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The Urban Sanctuary

Algae and Marine Invertebrates of Ricketts Point Marine Sanctuary

Jessica Reeves & John Buckeridge

Published by:
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Cover photo: Rocky reef habitat at Ricketts Point Marine Sanctuary, David Reinhard

Contents

Figure 1: Ricketts Point Marine Sanctuary. The intertidal zone rocky shore platform dominated by the brown alga *Hormosira banksii*. Photograph: John Buckeridge.

Introduction

Most Australians live near the sea – it is part of our national psyche. We exercise in it, explore it, relax by it, fish in it – some even paint it – but most of us simply enjoy its changing modes and its fascinating beauty. Ricketts Point Marine Sanctuary comprises 115 hectares of protected marine environment, located off Beaumaris in Melbourne's southeast (figs 1–2). The sanctuary includes the coastal waters from Table Rock Point to Quiet Corner, from the high tide mark to approximately 400 metres offshore.

With their extensive rocky outcrops, the shallow waters around Ricketts Point offer one of Port Phillip Bay's most outstanding examples of a sandstone-reef-based marine ecosystem. The diversity of species has come under threat in recent decades due to the intensive harvesting of shellfish and a corresponding decline in the higher animals that depend on them as a food source. Along with ten other Marine Sanctuaries along the coastline from Port Campbell to East Gippsland, and the thirteen larger Marine National Parks across the state, Ricketts Point Marine Sanctuary was established by the Victorian Government to safeguard marine ecosystems. The sanctuary protects species and their habitats, significant natural landscapes, and features of important cultural and aesthetic value. The sanctuary was established in November 2002, some fifteen years after the concept of a marine reserve for the area was first proposed.

Ricketts Point Marine Sanctuary comprises a variety of habitats, from intertidal rock pools to ornate sponge gardens, which all contribute to the rich biodiversity of the area. Walking along the intertidal platforms or snorkelling in the shallow waters can reveal many of the organisms found in this book. The sanctuary is dominated by sandstone reef rock platforms, and the water depth is mostly less than five metres at low tide. The rocks provide a surface for attachment; shelter from wind and waves; and cracks and fissures in which organisms can hide, either to escape predation or to ambush their own prey. Sand and silt provide opportunities for burrowing organisms.

Rocks, however, are more than simply a substrate, and in places like Ricketts Point they can tell us much about what happened in the area millions of years ago. One of the dominant rock types around Ricketts Point is a reddish brown sedimentary rock that contains a diverse fossil assemblage, ranging from terrestrial marsupials and marine vertebrates, to a rich diversity of invertebrates, including echinoderms (fig. 4), barnacles and shrimps. Of particular interest near Ricketts Point are the burrows and tracks that have been left by shrimps that lived in the area some 4 million years ago (fig. 3).

Figure 2: Locality map of Ricketts Point Marine Sanctuary. a) The sanctuary is one of three located in the north of Port Phillip Bay. b) This image shows the habitat distribution within the sanctuary. Images provided by Parks Victoria.

Visiting the Sanctuary

The proximity of Ricketts Point Marine Sanctuary to Melbourne ensures that it is popular as a marine studies learning site, as well as place for recreation. To maintain the health and diversity of the environment for future enjoyment we ask that you please observe these guidelines:

- Look at where you place your feet to avoid trampling delicate plants and animals.
- Make sure you can see where you place your hands, and learn how to identify potentially dangerous animals, such as the Blue-Ringed Octopus and cone shells (identified by a prominent red square in this guide).
- When diving or snorkelling, be wary of causing damage with your fins and do not chase or capture animals.
- Leave all shells on the beach – you never know what may be inside.
- Take all rubbish home with you and clean up other litter you may find.
- Be mindful of the chemicals that enter our waterways, such as detergents, oil and fertilisers, and consider what you use in your home.
- Take the time to learn more about the animals and plants of the sanctuary and the habitats they depend on.
- Take care of any animals or plants that you are observing by keeping them moist and always ensure they are returned to the same location where they were found.
- Carefully replace any rocks that may have been moved.

To look after yourself and to ensure the safety of those you care for:

- Make sure you can see where you place your hands, and learn how to identify potentially dangerous animals, such as the Blue-Ringed Octopus and cone shells.
- Wear appropriate footwear on the rocks and take care on slippery surfaces.
- Remember sun protection (sunscreen, hats and appropriate clothing), even in the water.

Please remember that Marine Sanctuaries are no-take environments. State laws prohibit fishing, netting, spearing, and collecting shells and artefacts in these areas.
Humanity's influence is not always benign, with the remains of our activities, such as flotsam and jetsam, often being harmful to the natural world. We encourage you to remove rubbish, especially plastic bags and fibres.

Figure 3: Thalassind burrows. Presumed to have been made by shrimps during the late Miocene. Ricketts Point.
Photograph: John Buckeridge.
Scale: coin diameter 25 mm.

Figure 4: Fossils of Ricketts Point. Two specimens of the Heart Urchin, *Lovenia woodsii*, c. 4 million years old. Photograph: John Buckeridge.

How to use this book

This book has been designed to help keen naturalists, high-school students and university undergraduates identify the aquatic plants and invertebrates within Ricketts Point Marine Sanctuary. Many of the species found here are common to the other sanctuaries in the north of Port Phillip Bay – Jawbone and Point Cook.

We have included entries for over 200 species that we know either live in the sanctuary or are commonly found washed up on the shore. The organisms are listed in systematic fashion, with the least specialised organisms placed first; thus, the book begins with the cyanobacteria and finishes with the higher invertebrates. Some of the very rare or more cryptic organisms are not included. It is also certain that invasive species will arrive as hitchhikers on ships or as a response to climate change.

This book thus represents a snapshot of the algal and marine invertebrate life at Ricketts Point in 2012. If you find other species that are not listed here, please contact Marine Care Ricketts Point so they can make a record for future editions of this book.

A key is provided on page 116 to help users identify the major group to which an organism belongs, e.g. sponges, seastars, bivalves, snails. The groups are colour-coded on the margin of the book for easy reference. There is a separate entry for each organism, which includes the scientific name and author; common name; a description of key identifying characters; its maximum size, preferred habitat, optimal depth range, distribution (locally and, if relevant, globally) and abundance; references; common scientific synonyms (any names by which the organism was previously known) and a colour photograph. The photographer of each image is acknowledged, along with the location at which the photograph was taken, if not at Ricketts Point. A glossary of technical terms, which are indicated in bold type in the species descriptions, is included at the end of the book.

Warning

Some species found within the sanctuary are poisonous and must not be handled. These are identified in the book by a prominent red square.

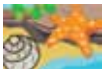
Habitat

The habitats found within the sanctuary have been classified by Parks Victoria as sand, seagrass, urchin barrens, intertidal rock platforms, shallow subtidal platforms, rocky reefs and open water. The distribution of each habitat within the sanctuary is shown on the map in figure 2b. The following codes, based upon those used by Parks Victoria, are included in each entry for quick reference to the habitat and substrate:

Sand habitats are home to numerous organisms that live both at the sand–water interface and in the spaces between sand particles. The micro-organisms that feed on detritus in the sand provide important nutrient cycling in the marine ecosystem. Common macro-organisms in sandy habitats include bivalves and crabs.

Seagrass forms extensive meadows in sheltered bays and estuaries and protects the coastline by trapping fine sediment, thus stabilising the sea bed. Seagrass habitats provide nursery grounds for many marine species. They are dominated by *Zostera* spp.

Urchin barrens are regions stripped of algae by the aggressive grazing of the echinoderm (or 'urchin') *Heliocidaris erythrogramma*. Fortunately, the regions of urchin barren in the sanctuary are currently small, but they still require careful monitoring.



Intertidal rock platforms are exposed at low tide and form one of the most diverse and interesting habitats to explore. Rock pools and crevices provide shelter from predators and waves, creating a diverse and protected habitat for a wide range of organisms. Neptune's Necklace, gastropods, mussels, seastars, crabs, shrimps, tube worms, anemones and barnacles can all be found here.

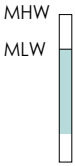
Shallow subtidal platforms are rocky surfaces located just below low tide, hence organisms living here are always submerged. Colourful algae, sea urchins, coral, seastars, molluscs, anemones, nudibranchs and sea squirts are common here.

Rocky reefs provide a solid substrate for marine organisms to attach to. Here you will find mixed algae in areas where light can penetrate, colourful sponge gardens, sea squirts, gastropods, sea stars and anemones. Under the ledges and in crevices on reefs are good places for some animals to shelter.

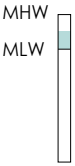
Open water environments extend beyond the reefs of Port Phillip Bay to Bass Strait and the Southern Ocean. These waters are home to organisms that include plankton, jellies, large fish and marine mammals. Although organisms from these deeper waters are sometimes found washed up on the shore, most are atypical of habitats within the sanctuary.

Depth

The optimal depth range of a species is represented by blue shading on a vertical bar. The top of the depth bar represents the average height of high tide, or mean high water (MHW); the line around one quarter of the way down the bar represents the average height of low tide, or mean low water (MLW); the bottom of the bar represents 10 m water depth.



This bar is for a species whose depth range is subtidal, from 0 m to about -7 m.



For species restricted to the intertidal zone, only the area between MHW and MLW will be shaded.

For species occurring in deeper waters, the lower section of the bar will be shaded from the minimum depth at which the species is known to occur. If the species occurs at depths greater than 10 m, the maximum depth at which it is known to occur is represented by the number to the left of the bar. This example is for a species that occurs from around depths of 2 m to 30 m.

Distribution

The distribution of a species is shown using the following maps:

Victoria, Tasmania

Victoria, Tasmania, South Australia, Southern New South Wales, Southern Western Australia

South of the Tropic of Capricorn

East coast of Australia

Australia

Introduced (exotic species which may have a wide global distribution)

Abundance

The abundance of each species is provided in graphic form. Abundance refers specifically to that within Ricketts Point Marine Sanctuary. When a species is listed as rare, it means that you will be very lucky to see a specimen, although they have been recorded in the sanctuary; uncommon implies that careful observation in the appropriate habitat should reveal one or two specimens; common organisms are easy to find in the habitat given; and abundant organisms comprise a significant portion of the biota in its given habitat.

Rare □

Uncommon ■

Common ■ ■

Abundant ■ ■ ■

Reference

Other well-known or easily accessibly sources of information about a species are listed with its description. The letter code refers to one of the resources listed below, and is followed by the page number, where applicable. For example, 'F 15'refers to page 15 of Seaweeds of Australia.

B	Friends of the Bluff, Barwon Heads, 2009. *Life on the Edge*.
D	Davey, K. 2000. *Life on Australian Seashores*.
E	Edgar, G.J. 2000. *Australian Marine Life*, revised edition.
E2	Edgar, G.J. 2008. *Australian Marine Life*, revised 2nd edition.
F	Fuhrer, B.A. et al. 1981. *Seaweeds of Australia*.
FN	Phillips, D.A.B. et al. 2006. *Coastal Invertebrates of Victoria*, revised edition.
R	Wescott, G.C. et al. 1980. *Life on the Rocky Shores of South-Eastern Australia*.
W	Whiteway, B. 1985. *Marine Life of the Coastal Fringe*.
AlgaeBase	www.algaebase.org
WoRMS	*World Register of Marine Species*, marinespecies.org
SS	*The Sea Slug Forum* seaslugforum.net
MV	*Marine Crustaceans of Southern Australia* museumvictoria.com.au/crust/ (now incorporated in the Taxonomic Toolkit for Marine Life of Port Phillip Bay, portphillipmarinelife.net.au)

These references, along with additional texts for further reading, are listed in full under Further reading on page 120.

A note on nomenclature

Plants and animals are described using a two-part scientific name consisting of the genus name and the species epithet. The use of scientific names allows plants and animals to be referred to unambiguously. For animals, the author (the person who first described the species) and the year that the name was first published are listed after the species name. If the genus name has changed through taxonomic revision, the author's name and date of description are placed in parentheses. For example, *Lovenia woodsii* (Etheridge, 1875) was first described by Etheridge in 1875, but he did not, at that time, call it *Lovenia* (he actually called it *Hemipatagus woodsii*). In botanical nomenclature, an entry such as '*Hormosira banksii* (Turner) Decaisne, 1842' tells us that although the organism was first described by Turner, it was Decaisne, in 1842, who provided the current name. Both systems allow species names and descriptions to be accurately cross-checked in other publications.

Acknowledgements

The genesis of this field guide followed a request from Marine Care Ricketts Point (www.marinecare.org.au), a volunteer group formed in 2003 to ensure the wellbeing of the Ricketts Point Marine Sanctuary. They wanted a guide to help them in their regular surveys of the sanctuary and to use as a teaching tool for the many school and other groups who visit the site. Funding to undertake this project was provided through the Norman Wettenhall Foundation, an environmental organisation and philanthropic trust that supports projects that enhance or maintain the vitality and diversity of the Australian natural living environment. RMIT provided in kind support, making this project possible.

This book represents the knowledge of a great number of naturalists and professional scientists. It is a culmination of their effort and enthusiasm, which has provided distribution data, photographs and confirmed identifications. We specifically acknowledge Ray Lewis, Bob Whiteway, Joe Mumford, Mel Mitchell and David Reinhard (Marine Care Ricketts Point); Rod Watson (Victorian Marine Science Consortium, Queenscliff); Mark Rodrigue and Steffan Howe (Parks Victoria); John Eichler, Leon Altoff (Field Naturalists Club Victoria); Isla Fletcher, Jan Carey (University of Melbourne), John Huisman (Murdoch University) and Sarah Speight. Michelle Kelly (National Institute of Water & Atmospheric Research, Auckland, New Zealand) provided valuable insight into sponge taxonomy. We also thank the many photographers who generously contributed their work to this project. The research and production team included Jackie Scally, Anthony Bright (graphics) and Alison Vaughan (editing), without whom this book would have simply languished as an idea.

This book is published with the generous support of Parks Victoria and the International Union of Biological Sciences.

John St James Stewart Buckeridge

Melbourne, Australia

Species descriptions

Kingdom **Monera** Phylum **Cyanophyta**

Rivularia firma

Womersley, 1946

BLUE-GREEN ALGAE

Description: *Rivularia firma* is a gelatinous, globular, green-black **cyanobacteria** that forms densely scattered, brain-like colonies.

Size: Diameter to 20 mm

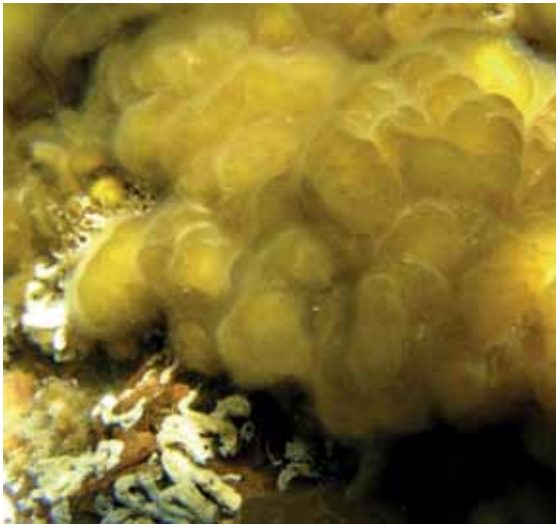
Habitat and distribution:

Abundance: ■ ■

Reference: F 15; E 19; B 7

Photograph: Rod Watson, Barwon Bluff

Kingdom **Protista** Phylum **Phaeophtya**



Leathesia difformis

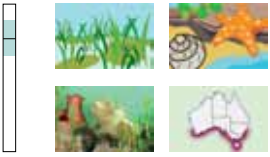
Areschoug, 1847

SEA POTATO

Description: *Leathesia difformis* is yellow-brown in colour, with a slimy texture when squashed. It is a seasonal species and is most evident in late spring and summer.

Size: **Thallus** width to 80 mm

Habitat and distribution:



Abundance: ■ ■

Reference: F 64; E 44; AlgaeBase

Photograph: Joe Mumford

Kingdom **Protista** Phylum **Phaeophyta**

Splachnidium rugosum

(Linnaeus) Greville, 1830

SAUSAGE WEED

Description: *Splachnidium rugosum* has a gel-filled, erect primary axis, with minor lateral axes. It is most conspicuous in summer.

Size: **Thallus** length to 50 mm

Habitat and distribution:

Abundance:

Reference: F 63; E 45; B 12; D 23

Photograph: Rod Watson

Kingdom **Protista** Phylum **Phaeophyta**

Dictyota dichotoma

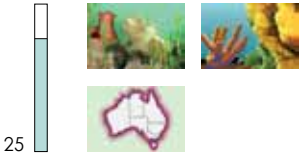
(Hudson) J.V. Lamouroux, 1809

BLUE GLOW WEED

Description: *Dictyota dichotoma* is a brown alga with flattened fronds. A distinguishing characteristic is the smooth, forked blades, with an iridescent blue sheen.

Size: **Thallus** length to 200 mm

Habitat and distribution:



Abundance:

Reference: E 46; AlgaeBase

Photograph: Tim Foster

Kingdom **Protista** Phylum **Phaeophyta**

Zonaria angustata

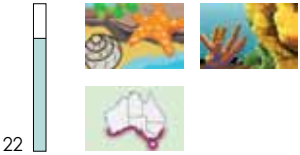
(Kützing) Papenfuss, 1952

THIN-LEAFED FANWEED

Description: *Zonaria angustata* has branched, narrow, ruffled fronds, with distinctive lighter margins.

Size: **Thallus** length to 180 mm

Habitat and distribution:



Abundance:

Reference: F 72; E 48; AlgaeBase

Photograph: David Reinhard

Kingdom **Protista** Phylum **Phaeophyta**

Distromium flabellatum

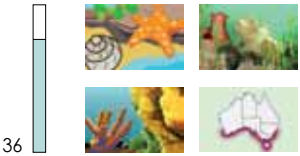
Womersley, 1967

SOUTHERN PEACOCK WEED

Description: *Distromium flabellatum* is characterised by a thin, delicate, fan-shaped **thallus**. The thallus is commonly iridescent blue.

Size: Thallus length to 140 mm

Habitat and distribution:



Abundance:

Reference: E 49; AlgaeBase

Photograph: David Reinhard

Kingdom **Protista** Phylum **Phaeophyta**

Scytosiphon lomentaria

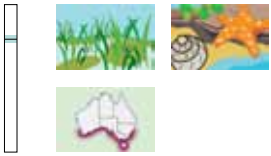
(Lyngbye) Link, 1833

TUBULAR STRINGWEED

Description: *Scytosiphon lomentaria* has long, brown, unbranched tubular **thalli** during winter. In summer, it is less distinct, occurring as an encrusting plant.

Size: Thallus length to 760 mm

Habitat and distribution:

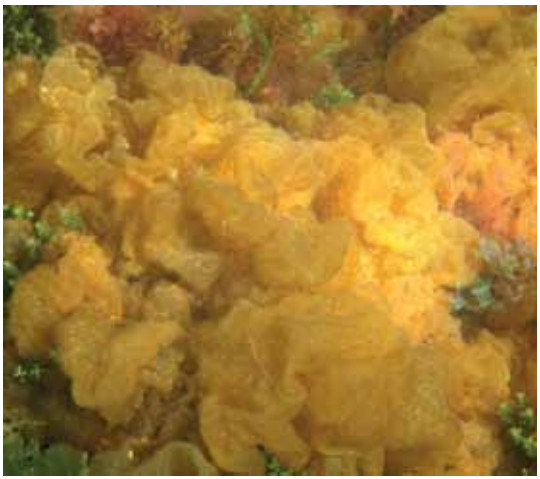


Abundance: ■

Reference: F 65; E 52; AlgaeBase

Photograph: Rod Watson, Barwon Heads

Kingdom **Protista** Phylum **Phaeophyta**



Colpomenia sinuosa

(Mertens ex Roth) Derbès & Solier, 1851

BUBBLE WEED

Description: *Colpomenia sinuosa* is light brown and globular in appearance, and is commonly found attached to other plants. It is distinguished from *Leathesia difformis* by its more solid, creased appearance.

Size: **Thallus** width to 150 mm

Habitat and distribution:

Abundance: ■■

Reference: E 52; F 64; B 12; AlgaeBase

Photograph: David Reinhard

Kingdom **Protista** Phylum **Phaeophyta**

Macrocystis pyrifera

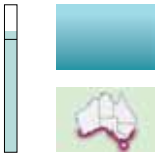
(Linnaeus) C. Agardh, 1820

STRING KELP

Description: *Macrocystis pyrifera* is the dwarf version of Giant Kelp. It has a massive branched and intertwined holdfast, with multiple **stipes**. The fronds are long, thin and narrow. This species is not found alive at Ricketts Point, but may be found washed up on shore.

