excellent arguments to retain the two families as distinct (see Shepherd 2008) and further work and changes are both needed and expected. Genera treated here under Amaranthaceae that were traditionally placed in the Chenopodiaceae are *Atriplex*, *Bassia*, *Beta*, *Chenopodium*, *Dysphania*, *Einadia*, *Rhagodia*, *Salsola*, *Sarcocornia*, *Suaeda*, *Tecticornia* and *Threlkeldia*.

The relationships of the diverse Australian members of the family have recently been the subject of a number of studies using molecular data (see Shepherd & Wilson 2007; Cabrera *et al.* 2009). These studies indicate that the delimitation of genera is not natural and several genera have been combined (Shepherd & Wilson 2007) or probably need to be combined (Cabrera *et al.* 2009). Further work is required and more name changes are anticipated.

Amaranthaceae contains important agricultural and food crops. These include cultivars of *Amaranthus* (edible seed, Americas), *Beta* (Beetroot, Sugarbeet, Spinach Beet, Swiss Chard), *Chenopodium* (vegetable, fruit and seed crops) and *Spinacia* L. (Spinach). Native species of *Atriplex*, *Bassia*, *Chenopodium* and

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2 Tasmanian Herbarium, Tasmanian Museum & Art Gallery, PO Box 5058, UTAS LPO, Sandy Bay, TAS 7005, Australia.

Rhagodia are important components of grazing in parts of semiarid and arid Australia. Several species of *Chenopodium* are common weeds.

Synonymy: Atriplicaceae, Betaceae, Chenopodiaceae, Dysphaniaceae, Salicorniaceae, Salsolaceae, Spinaciaceae.

Key references: Wilson (1984); Kühn *et al.* (1993); Townsend (1993); Walsh (1996).

External resources: accepted names with synonymy & distribution in Australia (APC); author & publication abbreviations (IPNI); mapping (ALA, AVH, NVA); nomenclature (APC, APNI, IPNI).

1. Stems fleshy, articulate and appearing leafless	2
1: Stems leafy and not articulate	3
2. Plant a herb or subshrub with procumbent rooting stems; upright stems not branched; flowers 3–9(–12) on each side of a stem article; stamens 2	12 Sarcocornia
2: Plant a bushy shrub; upright stems usually with obvious opposite decussate branching; flowers (1–)3 on each side of a stem article; stamen 1	13 Tecticornia
3. Perianth scarious (thin & dry)	4
3: Perianth herbaceous	7
4. Leaves opposite	1 Alternanthera
4: Leaves alternate	5
5. Tepals plumose	3 Ptilotus
5: Tepals glabrous	6
6. Flowers in cymose clusters forming axillary or terminal spikes or panicles	2 Amaranthus
6: Flowers solitary, axillary	4 Hemichroa
7. Leaves narrow, sub-terete or plano-convex, often ± fleshy; hairs (if present) simple, bifurcate or stellate, neither glandular or mealy	8
7: Leaves flat, if terete then mealy when young	11
8. Young stems and branches conspicuously woolly-hairy; tepals enlarged in fruit, with a transverse wing	Bassia +
8: Young stems and branches glabrous or sparsely hairy or with short axillary pubescence only; tepals not enlarged in fruit, without a transverse wing	9
9. Flowers clustered, at least in the lower leaf-axils; bracteoles of lateral flowers 3, minute, hyaline	14 Suaeda
9: Flowers solitary in leaf-axils; bracteoles of flowers absent or exceeding perianth	10
10. Leaves linear to oblanceolate; tepals c. 2 mm long, membranous, not hardening in fruit; stamens 3	10 Threlkeldia
10: Leaves narrow-triangular or subterete; tepals 2.5–3.0 mm long, membraneous at first, hardening in fruit; stamens 5	15 Salsola
11. Plants glabrous, leaves glossy, entire; ovary semi-inferior; fruiting perianth woody or corky towards base, adhering in a cluster	11 Beta
11: Plants usually mealy with vesicular hairs, at least when young, or glabrous; ovary superior; fruiting perianth not woody or corky, sometimes clustered but not adhering in a cluster	12
12. Flowers unisexual; male flowers with a 5 lobed perianth and 5 stamens; female flowers lacking a perianth, enclosed within paired appressed bracteoles enlarging in fruit, often becoming spongy, corky and/or with dorsal outgrowths	5 Atriplex

- 12: Flowers unisexual or bisexual, all with a perianth, 1–5-lobed, 1–5 stamens; fruit not enclosed within paired bracteoles 13
- 13: Plants herbaceous or soft-wooded; fruit dry or rarely perianth fleshy 14
- 13: Plants shrubby or wiry; fruit a succulent berry 15
- 14: Tepals 3–5, not hooded and inflated towards apex; stamens 1–5; glabrous or variously pubescent annuals or perennials 6 *Chenopodium*
- 14: Tepals 1–5, hooded and inflated towards apex in fruit; stamens 1–2; glandular pubescent annuals 7 *Dysphania*
- 15: Plants with bisexual and female flowers, wiry; flowers with 1–3 stamens 8 *Einadia*
- 15: Plant dioecious, shrubby; flowers with 5 stamens 9 *Rhagodia*

+ *Bassia scoparia* has been recorded in the north of the State near Devonport and Deloraine. At Deloraine it was a weed in carrot crops, apparently as a contaminant of seed from America. It is not considered to have successfully naturalised.

1 ALTERNANTHERA

Alternanthera Forssk., *Fl. Aegypt.-Arb.* 28 (1775).

Annual or perennial herbs, monoecious; stems procumbent or ascending, without fleshy articles, pubescent, at least when young. Leaves opposite, sessile, oblong to narrowly elliptic, margin irregularly and minutely toothed, not spine tipped. Inflorescence axillary or rarely terminal, a head or spike. Flowers small, bisexual, bracteate or bracteolate, bracts not exceeding perianth. Tepals 5, free, scarious, lacking transverse wing. Stamens 2–5. Fruit indehiscent, compressed, broadly obovate. Seed vertical.

A genus of c. 200 species mainly in tropical and subtropical regions; 8 or 9 species (3 naturalized) in Australia.

1 *Alternanthera denticulata* R.Br., *Prodr. Fl. Nov. Holl.* 417 (1810)

Lesser Joyweed, Rock Joyweed

Alternanthera triandra Lam. var. *denticulata* (R.Br.) Maiden & Betche, *Census N.S.W. Pl.* 73 (1916). *Alternanthera sessilis* R.Br. sensu J.D.Hooker, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 310 (1857) [Brown did not create the combination as stated by Hooker (see APNI)].

Illustrations: Kirkpatrick et al., *City Parks & Cemeteries: Tasmania's Remnant Grasslands & Grassy Woodlands* 115, pl. 25-1 (1988); Walsh, *Fl. Victoria* 3: 214, fig. 38c-d (1996); Corrick & Fuhrer, *Wildflowers of Victoria* 3 (2000); Jacobs & Lapinuro, *Fl. New South Wales* 1, rev. edn: 250 (2000); Richardson et al., *Weeds of the South-East, an Identification Guide for Australia* 92 (2006).

Perennial herb; stems prostrate and ascending 10–50(–90?) cm long, often rooting at the nodes, glabrous except for tomentose nodes and decurrent lines of hairs on the youngest branches. Leaves 1.5–6(–8) cm long, linear or narrow lanceolate, glabrous except for a few hairs on the midrib and the margins at the base, these deciduous in older leaves, margins entire or minutely denticulate, midrib prominent on both sides, apex obtuse or acute, minutely mucronate. Spikes sessile in the leaf axils, globular to oblong, 5–8 mm in diameter; bracts membranous, ovate, c. 1.25 mm long, bracteoles narrow lanceolate, c. 1.5 mm long. Tepals pinkish, becoming white and shining, c. 3 mm long at maturity, lanceolate, acute, midrib prominent, margins minutely denticulate above. Stamens 3–5; anther c. 0.3 mm long. Style short; stigma capitate. Fruit c. 2.25 mm wide, broad obcordate. Flowering and/or fruiting Nov.–Jul.

Tas. (TNM); all Australian states, New Zealand. A rare species, collected in the Launceston area and on the South Esk River. Found growing in wet areas such as in *Melaleuca ericifolia* swamp forest, *Poa* grassland, and rocky areas along rivers. Often found in disturbed areas.

2 * AMARANTHUS

Amaranthus L., *Sp. Pl.* 2: 989 (1753).

Annual or less commonly perennial herbs, usually monoecious. Leaves alternate, usually petiolate; lamina entire. Inflorescence of small cymes forming axillary or terminal spikes or panicles. Flowers small, mostly unisexual, each usually subtended by a bract and 2 bracteoles and these frequently unequal in size, occasionally spiny. Male flowers usually scattered among female flowers at the tips of the inflorescence. Tepals 2–5, membranous, green, red, brown or hyaline, persistent. Stamens as many as and opposite tepals, free. Fruiting pericarp dry, membranous, indehiscent or circumscissile. Seed vertical, lenticular, smooth, shining, black or dark brown.

A genus of c. 70 species in temperate and tropical regions, chiefly the Americas. Australia has 26 species (11 native); in Tasmania 3 species, all introduced. The genus contains many species of economic importance including crop plants, ornamentals and weeds.

Key reference: Palmer (2009).

- | | |
|---|------------------------|
| 1. Flowers in small axillary clusters | 2 |
| 1: Flowers in dense spikes or spike-like panicles, terminal or in upper axils | 3 |
| 2. Bracts and bracteoles spinescent, c. twice as long as perianth | 3 <i>A. albus</i> |
| 2: Bracts and bracteoles not spinescent, shorter than perianth | <i>A. graecizans</i> + |
| 3. Plant procumbent; fruit indehiscent | 1 <i>A. deflexus</i> |
| 3: Plant erect or decumbent; fruit dehiscent | 4 |
| 4. Bracts subtending inflorescence branches not spinescent, c. 3 mm long | 2 <i>A. powellii</i> |
| 4: Bracts subtending inflorescence branches spiny, in pairs, 10–15 mm long | <i>A. spinosus</i> + |

+ *Amaranthus graecizans* L. subsp. *silvestris* (Vill.) Brenan and *A. spinosus* L. have been recorded from a domestic garden in Launceston and from a forest nursery at Perth respectively. Neither species appears to have persisted.

1 * *Amaranthus deflexus* L., *Mant. Pl. Altera* 295 (1771)

Spreading Amaranth

Illustrations: Walsh, *Fl. Victoria* 3: 204, fig. 36j (1996); Jacobs & Lapinpuro, *Fl. New South Wales* 1, rev. edn: 252 (2000); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 93 (2006).

Procumbent perennial; stems up to 40 cm long, brownish green, younger stems and branches with crisped multicellular hairs. Leaves with petioles to 2 cm long, sparsely septate-hairy; lamina 0.5–4.5 cm long, 0.3–2.5 cm wide, trullate, entire, margins very narrowly membranous, apex acute, adaxial surface glabrous, abaxial surface with scattered septate hairs on the prominent veins. Inflorescence a terminal spike, c. 5 cm long, branched below, a few flowers clustered in the upper leaf axils; bracts 1.0–1.5 mm long, ovate-acute, membranous, keel green. Tepals 2–3, 2–3 mm long, oblanceolate-acute, wings membranous, keel green or brown. Stamens 3. Fruit brownish, with 3 greenish ribs, indehiscent, c. 3 mm long at maturity, ellipsoid. Seed ovate-lenticular, occupying the lower half of their pericarp. Flowering and/or fruiting Dec.–May.

Tas. (TNM, TSE); also naturalized in SA, NSW, Vic.; native to South America, widely naturalized, eg. in New Zealand, North America, the Mediterranean. Found in stockyards, along roadsides and in waste and urban areas. Most collections are from the greater Hobart area.

2 * *Amaranthus powellii* S.Watson, *Proc. Amer. Acad. Arts* 10: 347 (1875)

Powell's Amaranth, Amaranth

Amaranthus hybridus sensu W.M.Curtis, *The Student's Flora of Tasmania* 3: 566 (1967), non L. (1753). *Amaranthus hybridus* subsp. *incurvatus sensu* W.M.Curtis, *The Student's Flora of Tasmania* 3: 566 (1967), non

(Timeroy ex Gren. & Godr.) Brenan (1957). *Amaranthus retroflexus sensu* W.M.Curtis, *The Student's Flora of Tasmania* 3: 566 (1967), *non* L. (1753).

Illustrations: Walsh, *Fl. Victoria* 3: 204, fig. 36f (1996); Jacobs & Lapinpuro, *Fl. New South Wales* 1, rev. edn: 252 (2000); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 94 (2006).

Erect annual herb up to c. 1 m high, glabrous or the young stems and leaves with a few crisped septate hairs; stems angled. Leaves with petioles to 5 cm long, sparsely septate-hairy; lamina 1–10 cm long, 0.6–4.5 cm wide, narrow to broad-trullate, margins undulate, upper stem leaves much smaller. Inflorescence a panicle with a terminal spike up to 15(–25?) cm long, with shorter ± erect spikes in the upper leaf axils. Bracts of female flowers up to 6 mm long, ovate margins membranous, keel green, prolonged as a subulate mucro. Tepals 5, 1 or 2 longer than the others, 2.5–3.0 mm long, keeled, acuminate, similar to the bracts. Male flowers shorter than the females. Stamens 5. Fruit circumscissile at maturity ± equalling the perianth. Seed brown to black, 1.25–1.5 mm long, ovoid-lenticular, shining. Flowering and/or fruiting Jan.–Jun.

