

The marine hydroids of south-eastern Australia (Cnidaria: Hydrozoa)

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Abstract The marine hydroids (Cnidaria: Hydrozoa) of south-eastern Australia are reviewed and commonly-encountered species are described and illustrated. A brief introduction to hydroid morphology, ecology and study methods is also provided, along with an account of early investigations into hydroids and a brief history of Australian hydroid studies.

Keywords hydrozoans, cnidarians, pictorial guide



Figure 1. *Gymnangium aureum* (Watson, 1973). Lonsdale Wall, Port Phillip Heads. Photograph: J.E. Watson.

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Introduction

What are hydroids?

Hydroids (Class Hydrozoa, Phylum Cnidaria) are small to medium-sized sessile polyps which live on algae, rocks, piers and a great variety of other substrates. They are frequently branching or feather-like colonies but many are less conspicuous single polyps or encrusting forms.

Despite the fact that hydroids are nearly ubiquitous inhabitants on such substrates, especially in shallow water marine environments, the only recent attempts to provide an overview and summary of hydroid diversity of the region (south-eastern Australia) are a checklist by Watson (1994b) and guide to 50 or so larger shallow water species (Watson, 1982). Since those publications many new hydroid species have been described for the region and the classification of the Class Hydrozoa has undergone significant revision Schuchert (2023). Therefore, this publication has two aims: to provide an updated checklist of all species known from the region; and to facilitate identification by providing descriptions and images for as many species as possible. The currently accepted name and arrangement is provided for each species following Schuchert (2023). However, some taxonomic ranks seem unstable and are omitted here (the full taxonomic hierarchy can be found at Schuchert (2023)).

The Phylum Cnidaria is a large and diverse invertebrate group encompassing an enormous range of marine organisms including the well-known corals and anemones. The name is derived from the Greek word *cnidos* (stinging cell) because all cnidarian animals have a simple sac-like body surrounded by tentacles in which are embedded cells (nematocysts or cnidocysts) with barbed stinging threads.

Hydroids belong to the Cnidaria and the Class Hydrozoa (hydro=water, zoa=animal). They are predominantly marine, with only a few species such as *Hydra viridis* and *Cordylophora caspia* occurring in fresh or brackish water. While the name Hydrozoa is the scientifically correct one for the group, the colloquial term 'hydroid' is most often used by biologists when discussing these colonial hydrozoans.

Hydroids occur world-wide, there being about 4,000 known species ranging in depth distribution from intertidal rock pools to the abyssal zone and all latitudes. While moderately common in tropical waters, their diversity and abundance is greater in cooler, higher latitudes. The hydroid fauna of southern Australia is one of the richest in the world with more than 400 known species, with more new species constantly being discovered.

Hydroids in the fossil record

Hydrozoans are poor subjects for fossilisation as their bodies are composed of soft tissue and the slightly firmer structures if present, usually fragment and decay after death. The history of hydroids almost certainly goes much further back to the Ediacaran fauna (630-540 million years old) of the Flinders Ranges of South Australia where primitive, cnidarian species have been found. Some of the oldest recognizable hydroid fossils occur in rocks of Lower Cambrian age (over 500 million years old) at Heathcote and Lancefield, 60 km north of Melbourne. Some of the Heathcote fossils are almost indistinguishable from present day hydroids indicating the morphology of hydroids is highly conserved.

Early Studies of Hydroids

Not long after the invention of the microscope the first textbook on marine biology was published by John Ellis, a founder of marine biology (Ellis, 1755) - *Essay Towards a Natural History of the Corallines and Other Productions of the Like Kind, Commonly Found on the Coasts of Great Britain and Ireland*. His book includes descriptions and remarkably accurate hand-coloured illustrations of hydroids, algae and bryozoans of the English shoreline. Because of their plant-like appearance hydroids were long thought to be marine plants and when their animal nature was finally realized they were renamed 'zoophytes' (animal-plants), the name lingering into the late nineteenth century.

It was not until the early twentieth century that zoologists realised that many small jellyfish found in the marine plankton were a phase in the life-cycle of hydroids. Unfortunately by then two separate disciplines of study had emerged - one of the fixed, colonial hydroids and the other dealing with free-swimming jellyfish (medusae). Each discipline had its own experts and nomenclature and consequently, the two phases in the life-cycle of the many hydroids were long thought to be of entirely different organisms. Even today unless a colony is observed liberating medusae in aquarium studies the full life cycle of many hydroids is still poorly known or even unknown.



Figure 2. Frontispiece from *Essay Towards a Natural History of the Corallines ...* (Ellis, 1755).

Australian Hydroid Studies

Sir Joseph Banks may have collected Australian hydroids during the 1770 voyage of Captain Cook to the South Seas, but there are no positive records. The first undoubted records were those of a French expedition led by Nicholas Baudin which dredged hydroids off the coast of Australia in 1802. This collection is still in the Natural History Museum in Paris, some of the specimens bearing quaint locality names such as 'mers d'Australie' and 'southern seas'.

Interest in Australian hydroids gradually increased during the mid-nineteenth century when George Busk, an English clergyman published in 1852 a study of a collection of hydroids made by Thomas Huxley on board HMS Rattlesnake when charting Port Phillip and areas around Tasmania and Torres Strait. Then another English clergyman, Thomas Hincks described in 1861 more southern Australian hydroids. Other Europeans, including Gustav Kirchenpauer, George Allman and Robert von Lendenfeld (the latter travelling to the Antipodes to collect specimens) in the 1880s described more Australian hydroids. Some of these early descriptions were accurate and have stood the test of time but sadly, others are so poor as to even now give taxonomists headaches!

In the late 1800s new and exciting material was being dredged from Port Phillip. This first systematic biological survey of southern Port Phillip was carried out by John Bracebridge Wilson, Principal of Geelong Grammar School in Victoria under the auspices of the Royal Society of Victoria. Specimens of many fascinating and unknown invertebrates were sent all over the world for expert identification. Luckily, William Mountier Bale, a local microscopist, and Collector of Customs in Victoria became interested in the magnificent hydroid collection recovered by the survey. His meticulous collections are kept in Museums Victoria, Melbourne and in the Australian Museum, Sydney and William Bale's outstanding publications still remain a standard reference for the southern Australian hydroid fauna. Other researchers who have published on Victorian hydroids include: Spencer (1891), Bartlett (1907), Mulder & Trebilcock (1909, 1914), Hodgson (1950), Blackburn (1937a,b,a), Ralph (1966) and J.E. Watson (publications cited in the Bibliography below).

The Hydroid Colony

Hydroids have a simple body structure consisting of a sac-like stomach (coelenteron) surmounted by a simple mouth (hypostome) which is surrounded by one or more rings (whorls) of tentacles armed with stinging cells (nematocysts or cnidocysts). Food captured by the tentacles is passed to the mouth thence to the stomach where it is digested. Waste products are expelled back into the water via the mouth.

Most hydroid colonies consist of many thousands of individual polyps (hydranths) living together in a soft skeletal framework of chitin. Some species however, consist of only a few hydranths while even fewer are solitary.



Figure 3. A typical hydroid colony: *Aglaophenia whiteleggei*. Photograph: J.E. Watson.

Hydroid colonies assume a great variety of shapes and sizes (habit) - some are tree-like or bushy (arborescent), some straggling (flabellate), others feathery (pinnate or plumose) and some look like small stalked flowers (solitary). The form, size and colour of the colony is characteristic for many species. A large colony may comprise a single main stem (hydrocaulus) or many branched stems. The stems are interconnected at their base by a network of tubular stolons (hydrorhiza) which may form a root-like mass or be a network creeping over rocky, algal or other invertebrate substrates. The hydrorhiza anchors the colony in place and the hollow stolons distribute digested food between the stems of the colony.

Naked (athecate) hydranths of the Class Anthothecata are exposed to the water. They are usually small, about 1 mm or less in diameter but in certain species the hydranths reach several centimetres across the extended tentacles. In the Class Leptothecata (thecate hydroids) the hydranth is usually small and protected by a chitinous cup (hydrotheca) into which it can withdraw when disturbed. Chitin is a tough flexible material similar in composition to human fingernails and hair. All hydranths in a colony are connected by a simple neural network and share an internal canal system (coenosarc) which distributes digested food throughout the colony.

The shape, number and position of the tentacles on the hydranth are important in identification. In athecate hydroids the tentacles may be long and thin (filiform), or club-shaped (capitate) or be a mixture of both. They may be scattered over the body of the hydranth or grow in whorls or in a circlet around the mouth (hypostome). In thecate hydroids the arrangement is simpler, with only a single whorl of filiform tentacles surrounding the mouth.

The Cnidome

The tentacles, hypostome and sometimes the body of the hydranth are armed with a variety of stinging cells collectively referred to as the cnidome. There are 10 major classes of nematocysts and many differing shapes and sizes within the classes.

The nematocyst comprises two or three major parts: a lidded capsule, a thread and depending upon the class, sometimes a shaft. The capsule is a small tough-walled ovoid to banana-shaped container filled with liquid under pressure and embedded in the tentacles or body of the hydranth. Inside the capsule there is a tightly coiled thread and at the top of the capsule a trigger flush with the surface of the tentacle. When the trigger is chemically or mechanically irritated, the lid flies open, ejecting the shaft and uncoiling thread. Shaft and thread are usually armed with spines and bristles which entangle and immobilize predator or prey while the poison is injected. Some specialized nematocysts have short, coiled threads rather like a spring which fend off predators while others have entangling threads many times the length of the capsule. Capsules range from three to twenty micrometres (μm) in length, the shaft (if present) being about the same length as the capsule and the thread usually much longer.

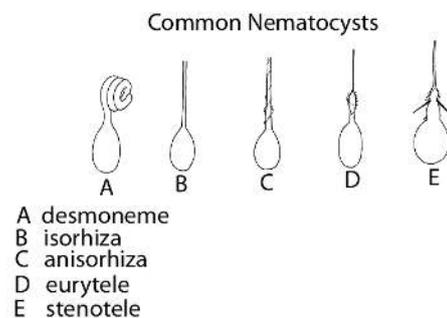


Figure 4. Different kinds of nematocysts found in hydroids. Illustration: J.E. Watson.

In athecate hydroids the shape, size and length of the thread and arrangement and size of spines on the shaft and thread are important diagnostic characters for identification of some species. Some species have only one or two classes of nematocysts in the cnidome while others have more than six. Additionally, there may be various sizes and slightly different shapes of nematocysts within the same class in the one species. Because in thecate hydroids the hydranth can withdraw into the protective hydrotheca the armature of nematocysts is much more limited in range and size than in athecate hydroids.

While detailed examination of the cnidome requires study under high magnification (at least $\times 1000$), in some species the nematocysts are so big that they are visible even at relatively low magnification. For examination, a hydranth is placed on a clean glass microscope slide in a drop of fresh water or in very dilute household bleach, firmly squashed under a glass coverslip and excess fluid blotted away. The nematocyst capsule opens, discharging its contents, thus allowing examination and measurement of capsule, shaft, thread and spines. Examination must be done on a living specimen as preservation in formalin or alcohol locks the capsule and prevents discharge of its contents thus reducing chance of identification.

Reproduction in hydroids

Strategies of reproduction are important in classification and identification of hydroids; there are so many modes of reproduction that it is difficult to describe a typical life-cycle. The classical textbook life-cycle describes a progression from colony to medusa, release of eggs and sperm and fertilization in the water to produce a larva that settles down to grow into a new colony to repeat the life cycle. Unfortunately, the reproductive phase is so complex that this simple pathway holds for a only minority of species. Reproductive strategies range from production of freely swimming medusa or a primitive medusa that cannot swim or eggs and sperm which are shed directly into the water, or even direct development of larvae that simply crawl away from the parent to start a new colony.

Hydroid colonies are usually either male or female but in some species both sexes occur on the same stem or colony. Reproductive cells develop in a soft receptacle (gonophore) which in athecate hydroids, depending upon species, may be borne on the hydranth, on the stems and branches of the colony or on the hydrorhiza. Depending upon the species the reproductive cells in the gonophore develop into eggs, sperm or medusae. In thecate hydroids the gonophore is protected by an outer capsule (gonotheca) composed of chitin. Like athecate hydroids, depending upon species the gonophores contain medusa, sperm or eggs or larvae which are shed to the water. Gonophores of some thecate species contain many developing medusae which are released one by one to swim away in the plankton; in other species the medusae are quite rudimentary and simply fall off the parent to swim away feebly or are borne away on water currents.

Thecate hydroids that produce larvae release these from the gonotheca either at an early developmental stage (planula) or retain them longer, finally emerging as a crawling larva (actinula) which leaves the parent to commence a new colony. In one thecate

family (the Aglaopheniidae) rows of gonophores are encased in gonothecae which are further protected inside a basket-like structure (corbula) armed with nematocysts.

When a larva selects and settles on a suitable substrate it commences growth as a new permanently fixed (sessile) hydroid colony. Growth of the colony is vegetative, new hydranths being added by budding, analogous to growth of plants.

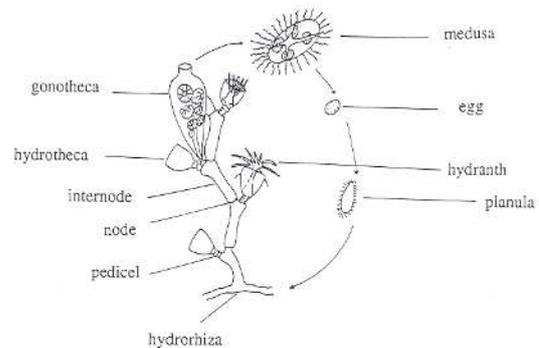


Figure 5. Generalised hydroid reproductive cycle. Illustration: J.E. Watson.

The Medusa

The Medusa is a tiny jellyfish structurally similar to an upside down hydranth. It consists of an umbrella-shaped bell equivalent to the hydranth body, a fringe of tentacles hanging below the bell and a centrally positioned stomach with a dependent mouth (manubrium) inside the top of the bell. Inside the bell are four equally spaced lines (radial canals) radiating from the top of the stomach to the margin of the bell. Medusae are usually colourless and the jelly transparent. All have gonads packed with microscopic eggs or sperm, those of athecate hydroids surrounding the walls of the stomach while in thecate hydroids the gonads are swellings along the radial canals. Gonads are often coloured in shades of gold, brown or red and colour is often useful in identification of species. Medusae are either male or female and when mature eggs and sperm are shed to be fertilized in the water. Fertilized eggs develop into larvae that settle and establish a new hydroid colony. Some medusae are short-lived while others survive for many weeks in the plankton, feeding on smaller planktonic organisms, while shedding fertilized eggs into the water.