Size: **Thallus** length to 10 m

Habitat and distribution:



Abundance:

Reference: F 75; E 54; AlgaeBase

Synonym: *Macrocystis angustifolia*

Photograph: Ray Lewis

Kingdom **Protista** Phylum **Phaeophyta**

Ecklonia radiata

(C. Agardh) J. Agardh, 1848

LEATHER KELP

Description: *Ecklonia radiata* has **stipes** of golden-brown to dark brown and occurs in a variety of forms, depending on water depth. Those in shallow water have a short stipe, and blades covered in spines.

Size: **Thallus** length to 2 m

Habitat and distribution:

Abundance:

Reference: F 74; E 55; R 16; B 10; D 26; AlgaeBase

Photograph: Phil Watson

Kingdom **Protista** Phylum **Phaeophyta**

Undaria pinnatifida

(Harvey) Suringar, 1873

JAPANESE KELP

Description: *Undaria pinnatifida* has large strong fronds with ruffled **stipes.**

Size: Thallus length to 1 m

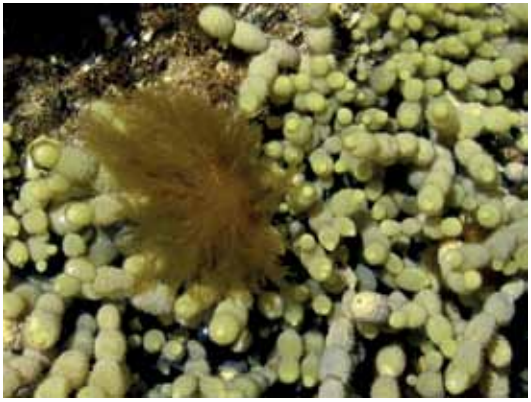
Habitat and distribution:

Abundance: ■ ■ ■

Reference: E 56; AlgaeBase

Photograph: Ray Lewis

Kingdom **Protista** Phylum **Phaeophyta**



Ectocarpus fasciculatus

Harvey, 1841

Description: *Ectocarpus fasciculatus* has pale brown, **filamentous**, jointed **stipes** and is commonly found growing on other seaweeds (here growing on *Hormosira banksii*).

Size: Thallus length to 100 mm

Habitat and distribution:

Abundance: ■ ■

Reference: F 60–61; AlgaeBase

Photograph: Rod Watson

Kingdom **Protista** Phylum **Phaeophyta**

Hormosira banksii

(Turner) Decaisne, 1842

NEPTUNE'S NECKLACE

Description: *Hormosira banksii* is a mid golden-brown alga, with bubble-like segments, and is generally attached to rocks. The degree of branching, size of segments and overall length are highly variable.

Size: **Thallus** length to 400 mm

Habitat and distribution:

Abundance: ■ ■ ■

Reference: F 62; E 57; W 8; R 16; B 9; D 26; AlgaeBase

Photograph: John Buckeridge

Kingdom **Protista** Phylum **Phaeophyta**

Cystophora moniliformis

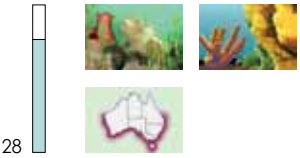
(Esper) Womersley & Nizamuddin, 1964

ZIGZAG CYSTOPHORA

Description: *Cystophora moniliformis* has zigzag-shaped branches with bushy ends, originating from the edges of a flat central axis. The terminal branches are long, thin and **nodose**, and lack floats.

Size: **Thallus** length to 4 m

Habitat and distribution:



Abundance: ■ ■

Reference: F 79; E 63; B 11; AlgaeBase

Photograph: Ray Lewis

Kingdom **Protista** Phylum **Phaeophyta**

Cystophora retorta

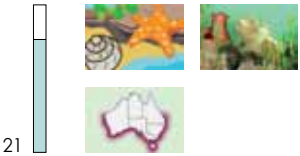
(Mertens) J. Agardh, 1848

OPEN-BRANCHED CYSTOPHORA

Description: *Cystophora retorta* has long, thin, pale greenish brown branches. The lateral fronds are spaced regularly and form small tufts. The main axis is slightly flattened.

Size: Thallus length to 1.2 m

Habitat and distribution:



Abundance:

Reference: F 80; E 66; AlgaeBase

Photograph: Joe Mumford

Kingdom **Protista** Phylum **Phaeophyta**

Cystophora subfarcinata

(Mertens) J. Agardh, 1848

BUSHY CYSTOPHORA

Description: *Cystophora subfarcinata* is light brown and characterised by the zigzag structure of the main axis, which is wide and thin. The lateral fronds are very dense and bushy.

Size: Thallus length to 2 m

Habitat and distribution:

Abundance:

Reference: F 78; E 67; AlgaeBase

Photograph: Joe Mumford

Kingdom **Protista** Phylum **Phaeophyta**

Caulocystis uvifera

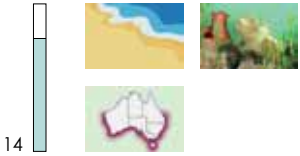
(C. Agardh) Areschoug, 1854

GRAPEWEED

Description: *Caulocystis uvifera* has round floats and a cylindrical axis, branching on all sides.

Size: **Thallus** length to 600 mm

Habitat and distribution:



Abundance:

Reference: F 81; E 68; AlgaeBase

Synonym: *Sargassum uviferum*

Photograph: Mel Mitchell, Black Rock

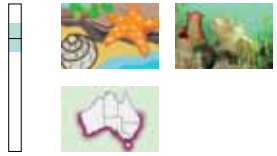
Kingdom **Protista** Phylum **Phaeophyta**

Sargassum spp.

Description: *Sargassum* is a genus of large brown algae that resembles a flowering plant with complex branching and distinctive mid-ribbed leaves. Many species are difficult to differentiate during much of the year when the reproductive fronds are absent.

Size: **Thallus** length to 1 m

Habitat and distribution:



Abundance:

Reference: F 83; E 69–71; AlgaeBase

Photograph: Ray Lewis

Kingdom **Protista** Phylum **Rhodophyta**

Liagora harveyana

Zeh, 1912

Description: *Liagora harveyana* is a calcified red alga, although distinct from the coralline algae. The forked branches are cylindrical, not jointed.
Size: **Thallus** length to 50 mm
Habitat and distribution:

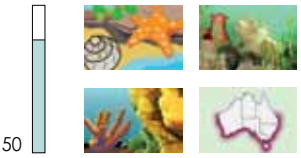
Abundance:
Reference: F 19; AlgaeBase
Photograph: David Reinhard, Black Rock

Kingdom **Protista** Phylum **Rhodophyta**

Plocamium angustum

(J. Agardh) J.D. Hooker & Harvey, 1847
COMMON PLOCAMIUM

Description: *Plocamium angustum* is a finely branching red alga. It has narrow, flat axes with alternating short **ramuli** with small, branched fronds.
Size: **Thallus** length to 250 mm
Habitat and distribution:



Abundance:
Reference: F 36; E 80; AlgaeBase
Photograph: Rod Watson

Kingdom **Protista** Phylum **Rhodophyta**

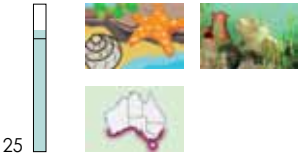
Plocamium leptophyllum

Kützing, 1849

Description: *Plocamium leptophyllum* is a red alga that grows as an **epiphyte** on other algae. The **thallus** is very delicate and densely branched.

Size: Thallus length to 150 mm

Habitat and distribution:



Abundance: ■ ■

Reference: AlgaeBase

Photograph: David Reinhard

Kingdom **Protista** Phylum **Rhodophyta**

Capreolia implexa

Guiry & Womersley, 1993

TUFTING RED ALGAE

Description: *Capreolia implexa* grows as a tufted mat. Classified as a red alga, it has a turf-like yellow-brown appearance.

Size: Tufts to 30 mm

Habitat and distribution:

Abundance: ■ ■ ■

Reference: R 33; AlgaeBase

Photograph: Ray Lewis

Kingdom **Protista** Phylum **Rhodophyta**

Corallina officinalis

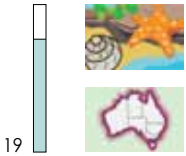
Linnaeus, 1758

TUFTED CORALLINE

Description: *Corallina officinalis* has pink-purple feather-like, articulated, branching fronds. The cells of coralline algae are hardened by deposits of calcium carbonate, giving them a coral-like texture.

Size: Thallus length to 150 mm

Habitat and distribution:



Abundance: ■ ■ ■

Reference: F 18; W 9; B 8; D 29; AlgaeBase

Photograph: David Reinhard

Kingdom **Protista** Phylum **Rhodophyta**

Lithothamnion spp.

ICING SEAWEED, ENCRUSTING CORALLINES

Description: *Lithothamnion* is a genus of pink, encrusting, coralline algae. It occurs as a hard pink coating on virtually all shaded rock surfaces. It is not possible to identify to species level without a microscope.

Size: Variable size

Habitat and distribution:

Abundance: ■ ■ ■

Reference: F 20–21; E 86; W 9; B 8; D 29

Photograph: David Reinhard

Kingdom **Protista** Phylum **Rhodophyta**

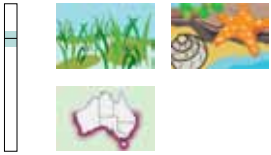
Laurencia filiformis

(C. Agardh) Montagne, 1845

Description: *Laurencia filiformis* has cylindrical fronds with branching in all directions. Like other *Laurencia* species, it has an indentation at the terminus of the branches. It sometimes grows as an **epiphyte** on seagrasses.

Size: Thallus length to 150 mm

Habitat and distribution:



Abundance:

Reference: F 57; AlgaeBase

Photograph: Ray Lewis

Kingdom **Protista** Phylum **Rhodophyta**

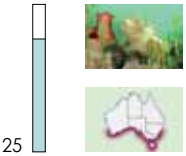
Lenormandia muelleri

Sonder, 1853

Description: *Lenormandia muelleri* has broad, flat, firm, leaf-like fronds, branching from the midrib and margins.

Size: Thallus length to 60 mm

Habitat and distribution:



Abundance:

Reference: R 33; AlgaeBase

Photograph: Ray Lewis

Kingdom **Protista** Phylum **Rhodophyta**

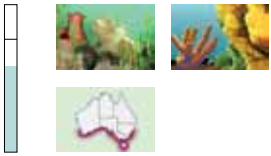
Botryocladia sonderi

P.C. Silva, 1996

Description: *Botryocladia sonderi* has clusters of hollow, grape-like branches originating from the main stem. It ranges in colour from red through to brown.

Size: Thallus length to 200 mm

Habitat and distribution:



Abundance:

Reference: F 46; E 89; AlgaeBase

Photograph: Ray Lewis

Kingdom **Plantae** Phylum **Chlorophyta**

Ulva compressa

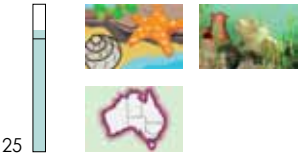
Linnaeus, 1753

BAIT WEED

Description: *Ulva compressa* is a vibrant green alga with hollow tubular fronds, branched at the base. It is held to the rocks by a holdfast.

Size: Thallus length to 150 mm

Habitat and distribution:



Abundance:

Reference: B 13; AlgaeBase

Synonym: *Enteromorpha compressa*

Photograph: Friends of the Barwon Heads Bluff, Barwon Bluff

Kingdom **Plantae** Phylum **Chlorophyta**

Ulva intestinalis

Linnaeus, 1753

GREEN BAIT WEED

Description: *Ulva intestinalis* has green, hollow, constricted tubular fronds, but unlike other species, is unbranched. It commonly forms dense turf-like mats.

Size: Thallus length to 250 mm

Habitat and distribution:

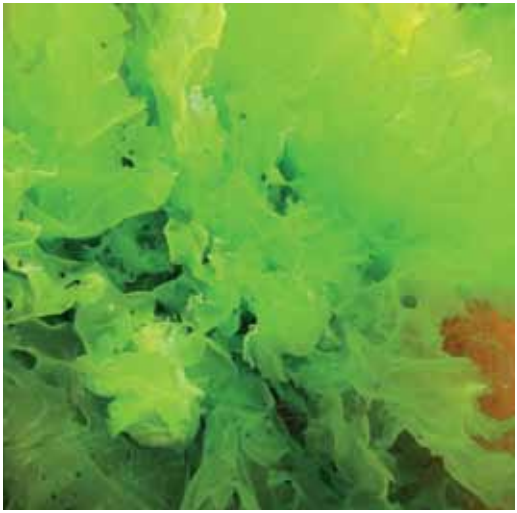
Abundance: ■ ■ ■

Reference: F 89–90; E 29

Synonym: *Enteromorpha intestinalis*

Photograph: Ray Lewis

Kingdom **Plantae** Phylum **Chlorophyta**



Ulva spp.

SEA LETTUCE

Description: *Ulva* are vibrant green algae with broad, thin fronds. Six species are present in southern Australia, the most common being *Ulva australis*.

Size: Thallus length to 300 mm

Habitat and distribution:

Abundance: ■ ■ ■

Reference: F 88–89; E 28; W 7; R 13; B 13; D 20; AlgaeBase

Photograph: David Reinhard

Kingdom **Plantae** Phylum **Chlorophyta**

Codium fragile

(Suringar) Hariot, 1889

GREEN SEA VELVET

Description: *Codium fragile* has dark green forked branches and a covering of hairs, creating a furry appearance. The **thalli** have pointed rather than rounded ends.

Size: Thallus length to 300 mm

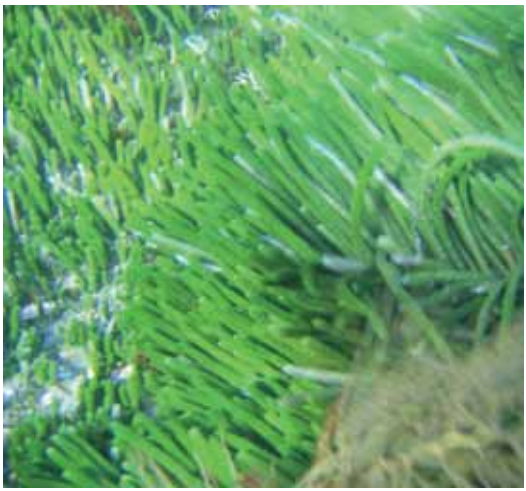
Habitat and distribution:

Abundance: ■ ■ ■

Reference: F 102–103; E 34; W 7; B 14; D 21; AlgaeBase

Photograph: David Reinhard

Kingdom **Plantae** Phylum **Chlorophyta**



Caulerpa brownii

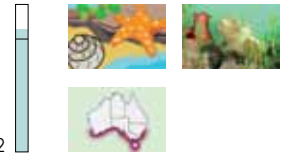
(C. Agardh) Endlicher, 1843

SPINY CAULERPA

Description: *Caulerpa brownii* is emerald green in colour. The erect axes are densely covered by short **ramuli**, which are mostly forked at their bases.

Size: **Thallus** length to 400 mm

Habitat and distribution:



Abundance: ■ ■ ■

Reference: F 97; E 38; B 14; AlgaeBase

Photograph: Rod Watson, Barwon Bluff

Kingdom **Plantae** Phylum **Chlorophyta**

Caulerpa flexilis

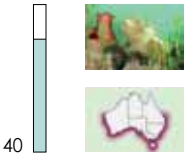
J.V.Lamouroux ex. C. Agardh, 1823

FEATHERY CAULERPA

Description: *Caulerpa flexilis* is a green seaweed with branches alternating along the erect primary axis. The conifer-like fronds are often heavily grazed, leaving only the **stolon**.

Size: Thallus length to 300 mm

Habitat and distribution:



Abundance:

Reference: F 95; E 39; B 14; AlgaeBase

Photograph: Rod Watson

Kingdom **Plantae** Phylum **Chlorophyta**

Caulpera longifolia

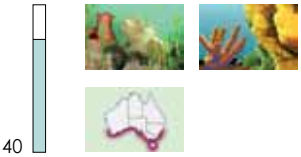
C. Agardh, 1823

LONG-FILAMENT CAULPERA

Description: *Caulpera longifolia* has long thread-like **ramuli**, usually in five rows along the sides of the erect axes. The species has a shaggy appearance.

Size: Thallus length to 650 mm

Habitat and distribution:



Abundance:

Reference: F 98; E 37; AlgaeBase

Photograph: Ray Lewis

Kingdom **Plantae** Phylum **Chlorophyta**

Caulerpa remotifolia

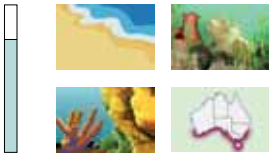
Sonder, 1853

HERRING-BONE CAULERPA

Description: *Caulerpa remotifolia* is a vivid green alga, distinguished by the regularly spaced, flattened ramuli that extend along the main axis. The gaps between the **ramuli** exceed the width of the ramuli.

Size: **Thallus** length to 300 mm

Habitat and distribution:



Abundance:

Reference: F 99; E 36; AlgaeBase

Photograph: David Reinhard

Kingdom **Plantae** Phylum **Chlorophyta**

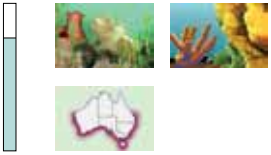
Caulerpa sedoides f. *geminata*

(Harvey) Weber Bosse, 1898

Description: *Caulerpa sedoides* f. *geminata* is a small green weed with bubble-like **ramuli**, either in pairs or attached irregularly to the axes.

Size: **Thallus** length to 150 mm

Habitat and distribution:



Abundance:

Reference: F 97; E 40; AlgaeBase

Synonym: *Caulerpa geminata*

Photograph: David Reinhard

Kingdom **Plantae** Phylum **Chlorophyta**

Caulerpa vesiculifera

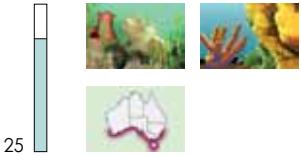
(Harvey) Harvey, 1863

BEADED CAULERPA

Description: *Caulerpa vesiculifera* has a pale green **thallus**, with thin **ramuli** densely arranged along the axes. Two similar species, *C. simpliciuscula* and *C. papillosa*, can be distinguished by their darker green colour and smaller size.

Size: Thallus length to 350 mm

Habitat and distribution:



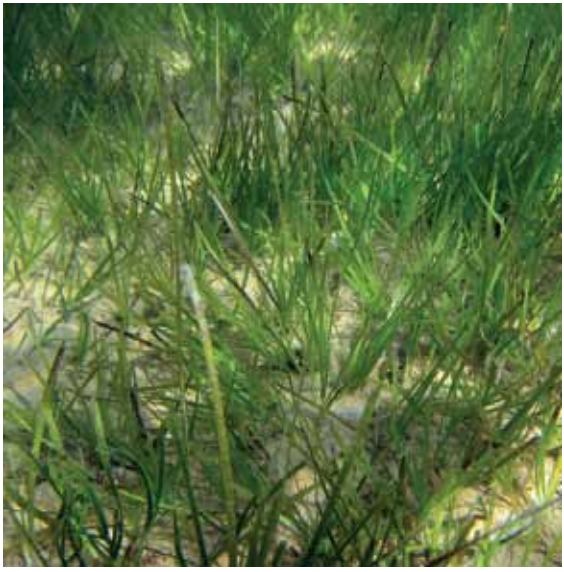
Abundance: ■■

Reference: F 100; E 42; AlgaeBase

Synonym: *Caulerpa simpliciuscula* var. *vesiculifera*

Photograph: Ray Lewis

Kingdom **Plantae** Phylum **Angiospermae**



Zostera muelleri

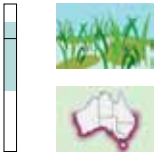
Irmisch ex P.F.A. Ascherson, 1867

EEL GRASS

Description: *Zostera muelleri* is a seagrass with strap-shaped green leaves, notched at the tip. It flowers throughout the warmer months.

Size: Leaf length to 300 mm

Habitat and distribution:



Abundance: ■■■

Reference: F 109; E 109

Photograph: Mark Rodrigue

Kingdom **Plantae** Phylum **Angiospermae**

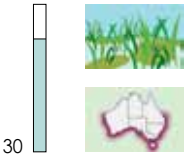
Zostera nigricaulis

(J.Kuo) S.W.L.Jacobs & D.H.Les, 2009

Description: *Zostera nigricaulis* is a seagrass with flattened, blade-like leaves and dark, wiry bases arising vertically from the rhizomes. It is difficult to distinguish from other *Zostera* species in the field.