Tas. (FUR, TNM, TNS, TSE, TSR); also naturalized in Qld, SA, NSW, Vic.; native to North America, widely naturalized including in New Zealand. A widespread weed of vegetable crops, hop paddocks and arable areas generally though also found in waste and other disturbed areas.

3 * *Amaranthus albus* L., *Syst. Nat. ed. 10*, 2: 1268 (1759)

Stiff Tumbleweed, Tumbleweed

Illustrations: Walsh, *Fl. Victoria* 3: 204, fig. 36h (1996); Jacobs & Lapinpuro, *Fl. New South Wales* 1, rev. edn: 252 (2000); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 93 (2006).

Much-branched erect or decumbent annual up to 50(–80) cm high; stems and branches pale, rigid, glabrous except for minute glandular or septate hairs sparsely scattered along the upper stems and branches, stem base sometimes reddish. Leaves 0.5–2(–5 outside Tas.) cm long including the petiole, 0.2–1.5(–2) cm wide; lamina grey-green, lanceolate, margins entire, veins prominent on abaxial surface, undulate, base cuneate, apex acute with a pungent mucro. Inflorescence of short, few-flowered spikes in axillary clusters along the stem and branches; bracts 3–4 mm long, narrow-lanceolate, folded, keeled, attenuate, apex pungent. Tepals 3, pale brown, unequal, 1–2 mm long, lanceolate, acute. Stamens 3. Fruit circumscissile at maturity ± equalling the perianth or slightly exceeding it. Seed black, c. 1 mm diam., deeply lenticular, shining, margin rounded, red-brown. Flowering and/or fruiting Jan.–Apr.

Tas. (KIN, FUR, TNM, TSE); also naturalized in WA, SA, NSW, Vic.; native to North America, naturalized in New Zealand and other temperate regions. Occasional in the north and east of the state in disturbed areas such as along railway lines and weedy riparian environments.

3 PTILOTUS

Ptilotus R.Br., *Prodr. Fl. Nov. Holl.* 415 (1810).

Synonymy: *Trichinium* R.Br., *Prodr. Fl. Nov. Holl.* 414 (1810); *Ptilotus* section *Trichinium* (R.Br.) Poir., *Nat. Pflanzenfam.*, ed. 2 [Engler & Prantl.] 16c: 56 (1934). *Dipteranthemum* F.Muell., *S. Sci. Rec.* 3(12): 281 (1884).

Perennial, rarely annual, herbs or undershrubs or shrubs, frequently with a woody rootstock, monoecious. Leaves radical or cauline and alternate, sessile or petiolate. Inflorescence a dense or rarely interrupted terminal or axillary, globular to cylindrical spike. Flowers bisexual, often brightly coloured (not in Tas.), each subtended by a bract and 2 bracteoles; bracts and bracteoles scarious, shining. Tepals 5, free or shortly united at the base, linear to sublinear, rigid, scarious at the tips or also along the upper margins, abaxial surface usually plumose or woolly, adaxial surface glabrous or the inner segments woolly at the base. Stamens 5, unequal, 1–3 of them often sterile; filaments united at the base in a membranous cup adnate to the perianth tube or free from it, occasionally with staminodes alternating with the stamens. Fruit indehiscent, enclosed within the persistent perianth. Seed basal, on a long funicle.

A genus of c. 100 species confined to Australian except for 1 species that extends to southern Malaysia. The majority of species are endemic to the drier regions of mainland Australia.

1 *Ptilotus spathulatus* (R.Br.) Poir., *Encyl. (Lamarck) Suppl.* 4: 620 (1816), f. **spathulatus** *Pussy Tails*

Trichinium spathulatum R.Br., *Prodr. Fl. Nov. Holl.* 415 (1810). *Trichinium mucronatum* Nees, *Pl. Preiss.* 1(4): 628 (1845).

Illustrations: Kirkpatrick *et al.*, *City Parks & Cemeteries: Tasmania's Remnant Grasslands & Grassy Woodlands* 115, pl. 25-2 (1988); Walsh, *Fl. Victoria* 3: 211, fig. 37i-j (1996); Jacobs & Lapinpuro, *Fl. New South Wales* 1, rev. edn: 258 (2000); Cameron, *A Guide to Flowers and Plants of Tasmania*, 3rd edn, 95, pl. 233 (2000); Gilfedder *et al.*, *The Nature of the Midlands* 88 (2003); Whiting *et al.*, *Tasmania's Natural Flora* 88 (2004); Simmons *et al.*, *A Guide to Flowers and Plants of Tasmania*, 4th edn, 127 (2008).

Perennial herb with a thick woody rootstock; septate-hairy on the upper stems and leaves and inflorescence, hairs glochidiate at the nodes; stems decumbent or ascending, radiating from a flat rosette of radical leaves, 5–20 cm long, sometimes branched above. Radical leaves up to 8 cm long, glabrous except for short crisped hairs on the midrib below, narrowed to a petiole, lamina ovate or spathulate, mucronate; stem leaves up to 2.5 cm long, scarcely petiolate, lamina narrow-ovate or spathulate, younger leaves with glabrous adaxial surfaces and with scattered hairs on the margins and midrib on the abaxial surface. Flower spikes ovate to cylindrical, yellowish-green, shining, upturned, 3–10 cm long, to 2 cm diam., elongating as the fruits mature; bracts pale brown, shining, 1-nerved, 6–8 mm long, lanceolate, acute, abaxial surface with a few long hairs; bracteoles hyaline, ± equalling the bract, 1-nerved, mucronate with long hairs along the midrib outside. Perianth 8–14 mm long, plumose segments greenish with long erect, septate barbed hairs, apex glabrous, membranous, pink, fading stramineous, inner segments narrower than the outer with long crisped hairs on the margins at the base, these confused around the ovary and filaments. Fertile stamens usually 3. Ovary stipitate, laterally compressed, margins hairy above; style eccentric. Flowering and/or fruiting Sep.-Apr.

Tas. (FUR, TNM, TSE); also WA, SA, NSW, Vic. Found in the eastern half of the state on dry hillsides, often on shallow soils or rock plates, open sites or under light tree cover or in grass and herb fields. The other form of the species, f. *angustatus* Benl, is found in Western Australia and South Australia and differs from the typical form by the narrower spikes and perianth tips distinctly projecting beyond the less dense and shorter dorsal pubescence.

4 HEMICHROA

Hemichroa R.Br., *Prodr. Fl. Nov. Holl.* 409 (1810).

Perennial herbs or low spreading monoecious shrubs; branches glabrous apart from young shoots. Leaves alternate, sessile, linear or lanceolate, thick, fleshy, piano-convex, mucronate. Flowers solitary, bisexual, axillary, sessile, subtended by 2 scarious bracteoles. Tepals 5, subequal, rigid, erect, persistent. Stamens 2 or 5; filaments united at the base; staminodes 0. Fruit indehiscent, pericarp membranous.

An endemic Australian genus of 3 species.

1 *Hemichroa pentandra* R.Br., *Prodr. Fl. Nov. Holl.* 409 (1810) *Trailing Hemichroa*

Polycnemum pentandrum (R.Br.) F.Muell., *Pap. & Proc. Roy. Soc. Tasmania 1877*: 15 (1878).

Illustrations: Curtis, *The Student's Flora of Tasmania* 3: 576, fig. 122 (1967); Walsh, *Fl. Victoria* 3: 204, fig. 36a-b (1996); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 163 (2001).

Perennial with slender, branched, widely-spreading rhizomes producing many erect or ascending aerial branches 3–20 cm high, glabrous except for soft crisped hairs towards the tips of the young branches and at the basal margins of young leaves. Leaves sessile, 8–16 mm long, linear to linear-oblongate, thick,

fleshy, plano-convex, apex mucronate. Bracteoles ovate-acute, 2.5–3.0 mm long, 1-nerved. Tepals pink, white or greenish, c. 4 mm long, subequal, ovate-lanceolate, 1–3-nerved, scarious. Stamens 5; filaments pink, united at the base in a short annular cup; anthers c. 0.6 mm long. Ovary pink, somewhat flattened; styles 2, c. 0.75 mm long, subulate. Ovule on a long funicle. Flowering and/or fruiting Sep.-Mar.

Tas. (FIN, KIN, TSE); also WA, SA, Vic. Found in the north and east of the state on the margins of salt-marshes in coastal and estuarine situations.

5 ATRIPLEX

Atriplex L., *Sp. Pl.* 2: 1052 (1753).

Synonymy: *Obione* Gaertn., *Fruct. Sem. Pl.* 2: 198, t. 126, fig. 5 (1791). *Theleophyton* Moq., *Prodr. (Candolle)* 13(2): 115 (1849). *Neopreissia* Ulbr., *Nat. Pflanzenfam. ed. 2 [Engler & Prantl]* 16c: 519, fig. 195 (1934). [For full synonymy see Wilson (1984); Kühn *et al.* (1993); APNI].

Annual or perennial herbs or shrubs, monoecious or dioecious, often mealy, with vesicle hairs which may collapse, becoming scurfy or scaly. Leaves alternate or sometimes the basal ones opposite, petiolate, flat to semiterete, entire, lobed or toothed. Inflorescence axillary, clusters of few flowers; clusters commonly arranged into spicate or racemose inflorescences. Flowers small, unisexual, sessile or subsessile. Male flowers ebracteate; perianth (3–)5 lobed; stamens (3–)5; pistillode minute or absent. Females flowers subtended by a pair of bracteoles which enlarge enclosing the fruit, the bracteoles variously winged, inflated, toothed and with appendage; tepals 0(4–5); staminodes absent. Pericarp membranous. Seed lenticular, usually erect, occasionally horizontal, occasionally dimorphic.

A cosmopolitan genus of over 250 species found mainly in subtropical and temperate regions often in saline habitats. In Australia there are about 60 species with 3 or 4 naturalized, 1 shared with New Zealand and the remainder endemic. The genus is classified into a number of subgenera and sections that are outlined, for Australian species, by Wilson (1984).

Key reference: Wilson (1984).

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|--|--------------------------|
| 1. Shrubs, dioecious or monoecious | 2 |
| 1: Annual or perennial herbs, monoecious | 3 |
| 2. Leaves glabrous on adaxial surface, white-scaly on abaxial surface; female flowers mostly in terminal and axillary spikes or panicles | 7 <i>A. paludosa</i> |
| 2: Leaves silvery or grey-green on both surfaces; female flowers clustered in axillary glomerules | 8 <i>A. cinerea</i> |
| 3. Plant prostrate, succulent, covered with shining watery bladder-hairs (sandy shores) | 9 <i>A. billardierei</i> |
| 3: Plant prostrate and ascending or erect; leaves not succulent, glabrous to scurfy (various habitats) | 4 |
| 4. Female flowers dimorphic; fruiting bracteoles suborbicular | 1 <i>A. hortensis</i> |
| 4: Female flowers all of one form; fruiting bracteoles rhombic to trullate | 5 |
| 5. Plants perennial; leaf venation minutely reticulate | 6 |
| 5: Plants annual; leaf venation open | 7 |
| 6. Leaf-margins entire or sinuate; fruiting bracteoles glabrescent, veins prominent | 5 <i>A. semibaccata</i> |
| 6: Leaf-margins toothed or shallowly lobed; fruiting bracteoles mealy, veins obscure | 6 <i>A. suberecta</i> |
| 7. Lower leaf-blades truncate, sagittate or hastate at the base, upper leaves triangular or ovate | 2 <i>A. prostrata</i> |
| 7: Lower leaves cuneate at the base, with forwardly-directed basal lobes, upper leaves linear, linear-lanceolate or elliptic | 8 |

8. Fruiting bracteoles mealy, venation obscure

3 *A. patula*

8: Fruiting bracteoles glabrous, shining, with prominent venation

4 *A. australasica*

1 * ? *Atriplex hortensis* L., *Sp. Pl.* 2: 1053 (1753)

Garden Orache

Illustrations: Walsh, *Fl. Victoria* 3: 139, fig. 27a (1996); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 221 (2006).

Erect, annual, monoecious herb to 2.5m high. Leaves not succulent, petiolate; lower leaves usually opposite, green or purplish-brown, 2–12 cm long, 1.5–10 cm wide, cordate-trullate, entire or dentate, fairly thin; upper leaves alternate, triangular or oblong-lanceolate. Inflorescence terminal, narrowly paniculate or spike-like, flowers numerous, male and female intermixed in clusters. Female flowers dimorphic; the majority with perianth 0, enclosed between a pair of accrescent bracteoles up to 10(–15?) mm long and wide at maturity, broadly ovate, prominently veined, seed red-brown, 2.5–3.0 mm diam., erect, flattened; other female flowers with 5 tepals and no enclosing bracts, seed black, 1.5–2.0 mm diam., horizontal, lenticular, shining. Fruiting mainly Aug.–Feb. (non-Tas.), Mar. (Tas. material).

Tas. (TSE); also naturalized in WA, SA, Vic.; possibly native to Asia and maybe E Europe, naturalized in New Zealand. Possibly introduced for culinary and/or horticultural purposes but not now commonly cultivated. The species is doubtfully naturalized as it is known only from only three collections in the Hobart area: two from Brown's River, Kingston (1951), and the third from Sandy Bay (1963). Wilson (1984) indicated that this taxon may be the result of selection from *A. nitens* Schkuhr.

