

# Field guide to common saltmarsh plants of Queensland





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Louise Johns

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# Foreword

There is a widespread recognition of the environmental value of mangrove communities, and this is reflected in both legislation and public concern. The importance of mangrove communities as ecosystems linking terrestrial environments to estuarine and coastal waters is well known, and scientists, conservation groups and recreational and professional fishing interests unite in their opposition to potentially damaging development.

However, mangroves are not the only intertidal vegetation on soft sediment coasts. Saltmarshes are also widespread, but until recently they have been virtually ignored—indeed they appear to have been almost invisible.

The saltmarsh environment is much more extreme than that of mangroves, with more variable and higher salinities, no shade (hence higher sunlight on the ground and greater exposure to wind) and less frequent tidal incursions, giving rise to periods of very low soil moisture content. The absence of trees and infrequent flooding make saltmarshes much more vulnerable to damage from recreational vehicles or grazing livestock than mangroves, and makes them more attractive as potential development sites.

Despite the harshness of the environment, saltmarshes support a diversity of plants and animals. The various ways in which organisms have evolved to tolerate extreme conditions are fascinating in their own right, and are potentially valuable sources of new methods of dealing with environmental problems. The relative infrequency of tidal flooding had led to a popular assumption that, in terms of links to estuaries, saltmarshes were less important than mangroves. We are now beginning to appreciate that saltmarshes are used as habitats by a range of fish species, are important in nutrient exchange between the terrestrial and marine environments, and are vital habitat for many species. Wise, sustainable management of coastal resources requires that we recognise and value the role of saltmarshes.

The number of flowering plants that can thrive in saltmarshes is relatively small. The *Field guide to common saltmarsh plants of Queensland* does not illustrate all of them, but it does include the majority of widespread species. This will enable major species to be easily identified, and I hope it will encourage readers of this publication to take a much closer look at the fascinating saltmarsh environment. The more we observe, the more we will understand and appreciate, and the more stewardship of saltmarsh resources will become an accepted matter of policy and practice.

## **Associate Professor Paul Adam**

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Sydney, Australia

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# How to use this guide

The aim of this guide is to assist those interested in identifying saltmarsh vegetation within the coastal zone of Queensland. It is a guide only to identifying saltmarsh species. Microscopic investigation is often required to accurately identify species and subspecies, and assistance with identification to higher levels should be sought from the Queensland Herbarium.

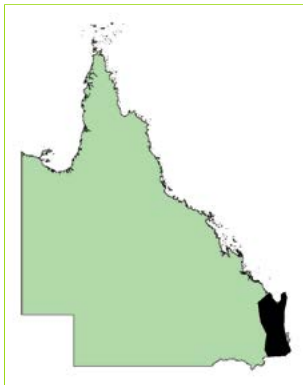
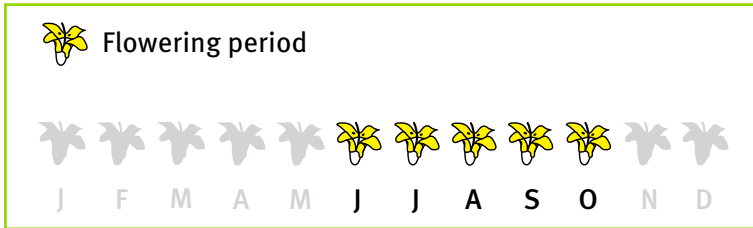
It should be noted that this guide only contains the most common species and is not an exhaustive list of saltmarsh species.

The guide has been divided into three main sections:

1. succulent plants
2. grasses, rushes and sedge plants
3. other plant types.

Descriptions are provided, along with photographs, flowering periods, illustrations and Queensland distribution maps.

**Flowering period of the species** (months highlighted in the example below)



The **distribution map** (example left) indicates where a species is commonly found.

The **plant icons** below indicate the features of the species.



**Grass-like:** Plants with leaf blades or flat elongated leaves—these include sedges or rushes



**Prostrate:** Trunk or main branch grows flat along the ground



**Succulent:** Juicy, thick and fleshy leaves and/or stems



**Upright:** Trunk or branches grow vertically

**Features of the species** (highlighted as shown in the example below)



Grass-like



Succulent



Prostrate



Upright

## Using the keys

The key at the beginning of each section may assist in the identification of the species. Work through the list of features about the type of plant you are trying to identify, for example:

- 1 a Defined leaves—**go to 2** ✓  
b No defined leaves—**go to 13**
- 2 a Red/green berries commonly present—see **Ruby saltbush** (page 24)  
b No red/green berries—**go to 3** ✓
- 3 a Prostrate growth form—**go to 4**  
b Upright growth form—**go to 9** ✓
- ...
- 9 a Prickly leaves—see **Prickly saltwort** (page 20) ✓  
b No prickly leaves—**go to 10**

# Acknowledgements

This guide was produced with enormous support from many people and I would like to thank the following for their assistance:

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- Geoff Dixon for producing the botanical illustrations, and Paul Lennon for producing the saltmarsh tidal illustrations.

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# Glossary

<b>Alternate</b>	Leaves that grow alternately at different levels around the stem, sometimes in a spiral formation
<b>Annual</b>	Completing life cycle within a year of germination
<b>Axil</b>	An area between a leaf and the stem from which the leaf arises
<b>Axillary</b>	Growing in axil
<b>Bract</b>	Leaf-like structure at base of flower
<b>Bracteole</b>	Secondary bract at base of flower
<b>Decumbent</b>	Lying on the ground, but rising at the tips; usually sets roots as the nodes touch the ground
<b>Detritus</b>	Particles from decaying plants and animals
<b>Elliptic</b>	Shaped like an ellipse
<b>Inflorescence</b>	A cluster of flowers
<b>Internodes</b>	Part of the stem between the two nodes
<b>Ligule</b>	The inner junction of the leaf-sheath and blade in grasses
<b>Linear</b>	Long and narrow with parallel edges
<b>Nodes</b>	Place on plant stems where leaves are attached
<b>Opposite</b>	Leaves arising at the same level but on opposite sides of the stem
<b>Ovate/ovoid</b>	Egg-shaped
<b>Panicle</b>	Branched flower head
<b>Perennial</b>	Plant that has a life cycle lasting more than two years
<b>Perianth</b>	The calyx (outer whorl of a flower) and corolla (formed of petals) collectively
<b>Procumbent</b>	Trailing on the ground
<b>Prostrate</b>	Lying flat on the ground
<b>Rhizomatous</b>	Having a rhizome or thick underground horizontal stem
<b>Sessile</b>	Flowers and/or leaves that sit directly on a base without a stalk
<b>Sheath</b>	An extension of the leaf that surrounds the stem
<b>Spikelet</b>	Units of flower heads on grasses, consisting of one or more florets (small flowers) on a thin stalk
<b>Terete</b>	Cylindrical, but usually slightly tapering at both ends; circular in cross-section and smooth-surfaced
<b>Terminal inflorescence</b>	Flowers at end of stem
<b>Tussock</b>	A small, thick clump of growing vegetation, usually grass or sedge





# Introduction

## What are saltmarshes?

Saltmarshes are important intertidal wetland plant communities made up of a mosaic of succulents, grasses, low shrubs and saltpans. They commonly occur in upper intertidal zones between the mangrove fringe and more terrestrial vegetation.

In most instances, saltmarshes are not subject to daily inundation by tides, but are flooded on king or spring tides. Due to the lack of regular flushing, these areas contain high levels of salt and low levels of oxygen in the soil and the vegetation has adapted to the harsh conditions. Halophytic (salt tolerant) vegetation occurs in saltmarshes and includes succulents, sedges, grasses and algae.

Saltmarshes are known to contribute to fisheries productivity by providing direct habitat for juvenile fish and invertebrates. Production of detritus and nutrients also adds to the food web cycle in estuarine areas adjacent to saltmarsh (Connolly 1999). Crab and gastropod larvae released within the saltmarsh community provide an important diet for juvenile fish (Hollingsworth & Connolly 2004; Mazumder et al. 2004).

There are approximately 6900 km<sup>2</sup> of saltmarsh in Queensland, which represents more than a third of the total area of saltmarsh in Australia (15 195 km<sup>2</sup>) (De Vries et al. 2002). Higher proportions of saltmarshes are found in the Gulf of Carpentaria and the Shoalwater Coast area (Figure 1), primarily due to low gradient topography and tidal influences on a local level.