Many newly released medusae do not resemble the mature medusa as the shape of the umbrella and manubrium may change and the number, length, shape and sequence of growth of the tentacles around

the lower margin of the bell usually also changes during growth. Nematocysts are often scattered over the outer surface of the bell and these are important in identification of species. Medusae vary in size but at release from the parent colony they are always small, perhaps one millimetre across the bell; some may grow to 5 cm across the bell at maturity. In some species the bell is almost flat, others are saucer-shaped to hemispherical. They swim expertly by alternately expanding the bell to allow water to enter then strongly contracting it to expel the water in a jet. One medusa genus (*Staurocladia*) has abandoned swimming altogether and crawls about on its tentacles.

The number and shape of the tentacles and shape and ornamentation around the manubrium are important in identification. The basic shape is cylindrical, but in many species it is quadrate in section and in others complexly folded or frilled.

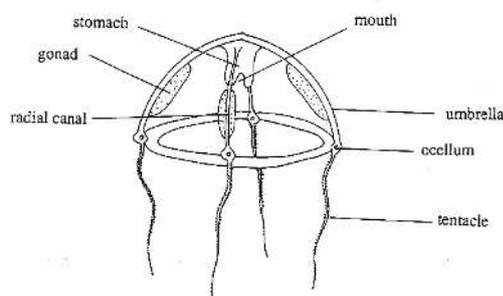


Figure 6. Generalised structure of a hydroid medusa. Illustration: J.E. Watson.

Prey and predation in hydroids

Hydroids and their medusae are micro-carnivores that feed on very small planktonic animals such as copepods and amphipods captured by the tentacles. Some colonial hydroids probably also feed on finely divided organic matter in the water. Colonies are most common in habitats with good current flow where water-borne food is abundant and easily captured. One southern Australian athecate species (*Candelabrum australe*) that lives on the brown kelp *Ecklonia* seems to be a grazer, sweeping its mouth back and forth across the algal frond, sucking up food particles. Another species (not yet found in Australia) lives in bryozoan colonies, extending its long tentacles to steal food from the bryozoan polyps.

Hydroids are preyed upon by small fish, sea spiders (pycnogonids) and sea slugs (nudibranchs). Some pycnogonids lay their eggs in the hydroid gonophores,

and nudibranchs after eating the hydranths lay small twisted egg ribbons around the stems of the colonies. Some nudibranchs ingest nematocysts, storing them undischarged in the cerata on their backs possibly for use in their own defence. Some species of nudibranchs so closely resemble their hydroid prey that it is difficult to distinguish between the two.



Figure 7. The nudibranch *Flabellina* sp. RB2 feeding on hydroids of the genus *Eudendrium*. Portsea Pier, Victoria. Photograph: John Chuk.

To keep ahead of predation many athecate hydroids adopt a strategy of rapid growth and reproduction while others rely on an impressive array of defensive nematocysts. Thecate species on the other hand rely upon the ability of the hydranth to withdraw inside the protective hydrotheca to avoid being eaten.

The ecology of hydroids

Hydroid colonies require a firm substrate for attachment and can be found growing on algae, reef, rubble and man-made structures and sometimes in other invertebrates - in fact any kind of firm substrate that suits the requirements of the larva. Some highly specialized tiny species live in holes in the muddy seabed while others live in the interstices between grains of sand on beaches. Many hydroids settle opportunistically on a variety of substrates, for example, the common southern Australian thecate *Plumularia setaceoides* colonises both algal and invertebrate substrates. Other species such as the small athecate *Zyzyzus spongicolus* colonises some soft sponges, the large athecate *Ralpharia magnifica* lives in an obligatory association on mats of the alcyonacean *Erythropodium hicksoni* and *Lobataria newtoni* grows on sandy bottom on old dead shells of the bivalve mollusc *Katelysia scalarina*.

Many species live only within a certain depth range, some preferring shallow water while others are confined to deeper waters. Such preferences are due partly to the location of suitable habitat as well

as to the availability of food. Depth range of some species is related to photosynthesis of symbiotic algae (zooxanthellae - microscopic plants) that live in the tissue (coenosarc) of the colony where metabolism of the hydroid is supported by conversion of carbon dioxide wastes by the zooxanthellae into useful sugars. The distinctive colour of some hydroids is due to the resident zooxanthellae.

The hydroid life cycle

The life cycle and growth rate of the hydroid colony depends chiefly upon species, the life spans of which may range from a few weeks to many years. Larger thecate colonies, for example some deep water species of *Aglaophenia* in the Great Australian Bight and *Clathrozoon wilsoni* in moderately deep water along the southern coastline may grow to 1 m high. Such colonies are probably decades old but unfortunately we know nothing of their longevity. Colonies of many small species such as the athecate *Eudendrium generale* and thecate *Halecium delicatulum* grow rapidly over days to weeks following larval settlement. Some species are seasonal, growing in winter while others prefer warmer summer water temperatures. Others such as *Gymnangium prolifer* and *Aglaophenia whiteleggei* grow from the same hydrorhizal rootstock over several years, the stems regenerating seasonally, reproducing then dying off to recommence the cycle of growth and reproduction in the next season.

Methods

Scope

The geographic scope of this publication is south-eastern Australia, from approximately Sydney to Adelaide and including Tasmania, the Bass Strait islands and Spencer and St Vincents Gulfs in South Australia. Commonly encountered species within this region are described and, where possible, illustrated. Uncommon and poorly-known species are listed under the relevant taxon but without descriptions. Freshwater hydrozoans, and species known only from the medusa, are not included. For the complete Australian Hydrozoan fauna, consult Bax & Gershwin (2022).

Sources

Full synonymies, type localities and type species for genera and families are not given; these can be found at Schuchert (2023) using the URL at the end of each species treatment. The URLs are persistent: if (when!)

the classification changes, the web page will point to the current accepted name and classification.

Collection, Preservation and Identification

Identification to family or genus requires at least the use of a powerful hand lens and often stereo and compound microscopes are necessary. However, with practice and as familiarity with the local fauna is gained, species can be identified in the field from characteristics of colony habit, structure and colour. For accurate identification a small stem or branch of a colony is taken and sealed underwater in a zip-top plastic bag or jar. Identification is easier if a photograph is also taken of the colony at the time of collection. Preliminary identification to genus or species can be undertaken using this guide. For confirmation the primary literature cited here should be consulted. Most of this literature is available either via the links provided in the bibliography or at the Biodiversity Heritage Library (<https://www.biodiversitylibrary.org/>).

It is important to consult regulations regarding collecting marine life, depending on the activity intended may require a collecting permit. In Australian coastal waters permits are typically managed by the environment or fisheries department of the relevant state government.

Most hydroids do not survive well out of their habitat so it is best to either preserve specimens soon after collection or keep them cool in seawater until they can be examined within a few hours of collection.

For quick microscopic examination a temporary slide preparation of a small fragment of the specimen is placed in a drop of glycerol (commercial grade) on a glass microscope slide and sealed under a glass coverslip. Specimens thus mounted will last up to a week allowing adequate time for examination. Identification is aided by staining the specimen for a minute or so in a dilute solution of Rose Bengal or other water soluble staining medium prior to mounting.

Preliminary field identification of many species can be made by observing colony size, structure and colour, and if present, the corbula. Provisional identification is possible by plucking several hydrocladia from a stem and laying them in a drop of water on a glass microscope slide, compressing them gently under a coverslip and then examining them microscopically. The important structures of the hydrocladium, hydrotheca and nematotheca can then be seen. Often however the dense and strongly coloured internal tissue (coenosarc) obscures diagnostic structures and in this case the coenosarc can be dissolved in a solution of domestic bleach (calcium hypochlorite) diluted in tap water. The specimen is soaked for a few minutes until the darker tissue begins to dissolve, then is

quickly transferred to fresh water for a few minutes to wash out the bleach, leaving cleared perisarc behind. Specimens can then be mounted in a drop of water or glycerol under a coverslip on a microscope slide and examined under suitable magnification. For precise identification examination is best done using a compound light microscope. (The above comments are especially relevant for the family Aglaopheniidae and are repeated below in the Remarks for that family.)

Temporary slide preparations in glycerol will be sufficient for many purposes, but for permanent storage hydroids and medusae are best first preserved for a few days in a 4% formaldehyde solution in seawater then transferred to ethanol diluted to approximately 70% with fresh water (household methylated spirits can be used in place of ethanol). Formaldehyde (known as formalin when dissolved in water) is toxic and carcinogenic and should only be used with suitable protective equipment or in a laboratory

equipped with a fume hood. Use of formalin also precludes DNA extraction from specimens. Since use of DNA sequence data has become routine in taxonomic research it is preferable to preserve samples directly into 95% ethanol, which will allow future DNA extraction. However tissues, especially of medusae, do not preserve well long-term if transferred directly into ethanol so for museum specimens it is ideal to have both formalin- and ethanol-fixed samples from the same specimen. Making permanent microscope slides of hydroids traditionally involved a complicated process requiring xylene (which is highly toxic) and Canada balsam. More modern methods can avoid some of the more toxic chemicals but still require access to a well-equipped laboratory. Summarising these techniques is beyond the scope of this paper but a detailed treatment can be found in (Neuhaus *et al.*, 2017).

Pictorial Guide

Figure 8. Athecate hydroids 1. See page references for species accounts, additional related species and image credits.

(left to right): *Candelabrum australe* (page 19); *Corymorpha rubicineta* (page 20); *Hybocodon cryptus* (page 22).



(left to right): *Lobataria newtoni* (page 22); *Ralpharia magnifica* (page 23); *Ralpharia magnifica* close-up (page 23).



(left to right): *Zyzyzus spongicolus* (page 24); *Eleutheria dichotoma* (page 26); *Staurocladia haswelli* (page 26).

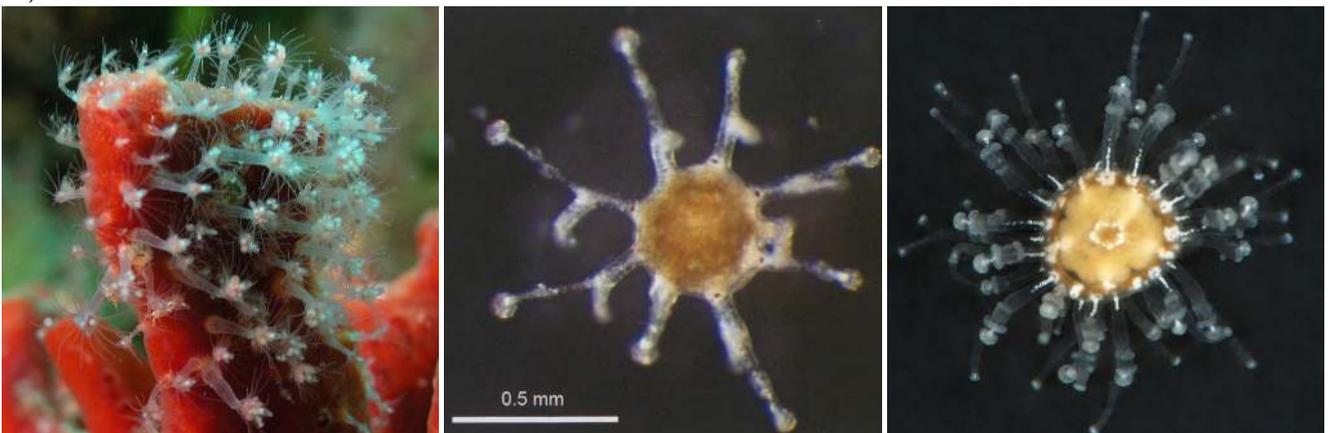


Figure 9. Athecate hydroids 2. See page references for species accounts, additional related species and image credits.

(left to right): *Coryne eximia* (page 27); *Pennaria disticha* (page 29); *Pennaria wilsoni* (page 30).



(left to right): *Solanderia fusca* (page 31); *Bougainvillia muscus* (page 32); *Turritopsis nutricula* (page 45).



(left to right): *Eudendrium balei* (page 35); *Eudendrium generale* (page 37); *Eudendrium pennycuikae* (page 39).

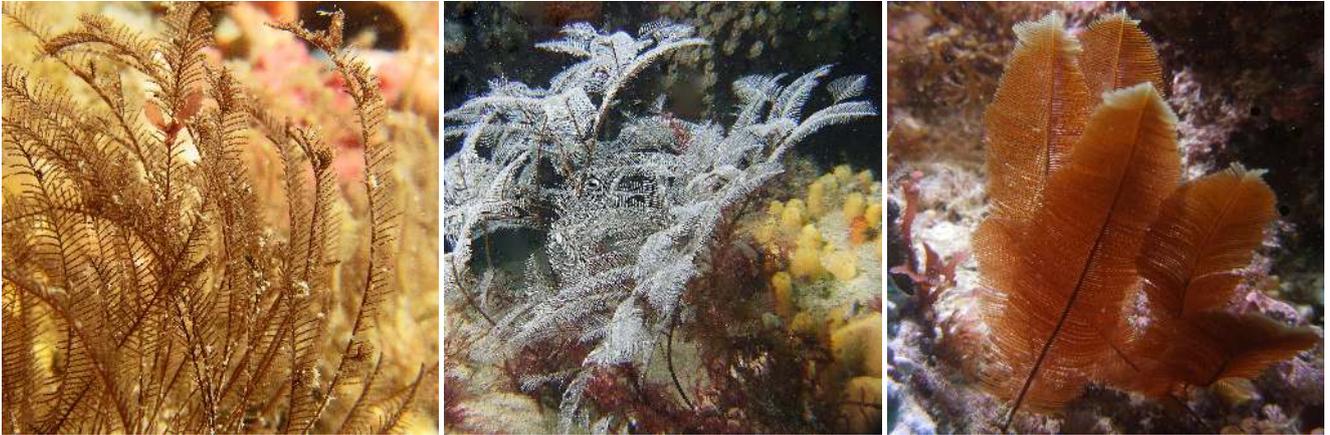


Figure 10. Thecate hydroids - 1. See page references for species accounts, additional related species and image credits.