2 * *Atriplex prostrata* Boucher ex DC., *Fl. Franc. (DC. & Lamarck)*, ed. 3, 3: 387 (1805)

Orache

Atriplex hastata L. var. *salina* (Wallr.) Gren., *Fl. France [Grenier]* 3: 12 (1856). *Atriplex hastata sensu* W.M.Curtis, *The Student's Flora of Tasmania* 3: 575 (1967), non L. (1753).

Illustrations: Walsh, *Fl. Victoria* 3: 139, fig. 27b (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 213 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 112 (2001); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 221 (2006).

Prostrate to ascending stout, monoecious, annual herb, up to 100 cm high but variable in size and habit, often much branched from the base; branches spreading or ascending, strongly ribbed and often reddish. Leaves petiolate; lower leaves opposite, green, 1.5–6(–8) cm long, 2–6 cm wide, triangular-hastate or sagittate, glabrescent to mealy, margins erose-dentate; upper leaves alternate, often narrowing, base cuneate. Inflorescence dense but slender axillary and terminal spikes or panicles, flowers sessile in small clusters, these often predominantly either staminate or pistillate, generally mixed. Female flowers all of one form. Bracteoles of the fruit 3–6 mm long, variable in size on the same plant, the larger bracteoles enclosing a seed, ovate or triangular, entire or toothed, smooth or tuberculate on the back, often turning black with age. Seed black, shining, 2.0–2.2 mm diam., lenticular. Flowering and/or fruiting most of year though mainly Feb.–May.

Tas. (FUR, KIN, TNM, TNS, TSE, TWE); also naturalized in WA, SA, NSW, Vic., New Zealand; native to Eurasia & N America. Common in coastal and estuarine situations in seasonal and permanent wet sites, often in saline soils, such as fringing saltmarsh.

3 * *Atriplex patula* L., *Sp. Pl.* 2: 1053 (1753)

Spear Orache, Common Orache

Illustrations: Walsh, *Fl. Victoria* 3: 139, fig. 27c (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 213 (2000); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 221 (2006).

Erect annual, monoecious herb, to 80(–100) cm high; stems often much-branched, prominently ribbed. Leaves alternate, petiolate; lower leaves with lamina 5–9 cm long, 1.5–4.0 cm wide, rhombic to trullate, often with a pair of forwardly directed basal lobes, margins entire or coarsely toothed, glabrous or the abaxial surface mealy; upper leaves mostly entire, linear-lanceolate to elliptic, progressively smaller towards the end

of the branches. Inflorescences spike-like, terminal and on short branches, male and female flowers intermixed. Female flowers all of one form. Bracteoles of the fruit 5–7 mm long, 3.0–4.5 mm wide, deltoid to narrow-trullate, margins above the lateral angler entire or shallowly lobed, dorsal surface mealy, smooth or with 2–4 protuberances. Seed black, shining smooth, lenticular or dark reddish-brown and flattened. Flowering and/or fruiting Jan.-May.

Tas. (TNS, TSE); also naturalized in NSW, Vic.; native to Eurasia, N Africa & widely naturalized including in New Zealand. An occasional weed on roadsides and in cultivated and waste areas, mostly coastal but up to c. 500 m alt. Rodway (1903) described two varieties under this species: viz. var. *angustifolia* Rodway and var. *littoralis* Rodway. Due to the poor nature of the descriptions and that no specimens were cited the names can not be applied (see Wilson 1984).

4 * ? *Atriplex australasica* Moq., *Chenop. Monogr. Enum.* 59 (1840)

Native Orache

Atriplex patula var. *gunnii* Aellen, *Bot. Jahrb. Syst.* 68(5): 385 (1938). *Atriplex patula* var. *serratifolia* Aellen, *Bot. Jahrb. Syst.* 68(5): 385 (1938).

Illustrations: Wilson, *Fl. Australia* 4: 92, fig. 20a [fruit] (1984); Walsh, *Fl. Victoria* 3: 139, fig. 27d (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 213 (2000).

Monoecious annual up to c. 1 m high, spreading to erect; stems and branches prominently ribbed. Leaves alternate, petiolate; lower leaves lanceolate to narrow-rhombic, 5–10 mm long, 1.5–4.0 mm wide, entire or with a pair of forwardly-directed basal lobes, glabrous or mealy beneath; upper leaves mostly linear to linear-lanceolate, progressively smaller. Inflorescence spike-like or narrowly paniculate, male and female flowers intermixed in small clusters. Bracteoles of the fruit 2–4 mm long and wide, deltoid, mealy at first, glabrous and shining in fruit, venation prominent, interveinal areas minutely reticulate in the lower half, dorsal area smooth or with 2 warty protuberances; smaller bracteoles with entire margins, seed within black, shining, c. 1.5 mm diam., lenticular; larger bracteoles with shallowly toothed margins, the seed within red-brown, c. 2 mm diam., flattened. Fruiting Feb.-Apr.(-May. in Vic.).

Tas. (FUR/TNS°, TSE); native to SA, NSW, Vic. An interstate native that may be sparingly naturalized or, if native, quite rare in Tasmania. Collected in 1833 in the Launceston area (see Wilson 1984) and since then again in the Derwent estuary (1998 & 2004). Interstate the species occurs on the margins of brackish lakes and in coastal and estuarine areas. Similar to and easily confused with *A. patula*.

5 * *Atriplex semibaccata* R.Br., *Prodr. Fl. Nov. Holl.* 406 (1810)

Berry Saltbush, Creeping Saltbush

Atriplex denticulata Moq., *Prodr.* (Candolle) 13(2): 97 (1849). *Atriplex flagellaris* Wootton & Standl., *Contr. U.S. Natl. Herb.* 16: 119 (1913). *Atriplex neurivalvis* Domin, *Biblioth. Bot.* 89(4): 619 (1930). *Atriplex semibaccata* var. *appendiculata* Aellen, *Bot. Jahrb. Syst.* 68(5): 411 (1938). *Atriplex semibaccata* var. *gracilis* Aellen, *Bot. Jahrb. Syst.* 68(5): 412 (1938).

Illustrations: Cunningham et al., *Plants of Western New South Wales* 242, fig. 44(25) (1982); Walsh, *Fl. Victoria* 3: 139, fig. 27q (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 213 (2000); Richardson et al., *Weeds of the South-East, an Identification Guide for Australia* 222 (2006).

Prostrate or decumbent, monoecious perennial herb, often forming mats to 1 m diam. and 40 cm high, with deep taproot; branches ribbed. Leaves thin, subsessile, 6–20(–25) mm long, 2–7(–15) mm wide, oblong-elliptic, margins sinuate or entire, adaxial surface glabrescent, abaxial surface scurfy, the venation finely reticulate. Male flowers in small clusters in the upper leaf axils. Female flowers monomorphic, in axillary clusters along the stem. Bracteoles of the fruit 2–5 mm long and wide, rhomboid, glabrous to sparsely mealy, entire or with 1–4 teeth on each margin in the free portion, veins prominent. Seed brown to dark brown, c. 1.5–2.0 mm diam., lenticular, flattened. Fruiting Sep.-Dec. (Victoria).

Tas. (TSE); native to WA, SA, Qld, NSW, Vic. Apparently introduced into Tasmania for grazing in saline areas (Walsh 1996). Known only from a single specimen collected from Triabunna in 1903. Intermediates between *A. semibaccata* and *A. suberecta* are known in Victoria (APNI).

6 *Atriplex suberecta* I. Verd., *Bothalia* 6(2): 418 (1954)

Lagoon Saltbush

Illustrations: Wilson, *Fl. Australia* 4: 93, fig. 21a [fruit] (1984); Walsh, *Fl. Victoria* 3: 139, fig. 27s (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 216 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 112 (2001); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 222 (2006).

Sprawling to erect monoecious annual or perennial herb up to 50 cm high; stems slightly ribbed to smooth. Leaves shortly petiolate; lamina 6–55 mm long, 5–25 mm wide, rhombic to ovate, coarsely sinuate-toothed, adaxial surface glabrescent, abaxial surface scurfy, venation finely reticulate. Male flowers in terminal and subterminal clusters. Female flowers monomorphic, in axillary clusters along the stem and a few at the base of the male clusters. Bracteoles of the fruit shortly stipitate, 2–5 mm long, 2–3 mm wide, rhomboid, convex, thickened, vesicular-papillose, fused in the lower half, margin 2–4 toothed in the free portion, apex acute. Seed red-brown, c. 1.5 mm wide, lenticular, flattened. Flowering and/or fruiting throughout the year

Tas. (FUR, TSE); also WA, SA, NSW, Vic. Found on the islands in the Furneaux Group and isolated collections made from roadsides in the Hobart area. Intermediates between *A. semibaccata* and *A. suberecta* are known in Victoria (APNI).

7 *Atriplex paludosa* R.Br., *Prodr. Fl. Nov. Holl.* 406 (1810), subsp. **paludosa**

Marsh Saltbush

Atriplex paludosa subsp. *eupaludosa* Aellen, *Bot. Jahrb. Syst.* 68(5): 402 (1938), *nom. inval.* *Atriplex paludosa* subsp. *tridentata* Aellen, *Bot. Jahrb. Syst.* 68(5): 405 (1938).

Illustrations: Walsh, *Fl. Victoria* 3: 139, fig. 27x (1996); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 111 (2001).

Decumbent or sprawling, predominantly dioecious shrubs to 3 m high; stems slightly ribbed to smooth. Leaves narrowing to a short petiole, 1.2–4.0 cm long, 2–9 mm wide, narrow-elliptic, acute, entire or shallowly lobed, adaxial surface glabrous, abaxial surface white-scaly. Male flowers in ± distant globular clusters forming spikes or panicles at the tips of the branches. Female flowers monomorphic, in clusters in upper leaf axils or in terminal spikes or panicles. Bracteoles of the fruit sessile or on a short stipe, up to 4(–10?) mm long, 3(–10) mm wide, triangular, acute, somewhat thick, scaly, lacking dorsal appendages. Mature seed not seen. Flowering and/or fruiting most of the year.

Tas. (FUR, KIN, TSE, TWE); also SA, Vic. Locally common on the landward edge of saltmarshes in coastal and estuarine localities. The species has 4 subspecies; the other subspecies, subsp. *baudinii* (Moq.) Aellen, subsp. *cordata* (Benth.) Aellen (based on var. *cordata* Benth.; *A. reniformis* R.Br. is probably a synonym of this taxon) and subsp. *moquiniana* (Webb ex. Moq.) Parr-Sm., are confined to Western Australia and South Australia and have leaves that are grey-mealy on both surfaces.

8 *Atriplex cinerea* Poir., *Encycl. (Lamarck) Suppl.* 1: 471 (1811)

Grey Saltbush, Barilla, Coast Saltbush

Atriplex elaeagnoides Moq., *Chenop. Monogr. Enum.* 65 (1840); *A. cinerea* var. *elaeagnoides* (Moq.) Moq., *Prodr.* (Candolle) 13(2): 101 (1849). *Neopreissia cinerea* (Poir.) Ulbr., *Nat. Pflanzenfam. ed. 2 [Engler & Prantl]* 16c: 520, fig. 195 (1934). *Atriplex halimus* L. var. *adscendens* Nees, *Pl. Preiss.* 1(4): 633 (1845); *Atriplex cinerea* var. *adscendens* (Nees) H.Eichler, *Suppl. Black's Fl. S. Austral. ed. 2* 108 (1965). *Atriplex cinerea* f. *appendiculata* Aellen, *Bot. Jahrb. Syst.* 68(5): 394 (1938). *Atriplex cinerea* var. *globulosa* Aellen, *Bot. Jahrb. Syst.* 68(5): 396 (1938). *Atriplex cinerea* var. *palmata* Aellen, *Bot. Jahrb. Syst.* 68(5): 394 (1938).

Illustrations: Wilson, *Fl. Australia* 4: 93, fig. 21q [fruit] (1984); Walsh, *Fl. Victoria* 3: 139, fig. 27y (1996); Corrick & Fuhrer, *Wildflowers of Victoria* 55, fig. 193 (2000); Jacobs, *Fl. New South Wales* 1, rev. edn: 211 (2000);

Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 111 (2001); Woolmore *et al.*, *King Island Flora* 37 (2002); Whiting *et al.*, *Tasmania's Natural Flora* 93 (2004).

Spreading to erect dioecious or monoecious shrubs to 1.5 m high; stems with a silver-grey scurfy sheen, slightly ridged to smooth. Leaves petiolate; lamina 1.5–8.0 cm long, 8–25 mm wide, narrow-lanceolate, lanceolate, elliptical or trullate, margins entire or, in trullate leaves, with one or two short blunt lobes, both surfaces with a silver-grey scurfy sheen. Male flowers yellow or reddish-purple, in dense clusters 3–7 mm diam. in dense or interrupted spikes or panicles; in monoecious plants a few female flowers included in the male clusters and solitary or in pairs in leaf axils below the male inflorescences. Female plants: flowers sessile or subsessile in axillary clusters in compact leafy inflorescences at the tips of the branches. Bracteoles of the fruit to 10 mm long and wide, broadly rhomboid, subsessile or with a short broad stipe, free to the middle, the base swollen and hardened, mealy. Seed red-brown, c. 1.5–2.0 mm wide, lenticular, flattened. Flowering and/or fruiting most of the year.