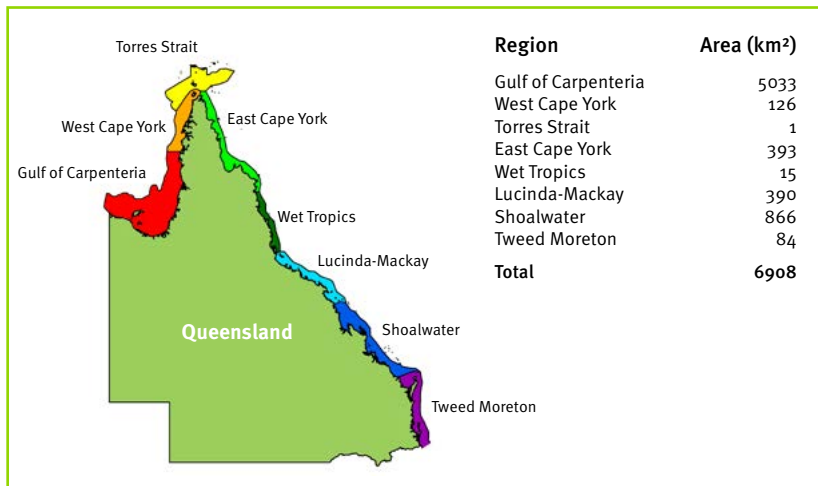


Figure 1. Saltmarsh areas (km<sup>2</sup>) in Queensland

In contrast to mangrove and seagrass species, saltmarsh species diversity progressively decreases moving north along the east coast of Australia (OzCoasts 2010). While vegetation diversity within saltmarshes may be low, there is often a clear zonation from high to low elevations. Also, there is often a defined soil variation through saltmarsh, where silt and sediments accrete around vegetation at lower levels on the saltmarsh and clay formations are found at higher levels (Adam 1990). During periods of low rainfall and no tidal influence, vegetation often retreats leaving exposed saltpan areas.

## Under threat

Saltmarshes have previously been viewed as dumping grounds with little value, often being reclaimed for coastal development. Although still very much under threat, these habitats are now recognised by coastal managers as significant areas that play a major role as nutrient sinks, provide habitats for a wide range of juvenile fish and bird species, and also act as a buffering and filtering system for sediments and nutrients.

Even in areas where saltmarshes have been preserved, impacts from adjacent development caused by stormwater outlets, vehicular traffic and vegetation dumping affect the function of saltmarsh communities. Alteration in salinity from stormwater can greatly affect community diversity in these areas, as well as cause erosion and sedimentation problems. Weed infestation due to stormwater or vegetation dumping alters the biodiversity of saltmarsh areas. Traffic within and grazing of these areas can change the drainage or microtopography, thus influencing the vegetation patterns and distribution. When damaged, it often takes saltmarshes many years to recover (Adam 1995).

Saltmarshes are under threat, not only from the impact of humans but by invasion from mangrove colonisation. Many cases of mangrove invasion into saltmarsh areas have been noted along the east coast of Australia. Where saltmarsh is restricted along its landward edge by development, it can be squeezed against these obstacles by landward-shifting mangroves (Saintilan & Williams 1999). Some reported losses of saltmarsh include small areas of natural loss of marine couch at the upper tidal limits as a result of invasion by *Casuarina glauca* in south-east Queensland (Queensland Herbarium 2001).

There may be a number of factors contributing to the landward incursion of mangroves, including changes in rainfall patterns, agricultural activities, sea level rise and urban activities resulting in increased sediment and nutrient inputs. However, further research is still required to answer this complex issue.

## What protection exists?

All saltmarsh vegetation is protected under Queensland legislation through the *Fisheries Act 1994*. This protection ensures that there are healthy fish habitats available for shelter, feeding and nursery areas. Additional protection of saltmarsh communities (and other marine plants such as mangroves and seagrasses, and non-vegetated tidal areas) occurs throughout Queensland within Fish Habitat Areas declared under the *Fisheries Act 1994*.

Under the federal *Environment Protection and Biodiversity Conservation Act 1999*, saltmarsh vegetation located south of Rockhampton, Queensland, is listed as a vulnerable ecological community.

For further information regarding required approvals for work or research proposals relating to saltmarshes, call Fisheries Queensland (Department of Agriculture and Fisheries) on **13 25 23** or visit **[fisheries.qld.gov.au](http://fisheries.qld.gov.au)**

## Fish in saltmarshes

Fish species living within saltmarshes vary along the coast. Juvenile and adult fish of commercial and recreational species—including bream, whiting, mullet, mangrove jack, barramundi, mud crab, leader and banana prawns—have been captured in saltmarsh areas. Important bait or prey species such as scat, glassfish, moses perch, gobies, greenback mullet, herring, banded trumpeter, ponyfish, silver biddy and mangrove cardinal fish also occur in both tropical and subtropical saltmarshes (Connolly 1999; A McDougall [Department of Natural Resources Mines and Water] 2005, pers. comm., January).

The presence and extent of use by these species are heavily reliant on the maintenance of tidal flows and clear passage for fish during high tides (Figure 2).

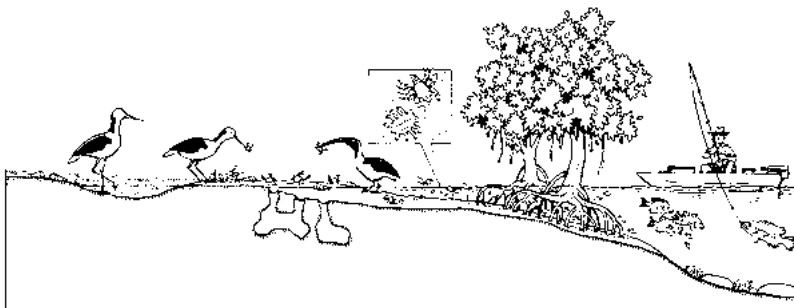


Illustration on courtesy of Paul Lennon

**Figure 2. Saltmarsh during high tide**

## Birdlife in saltmarshes

Birdlife in saltmarshes can be diverse. The number of species that breed within a saltmarsh is relatively small, but habitat and feeding grounds are provided for birds, including three listed under the Ramsar Convention—the eastern curlew, the sooty oyster catcher and the little tern (Patterson 2000). Many migratory waders feed on invertebrates on intertidal mud flats and use saltmarsh areas as high tide roosts (Adam 1995).

## Other animals in saltmarshes

Saltmarsh also provides key habitats for terrestrial organisms such as insects, bats and birds (Laegdsgaard 2005), along with wallabies and kangaroos (Figure 3).

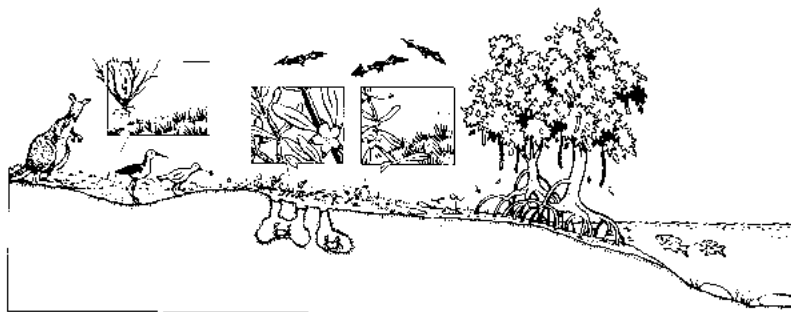


Illustration on courtesy of Paul Lennon

Figure 3. Saltmarsh during low tide

# Succulent plants

Plants with juicy, thick and fleshy leaves and/or stems





# Key to succulent plants

Work through the following list of features to help you identify the plant.