Size: Leaf length to 1.5 m

Habitat and distribution:



Abundance: ■ ■ ■

Reference: E 108; AlgaeBase

Synonym: *Heterozostera nigricaulis*

Photograph: David Reinhard

Kingdom **Plantae** Phylum **Angiospermae**

Sarcocornia quinqueflora

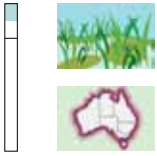
(Bunge ex Ungern-Sternberg) A.J. Scott, 1977

BEADED GLASSWORT, BEADED SAMPHIRE

Description: *Sarcocornia quinqueflora* is a succulent saltmarsh plant with segmented green stems, becoming red at the tips.

Size: Stem length to 300 mm

Habitat and distribution:



Abundance: ■ ■

Reference: E 111

Synonym: *Salicornia quinqueflora*

Photograph: Rod Watson, Barwon Estuary

Kingdom **Animalia** Phylum **Porifera**

Sycon whiteleggei

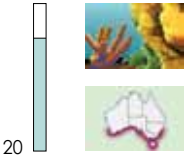
Dendy, 1893

CREAM TUBE SPONGE

Description: *Sycon whiteleggei* is a **calcareous** sponge, typically a branching mass of hollow tubes, with openings at the ends of each branch.

Size: Length to 30 mm

Habitat and distribution:



Abundance:

Reference: E 113; WoRMS

Synonym: *Sycon gelatinosum*

Photographer: David Reinhard

Kingdom **Animalia** Phylum **Porifera**

Tethya burtoni

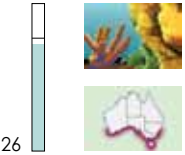
Sarà & Sarà, 2004

GOLF BALL SPONGE

Description: *Tethya burtoni* is commonly bright peach-orange in colour. Its spherical shape and dimpled surface are characteristic of the genus. The sponge is anchored to the rock surface by up to ten small pedicels.

Size: Diameter to 25 mm

Habitat and distribution:



Abundance:

Reference: E 114; WoRMS

Photographer: David Reinhard

Kingdom **Animalia** Phylum **Porifera**

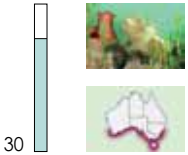
Ecionemia robusta

(Carter, 1883)

Description: *Ecionemia robusta* is a subspherical yellow sponge with prominent openings.

Size: Diameter to 150 mm

Habitat and distribution:



Abundance:

Reference: WoRMS

Photographer: David Reinhard

Kingdom **Animalia** Phylum **Porifera**

Ciocalypta polymastia

(Ledenfeld, 1888)

Description: *Ciocalypta polymastia* is a sponge with a large base buried in the sand and erect, conical, translucent **papillae** protruding above the surface. The colour is generally white or cream.

Size: Length to 90 mm

Habitat and distribution:

Abundance:

Reference: WoRMS

Photographer: David Reinhard

Kingdom **Animalia** Phylum **Porifera**

Clathria australiensis

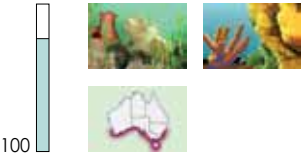
Carter, 1885

FINGER SPONGE

Description: *Clathria australiensis* is an erect, red, branching sponge with numerous flattened branches.

Size: Length to 400 mm

Habitat and distribution:



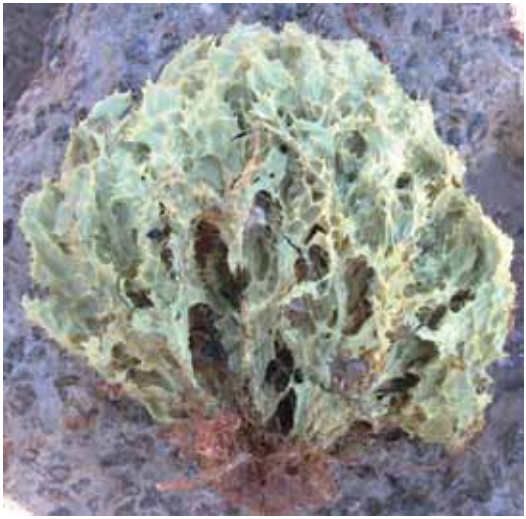
Abundance:

Reference: WoRMS

Synonym: *Wilsonella australiensis*

Photographer: David Reinhard, Rye

Kingdom **Animalia** Phylum **Porifera**



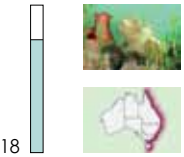
Darwinella australiensis

Carter, 1885

Description: *Darwinella australiensis* is a yellow sponge that quickly bleaches on exposure. The skeleton is made of **spongin** fibres, folded into irregular lace-like lobes.

Size: Length to 100 mm

Habitat and distribution:



Abundance:

Reference: E 117; WoRMS

Photographer: Ray Lewis

Kingdom **Animalia** Phylum **Porifera**

Aplysilla rosea

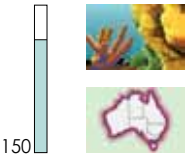
(Barrios, 1876)

ENCRUSTING ROSE SPONGE

Description: *Aplysilla rosea* is a pink encrusting sponge with an irregular surface. It occurs widely in sheltered habitats and is extremely common on jetty pylons.

Size: Width to 500 mm

Habitat and distribution:



Abundance:

Reference: E2 140

Photographer: David Reinhard

Kingdom **Animalia** Phylum **Porifera**

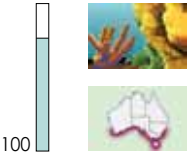
Pseudoceratina durissima

Carter, 1885

Description: *Pseudoceratina durissima* is bright yellow and rubbery when alive, but turns dark purple or royal blue when exposed to air.

Size: Variable size

Habitat and distribution:



Abundance:

Reference: WoRMS

Synonym: *Aplysina laevis*

Photographer: David Reinhard

Kingdom **Animalia** Phylum **Porifera**

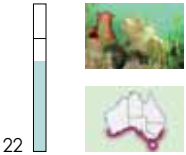
Dendrilla cactos

(Selenka, 1867)

Description: *Dendrilla cactos* is a bright pink sponge with a ruffled surface. It occurs in erect, branching and encrusting forms.

Size: Length to 400 mm

Habitat and distribution:



Abundance:

Reference: E 117; WoRMS

Photographer: Ray Lewis

Kingdom **Animalia** Phylum **Porifera**

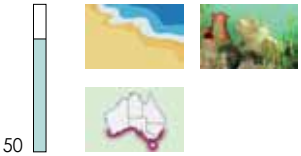
Chondropsis kirki

(Bowerbank, 1841)

Description: *Chondropsis kirki* is a sand sponge with a weakly developed skeleton of simple, straight, **siliceous spicules.**

Size: Length to 100 mm

Habitat and distribution:



Abundance:

Reference: WoRMS

Photographer: David Reinhard

Kingdom **Animalia** Phylum **Porifera**

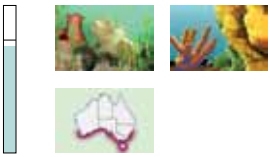
Crella incrustans

(Carter, 1885)

Description: *Crella incrustans* forms as an encrustation from which long digits arise. The sponge is highly variable in shape, very fibrous and reddish-orange in colour.

Size: Length to 400 mm

Habitat and distribution:



Abundance: ■

Reference: WoRMS

Synonym: *Clathrissa incrustans*

Photographer: David Reinhard

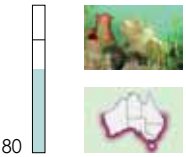
Kingdom **Animalia** Phylum **Porifera**

Ircinia sp.

Description: *Ircinia* is compressible and elastic, but very tough and difficult to tear. This genus is typically darkish to light grey externally and tan internally.

Size: Length to 500 mm

Habitat and distribution:



Abundance: ■ ■

Reference: WoRMS

Photographer: David Reinhard

Kingdom **Animalia** Phylum **Porifera**

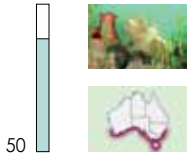
Spheciospongia papillosa

(Ridley & Dendy, 1886)

Description: *Spheciospongia papillosa* is a cream-yellow sponge, covered in irregular **papillae.**

Size: Height to 300 mm

Habitat and distribution:



Abundance:

Reference: WoRMS

Synonym: *Spirastrella papillosa*

Photographer: David Reinhard

Kingdom **Animalia** Phylum **Platyhelminthes**

Notoplana australis

(Schmarda, 1859)

COMMON FLATWORM

Description: *Notoplana australis* is a large, brown, gelatinous flatworm. It is most commonly found under boulders.

Size: Length to 40 mm

Habitat and distribution:

Abundance:

Reference: E 152; R 26; B 40; WoRMS

Synonym: *Leptoplana australis*

Photographer: Mel Mitchell

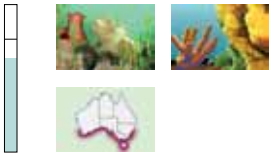
Kingdom **Animalia** Phylum **Platyhelminthes**

Thysanozoon spp.

Description: Thysanazoons are flatworms with warty **papillae** over their upper surface. They are a poorly described group, but are common in Australian temperate waters.

Size: Length to 30 mm

Habitat and distribution:



Abundance:

Reference: E 152

Photographer: John Eichler

Kingdom **Animalia** Phylum **Nemertea**

Baseodiscus sp.

Description: *Baseodiscus* sp. is a cream and reddish brown striped worm often in what appear to be tangled masses. This specimen closely resembles *B. delineatus,* which has not been recorded in Australia.

Size: Length to 200 mm

Habitat and distribution:

Abundance:

Reference: WoRMS

Photographer: John Eichler

Phylum **Annelida** Class **Polychaeta**

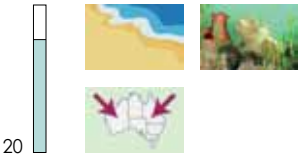
Sabella spallanzanii

(Gmelin, 1791)

Description: *Sabella spallanzanii* is a large polychaete with a tapered body and a distinctive spiral crown of banded tentacles. It is an aggressive introduced species and is particularly abundant in Port Phillip Bay.

Size: Body length to 10 mm

Habitat and distribution:



Abundance: ■ ■

Reference: E 160; WoRMS; MV

Photographer: Sarah Speight, Altona Pier

Phylum **Annelida** Class **Polychaeta**

Sabellastarte spectabilis

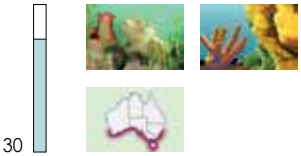
(Grube, 1878)

FEATHER-DUSTER WORM

Description: *Sabellastarte spectabilis* is a large feather-duster worm with distinctive banding of the tentacles. The body is buff coloured, with purple flecks.

Size: Body length to 80 mm

Habitat and distribution:



Abundance: □

Reference: W 26

Synonym: *Sabellastarte indica*

Photographer: David Reinhard

Phylum **Annelida** Class **Polychaeta**

Galeolaria caespitosa

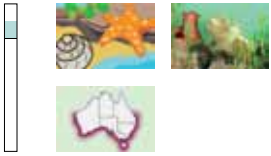
Lamarck, 1818

TUBE WORM

Description: *Galeolaria caespitosa* has a white, elongate, convoluted shell. The living animal has black tentacles and an **operculum** with nine to eleven movable gills projecting from the centre. It occurs in great density in southern Australia, commonly on wharves.

Size: Length to 20 mm

Habitat and distribution:



Abundance:

Reference: E 162; W 26; R 33; B 40; D 38; WoRMS

Photographer: Mark Rodrigue

Kingdom **Animalia** Phylum **Sipuncula**

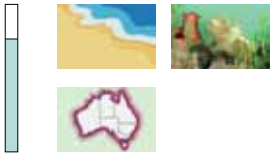
Sipunculids

PEANUT WORMS

Description: Sipunculids are unsegmented, cylindrical worms. Their bodies typically have a fat trunk and a longer slender **proboscis**.

Size: Length to 100 mm

Habitat and distribution:



Abundance:

Reference: E 163

Photographer: Sarah Speight, Rye Pier

Phylum **Cnidaria** Class **Hydrozoa**

Aglaophenia plumosa

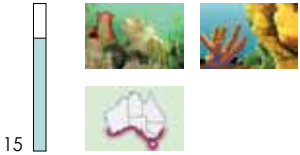
Bale, 1882

PURPLE HYDROID

Description: *Aglaophenia plumosa* is a hydroid with fine, white, feather-like branches extending from a darker stem.

Size: Stem length to 150 mm

Habitat and distribution:



Abundance: ■ ■

Reference: E 119; WoRMS

Photographer: Ray Lewis

Class **Anthozoa** Order **Actiniaria**

Actinia tenebrosa

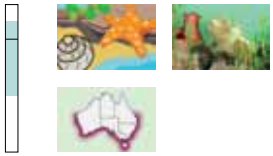
Farquhar, 1898

WARATAH ANEMONE

Description: *Actinia tenebrosa* is the dominant anemone of southern coastal waters. At low tide it is found as a dark red blob with a lighter red spot at the mouth. The conspicuous red tentacles become apparent as the tide comes in.

Size: Diameter to 40 mm

Habitat and distribution:



Abundance: ■ ■

Reference: E 126; FN 10; W 13; R 26; B 18; D 31; WoRMS

Photographer: John Eichler, Black Rock

Class **Anthozoa** Order **Actiniaria**

Oulactis muscosa

(Drayton, 1846)

EASTERN SAND ANEMONE

Description: *Oulactis muscosa* is usually found buried in the sand. It has dark grey-white blotched tentacles and a cream column with darker spots, which is rarely visible.

Size: Diameter to 80 mm

Habitat and distribution:

Abundance: ■

Reference: E 126–127; FN 11; D 32; WoRMS

Photographer: John Eichler

Class **Anthozoa** Order **Actiniaria**

Aulactinia veratra

(Drayton, 1846)

GREEN ANEMONE

Description: *Aulactinia veratra* has a dark green column with long, narrow tentacles of lighter green. It is commonly found on rock surfaces and in crevices.

Size: Diameter to 70 mm

Habitat and distribution:

Abundance: ■■

Reference: E 127; FN 12; B 18; WoRMS

Photographer: Sarah Speight, Mordialloc Pier

Class **Anthozoa** Order **Actiniaria**

Anthopleura aureoradiata

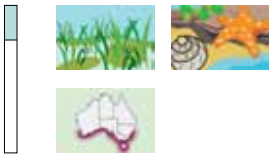
(Stuckey, 1909)

MUDFLAT ANEMONE

Description: *Anthopleura aureoradiata* has a brownish-grey column, with rows of white nodes increasing in size towards the top. The oral disc is pale, with dark lines radiating from the mouth. Tentacles are a dull greenish colour with white specks.

Size: Diameter to 15 mm

Habitat and distribution:



Abundance:

Reference: FN 11; WoRMS

Photographer: John Eichler

Class **Anthozoa** Order **Actiniaria**

Anthothoe albocincta

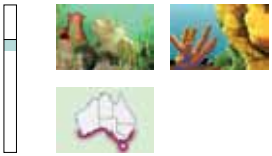
(Hutton, 1879)

WHITE STRIPED ANEMONE

Description: *Anthothoe albocincta* has a distinctive striped orange and white column with a crown of up to 200 short white tentacles. When disturbed, the animal releases stinging cells through the body wall, which are generally harmless to humans.

Size: Diameter to 20 mm

Habitat and distribution:



Abundance:

Reference: E 127; FN 12; W 13; B 18; WoRMS; MV

Synonym: *Actinothoe albocincta*

Photographer: Sarah Speight

Class **Anthozoa** Order **Actiniaria**

Phlyctenactis tuberculosa

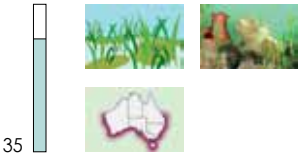
(Quoy & Gaimard, 1833)

SWIMMING ANEMONE

Description: *Phlyctenactis tuberculosa* is a large, 'swimming' anemone, which may attach to seagrasses or drift in shallow water. The column is covered by large orange-red **vesicles**, resembling a plate of beans. The tentacles are long and orange.

Size: Diameter to 150 mm

Habitat and distribution:



Abundance: ☐

Reference: E 128; FN 9; D 31; WoRMS

Photographer: Sandy Webb

Class **Anthozoa** Order **Actiniaria**

Epiactis australiensis

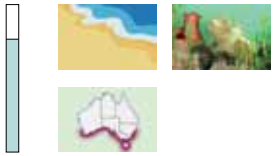
Carlgren, 1950

PINK-TIPPED ANEMONE

Description: *Epiactis australiensis* has a long, smooth column with rounded extensions at the base and pale tentacles with purplish tips. It is usually found buried in sand, but attached to shells or rock.

Size: Diameter to 25 mm

Habitat and distribution:



Abundance: ☐

Reference: E 129; WoRMS

Photographer: Sarah Speight

Class **Anthozoa** Order **Actinaria**

Isanemonia australis

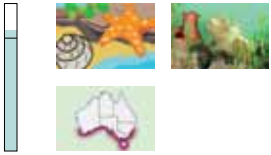
Carlgren, 1950

AUSTRALIAN WAX ANENOME

Description: *Isanemonia australis* has a dark green column with red markings and **vesicles** with stinging cells. The tentacles are long, coloured green or pink with white specks, and have conical tips.

Size: Diameter to 50 mm

Habitat and distribution:



Abundance: ■

Reference: E 128; WoRMS; MV

Synonym: *Phylctenanthus australis*

Photographer: Sarah Speight

Class **Anthozoa** Order **Zoanthidea**

Zoanthids

Description: Zoanthids resemble soft coral and anenomes, and are generally **colonial** animals. They have a fleshy **stolon** and usually two rows of smooth tentacles.

Size: Length to 100 mm

Habitat and distribution:

Abundance: □

Reference: E 131

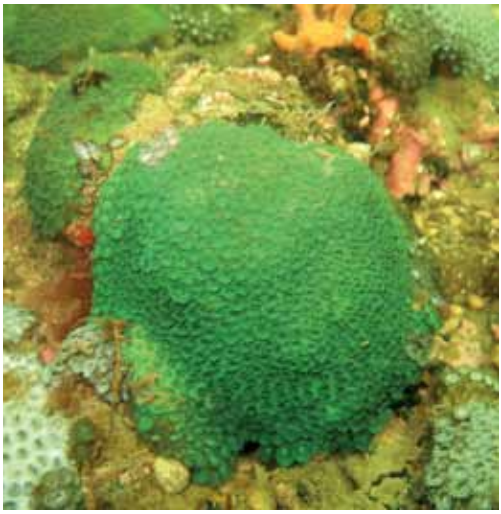
Photographer: Sandy Webb

Class **Anthozoa** Order **Scleractinia**

Plesiastrea versipora

(Lamarck, 1816)

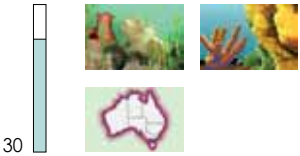
SMALL KNOB CORAL



Description: *Plesiastrea versipora* is the common reef-building coral of southern Australia. It is green-brown in colour and has distinctive large, roughly circular pits, containing the **polyps**.

Size: Colony width to 3 m

Habitat and distribution:



Abundance:

Reference: E 134; WoRMS

Photographer: David Reinhard

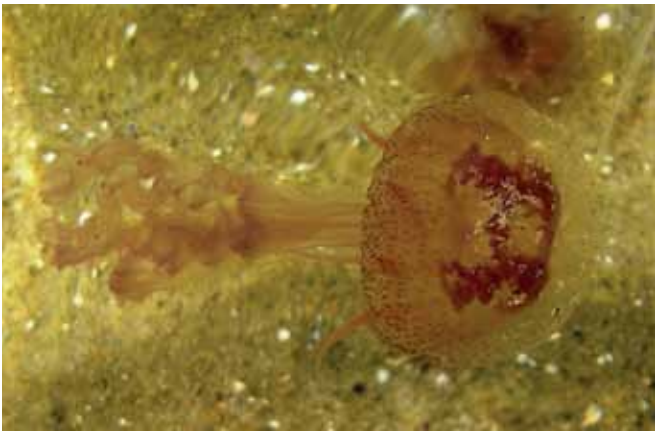
Phylum **Cnidaria** Class **Scyphozoa**

Pelagia noctiluca

(Forsskål, 1775)

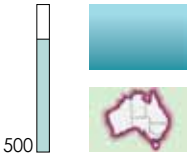
MAUVE STINGER

Description: *Pelagia noctiluca* is a jelly with purple streaks on an otherwise clear bell. It has four arms and eight fine tentacles. Stings from this species have been reported as being lethal to humans.