Tas. (FUR, KIN, TNS, TSE, TWE); also WA, SA, NSW, Vic.; naturalized in New Zealand. A widespread coastal species that is found in coastal and estuarine communities on sand and/or shingle.

9 *Atriplex billardierei* (Moq.) Hook.f., *Bot. Antarct. Voy. II. (Fl. Nov.-Zel.)* 1: 215 (1853) [as *A. billardieri*]

Glistening Saltbush

Obione billardierei Moq., *Chenop. Monogr. Enum.*, 72 (1840) [as *O. billardieri*]; *Theleophyton billardierei* (Moq.) Moq., *Prodr. (Condolle)* 13(2): 116 (1849) [as *T. billardieri*]. *Atriplex chrystallina* Hook.f., *Hooker's J. Bot. Kew Gard. Misc.* 6: 279 (1847); *A. crystallina* Hook. *sensu* L.Rodway, *Tasman. Fl.* 157 [in synonymy] (1903), orth. var.

Illustrations: Wilson, *Fl. Australia* 4: 93, fig. 21u [fruit] (1984); Walsh, *Fl. Victoria* 3: 139, fig. 27cc (1996); de Lange *et al.*, *New Zealand J. Bot.* 38: 560 – fig. 6 [habit], 561 – fig. 7 [leaves], fig. 8 [bracteole & seeds] (2000).

Slender, prostrate, short-lived, perennial, monoecious herb; branches, leaves, perianth of male flowers and bracts subtending female flowers ± densely covered in vesicular papillae; branches up to 50 cm long, pale brown or yellowish, glabrescent. Leaves alternate, sessile or subsessile, 5–13 mm long, 2–7 mm wide, ovate-elliptic, fairly fleshy, entire or obscurely lobed; the vesicular papillae collapsing with age, becoming scurfy, sand-grains often adhering to the surfaces. Male flowers c. 2.5 mm diam., solitary and axillary or in axillary clusters towards the apex of the branches; tepals oblong, obtuse; stamens 5, long-exserted; pistillode present. Female flowers shortly pedicellate, solitary or 2 or 3 together in lower leaf axils; bracteole united at the base, at maturity c. 5 mm long, c. 3 mm wide. Seed 2 mm diam. Flowering and/or fruiting throughout the year.

Tas. (FUR, KIN, TNM, TNS, TSE, TSR, TWE); also Vic. (extinct), New Zealand. A widespread though localised species found on sandy beaches near high water level in most coastal regions. The species appears to be extinct over a large part of its former range (eg. in Vic., South Island & Stewart Islands of New Zealand) and is extant only in Tasmania and the Chatham Island group (New Zealand) (de Lange *et al.* 2000). A detailed account of the species is given by de Lang *et al.* (2000). This species is unusual in the genus and is the sole representative of *Atriplex* subgenus *Theleophyton* (Moq.) Volkens (based on *Theleophyton*) (see Wilson 1984; de Lang *et al.* 2000).

6 CHENOPODIUM

Chenopodium L., *Sp. Pl.* 1: 218 (1753).

Synonymy: *Blitum* L., *Sp. Pl.* 1: 4 (1753).

Annual or perennial herbs or occasionally weak monoecious, shrubs; mealy due to sessile vesicular hairs or with glandular or septate hairs, sometimes glabrous; stems often ribbed, the furrows contrasting with the

whitish ribs. Leaves mostly alternate above, basal leaves sometimes opposite, petiolate, flat, fairly thin, variable in shape, entire or dissected. Inflorescence of flower clusters in terminal spikes or panicles, ebracteate; all flowers bisexual, or the terminal flowers male or bisexual and lateral flowers female. Flowers small. Tepals (2)3–5, herbaceous, incurved, fused at base, \pm accrescent. Stamens 1–5. Fruit with thin, membranous or rarely succulent pericarp. Seed horizontal or vertical, lenticular to sub-globular, usually falling enclosed in the perianth.

A genus of 80–100 species, found world-wide and often in coastal situations. In Australia there are 23 species (9 naturalized). There are a number of subgenera and sections recognised for *Chenopodium*: see Wilson (1984) for an outline for Australian taxa. A number of species traditionally placed in *Chenopodium* have been moved to *Dysphania* (see Masyakin & Clemants 2002, 2008; Shepherd & Wilson 2008, 2009).

Key references: Wilson (1983, 1984); Shepherd & Wilson (2008, 2009).

- | | |
|--|----------------------|
| 1. Tepals glabrous; seed horizontal or erect | 2 |
| 1: Tepals mealy, at least when young; seed horizontal | 3 |
| 2. Inflorescence terminal or axillary, of clusters of flowers arranged in short simple or branched spikes | 1 <i>C. glaucum</i> |
| 2: Inflorescence axillary, of clusters of flowers arranged in globular heads | <i>C. foliosum</i> + |
| 3. Plant with an unpleasant odour resembling rotting fish; tepals united, completely enclosing the seed | 4 <i>C. vulvaria</i> |
| 3: Plant without an unpleasant odour; tepals not united or united to midway, not or enclosing fruit | 4 |
| 4. Seed prominently pitted in concentric lines; tepals opening widely in fruit, with a prominent midrib (Flinders Is.; presumed extinct) | 5 <i>C. erosum</i> |
| 4: Seed smooth or minutely pitted; tepals enclosing the seed (widespread) | 5 |
| 5. Leaves light grey-green to yellowish; upper leaves narrow-lanceolate to elliptic, usually entire; seed margin rounded | 2 <i>C. album</i> |
| 5: Leaves dull grey-green; upper leaves narrow-trullate, shallowly toothed; seed margin acute | 3 <i>C. murale</i> |

+ *Chenopodium foliosum* (Moench) Asch. is a native of Eurasia. It is grown for the edible leaves and fruit, and has been collected once in the Hobart area (2008) on a sealed driveway. It is not considered to have naturalised in Tasmania

1 *Chenopodium glaucum* L., *Sp. Pl.* 1: 220 (1753) *Oak-leaf Goosefoot, Pale Goosefoot, Glaucous Goosefoot*

Chenopodium ambiguum R.Br., *Prodr. Fl. Nov. Holl.* 407 (1810); *C. glaucum* var. *ambiguum* (R.Br.) Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1(4): 313 (1857); *C. glaucum* subsp. *ambiguum* (R.Br.) Murr. & Thell. ex Thell., *Mem. Soc. Sci. Nat. Cherbourg* 38: 196 (1912). *Chenopodium littorale* Moq., *Chenop. Monogr. Enum.* 24 (1840), *nom. illeg., non* (L.) Thunb. (1845). *Chenopodium ambiguum* var. *majus* Moq., *Prodr. (Candolle)* 13(2): 67 (1849). *Chenopodium ambiguum* var. *minus* Moq., *Prodr. (Candolle)* 13(2): 67 (1849); *C. glaucum* f. *minus* (Moq.) Aellen, *Vierter Beitrag zur Adventiv-Flora von Solothurn und Umgeburg* 16 (1931). *Chenopodium glaucum* var. *littorale* Rodway, *Tasman. Fl.* 155 (1903).

Illustrations: Walsh, *Fl. Victoria* 3: 150, fig. 28a (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 218 (2000); Harris et al., *One Hundred Islands: the Flora of the Outer Furneaux* 133 (2001); Richardson et al., *Weeds of the South-East, an Identification Guide for Australia* 224 (2006).

Prostrate or ascending annual; stems up to 1 m long, glabrous, ridged, green to reddish. Leaves fleshy; petiole to 5 cm long, flattened, on lower leaves as long as lamina; lamina up to 6 cm long, trullate, ovate-oblong or lanceolate, margins entire to sinuate-dentate or irregularly lobed, adaxial surface at first brown \pm mealy, then glabrescent or glabrous and dark green, abaxial surface densely mealy, grey or white. Inflorescence terminal or axillary, of small dense clusters of flowers arranged in short simple or branched spikes. Flowers bisexual or female, c. 1 mm diam. Tepals (4)5 in terminal flowers, 3–4 in lateral flowers, free to the base, glabrous, obovate, cucullate, green to reddish, margins membranous. Stamens 1(–5) in terminal

flowers, (0)1–(3) in lateral flowers. Fruit horizontal or erect, 1.0–1.5 mm diam., testa membranous, free. Seed horizontal or erect, dark red-brown to black, glossy, lenticular, margin rounded. Flowering and/or fruiting Dec.–May.

Tas. (FIN, KIN, TSE, TSR, TWE); also WA, SA, Qld, NSW, Vic; cosmopolitan. A widespread species found on sandy, shingle or rocky shores often in strand debris, edges of lagoons and inland saline lagoons.

2 * *Chenopodium album* L., *Sp. Pl.* 1: 219 (1753)

Fat Hen, White Goosefoot

Chenopodium lanceolatum R.Br., *Prodr. Fl. Nov. Holl.* 407 (1810), *nom. illeg., non Willd.* (1809); *C. browneanum* Roem. & Shult., *Syst. Veg. ed.* 16, 6: 275 (1820). *Chenopodium album* var. *hastatum* C.Klinger, *Fl. Preuss.* 2: 130 (1866); *C. album* subsp. *hastatum* (Klinger) Graebn., *Syn. Mitteleur. Fl.* [Ascherson & Graebner] 5(1): 59 (1913). *Chenopodium striatiforme* Murr., *Deutsche Bot. Monatsschr.* 19: 50 (1901); *C. album* var. *striatiforme* (Murr.) Murr., *Magyar. Bot. Lapok.* 1: 364, fig. 23a-c (1902), *nom. illeg.* *Chenopodium probstii* Aellen, *Mitt. Naturf. Ges. Solothurn* 20: 80 (1928).

Illustrations: Cunningham *et al.*, *Plants of Western New South Wales* 259 (1982); Wilson, *Fl. Australia* 4: 136, fig. 23j-n (1984); Walsh, *Fl. Victoria* 3: 150, fig. 28c (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 220 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 133 (2001); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 223 (2006).

Erect annual to 1 m high, grey mealy; stems glabrous, ridged, furrows sometimes pink-tinged. Leaves: petioles shorter or longer than the lamina; lamina up to 4.5 cm long and 3 mm wide, rather thin, trullate to ovate-cuneate, margins entire or irregularly sinuate-dentate, adaxial surface glabrous, abaxial surface sparingly to densely mealy; upper leaves narrow-lanceolate to elliptic, usually entire. Inflorescence paniculate, the glomerules densely clustered or ± distant on axillary branches or terminal. Flowers bisexual and female, c. 1.5 mm diam. Tepals 5, united in the lower half, mealy, keeled, margins hyaline. Stamens 5. Fruit enclosed within the perianth, 1.1–1.3 mm diam., pericarp minutely papillose, easily removed. Seed horizontal, black, glossy, margin rounded. Flowering and/or fruiting Nov.–May.

Tas. (BEL, FUR, TNM, TSE, TSR); also naturalized in all Australian states; native to Eurasia & N Africa, now a cosmopolitan weed. A common and widespread weed of roadsides, waste and cropping areas. A number of subspecific taxa are recognised for the species in Europe.

3 * *Chenopodium murale* L., *Sp. Pl.* 1: 219 (1753)

Green Fat Hen, Nettle-leaf Goosefoot, Sowbane

Chenopodium biforme Nees, *Pl. Preiss.* 1(4): 636 (1845); *C. murale* var. *biforme* (Nees) Moq., *Prodr. (Candolle)* 13(2): 69 (1849). *Chenopodium congestum* Hook.f., *Hooker's J. Bot. Kew Gard. Misc.* 6: 280 (1847); *Rhagodia congesta* (Hook.f.) Moq., *Prodr. (Candolle)* 13(2): 51 (1849); *R. baccata* var. *congesta* (Hook.f.) Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1(4): 312 (1857); *R. billardieri* R.Br. var. *congesta* (Hook.f.) Benth., *Fl. Austral.* 5: 153 (1870).

Illustrations: Curtis, *The Student's Flora of Tasmania* 3: 572, fig. 121 (1967); Cunningham *et al.*, *Plants of Western New South Wales* 261 (1982); Wilson, *Nuytsia* 4: 239, fig. 4b [seed] (1983); Wilson, *Fl. Australia* 4: 149, fig. 25b [seed] (1984); Walsh, *Fl. Victoria* 3: 150, fig. 28e (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 220 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 134 (2001); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 225 (2006).

Erect or rare prostrate annual to 1m high, branches often wide spreading; stems ridged, glabrous, green or often purplish-red. Leaves thin; petiole shorter or longer than the lamina; lamina 1–8 cm long, 0.5–5.0 cm wide, broadly triangular or trullate, base wide to narrow-cuneate, margins sinuate-toothed, the teeth antrorse, both surfaces sparsely mealy at first, adaxial surface glabrescent, abaxial surface with scattered vesicular hairs; upper leaves narrower. Inflorescence dense, terminal and axillary panicles. Flowers bisexual or female, c. 1.5 mm diam. Tepals 5, free for ± half their length, mealy at first, glabrescent, obovate, keeled, margins narrowly membranous. Stamens 0 or 5. Fruit 1.2–1.5 mm diam. Pericarp minutely papillose,

adherent to the seed. Seed horizontal, blackish, lenticular, both faces deeply convex, margin keeled, falling enclosed in the perianth. Flowering & fruiting Oct.-Jun.