- 1 a Defined leaves—**go to 2**  
b No defined leaves—**go to 13**
- 2 a Red/green berries commonly present—**see Ruby saltbush (page 24)**  
b No red/green berries—**go to 3**
- 3 a Prostrate growth form—**go to 4**  
b Upright growth form—**go to 9**
- 4 a Leaves triangular in cross-section—**see Pigface (page 16)**  
b Leaves not triangular in cross-section—**go to 5**
- 5 a Large mat formation; flat, strap-like leaves; creeper—**see Sea purslane (page 28)**  
b Mat formation less than 30 cm—**go to 6**
- 6 a Leaves spoon-shaped—**see Pigweed (page 18)**  
b Leaves not spoon-shaped—**go to 7**
- 7 a Flowers inconspicuous—**see Red crumbweed (page 22)**  
b Flowers not inconspicuous—**go to 8**
- 8 a Axillary hairs conspicuous—**see Pigweed (page 18)**  
b Axillary hairs absent, red stems—**see Pigweed (page 18)**
- 9 a Prickly leaves—**see Prickly saltwort (page 20)**  
b No prickly leaves—**go to 10**
- 10 a Stems silver/grey in colour—**see Twin flower saltbush (page 30)**  
b Stems not silver/grey in colour—**go to 11**
- 11 a Leaves D-shaped in cross-section—**go to 12**  
b Leaves (not D-shaped in cross-section) but round in cross-section—**see Batis (page 8)**
- 12 a New stem has red and green stripes, wide growth pattern—**see Seablite (page 26)**  
b No stripe on new stem, forms distinctive small bushes with trunk—**see Seablite (page 26)**
- 13 a Thick swollen ends on branches, grey-green in appearance—**see Grey samphire (page 14)**  
b Barrel-shaped segments on stems—**go to 14**
- 14 a Prostrate growth form, rooting at nodes—**see Bead weed (page 10)**  
b Upright growth form with woody stem and trunk—**see Glasswort (page 12)**

# Batis

*Batis argillicola*

Family: **Bataceae**

## Description

Batis is an erect shrub that grows up to 70 cm tall.

It has a woody base and succulent leaves that are round in cross-section and are opposite.

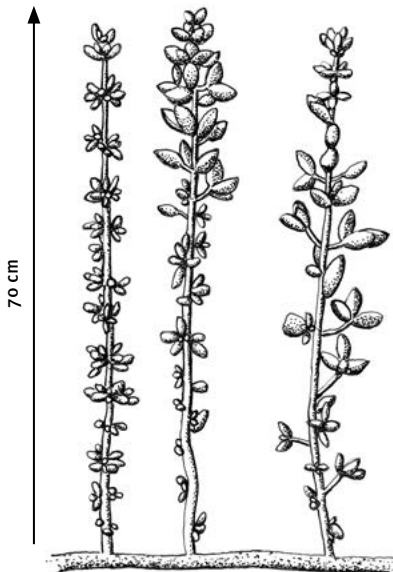
Male and female flowers grow on the same plant.

Small, inconspicuous flowers bloom between June and October, with fruit that matures from December to February.

It grows mainly in clay soil.

## Distribution

It is found from Cape Flattery to the Northern Territory border.



Growth habit



Leaves in detail



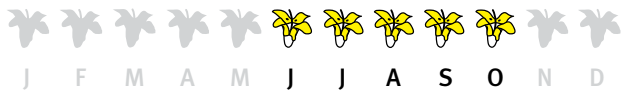


Image courtesy of Glenn Wightman

**Distribution**



**Flowering period**



Grass-like



Succulent



Prostrate



Upright

# Bead weed

*Sarcocornia quinqueflora*

Family: **Chenopodiaceae**

## Description

This succulent perennial herb has branches that reach 20 cm in height, and stems that creep along the ground.

The stems are leafless and segmented, and set roots at the nodes.

Bead weed is usually green, but in conditions of stress (for example, when in low water and high sunlight) it turns red.

Stem segments are 5–10 cm long and 3–4 mm in diameter.

Between 5 and 7 inconspicuous flowers grow in a single row around the flower head.

The plant flowers from November to February.

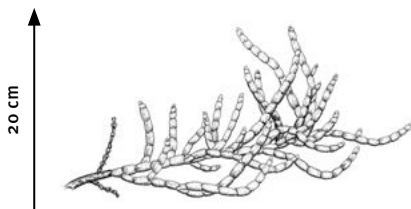
Bead weed usually grows in the wettest area of saltmarsh.

The species can be distinguished by its low-growing mat formation with upright tips (decumbent), compared with the low-growing (procumbent) shrub growth forms of glasswort.

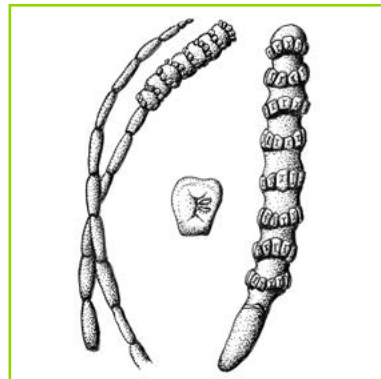
In shady conditions, the growth form can change and the plant has longer upright branches.

## Distribution

The plant is found along the entire Queensland coast.



Branch and stem in detail

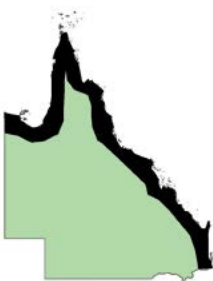


Flowers in detail





Distribution



Flowering period



Grass-like



Succulent



Prostrate



Upright

# Glasswort

*Tecticornia halocnemoides*  
*Tecticornia indica*  
*Tecticornia pergranulata*

**Family: Chenopodiaceae**

## Description

The height of the species varies—both *Tecticornia indica* and *Tecticornia pergranulata* grow up to 1 m high, while *Tecticornia halocnemoides* is a smaller plant that grows to around 30 cm high.

Glasswort leaves are barrel shaped (giving the appearance of being leafless) with a woody stem.

Glasswort flowers (bisexual and inconspicuous) bloom from December to March in southern Queensland, but in the northern Wet Tropics they bloom during June and July.

The species are distinguished from each other not only by height and form, but also by flower morphology that is often difficult to determine in the field.

*T. indica* has a spiky flower head, while both *T. halocnemoides* and *T. pergranulata* have uneven flower heads.

Glasswort seeds are around 1 mm in diameter.

*T. halocnemoides* has an oval, smooth seed, while *T. pergranulata* has a comma-shaped seed. There are subspecies of these two species, but identification of them in the field is very difficult.

Glasswort is sometimes confused with bead weed, but it can be distinguished by differences in its woody stem and trunk. Also, glasswort has more rounded and bulbous segments than bead weed.

## Distribution

The plant grows in intermittent patches along the entire Queensland coast.

Note: In 2007, the genus was changed from *Halosarcia* to *Tecticornia* as a result of taxonomic revisions.



*Tecticornia halocnemoides*



Images courtesy of Paul Gullan (Viridans Images)



*Tecticornia indica*

Image courtesy of Glenn Leiper



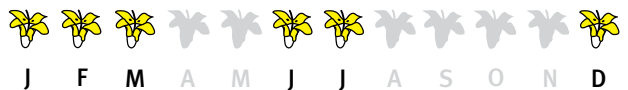
*Tecticornia pergranulata*

Image courtesy of Glenn Leiper

Distribution



Flowering period



Grass-like



Succulent



Prostrate



Upright

# Grey samphire

*Tecticornia australasica*

**Family: Chenopodiaceae**

## Description

This annual succulent grows up to 40 cm tall.

The plant's leaves are succulent and barrel shaped, giving it the appearance of being leafless.

Its leaves are opposite and are bluish-green, but during dry periods they have a purple tinge.

From June to December, small yellow flowers emerge from swollen segments of the plant (see inset photograph on opposite page).

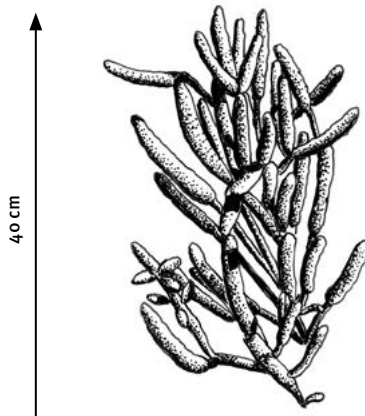
The seeds are approximately 1.5 mm long, with ridges on their upper margins.

New plants usually germinate from March to April and after heavy rainfall.

Grey samphire grows in upper tidal areas where there is some freshwater influence.

## Distribution

The plant can be found in intermittent patches north from Mackay.