Size: Diameter to 120 mm

Habitat and distribution:



Abundance:

Reference: E 146

Photographer: John Eichler

Phylum **Cnidaria** Class **Scyphozoa**

Catostylus mosaicus

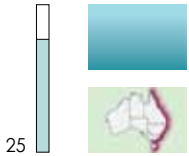
(Quoy & Gaimard, 1824)

JELLY BLUBBER, BLUE JELLY, BLUE BLUBBER

Description: *Catostylus mosaicus* is pale blue and possesses eight three-winged arms and a conspicuous internal cross that is apparent through the top of the bell. It is seasonally found washed up on the beach.

Size: Bell width to 350 mm

Habitat and distribution:



Abundance:

Reference: E 147; W 13; WoRMS

Photographer: (TOP) David Reinhard; (BOTTOM) John Buckeridge

Phylum **Cnidaria** Class **Scyphozoa**

Pseudorhiza haeckeli

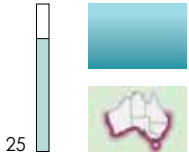
Haacke, 1884

SOUTHERN TAILED JELLY

Description: *Pseudorhiza haeckeli* is an elegant jelly with a rounded bell covered in **papillae**. The arms are small, curved and feather-like with one long colourful tail. This jelly may give a minor sting. Do not handle.

Size: Bell width to 400 mm

Habitat and distribution:



Abundance:

Reference: MV

Photographer: Ray Lewis

Phylum **Mollusca** Class **Polyplacophora**

Ischnochiton lineolatus

(de Blainville, 1825)

LINED CHITON

Description: *Ischnochiton lineolatus* has a cream background with dark patterning and a fawn girdle. The **pleural** and **dorsal** patterning is zigzagged and the girdle is striated.

Size: Length to 50 mm

Habitat and distribution:

Abundance: □

Reference: E 221; FN 14; WoRMS

Synonym: *Chiton lineolatus*

Photographer: John Eichler, Brighton

Phylum **Mollusca** Class **Polyplacophora**

Ischnochiton elongatus

(de Blainville, 1825)

ELONGATED CHITON

Description: *Ischnochiton elongatus* has extremely variable patterning and may be cream, yellow, brown, red, purple, grey or black; plain, dotted, striped or with wavy lines. A dark background with light stripe is the most common pattern. The shell is elongated and has small girdle scales and fine ridges in the **pleural** area.

Size: Length to 35 mm

Habitat and distribution:

Abundance: ■ ■

Reference: E 221; FN 14; D 69; WoRMS

Photographer: (LEFT) Ray Lewis; (RIGHT) John Eichler, Black Rock

Phylum **Mollusca** Class **Polyplacophora**

Ischnochiton australis

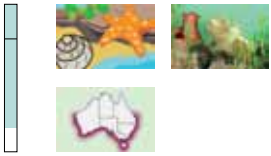
(Sowerby, 1840)

AUSTRALIAN CHITON, SOUTHERN CHITON

Description: *Ischnochiton australis* is a dark green-brown chiton with a large girdle the same colour as the shell. It has diagonal ridges laterally, and fine longitudinal **pleural** ridges. This is the largest *Ischnochiton* found in southern Australia.

Size: Length to 90 mm

Habitat and distribution:



Abundance:

Reference: E 220; FN 16; B 27; D 69; WoRMS

Synonym: *Chiton australis*

Photographer: John Eichler

Phylum **Mollusca** Class **Polyplacophora**

Ischnochiton cariosus

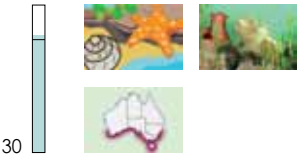
(Pilsbry, 1892)

BEADED CHITON

Description: *Ischnochiton cariosus* is generally cream, yellow or brown in colour. It is an elongate chiton and is distinctly **nodular** in the lateral area. The girdle is wide and has scales of differing sizes.

Size: Length to 50 mm

Habitat and distribution:



Abundance:

Reference: E 222; FN 16; WoRMS

Photographer: John Eichler

Phylum **Mollusca** Class **Polyplacophora**

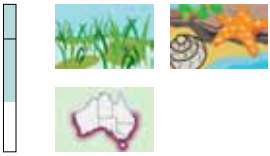
Ischnochiton virgatus

(Reeve, 1848)

Description: *Ischnochiton virgatus* is bright orange in colour, with brown patterning and bright green flecks. The girdle is cream with dark brown stripes.

Size: Length to 10 mm

Habitat and distribution:



Abundance: ☐

Reference: FN 17; MV

Photographer: John Eichler, Barwon Heads

Phylum **Mollusca** Class **Polyplacophora**

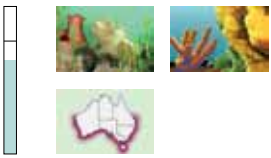
Callistochiton antiquus

(Reeve, 1847)

Description: *Callistochiton antiquus* is a chiton with a reddish brown shell and girdle. The end valves and the lateral areas have strong **nodular** ribs, with ornate diagonal nodules in the **pleural** regions.

Size: Length to 40 mm

Habitat and distribution:



Abundance: ■

Reference: FN 18; E 224

Photographer: John Eichler

Phylum **Mollusca** Class **Polyplacophora**

Plaxiphora albida

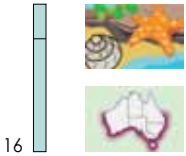
(de Blainville, 1825)

HAIRY CHITON, GIANT CHITON

Description: *Plaxiphora albida* is a large dark green chiton, with lighter wavy bars on some valves, and a dark girdle. The girdle is large and covered by bristles.

Size: Length to 100 mm

Habitat and distribution:



Abundance:

Reference: E 224; FN 19; W 17; R 34; B 27; D 72; WoRMS, MV

Photographer: Mel Mitchell, Black Rock

Phylum **Mollusca** Class **Polyplacophora**

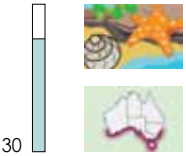
Rhyssoplax tricostalis

(Pilsbry, 1894)

Description: *Rhyssoplax tricostalis* has a dull olive-green to brown shell and girdle. The shell is elongated and elevated, with **nodulose** radial ribs in the end valves and lateral areas.

Size: Length to 35 mm

Habitat and distribution:



Abundance:

Reference: FN 21

Photographer: John Eichler, Brighton

Phylum **Mollusca** Class **Polyplacophora**

Cryptoplax striata

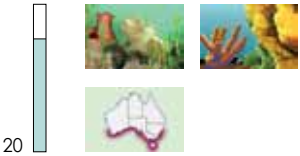
(Lamarck, 1819)

MOTTLED WORM CHITON

Description: *Cryptoplax striata* is an elongate, narrow chiton. It is commonly cream or brown, with a banded, flexible girdle.

Size: Length to 120 mm

Habitat and distribution:



Abundance: ■

Reference: E 226; FN 21; WoRMS

Photographer: John Eichler

Phylum **Mollusca** Class **Polyplacophora**

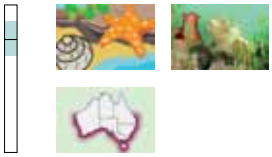
Acanthochitona granostriata

(Pilsbry, 1894)

Description: *Acanthochitona granostriata* is a chiton with a variable shell pattern, with colours including orange, cream, red and green. Conspicuous green tufts are arranged along a dark, wide, spiny girdle.

Size: Length to 20 mm

Habitat and distribution:



Abundance: □

Reference: FN 22

Photographer: John Eichler

Phylum **Mollusca** Class **Polyplacophora**

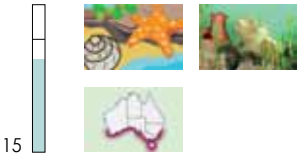
Notoplax speciosa

(H. Adams, 1861)

Description: *Notoplax speciosa* is a brownish, speckled chiton with a soft, **nodulose**, oval body. The shell plates are small and occur in a ridge along the back.

Size: Length to 80 mm

Habitat and distribution:



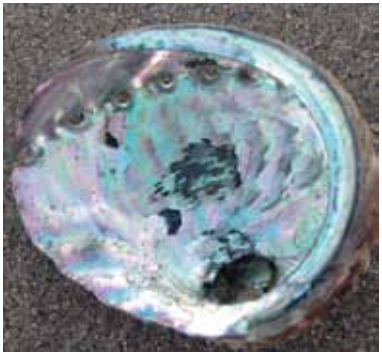
Abundance:

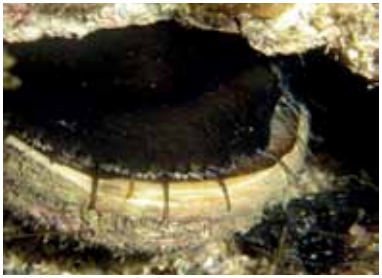
Reference: WoRMS; MV

Synonym: *Notoplax addenda*

Photographer: John Eichler

Class **Gastropoda** Subclass **Prosobranchia**





Haliotis rubra

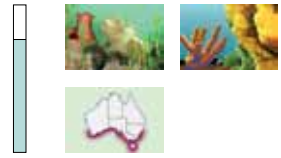
Leach, 1814

BLACKLIP ABALONE

Description: *Haliotis rubra* is the common edible abalone. The exterior of the large, oval-shaped shell is reddish with a black lip and numerous spiral ridges, crossed by radiating ribs and a row of tubercules towards the margin. The interior is opalescent mother-of-pearl.

Size: Length to 200 mm

Habitat and distribution:



Abundance:

Reference: E 227; FN 24–25; W 20; D 74; WoRMS

Photographer: (TOP) Ray Lewis; (BOTTOM) Sarah Speight

Class **Gastropoda** Subclass **Prosobranchia**

Scutus antipodes

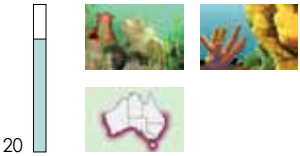
Montfort, 1810

ELEPHANT SNAIL

Description: *Scutus antipodes* is a gastropod with a brownish white shell. The shell is shield-shaped and almost flat, with a slight **apex** at the **anterior** end. The live animal is black and many times larger than the shell.

Size: Length to 100 mm

Habitat and distribution:



Abundance:

Reference: E 230; FN 25; WoRMS

Photographer: John Eichler, Anglesea

Class **Gastropoda** Subclass **Prosobranchia**

Diodora lineata

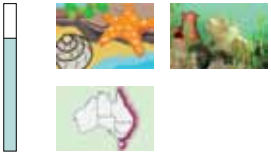
(Sowerby, 1835)

KEYHOLE LIMPET

Description: *Diodora lineata* has an oval shell with a keyhole opening at the high **apex**. The surface ornamentation forms an intricate lattice pattern.

Size: Length to 50 mm

Habitat and distribution:



Abundance:

Reference: FN 27; E 231

Photographer: John Eichler

Class **Gastropoda** Subclass **Prosobranchia**

Cellana tramoserica

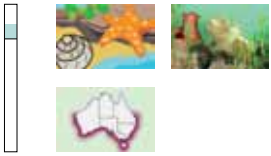
(Holten, 1802)

COLOURFUL LIMPET

Description: *Cellana tramoserica* has a large, decorative shell, with dark radiating stripes and/or crescent-shaped markings on an orange-tan background.

Size: Length to 50 mm

Habitat and distribution:



Abundance: ■■■

Reference: E 233; FN 29; W 21; R 37; B 28; D 79; WoRMS

Photographer: John Eichler

Class **Gastropoda** Subclass **Prosobranchia**

Patelloida alticostata

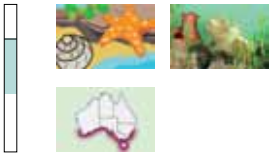
(Angas, 1865)

TALL-RIBBED LIMPET

Description: *Patelloida alticostata* is pale in colour with black markings between the ribs. The ribs are distinct and the shell is strong and often partially eroded. The edge is scalloped.

Size: Length to 40 mm

Habitat and distribution:



Abundance: ■■

Reference: E 234; FN 30; W 21; R 38; B 28; D 78; WoRMS

Photographer: John Eichler

Notoacmea flammea

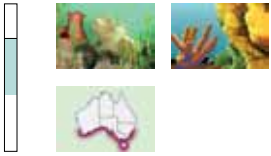
(Quoy & Gaimard, 1834)

FLAMED LIMPET

Description: *Notoacmea flammea* is highly variable in colour (including yellow, orange and brown) with a striped, flamed or **reticulated** patterning of darker colours. It is oval in shape, small and relatively flat, with a thin shell.

Size: Length to 17 mm

Habitat and distribution:



Abundance: ■

Reference: E 236; FN 32; W 21; D 85; WoRMS

Photographer: John Eichler, San Remo

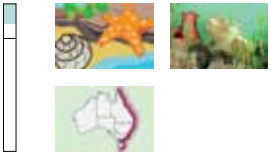
Notoacmea petterdi

(Tenison Woods, 1876)

Description: *Notoacmea petterdi* is a limpet with a dull white shell with dark radiating bands. It is common on vertical rock faces. The **apex** is brown, as is the interior of the shell.

Size: Length to 22 mm

Habitat and distribution:



Abundance: ■ ■

Reference: FN 33; E 236

Photographer: John Eichler

Class **Gastropoda** Subclass **Prosobranchia**

Austrocochlea constricta

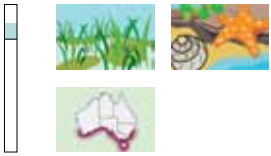
(Lamarck, 1822)

RIBBED TOP SHELL

Description: *Austrocochlea constricta* has **whorls** with prominent spiral ridges, which give it a grooved appearance. The shell height is greater than or equal to its width, and the inside of the shell is an off-white colour.

Size: Height to 25 mm

Habitat and distribution:



Abundance: ■ ■ ■

Reference: E 240; F 38; W 20; R 42; B 31; D 88; WoRMS

Photographer: Ray Lewis

Class **Gastropoda** Subclass **Prosobranchia**

Austrocochlea porcata

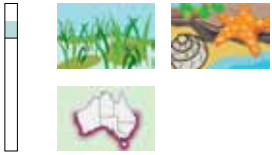
(A. Adams, 1853)

ZEBRA TOP SHELL

Description: *Austrocochlea porcata* has a shell similar in shape to *A. constricta*, but with broken ridges and parallel oblique bands of black and white extending onto the spire.

Size: Height to 25 mm

Habitat and distribution:



Abundance: ■ ■ ■

Reference: E 240; D 88; WoRMS

Photographer: Mel Mitchell, Black Rock

Class **Gastropoda** Subclass **Prosobranchia**

Austrocochlea concamerata

(Wood, 1828)

WAVY TOP SHELL

Description: *Austrocochlea concamerata* has a black shell with white spots on the ribs. The shell is very wide and thick and the sculpture of the ribs is distinct.

Size: Height to 25 mm

Habitat and distribution:

Abundance:

Reference: E 241; FN 38; D 89

Synonym: *Diloma concamerata*

Photographer: John Eichler

Class **Gastropoda** Subclass **Prosobranchia**

Austrocochlea odontis

(Wood, 1828)

CHECKERED TOP SHELL

Description: *Austrocochlea odontis* has a rounded, blue-black shell with a checkerboard pattern of small white-yellow spots. There is a bright green edge to the **aperture**.

Size: Height to 15 mm

Habitat and distribution:

Abundance:

Reference: E 241; F 39; W 20; R; 43; D 89

Synonym: *Chlorodiloma odontis*

Photographer: Mel Mitchell, Black Rock

Class **Gastropoda** Subclass **Prosobranchia**

Phasianella ventricosa

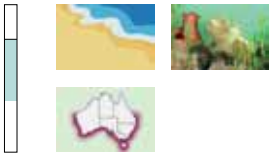
Swainson, 1822

PHEASANT SHELL

Description: *Phasianella ventricosa* has a smooth shell with variable brown, pink and cream colours and characteristic stipple-striped patterning. The shell is an elongate turbo with solid rounded **whorls** and a short **apex**. The **operculum** is large and oval, and the interior is white.

Size: Height to 35 mm

Habitat and distribution:



Abundance: ■

Reference: E 242; FN 43

Photographer: Ray Lewis

Class **Gastropoda** Subclass **Prosobranchia**

Turbo undulatus

Lightfoot, 1786

WARRENER, GREEN TURBAN

Description: *Turbo undulatus* has a blue-green shell with lighter oblique stripes. The shell is wide, round and smooth, with a low spire.

Size: Height to 50 mm

Habitat and distribution:

Abundance: ■ ■

Reference: E 242; FN 42; W 18; R 44; B 30; D 92

Photographer: (TOP) John Buckeridge; (BOTTOM) John Eichler

Class **Gastropoda** Subclass **Prosobranchia**

Astralium squamiferum

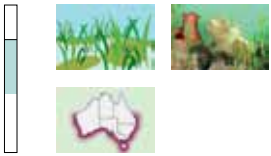
(Koch, 1844)

SEAGRASS STAR

Description: *Astralium squamiferum* has a very low shell with outward projections from the **whorls**, giving it a star-shaped appearance when seen from above.

Size: Width to 30 mm

Habitat and distribution:



Abundance: ■

Reference: E 243

Photographer: Mel Mitchell, Black Rock

Class **Gastropoda** Subclass **Prosobranchia**

Nerita atramentosa

Reeve, 1855

BLACK CROW

Description: *Nerita atramentosa* has a black shell with a white ovoid **aperture**. The shell is rounded, with a flattened spire and fine lines crossing the **striations**.

Size: Height to 28 mm

Habitat and distribution:

Abundance: ■■■

Reference: E 244; FN 44; R 45; B 30; D 96

Synonym: *Nerita melanotragus*

Photographer: Mel Mitchell, Black Rock

Class **Gastropoda** Subclass **Prosobranchia**

Bembicium nanum

(Lamarck, 1822)

STRIPED-MOUTH CONNIWINK

Description: *Bembicium nanum* has a low conic shell, which is wider than it is high. The shell has dark brown wavy lines running obliquely across the lower **whorls**, with orange colouring to the **apex**.

Size: Height to 10 mm

Habitat and distribution:

Abundance: ■ ■ ■

Reference: E 244; F 46; R 46; B 30; D 98; WoRMS

Photographer: Rod Watson

Class **Gastropoda** Subclass **Prosobranchia**

Bembicium melanostoma

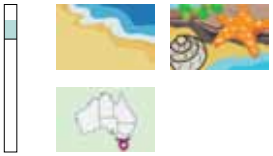
(Gmelin, 1791)

DARK-MOUTHED CONNIWINK, GOLD-MOUTH CONNIWINK

Description: *Bembicium melanostoma* has a brownish-red conical shell with five to seven spiral grooves around the edge of the last **whorl**. The interior is dark.

Size: Height to 20 mm

Habitat and distribution:



Abundance: ■ ■ ■

Reference: E 245; F 46; W 19; D 99; WoRMS

Synonym: *Bembicum lividum*

Photographer: John Eichler

Austrolittorina unifasciata

(Gray, 1826)

PERIWINKLE

Description: *Austrolittorina unifasciata* has a small, smooth shell that is mostly pale blue with a brownish **apex**. It is usually found clustered in depressions and crevices.

Size: Height to 25 mm

Habitat and distribution:

Abundance: ■ ■ ■

Reference: G 136; FN 44; R 47; B 30; D 100; WoRMS

Synonym: *Nodolittorina unifasciata*

Photographer: Mel Mitchell, Black Rock

Class **Gastropoda** Subclass **Prosobranchia**

Afrolittorina praetermissa

(May, 1909)

Description: *Afrolittorina praetermissa* has a grey-green shell with brown zigzag stripes and a white stripe at the base. The **whorls** are broader than in *A. unifasciata*.

Size: Length to 15 mm

Habitat and distribution:

Abundance: ■ ■

Reference: FN 45

Photographer: John Eichler

Class **Gastropoda** Subclass **Prosobranchia**

Batillaria australis

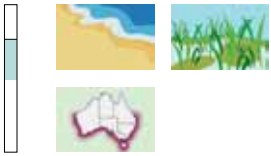
(Quoy & Gaimard, 1834)

SOUTHERN MUDWHELK

Description: *Batillaria australis* is an elongated brown mudwhelk with **nodular** ridges around the **whorls** and raised folds running obliquely across them.