Tas. (FUR, KIN, TNS, TSE, TWE); also naturalized in WA, SA, Qld, NSW, Vic.; native to S Europe & Asia; cosmopolitan weed in temperate and warm temperate regions. A widespread weed of roadsides, waste areas, cropping areas, and domestic gardens.

4 * *Chenopodium vulvaria* L., *Sp. Pl.* 1: 220 (1753)

Stinking Goosefoot

Chenopodium olidum W.Curtis, *Fl. Londin. (Curtis)* 5: t. 20 (fasc. index) = t. 68 (vol. index) (1788), *nom. illeg.*

Illustrations: Walsh, *Fl. Victoria* 3: 150, fig. 28d (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 219 (2000).

Prostrate or decumbent annual, with strong fishy smell; stems up to 30 cm long, pale green, ridged, mealy. Leaves grey-green; petiole shorter than the lamina; lamina 1–3 cm long, 0.5–1.5 cm wide, ovate to broad-ovate or trullate, acute, margins entire, mealy on both surfaces at first, adaxial surface becoming glabrous. Inflorescence of dense clusters of families in axillary and terminal panicles up to 3 cm long. Flowers bisexual and female, c. 1.2 mm diam. Tepals (4)5, united below, densely mealy, keeled, completely enclosing the fruit. Stamens 5. Fruit lenticular, more deeply convex below than above, keel rounded; pericarp reticulate, easily separated from the seed. Seed horizontal, black, glossy. Flowering and/or fruiting Dec.-Apr.

Tas. (TNM, TSE, TSR); also naturalized in SA, NSW, Vic., New Zealand; native to N Hemisphere. An uncommon weed that has been found in areas around Ross, Lower Marshes and Recherche Bay. Usually found in domestic gardens or fallow paddocks, as well as agricultural areas interstate.

5 † *Chenopodium erosum* R.Br., *Prodr. Fl. Nov. Holl.* 407 (1810)

Illustrations: Wilson, *Nuytsia* 4: 239, fig. 4a [seed] (1983); Wilson, *Fl. Australia* 4: 149, fig. 25a [seed] (1984); Walsh, *Fl. Victoria* 3: 150, fig. 28f (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 219 (2000).

Erect annual to 1.5 m high, almost glabrous. Leaves; petiole to 4 cm long; lamina 4–15(–20) cm long, 0.5–6(–10) cm wide, papery, triangular to ovate, irregularly toothed, green, glabrous. Inflorescence axillary and terminal, a panicle. Flowers bisexual and female, c. 1 mm diam. Tepals 5, slightly mealy when young, glandular-hairy on margins, united only at the base. Stamens (0)5. Pericarp persistent. Seed horizontal, blackish, 1.25–1.5 mm diam., muricate in spiralling or concentric lines, falling free or united with the fruiting perianth. Flowering and/or fruiting Dec.-Feb. [in Vic.].

Tas. (FUR^o); also SA, Qld, NSW, Vic.; naturalized in New Zealand. Known, in Tasmania, only from Robert Brown's collection of the type specimen from the Kent Group in 1804. Interstate, the species grows in damp, disturbed areas, eg. river banks, margins of forests etc (Wilson 1984). The above description was adapted from Wilson (1984), Walsh (1996) and Jacobs (2000) and based on non-Tasmanian material.

7 * ? **DYSPHANIA**

Dysphania R.Br., *Prodr. Fl. Nov. Holl.* 411 (1810)

Synonymy: *Chenopodium* section *Orthosporum* R.Br., *Prodr. Fl. Nov. Holl.* 407 (1810); *Orthosporum* (R.Br.) C.A.Mey ex T.Nees, *Gen. Fl. Germ.* 4: t. 57 (1835). *Ambrina* Spach, *Hist. Nat. Veg. (Spach)* 5: 295 (1836), *nom. illeg.*; *Chenopodium* section *Ambrina* Hook.f., *Gen. Pl.* 3(1): 51 (1880). *Chenopodium* section *Dysphania* (R.Br.) Aellen, *Bot. Jahrb. Syst.* 63: 486 (1930). *Chenopodium* section *Tetrasepala* Aellen, *Bot. Jahrb. Syst.* 63: 490 (1930); *Dysphania* section *Tetrasepala* (Aellen) A.J.Scott, *Bot. Jahrb. Syst.* 100: 218 (1978). *Dysphania* section *Caudatae* A.J.Scott, *Bot. Jahrb. Syst.* 100: 218 (1978).

Annual or perennial, glandular, aromatic monoecious herbs; stems prostrate to suberect, without fleshy articles. Leaves alternate, petiolate, simple, entire or dissected. Inflorescence axillary, a spike or panicle or clusters of flowers. Flowers minute, bisexual and/or unisexual, usually mixed within inflorescence. Tepals 1–

5, free or shortly united, hooded and inflated towards apex in fruit. Stamens 1–2. Pericarp usually thinly membranous. Seed erect to horizontal, globular or laterally compressed.

Once considered to be an Australian genus of 10 species (see Wilson 1984), the genus is now considered to be cosmopolitan with c. 30 species. A number of species traditionally placed in *Chenopodium* have recently been moved to *Dysphania* (see Mosyakin & Clemants 2002, 2008; Shepherd & Wilson 2008, 2009). The recent nomenclatorial history of the genus is complicated (see Shepherd & Wilson 2009) though fortunately this does not affect Tasmanian taxa. The genus is probably not native to Tasmania as *D. pumilio* was first collected in 1912 and *D. glomulifera* in 2008.

Key references: Wilson (1983, 1984); Shepherd & Wilson (2008, 2009).

- | | |
|---|-------------------------|
| 1. Tepals 3; leaf margin smooth | 1 <i>D. glomulifera</i> |
| 1: Tepals 5; leaf margin sinuate or bluntly lobed | 2 <i>D. pumilio</i> |

1 * ? *Dysphania glomulifera* (Nees) Paul G.Wilson, *Nuytsia* 4: 183 (1983), subsp. **glomulifera** *Pigweed*

Atriplex glomulifera Nees, *Pl. Preiss.* 1(4): 634 (1845). *Dysphania myriocephala* Benth., *Fl. Austral.* 5: 165 (1870); *Chenopodium myriocephalum* (Benth.) Aellen, *Bot. Jahrb. Syst.* 63: 488 (1930).

Illustrations: Cunningham *et al.*, *Plants of Western New South Wales* 264 (1982), as *D. littoralis*; Wilson, *Nuytsia* 4: 241, fig. 6a [seed]; 242, fig. 7b, as *D. littoralis* [seed] (1983); Wilson, *Fl. Australia* 4: 155, fig. 26a [seed] (1984); Walsh, *Fl. Victoria* 3: 155, fig. 29a-c (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 223 (2000).

Somewhat fleshy annual aromatic herb; branches spreading, prostrate or weakly erect, to c. 20 cm long. Leaves shortly petiolate; lamina 2–12 mm long, 1.5–3.0 mm wide, spatulate to broadly elliptic, margin smooth, adaxial surface almost glabrous, abaxial surface sparsely pubescent with shortly stalked glandular hairs. Inflorescence an axillary sessile and crowded cluster of flowers; pedicels to 0.25 mm long; each cluster with 1-few bisexual flowers surrounded by mainly female flowers. Bisexual flowers: tepals 3, free or shortly united, obovate; stamens 1–2. Female flowers: tepals 1(2), filiform at base, expanded and spongy above, hooding the developing fruit, generally falling with seed attached. Seed dark red-brown, c. 0.5 mm long, erect, flattened-ovoid, with a narrow flange down one side, smooth or minutely verrucose. Flowering and/or fruiting usually Dec.–Apr. [for. Vic.]; in Tas. fertile collections made in Mar. & May.

Tas. (KIN, TCH); native to all other Australian states. Recently collected on King Island (KIN) and Weasel Plains (TCH). Found growing on the margins of lakes, in areas once inundated with water, and swamps. The species is probably a recent introduction to Tasmania but it is not known if the introduction is natural or anthropomorphic. The above description is largely based on Wilson (1984) and Walsh (1996). There are two subspecies for *D. glomulifera*: the typical, and subsp. *eremea* Paul G.Wilson which is found over large parts of arid Australia.

2 * ? *Dysphania pumilio* (R.Br.) Mosyakin & Clemants, *Ukrayin'k Bot. Zhurn.* 59(4): 382 (2002)

Small Crumbweed, Rough-leaved Goosefoot, Clammy Goosefoot

Chenopodium pumilio R.Br., *Prodr. Fl. Nov. Holl.* 407 (1810); *Blitum pumilio* (R.Br.) Steud., *Nomencl. Bot.*, ed. 2 (Steudel) 1: 210 (1840); *Ambrina pumilio* (R.Br.) Moq., *Chenop. Monogr. Enum.*, 42 (1840). *Blitum glandulosum* Moq., *Prodr. (Candolle)* 13(2): 82 (1849); *Chenopodium glandulosum* (Moq.) F.Muell., *Fragm. (Mueller)* 7(52): 11 (1869); *C. pumilio* f. *glandulosa* (Moq.) Aellen, *Verh. Naturf. Ges. Basel* 44: 315 (1933). *Chenopodium pumilio* var. *oblongifolium* J.M.Black, *Fl. S. Austral. [J.M.Black]*, ed. 2, 2: 289 (1948), *nom. inval.*

Illustrations (usually as *C. pumilio*): Wilson, *Fl. Australia* 4: 148, fig. 24a-e (1984); Kirkpatrick *et al.*, *City Parks & Cemeteries: Tasmania's Remnant Grasslands & Grassy Woodlands* 115, pl. 25-3 (1988); Walsh, *Fl. Victoria* 3: 150, fig. 28m (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 221 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 134 (2001); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 225 (2006).

Prostrate or decumbent, aromatic annual or short-lived perennial herb; branches to 50 cm long, green or reddish with ribs of contrasting colour, septate-hairy. Leaves: petiole to 12 mm long; lamina to 3 cm long, ovate to obovate, margins sinuate or bluntly lobed, adaxial surface with septate hairs and occasional sessile glands, abaxial surface glandular, septate-hairy on the veins. Flowers in axillary clusters, bisexual or female, 0.75–1 mm long on pedicels c. 0.25 mm long. Tepals 5, linear-lanceolate, united only at the base, with a few septate hairs down the middle and at the apex with sessile glands. Stamens 0–1. Fruit shed enclosed in the perianth; pericarp membranous. Seed dark brown to black, erect, lenticular, margin acute to rounded, pericarp adherent or easily detached. Flowering and/or fruiting Dec.–May.

Tas. (FUR, KIN, TNM, TSE); native to all Australian mainland states; widely naturalized, including in New Zealand. Widespread in the eastern part of the state in coastal and inland areas at lower altitudes including coastal sands, rocky islets, suburban footpaths and pasture paddocks. As the species was not recorded in earlier Tasmanian floras and with the first known Tasmanian collection being made in 1912 it is thought that it may be an introduction from interstate.

8 EINADIA

Einadia Raf., *Fl. Tellur.* 4: 121 (1838).

Synonymy: *Suaeda* section *Schanginia* Volken, *Nat. Pflanzenfam. [Engler & Prantl]* 1a: 80 (1893). *Chenopodium* section *Polygonoidea* Aellen, *Feddes Repert. Spec. Nov. Regni Veg.* 69: 69 (1964).

Herbs or weakly woody subshrubs, monoecious; branches lax, scrambling, younger parts mealy. Leaves opposite, sub-opposite or alternate, petiolate, linear to broad hastate or sagittate, mealy when young. Inflorescence of flowers clustered in glomules arranged in spikes, racemes or panicles; terminal flowers usually bisexual, lateral flowers female. Tepals (4)5, fused at base. Stamens 1–3. Fruiting pericarp dry or becoming swollen and succulent, forming a red or orange berry (bacca). Seed horizontal, lenticular.

A genus of 6 species; 4 endemic to Australia, 2 to New Zealand.

Key references: Wilson (1983, 1984).

1 *Einadia nutans* (R.Br.) A.J.Scott, *Feddes Repert.* 89: 3 (1978), subsp. **nutans**

Climbing Saltbush, Nodding Saltbush

Rhagodia nutans R.Br., *Prodr. Fl. Nov. Holl.* 408 (1810). *Rhagodia chenopodioides* Moq., *Chenop. Monogr. Enum.* 11 (1840). *Chenopodium triangulare* subsp. *convolvulinum* Murr., *Allg. Bot. Z. Syst.* 16: 56 (1910); *C. triangulare* var. *convolvulinum* (Murr.) Maiden & Betche, *Census N.S.W. Pl.* 66 (1916). *Rhagodia nutans* var. *fallacina* Domin, *Biblioth. Bot.* 89(4): 619 (1930).

Illustrations: Wilson, *Nuytsia* 4: 239, fig. 4e [seed] (1983); Wilson, *Fl. Australia* 4: 149, fig. 25e [seed] (1984); Walsh, *Fl. Victoria* 3: 155, fig. 29e (1996); Corrick & Fuhrer, *Wildflowers of Victoria* 55, fig. 195 (2000); Jacobs, *Fl. New South Wales* 1, rev. edn: 225 (2000); Woolmore et al., *King Island Flora* 37 (2002); Gilfedder et al., *The Nature of the Midlands* 134 (2003); Whiting et al., *Tasmania's Natural Flora* 93 (2004).