**Growth habit**

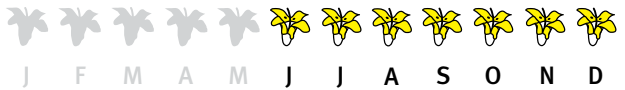




Distribution



Flowering period



Grass-like



Succulent



Prostrate



Upright

# Pigface

*Carpobrotus glaucescens*

Family: Aizoaceae

## Description

This succulent prostrate creeper has thick fleshy leaves that are 4–8 cm long, 8–17 mm wide and triangular in cross-section.

The leaves range from bright green to green with tinges of red along the edges and are opposite.

The plant's flowers, which are white at the base, range from pink to purple and contain numerous petals.

The flowers bloom mostly between March and August.

In February, the plant produces red, succulent fruit with 2 horns.

Pigface can be established by using seed or cuttings.

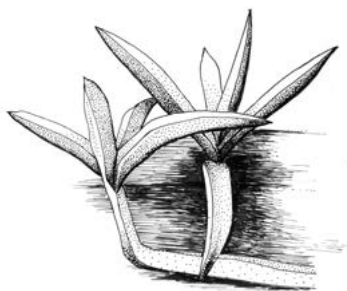
It is not commonly found within the central saltmarsh, but more likely on the edge of saltmarsh on sandy substrates.

The plant is useful for sandy foredune stabilisation.

## Distribution

Pigface is found from south-east Queensland north to Mackay.

10 cm



Leaves in detail



Flower in detail

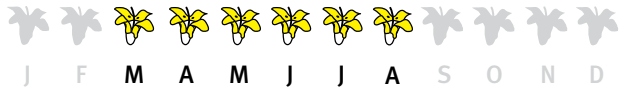




Distribution



Flowering period



Grass-like



Succulent



Prostrate



Upright

# Pigweed

*Portulaca bicolor*  
*Portulaca oleracea*  
*Portulaca pilosa*

Family: **Portulacaceae**

## Description

These prostrate herbs have succulent green to red leaves.

*Portulaca bicolor* has cylindrical leaves with red stems. The leaves are opposite. It flowers most of the year with yellow or purple flowers. This species is common in saltpan areas.

*Portulaca oleracea* has spoon-shaped leaves attached to the stem at the narrow end. This species is a low-growing prostrate form and has yellow flowers in its axils. The leaves are mostly alternate. It usually flowers between December and March.

*Portulaca pilosa* (an introduced species) has linear leaves and pink flowers. This species is low-growing and is found on the edge of salt pans and urban areas where the salt content of soil is high. The leaves are usually alternate. It mainly flowers between December and March.

Pigweed is common in sandy soils and can be established by seed or cuttings.

As with all succulents, the appearance of these species can vary depending on the amount of water available.

## Distribution

*P. pilosa* and *P. oleracea* are present along the entire Queensland coast, while *P. bicolor* is not found south of Bundaberg.

*Portulaca bicolor*



*Portulaca oleracea*



*Portulaca pilosa*





*Portulaca bicolor*



*Portulaca oleracea*

Image courtesy of Glenn Leiper

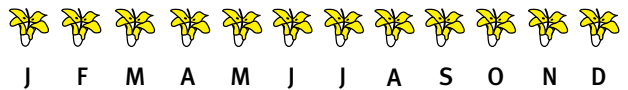


*Portulaca pilosa*

Image courtesy of Glenn Leiper

**Flowering period**

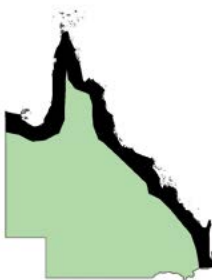
*Portulaca bicolor*



*Portulaca oleracea* and *Portulaca pilosa*



**Distribution**



Grass-like



Succulent



Prostrate



Upright

# Prickly saltwort

*Salsola australis*

**Family: Chenopodiaceae**

## Description

This prickly perennial shrub grows up to 1 m tall.

The plant's leaves are alternate, narrow, linear, cylindrical with sharp pointed ends, and are usually less than 1 cm long.

Its flowers are white with a tinge of green, insignificant, solitary and grow in the leaf axil.

Prickly saltwort flowers from September to March.

The plant grows on the edge of saltmarsh and in dunal areas.

## Distribution

It is widespread throughout Queensland.



Stem in detail



Flower in detail

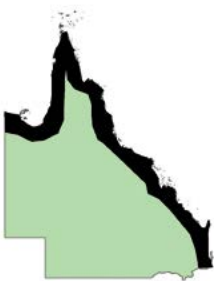
Note: Previously known as *Salsola kali*.





Image courtesy of Glenn Leiper

**Distribution**



**Flowering period**



Grass-like



Succulent



Prostrate



Upright

# Red crumbweed

*Dysphania littoralis*

**Family: Chenopodiaceae**

## Description

Red crumbweed is a small, prostrate annual.

It is many stemmed, and grows in a mat up to 30 cm wide and to a height of 5–10 cm.

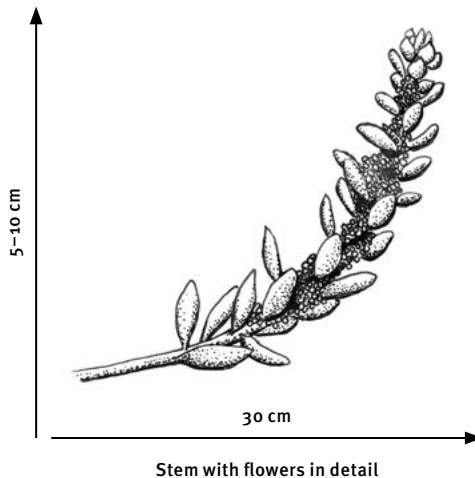
The plant's leaves are alternate and elliptic, and are 5–10 mm long.

White, inconspicuous flowers grow on stems between the leaves.

It flowers throughout the year in southern areas and may be poisonous to some grazing animals.

## Distribution

The plant can be found from south-east Queensland north to around Cardwell.



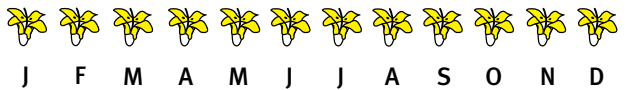


Images courtesy of Glenn Leiper

**Distribution**



**Flowering period**



Grass-like



Succulent



Prostrate



Upright



# Ruby saltbush *Enchylaena tomentosa* var. *glabra*

Family: Chenopodiaceae

## Description

This semi-woody, low-growing shrub can grow up to 1 m tall.

Its leaves are grey/green (changing to red during dry periods), circular to D-shaped in cross-section, semi-succulent and grow up to 2 cm long.

The plant's stems are sometimes red.

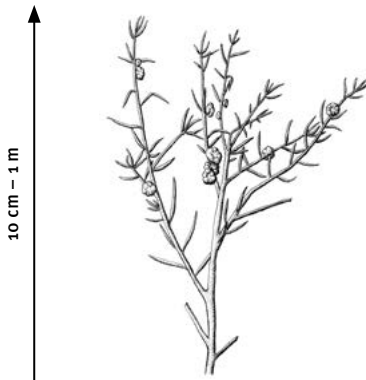
A single axillary flower (inconspicuous) appears between September and May.

The fruit is succulent and varies in colour from green through to yellow and red prior to ripening. The fruit is often the most distinguishable characteristic of the species.

When not in flower, ruby saltbush is often confused with seablite (*Suaeda australis*). Ruby saltbush leaves originate from the stem, whereas seablite often has a more branched form. Also, the newly formed stems of ruby saltbush do not have the distinctive red and green stripe seen on seablite.

## Distribution

Ruby saltbush is found throughout most of Queensland, but is less common north of Townsville and on Cape York.



Growth habit



Fruit in detail





Image courtesy of Glenn Leiper

**Distribution**



**Flowering period**



Grass-like



Succulent



Prostrate



Upright

# Seablite

*Suaeda arbusculoides*  
*Suaeda australis*

Family: Chenopodiaceae

## Description

Seablite is a small, woody, upright perennial herb. It ranges in height from 30 cm tall in *Suaeda arbusculoides* to 80 cm tall in *Suaeda australis*.