(left to right): *Aglaophenia cystifera* (page 51); *Aglaophenia divaricata* (page 51); *Aglaophenia parvula* (page 52).



(left to right): *Aglaophenia plumosa* (page 53); *Aglaophenia whiteleggei* (page 54); *Gymnangium ascidioides* (page 55).



(left to right): *Gymnangium aureum* (page 55); *Gymnangium ilicistomum* (page 58); *Gymnangium longirostre* (page 58).



Figure 11. Thecate hydroids - 2. See page references for species accounts, additional related species and image credits.

(left to right): *Gymnangium prolifer* (page 59); *Gymnangium superbum* (page 59); *Obelia dichotoma* (page 63).



(left to right): *Obelia geniculata* (page 64); *Obelia spongicola* (page 64); *Orthopyxis angulata* (page 66).



(left to right): *Orthopyxis caliculata* (page 66); *Clathrozoön wilsoni* colony (page 68); *Clathrozoön wilsoni* detail (page 68).



Figure 12. Thecate hydroids - 3. See page references for species accounts, additional related species and image credits.

(left to right): *Halecium bruniensis* (page 71); *Halecium delicatulum* (page 71); *Antennella secundaria* (page 74).



(left to right): *Halopteris campanula* (page 74); *Halopteris glutinosa* (page 75); *Monostaechas quadridens* (page 75).



(left to right): *Hebella albida* (page 77); *Halicornopsis elegans* (page 78); *Kirchenpaueria bellarensis* (page 79).



Figure 13. Thecate hydroids - 4. See page references for species accounts, additional related species and image credits.

(left to right): *Pycnotheca producta* (page 80); *Hydrodendron australe* (page 84); *Monothecha flexuosa* (page 86).



(left to right): *Plumularia filicaulis* (page 87); *Plumularia procumbens* (page 87); *Plumularia setacea* (laboratory photo) (page 89).



(left to right): *Plumularia setaceoides* (page 90); *Plumularia sulcata* (page 90); *Plumularia wattsi* (page 91).

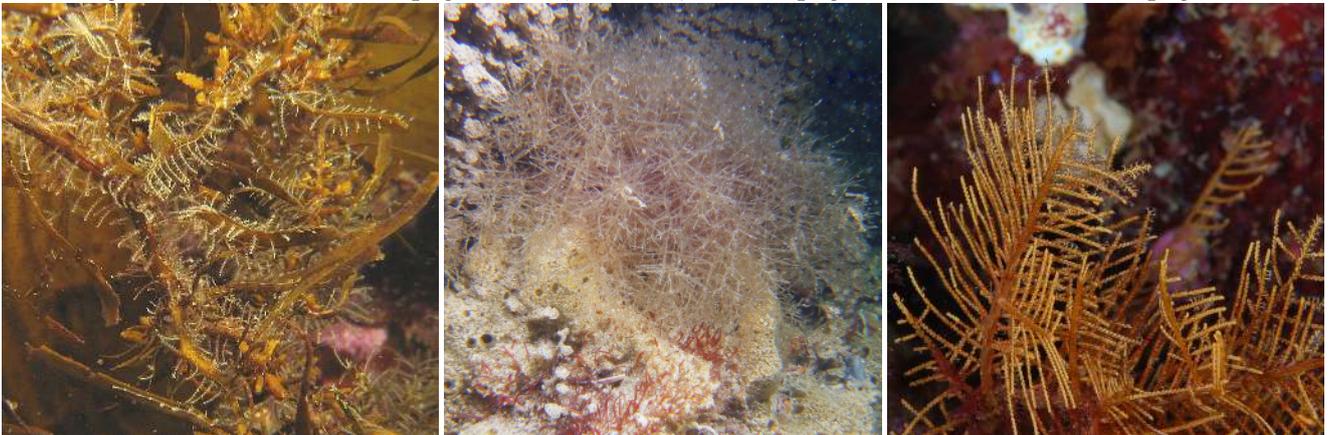


Figure 14. Thecate hydroids - 5. See page references for species accounts, additional related species and image credits.

(left to right): *Sertularella pinnata* (page 92); *Sertularella quasiplana* (page 92); *Amphisbetia maplestonei* (page 94).



(left to right): *Amphisbetia minima* (page 95); *Amphisbetia operculata* (page 95); *Crateritheca crenata* (page 96).



Diphasia subcarinata (page 97).



Figure 15. Thecate hydroids - 6. See page references for species accounts, additional related species and image credits.

(left to right): *Sertularia macrocarpa* (page 97); *Sertularia marginata* (page ??); *Sertularia tenuis* (page 98).



(left to right): *Sertularia unguiculata* (page 99); *Stereotheca elongata* (page 99); *Symplectoscyphus indivisus* (page 101).



(left to right): *Symplectoscyphus rostratus* (page 102); *Symplectoscyphus subdichotomus* (page 103); *Syntheceium patulum* (page 105).



Key to major groups of Hydrozoa from south-eastern Australia

Phylogenetic studies based on DNA data in recent years have confirmed that although many hydroid families are natural (monophyletic) groups, shared morphological features that could define those groupings in most cases have not yet been discovered (Daly *et al.*, 2007; Leclère *et al.*, 2007; Maronna *et al.*, 2016). Thus, constructing identification keys to families is problematic. Therefore, the pictorial overview of hydroid families on pages 10 to 17 is intended as a guide to where in the taxonomic treatment a given species and its relatives may be found, in conjunction with following key to Orders and Suborders:

1. Hydranth naked without a protective cup into which the hydranth can withdraw (**Order Anthoathecata**) 2
Hydranth enclosed in a protective chitinous cup **Order Leptothecata**
2. Lacking medusa stage; most Australian species solitary (except some Tubulariidae) **Suborder Aplanulata**
Life history includes medusa stage; most Australian species form colonies (Capitata & Filifera) 3
3. With tentacles terminating in knobs (sometimes only in juveniles) **Suborder Capitata**
With thread-like (filiform) tentacles **Suborder Filifera**

Order Anthoathecata

In the Anthoathecata the polyp (hydranth) is naked and exposed to the water (athecate = without a theca or covering), and lacks a protective hydrotheca or cup into which the hydranth can withdraw. Tentacles of athecate hydroids may be scattered over the body of the hydranth or disposed in two or three whorls, the upper set surrounding the mouth being known as the orals, and the lower sets, aborals. The Suborders Filifera and Capitata of the Anthoathecata describe the shape of the tentacles: the tentacles of species in the Suborder Filifera being long and thread-like (filiform) while in members of the Suborders Capitata some or all tentacles are short with a club-shaped terminal swelling (capitate).

Gonophores of athecate hydroids may bud off the hydranth, stem or hydrorhiza and their position on the colony is important in determining what family the genus or species belongs to. Eggs of some species are shed into the water from the gonophore or may be fertilised within the gonophore where they develop into larvae. In some species, fully formed free-swimming medusae are released into the water while in others only partially developed medusae are produced, to drift away on tidal currents.

The Order encompasses many hundreds of species with a bewildering array of shapes, sizes, colours and strategies of growth, feeding, defence and reproduction. Many athecate hydroids are small and cryptic so that new discoveries are often only made accidentally when examining other specimens. For example, *Rathkea octopunctata* (page 46), less than a millimetre high lives inside worm tubes in muddy bottom in Port Phillip Bay. Other species are large and solitary while others grow in spreading colonies of many thousands of individual hydranths. About half of the known major athecate families have so far been recorded from southern Australia. This is not because Australian waters have fewer athecate hydroids but rather, reflects local lack of collectors of this group.

For a recent revision of the group including DNA evidence see Collins *et al.* (2005).

Suborder Aplanulata

The Suborder Aplanulata comprises hydroids that lack a planula larva in their development.

Family Candelabridae

Description Hydroid solitary, hydrorhiza a root-like adhesive process, hydranth cap-shaped, tapering to mouth. Tentacles capitate, numerous, scattered over body, gonophores around base of hydranth.

Remarks The Candelabridae includes several species world-wide. A single genus, *Candelabrum* is known from Australia with two species. *Candelabrum australe* is described below; the second species, *Candelabrum harrisoni* (Briggs, 1928) is recorded from a coralline alga (genus *Amphiroa*) in the Abrolhos, Western Australia (Watson, 1997).

Nomenclature <http://www.marinespecies.org/aphia.php?p=taxdetails&id=1595>

Candelabrum australe (Briggs, 1928)



Figure 16. *Candelabrum australe*. Photograph: Ron Greer.

Description Hydranth orange-brown, anchored to the substrate by a cluster of tough hydrorhizal tubes hidden beneath the body. Hydranth large, to 1 cm long cap-like when contracted but can extend to 6 cm long, tapering to the mouth. Body thickly covered with hundreds of short, globular, capitate tentacles. Gonophores borne in a decorative fringe around base of the hydranth, releasing a large crawling larva.

Remarks Recognisable as a cap-like orange hydranth on kelp frond.

Ecology Usually found anchored on fronds of the

common brown kelp *Ecklonia radiata*. The hydranth has been observed grazing at night by sweeping its mouth across the algal frond. Known to spend several years anchored in same place.

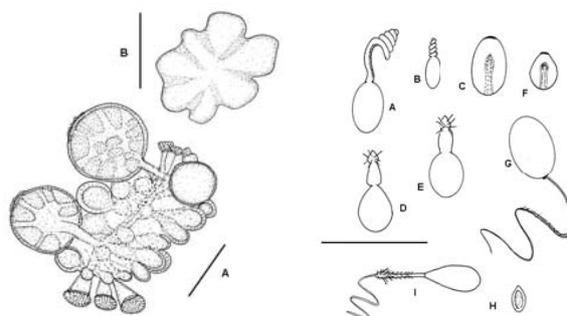


Figure 17. *Candelabrum australe* blastostyle (left) and desmoneme [a kind of nematocyst] (right). From Watson (2007).

Distribution Port Phillip to Sydney, possibly also New Zealand. Widespread but rare in the *Ecklonia* canopy.

References (Briggs, 1928, p. 307) [original description, as *Myriothela australis* Briggs, 1928].–Watson (2007, as *Candelabrum australe*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284430

Family Corymorphidae

Description Hydroid large, solitary, a single hydranth at top of stem. Base of stem without hydrorhiza but with anchoring filaments. Hydranth with one whorl of oral and one whorl of aboral tentacles, gonophores borne above aboral tentacles.

Remarks The Corymorphidae includes one of the largest known hydroids, *Branchiocerianthus*, from abyssal oceanic basins. The family is rare in Australia, there being only two reported species of *Corymorpha*, one doubtful, recorded from Western Australia in 1931 and the other reported in 2008 from Port Phillip.

Nomenclature <http://www.marinespecies.org/aphia.php?p=taxdetails&id=1598>

Corymorpha rubicincta Watson, 2008



Figure 18. *Corymorpha rubicincta*. Point Richards, Port Phillip, 6 m. Photograph: Andrew Newton.

Description Stems solitary, to 4 cm high, cylindrical, rooted in soft sediments by a thick mass of hair-like filaments. At about one third to halfway up the stem a transverse red band divides the stem into a lower region with numerous papillae on the surface and a smooth upper region. Hydranth at top of stem, large, with a whorl of 20-24 long, slender aboral tentacles and a tuft of about 30 shorter oral tentacles around a tall hypostome. Gonophores borne in clusters of up to 20 above aboral tentacles, releasing a primitive medusa (eumedusa) that metamorphoses into a new stem near the parent. Stems yellowish with a red band, hydranth pale flesh-colour, tentacles translucent white, gonophores colourless to white.

Remarks Recognisable from the stem with red band, long tentacles and clusters of gonophores.

Ecology Silty sand at 4-6 m depth in sheltered water. Grows over winter.

Distribution known only from one locality in Port Phillip Bay, Victoria, Australia.

References Watson (2008a).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=403644

Family Tubulariidae

Description Solitary hydroids growing singly or in clusters. Hydranths small to large with a tuft of oral tentacles and a whorl of aboral tentacles. Gonophores borne in clusters above aboral tentacles, developing into primitive medusae (eumedusae) or crawling larva.

Remarks The family includes many species ranging in size from small cryptic forms to large conspicuous hydroids. As most species of the Tubulariidae are delicate in structure there are few early Australian records of from dredging collections. The greater number of species now known are due to careful collection by divers. The cnidome always includes stenotele nematocysts.

Ectopleura crocea (L. Agassiz, 1862)



Figure 19. *Ectopleura crocea* hydranth. Long Island Sound, USA. Specimen from Yale Peabody Museum (YPM IZ 077236), Photograph Eric A. Lazo-Wasem, CC0, via Wikimedia Commons.

Description Colony unbranched hydroids arising from stolon 38 mm. Hydranths up to 38 mm high, vase-shaped with two whorls of filiform tentacles: 18-20 short oral tentacles and 20-23 longer aboral tentacles longer. Stem with brown slightly-wavy perisarc, distally wrinkled thinning to a transparent sheath terminating below hydranth. Perisarc with a few irregular corrugations. Gastroderm of caulus with two longitudinal ridges, expanding distally to form distinct, dilated, spherical neck region. Gonophores spherical, borne in clusters on short stems on unbranched blastostyles just above aboral tentacles. Gonophores without radial canals, female gonophores with lateral processes around opening. (abstracted from Preker & Lawn (2010, p. 112))

Remarks Both Watson (1980) and Preker & Lawn (2010) have been cautious in identifying Australian records of *E. crocea* and related species. In addition

to *Ectopleura crocea*, *Ectopleura exxonina* (Watson, 1978) and *Ectopleura larynx* (Ellis & Solander, 1786) are also recorded from southern Australia, see Watson (1973, 1978) for further details.

Ectopleura crocea and *E. larynx* are distinguished by the distal processes on the older female gonophores (Petersen, 1990).

The northern hemisphere species *Ectopleura dumortierii* (Van Beneden, 1844) was reported from the Derwent River, Tasmania in a survey of exotic marine pests (?), however this would represent the first southern hemisphere record and is not accepted here pending further information. The cnidome apparently differs: *E. crocea* has atrichous isorhizas while Watson (1980) has heterotrichous anisorhizas (Watson, 1980).