Mound-forming or scrambling perennial herb, stems up to 60 cm long, sometimes woody at the base, much-branched and interwoven, ribbed, the younger parts mealy. Leaves opposite, sub-opposite or alternate; lamina to 3.2 cm long, to 1.2 cm wide, ovate-triangular, hastate or occasionally sagittate at the base; upper leaves lanceolate, base cuneate, apex acute or occasionally in young leaves obtuse; sparsely to moderately mealy when young, adaxial surface glabrescent. Inflorescences of clusters of flowers in short lateral or terminal spikes or racemose panicles. Terminal flowers bisexual, lateral flowers female. Perianth depressed, globular, segments (4)5, oblong, mealy at first, glabrescent, slightly accrescent. Stamens 1–2(3). Ovary ovoid, glabrous; stigmas 2–3. Fruit with perianth inflated, succulent, orange or red, depressed globular, c. 4 mm in diameter, exceeding the perianth. Seed black, lenticular, margin rounded, areolate-reticulate. Flowering and/or fruiting throughout the year.

Tas. (BEL, FUR, TNM, TSE, TSR); also WA, NT, SA, Qld, NSW, Vic.; naturalized in New Zealand. A widespread taxon in the eastern half of the island of Tasmania where found in dry, usually rocky and/or coastal situations. It appears to be absent from the islands of Bass Strait. Wilson (1983, 1984) states that this species is polymorphic with the main variants being described as 4 subspecies which are distinguished on leaf and fruit shape and seed size.

9 RHAGODIA

Rhagodia R.Br., *Prodr. Fl. Nov. Holl.* 408 (1810).

Sprawling perennial dioecious shrubs; young branches and leaves often with vesicular hairs producing a mealy or scurfy indumentums; stems woody. Leaves opposite or alternate, simple, entire or lobed at the base. Inflorescence of flowers in clusters usually arranged in panicles or spike-like thyrses; bracts small or absent. Flowers small. Tepals 5, fused at base, usually enlarging and spreading in fruit. Male flowers: stamens 5, filaments \pm flattened, united at the base into a thickened disc; pistillodes small. Female flowers: staminodes absent or present (when flowers terminal). Fruit a red or yellow berry, pericarp fleshy, depressed-globular. Seed single, horizontal, flattened.

An endemic Australian genus of 11 species.

Key references: Wilson (1983, 1984).

1 *Rhagodia candolleana* Moq., *Chenop. Monogr. Enum.* 10 (1840), subsp. **candolleana**

Coastal Saltbush, Seaberry Saltbush

Rhagodia baccata var. *candolleana* (Moq.) Moq., *Prodr. (Candolle)* 13(2): 50 (1849). *Rhagodia baccata* var. *parvifolia* Moq., *Prodr. (Candolle)* 13(2): 50 (1849). *Chenopodium furfuraceum* Moq., *Prodr. (Candolle)* 13(2): 64 (1849). *Rhagodia billardierei sensu* G.Bentham, *Fl. Austral.* 5: 152 (1870), *p.p.*; L.Rodway, *Tasman. Fl.* 154 (1903), *non* R.Br. (1810). *Rhagodia baccata sensu* W.M.Curtis, *The Student's Flora of Tasmania* 3: 570 (1967), *non* (Labill.) Moq. (1849).

Illustrations: Walsh, *Fl. Victoria* 3: 155, fig. 29h-i (1996); Corrick & Fuhrer, *Wildflowers of Victoria* 56, fig. 201 (2000); Jacobs, *Fl. New South Wales* 1, rev. edn: 237 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 215 (2001); Woolmore *et al.*, *King Island Flora* 38 (2002); Whiting *et al.*, *Tasmania's Natural Flora* 94 (2004).

Prostrate to erect shrub to 2(-3) m high; young stems and branches mealy, stems glabrescent, ribbed, sometimes reddish. Leaves alternate to subopposite; lamina 5-30 mm long, thin to somewhat fleshy, elliptic, ovate-lanceolate or trullate with a single short blunt lobe at each angle, apex obtuse, margins often narrowly recurved, adaxial surface sparingly vesicular to glabrous, abaxial surface mealy at first, becoming silver-scurfy as the vesicles collapse. Panicles terminal, axis and branches mealy, branches spreading at an angle of c. 45° from the axis. Tepals mealy abaxially, midrib thickened. Male flowers c. 4.5 mm in diam.; filaments and disc with capitate hairs; pistillode with short erect stigmas. Female flowers c. 2 mm diam.; staminodes membranous; stigmas spreading. Fruit: developing fruit papillose; mature fruit dark red to purple, fleshy, c. 4.5 mm diam. Flowering all year; fruiting mainly Dec.-Mar.

Tas. (BEN, FUR, KIN, TNM, TNS, TSE, TSR, TWE); also WA, SA, NSW, Vic. Found in all coastal regions (apart from Macquarie Is.) in coastal shrubberies and herbfields, on dunes and rocky outcrops. Insect infestations in male flowers may result in the development of a thickened pedicel and the enlargement of the pistillode, making the plant appear monoecious. *Rhagodia candolleana* subsp. *argentea* Paul G.Wilson occurs in north-western South Australia and can be distinguished from the typical variety by the hastate leaves with a silvery sheen on the abaxial surface.

10 THRELKELDIA

Threlkedia R.Br., *Prodr. Fl. Nov. Holl.* 409 (1810).

Weakly woody short-lived perennials, monoecious; branchlets prostrate to procumbent, without fleshy articles, glabrous except for short axillary pubescence. Leaves alternate, sessile, fleshy, often crowded, linear to terete, glabrous, somewhat fleshy. Flowers axillary, solitary, bisexual. Tepals 3–5, fused at base; tube fleshy, glabrous ovoid or cylindrical, hardening at the fruiting stage; lobes glabrous or minutely pubescent along margins. Stamens 3–5. Fruiting perianth tubular or urceolate, at least partially woody, lacking appendages; pericarp membranous below, thickened at apex. Seed enclosed in the hardened perianth tube, horizontal to vertical.

An endemic Australian genus of 2 species: one, *T. diffusa*, widespread across southern Australia, and the other *T. inchoate* (J.M.Black) J.M.Black of Central Australia. *Threlkedia* is closely related to *Enchylaena* R.Br., *Maireana* Moq., *Neobassia* A.J.Scott, *Osteocarpum* F.Muell. and *Sclerolaena* R.Br. (all endemic to Australia; see Wilson 1984). Cabrera *et al.* (2009) argues these genera should be combined though they presented no formal taxonomic work.

Key reference: Wilson (1984).

1 *Threlkedia diffusa* R.Br., *Prodr. Fl. Nov. Holl.* 410 (1810)

Coast Bonefruit

Threlkedia diffusa var. *latifolia* Benth., *Fl. Austral.* 5: 197 (1870). *Threlkedia drupata* Diels, *Bot. Jahrb. Syst.* 35: 186, fig. 21d-f (1904).

Illustrations: Walsh, *Fl. Victoria* 3: 173, fig. 31c (1996); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 239 (2001).

Prostrate to decumbent perennial, glabrous except for a few caducous hairs in the leaf axils and at the basal margins of young leaves. Stems up to 40 cm long, ridged, green or occasionally reddish. Leaves alternate, 5–20 mm long, linear to oblanceolate, fleshy, apex acute, often recurved. Flowers c. 1.5 mm long at anthesis. Tepals 3–5, basal tube c. 1 mm long, lobes 3–5, c. 0.5 mm long, membranous, triangular, margins densely ciliate. Stamens 3; anthers c. 0.5 mm long. Styles c. 1mm long. Fruiting perianth 2.5–3.5 mm long, ovate to dolioform, thinly fleshy and often reddish externally, woody within, the apex of the tube extending beyond the lobes as a shallow 2–4 lobed rim. Seed enclosed in the lower half of the hardened perianth, obliquely erect. Flowering and/or fruiting most of the year

Tas. (FUR); also WA, SA, Vic. Known from many of the islands of eastern Bass Strait including those of the Clark Island, Hogan Island, Kent Island and Furneaux Groups. A poorly collected species on the island of Tasmania: recorded in the 19th Century from near George Town and in 2001 from Five Mile Bluff (NE of George Town). Found in sandy and rocky shoreline communities.

11 * BETA

Beta L., *Sp. Pl.* 1: 222 (1753).

Annual to perennial herbs, glabrous, monoecious; stems erect, without fleshy articles. Leaves petiolate, flat, entire, not spine tipped. Flowers bisexual, solitary or in small cymes arranged in branched spike like inflorescences, each flower or cluster subtended by a bract and 2 bracteoles. Tepals 5, shortly tubular at base, thickened and connate with ovary in lower part. Stamens 5. Fruits 1-seeded, often in glomerules, adhering by the hardened and swollen receptacles and tepals. Seed horizontal.

A genus of about 7 species of Eurasia; 1 naturalized in Australia.

1 * Beta vulgaris L., *Sp. Pl.* 1: 222 (1753), subsp. **maritima** (L.) Arcang., *Fl. Advent. Montpellier* 189 (1912)

Wild Beet

Beta maritima L., *Sp. Pl.* edn 2, 1: 322 (1762); *B. vulgaris* var. *maritima* (L.) Moq., *Prodr. (Candolle)* 13(2): 56 (1849). *Beta vulgaris* var. *perennis* L., *Sp. Pl.* 1: 222 (1735).

Illustrations: Walsh, *Fl. Victoria* 3: 187, fig. 33a-b (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 216 (2000).

Annual to perennial herb, root not conspicuously swollen; stem decumbent to erect, up to 80 cm high. Basal leaves up to 20 cm long, petiole ± as long as the blade; blade ovate to rhomboid, somewhat fleshy, margins undulate; cauline leaves progressively smaller and becoming sessile or subsessile. Flower solitary or in clusters of 2–4. Tepal lobes up to 2.5 mm long, uncurved strongly keeled above, swollen and corky at the base. Fruits fused at the base, the cluster falling together. Flowering and/or fruiting most of the year

Tas. (FUR?°, TSE); also naturalized in SA, NSW, Vic.; native to Eurasia. An occasional weed near the Derwent Estuary. The taxon has apparently also been collected from Flinders Island (see AVH). The species is usually found in disturbed areas near the shoreline. The various cultivated forms of *B. vulgaris* subsp. *vulgaris* include Silver Beet, Beetroot, Sugar Beet and Fodder Beets. This subspecies is distinguished from *B. vulgaris* subsp. *maritima* by having a swollen taproot and up to eight flowers per cluster in the inflorescence.

12 SARCOCORNIA

Sarcocornia A.J.Scott, *Bot. J. Linn. Soc.* 75: 366 (1978).

Low shrubs, undershrubs or perennials, monoecious or dioecious; glabrous, succulent, apparently leafless; young stems fleshy, appearing articulated with cylindrical segments (articles), the apex of each article cup-shaped or shortly 2-lobed. Inflorescence terminal, spike-like, the flowers in cymules of 3–12 in the axils of opposite fleshy bracts, the pairs of cymules forming false whorls around the axis. Perianth succulent, 3–4-lobed the two lateral lobes vertical, the adaxial lobe small, semi circular and occasionally a small abaxial lobe, the lobes fused at anthesis; stamens and stigma exerted through a vertical slit. Stamens 2. Fruiting perianth spongy, usually falling entire but occasionally splitting vertically, releasing the seed. Seed ovate to orbicular, flattened.

A cosmopolitan genus of 16 species with 3 native to Australia. The third Australian species, *S. globosa* Paul G.Wilson, is restricted to the margins of salt lakes in inland areas of south-western Western Australia.

Key references: Wilson (1980, 1984).

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| 1. Sterile branches green or red; fruiting spikes 4–6 mm diam.; seed with slender, spreading or short, curved hairs (estuarine salt flats & rocky shores) | 1 <i>S. quinqueflora</i> |
| 1: Sterile branches usually glaucous; fruiting spikes 5–8 mm diam.; seed with papillose hairs (estuarine salt flats) | 2 <i>S. blackiana</i> |

1 *Sarcocornia quinqueflora* (Bunge ex. Ung.-Sternb) A.J.Scott, *Bot. J. Linn. Soc.* 75: 368 (1977)

Beaded Glasswort, Glasswort, Marsh Samphire

Salicornia quinqueflora Bunge ex. Ung.-Sternb., *Vers. Syst. Salicorn.* 59 (1866). *Salicornia australis* Sol. ex F.Muell., *Fragm. (Mueller)* 7(52): 15 (1869). *Salicornia australis* Sol. ex. Benth., *Fl. Austral.* 5: 205 (1870), *nom. illeg., non F.Muell.* (1869). *Salicornia australis* Sol. ex. Rodway, *Tasman. Fl.* 158 (1903), *nom. illeg., non F.Muell.* (1869). *Arthrocnemum heptiflorum* Moss., *J. South African Bot.* 20: 18 (1954), *nom., illeg., non Moss ex Fourc.* (1941). *Salicornia indica sensu J.D.Hooker*, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 2(11): xlvii, 1(4): 317 (1859), *non Willd.* (1799).

Illustration: Curtis, *The Student's Flora of Tasmania* 3: 579 (1967), as *Salicornia quinqueflora*; Corrick & Fuhrer, *Wildflowers of Victoria* 57, fig. 203 (2000); Woolmore et al., *King Island Flora* 38 (2002); Whiting et al., *Tasmania's Natural Flora* 94 (2004).