Its leaves are succulent, cylindrical to D-shaped in cross-section, alternate and range in colour from green to purple. *S. australis* leaves are around 5.5 cm long, while *S. arbusculoides* leaves are shorter at 2.5 cm long.

The plant's flowers are bisexual and form in clusters at the base of the leaf. *S. australis* has clusters of up to 9 flowers and *S. arbusculoides* has up to 3 flowers.

Both species flower from September to March.

The fruiting body is round and flattened, 1–2 mm long, with 5 succulent lobes closing over the seed.

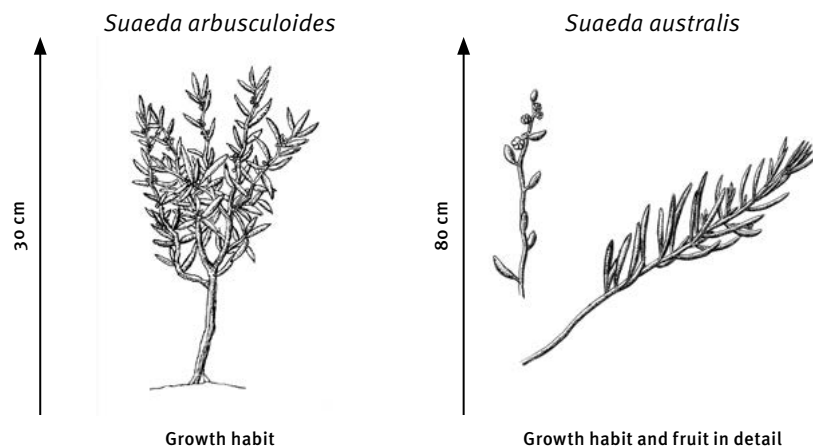
The most visible difference between the two species is that *S. arbusculoides* has smaller, much fatter leaves with less flower heads.

*S. australis* has a red stripe on newly formed stems. *S. australis* forms dense bushes, whereas *S. arbusculoides* usually occurs as a single plant.

*S. australis* is a more common species than *S. arbusculoides*.

## Distribution

Seablite can be found along the entire Queensland coast.





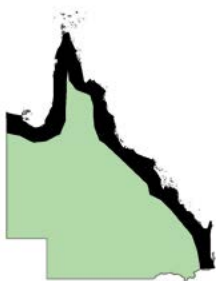
*Suaeda arbusculoides*

Images courtesy of Glenn Leiper



*Suaeda australis*

Distribution



Flowering period



Grass-like



Succulent



Prostrate



Upright

# Sea purslane

*Sesuvium portulacastrum*

Family: Aizoaceae

## Description

This spreading creeper is a succulent herb with roots at the joints (nodes).

Its leaves are opposite, glossy, flat, strap-like and around 2.5–5 cm long.

The plant's stems can range in colour from green through to red and orange.

The flowers are pink and approximately 1 cm long, with 5 petals and solitary in the axils.

It flowers throughout the year.

The fruits are ovoid, smooth and around 8 mm long, with black pea-shaped seeds approximately 1 mm in diameter.

Sea purslane is often seen growing as mats or carpets in sunny, exposed areas.

## Distribution

The plant is found along the entire Queensland coast.



Stem and growth form

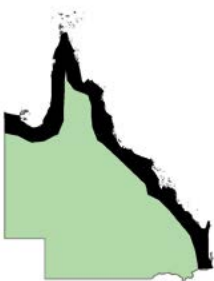




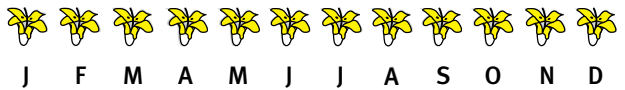
Image courtesy of Glenn Leiper



**Distribution**



**Flowering period**



Grass-like



Succulent



Prostrate



Upright

# Twin flower saltbush

*Dissocarpus biflorus*

Family: Chenopodiaceae

## Description

Twin flower saltbush is a short-lived perennial shrub that grows to a height of approximately 40 cm.

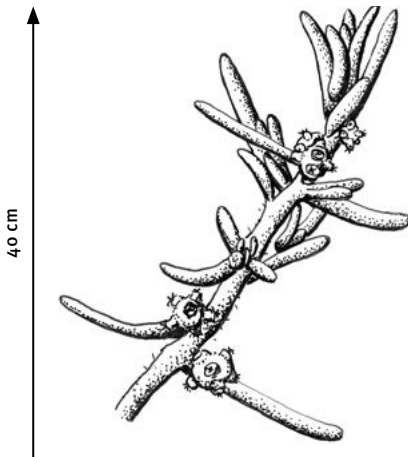
Its leaves are alternate or scattered, hairy, around 10 mm long and grey-green in appearance.

The plant's flowers are bisexual and grow in axils as hairy clumps with horn-like protrusions. The plant flowers between May and July.

Twin flower saltbush is most easily recognised by its silver-grey stems.

## Distribution

It is found along the coast north of Bundaberg to around Cardwell.



Stem in detail



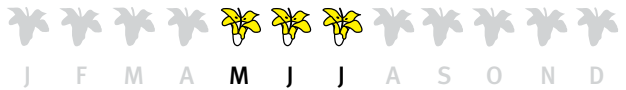
Flower in detail



Distribution



Flowering period



Grass-like



Succulent



Prostrate



Upright





# Grasses, rushes and sedge plants

Plants with sheath-forming leaves, often hollow stemmed, and with flowers arranged in spikelets

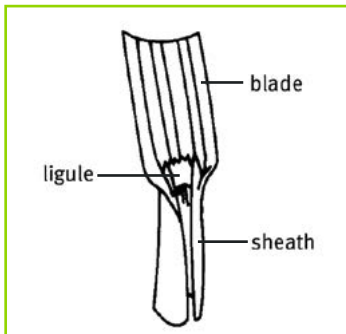




# Key to grasses, rushes and sedge plants

Work through the following list of features to help you identify the plant.

- 1 a Visible sheath, ligule and blade—go to 2  
b No visible sheath, ligule and blade—go to 5
- 2 a Taller than 60 cm—see **Common reed** (page 36)  
b Less than 60 cm—go to 3
- 3 a Growth rhizomatous—go to 4  
b No rhizomes, growth tufted—see **Rice grass** (page 46)
- 4 a Leaves short, around 7 cm long—see **Greencouch** (page 38)  
b Leaves around 15 cm long—see **Saltcouch** (page 50)
- 5 a Leaves flat in cross-section—go to 10  
b Leaves not flat in cross-section—go to 6
- 6 a Leaves with parallel lines—see **Streaked arrow grass** (page 52)  
b Leaves with no parallel lines—go to 7
- 7 a Round flower head—see **Knobby club rush** (page 42)  
b No round flower head—go to 8
- 8 a Growth habit >30 cm tall—go to 9  
b Growth habit <30 cm tall—go to 10
- 9 a Cluster of flowers on each stem—see **Jointed rush** (page 40)  
b Solitary flower heads—see **Rusty sedge** (page 48)
- 10 a Flowers clustered along branches—see **Toad rush** (page 54)  
b Flowers in spikelet with 1 or 2 flowers—go to 11
- 11 a Flowers with leaf stem extending past spikelet—see **Rusty sedge** (page 48)  
b Flowers ovoid in shape—see **Nodding club rush** (page 44)



Parts of a leaf

# Common reed

*Phragmites australis*

**Family: Poaceae**

## Description

Common reed is a perennial grass that grows to 4 m tall in both fresh and brackish water.

Its leaves are alternate, up to 70 cm long and 3.5 cm wide, and smooth in appearance.

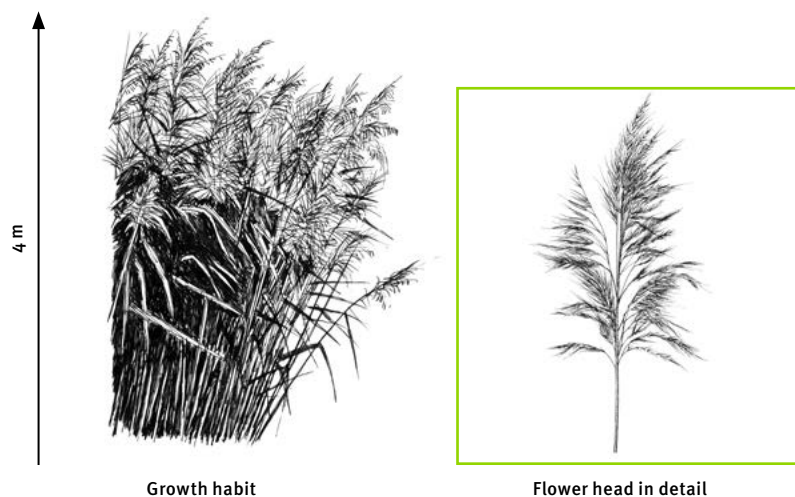
The plant's flowers are 15–30 cm long and 5–20 cm wide. The flower head changes colour with age, becoming silvery grey.