Ecology Favours piers and similar shaded habitats in harbours and estuarine conditions (Petersen, 1990).

Distribution Widely reported from Atlantic and Pacific Oceans including Australia and New Zealand but many records require verification (Petersen, 1990).

References Watson (1978, 1980); Preker & Lawn (2010).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117981

Hybocodon cryptus Watson, 1984



Figure 20. *Hybocodon cryptus* hydranth with gonophores, Popes Eye reef, Port Phillip, 4 m. Photograph Andrew Newton.

Description Scattered groups of small, solitary hydroids. Stems thin, to 2 cm high, each with a single terminal hydranth about 0.5 mm in diameter. Hydranth with about 25 long aboral tentacles and a thick tuft of oral tentacles. Medusa buds borne thickly above the aboral tentacles, bell of medusa at release has a long tubular stomach and one tentacle. Body of hydranth pink, tentacles translucent white, gonophores pink to colourless, medusa colourless.

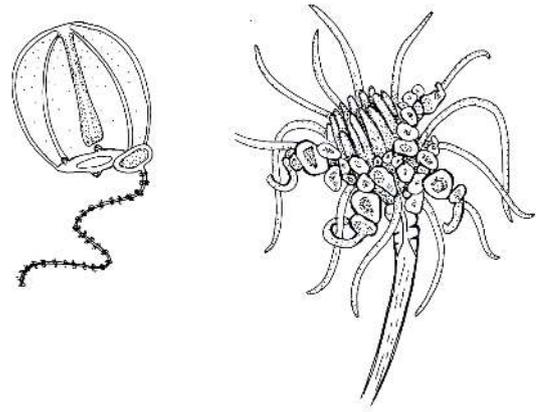


Figure 21. *Hybocodon cryptus* medusa and hydranth. From Watson (1984, figure 2A).

Remarks Small almost transparent colonies; common, but easily overlooked.

Ecology On sponges, worm tubes and other invertebrates in good water flow. Often on sandy surface of rocks. Colonies present and fertile late autumn to winter.

Distribution Sheltered reef in southern Port Phillip; probably more widespread along the southern coastline.

References Watson (1984).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285972

Lobataria newtoni Watson, 2008

Description Stems solitary, slender, to 4 cm high, growing from a simple hydrorhizal tube attached to old bivalve shell buried in sand. Hydranth up to 2 cm across the extended tentacles, about 24 short oral tentacles in a tight tuft and a single whorl of 28-34 aboral tentacles. Gonophores borne in trailing clusters of 30-50 between aboral tentacles. Mature gonophore with four transparent lobe-shaped flanges extending halfway down body, female containing a single larva that crawls away to commence a new hydroid. Stems usually pale brown, tentacles translucent white, female gonophore orange to rose red, male gonophore sometimes bluish black.



Figure 22. *Lobataria newtoni* Blairgowrie, Port Phillip Bay, 2 m. Photograph: Andrew Newton.



Figure 23. *Lobataria newtoni* Blairgowrie, Port Phillip Bay, 2 m. Photograph: Andrew Newton.

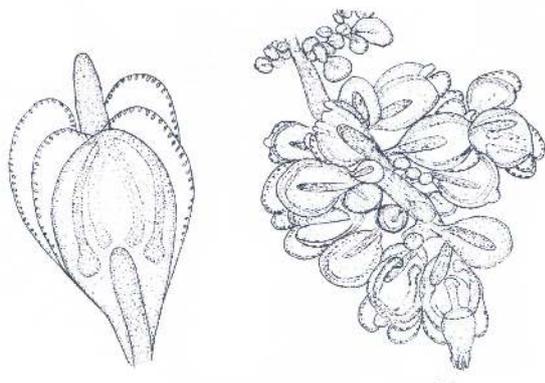


Figure 24. *Lobataria newtoni* medusa and hydranth. From Watson (2008b).

Remarks solitary stems attached to old bivalve shells; brightly coloured gonophores.

Ecology On old bivalve shells (eg *Katelysia scalarina*) on sandy bottom in shallow sheltered waters 1-3 m deep. Colonies present spring to autumn. Only appears in the spring and often with an undescribed species

of aeolid nudibranch in association (R. Burn pers. comm.).

Distribution Several localities in Port Phillip, probably more widely spread.

References Watson (2008b).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=403652

Ralpharia magnifica Watson, 1980

Description Colonies of up to 50 solitary tubular stems to 10 cm high. Hydrorhizal tubes embedded in a sheet-like alcyonacean (soft coral) host. Hydranths to 4 cm across extended about 40 aboral tentacles with about 150 oral tentacles. Gonophores blocky in shape with four terminal knobs, borne thickly above aboral tentacles. Gonophore at release a primitive medusa (eumedusa) unable to swim, borne away on water currents to form a new colony. Colour: body of hydranth and gonophores rose red, tentacles white, stems greenish to brown.

Remarks Graceful hydranths of pink colour; one of Australia's largest hydroids, often photographed by divers.

A second species in the same genus, *Ralpharia coccinea* Watson, 1984, occurs on the same species of alcyonacean, the two *Ralpharia* species often growing across each other. *Ralpharia magnifica* grows in sparse colonies of up to 20 stems while *R. coccinea* may form colonies of up to 200 hydranths growing close to the alcyonacean surface. The growth and reproductive seasons of the two species overlap only slightly: *R. magnifica* is a summer hydroid, reproducing at maximum water temperature, whereas *R. coccinea* grows and reproduces late winter to spring.

(A third species, *Ralpharia rosetta* Watson 2000 www.marinespecies.org/aphia.php?p=taxdetails&id=290955, is known from Darwin, Northern Territory.)

Ecology Hydrorhiza embedded in purplish sheets of the shallow water alcyonacean *Erythropodium hicksoni* growing on rocks. Colonies regenerate annually in warmer months from the hydrorhiza permanently embedded in the alcyonacean.

Distribution common in Port Phillip, Western Port and in sheltered ocean and bays across southern Australia. Also Recherche, WA.

References Watson (1980, 1984, 2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=290952



Figure 25. *Ralpharia magnifica*. Photograph: Andrew Newton.



Figure 26. *Ralpharia magnifica* Bicheno, Tasmania. Photograph: Andrew Newton.

***Zyzyzus spongicolus* (von Lendenfeld, 1885)**

Description Hydroids small, solitary, to 6 mm high, each rooted by finger-like stolons penetrating the pores of soft sponges. Hydranth stubby with 10-12 short oral tentacles and 12-16 aboral tentacles. Gonophores ovoid, borne above the aboral tentacles, liberating two or three larvae at maturity. Larvae crawl away into adjacent pores of the sponge to grow into new hydranths. This is a solitary hydroid, with no hydrorhizal connection between the hydranths. Hydranths white, gonophores rose pink to red.

Remarks Recognition: small brightly coloured hydranths on sponge.

Ecology On soft-textured sponges. Abundant in winter.

Distribution Common in ocean and sheltered bays across southern Australia.

References Watson (1978) [*Zyzyzus spongicolus* re-description].

Nomenclature <http://www.marinespecies.org/>

aphia.php?p=taxdetails&id=291317



Figure 27. *Zyzyzus spongicolus* Popes Eye reef, Port Phillip Bay, 6 m. Photograph: Andrew Newton.

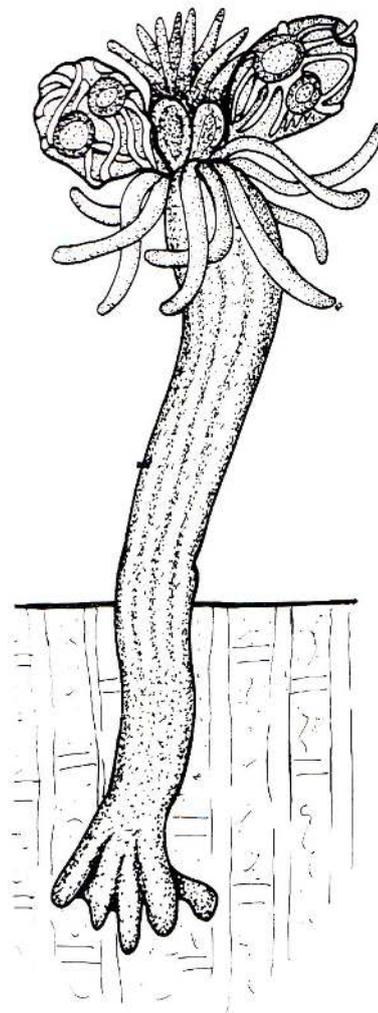


Figure 28. *Zyzyzus spongicolus* hydranth in sponge. From Watson (1978).

Suborder Capitata

Members of this suborder are characterised by the tentacles of the polyps terminating in knobs. In some species these are only present in juvenile forms being replaced in adults by more threadlike tentacles. A high nematocyst concentration is present in the knobs. A few hydroids in this group are better known as their solitary medusa form than as their polyp form. These include species in the genera *Sarsia*, *Polyorchis* and *Cladonema*.

Nomenclature <http://www.marinespecies.org/aphia.php?p=taxdetails&id=16351>

Family Cladocorynidae

Description Single hydranths borne on a stem from a creeping hydrorhiza. Hydranth with a whorl of capitate oral tentacles and a whorl of branched capitate aboral tentacles. Gonophores borne on hydranth amongst tentacles.

Remarks There is only one genus in the family, *Cladocoryne*, with three species known from Australia. *Cladocoryne floccosa* and *Cladocoryne minuta* occur in southern Australia; both are small and well hidden amongst other invertebrates. A third species, *Cladocoryne haddoni*, occurs in northern Australia and is not treated below.

Nomenclature <http://www.marinespecies.org/aphia.php?p=taxdetails&id=22778>

Cladocoryne floccosa Rotch, 1871

Description Hydranths small, to 12 mm high, borne at intervals along a creeping tubular hydrorhiza. Hydranth body cylindrical with dome-shaped hypostome and short branched aboral tentacles and short capitate oral tentacles. Gonophore globular on a short stem on hydranth body among aboral tentacles. Colour: white.

Remarks Recognition: small white hydranths with branched tentacles.

Ecology Usually on other hydroids. Seasonality unknown.

Distribution Southern Australia, generally rare.

References Watson (2000).

Nomenclature <http://www.marinespecies.org/aphia.php?p=taxdetails&id=117424>

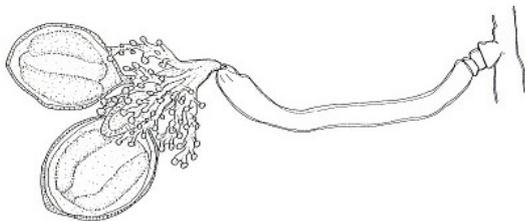


Figure 29. *Cladocoryne floccosa* hydranth. From Watson (2000).

Cladocoryne minuta Watson, 2005

Description Hydranths very small, less than 1 mm long, arising at intervals from an unbranched tubular

hydrorhiza. Hydranth body cylindrical with dome-shaped hypostome surrounded by four to six rather short branched aboral tentacles in two whorls, each tentacle with three or four opposite pairs of short capitate side branches, a terminal capitalum on branch; four short capitate oral tentacles. Gonophore a globular fixed sporosac, one on hydranth on a short pedicel among basal aboral tentacles.

Remarks *Cladocoryne minuta* is similar to *C. floccosa* but much smaller. Both species have the same number of oral tentacles but they have fewer branches in *C. minuta*. The two species also differ in the composition of their nematocysts, as described in Watson (2005).

Ecology *Cladocoryne minuta* occurs at depths of 17-20 m. The known hosts are species of hydroid in the genus *Gymnangium*.

Distribution Recherche Archipelago, Western Australia.

References Watson (2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=389567

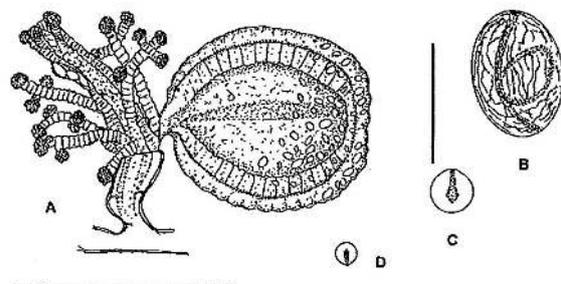


Figure 30. *Cladocoryne minuta* hydranth. From Watson (2005).

Family Cladonematidae

Description Hydranths on stem, hydrorhiza creeping, hydranth with an oral whorl of capitate tentacles and with or without a whorl of short filiform aboral tentacles. Gonophores borne on hydranth releasing free medusa. Marginal tentacles of medusa branched, with adhesive disks.

Remarks The family includes two marine species of crawling medusae recorded from southern Australia; in both the medusa is more common than the seldom seen very small hydroid colony. (A third species, *Cladonema timmsii* Gershwin & Zeidler 2008, occurs in salt lakes in South Australia.)

Nomenclature <http://www.marinespecies.org/aphia.php?p=taxdetails&id=16356>

Eleutheria dichotoma Quatrefages, 1842

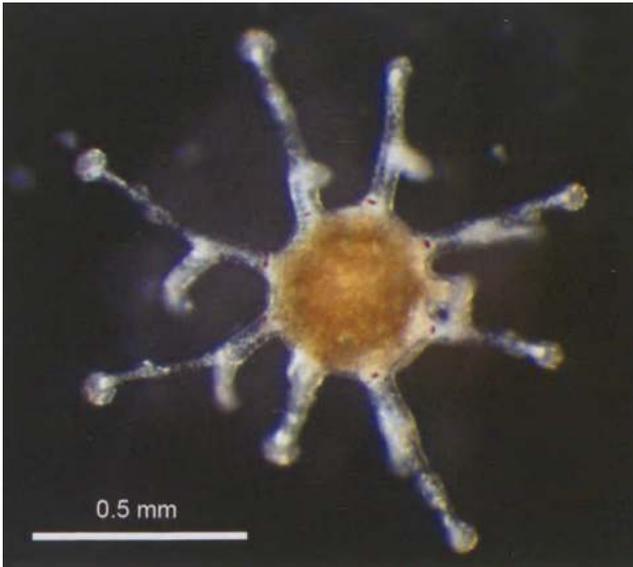


Figure 31. *Eleutheria dichotoma* Queenscliff. Photograph: Richard Emlet. From Emlet & Watson (2015).