Size: Height to 45 mm

Habitat and distribution:



Abundance: ■■■

Reference: E 249; F 48; WoRMS

Photographer: John Buckeridge

Class **Gastropoda** Subclass **Prosobranchia**

Serpulorbis sipho

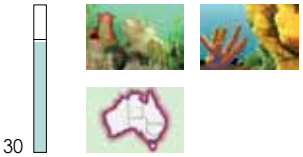
(Lamarck, 1818)

WORM SHELL

Description: *Serpulorbis sipho* is a worm-like gastropod that lives in a large, irregular, white-brown **calcareous** tube marked by longitudinal ridges.

Size: Diameter to 120 mm

Habitat and distribution:



Abundance: ■

Reference: E 248

Photographer: John Eichler

Polinices conicus

(Lamarck, 1822)

MOON SHELL, SAND SNAIL

Description: *Polinices conicus* is lead-grey in colour, with red-brown **striations.** The shell is solid and pear-shaped. The **aperture** is large, with an orange-brown **callus.**

Size: Height to 42 mm

Habitat and distribution:

Abundance:

Reference: E 249; FN 51; W 18; WoRMS

Photographer: John Eichler

Class **Gastropoda** Subclass **Prosobranchia**

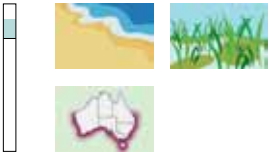
Polinices sordidus

(Swainson, 1821)

Description: *Polinices sordidus* has a grey shell with reddish-brown staining. The shell is solid and broader than *P. conicus*, with a less pronounced **apex.**

Size: Length to 35 mm

Habitat and distribution:



Abundance:

Reference: FN 51

Photographer: John Eichler

Semicassis semigranosum

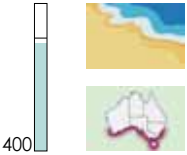
(Lamarck, 1822)

HALF-GRAINED HELMET

Description: *Semicassis semigranosum* is a helmut shell, identified by the rows of beads in the spire **whorls**. There is a small chink at the top of the **aperture** and the **siphonal canal** is deep. Commonly cream or pink in colour. The species is not found alive at Ricketts Point, but may be found washed up on the shore.

Size: Height to 60 mm

Habitat and distribution:



Abundance: ☐

Reference: E 254–255

Photographer: Ray Lewis

Cabestana spengleri

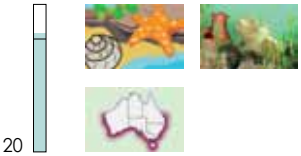
(Perry, 1811)

SPENGLER'S TRITON

Description: *Cabestana spengleri* is a cream triton shell with a brown **periostracum**. The shell is characterised by strong ridges with fine **axial striations** and **nodular** shoulders, and a spire almost half the length of the shell. The interior of the white **aperture** is also strongly ribbed.

Size: Height to 150 mm

Habitat and distribution:



Abundance: ■

Reference: E 255; FN 54

Photographer: Ray Lewis

Class **Gastropoda** Subclass **Prosobranchia**

Dicathais orbita

(Gmelin, 1791)

CART-RUT SHELL, DOG WINKLE

Description: *Dicathais orbita* is generally mid to pale brown in colour. The shell is characterised by deep grooves and an **aperture** with an interior **siphonal canal**. This is a very aggressive carnivore.

Size: Height to 75 mm

Habitat and distribution:

Abundance:

Reference: E 57; FN 59

Synonym: *Thais orbita*

Photographer: John Buckeridge

Class **Gastropoda** Subclass **Prosobranchia**

Lepsiella vinosa

(Lamarck, 1822)

WINE-MOUTHED LEPSIELLA

Description: *Lepsiella vinosa* is variable in shell shape and colour. It has a number of off-white ridges on each **whorl**, crossed by ribs and with dark grooves between.

Size: Height to 20 mm

Habitat and distribution:

Abundance:

Reference: E 258; FN 58; W 19; R 48; B 33; D 13

Photographer: Mel Mitchell

Class **Gastropoda** Subclass **Prosobranchia**

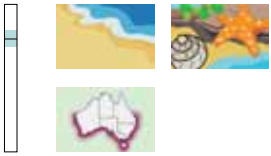
Bedeva paivae

(Crosse, 1864)

Description: *Bedeva paivae* has a solid, light brown shell, with a cream-coloured interior. The spire of the shell is less than half the full shell length. The **nodose axial** ribs are prominent with numerous **striations** in between.

Size: Length to 25 mm

Habitat and distribution:



Abundance:

Reference: FN 57; WoRMS

Synonym: *Lepsiella paivae*

Photographer: John Eichler

Class **Gastropoda** Subclass **Prosobranchia**

Pleuroploca australasia

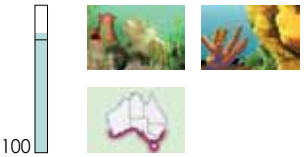
(Perry, 1811)

TULIP SHELL

Description: *Pleuroploca australasia* is a large tulip shell with prominent **nodules** on the spire and upper body, and fine spiral ridges. The shell of the live animal has brown ridges on a pale background, with a dark brown **periostracum**.

Size: Height to 150 mm

Habitat and distribution:



Abundance:

Reference: E 260; FN 64

Photographer: John Eichler, Inverloch

Class **Gastropoda** Subclass **Prosobranchia**

Cominella lineolata

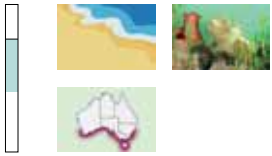
(Lamarck, 1809)

FALSE WHELK

Description: *Cominella lineolata* is a smooth, cigar-shaped gastropod with a variable checkerboard-like pattern. The shell can be smooth or with weakly **nodulose** shoulders.

Size: Height to 30 mm

Habitat and distribution:



Abundance:

Reference: E 262; FN 62; R 52; B 33; D 115; WoRMS

Photographer: Mel Mitchell

Class **Gastropoda** Subclass **Prosobranchia**

Nassarius pauperatus

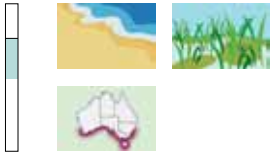
(Lamarck, 1822)

POOR DOG WHELK

Description: *Nassarius pauperatus* has a creamy coloured shell with brown banding at the centre and bottom of the **whorls**. The shell has a granular texture, caused by the crossing of the **axial** ribs and the spiral ridges. The inner edge of the **aperture** is broad and smooth

Size: Length to 20 mm

Habitat and distribution:



Abundance:

Reference: E 262; FN 64

Synonym: *Niota pauperatus*

Photographer: Ray Lewis

Class **Gastropoda** Subclass **Prosobranchia**

Nassarius pyrrhus

(Menke, 1843)

LITTLE DOG WHELK

Description: *Nassarius pyrrhus* has a creamy shell with a prominent brown band and other minor banding. The shell is solid and rather elongate and has a granular pattern.

Size: Length to 20 mm

Habitat and distribution:

Abundance: ■

Reference: FN 63

Synonym: *Zeuxis pyrrhus*

Photographer: John Eichler

Class **Gastropoda** Subclass **Prosobranchia**

Nassarius burchardi

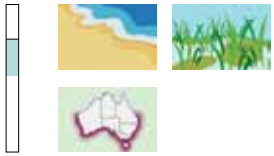
(Dunker, 1849)

AUSTRALIAN DOG WHELK

Description: *Nassarius burchardi* has a brown shell with a dark band just below the **suture**. The shell is solid and stout and the **operculum** is horny.

Size: Length to 15 mm

Habitat and distribution:



Abundance: □

Reference: FN 63

Synonym: *Plicarcularia burchardi*

Photographer: John Eichler

Class **Gastropoda** Subclass **Prosobranchia**

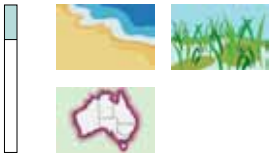
Zeacumantus diemenensis

(Quoy & Gaimard, 1834)

Description: *Zeacumantus diemenensis* is a bluish-grey to brown, elongated gastropod with a granulated surface with four to five rows of concentric ridges crossed by ribs. The **operculum** is horny and red, with concentric striations.

Size: Height to 32 mm

Habitat and distribution:



Abundance:

Reference: FN 48; WoRMS

Photographer: Rod Watson

Class **Gastropoda** Subclass **Prosobranchia**

Conus anemone

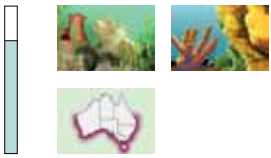
(Lamarck, 1810)

CONE SHELL

Description: *Conus anemone* has a cone-shaped shell with a variable blotched-brown, pink, orange and/or yellow pattern on a cream base. It has a venomous sting and should not be handled. It is nocturnal.

Size: Height to 70 mm

Habitat and distribution:



Abundance:

Reference: E 263; FN 66; W 19; R 54; D 116; WoRMS

Synonym: *Conus fusiformis*

Photographer: Ray Lewis

Mitra carbonaria

Swainson, 1822

Description: *Mitra carbonaria* has a smooth, elongate, dark brown shell, with very fine **striations**. It is commonly found under rocks.

Size: Length to 55 mm

Habitat and distribution:

Abundance:

Reference: FN 65

Synonym: *Mitra badia*

Photographer: John Eichler, Barwon Heads

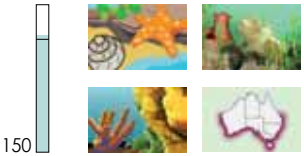
Sigapatella calypatraeformis

(Lamarck, 1822)

Description: *Sigapatella calypatraeformis* has a flattened pale, white-cream to pink shell. The basal **aperture** is large; the spire is not high, with up to three **whorls**.

Size: Diameter up to 26 mm

Habitat and distribution:



Abundance:

Reference: WoRMS

Photographer: Ray Lewis

Salinator fragilis

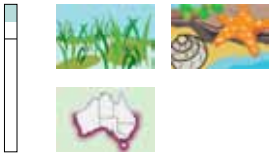
(Lamarck, 1822)

FRAGILE AIR-BREATHER

Description: *Salinator fragilis* has a very thin brown shell with dark banding. It is rounded in shape, with a wide **aperture** and small spire.

Size: Height to 18 mm

Habitat and distribution:



Abundance: ■ ■ ■

Reference: E 266; FN 77; WoRMS

Synonym: *Ampullaria fragilis*

Photographer: John Eichler, Altona

Siphonaria diemenensis

Quoy & Gaimard, 1833

VAN DIEMEN'S SIPHON SHELL

Description: *Siphonaria diemenensis* has a dark shell with raised, white radiating ribs. The shell is raised in profile and the **apex** is often eroded.

Size: Length to 28 mm

Habitat and distribution:

Abundance: ■ ■

Reference: E 267; FN 78; B 29

Photographer: John Eichler

Siphonaria zelandica

Quoy & Gaimard, 1833

LINED SIPHON SHELL

Description: *Siphonaria zelandica* is cream-green in colour, and flat compared with *S. diemenensis*. The ribs are also less sculptured than those of *S. diemenensis* and the **apex** is commonly eroded.

Size: Length to 25 mm

Habitat and distribution:

Abundance: ■

Reference: E 267; FN 78

Photographer: John Eichler

Onchidella nigricans

(Quoy & Gaimard, 1832)

OCEAN BEACH SLUG

Description: *Onchidella nigricans* is dark green to yellowish-brown in colour, decorated with irregular spots or stripes and a scalloped border. It has an oval-shaped, leathery body with small granules covering the upper surface. It is largely nocturnal and is more common along the open coast.

Size: Length to 25 mm

Habitat and distribution:

Abundance: □

Reference: E 269; FN 75; R 55; B 29; D 119; WoRMS

Synonym: *Onchidella patelloides*

Photographer: Mel Mitchell

Class **Gastropoda** Subclass **Opisthobranchia**

Bulla punctulata

A. Adams, 1850

BOTANY BAY BUBBLE SHELL

Description: *Bulla punctulata* has a marbled red-brownish shell with a diminished spire and narrow outer lip. The animal is brown with a broad head and two tentacles.

Size: Height to 50 mm

Habitat and distribution:

Abundance: □

Reference: E 269; FN 68; WoRMS

Synonym: *Bulla quoyii*

Photographer: John Eichler, Clifton Springs (juvenile)

Class **Gastropoda** Subclass **Opisthobranchia**

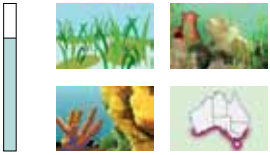
Haminoea maugeansis

Burn, 1966

Description: *Haminoea maugeansis* is a dark brown sea slug with a thin, mottled brown and transparent bubble-shaped shell.

Size: Length to 15 mm

Habitat and distribution:



Abundance: ■■

Reference: SS

Photographer: John Eichler

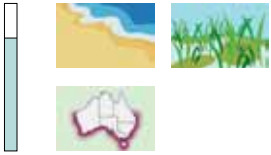
Philine angasi

(Crosse & Fischer, 1865)

Description: *Philine angasi* has a translucent internal shell. The body is ovate, fleshy and creamy-white, and is twice the size of the shell.

Size: Length to 40 mm

Habitat and distribution:



Abundance: ☐

Reference: FN 69; E 271

Photographer: John Eichler, Altona

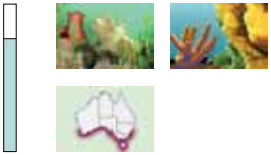
Berthella medietas

Burn, 1962

Description: *Berthella medietas* is a yellowish to pale grey cylindrical sea slug with two stout **rhinophores** extending from the head. The **mantle** extends laterally to cover the foot and the gill is often visible extending from the right side. It is commonly found on sponges.

Size: Length to 30 mm

Habitat and distribution:



Abundance: ☐

Reference: SS

Photographer: John Buckeridge

Class **Gastropoda** Subclass **Opisthobranchia**

Tambja verconis

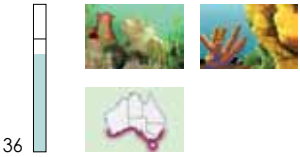
(Basedow & Hedley, 1905)

VERCO'S NUDIBRANCH

Description: *Tambja verconis* has a distinctive blue and yellow-green body, and blue gills and **rhinophores.** It feeds solely on the bryozoan *Bugula dentata*.

Size: Length to 130 mm

Habitat and distribution:



Abundance: ☐

Reference: E 277; WoRMS

Photographer: Sarah Speight, Blairgowrie

Class **Gastropoda** Subclass **Opisthobranchia**

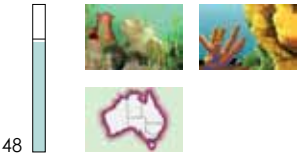
Discordia paroa

Burn, 1969

Description: *Discordia paroa* is a mottled orange, flattened sea slug with darker orange **rhinophores** set back from the **anterior** edge.

Size: Height to 75 mm

Habitat and distribution:



Abundance: ■

Reference: WoRMS

Photographer: John Eichler

Ceratosoma brevicaudatum

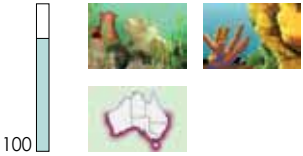
Abraham, 1876

SHORT-TAILED SEA SLUG

Description: *Ceratosoma brevicaudatum* has a variable colour pattern, but with a vivid pink-orange background with numerous red spots and white margins. It has a firm, rippled body with a distinct tail.

Size: Length to 150 mm

Habitat and distribution:



Abundance: ■ ■ ■

Reference: E 279; FN 72; B 34; WoRMS

Synonym: *Cerastoma adelaidae*

Photographer: David Reinhard

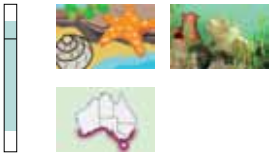
Hoplodoris nodulosa

(Angas, 1864)

Description: *Hoplodoris nodulosa* is a brownish grey to yellowish brown mottled, flattened sea slug. It has a pustulose upper surface except for the area immediately behind the **rhinophores**, which is smooth.

Size: Length to 40 mm

Habitat and distribution:



Abundance: ■ ■

Reference: SS

Photographer: John Eichler, Brighton

Class **Gastropoda** Subclass **Opisthobranchia**

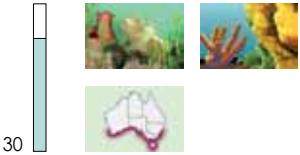
Spurilla macleayi

(Angas, 1864)

Description: *Spurilla macleayi* is a pale brown sea slug with cream and white mottling. The **cerata** are brown with transluscent tips, and the **rhinophores** are transluscent white with fine wrinkles.

Size: Length to 20 mm

Habitat and distribution:



Abundance:

Reference: E 282; SS; MV

Photographer: John Eichler, Brighton

Class **Gastropoda** Subclass **Opisthobranchia**

Anteaeolidiella foulisi

(Angas, 1864)

Description: *Anteaeolidiella foulisi* is a white to orange sea slug. It has numerous **cerata** with pale orange-brown and white banding.

Size: Length to 35 mm

Habitat and distribution:

Abundance:

Reference: SS; WoRMS

Synonym: *Aeolidiella foulisi*

Photographer: John Eichler

Class **Gastropoda** Subclass **Opisthobranchia**

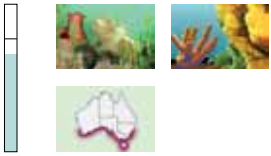
Noumea haliclona

(Burn, 1957)

Description: *Noumea haliclona* is a small pink, red-spotted sea slug with a white edge to the **mantle**. It is commonly found on sponges.

Size: Length to 20 mm

Habitat and distribution:



Abundance:

Reference: SS

Photographer: John Eichler, Brighton

Class **Gastropoda** Subclass **Opisthobranchia**

Dendrodoris arborescens

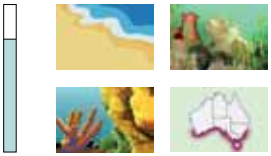
(Collingwood, 1881)

BLACK DENDRODORID

Description: *Dendrodoris arborescens* has a gelatinous texture and a variable body pattern. The adults are characteristically black, with a red, frilled margin.

Size: Length to 50 mm

Habitat and distribution:



Abundance:

Reference: E2 330; WoRMS

Synonym: *Doridopsis arborescens*

Photographer: Sarah Speight, Blairgowrie

Class **Gastropoda** Subclass **Opisthobranchia**

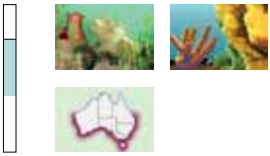
Placida dendritica

(Alder & Hancock, 1843)

Description: *Placida dendritica* is a very small green sea slug with numerous well-formed **cerata**; the green colour is due to the presence of ingested plastids, which carry out photosynthesis.

Size: Length to 5 mm

Habitat and distribution:



Abundance: ☐

Reference: SS

Photographer: John Eichler

Phylum **Mollusca** Class **Bivalvia**

Anadara trapezia

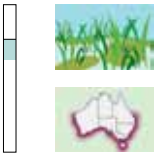
(Deshayes, 1840)

SYDNEY COCKLE

Description: *Anadara trapezia* is a bivalve with a solid shell, with broad, flat, radiating ribs. The shell is white when alive and may have a thin **periostracum**. The interior is also white, and the dentition is **heterodont**.

Size: Length to 75 mm

Habitat and distribution:



Abundance: ■

Reference: E 284; FN 81; WoRMS

Photographer: John Buckeridge

Barbatia pistachia

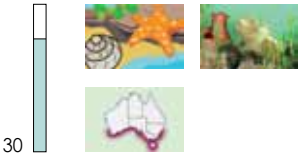
(Lamarck, 1819)

HAIRY ARK

Description: *Barbatia pistachia* is a bivalve with a cream-coloured exterior shell with numerous fine cross-hatched ridges and **striations**. When alive, the margin is covered by brown hairs. The basal margin is concave.

Size: Length to 70 mm

Habitat and distribution:



Abundance:

Reference: E 285; FN 82; WoRMS

Synonym: *Arca pistachia*

Photographer: (TOP) John Eichler, Inverloch (BOTTOM) Ray Lewis

Mytilus galloprovincialis

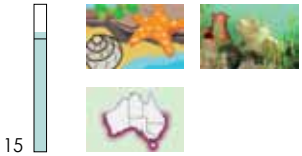
Lamarck, 1819

BLUE MUSSEL

Description: *Mytilus galloprovincialis* is a large blue-black mussel. It is elongated and fan-shaped, being broad at the opening and narrow at the **umbo**. The shell is largely smooth, other than growth banding. It is an edible mussel and is commercially harvested.

Size: Length to 120 mm

Habitat and distribution:



Abundance:

Reference: E 286; FN 85; WoRMS

Synonym: *Mytilus edulis*

Photographer: John Buckeridge

Phylum **Mollusca** Class **Bivalvia**

Xenostrobus pulex

(Lamarck, 1819)

LITTLE BLACK HORSE MUSSEL

Description: *Xenostrobus pulex* is a small, shiny, purple-black mussel. It is inflated and has the **umbo** at the end of a steep ridge.