It flowers between September and October, but dead flower heads often remain for some time after the flowering period.

Common reed often invades saltcouch (*Sporobolus virginicus*) grasslands where there is ponding of fresh or brackish water.

## Distribution

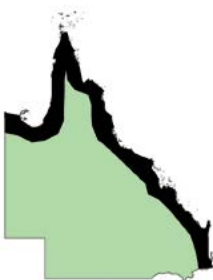
Common reed grows along the entire Queensland coast.





Images courtesy of Glenn Leiper

**Distribution**



**Flowering period**



**Grass-like**



**Succulent**



**Prostrate**



**Upright**

# Greencouch

*Cynodon dactylon*

Family: Poaceae

## Description

Greencouch is a perennial grass that grows approximately 15 cm tall.

It has the growth habit of running rhizomes that root at the nodes.

The leaf blades are flat, with the leaf sheath half as long as the internodes. Growing upright in line with the stem, the leaf blades reach a length of around 7 cm.

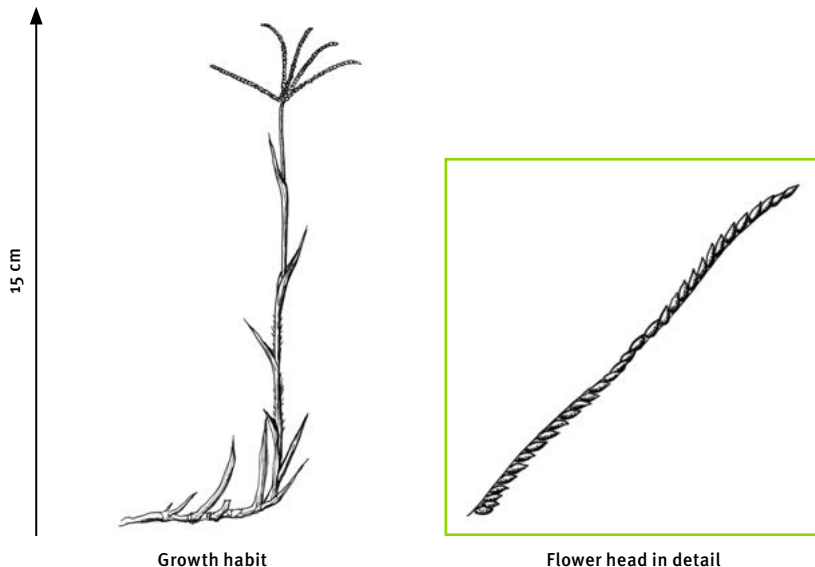
The plant's flowers have 2–7 spikes, each between 2 cm and 6 cm long and linear. They are green to purple and mostly flower between May and October.

The fruit is approximately 2.5 mm long.

Greencouch is often confused with saltcouch. Greencouch is generally a lower growing grass than saltcouch and less salt tolerant. Greencouch is a softer grass to touch and has more hairs along the stem than saltcouch.

## Distribution

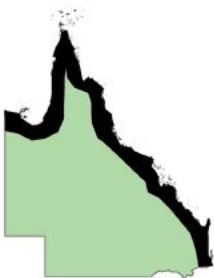
The plant is found along the entire Queensland coast.



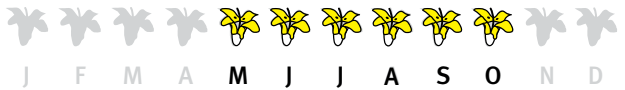




Distribution



Flowering period



Grass-like



Succulent



Prostrate



Upright

# Jointed rush

*Juncus kraussii*

Family: Juncaceae

## Description

This perennial rush grows to 50 cm tall, with a rhizomatous habit.

It often grows in thick tussocks or clumps.

The plant's stems are cylindrical to slightly flattened in cross-section, and are 1.5–3 mm in diameter.

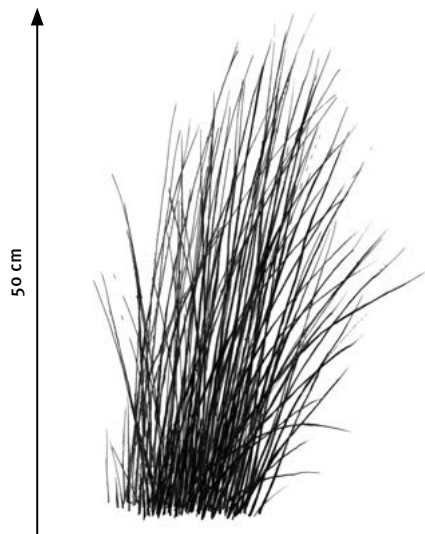
Flowers grow in clusters, with brown perianths and 2–3.5 mm long segments.

There are 4–6 flowers in each cluster and 15–50 clusters per inflorescence.

The plant flowers throughout the year.

## Distribution

Jointed rush grows in coastal areas from south-east Queensland to Mackay.



Growth habit



Flower head in detail

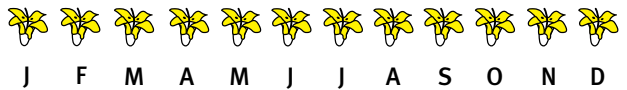




Distribution



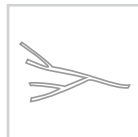
Flowering period



Grass-like



Succulent



Prostrate



Upright

# Knobby club rush

*Ficinia nodosa*

Family: Cyperaceae

## Description

This perennial rush has clumps of dark-green stems on long creeping rhizomes. It grows to a height of 30–90 cm.

The stems are cylindrical (usually with a slight tapering at both ends), smooth-surfaced and approximately 1.5–3 mm thick.

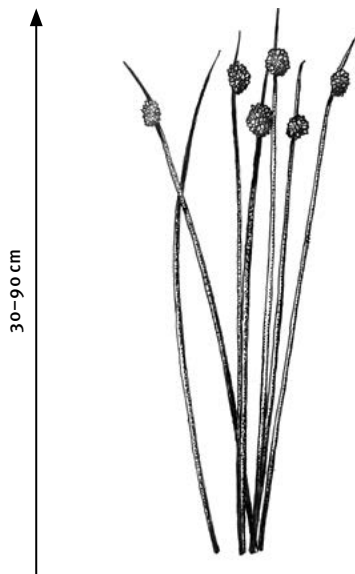
The flower is a dense rounded form, 7–20 mm in diameter, with a sharp pointed leaf end protruding past the flower head.

It flowers throughout the year.

The fruits are shiny and black.

## Distribution

Knobby club rush is found in south-east Queensland.



Growth habit



Flower head in detail

Note: Previously known as *Isolepis nodosa*.

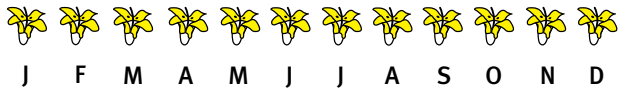




Distribution



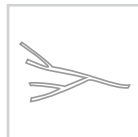
Flowering period



Grass-like



Succulent



Prostrate



Upright

# Nodding club rush

*Isolepis cernua*

Family: Cyperaceae

## Description

This erect, rhizomatous, grass-like sedge is both annual and perennial.

It grows to 30 cm tall.

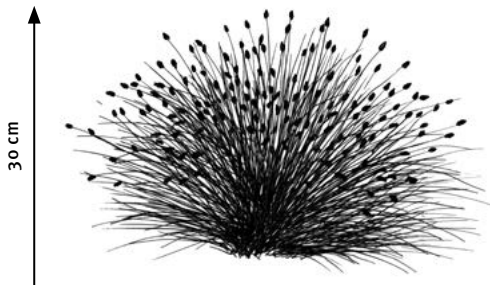
The flowering stem is thread-like and reaches 2–20 cm high.