Description Hydroid: stolonial, hydranth up to 6 mm high, with very short pedicel, perisarc smooth. Hydranth almost cylindrical, with an oral whorl of four to eight capitate tentacles. Medusa buds borne low on hydranth. Medusa : width 4-5 mm across extended tentacles, umbrella flattened hemispherical, oral surface more or less six-sided with thickened marginal ring packed with nematocysts. Velum broad and almost closed, opening only when feeding. Manubrium broad, filling most of subumbrella cavity, mouth simple. Usually six radial canals, gonads on manubrium. Tentacles usually five to six, bifurcated about middle, upper branch with terminal nematocyst cluster, lower branch terminating in an adhesive pad armed with stenotele and desmoneme nematocysts. An ocellus at base of each tentacle. Secondary medusae budding from bell margin. From Emlet & Watson (2015).

Remarks Most often seen in the crawling medusa stage (the hydroid colony is small and not often seen). This European species has been introduced to Australia, probably in ship ballast water (Fraser *et al.*,

2006).

Ecology Abundant as a crawling medusa in intertidal habitats in south-eastern Australia, especially on the leafy green alga *Enteromorpha australis* (previously known as *Ulva australis*)

Distribution Widespread in European waters and now common in south-eastern Australia.

References Fraser *et al.* (2006); Emlet & Watson (2015)

Nomenclature <http://www.marinespecies.org/aphia.php?p=taxdetails&id=117531>

Staurocladia haswelli (Briggs, 1920)



Figure 32. *Staurocladia haswelli*. Photograph: Leon Altoff.

Description Hydroid small, single stems to 1.5 mm high, mature hydranth with 5-7 capitate tentacles. Medusa buds borne on hydranth and hydrorhiza. Medusa at release small, about 1 mm in diameter with four sets of bifurcated (double) marginal tentacles, each tentacle with groups of nematocysts arranged in pads, the tentacles increasing in number to about 18 over several days. The hydroid and medusa are transparent white to buff colour, eggs yellow.

Remarks The crawling habit of the tiny medusa is unique. The nematocyst pads stick to the substrate when the tentacle contracts, pulling the medusa along in a crawling motion. Smaller medusae bud off the stomach of the parent medusa, the female medusa containing eggs.

Ecology The medusa can be found on many algae including corallines and the green alga *Enteromorpha australis* (previously known as *Ulva australis*), and the seagrass *Amphibolis antarctica*. *Staurocladia haswelli* is abundant in summer in sheltered shallow water in Port Phillip and Western Port.

Distribution Port Phillip to Sydney, probably more widespread in suitable habitat.

References Watson & McInnes (1999).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284627

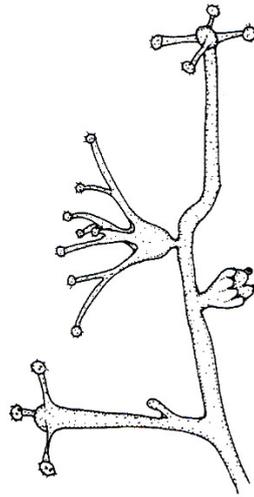


Figure 33. *Staurocladia haswelli*. Colony with hydranths and medusa bud with developing medusae. From Watson & McInnes (1999).

Family Corynidae Johnston, 1836

Description Hydroids stolonial or erect, with firm perisarc, all tentacles capitate, with oral tentacles and one or two whorls of aboral tentacles. Gonophores borne on hydranth among tentacles liberating either eggs or free medusa (depending upon species). Nematocysts are stenoteles.

Remarks Many species of this family are cryptic and hidden amongst mussels and other small invertebrates and are found only with careful examination of material collected from jetties or shallow tide pools. For positive identification specimens must be kept alive for microscopic examination of the cnidome. Australian species previously belonging to *Sarsia* have been reassigned to *Coryne*, and no members of *Sarsia* are now known to occur in Australia.

Nomenclature <http://www.marinespecies.org/aphia.php?p=taxdetails&id=1599>

Coryne eximia Allman, 1859



Figure 34. *Coryne eximia* colony, Popes Eye, Port Phillip Bay. Photograph: J.E. Watson.

Description Colonies short, growing from a simple hydrorhiza. Stems irregularly branched, annulated at base. Hydranth small, tubular, on end of branch, with capitate tentacles scattered over body. Medusa

buds on short stalks borne among the tentacles, releasing free-swimming medusae. Medusa at liberation bell-shaped, about 1 mm high with a cylindrical stomach with a simple circular mouth and four gonads surrounding the stomach. Colour: stems pale brown, hydranth white, pink or orange, tentacles white, gonads of medusa rose red.

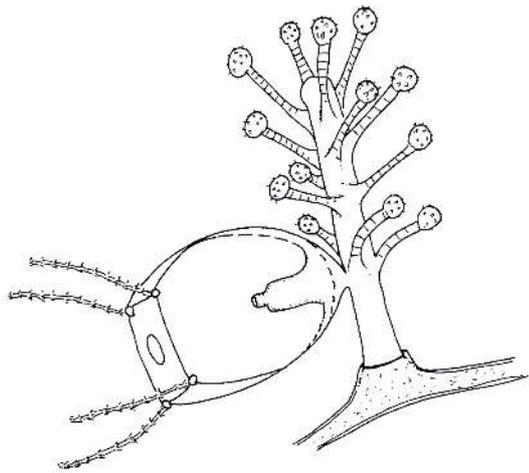


Figure 35. *Coryne eximia* colony. From Watson & McInnes (1999).

Remarks Recognition: small, cryptic colonies, tubular hydranth and capitates tentacles. Previously published under the synonymous names *Sarsia eximia* and *Sarsia radiata*.

Ecology Habitat: sheltered ocean and bays, on algal

holdfasts, on rocks and jetty pilings. Seasonality: colonies grow throughout the year, fertile over summer.

Distribution. World-wide, common in Port Phillip.

References Watson (1978, 1997); Watson & McInnes (1999, as *Sarsia eximia*).

Nomenclature

<http://www.marinespecies.org/aphia.php?p=taxdetails&id=151860>

***Coryne* sp.**



Figure 36. *Coryne* sp. in laboratory. Photograph: J.E. Watson.

Description Hydrorhiza consisting of tubular stolons. Stems straight, unbranched, perisarc thick, deeply

and regularly segmented, top segment bowl-shaped, supporting the hydranth. Hydranth spindle-shaped, to 1.5 mm long, with a whorl of 4-7 capitate oral tentacles and a whorl of 12-16 capitate aboral tentacles. Gonophores globular, borne above aboral tentacles. Colour: perisarc of hydrorhiza and stems honey brown, body of hydranth flesh pink, tentacles translucent white, gonophores rose pink to orange.

Remarks Probably an undescribed species, recog-

nisable by the unusually segmented stems and the capitate tentacles of hydranths.

Ecology Habitat: grows on coralline algae, known only from tide pools on reef platforms. Seasonality: fertile late winter to summer.

Distribution. Bass Strait coast.

References Watson & McInnes (1999).

Nomenclature Undescribed.

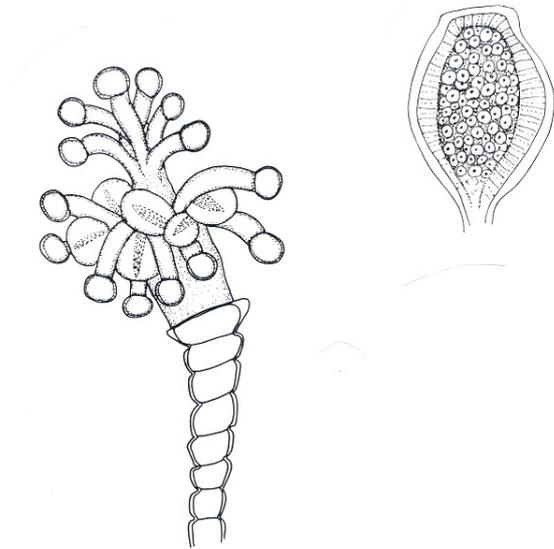


Figure 37. *Coryne* sp. colony. Figure: J.E. Watson.

Family Pennariidae McCrady, 1859

Description Colony branching, hydranths with an aboral whorl of long filiform tentacles and an oral whorl of short capitate tentacles. Gonophore a primitive medusa (eumedusa) borne between aboral and oral tentacles.

Remarks The family Pennariidae contains a single genus, *Pennaria*, and two Australian species. *Pennaria disticha* Goldfuss, 1820 occurs world-wide including tropical and temperate Australia (Watson, 2000) while *Pennaria wilsoni* (Bale, 1913) is only known from cool temperate Victoria and Tasmania.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=22787

Pennaria disticha Goldfuss, 1820

Description Colonies plumose, stems to 6 cm high, hydrorhiza creeping. Hydrocladia (branches) alternate on stem, long, curved, with upright rows of regularly spaced hydrothecae borne on short stalks (pedicels). Hydranth spindle-shaped, upper body with about 16 short, randomly scattered capitate tentacles, base a whorl of about 12 long tentacles with thickened ends (semi-capitate). Gonophores eumedusae, large, ovoid, borne on hydranths above aboral tentacles, with four radial canals and four vestigial tentacles; incapable of swimming. Colour: stems shining dark brown, hy-

dranths pinkish, tentacles white.

Remarks Recognition: neat plumose stems with upright hydranths. Colony structure differs fundamentally from spirally branched *P. wilsoni*. *Pennaria australis* Bale, 1884 is a synonym of *Pennaria disticha*.

Ecology Habitat: shallow water reefs, jetty piles. Seasonality: colonies grow and are fertile throughout year.

Distribution Cosmopolitan in temperate and tropical waters and around Australia; not recorded from Victoria.

References Watson (1996, 2000); Preker & Lawn (2010).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117802



Figure 38. *Pennaria disticha*. Photograph: J.E. Watson.

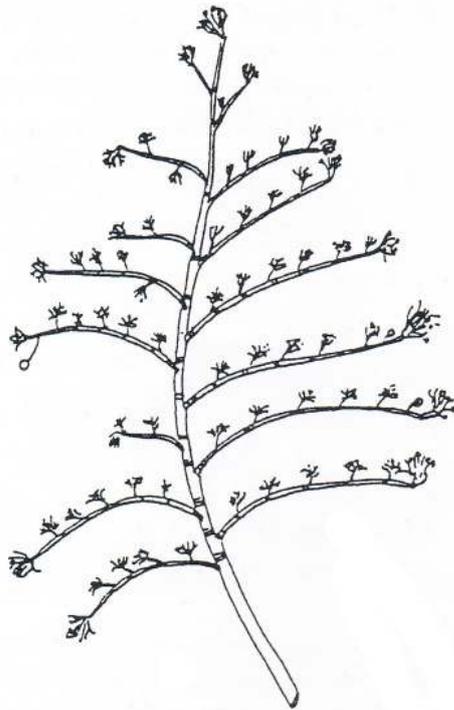


Figure 39. *Pennaria disticha*. From Watson (2000)

***Pennaria wilsoni* (Bale, 1913)**

Description Colonies to 20 cm high, bushy, delicate and lacy, larger colonies comprising many thin stems branching in a loose spiral pattern. Hydranths flask-shaped, borne on short annulated stalks 1-3 mm high on branches, with four or five capitate oral tentacles

around the mouth and 6-10 long aboral tentacles with thickened end (semi-capitate). Gonophores eumedusae, large, ovoid, borne above aboral tentacles on hydranths, with four radial canals and four vestigial tentacles; incapable of swimming. Colour: perisarc of stems and branches shining brown, hydranth body white to rose red, tentacles white, gonophores white, radial canals of eumedusa red.

Remarks Recognition: delicate lacy brown stems, with spiral branching pattern; white and pink hydranths.

Ecology Habitat: sheltered or deeper ocean waters with good current flow. Colonies often covered by small filamentous red algae. Preyed upon by pycnogonids and nudibranchs. Seasonality: colonies prolific, reproducing over winter.

Distribution common in southern Port Phillip, Western Port and southern Victoria generally.

References Watson (2015b).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285159



Figure 40. *Pennaria wilsoni*. Popes Eye, Port Phillip Bay, 6 m. Photograph: J.E. Watson.



Figure 41. *Pennaria wilsoni*. Popes Eye, Port Phillip Bay, 6 m. Photograph: J.E. Watson.

Family Rosalindidae Bouillon, 1985

Description "Colonies with plump, sausage-shaped hydranth with 30-50 scattered capitate tentacles, almost sessile, arising from a crust-like stolonal plate ... medusa buds or fixed gonophores carried singly or on short pedicels among proximal tentacles." (Bouillon & Boero, 2000, p. 155).

Remarks Some authors do not accept Rosalindidae and instead include *Rosalinda* within Zancleidae.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=22789

Rosalinda marlina Watson, 1978

Description Colonies formed from an encrusting mat, either reticulate or continuous, from which arise hydranths about 2 mm long. The club-like or cylindrical hydranths have about 40-45 tentacles which are scattered, not forming an oral whorl. The body of the hydranth is orange-pink, tentacles translucent white. Nematocysts of three kinds are present: numerous large bean shaped mastigophores, stenoteles with round capsule and small nematocysts presumed to be isorhizas. See Watson (1978) for detailed description and additional figures.

Remarks The genus *Rosalinda* contains 4 species; *Rosalinda marlina* is the only one known from the Southern Hemisphere.

Ecology *Rosalinda marlina* is an epizoic, having been found on a barnacle and an ascidian.

Distribution Bass Strait, southe-eastern Australia, 10-33 m.

References Watson (1978).

Nomenclature www.marinespecies.org/aphia.php?

[p=taxdetails&id=285348](http://www.marinespecies.org/aphia.php?p=taxdetails&id=285348)

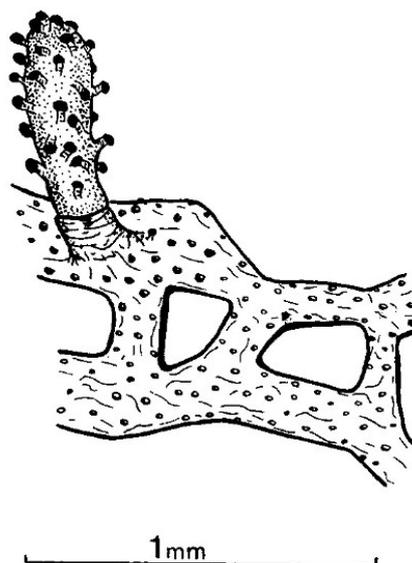


Figure 42. *Rosalinda marlina*: club-shaped hydranth and reticulate hydrorhiza. From Watson (1978, figure 2E).