Size: Length to 25 mm

Habitat and distribution:

Abundance: ■

Reference: E 286; FN 83; B 35; D 122

Photographer: Rod Watson

Phylum **Mollusca** Class **Bivalvia**

Electroma georgiana

(Quoy & Gaimard, 1835)

COMMON BUTTERFLY SHELL

Description: *Electroma georgiana* has a thin shell, commonly with rays of green or brown on a pale background. The shell is wing-shaped, shiny and smooth.

Size: Length to 40 mm

Habitat and distribution:

Abundance: ■ ■

Reference: E 290; FN 85

Photographer: Ray Lewis

Pecten fumatus

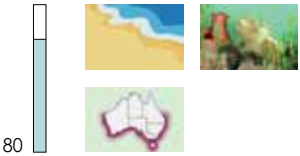
Reeve, 1852

KING SCALLOP

Description: *Pecten fumatus* is has a flat left valve, whereas the right is concave, with twelve to sixteen radial ribs. The wings form mirror images of each other. This is the commercially harvested scallop.

Size: Length to 145 mm

Habitat and distribution:



Abundance:

Reference: E 291; WoRMS

Photographer: Ray Lewis

Anomia trigonopsis

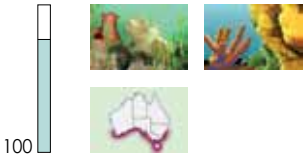
Hutton, 1877

JINGLE SHELL

Description: *Anomia trigonopsis* has a thin, opalescent shell, ranging in colour from pink to green-blue. The upper shell is convex and free, and the lower is attached to the substrate.

Size: Length to 90 mm

Habitat and distribution:



Abundance:

Reference: E 293; WoRMS

Photographer: Ray Lewis

Ostrea angasi

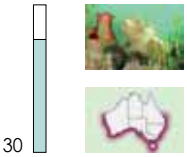
Sowerby, 1871

BAY OYSTER, MUD OYSTER

Description: *Ostrea angasi* is a large, heavy-shelled, oval-shaped oyster with a convex upper valve and flat lower valve. The shell has a dirty white exterior and white interior.

Size: Length to 180 mm

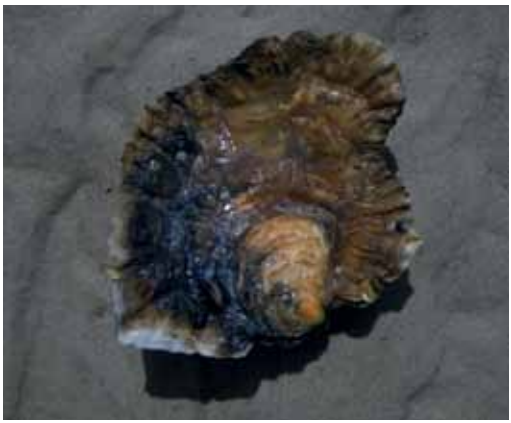
Habitat and distribution:



Abundance:

Reference: E 294; FN 86; WoRMS

Photographer: John Eichler, Foster Beach



Fulvia tenuicostata

(Lamarck, 1819)

THIN-RIBBED COCKLE

Description: *Fulvia tenuicostata* is a bivalve with a fragile creamy-white shell, pink at the **umbo**, with up to sixty fine ribs and a **crenulated** margin. When viewed from the side, the two valves appear heart-shaped.

Size: Length to 60 mm

Habitat and distribution:

Abundance:

Reference: E 298; FN 88; WoRMS

Photographer: Ray Lewis

Phylum **Mollusca** Class **Bivalvia**

Paphies elongata

(Reeve, 1854)

Description: *Paphies elongata* is a bivalve with a white, wedge-shaped shell, covered with a yellow-brown **periostracum.**

Size: Length to 30 mm

Habitat and distribution:

Abundance:

Reference: E 301; FN 94; WoRMS

Synonym: *Amesodema elongata*

Photographer: John Eichler, Altona

Phylum **Mollusca** Class **Bivalvia**

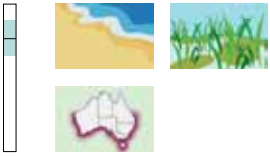
Tellina deltoidalis

Lamarck, 1818

Description: *Tellina deltoidalis* is a bivalve with a thin, finely sculptured, greyish white, subtriangular shell that is weakly folded towards the **anterior** end. A delicate, rounded ridge runs along the hinged margin.

Size: Length to 40 mm

Habitat and distribution:



Abundance:

Reference: E 302; FN 97

Synonym: *Macomona deltoidalis*

Photographer: John Eichler, Newport

Donax deltoides

Lamarck, 1818

PIPI

Description: *Donax deltoides* may be cream, brown, pink or mauve in colour, with a green-brown **periostracum** and mauve interior. The shell is solid and flat, with fine radial lines. This species is not found alive at at Ricketts Point, but may be found washed up on shore.

Size: Length to 60 mm

Habitat and distribution:

Abundance:

Reference: FN 95

Photographer: Ray Lewis

Soletellina biradiata

(Wood, 1815)

Description: *Soletellina biradiata* is a bivalve with a thin, cream-mauve shell, with a flaky brown **periostracum** at the margin. Two pale rays are commonly seen extending from the **umbo** to the margin. Fine concentric bands are also present.

Size: Length to 65 mm

Habitat and distribution:

Abundance:

Reference: E 303–304; FN 96; WoRMS

Photographer: John Eichler, Altona

Katelysia rhytiphora

(Lamy, 1937)

COCKLE, TAPESTRY VENERID

Description: *Katelysia rhytiphora* has a cream shell with distinctive brown markings. Like *K. scalarina*, it has concentric ridges, although they are crossed by fine **striations** in this species. The interior is pale yellow with purple markings.

Size: Length to 60 mm

Habitat and distribution:

Abundance:

Reference: E 305–306; FN 90

Photographer: Ray Lewis

Callista kingii

(Gray *in* King, 1827)

Description: *Callista kingii* is a bivalve with a cream shell with mid-brown and white rays and radial bands, giving a characteristic plaid appearance. The shell has very fine concentric **striations**.

Size: Length to 50 mm

Habitat and distribution:

Abundance:

Reference: FN 89; WoRMS

Synonym: *Notocallista kingii*

Photographer: Ray Lewis

Phylum **Mollusca** Class **Bivalvia**

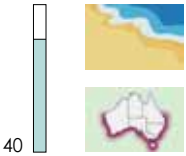
Tawera gallinula

(Lamarck, 1818)

Description: *Tawera gallinula* is a cream bivalve with brown blotches in radiating bands. The concentric ridges are more prominent than in *T. lagopus*, and the interior is purple.

Size: Length to 40 mm

Habitat and distribution:



Abundance:

Reference: E 306; WoRMS

Synonym: *Venus gallinula*

Photographer: Ray Lewis

Phylum **Mollusca** Class **Bivalvia**

Tawera lagopus

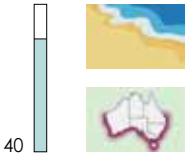
(Lamarck, 1818)

VENUS COCKLE

Description: *Tawera lagopus* has a cream shell with brown markings and a white interior. There are numerous concentric ridges outside, and fine serrations on the outer edge of the interior.

Size: Length to 40 mm

Habitat and distribution:



Abundance:

Reference: E 306; WoRMS

Synonym: *Venus lagopus*

Photographer: Ray Lewis

Phylum **Mollusca** Class **Bivalvia**

Eumarcia fumigata

(Sowerby, 1853)

Description: *Eumarcia fumigata* is a bivalve with a smooth, cream shell with mottled brown rays and very fine grooves.

Size: Length to 45 mm

Habitat and distribution:

Abundance:

Reference: FN 89; E 306

Photographer: John Eichler

Phylum **Mollusca** Class **Bivalvia**

Venerupis galactites

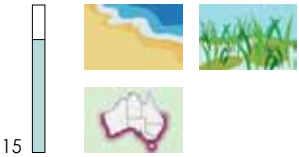
(Lamarck, 1818)

LARGE BEAN COCKLE

Description: *Venerupis galactites* is a bivalve with a creamy-white shell with fine concentric ridges and radial **striations**. The hinge is commonly brown.

Size: Length to 50 mm

Habitat and distribution:



Abundance:

Reference: E 307; WoRMS

Synonym: *Venus galactites*

Photographer: Ray Lewis

Venerupis anomala

(Lamarck, 1818)

Description: *Venerupis anomala* is a bivalve with a white shell that has a pattern of dark chevrons towards the lateral margins; the intensity of the patterns diminishes with increasing age and size.

Size: Length to 25 mm

Habitat and distribution:

Abundance: ■■

Reference: E 307; FN 92

Photographer: John Eichler

Circomphalus disjecta

(Perry, 1811)

FRILLED VENUS, WEDDING CAKE VENUS

Description: *Circomphalus disjecta* is a bivalve with clear **striations** and widely spaced, pink-tinged, concentric frills.

Size: Length to 63 mm

Habitat and distribution:

Abundance: ■

Reference: E 308; WoRMS

Synonym: *Venus disjecta*

Photographer: John Eichler, Port Welshpool

Phylum **Mollusca** Class **Bivalvia**

Barnea australasiae

(G.B. Sowerby II, 1849)

ANGEL WING

Description: *Barnea australasiae* is a rock-boring bivalve with a thin, white, fragile shell, characterised by intricate concentric scalloped ridges and fine radiating spines. The soft bodied animal is far larger than its shell.

Size: Length to 60 mm

Habitat and distribution:

Abundance:

Reference: E 309; FN 98; WoRMS

Synonym: *Pholas australasiae*

Photographer: Ray Lewis

Phylum **Mollusca** Class **Cephalopoda**

Hapalochlaena maculosa

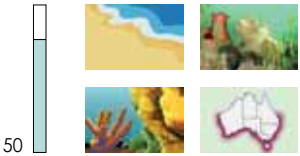
(Hoyle, 1883)

BLUE-RINGED OCTOPUS

Description: *Hapalochlaena maculosa* is a small, mottled brown octopus, with characteristic neon blue rings that glow strongly when the animal is irritated. It is often found in rock crevices. The Blue-ringed Octopus is capable of injecting a powerful nerve toxin if provoked.

Size: Length to 220 mm

Habitat and distribution:



Abundance:

Reference: E 312; FN 101; W 22; R 60; B 36; WoRMS; MV

Synonym: *Octopus maculosus*

Photographer: John Eichler

Octopus kaurna

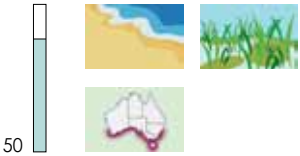
Stranks, 1990

SAND OCTOPUS

Description: *Octopus kaurna* is a nocturnal feeder. It has round tubercules on the upper surface, and long, thin arms, with webbing at the base. The overall appearance is highly variable.

Size: Length to 420 mm

Habitat and distribution:



Abundance: ☐

Reference: E 314; WoRMS; MV

Photographer: Sandy Webb

Argonauta nodosa

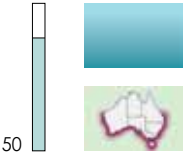
Lightfoot, 1786

PAPER NAUTILUS

Description: *Argonauta nodosa* has a delicate white shell, which is an egg case with **nodular** ridges and a wide, grooved keel. The body of the animal is slender, with arms of unequal length. This species is not found alive at Ricketts Point, but may be found washed up on shore.

Size: Shell length to 350 mm

Habitat and distribution:



Abundance: ☐

Reference: E 315

Photographer: Kim Croker

Phylum **Mollusca** Class **Cephalopoda**

Idiosepius notoides

Berry, 1921

SOUTHERN PYGMY SQUID

Description: *Idiosepius notoides* is a small yellow-brown squid with tiny black and blue spots and white lines around the eyes. The fins are rounded.

Size: Length to 25 mm

Habitat and distribution:

Abundance: ■■

Reference: E 318

Photographer: John Eichler

Phylum **Mollusca** Class **Cephalopoda**

Euprymna tasmanica

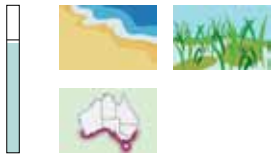
(Pfeffer, 1884)

SOUTHERN DUMPLING SQUID

Description: *Euprymna tasmanica* is a small squid with short tentacles. It is often iridescent, but has the ability to change colour to match its background. Its skin exudes mucus to which sand sticks as a camouflage device. Adults possess photoluminescent bacteria. It is nocturnal.

Size: Length to 25 mm

Habitat and distribution:



Abundance: □

Reference: E 318

Photographer: John Eichler

Bugula dentata

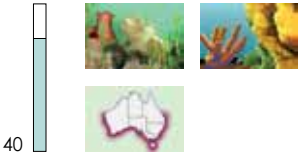
(Lamouroux, 1816)

BLUE-GREEN BRYOZOAN

Description: *Bugula dentata* forms bushy blue-green colonies made up of paired **zooids** aligned end to end to form filaments. Like other species in the genus *Bugula*, the walls of the zooids are not calcified, allowing the colony to flex with wave motion.

Size: Length to 50 mm

Habitat and distribution:



Abundance: ■

Reference: E 323; WoRMS

Photographer: David Reinhard

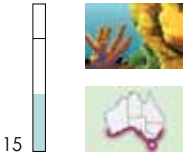
Celleporaria sp.

ORANGE PLATE BRYOZOAN

Description: *Celleporaria* is an orange bryozoan with flattened, fan-like colonies attached to the reef surface.

Size: Colony length to 120 mm

Habitat and distribution:



Abundance: ■ ■

Reference: E 325

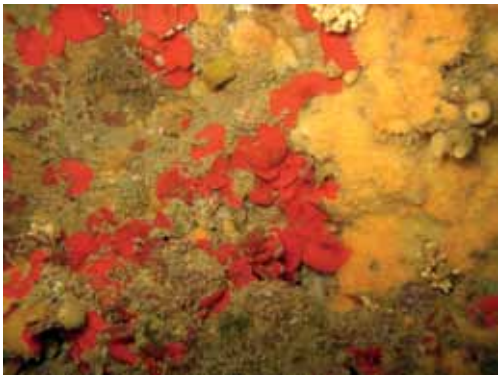
Photographer: David Reinhard

Kingdom **Animalia** Phylum **Bryozoa**

Mucropetraliella ellerii

(MacGillivray, 1869)

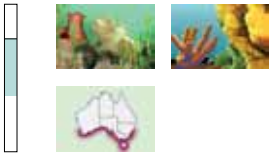
RED BRYOZOANS



Description: *Mucropetraliella ellerii* is a bright red bryozoan. It is most commonly found as encrusting colonies on seaweed and in crevices.

Size: Colony length to 40 mm

Habitat and distribution:



Abundance: ■ ■

Reference: E 324; R 76; WoRMS

Synonym: *Mucronella ellerii*

Photographer: David Reinhard

Phylum **Echinodermata** Class **Asteroidea**

Tosia magnifica

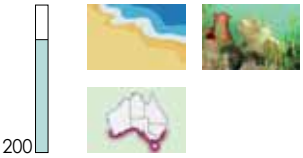
(Müller & Troschel, 1842)

MAGNIFICENT BISCUIT STAR

Description: *Tosia magnifica* is similar to *T. australis*, but has more numerous and varied plates along the body margins. Colours are varied, and include brown, orange and cream.

Size: Arm radius to 45 mm

Habitat and distribution:



Abundance: □

Reference: E 336; FN 132; WoRMS

Synonym: *Pentagonaster magnificus*

Photographer: Ray Lewis

Tosia australis

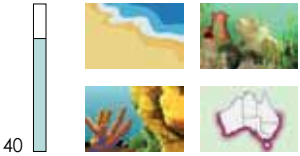
Gray, 1840

BISCUIT STAR

Description: *Tosia australis* varies in colour, including brown, orange, black, grey and purple. It most commonly has six plates along the margin between each arm tip, with the plates at the arms enlarged.

Size: Diameter to 100 mm

Habitat and distribution:

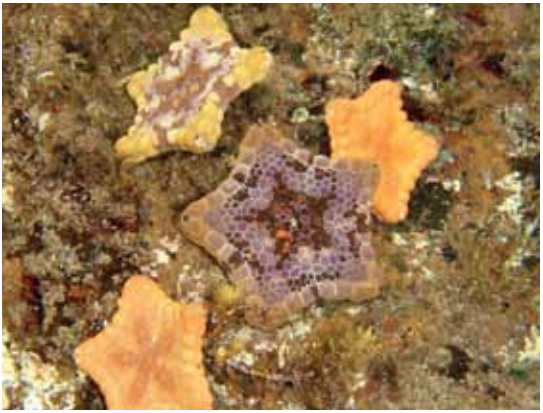


Abundance: ■ ■ ■

Reference: E 337; FN 132; W 15; R 78; B 38; D 128; MV

Synonym: *Pentagonaster australis*

Photographer: John Eichler



Nectria macrobrachia

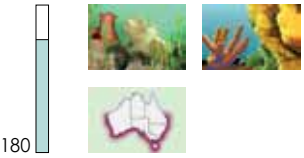
H.L. Clark, 1923

LARGE-PLATED SEASTAR

Description: *Nectria macrobrachia* is most commonly yellow, orange or red in colour, with closely packed plate-like **tabulae** across the surface and extending along the arms.

Size: Arm radius to 115 mm

Habitat and distribution:



Abundance: □

Reference: E 339; FN 131; WoRMS

Photographer: David Reinhard, Wilsons Promontory

Petricia vernicina

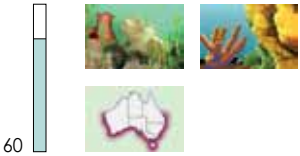
(Lamarck, 1816)

VELVET SEASTAR

Description: *Petricia vernicina* is a red-orange seastar. It is covered by a skin that gives it a soft, velvety appearance, and which is punctuated by large respiratory **papulae**.

Size: Arm radius to 90 mm

Habitat and distribution:



Abundance: ■

Reference: E 341; FN 133; W 16; WoRMS

Photographer: Ray Lewis

Meridiastra calcar

(Lamarck, 1816)

COMMON SEASTAR

Description: *Meridiastra calcar* is typically an eight-armed seastar. The colours are highly variable, but include red, purple, pink, green, brown and blue on the upper surface. The underside is uniformly pale.

Size: Diameter to 90 mm

Habitat and distribution:

Abundance: ■ ■ ■

Reference: E 345; FN 135; W 15; R 60; B 38; D 129; G 245; WoRMS

Synonym: *Patriella calcar*

Photographer: David Reinhard

Meridiastra gunnii

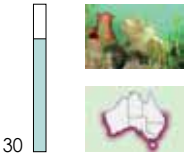
(Gray, 1840)

SIX-ARMED SEASTAR

Description: *Meridiastra gunnii* is a crimson-purple six-armed seastar with orange tube feet. The body is thick and domed and the arms are distinct.

Size: Arm radius to 65 mm

Habitat and distribution:



Abundance:

Reference: E 346; FN 136; D 130; WoRMS

Synonym: *Patriella brevispina*

Photographer: John Eichler

Parvulastra exigua

(Lamarck, 1816)

FIVE-ARMED CUSHION STAR, SMALL GREEN SEASTAR

Description: *Parvulastra exigua* has a mottled olive-green upper surface; the underside is light blue. The five arms are short, giving the animal a pentagonal shape.

Size: Diameter to 40 mm

Habitat and distribution:

Abundance:

Reference: FN 135; R 79; B 38; D 129; WoRMS; MV

Synonym: *Patriella exigua*

Photographer: Rod Watson, Barwon Bluff

Phylum **Echinodermata** Class **Asteroidea**

Paranepanthia grandis

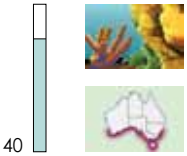
(H.L. Clark, 1928)

GRAND SEASTAR

Description: *Paranepanthia grandis* is a mottled pink, orange and pale brown five-armed seastar with distinct webbing between the arms.

Size: Length to 140 mm

Habitat and distribution:



Abundance: ■

Reference: E 344

Photographer: John Eichler

Phylum **Echinodermata** Class **Asteroidea**

Coscinasterias muricata

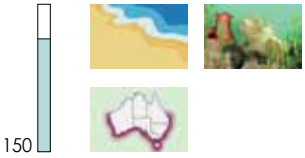
Verrill, 1870

ELEVEN-ARMED SEASTAR

Description: *Coscinasterias muricata* has a mottled blue-brown appearance, with rows of large spines along its upper surface. The number of arms is usually eleven, but can vary from seven to fourteen.