The flowers are straw to orange coloured or red-brown.

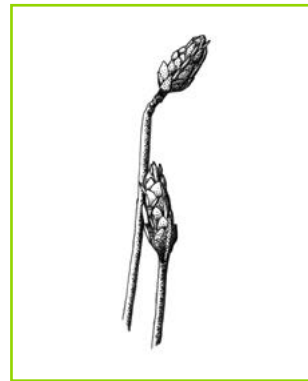
Nodding club rush flowers between September and March.

## Distribution

Nodding club rush can be found from south-east Queensland to as far north as Bundaberg.



Growth habit



Flower head in detail





Images courtesy of Paul Gullan (Viridans Images)

**Distribution**



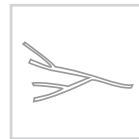
**Flowering period**



Grass-like



Succulent



Prostrate



Upright

# Rice grass

*Xerochloa imberbis*

Family: Poaceae

## Description

This perennial grass has narrow leaf blades and grows to around 60 cm tall.

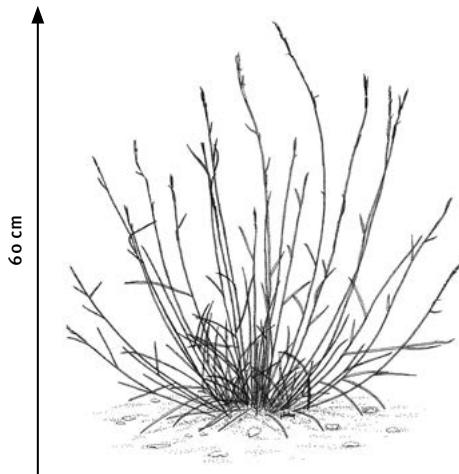
Its flowers are green and solitary.

Rice grass flowers from April to October.

It grows in areas with low soil moisture.

## Distribution

The plant grows from around Cardwell to the Northern Territory border.

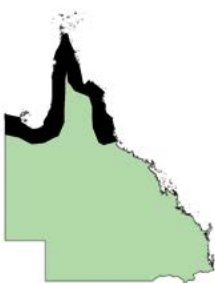


Growth habit

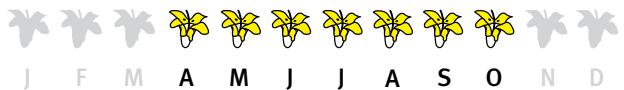




Distribution



Flowering period



Grass-like



Succulent



Prostrate



Upright

# Rusty sedge

*Fimbristylis ferruginea*  
*Fimbristylis polytrichoides*

Family: Cyperaceae

## Description

These perennial sedges differ in height, *Fimbristylis ferruginea* being the taller species of the two.

*Fimbristylis polytrichoides* is small and densely tufted (5–30 cm tall). Flowers appear on a single spikelet, sometimes on 1 or 2 lateral spikelets.

*F. ferruginea* is tufted (20–65 cm tall) with very short rhizomes. It has a brown membranous sheath around its stems. The spikelets are solitary and brown, with many flowers that usually number 1–10 (sometimes up to 25, but this number is very rare).

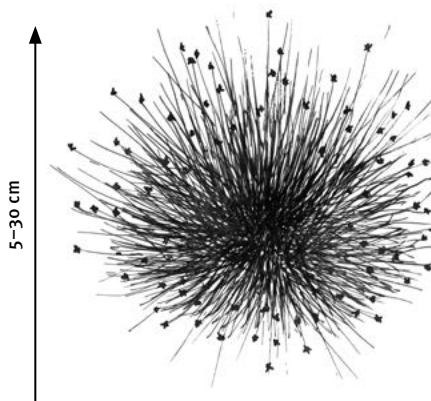
Rusty sedge has distinctive rusty brown flowers.

Rusty sedge flowers from February to July.

## Distribution

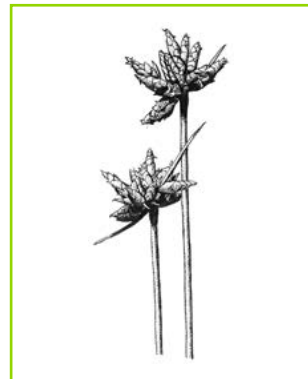
The plant is found along the entire Queensland coast.

*Fimbristylis polytrichoides*



Growth habit

*Fimbristylis ferruginea*

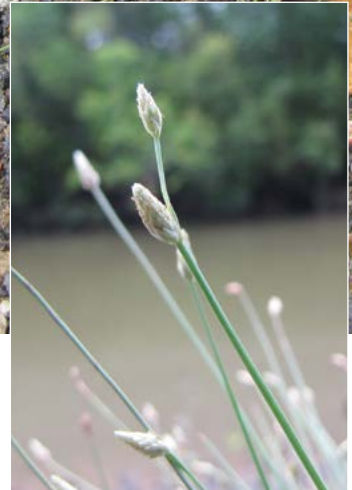


Flower head in detail



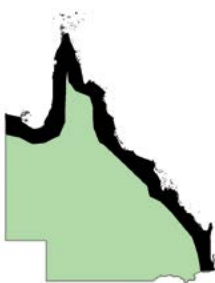
*Fimbristylis ferruginea*

Image courtesy of Glenn Leiper

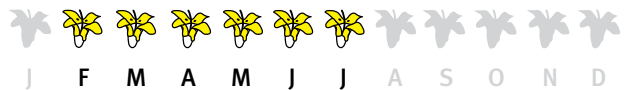


*Fimbristylis polytrichoides*

**Distribution**



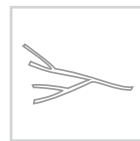
**Flowering period**



Grass-like



Succulent



Prostrate



Upright

# Saltcouch

*Sporobolus virginicus*

**Family: Poaceae**

## Description

Saltcouch is a perennial grass with erect, leafy stems. It grows in mat formations from rhizomes to a height of 15–30 cm.

The plant's leaves are alternate, up to 15 cm long, and are in 2 ranks on either side of the stem.

The stems can be both vertical and horizontal (underground rhizomes).

It flowers throughout the year and flower heads can grow up to 10 cm long.

The fruit is approximately 4 mm long.

Saltcouch grows in upper tidal, intertidal and some inland areas. It prefers sandy soils and tends to form dense, low mats of vegetation.

When transplanted as a turf it makes an excellent plant for rehabilitation of saline wetlands.

## Distribution

The plant appears Queensland-wide on the coast and in inland saline soils.



Growth habit



Flower head in detail

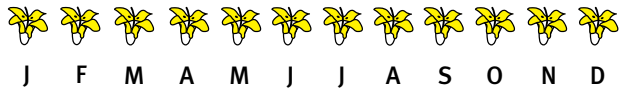




Distribution



Flowering period



Grass-like



Succulent



Prostrate



Upright

# Streaked arrow grass

*Triglochin striata*

**Family:** Juncaginaceae

## Description

This rhizomatous perennial has narrow, linear leaves with parallel lines.

It ranges in height between 3 cm and 25 cm.

The plant produces numerous small, round, green flowers on a central stem that can range in height from 3 cm to 15 cm.

The leaves and stems grow from rhizomes (stems along or below ground).

It flowers in a dense spike between November and December. Individual flowers have short stalks.

The fruit is around 3 mm in diameter.

Streaked arrow grass is commonly found in swampy sections of saltmarsh.

## Distribution

The plant can be found from the Queensland – New South Wales border to just south of Mackay.



Growth habit



Flower head in detail





Image courtesy of Glenn Leiper

**Distribution**



**Flowering period**



Grass-like



Succulent



Prostrate



Upright

# Toad rush

*Juncus bufonius*

Family: Juncaceae

## Description

This annual grows in tufts and to a height of 20–30 cm.

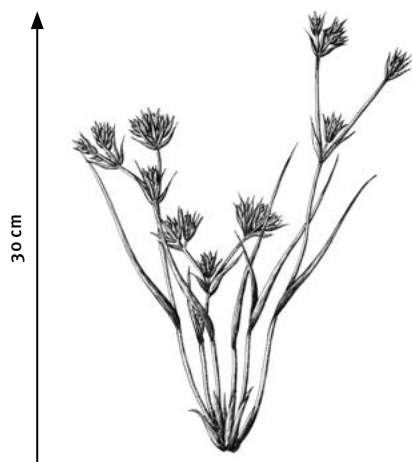
The leaf blades are flat and around 5 mm wide. The stems are usually pale.