Family Solanderiidae Marshall, 1892

Description Large branching colonies with a chitinous skeletal meshwork into which hydranths can withdraw. Hydranth cylindrical with scattered capitate tentacles, gonophore a primitive medusa (eumedusa).

Remarks The Solanderiidae is the only athecate hydroid family with an internal skeleton formed from a meshwork of interconnected chitinous tubes. Colonies are among the largest Australian hydroids. Several species occur in tropical Australia but only one is known from southern Australia. (A second species, *Solanderia secunda* was recorded from the Northern Territory by Watson (2000).)

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=266972

Solanderia fusca (Gray, 1868)

Description Colony fan-shaped, to 20 cm high, profusely branched. Main stem thick and woody from intertwined tubes, hydrorhiza a thick plug attached to rock. Numerous small spiky ledges of chitin protruding from the branches support small hydranths. Gonophore a globular eumedusa, borne beside hydranth. Colour: chitin perisarc brown, becoming lighter towards growing tips of colony, hydranths and gonophores white.

Remarks Recognition: large fan-shaped brown

colonies, can be mistaken for a gorgonian. Distinguished from the woody thecate hydroid *Clathrozoön wilsoni* by the flatter, fan-shaped colony with less intricate branching.

Ecology Habitat: ocean reef, grows out from rocky ledges. Seasonality: colonies live for several years, becoming fertile in late summer.

Distribution Southern Port Phillip, southern Australia generally.

References Watson & Utinomi (1971); Watson (1973, 2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?

p=taxdetails&id=288711

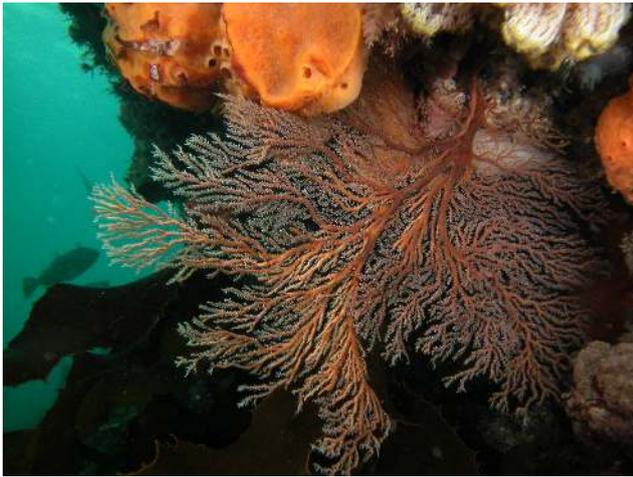


Figure 43. *Solanderia fusca* colony. Photograph: Andrew Newton.



Figure 44. *Solanderia fusca*, hydranths extended. Photograph: J.E. Watson.

Suborder Filifera Kühn, 1913

Family Bougainvilliidae Lütken, 1850

Description Colony stolonial or erect, perisarc extending over base of hydranth. Hydranth with one or more whorls of tentacles and a conical hypostome. Gonophore (depending on species) may develop into a free medusa or produce eggs.

Remarks Contains 15 accepted genera, 2 of which are known to occur in southern Australia.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1594

Bimeria australis Blackburn, 1937

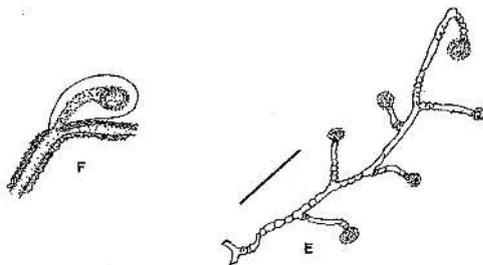


Figure 45. *Bimeria australis*. From Watson (2005, Fig A-6).

Description Stems to 5 mm long, sometimes sparingly branched. Hydranths small on short stalks (pedicels) scattered along stem and branches, conical with several short finger-shaped sheathed tentacles. Colony coated in fine sediment almost to tips of the tentacles. Gonophores globular, borne prolifically on stem and branches, releasing larvae. Colour: greyish white from coating of sediment, gonophores usually rose red.

Remarks Recognition: very small greyish sediment-covered colonies.

Ecology Habitat: abundant on other hydroids or al-

gae in ocean and sheltered environments. Seasonality: colonies grow and become fertile late summer to winter.

Distribution Port Phillip, Western Port; Recherche, WA; probably widespread across southern Australia.

References Watson (1978, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284222

Bougainvillia muscus (Allman, 1863)

Description Colony erect and straggling, to 50 mm high, profusely and irregularly branched. Hydranth small, spindle-shaped with 10-12 filiform tentacles surrounding the hypostome. Perisarc usually coated with fine sediment that continues onto the base of the hydranth. Medusa buds borne on the hydranth and younger branches, medusa at release less than 1 mm high, bell-shaped to hemispherical, gonads on a tubular manubriums; two tentacles at base of each radial canal. Medusa several millimetres across the bell at maturity. Colour: colony greyish white, body of hydranth white to pale pink; medusa transparent white.

Remarks Recognition: dirty white straggling colonies

in sheltered environments. *Bougainvillia muscus* is one of the larger species in the family, and is most often seen by divers. A second provisionally identified species of *Bougainvillia* was reported from the Beagle Gulf, NT by Watson (2000).

Ecology Habitat: on jetty piles and in sheltered water; older colonies often partly overgrown by soft sponge. Seasonality: colonies grow and become fertile in autumn and winter.

Distribution World-wide including southern Australia. May have been introduced to Australia as a fouling organism on colonial era ships.

References Southcott (1971), Watson (1994b) (as *Bougainvillia ramosa* (Van Beneden, 1844)), Watson (1996), Watson (1999).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117328



Figure 46. *Bougainvillia muscus*. Point Wilson jetty, Port Phillip Bay, 2 m. Photograph: J.E. Watson.



Figure 47. *Bougainvillia muscus*. polyp stage with medusa buds, part of colony. Photograph: Peter Schuchert, from <http://www.marinespecies.org/aphia.php?p=image&tid=117328&pic=23678> licensed under a Creative Commons Attribution-Noncommercial-Share Alike 4.0 License.

Dicoryne annulata von Lendenfeld, 1884

Description "Colonies infertile. Hydrorhiza not observed. Hydranth pedicel cylindrical, 0.6 mm long, 0.18 mm wide, perisarc moderately thick, deeply annulated. Extended hydranth 1.3-1.5 mm long, spindle-shaped, with 16-18 distal filiform tentacles to 0.8 mm long, hypostome an open annulus." (Watson & McInnes, 1999, p. 105)

Remarks Schuchert (1996) stated that the description of *Dicoryne annulata* was unsatisfactory and the species is currently listed by Schuchert (2023). However, Watson & McInnes (1999) were in no doubt that they had re-discovered von Lendenfeld's species, the first such record since 1884.

Ecology Intertidal, including on red corraline algae.

Distribution One record, from Ricketts Point, Port Phillip Bay.

References Watson & McInnes (1999).

Nomenclature https://biodiversity.org.au/afd/taxa/Dicoryne_annulata

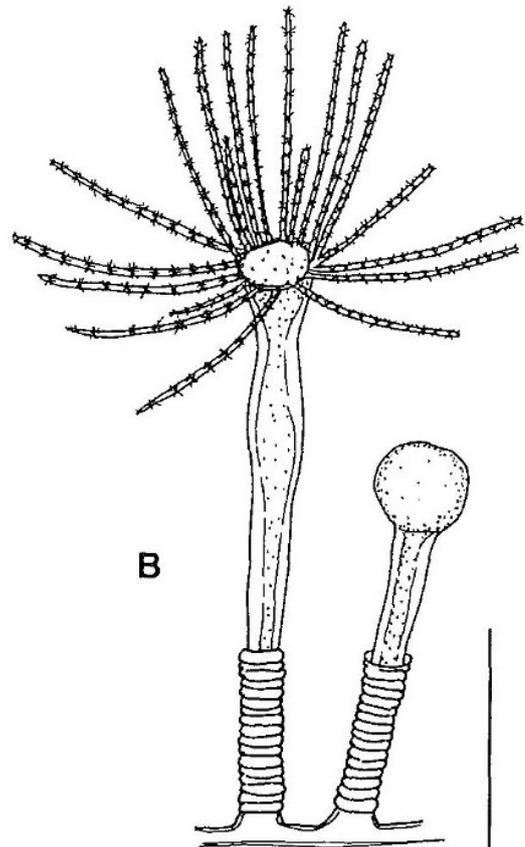


Figure 48. *Dicoryne annulata*. From Watson & McInnes (1999, figure 2B). Scale bar = 1 mm.

Family Clathrozoellidae Peña Cantero, Vervoort & Watson, 2003

Description Athetic hydroids with erect and branched stems; unbranched in young colonies. Stem resulting from addition of successive pseudohydrothecae (the hydrothecae in Clathrozoellidae have a structure differing from those of Leptothecatae). See Peña Cantero *et al.* (2003) for a complete description.

Remarks The Clathrozoellidae comprises a single genus of small, rare hydroids, known from about 200-800 m off New Zealand, south-eastern Australia and in the Bransfield Strait region of the Antarctic Peña Cantero *et al.* (2003). The four known species are *Clathrozoella abyssalis* Peña Cantero, Vervoort & Watson, 2003, *Clathrozoella bathyalis* Peña Cantero, Vervoort & Watson, 2003, *Clathrozoella drygalskii* (Vanhöffen, 1910) and *Clathrozoella medeae* Peña Cantero, Vervoort & Watson, 2003. Peña Cantero *et al.* (2003) can be consulted to distinguish these rarely-encountered deep water hydroids.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=231543

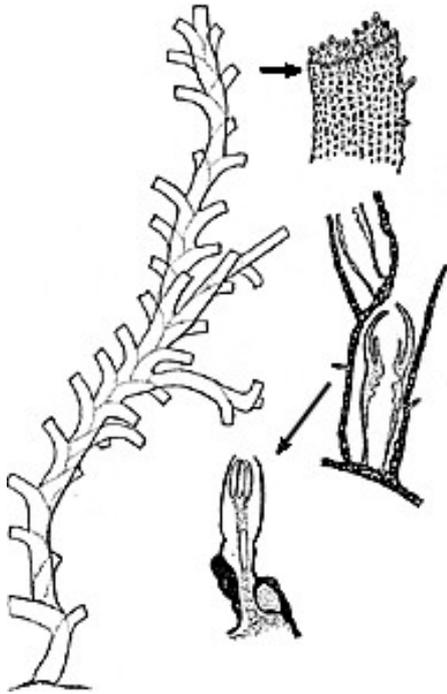


Figure 49. *Clathrozoella* Stechow, 1921. Image licensed under a Creative Commons Attribution-Noncommercial-Share Alike 4.0 License. From <http://www.marinespecies.org/aphia.php?p=taxdetails&id=231543>

Family Eudendriidae L. Agassiz, 1862

Description Colonies usually branched, enclosed in a firm perisarc. Hydranth with one whorl of tentacles below a large hypostome. Reproduction by gonophores borne below or on the hydranth, male with several bead-like chambers, female with a single egg.

Remarks The Eudendriidae is a common southern Australian family. The hydroids are easily recognised by their untidy, bushy growth and their pink-yellow-orange colour. As many species are similar in appearance these can only be positively identified by microscopic examination of the cnidome (which always includes euryteles) and the distribution of female gonophores on the colony.

Nineteen species of *Eudendrium* are recorded from Australia (Bax & Gershwin, 2022); they can be distinguished using Watson (1985, 2003).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1600

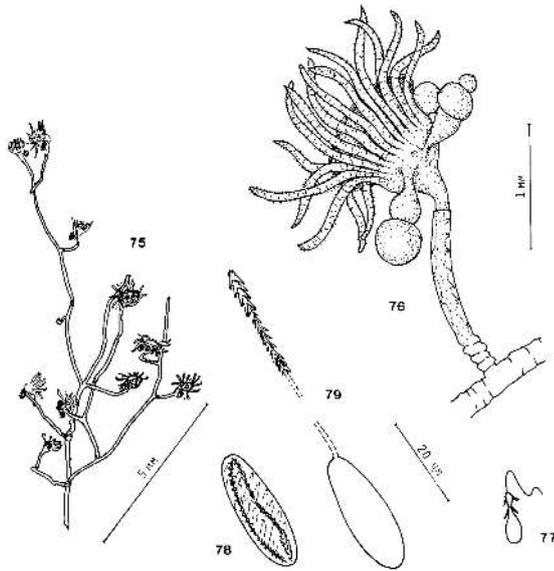
Eudendrium aylingae Watson, 1985

Figure 50. *Eudendrium aylingae*. 75, whole stem; 76, hydranth with male gonophores; 77-79, nematocysts, drawn to same scale; 77, microbasic eurytele from tentacles; 78, macrobasic eurytele, undischarged, from hypostome; 79, macrobasic eurytele, discharged, showing overlapping distal spines on shaft. From Watson (1985).

Description "Colony erect with no definite main stem. Branching irregular, branches straggling, with 3-4 indistinct annulations at origin and at irregular intervals throughout; stems otherwise smooth and shining, perisarc thin. Hydranths terminal on branches or borne on irregularly-spaced pedicels, indistinctly annulated at origin. Hydranths moderately large with a wide hypostome (preserved material) and 20-22 tentacles. Male gonophores 2-chambered, up to 5 borne on a fully-developed hydranth with hypostome; at maturity the distal chamber globular or flattened, tentacles of blastostyle not reduced, or partly atrophied." From Watson (1985).

Remarks Distinguished from a tropical species, *Eudendrium infundibuliforme* Kirkpatrick, 1890 by the nematocysts, which in *E. aylingae* have a very long, distally-swollen shaft.

Ecology Shallow water to a depth of 70 m.

Distribution Eastern and southern Australia.