Size: Diameter to 250 mm

Habitat and distribution:



Abundance: ■■■

Reference: E 347–348; FN 137; W 16; R 82; B 38; D 131; WoRMS

Synonym: *Coscinasterias calamaria*

Photographer: David Reinhard

Asterias amurensis

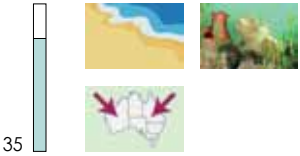
Lütken, 1871

NORTHERN PACIFIC SEASTAR

Description: *Asterias amurensis* is a purple or yellow five-armed seastar. It can be confused with *Uniophora granifera*, but differs from that species by having distinctly pointed arms and one row of spines (as opposed to two) along the **ambulacral groove** on the underside.

Size: Arm radius to 230 mm

Habitat and distribution:



Abundance:

Reference: E 348; WoRMS

Photographer: John Eichler, Mud Islands

Uniophora granifera

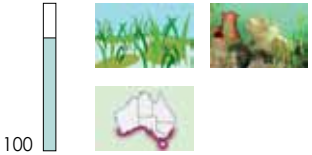
(Lamarck, 1816)

GRANULAR SEASTAR

Description: *Uniophora granifera* exhibits a range of colours, commonly orange, red, brown or yellow. The upper surface is covered with spines that have swollen rounded tips, which can create a zigzag pattern along the arms.

Size: Arm radius to 120 mm

Habitat and distribution:



Abundance:

Reference: E 349; FN 138; W 1; WoRMS; MV

Photographer: John Eichler, Brighton

Allostichaster polyplax

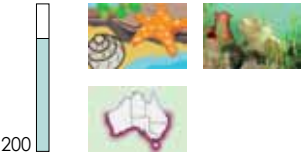
(Müller and Troschel, 1844)

LITTLE SEASTAR

Description: *Allostichaster polyplax* is a small seastar with between six and nine, but commonly eight, spine-covered arms. Several of the arms may only be in the bud stage of regrowth. It varies in colour, but is commonly grey, brown or red.

Size: Diameter to 100 mm

Habitat and distribution:



Abundance:

Reference: E 350; FN 137; W 16; D 131; MV

Photographer: John Eichler

Amphipholis squamata

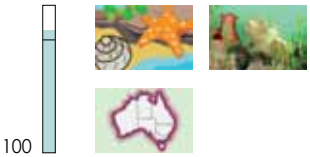
(Della Chiaje, 1828)

SMALL BRITTLE STAR

Description: *Amphipholis squamata* has a pale disc, which is usually grey, with white arms. The disc is covered in minute scales and the arms are relatively stiff. It hides in algal tufts or under rocks, and is rarely seen due to its small size and camouflage colouration.

Size: Disc diameter to 5 mm

Habitat and distribution:



Abundance:

Reference: FN 144; WoRMS; MV

Photographer: Mel Mitchell

Amblypneustes ovum

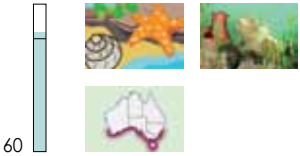
(Lamarck, 1816)

EGG-SHAPED SEA URCHIN

Description: *Amblypneustes ovum* is a globe-shaped urchin with dark primary spines only 5 mm long, and white secondary spines. The **test** is creamy-white in colour.

Size: Diameter to 60 mm

Habitat and distribution:



Abundance:

Reference: E 361–362; FN 147; WoRMS

Photographer: Ray Lewis

Heliocidaris erythrogramma

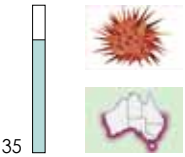
(Valenciennes, 1846)

PURPLE SEA URCHIN

Description: *Heliocidaris erythrogramma* has a round, slightly flattened **test** and varies in colour from white to green to purple. The colour can differ between the spines and test. Primary spines are long and tapered, whereas secondary spines are shortened and blunt. This species is responsible for the urchin barrens at Ricketts Point.

Size: Test diameter to 90 mm

Habitat and distribution:



Abundance:

Reference: E 365; FN 148; W 15; R 77; D 133; WoRMS

Photographer: David Reinhard, Black Rock

Phylum **Echinodermata** Class **Holothuroidea**

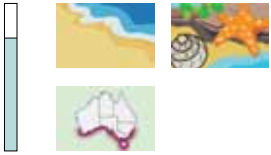
Lipotrapeza vestiens

(Joshua, 1914)

Description: *Lipotrapeza vestiens* has a red-brown or pale brown sausage-like body, covered in tube feet. Shell and rock fragments are commonly attached to its body.

Size: Length to 120 mm

Habitat and distribution:



Abundance:

Reference: F 150; E 369

Photographer: John Eichler

Phylum **Echinodermata** Class **Holothuroidea**

Neoamphicyclus mutans

(Joshua, 1914)

Description: *Neoamphicyclus mutans* is a pale to dark grey-brown sea cucumber with violet hues. Its body is elongate and tapering, with five longitudinal sets of tube feet.

Size: Length to 50 mm

Habitat and distribution:

Abundance:

Reference: MV

Photographer: John Eichler

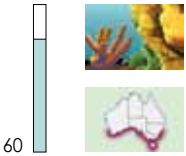
Plesiocolochirus ignava

(Ludwig, 1875)

Description: *Plesiocolochirus ignava* is a whitish to mauve sea cucumber with bright orange flecks. Its body is rectangular in section with numerous knobs and tube feet on the base.

Size: Length to 30 mm

Habitat and distribution:



Abundance: ■

Reference: E 370; MV

Photographer: John Eichler, Point Franklin

Cucuvitrum rowei

O'Loughlin & O'Hara, 1992

Description: *Cucuvitrum rowei* is a cream-white, worm-like sea cucumber with white, branching, tentacles.

Size: Length to 25 mm

Habitat and distribution:

Abundance: □

Reference: FN 153; MV

Photographer: John Eichler

Phylum **Echinodermata** Class **Holothuroidea**

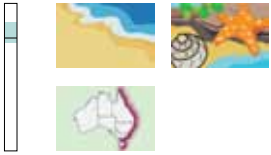
Taeniogyrus roebucki

(Joshua, 1914)

Description: *Taeniogyrus roebucki* is a uniformly bright red sea cucumber. It has a long, thin body without tube feet.

Size: Length to 80 mm

Habitat and distribution:



Abundance:

Reference: FN 155

Photographer: John Eichler

Phylum **Arthropoda** Order **Isopoda**

Paridotea ungulata

(Pallas, 1772)

SHARP-TAILED SEA CENTIPEDE

Description: *Paridotea ungulata* is a large green-brown isopod, capable of camouflage with the host plant. It has sharp points at the end of the last body segment.

Size: Body length to 43 mm

Habitat and distribution:

Abundance:

Reference: E 184; WoRMS

Photographer: Ray Lewis

Phylum **Arthropoda** Order **Amphipoda**

Ceradocus serratus

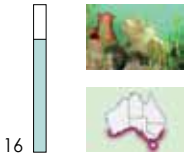
(Bate, 1862)

SEA LICE

Description: *Ceradocus serratus* is an amphipod with a pinkish-red translucent **carapace** and is often found under rocks. It has characteristic spines around the segments towards the end of the body.

Size: Length to 14 mm

Habitat and distribution:



Abundance:

Reference: E 186

Photographer: Mel Mitchell

Phylum **Arthropoda** Order **Decapoda**

Palaemon serenus

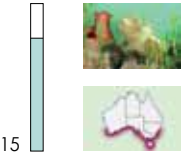
Heller, 1862

ROCK POOL SHRIMP, RED-HANDED SHRIMP

Description: *Palaemon serenus* is a transparent shrimp with oblique red lines on the **carapace** and flecks of red and yellow over the abdomen and legs. The second pair of legs is long and has red 'socks'.

Size: Length to 60 mm

Habitat and distribution:



Abundance:

Reference: E 191; W 24; B 23; WoRMS

Photographer: Ray Lewis

Alpheus euphrosyne

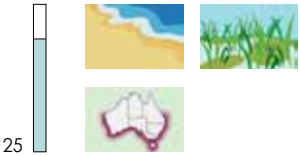
De Man, 1897

GREEN SNAPPING SHRIMP

Description: *Alpheus euphrosyne* has a pale to dark green tail with brown bands, while the **carapace** and large right claw are usually all green.

Size: Length to 65 mm

Habitat and distribution:



Abundance:

Reference: G 215

Photographer: Mel Mitchell

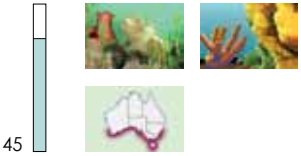
Alpheus villosus

(Olivier, 1811)

Description: *Alpheus villosus* is a bright orange shrimp covered with hairs. It is commonly found on the underside of rocks.

Size: Length to 60 mm

Habitat and distribution:



Abundance:

Reference: E 194, WoRMS

Photographer: John Eichler

Phylum **Arthropoda** Order **Decapoda**

Synalpheus tumidomanus

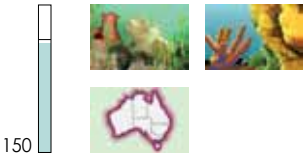
Paulson, 1875

SNAPPING SHRIMP

Description: *Synalpheus tumidomanus* is a small shrimp with a shiny green **carapace** and a large barrel-shaped front claw, with small fingers.

Size: Length to 25 mm

Habitat and distribution:



Abundance: ■

Reference: MV

Photographer: John Eichler

Phylum **Arthropoda** Order **Decapoda**

Paguristes frontalis

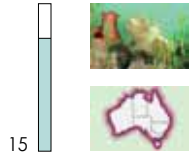
(H. Milne Edwards, 1836)

HERMIT CRAB

Description: *Paguristes frontalis* is mainly red, but the large, left front claw may be pale. It lacks hairs, but possesses tubercules and a movable finger on the right claw.

Size: Length to 30 mm

Habitat and distribution:



Abundance: □

Reference: E 198; FN 110; W 19, 24; WoRMS; MV

Synonym: *Pagurus frontalis*

Photographer: Sarah Speight, Blairgowrie

Phylum **Arthropoda** Order **Decapoda**

Pagurixus handrecki

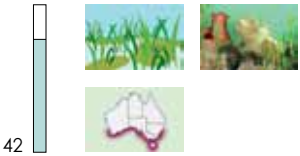
Gunn & Morgan, 1992

HENDRICK'S HERMIT CRAB

Description: *Pagurixus handrecki* is a hermit crab with legs distinguished by longitudinal red stripes on a white background. It is very small and often overlooked.

Size: Length to 6 mm

Habitat and distribution:



Abundance: ☐

Reference: E 200; WoRMS

Photographer: Mel Mitchell

Phylum **Arthropoda** Order **Decapoda**

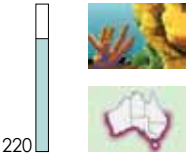
Stimdromia lateralis

(Gray, 1831)

Description: *Stimdromia lateralis* is a sponge-carrying crab with two large teeth and a smaller central tooth. It is commonly found on jetty pylons.

Size: Carapace width to 25 mm

Habitat and distribution:



Abundance: ■

Reference: E 203

Photographer: John Eichler

Austrodromidia octodentata

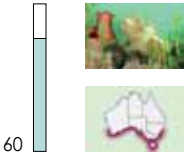
(Haswell, 1882)

BRISTLED SPONGE CRAB

Description: *Austrodromidia octodentata* has a rounded **carapace** with four or five inconspicuous teeth on the side margins towards the front. The most distinctive feature is a dense covering of tufted bristles on the carapace and legs.

Size: Carapace width to 75 mm

Habitat and distribution:



Abundance: ■■

Reference: E 203; WoRMS

Synonym: *Dromia octodentata*

Photographer: Ray Lewis
(specimen most likely juvenile)

Bellidilia laevis

(Bell, 1855)

SMOOTH PEBBLE CRAB

Description: *Bellidilia laevis* is light to dark grey-brown in colour, although always with four white dots on the **carapace**. This crab lacks spines on the **posterior** carapace.

Size: Carapace to 30 mm

Habitat and distribution:

Abundance: ■■

Reference: G 225; F 124; WoRMS; MV

Photographer: John Eichler, Altona

Phylum **Arthropoda** Order **Decapoda**

Naxia aurita

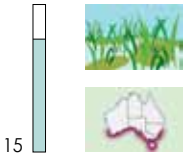
(Latreille, 1825)

DECORATOR CRAB

Description: *Naxia aurita* has a pear-shaped body and orange front claws with blue trim. It is lacking the spines and tubercules of the closely related species *N. spinosa* and *N. tumida*, but still accumulates algae on its **carapace**. Typically, this species is well camouflaged and difficult to spot.

Size: Carapace width to 40 mm

Habitat and distribution:



Abundance:

Reference: E 205; D 48; WoRMS

Photographer: Ray Lewis

Phylum **Arthropoda** Order **Decapoda**

Halicarcinus ovatus

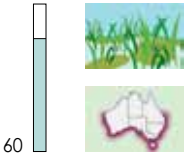
Stimpson, 1858

THREE-PRONGED SPIDER CRAB

Description: *Halicarcinus ovatus* is brown, green and/or black in colour. It has a flattened and broadly rounded **carapace**, more angular at the front, with three short spines of equal length between the eyes.

Size: Carapace width to 13 mm

Habitat and distribution:



Abundance:

Reference: E 208; FN 111; D 48

Photographer: John Eichler

Carcinus maenas

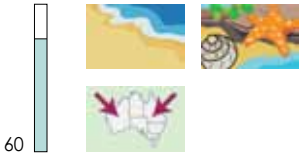
(Linnaeus, 1758)

COMMON SHORE CRAB, EUROPEAN SHORE CRAB

Description: *Carcinus maenas* has a greenish grey **carapace** with three teeth between the eyes and five teeth around the front of the side margin. The hind legs are less flattened than on most crabs.

Size: Carapace width to 100 mm

Habitat and distribution:



Abundance: ■ ■ ■

Reference: E 208; FN 112; W 24; R 70; WoRMS; MV

Synonym: *Carcinus granulatus*

Photographer: John Eichler, Foster Beach

Heteropilumnus fimbriatus

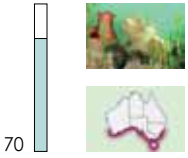
(H. Milne Edwards, 1834)

BEARDED CRAB

Description: *Heteropilumnus fimbriatus* has a flattened yellow-brown **carapace**, with dense hairs along the front margin and legs.

Size: Carapace width to 25 mm

Habitat and distribution:



Abundance: ■ ■

Reference: E 212; WoRMS; MV

Synonym: *Pilumnus fimbriatus*

Photographer: John Eichler

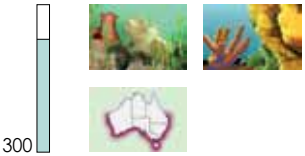
Pilumnus tomentosus

Latreille, 1825

Description: *Pilumnus tomentosus* is red-brown in colour with a sparse covering of long hairs over the **carapace**. There are three prominent protrusions along either side of the carapace and raised **papillae** along the claws, body and legs.

Size: Carapace width to 40 mm

Habitat and distribution:



Abundance:

Reference: E 212; WoRMS

Synonym: *Pilumnus major*

Photographer: John Eichler

Pilumnus fissifrons

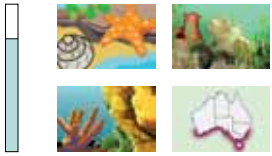
Stimpson, 1858

HAIRY CRAB

Description: *Pilumnus fissifrons* is a hairy crab with triangular teeth along its broadly curved front.

Size: **Carapace** width to 20 mm

Habitat and distribution:



Abundance:

Reference: MV; WoRMS

Photographer: John Eichler, Newport

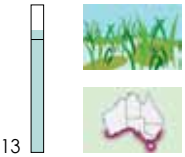
Pilumnopeus serratifrons

(Kinahan, 1856)

Description: *Pilumnopeus serratifrons* is brownish-purple, with black-tipped claws. The front margin of the **carapace** is divided by a small notch. Short hairs are present on the sides, with stout hairs on the margins of the legs.

Size: Carapace width to 30 mm

Habitat and distribution:



Abundance:

Reference: FN 115; MV

Photographer: John Eichler

Cyclograpsus audouinii

H. Milne Edwards, 1837

SMOOTH SHORE CRAB

Description: *Cyclograpsus audouinii* has a smooth **carapace** with a range of colours, commonly red, brown, purple and yellow. It is very similar to *C. granulosus*, but has tufts of hair in the joints of the walking legs.

Size: Carapace width to 40 mm

Habitat and distribution:

Abundance:

Reference: E 213; FN 117; R 72; B 20; D 53; WoRMS

Photographer: Mel Mitchell, Sandringham

Phylum **Arthropoda** Order **Decapoda**

Cyclograpsus granulosus

H. Milne Edwards, 1853

MOTTLED SHORE CRAB

Description: *Cyclograpsus granulosus* has a mottled red, brown and yellow **carapace**, with a smooth margin. The legs are flattened.

Size: Carapace width to 35 mm

Habitat and distribution:

Abundance:

Reference: E 213; FN 117; D 53; WoRMS

Photographer: John Eichler

Phylum **Arthropoda** Order **Decapoda**

Paragrapsus quadridentatus

(H. Milne Edwards, 1837)

Description: *Paragrapsus quadridentatus* has a rounded, flattened **carapace**. It is distinguished from *Helograpsus haswellianus* by a rounded projection on the side margin.

Size: Carapace width to 30 mm

Habitat and distribution:

Abundance:

Reference: FN 118; E 214; MV

Photographer: John Eichler, Sorrento

Brachynotus spinosus

(H. Milne Edwards, 1853)

LITTLE SHORE CRAB

Description: *Brachynotus spinosus* is a small pale brown to olive-green crab with a squarish **carapace** and three strong teeth on each side. The eyes are black with fine white spots.

Size: Carapace width to 20 mm

Habitat and distribution:

Abundance: ■

Reference: E 215; FN 121; W 24; R 75; WoRMS; MV

Synonym: *Heterograpsus spinosa*

Photographer: John Eichler, Mud Islands

Guinusia chabrus

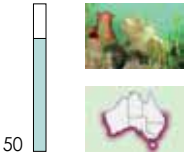
(Linnaeus, 1758)

RED BAIT CRAB

Description: *Guinusia chabrus* is a reddish crab with short hairs on the body and legs. Coarse tubercules occur along the front claws, and the **carapace** is deeply indented at the front.

Size: Carapace width to 70 mm

Habitat and distribution:



Abundance: □

Reference: E 215; FN 122; WoRMS; MV

Synonym: *Plagusia chabrus*

Photographer: David Reinhard, Rosebud

Mictyris platycheles

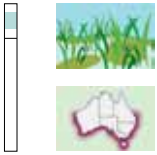
H. Milne Edwards, 1852

SOLDIER CRAB

Description: *Mictyris platycheles* has a blue-grey, globular **carapace**, with purple sides.

Size: Carapace width to 15 mm

Habitat and distribution:



Abundance: ■ ■

Reference: E 217; FN 125; WoRMS

Photographer: John Eichler

Pinnotheres hickmani

(Guiler, 1950)

PEA CRAB

Description: *Pinnotheres hickmani* is a small crab with a smooth, soft, rounded **carapace**. It is pale cream in colour, although the carapace may be darker. The eyes are not visible from above and the legs are weak. Males are much smaller than females and are rarely found. This crab inhabits bivalves.

Size: Carapace width to 10 mm

Habitat and distribution:

Abundance: □

Reference: E 218; FN 116; D 67; MV

Synonym: *Fabia hickmani*

Photographer: Ray Lewis

Phylum **Arthropoda** Order **Decapoda**

Helograpsus haswellianus

(Whitelegge, 1889)

HIDING CRAB

Description: *Helograpsus haswellianus* is commonly brown-green in colour. It has an inflated body and a single notch on the side margins of the **carapace**.

Size: Carapace width to 30 mm

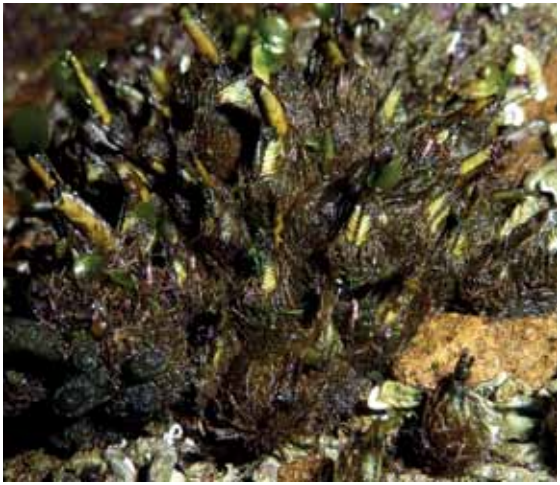
Habitat and distribution:

Abundance: ■

Reference: E 214; FN 118; W 24; D 55; WoRMS

Photographer: John Eichler, Avalon

Class **Thecostraca** Subclass **Cirripedia**



Ibla quadrivalvis

(Cuvier, 1817)

HAIRY STALKED BARNACLE

Description: *Ibla quadrivalvis* is a small stalked barnacle characterised by a brown, hairy stalk and a crown of four yellow plates. Two of these plates are elongated and tooth-like.