It has solitary flowers along branches, in clusters of 2–6.

The plant flowers between September and March.

## Distribution

Toad rush is mostly found from south-east Queensland north to Bundaberg.



Growth habit



Flower head in detail



Images courtesy of Paul Gullan (Viridans Images)

**Distribution**



**Flowering period**



**Grass-like**



**Succulent**



**Prostrate**



**Upright**



## Other plant types







# Key to other plant types

Work through the following list of features to help you identify the plant.

- 1
  - a Leaves flat and grow from a central root stock—**go to 2**
  - b Growth habit prostrate and creeping in nature—**go to 3**
- 2
  - a Flower from a central stem and yellow in colour—**see Native sea lavender (page 64)**
  - b Flower from a central stem and pink in colour—**see Native sea lavender (page 64)**
- 3
  - a Stems waxy and wrinkled—**see Creeping bushweed (page 60)**
  - b Leaves flat and oblong, smooth on top and scaly below—**see Creeping saltbush (page 62)**

# Creeping bushweed

*Samolus repens*

Family: Primulaceae

## Description

This perennial grows to a height of 10–30 cm and a width of 5–60 cm.

Its stems are often wrinkled or warty.

The stems often creep along the ground, rooting at the nodes.

It has thick leaves without hairs (glabrous).

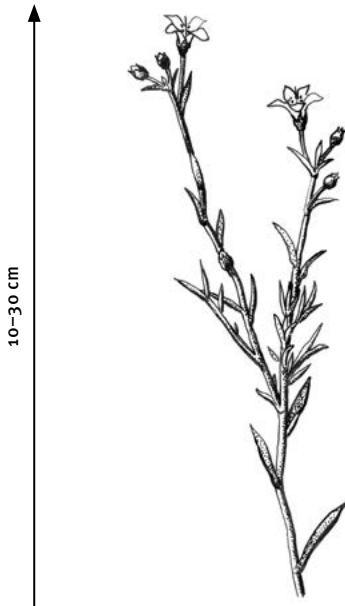
The leaves are alternate and usually less than 4 mm wide.

Flowers are usually white, but occasionally pink.

This plant flowers between September and March.

## Distribution

Creeping bushweed grows from south-east Queensland north to Bundaberg.



Growth habit



Flower head in detail



Image courtesy of Glenn Leiper

**Distribution**



**Flowering period**



Grass-like



Succulent



Prostrate



Upright

# Creeping saltbush

*Atriplex semibaccata*

Family: **Chenopodiaceae**

## Description

This perennial prostrate shrub is low creeping, and grows up to 50 cm tall and 1.8 m wide.

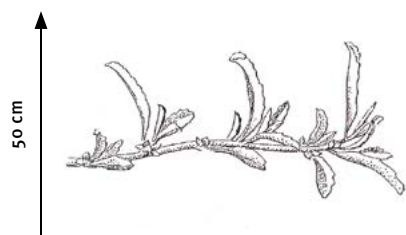
Its leaves are opposite, flat and oblong (sometimes ovate), and around 10–20 mm long. They are smooth on top, scaly underneath and grey/green. New leaves are quite succulent.

Separate male and female flowers grow on the 1 plant. It flowers most of the year.

The fruits are cube/diamond-shaped berries, 2–5 mm long and wide.

## Distribution

Creeping saltbush grows along the coast of south-east Queensland north to Cardwell.



Growth habit



Flower head in detail

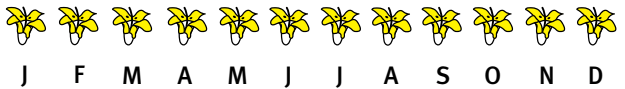


Image courtesy of Glenn Leiper

**Distribution**



**Flowering period**



Grass-like



Succulent



Prostrate



Upright

# Native sea lavender

*Limonium australe*  
*Limonium solanderi*

Family: Plumbaginaceae

## Description

These plants are perennial herbs with a clumping appearance and grow to around 40 cm tall.

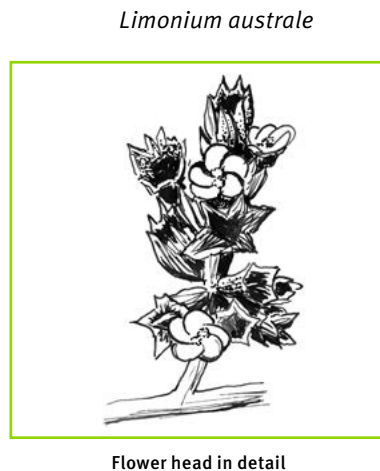
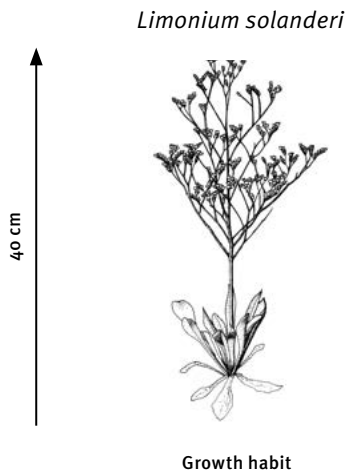
Native sea lavender leaves grow directly from roots (no stem), are narrow at the base and widen near the tips. The roots are very sturdy and thick.

Flowers grow from a tall stalk at the centre of the plant. The flower heads are heavily branched with flat-topped clusters of flowers. They vary in colour from pale pink (*Limonium solanderi*) to yellow (*Limonium australe*) and bloom between September and March.

## Distribution

*L. solanderi* can be found along the coastal region north of Brisbane up to Townsville.

*L. australe* is found between Brisbane and Mackay.







*Limonium solanderi*

Image courtesy of Glenn Leiper

*Limonium australe*

Images courtesy of Paul Gullan (Viridans Images)

Distribution



Flowering period



Grass-like



Succulent



Prostrate



Upright

# Saltmarsh weeds and associates

The species identified in this guide are the most common plant species found within Queensland saltmarshes. However, there are others, including introduced or weed species. Some introduced saltmarsh species have become naturalised, such as greencouch (*Cynodon dactylon*) and jointed rush (*Juncus articulatus*) (Batianoff & Butler 2002).

Common weed species found within saltmarshes include:

- coast barbgrass (*Parapholis incurva*)
- green fat-hen (*Chenopodium murale*)
- hottentot fig (*Carpobrotus edulis*)
- jointed rush (*Juncus articulatus*)
- sand spurry (*Spergularia rubra*).

The value of these weed species in the saltmarsh is not clearly understood, but the main concern is their ability to compete with native species and reduce the biodiversity of the saltmarsh.

Salt-tolerant saltmarsh associates that grow in close proximity to saltmarshes, or occasionally within the saltmarsh, include:

- mangrove fern (*Acrostichum speciosum*)
- paperbark and tea tree (*Melaleuca* spp.)
- she-oak and swamp oak (*Casuarina* spp.).

Other saltmarsh plant species located in saltmarsh habitats and native to Queensland include:

- bacopa (*Bacopa monnieri*)
- berry saltbush (*Einadia hastata*)
- fishweed (*Einadia trigonos* subsp. *stellulata*)
- native seaberry (*Einadia nutans*)
- coastal boobialla (*Myoporum acuminatum*)
- swamp club rush (*Isolepis inundata*).

Some native species are more commonly found in dunal habitats rather than in saltmarsh, but sometimes they may overlap these habitats. These species include:

- burrs (*Sclerolaena* spp.)
- grasses (*Ischaemum australe*, *Ischaemum fragile* and *Lepturus repens*)
- prickly couch (*Zoysia macrantha*)
- tropical beachgrass (*Thuarea involuta*).

Naturalised species that overlap dunal and saltmarsh habitats include fleabanes (*Conyza* spp.) and pigweed (*Trianthema* spp.).

Other naturalised species found on the terrestrial side adjacent to saltmarsh—such as New Zealand sea spinach (*Tetragonia tetragonooides*)—may also be referred to as saltmarsh species.

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