References Watson (1985).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284647

Eudendrium balei Watson, 1985

Description Colonies large and bushy, comprising many branched stems to 10 cm high, with thick perisarc. Hydranths large, borne on long stalks (pedicels) on branches, with 20-24 tentacles surrounding a large

hypostome. Male and female gonophores borne on different colonies, males in bead-like clusters below the hydranth, females in groups along stem below a hydranth, each gonophore containing a single egg. Colour: colonies yellowish, brownish orange sometimes with a pink tinge, stems and branches shining brown.

Remarks Recognition: large bushy colonies with hundreds of colourful hydranths.

Ecology Habitat: deep tidal channels in good current flow. Seasonality: colonies grow and become fertile late summer to autumn.

Distribution Southern Port Phillip and Western Port, probably more widespread across southern Australia.

References Watson (1985).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284648

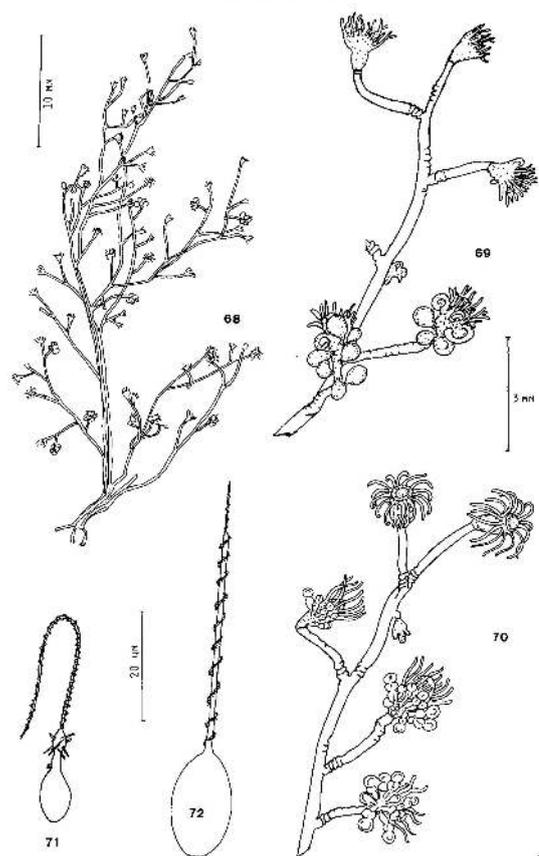


Figure 51. *Eudendrium balei*. 70, distal part of branch with male gonophores, from paratype; 71, 72, nematocysts, drawn to same scale; 71, microbasic eurytele from tentacles; 72, microbasic p-mastigophore from hydranth; 73, female blastostyle from holotype with gonophores in various stages of maturity; 74, mature male blastostyle. From Watson (1985).

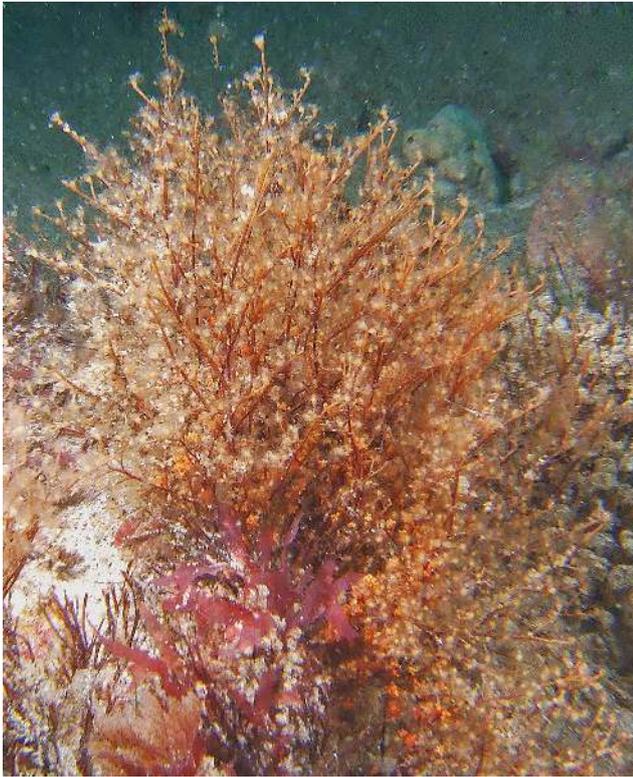


Figure 52. *Eudendrium balei*. Crawfish Rock, Westernport, 10 m. Photograph: J.E. Watson

Eudendrium cf. capillare Alder, 1856

Description "Dense colony heavily investing the algal stipe. Stems up to 25 mm in height, arising from a tangled and intergrown hydrorhiza. Stems unfascicled, irregularly branched, branches bent, seldom straight, often indistinguishable from main stems. Branches with up to 10 annulations at origin, perisarc obscurely wrinkled throughout, especially on hydrothecal pedicels, but occasionally smooth. Hydranths terminal on branches, long and slender (preserved material), with a distinct proximal contraction groove but no nematocyst ring, tentacles long, filiform, nematocysts prominently displayed, hypostome wide, annular." From Watson (1985).

Remarks The above description is based on a single historical specimen in the collection of the Australian Museum, and could represent either *Eudendrium nambuccense* or *E. capillare*; see (Watson, 1985) for further discussion.

Ecology On the brown alga *Hormosira banksii*, thus evidently intertidal.

Distribution Sydney Harbour, New South Wales.

References Watson (1985).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117544

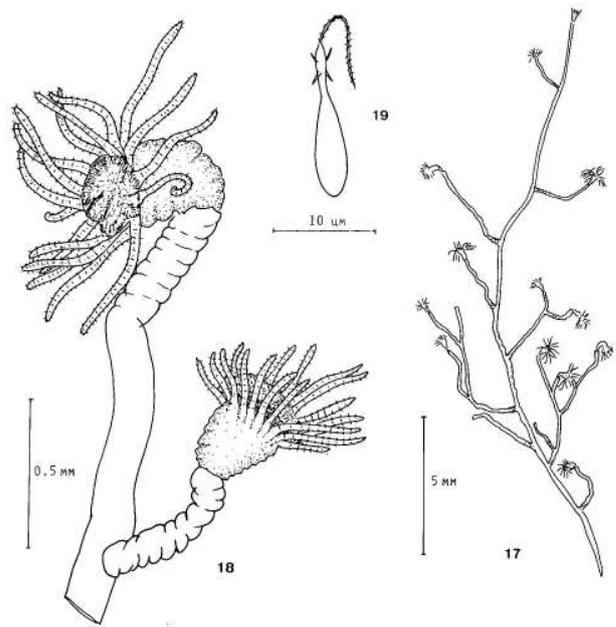


Figure 53. *Eudendrium cf. capillare*. 17, single stem; 18, distal part of branch with hydranths; 19, microbasic eurytele from hydranth. From Watson (1985).

Eudendrium carneum Clarke, 1882

Description "Mains stems thick, gnarled and heavily fascicled, the fasciculations extending to all but the growing tips of the colony and along the primary branches. Branching profuse, irregular, each branch with 4-7 deep proximal annulations, the younger branches sometimes with scattered groups of annulations, perisarc otherwise smooth, thick and shining. Hydranths large, of elegant form, with a long body and 28-32 tentacles, a very prominent clavate hypostome (preserved material), and a distinct contraction groove at base. Female gonophores borne on a specialised blastostyle on a short wrinkled pedicel arising from the smaller branches. Immature gonophores small, knob-like, 4-6 borne in a whorl below a hydranth with 10-14 atrophied tentacles; gonophores later developing a bifurcated spadix. Mature gonophores in elongate clusters of 5-8 scattered along a thickened blastostyle which may be surmounted by a cluster of remnant tentacles without hypostome, each gonophore enclosed in a capsule of perisarc with two large fenestrations." From Watson (1985, p. 202).

Remarks The large, strongly-fascicled colonies, the bifurcated female spadix and the fenestrate capsule of the mature female gonophore distinguish this species from other *Eudendrium* spp.

Ecology On wharf pilings and rocks.

Distribution In Australia recorded from the Port of Fremantle, WA, likely an introduction from ship-

ping. Widely recorded in the Americas and elsewhere, including many more probable shipping-related introductions.

References Watson (1985).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117545

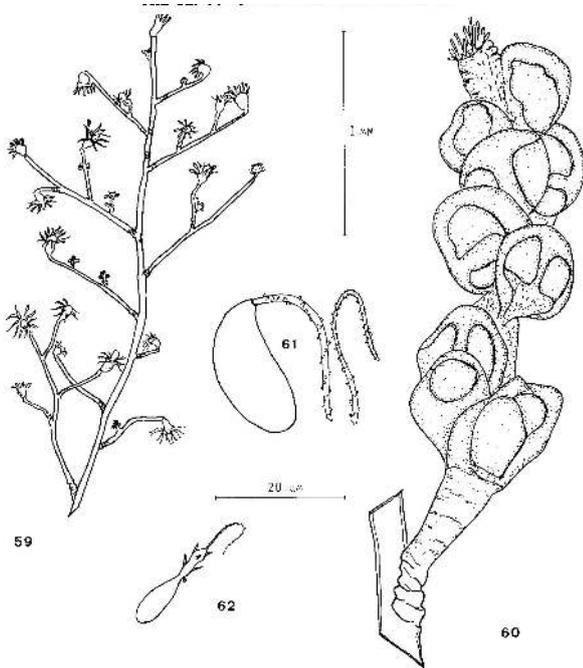


Figure 54. *Eudendrium carneum*. 59, distal part of branch from female colony from Fremantle, W.A.; 60, female blastostyle with mature gonophores surmounted by a reduced hydranth; 61, 62, nematocysts, drawn to same scale; 61, large heterotrichous anisorhiza from hydranth; 62, microbasic eurytele from tentacles. From Watson (1985).

Eudendrium generale von Lendenfeld 1885

Description Colonies bushy, stems irregularly straggling and branched, 2-5 cm high. Stem perisarc smooth and shining, branches annulated at base. Hydranths with 16-24 tentacles borne prolifically on short stalks (pedicels). Gonophores borne on lower stems of colony, male shining pearly bead-like clusters on branches, mature female yellow, grouped below tentacles of hydranth. Colour: stems shining brown, hydranths and gonophores yellow to orange.

Remarks Recognition: small bushy yellow to orange colonies in sheltered habitat.

Ecology Habitat: among sponges and bryozoans, often in shallow water on jetty pilings or among rocks. Seasonality: colonies abundant and fertile late summer to winter.

Distribution Common in Port Phillip and Western Port, probably occurs more widely in sheltered waters.

References Watson (1985).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=231590

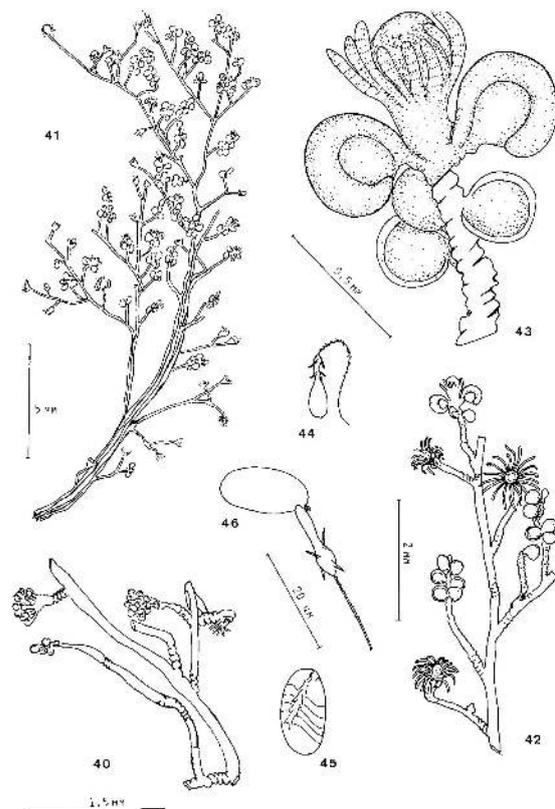


Figure 55. *Eudendrium generale*. 40, part of stem from microslide BM1886.6.8.38; 41-52, specimens from Western Port, Vic., drawn from living material; 41, typical stem with female gonophores; 42, distal part of branch from same stem showing female gonophores in various stages of maturity; 43, young female blastostyle before complete loss of tentacles; 44-46, nematocysts, drawn to same scale; 44, microbasic eurytele from tentacles; 45, large microbasic eurytele from hydranth, undischarged; 46, same, discharged. From Watson (1985).



Figure 56. *Eudendrium generale*. St Leonards pier, Port Phillip Bay, 2 m. Photograph: J.E. Watson

Eudendrium merulum Watson, 1985

Description "Hydrorhiza tubular, giving rise to simple or branched stems of the same diameter. Stems erect, up to 20 mm in height, unfascicled, lower stems roughly annulated up to the lowest branch, branching and rebranching sparse and irregular, in all planes, branches straight or undulated, upwardly directed, with up to 12 indistinct proximal annulations. Perisarc of lower stems thick and shining, becoming markedly thinner in distal region. Hydranths small, with approximately 24 tentacles surrounding a club-shaped hypostome (preserved material) and a distinct contraction groove around the base below a nematocyst ring containing a few large nematocysts. Sexes borne on separate colonies. Female gonophores borne thickly, on lower parts of colony, clusters extending to halfway up stems, immature gonophores disk-shaped with a curved, unbranched spadix, in a verticil surrounding a hydranth without hypostome. Mature female gonophore globular, containing one egg enclosed in a thin pellicle, up to 6 gonophores scattered along a wrinkled blastostyle devoid of tentacles. Male gonophores borne on lower stems, in a dense cluster of up to 20 on a wrinkled blastostyle completely devoid of tentacles at all stages. Gonophores 2- or 3-chambered, the chambers connected by a distinct neck; immature gonophores elongate, some with an apical knob, mature gonophores bead-shaped." From Watson (1985, p. 200).

Remarks In the field colonies of *E. merulum* are indistinguishable those of *E. generale* however microscopic characters easily separate the two: *E. merulum* has larger microbasic euryteles than *E. generale* and in *E. merulum* tentacles are absent from blastostyles of mature males and females.

Ecology Forms extensive meadows in shaded habitats with strong current flow.

Distribution Bass Strait, Victoria. Similar specimens from Palm Isles, Queensland may be the same species. Depth 2-8 m.