Size: Length to 20 mm

Habitat and distribution:

Abundance: □

Reference: FN 104

Photographer: John Buckeridge

Chthamalus antennatus

Darwin, 1854

SURF BARNACLE

Description: *Chthamalus antennatus* has a pale brown shell with six solid, ribbed plates, which are often worn. The edge of the shell has strong grooves and the **orifice** is ellipsoid.

Size: Diameter to 12 mm

Habitat and distribution:

Abundance:

Reference: E 172; FN 105; R 62; B 22; D 40

Photographer: John Buckeridge

Chamaesipho tasmanica

Foster & Anderson, 1986

HONEYCOMB BARNACLE

Description: *Chamaesipho tasmanica* is pale brown with four solid plates fused to form a solid wall, often forming a honeycomb-like structure with neighbouring shells. The **orifice** is large and sub-circular.

Size: Diameter to 8 mm

Habitat and distribution:

Abundance:

Reference: FN 105

Photographer: John Buckeridge

Austrominius modestus

(Darwin), 1854

ESTUARINE BARNACLE

Description: *Austrominius modestus* has a cream-white conic shell with four thin, solid, weakly ribbed wall plates. The outline is sinuous and the **orifice** diamond shaped. It is a common fouling barnacle.

Size: Diameter to 12 mm

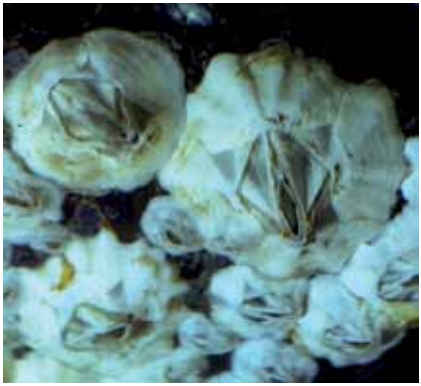
Habitat and distribution:

Abundance:

Reference: E 175; FN 107; W 25; R 69

Synonym: *Elminius modestus*

Photographer: John Buckeridge



Tesseropora rosea

(Krauss, 1848)

ROSE BARNACLE

Description: *Tesseropora rosea* has a pink, high conic shell, with four plates, which may develop deep erosional grooves. The **orifice** is pentangular.

Size: Diameter to 30 mm

Habitat and distribution:

Abundance:

Reference: E 174; FN 106; R 65; D 42

Synonym: *Conia rosea*

Photographer: Mel Mitchell, Black Rock

Tetraclitella purpurascens

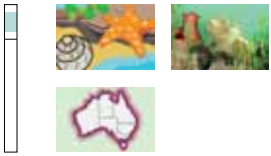
(Wood, 1815)

ROSETTE BARNACLE

Description: *Tetraclitella purpurascens* has a purple to pale grey, flat to low, conic shell with four strongly ribbed plates. The **orifice** is a wide diamond shape and the shells erode to produce a **nodular** surface.

Size: Diameter to 25 mm

Habitat and distribution:



Abundance: ■

Reference: E 172; FN 106; R 64; B 22; D 43

Photographer: John Buckeridge

Balanus trigonus

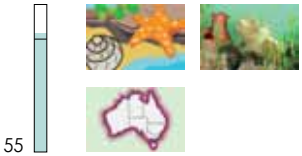
Darwin, 1854

TRIANGLE BARNACLE

Description: *Balanus trigonus* has a conic shell with alternating white and purplish stripes. It has six plates and a triangular **orifice**. It is a common fouling barnacle.

Size: Diameter to 10 mm

Habitat and distribution:



Abundance: □

Reference: E2 206

Photographer: John Buckeridge

Pyura stolonifera

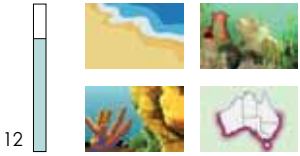
(Heller, 1878)

CUNJEVOI

Description: *Pyura stolonifera* has a brownish, cylindrical body, with a rough texture formed by the incorporation of cemented sand grains into the **test**. It is commonly covered with algae. Two siphon openings lie close to each other, projecting a little above the surface. The **orifice** is pentangular.

Size: Height to 300 mm

Habitat and distribution:



Abundance:

Reference: E 379; FN 156; W 27; R 85; B 41; D 136; WoRMS

Synonym: *Cynthia praeputalis*

Photographer: John Buckeridge, Wilsons Promontory

Sycozoa cerebriformis

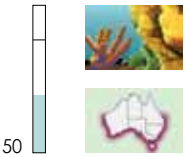
(Quoy & Gaimard, 1834)

BRAIN ASCIDIAN

Description: *Sycozoa cerebriformis* is an ascidian that is variable in shape and colour (red, pink, orange, yellow or blue). As the colonies grow, the fan structure becomes convoluted to form brain-like clusters.

Size: Height to 100 mm

Habitat and distribution:



Abundance:

Reference: E 384; WoRMS

Photographer: David Reinhard

Phylum **Chordata** Class **Ascidiacea**

Aplidium sp.

COMPOUND ASCIDIAN

Description: *Aplidium* is mostly found in warmer waters, forming colonies up to 70 mm across over hard surfaces. **Zooids** are aligned in double rows along canals. It is variable in colour, but red and orange are common.

Size: Height to 10 mm

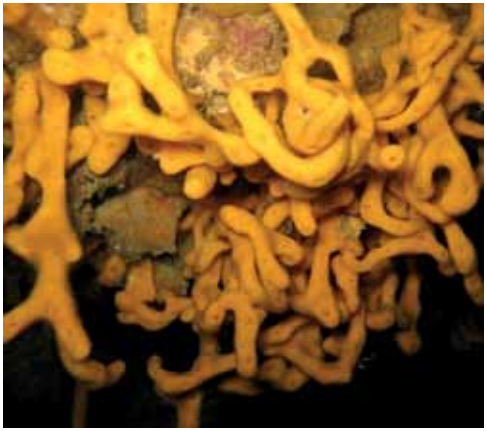
Habitat and distribution:

Abundance: ☐

Reference: E 387; WoRMS

Photographer: Ray Lewis

Phylum **Chordata** Class **Ascidiacea**



Didemnum lissoclinum

Kott, 2001

SPONGY COMPOUND ASCIDIAN

Description: *Didemnum lissoclinum,* commonly mistaken for a sponge, forms twisted, yellow, banana-like colonies attached to reef overhangs.

Size: Colony to 1 m

Habitat and distribution:

Abundance: ■ ■

Reference: WoRMS

Photographer: David Reinhard

Key to the major groups of algae, cyanobacteria and marine plants at Ricketts Point

The identification of algae, cyanobacteria and marine plants is complex and often requires examination of specimens under a microscope. Because of this, a key to even generic level would be outside the scope of this book. Instead, we describe here a rough guide to the major groups used throughout the book. The key is adapted from Huisman *et al*. 2007, *Hawaiian Reef Plants*.

Glossary terms are show in italics.

1a Generally simply constructed, hairlike or forming pads. Colour generally blue-green to violet, occasionally brown, red, green or black. ..... **Phylum Cyanophyta** (blue-greens) p. 1
1b Simple to elaborately constructed *macrophytes*. Colour green, brown, red or golden, rarely blue-green **2**
2a (1b) Grass-green to grey-green in colour **3**
2b (1b) Red, brown, or golden in colour **4**
3a (2a) Grass-like or leaf-like, differentiated into *vascular* tissue ..... **Phylum Angiospermae** (flowering plants) pp. 19–20
3b (2a) Plants with a variety of forms; *filamentous*, *membranous* or with a complex structure; lacking *vascular* tissue..... **Phylum Chlorophyta** (green algae) pp. 14–19
4a (2b) Commonly red or purple, mostly with moderately-sized *thalli* ..... **Phylum Rhodophyta** (red algae) pp. 10–14
4b (2b) Mostly various shades of brown, sometimes greenish-brown, ranging from small colonial organisms to large *thalli* ..... **Phylum Phaeophyta** (brown algae) pp. 1–9

Key to the major groups of marine invertebrates at Ricketts Point

The key is made up of couplets (or, in some cases, triplets), which are mutually exclusive. If you work though the key, you should be able to identify the organism to phylum level or below; from there you can look at the species descriptions in the relevant section of the book to further identify the organism. The number in parentheses shows the source couplet from which each step in the key is derived.

Glossary terms are shown in italics.

1a *Colonial* habit **2**
1b Solitary habit **4**
2a (1a) Colony with numerous pores, *radially symmetrical* or irregular with one or more large openings; no mouth ..... **Phylum Porifera** (sponges) pp. 23–29
2b (1a) Colony with discrete *zooids*, each defined by a thin *calcareous* wall and one major opening ..... **Phylum Bryozoa** (bryozoans) pp. 86–87

2c (1a) Colony with numerous *polyps*, each with tentacles surrounding a mouth; walls *calcareous* or soft **3**

3a (2c) *Polyps* typically small (<1 cm in diameter), often branching; gastrovascular cavity not divided by vertical walls ..... **Class Hydrozoa** (hydroids) p. 33

3b (2c) *Polyps* typically large (>1 cm in diameter); gastrovascular cavity divided by vertical walls ..... **Class Anthozoa** (sea anemones, zoanthids and corals) pp. 33–38

3c (2c) Body a gelatinous *medusa* ..... **Class Scyphozoa** (jellies) pp. 38–39

4a (1b) Body with *radial symmetry* **5**

4b (1b) Body with *bilateral symmetry* **7**

5a (4a) Body with a rigid *exoskeleton* and spines; body globose or flattened ..... **Class Echinoidea** (urchins) p. 94

5b (4a) Body sac-like with tube feet and leathery skin ..... **Class Holothuroidea** (sea cucumbers) pp. 95–97

5c (4a) Body with arms; oral surface *ventral* **6**

6a (5c) Arms not distinct from central disc ..... **Class Asteroidea** (seastars) pp. 87–93

6b (5c) Arms distinct from central disc ..... **Class Ophiuroidea** (brittle stars) p. 93

7a (4b) No lateral gills in *pharynx*; no internal skeleton (either cartilage or bone) **8**

7b (4b) Lateral gills present in *pharynx* ..... **Class Ascidiacea** (sea squirts) pp. 114–115

8a (7a) Body worm-like **9**

8b (7a) Body not worm-like **11**

9a (8a) Body segmented; many short stiff hairs present; no jointed appendages ..... **Class Polychaeta** (tube worms) pp. 31–32

9b (8a) Body not segmented **10**

10a (9b) Body cylindrical, *proboscis* present ..... **Phylum Sipuncula** (peanut worms) p. 32

10b (9b) Body normally flattened, no *proboscis* ..... **Phylum Platyhelminthes** (flatworms) pp. 29–30

11a (8b) Body with rigid *exoskeleton*; segmented; appendages jointed **12**

11b (8b) Body soft and unsegmented **13**

12a (11a) Paired legs visible; mobile ..... **Class Malacostraca** (crabs, shrimps, isopods and amphipods) pp. 97–110

12b (11a) *Sessile*; legs only visible when feeding; enclosed in a *calcareous*, multi-plated shell ..... **Subclass Cirripedia** (barnacles) pp. 110–113

13a (11b) Shell absent **14**

13b (11b) Shell present **15**

14a (13a) Head large and well-developed with two large eyes; eight to ten *prehensile* arms with suckers ..... **Class Cephalopoda** (octopus and squid) pp. 83–85

14b (13a) Head indistinct; one or two pairs of tentacles; often brightly coloured ..... **Subclass Opisthobranchia** (sea slugs) pp. 66–72

15a (13b) Shell comprising a single piece (excluding *operculum*) ..... **Class Gastropoda** (snails) pp. 45–65

15b (13b) Shell comprising more than one piece **16**

16a (15b) Shell of two, generally sub-equal plates ..... **Class Bivalvia** (bivalves) pp. 72–83

16b (15b) Shell of eight plates ..... **Class Polyplacophora** (chitons) pp. 40–45

Glossary

ambulacral groove: a groove on the underside of seastars that extends from the mouth to the end of each ray or arm

aperture: an opening in a shell; (e.g. in gastropods, the opening through which the foot protrudes)

apex: the tip, or pointed end, of a shell

axial: a theoretical line oriented subparallel to the axis, i.e. axial ribs of gastropods are elongated, in the orientation of the axis

bilateral symmetry: the arrangement of parts in an organism such that it produces similar halves when split along only one given plane (e.g. a flatworm)

calcareous: composed of calcium carbonate; in this context, it refers to the composition of the shells of invertebrates

callus: a calcareous secretion that forms near the aperture in many gastropods

carapace: the hard exoskeleton or shell in crabs and shrimps

cerata: tubular extensions on the bodies of sea slugs

chitin, chitinous: a hard, protein-like material that forms the external skeleton of many invertebrates

colonial: describing a group of organisms of the same species that live close together and reproduce asexually

crenulated: having a scalloped or toothed margin (e.g. of a shell)

cyanobacteria: a group of bacteria that obtain their energy through photosynthesis

epiphyte: a non-parasitic plant (or alga) that grows on another plant

exoskeleton: the external skeleton, including the carapace and leg coverings of crustaceans; the exoskeleton is generally comprised of chitin

filamentous: a thin, chain-like series of cells that together form a long thread

heterodont: a bivalve in which the teeth (along the hinge) are of at least two distinct shapes

macrophytes: aquatic plants visible to the naked eye

mantle: in molluscs, a sheet of tissue that encloses the body mass and which may protrude in the form of flaps (e.g. in squids)

membranous: algae which form as thin, translucent membrane-like fronds e.g. *Ulva*

nodose, nodular, nodulose: possessing numerous small nodes or projections

operculum: a lid over an opening in a shell; in gastropod shells the operculum comprises a single plate; in barnacles the operculum is made up of four articulating plates

orifice: an opening, e.g. where the opercula of a barnacle are situated.

papillae: small, nipple-like projections on a surface

periostracum: a thin, yellow to brown layer of organic material that covers the shells of many invertebrates

pharynx: post oral cavity

pleural: refers to the cavity that surrounds the lungs in an animal

polyp: a single individual of a colonial animal (e.g. coral)

prehensile: describes an organ that has been adapted for grasping (e.g. claws in crabs)

radula: a tongue-like feeding apparatus in molluscs, covered in minute teeth

ramuli: small branches or extensions along algal fronds

reticulated: having a net-like pattern (e.g. on many gastropod shells)

rhinophores: chemosensory organs that form club-like extensions from the head of sea slugs

sessile: fixed to a surface; immobile (e.g. adult barnacles)

siphonal canal: a tubular extension of the mantle of gastropods, which is used to seek food

spongin: a modified fibrous protein found in sponges

stipe: a basal stalk joins the thallus to the holdfast in brown algae

stolon: a horizontal connecting stem e.g. a branch of an alga which produces offshoots at the nodes

striations: fine ridges or grooves on shells, often produced by growth bursts

suture: a joint between two parts of an organism's skeleton

radial symmetry: describes the structure of an organism that can be rotated around a central point and retain the same appearance from all angles (e.g. a coral polyp)

test: a shell-like structure (e.g enclosing the body of urchins)

thallus, thalli: the undifferentiated shoot in algae, representing its primary body part

umbo: the apex of the bivalve found behind the hinge.

vascular: plants with conducting tissue (xylem and phloem) and associated supporting fibres

whorl: a single revolution in a spiral (e.g. in gastropod shells)

zooid: a single organism that is part of a colony (e.g. bryozoans)

Further reading

Web resources

AlgaeBase, <www.algaebase.org>
Guiry, M.D. and G.M. Guiry. 2012. National University of Ireland, Galway.

Life on Australian Seashores, <www.mesa.edu.au/friends/seashores>
Davey, K. 2000.

Taxonomic Toolkit for Marine Life of Port Phillip Bay, <portphillipmarinelife.net.au>
Museum Victoria, 2012.

The Sea Slug Forum, <www.seaslugforum.net>
Australian Museum, 1998–2010.

World Register of Marine Species, <www.marinespecies.org>
Appeltans, W., Bouchet, P., Boxshall, G.A., De Broyer, C., de Voogd, N.J., Gordon, D.P., Hoeksema, B.W., Horton, T., Kennedy, M., Mees, J., Poore, G.C.B., Read, G., Stöhr, S., Walter, T.C. and M.J. Costello (Eds). 2012.

Field guides

Bennett, I. 1992. *Australian Seashores* [adapted from W.J. Dakin's Australian seashores]. Collins/Angus & Robertson, Sydney.

Coleman, N. 1977. *A Field Guide to Australian Marine Life*. Rigby, Sydney.

Dakin, W.J. 1987. *Australian Seashores*. Angus & Robertson, Sydney.

Edgar, G.J. 1997. *Australian Marine Life: The Plants and Animals of Temperate Waters*. Reed Books, Kew, Australia.

Edgar, G.J. 2008. *Australian Marine Life: The Plants and Animals of Temperate Waters*, 2nd edition. New Holland, Sydney, Australia.

Friends of the Barwon Bluff. 2009. *Life on the Edge: A Guide to the Animals and Plants of the Barwon Bluff Marine Sanctuary*. Parks Victoria, Australia.

Fuhrer, B.A., Christianson, I.G., Clayton, M.N. and B.M. Allender. 1981. *Seaweeds of Australia*. Reed, Sydney.

Gowlett-Holmes, K. 2008. *A Field Guide to the Marine Invertebrates of South Australia*. Notomares, Australia.

Healy, A. and J. Yaldwyn. 1970. *Australian Crustaceans in Colour*. Reed, Sydney.

Jones, D.S. and G.J. Morgan. 2002. *A Field Guide to Crustaceans of Australian Waters*, 2nd edition. Reed New Holland, Sydney.

Morton, J. and J. Miller. 1968. *The New Zealand Sea Shore*. Collins, Auckland, New Zealand.

Phillips, D.A.B., Handreck, C.P., Bock, P.E., Burn, R., Smith, B.J. and D.A. Staples (Eds). 2006. *Coastal Invertebrates of Victoria: An Atlas of Selected Species*, revised edition. Field Naturalists Club of Victoria, Melbourne.

Wescott, G.C., Synott, R.N. and H.K. Powell. 1980. *Life on the Rocky Shores of South-Eastern Australia*. Victorian National Parks Association, Melbourne.

Whiteway, B. 1985. *Marine Life of the Coastal Fringe*. City of Sandringham, Melbourne.

Other scientific literature

Addison, P.E., Koss, R. and T. O'Hara. 2008. Recreational use of a rocky intertidal reef in Victoria: implications for ecological research and management. *Australasian Journal of Environmental Management* 15: 169–179.

Buckeridge, J.S. 1983. The fossil barnacles (Cirripedia: Thoracica) of New Zealand and Australia. *New Zealand Geological Survey Paleontological Bulletin* 50: 1–151 + 14pls.

Gordon, D.P. (Ed.) 2009. *The New Zealand Inventory of Biodiversity*. Volume 1. Kingdom Animalia: Radiata, Lophotrochozoa, Deuterostomia. Canterbury University Press, Christchurch, New Zealand.

Gordon, D.P. (Ed.). 2010. *The New Zealand Inventory of Biodiversity*. Volume 2. Kingdom Animalia: Chaetognatha, Ecdysozoa, Ichnofossils. University of Canterbury Press, Christchurch, New Zealand.

Huisman, J.M., Abbott, I.A. and C.M. Smith. 2007. *Hawaiian Reef Plants*. University of Hawai'i Sea Grant College Program, Honolulu.

Morton, J. 2004. *Seashore Ecology of New Zealand and the Pacific*. Bateman, New Zealand.

Newman, W.A. and A. Ross. 1976. Revision of the balanomorph barnacles; including a catalog of the species. *San Diego Society of Natural History Memoir* 9: 1–108.

Wilson, R.S., Hutchings, PA. and C.J. Glasby. 2003. *Polychaete: an Interactive Identification Guide* (booklet and CD). Museum Victoria, Melbourne.

Wilson, R.S., Norman, M. and A. Syme. 2007. *An Introduction to Marine Life*. Museum Victoria, Melbourne.

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