Perennial with decumbent stems 20–40 cm long, often stoloniferous, rooting at nodes, bearing numerous erect or ascending branches occasionally up to 30 cm high; articles green to red, cylindrical to narrow-ovoid, 5–10(–20) mm long, obscurely 2-keeled towards the apex which is cup-shaped or 2-lobed. Flowering spikes terminal, 1–5 cm long, 4–6 mm diam. Flowers (3–)5(–9) in a row on each side of a segment. Fruiting perianth spongy, flattened at the apex, usually falling entire, occasionally splitting vertically to release the seed. Seed ovate in outline, somewhat flattened, covered with short curved or slender spreading hairs, the hairs in both cases more prominent at the margin. Flowering and/or fruiting Nov–May.

Tas. (FUR, KIN, TNS, TSE, TSR, TWE); also WA, SA, Qld, NSW, Vic., New Zealand, New Caledonia. A common species in saltmarshes and on coastal rock platforms and in rock crevices along all Tasmanian coasts (except Macquarie Is.). *Sarcocornia quinqueflora* is an important food plant of the rare Orange-bellied Parrot (*Neophema chrysogaster*) (OBPRT 1998). Often flower-like, stem galls are found on plants which contain larvae of gall midges (Veenstra-Quah *et al.* 2007).

There are 2 subspecies. Many specimens of *S. quinqueflora*, lacking fruit, cannot be placed in a subspecies and the records of distribution of the subspecies are subsequently incomplete.

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| 1. Plants usually decumbent, rooting at the nodes; stem articles mostly > 2 mm diam.; seed with slender spreading hairs | 1a subsp. <i>quinqueflora</i> |
| 1: Plants tufted; stem articles < 2 mm diam.; seed with short acute curved hairs | 1b subsp. <i>tasmanica</i> |

1a *Sarcocornia quinqueflora* (Bunge ex. Ung.-Sternb) A.J.Scott subsp. ***quinqueflora***

Beaded Glasswort, Glasswort, Marsh Samphire

Illustrations: Wilson, *Nuytsia* 3: 136–137, figs 68–69 [seed] (1980); Wilson, *Fl. Australia* 4: 279, fig. 49a-b; 285, fig. 50a [seed] (1984); Walsh, *Fl. Victoria* 3: 187, fig. 33c-e (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 239 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 220 (2001); Simmons *et al.*, *A Guide to Flowers and Plants of Tasmania*, 4th edn, 99 (2008).

Description as per key.

Tas. (FUR, KIN, TNS, TSE, TSR, TWE); also WA, SA, Qld, NSW, Vic., New Zealand, New Caledonia. A common coastal taxon found in moderately saline and frequently flooded communities, usually in estuaries.

1b *Sarcocornia quinqueflora* subsp. ***tasmanica*** Paul G.Wilson, *Nuytsia* 3: 74 (1980)

Beaded Glasswort, Glasswort, Marsh Samphire

Illustrations: Wilson, *Fl. Australia* 4: 279, fig. 49c [seed] (1984); Walsh, *Fl. Victoria* 3: 187, fig. 33f (1996); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 220 (2001).

Description as per key.

Tas. (FUR, KIN, TSE, TSR, TWE); also Vic. Scattered in coastal areas on rocky substrates that are flooded by the sea.

2 *Sarcocornia blackiana* (Ulbr.) A.J.Scott, *Bot. J. Linn. Soc.* 75: 369 (1978)

Thick-head Glasswort, Glasswort, Marsh Samphire

Salicornia blackiana Ulbr., *Nat. Pflanzenfam.*, ed. 2 [Engler & Prantl.] 16c: 552 (1934). *Salicornia pachystachya* J.M.Black, *Trans. & Proc. Roy. Soc. South Australia* 45: 8, t. 11 (1921), *nom illeg., non* Ung.-Sternb. (1866); *Arthrocnemum heptiflorum* Moss ex Fourc., *Mem. Bot. Surv. South Africa* 20: 19, 115 (1941), *nom. illeg., nom. superfl.*

Illustrations: Wilson, *Nuytsia* 3: 138–139, figs 70–71 [seed] (1980); Wilson, *Fl. Australia* 4: 237, fig. 45; 279, fig. 49d-e; 285, fig. 50b [seed] (1984); Walsh, *Fl. Victoria* 3: 187, fig. 33g (1996); Woolmore *et al.*, *King Island Flora* 38 (2002).

Perennial with decumbent stems, rooting at the nodes, producing numerous erect or ascending branches 8–20 cm high, usually somewhat glaucous, fleshy; articles 5–15(–20) mm long, cylindrical or narrow-obconical, sometimes glaucous, the apex forming a 2-lobed cup, the lobes shallowly keeled. Fruiting spikes 2.0–4.5 cm long, 5–8 mm diam., flowers 5–9 on each side of the segment, forming a false whorl, sometimes an additional floret present below the central floret. Fruiting perianth spongy, flattened at the apex, falling entire. Seed ovate in outline, somewhat flattened covered in short papillae. Flowering and/or fruiting mainly Nov.–May.

Tas. (FUR, KIN, TNS, TSE, TWE); also WA, SA, Vic. Scattered around Tasmania and found in coastal and estuarine saltmarshes, often growing with *S. quinqueflora*.

13 TECTICORNIA

Tecticornia Hook.f., *Gen. Pl.* 3(1): 65 (1880).

Synonymy: *Pachycornia* Hook.f., *Gen. Pl.* 3(1): 65 (1880). *Arthrocnemum* section *Trachysperma* J.M.Black, *Trans. & Proc. Roy. Soc. South Australia* 43: 357 (1919). *Arthrocnemum* section *Leiosperma* J.M.Black, *Trans. & Proc. Roy. Soc. South Australia* 43: 358 (1919). *Arthrocnemum* subgenus *Angianthemum* Moss, *J. S. African Bot.* 20: 5 (1954). *Sclerostegia* Paul G.Wilson, *Nuytsia* 3(1): 17 (1980). *Tegicornia* Paul G.Wilson, *Nuytsia* 3(1): 25 (1980). *Halosarcia* Paul G.Wilson, *Nuytsia* 3(1): 28 (1980).

Erect or spreading annual or perennial shrubs or herbs, monoecious or dioecious (not in Tas.), much-branched, glabrous; the stems during their first year fleshy, segmented and appearing leafless, the segments (articles) cylindrical or spherical, widening above to a shallow 2-lobed cup, the fleshy outer portion eventually shrivelling and deciduous. Inflorescence of terminal or lateral spike-like thyrse comprising (1–)3(–5)-flowered cymules immersed in the apex of the fleshy, opposite, usually united bracts. Flowers sessile; andromonoecious with central flower bisexual and lateral flowers male, or plant dioecious (not in Tas.). Perianth with fused segments, at first thin, in fruit membranous, succulent or shrivelled. Stamens 1. Fruit with pericarp crustaceous to woody. Seed ovoid.

A genus of about 33 species, all but two endemic to Australia. Shepherd and Wilson (2007) present a cladistic analysis based on morphological and molecular data that show that five basically Australian genera, *Halosarcia*, *Pachycornia*, *Sclerostegia*, *Tecticornia* and *Tegicornia*, form a closely related natural group, but with all the smaller genera nested within a paraphyletic *Halosarcia*. *Tecticornia* and *Pachycornia* are the oldest available names in this group (published on the same page). Shepherd and Wilson (2007), as *Pachycornia* had a number of unusual features, synonymised it and the other three genera under *Tecticornia*.

Key references: Wilson (1980, 1984); Shepherd & Wilson (2007).

1 *Tecticornia arbuscula* (R.Br.) K.A.Sheph. & Paul G.Wilson, *Austral. Syst. Bot.* 20: 325 (2007)

Shrubby Glasswort

Salicornia arbuscula R.Br., *Prodr. Fl. Nov. Holl.* 411 (1810); *Arthrocnemum arbusculum* (R.Br.) Moq., *Chenop. Monogr. Enum.* 113 (1840); *Halocnemum arbuscula* (R.Br.) F.M.Bailey, *Syn. Queensl. Fl.* 409 (1883); *Pachycornia arbuscula* (R.Br.) A.J.Scott, *Bot. J. Linn. Soc.* 75: 369 (1978); *Sclerostegia arbuscula* (R.Br.) Paul G.Wilson, *Nuytsia* 3(1): 20 (1980).

Illustrations (usually as *Sclerostegia arbuscula*): Walsh, *Fl. Victoria* 3: 198, fig. 35a-b (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 246 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 222 (2001); Woolmore *et al.*, *King Island Flora* 39 (2002); Whiting *et al.*, *Tasmania's Natural Flora* 95 (2004).

Erect bushy shrub 20–150 cm high; older stems slender, young parts green, fleshy; articles 3–8 mm long, 3–4 mm diam. Flowering branches terminal and on short spreading lateral branches, each with 2–7 short fleshy segments; bracts opposite, united. Central bisexual flower larger than the lateral male flowers which are often not produced. Stamen 1 in all flowers. Fruit with perianth becoming succulent at first, shrivelling later,

triangular in outline, the pericarp hard, exerted beyond the bract as a persistent beak. Seed c. 1.5 mm long, minutely wrinkled. Flowering and/or fruiting (Jul.-)Nov.-Feb.

Tas. (FUR, KIN, TNS, TSE, TSR); also WA, SA, NSW, Vic. A common species of coastal and estuarine salt-marshes and mudflats.

14 SUAEDA

Suaeda Forssk. ex Scop., *Intr. Hist. Nat.* 333 (1977), *nom. cons.*

Synonymy: *Suaeda* section *Chenopodina* Moq., *Chenop. Monogr. Enum.* 124 (1840); *Chenopodina* (Moq.) Moq., *Prodr. (Candolle)* 13(2): 159 (1849), *nom. illeg.* *Lerchia* Haller ex Zinn, *Cat. Pl. Hort. Gott.* 30 (1757), *nom. rej.*

Annuals or short-lived weak perennials, herbs or shrubs, monoecious; stems without fleshy articles, glabrous or the young shoots sparsely hairy. Leaves usually alternate, occasionally subopposite, sessile, linear to narrow-elliptic or oblanceolate, flat or fleshy. Flowers solitary or in axillary clusters of 2–5, subtended by 2–3 small membranous bracteoles. Tepals 5, free or united at the base, ± succulent, lacking transverse wing. Stamens 5, hypogynous or attached to the short perianth tube. Pericarp membranous or slightly succulent. Seed lenticular, erect or horizontal.

A genus of c. 140 species found mostly in the Northern Hemisphere; 6 species (4 naturalized, 2 endemic) in Australia.

Key reference: (Wilson 1984).

- | | |
|---|-----------------------|
| 1. Plants annual, tinged pink or red, glaucous; seed slightly keeled around perimeter, with testa minutely reticulate-patterned | 1 <i>S. maritima</i> |
| 1: Plants perennial (under normal conditions), usually green; seed lenticular, not keeled around perimeter, testa smooth | 2 <i>S. australis</i> |

1 * *Suaeda maritima* (L.) Dumort., *Fl. Belg.* 22 (1827), var. *maritima*

Chenopodium maritimum L., *Sp. Pl.* 1: 221 (1753); *Chenopodina maritima* (L.) Moq., *Prodr. (Candolle)* 13(2): 161 (1849). ?*Suaeda* sp. A *sensu* S.W.L.Jacobs, *Fl. New South Wales* 1: 247 (1990).

Illustrations: Walsh, *Fl. Victoria* 3: 198, fig. 35k-l (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 248 (2000) [as *Suaeda* sp. A]; Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 228 (2006).

Erect or ascending annual to 1 m high, branched from near base, glabrous, dull grey-green to strongly pink-tinged. Leaves 6–15 mm long, c. 1 mm wide, linear to narrowly elliptic, acute to obtuse. Flowers all bisexual or some female, in axillary clusters. Perianth lobed from base; fruiting perianth not inflated, but sometimes prominently keeled dorsally and/or with a narrow basal lobe, depressed-globular, to c. 2.5 mm diam. Seed horizontal, dark reddish-brown, 1.5–2.0 mm diam., lenticular with perimeter acute, slightly keeled, minutely reticulate-patterned. Flowering and/or fruiting Dec.-Apr.

Tas. (FUR); also naturalized in NSW, Vic.; native to Europe. Rare weed found in saltmarshes and wetlands in the Furneaux Group and north-eastern Tasmania. In Europe *S. maritima* is a widespread and variable species and a number of varieties are recognised.

2 *Suaeda australis* (R.Br.) Moq., *Ann. Sci. Nat.* ser 1, 23:318 (1831)

Southern Sea-blite, Austral Sea-blite, Sea-blite

Chenopodium australe R.Br., *Prodr. Fl. Nov. Holl.* 407 (1810); *Schoberia australis* (R.Br.) Steud., *Nom. Bot.* 2nd ed., 2: 532 (1841); *Chenopodina australis* (R.Br.) Moq., *Prodr. (Candolle)* 13(2): 78, 163 (1849); *Lerchea maritima* var. *australis* (R.Br.) Kuntze., *Revis. Gen. Pl.* 2: 549 (1891); *Suaeda maritima* var. *australis* (R.Br.) Domin., *Biblioth. Bot.* 89: 72 (1921). *Chenopodium insulare* J.M.Black, *Trans. Roy. Soc. South Australia* 69: 309 (1945).

Suaeda maritima sensu J.D.Hooker, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 316 (1857); G.Bentham, *Fl. Austral.* 5: 206 (1870); L.Rodway, *Tasman. Fl.* 157 (1903), non (L.) Dumort. (1827).

Illustrations: Wilson, *Fl. Australia* 4: 311, fig. 55a-g (1984); Walsh, *Fl. Victoria* 3: 198, fig. 35f-h; oppo. 341, pl. 6a-c (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 247 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 235 (2001); Woolmore *et al.*, *King Island Flora* 39 (2002); Whiting *et al.*, *Tasmania's Natural Flora* 95 (2004); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 228 (2006).

Erect or rounded perennial, to c. 80 cm high, very variable (some depauperate plants appearing annual), glabrous, woody at the base, much branched; stems spreading or erect, branches bright green, yellowish or often reddish. Leaves 6–20(–50) mm long, 1.0–3.5 mm wide, fleshy, plano-convex, linear to elliptical or oblanceolate, acute or obtuse, half-spreading to erect and somewhat incurved; floral leaves shorter, oblanceolate to spatulate, obtuse. Flowers all bisexual, solitary or in axillary clusters of 3–5 towards the ends of the branches. Perianth ± globular, the segments somewhat fleshy, green with narrow membranous margins, c. 2 mm diam. in fruit. Seed horizontal, dark brown to black, shining, c. 1.5 mm diam., lenticular, smooth or minutely reticulate near margin, enclosed in the dried and wrinkled perianth. Flowering and/or fruiting most of the year

Tas. (FUR, KIN, TNS, TSE, TSR, TWE); WA, SA, Qld, NSW, Vic. A widespread species and a common component of saltmarsh, shoreline and estuarine communities.

15 SALSOLA

Salsola L., *Sp. Pl.* 1: 222 (1753).

Annual erect herbs or short-lived shrubs, monoecious; glabrous or pubescent; stems without fleshy articles. Leaves alternate or lower leaves opposite, sessile, narrow-triangular to subterete, entire, spine-tipped. Flowers axillary, usually solitary, bisexual; bracteoles 2, exceeding the perianth. Tepals 5, free or fused at the base, membranous at first, becoming hardened and in fruit usually developing a transverse wing on the dorsal face. Stamens 5; filaments free. Pericarp membranous or cartilaginous. Fruit a utricle. Seed orbicular, usually horizontal.

A genus of c. 100 species (depending on account) in coastal and saline areas of Eurasia and Africa; one species in Australia, though the taxonomy is uncertain and more may be present.

Key reference: Wilson (1984).

1 *Salsola australis* R.Br., *Prodr. Fl. Nov. Holl.* 411 (1810) *Buckbush, Soft Buckbush, Prickly Saltwort, Roly-poly*

Salsola tragus L., *Sp. Pl.* 1: 222 (1753) sensu Duretto & Morris, *Flora of Tasmania Online* 97. Amaranthaceae v. 2011:1 (2011). *Salsola macrophylla* R.Br., *Prodr. Fl. Nov. Holl.* 411 (1810). *Salsola kali* subsp. *tragus* (L.) Nyman, *Consp. Fl. Eur.* 3: 631 (1881). *Salsola kali* sensu G.Bentham, *Fl. Austral.* 5: 207 (1870); P.G.Wilson, *Fl. Australia* 4: 314 (1984); N.G.Walsh, *Fl. Victoria* 3: 198 (1996), non L. (1753).

Illustrations (usually as *S. kali*): Walsh, *Fl. Victoria* 3: 198, fig. 35m-o (1996); Jacobs, *Fl. New South Wales* 1, rev. edn: 238 (2000); Harris *et al.*, *One Hundred Islands: the Flora of the Outer Furneaux* 219 (2001); Richardson *et al.*, *Weeds of the South-East, an Identification Guide for Australia* 226 (2006).

Annual herb to 50 cm high; stems prominently ridged, yellowish green; young stems and base of young leaves with deciduous crisped hairs. Leaves 0.5–2(–4) cm long, narrow triangular to subterete, expanded and ± stem clasping below, apex spine-tipped. Floral leaves similar to stem leaves but shorter and broader at the base; bracteoles similar to floral leaves but smaller, exceeding the perianth. Perianth 2.5–3.0 mm long, ovate-acuminate, membranous at first, hardening in fruit, lacking a transverse wing. Staminal filaments c. 4 mm long, expanded below; anther c. 1 mm long. Style branches c. 2 mm long. Seed c. 2.5 mm diam. Flowering and/or fruiting May.–Oct. (Vic.), Feb. (Tas. collections).

Tas. (FUR, KIN); All Australian states, naturalised in the ACT; Known from few collections from islands of Bass Strait: Hogan and West Sister Islands in the east, and also, recently, from King Island. In Tasmania found in near coastal communities though in the remainder of Australia widespread across the continent in arid, semi-arid and slightly saline areas. The species and genus in Australia is highly variable and there has been great uncertainty on both the application of names and on how many taxa are present (see APC; Wilson 1984; Walsh 1996; Borger *et al.* 2008; Chinnock (2010)).

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- NOTE:** Web addresses can and do change: a list of current web addresses is maintained in the web version of this treatment on the *Flora of Tasmania Online* website at <https://flora.tas.tmag.gov.au>

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<i>Beta vulgaris</i> var. <i>perennis</i>	20	Clammy Goosefoot.....	16
Betaceae.....	2	Climbing Saltbush.....	17
<i>Blitum</i>	12	Coast Bonefruit.....	19
<i>Blitum glandulosum</i>	16	Coast Saltbush.....	11
<i>Blitum pumilio</i>	16	Coastal Saltbush.....	18
Buckbush.....	25	Common Orache.....	9
C		Creeping Saltbush.....	10
Caryophyllaceae.....	1	D	
Caryophyllales.....	1	<i>Dipteranthemum</i>	6
Chenopodiaceae.....	1, 2	<i>Dysphania</i>	1, 12, 15 , 16
<i>Chenopodina</i>	23	<i>Dysphania glomulifera</i>	16
<i>Chenopodina australis</i>	24	<i>Dysphania glomulifera</i> subsp. <i>glomulifera</i>	16
<i>Chenopodina maritima</i>	24	<i>Dysphania myriocephala</i>	16
<i>Chenopodium</i>	1, 2, 12 , 16	<i>Dysphania pumilio</i>	16
<i>Chenopodium album</i>	13	<i>Dysphania</i> section <i>Caudatae</i>	15
<i>Chenopodium album</i> subsp. <i>hastatum</i>	13	<i>Dysphania</i> section <i>Tetrasepala</i>	15
<i>Chenopodium album</i> var. <i>hastatum</i>	13	Dysphaniaceae.....	2
<i>Chenopodium album</i> var. <i>striatiforme</i>	13	E	
<i>Chenopodium ambiguum</i>	13	<i>Einadia</i>	1, 17
<i>Chenopodium ambiguum</i> var. <i>majus</i>	13	<i>Einadia nutans</i> subsp. <i>nutans</i>	17
<i>Chenopodium ambiguum</i> var. <i>minus</i>	13	<i>Enchylaena</i>	19
<i>Chenopodium australe</i>	24	F	
<i>Chenopodium biforme</i>	14	Fat Hen.....	13
<i>Chenopodium browneanum</i>	13	G	
<i>Chenopodium congestum</i>	14	Garden Orache.....	8
<i>Chenopodium erosum</i>	15	Glasswort.....	21, 22
<i>Chenopodium foliosum</i>	13	Glaucous Goosefoot.....	13
<i>Chenopodium furfuraceum</i>	18	Glistening Saltbush.....	12
<i>Chenopodium glandulosum</i>	16	Green Fat Hen.....	14

Grey Saltbush.....	11	<i>Rhagodia congesta</i>	14
H		<i>Rhagodia nutans</i>	17
<i>Halocnemum arbuscula</i>	23	<i>Rhagodia nutans</i> var. <i>fallacina</i>	17
<i>Halosarcia</i>	22, 23	Rock Joyweed.....	3
<i>Hemichroa</i>	7	Roly-poly.....	25
<i>Hemichroa pentandra</i>	7	Rough-leaved Goosefoot.....	16
L		S	
Lagoon Saltbush.....	10	<i>Salicornia arbuscula</i>	23
<i>Lerchea maritima</i> var. <i>australis</i>	24	<i>Salicornia australis</i>	21
<i>Lerchia</i>	23	<i>Salicornia blackiana</i>	22
Lesser Joyweed.....	3	<i>Salicornia indica</i>	21
M		<i>Salicornia pachystachya</i>	22
<i>Maireana</i>	19	<i>Salicornia quinqueflora</i>	21
Marsh Saltbush.....	11	Salicorniaceae.....	2
Marsh Samphire.....	21, 22	<i>Salsola</i>	1, 25
<i>Melaleuca ericifolia</i>	4	<i>Salsola australis</i>	25
N		<i>Salsola kali</i>	25
Native Orache.....	9	<i>Salsola kali</i> subsp. <i>tragus</i>	25
<i>Neobassia</i>	19	<i>Salsola macrophylla</i>	25
<i>Neophema chrysogaster</i>	21	<i>Salsola tragus</i>	25
<i>Neopreissia</i>	7	Salsolaceae.....	2
<i>Neopreissia cinerea</i>	11	<i>Sarcocornia</i>	1, 20
Nettle-leaf Goosefoot.....	14	<i>Sarcocornia blackiana</i>	22
Nodding Saltbush.....	17	<i>Sarcocornia globosa</i>	20
O		<i>Sarcocornia quinqueflora</i>	21, 22
Oak-leaf Goosefoot.....	13	<i>Sarcocornia quinqueflora</i> subsp. <i>quinqueflora</i>	21
<i>Obione</i>	7	<i>Sarcocornia quinqueflora</i> subsp. <i>tasmanica</i>	22
<i>Obione billardierei</i>	12	<i>Schoberia australis</i>	24
Orache.....	8	<i>Sclerolaena</i>	19
<i>Orthosporum</i>	15	<i>Sclerostegia</i>	22, 23
<i>Osteocarpum</i>	19	<i>Sclerostegia arbuscula</i>	23
P		Sea-blite.....	24
<i>Pachycornia</i>	22, 23	Seaberry Saltbush.....	18
<i>Pachycornia arbuscula</i>	23	Shrubby Glasswort.....	23
Pale Goosefoot.....	13	Small Crumbweed.....	16
<i>Poa</i>	4	Soft Buckbush.....	25
<i>Polycnemum pentandrum</i>	7	Southern Sea-blite.....	24
Powell's Amaranth.....	5	Sowbane.....	14
Prickly Saltwort.....	25	Spear Orache.....	9
<i>Ptilotus</i>	6	Spinach.....	2
<i>Ptilotus</i> section <i>Trichinium</i>	6	Spinach Beet.....	1
<i>Ptilotus spathulatus</i> f. <i>angustatus</i>	6	<i>Spinacia</i>	2
<i>Ptilotus spathulatus</i> f. <i>spathulatus</i>	6	Spinaciaceae.....	2
Pussy Tails.....	6	Spreading Amaranth.....	4
R		Stiff Tumbleweed.....	5
<i>Rhagodia</i>	1, 2, 18	Stinking Goosefoot.....	15
<i>Rhagodia baccata</i>	18	<i>Suaeda</i>	1, 23
<i>Rhagodia baccata</i> var. <i>candolleana</i>	18	<i>Suaeda australis</i>	24
<i>Rhagodia baccata</i> var. <i>congesta</i>	14	<i>Suaeda maritima</i>	24
<i>Rhagodia baccata</i> var. <i>parvifolia</i>	18	<i>Suaeda maritima</i> var. <i>australis</i>	24
<i>Rhagodia billardierei</i>	18	<i>Suaeda maritima</i> var. <i>maritima</i>	24
<i>Rhagodia billardierei</i> var. <i>congesta</i>	14	<i>Suaeda</i> section <i>Chenopodina</i>	23
<i>Rhagodia candolleana</i> subsp. <i>argentea</i>	19	<i>Suaeda</i> section <i>Schanginia</i>	17
<i>Rhagodia candolleana</i> subsp. <i>candolleana</i>	18	<i>Suaeda</i> sp. A sensu S.W.L.Jacobs.....	24
<i>Rhagodia chenopodioides</i>	17	Sugarbeet.....	1

Swiss Chard.....	1	<i>Threlkeldia diffusa</i>	19
T		<i>Threlkeldia diffusa</i> var. <i>latifolia</i>	19
<i>Tecticornia</i>	1, 22 , 23	<i>Threlkeldia drupata</i>	19
<i>Tecticornia arbuscula</i>	23	Trailing Hemichroa.....	7
<i>Tegicornia</i>	22, 23	<i>Trichinium</i>	6
<i>Theleophyton</i>	7, 12	<i>Trichinium mucronatum</i>	6
<i>Theleophyton billardierei</i>	12	<i>Trichinium spathulatum</i>	6
Thick-head Glasswort.....	22	Tumbleweed.....	5
<i>Threlkeldia</i>	19	W	
<i>Threlkeldia diffusa</i>	19	White Goosefoot.....	13
<i>Threlkeldia inchoate</i>	19	Wild Beet.....	20
<i>Threlkeldia</i>	1, 19		