References Watson (1985).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117550

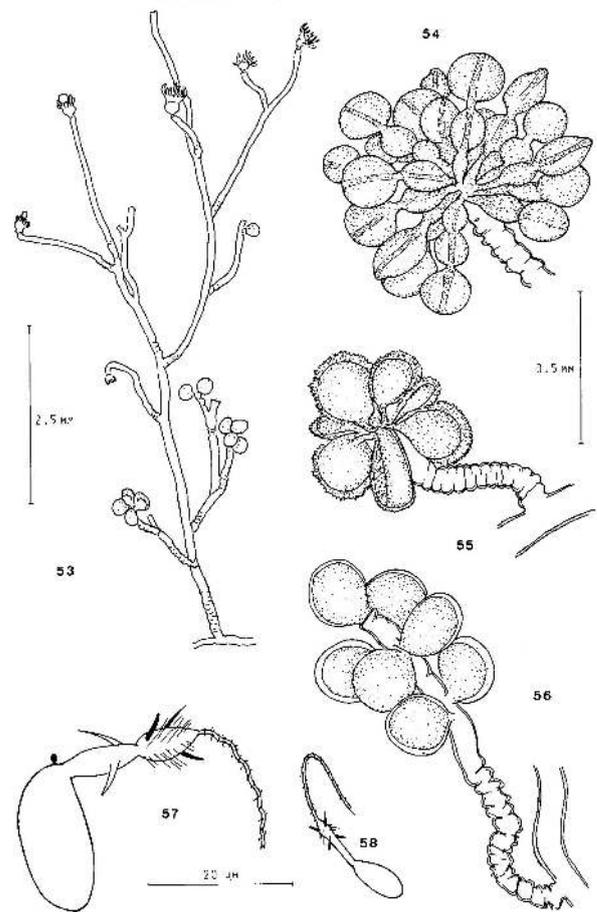


Figure 57. *Eudendrium merulum*. 53, whole stem from holotype, Bass Strait, Vic; 54, mature male gonophores from paratype colony; 55, 56, female gonophores from holotype; 55, immature gonophores; 56, mature gonophores; 57, 58, nematocysts, drawn to same scale; 57, large microbasic eurytele from hypostome, discharged; 58, small microbasic eurytele from tentacles. From Watson (1985).

Eudendrium minutum Watson, 1985

Description "Colony sterile, comprising 15-20 stems arising from a tubular stolon wandering on surface of substrate. Stems up to 3 mm in height, unfascicled, slender, simple, or if branched, bearing 1-3 irregularly-spaced branches each with a terminal hydranth. Lower part of branched stems and simple stems deeply annulated with up to 10 spiral rings, branches with a few indefinite proximal annulations, those term inating in a hydranth frequently annulated throughout. Perisarc of stems moderately thick, becoming thinner distally. Hydranths small, with approximately 20 tentacles, hypostome large, open and annular (preserved material)." From Watson (1985, p. 183).

Remarks *Eudendrium minutum* can be distinguished from all other Australian *Eudendrium* species by the small size of colonies (stems 3 mm high) and in having three different kinds of microbasic euryteles (see

Figure 58 2, 3 & 4).

Ecology Oceanic waters in strong currents, depth 12 m.

Distribution Port Phillip Heads, Victoria.

References Watson (1985, 1997).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284677

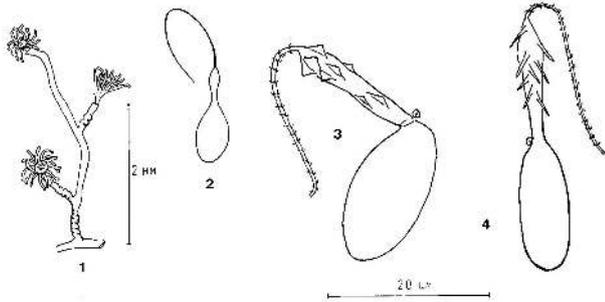


Figure 58. *Eudendrium minutum*, 1, colony, 2-4 microbasal euryteles. From Watson (1985) figures 1-4.

Eudendrium nambuccense Watson, 1985

Description "Colony luxuriant, comprising many stems arising from a tangled hydrorhiza on the surface of the mussel. Stems bushy, about 10 mm in height, unfascicled, irregularly and profusely branched. Perisarc of stems smooth and shining, becoming very thin and delicate distally. Primary stems ringed proximally, branches with up to 8 indistinct annulations at origin and obscurely ringed at intervals throughout their length. Hydranths small, terminal on branch, with 24-28 tentacles. A prominent ring of nematocysts ("nettle ring" of early authors) encircles the lower body of the hydranth. Male gonophores borne on lower region of colony, single chambered, elliptical in shape when mature, each on a long stalk, in clusters of up to 15 on a corrugated blastostyle. Blastostyle completely devoid of tentacles at all stages. Younger gonophores with a pronounced apical pad of nematocysts, lost at maturity." From Watson (1985, p. 185).

Remarks *Eudendrium nambuccense* is similar to *E. capillare* but distinguished from that species by having nematocyst pads present on gonophores of both sexes.

Ecology On bryozoans and mussels, 3-12 m.

Distribution New South Wales and Victoria.

References Watson (1985, 1997).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284678

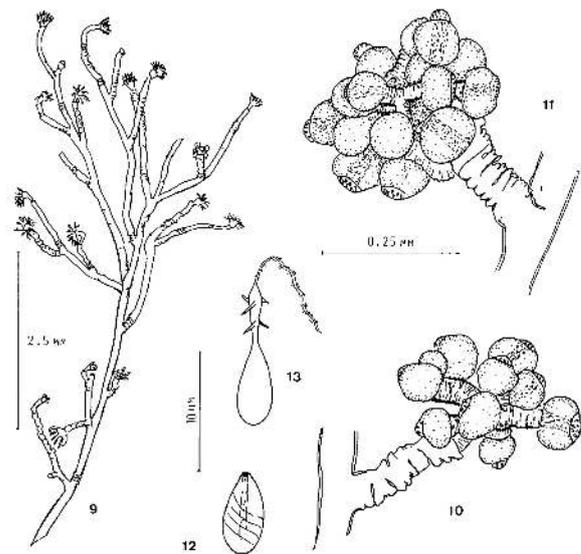


Figure 59. *Eudendrium nambuccense*. 9, holotype, Nambucca Heads, N.S.W.; 10, 11, mature male gonophores with nematocyst pads; 12, 13, nematocysts from tentacles of holotype; 12, undischarged microbasal eurytele; 13, microbasal eurytele, discharged; 14-16, colony from Portsea, Vic. From Watson (1985) figures 9-16.

Eudendrium pennycuikae Watson, 1985

Description Sparsely branched straggling colonies to 10 mm high, branches annulated at base. Hydranths small with 20-24 tentacles, borne on short stalks (pedicels) along branches. Gonophores borne on lower parts of colony, male in bead-like clusters. Colony erect with no definite main stem. Branching irregular, branches straggling, with 3-4 indistinct annulations at origin and at irregular intervals throughout; stems otherwise smooth and shining, perisarc thin. Hydranths terminal on branches or borne on irregularly-spaced pedicels, indistinctly annulated at origin. Hydranths moderately large with a wide hypostome (preserved material) and 20-22 tentacles. Male gonophores 2-chambered, up to 5 borne on a fully-developed hydranth with hypostome; at maturity the distal chamber globular or flattened, tentacles of blastostyle not reduced, or partly atrophied. Below a fully formed hydranth, females in groups of 3-5 scattered along branch below a hydranth. Colour: yellow to orange, sometimes white.

Remarks Recognition: small white to yellow colonies usually hidden among other invertebrates. *Eudendrium pennycuikae* is very similar to *E. capillare* but distinguished from the latter species by having the male gonophores borne on a fully-developed hydranth.

Ecology Habitat: shaded sheltered shallow water, often on jetty pilings.

Distribution Port Phillip, southern Queensland, prob-

ably throughout southern Australia.

References Watson (1985, 2015b).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284678



Figure 60. *Eudendrium pennycuikae*. St Leonards pier, Port Phillip Bay, 2 m. Photograph: J.E. Watson.

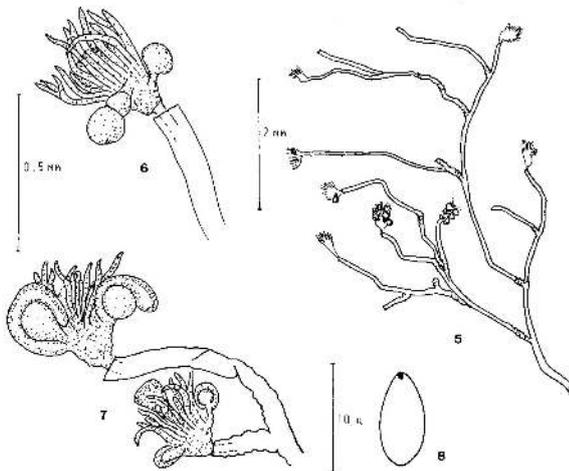


Figure 61. *Eudendrium pennycuikae*. 5, whole stem, drawn from holotype, Bundaberg, Qld; 6, hydranths with mature male gonophores, from holotype; 7, hydranth with young female gonophores, from paratype; 8, microbasic eurytele, undischarged, from tentacles. From Watson (1985) figures 5-8.

Eudendrium ramosum Watson, 1985

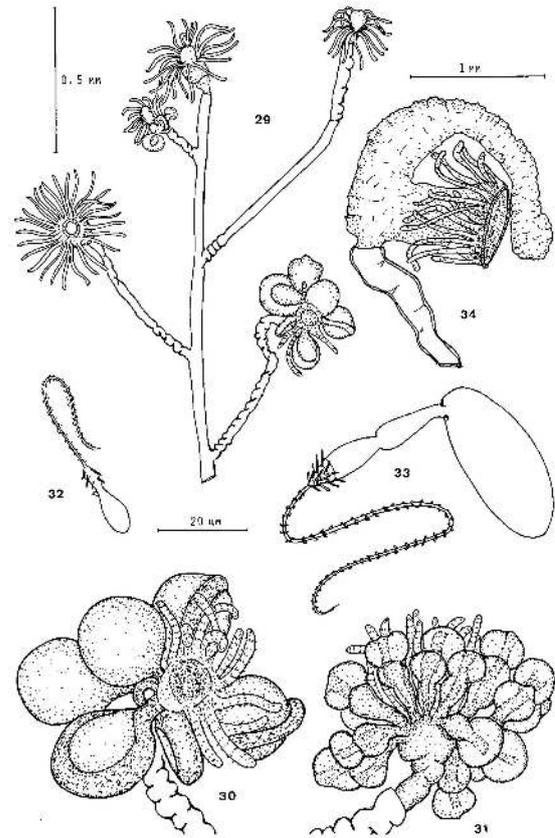


Figure 62. *Eudendrium ramosum*. 29, distal part of stem from colony, Port Phillip Heads, Vic; 30, immature and mature female gonophores; 31, mature male gonophores; 32, 33, nematocysts; 32, microbasic eurytele from tentacles; 33, large microbasic eurytele from hypostome; 34, aberrant hydranth with pseudo-cnidophore from colony from Hervey Bay, Qld. From Watson (1985) figures 29-34.

Description "Colonies up to 20 mm in height. Hydrorhiza tubular, wandering over and through the substrate, becoming erect at intervals as single stems. Stems thick and smooth, unfasciated, sparingly and irregularly branched with up to 10 branches, re-branching common. Stems with 6-12 distinct proximal annulations, ringed at intervals throughout length, branches with 6-10 annulations just above origin. Hydranths terminal on branches, pedicels indistinctly annulated at intervals, widening distally, sometimes terminating obliquely below hydranth. Hydranths large, with 24-30 tentacles (very long in life), a distinct proximal groove in the lower body of some, but not all hydranths. Hypostome large, annular to clavate in preserved material. Sexes on separate colonies, the gonophores scattered on all but the most distal branches. Male gonophores in all stages of maturity borne in a single crowded vertical below a hydranth with a fully-developed hypostome and a full number of partially-atrophied tentacles. Mature

gonophore 3 or 4-chambered, immature gonophore with a rod-shaped spadix and a small apical knob without nematocyst pad. Mature gonophore globular or bun-shaped, apical tubercle lost at this stage. Female gonophores borne low on stem, clustered in all stages of development below a hydranth with hypostome and a full number of partially-atrophied tentacles. Young gonophores on a long, thin pedicel, disk-shaped with unbranched spadix, mature gonophores retained below hydranth, oval, containing a single egg encased in a tough gelatinous pellicle." From Watson (1985, pp. 192-194).

Remarks *Eudendrium ramosum* is distinguished from other Australian members of the genus by having microbasic euryteles of two kinds (sizes) and by both sexes having mature gonophores with tentacles reduced to stumps.

Ecology In habitats of strong current flow, 6-25 m.

Distribution Widely distributed in the North Atlantic Ocean and Mediterranean Sea. In Australia recorded from Bass Strait, Victoria and from Queensland.

References Watson (1985).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117555

Eudendrium terranovae Watson, 1985

Description "Colony 50 mm high, dichotomously branched halfway up stem. Stem strongly fascicled to about two-thirds height of colony, branches unfascicled. Branching alternate, branches passing outwards at about 30°, in one plane, with up to 5 proximal annulations, a few superficial annulations at intervals along length, perisarc otherwise smooth and shining. Hydrothecal pedicels rather long, alternate, mostly in one plane at either side of branch, a few directed anteriorly, most curved, but some straight, with 1-4 indefinite proximal annulations, otherwise smooth or indistinctly ringed at intervals. Hydranths well preserved, of moderate size, body long, with a clavate to trumpet-shaped hypostome and 24-28 tentacles, a deep proximal groove around body but no nematocyst ring." From Watson (1985, p. 189).

Remarks *Eudendrium terranovae* forms colonies up to 100 mm high with the stem of the colony composed

of several tubes (fascicled). Unlike most Australian *Eudendrium* species, in *E. terranovae* the microbasic euryteles are uniform in size; *E. terranovae* is further distinguished by lacking deep corrugations in the pedicel of hydranth.

Ecology Oceanic conditions, 10-37 m. Watson (1985) provides some observations of living specimens in laboratory conditions.

Distribution Bass Strait, Victoria and North Cape, New Zealand (apparently the only *Eudendrium* species with a trans-Tasman distribution).

References Watson (1985).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284690

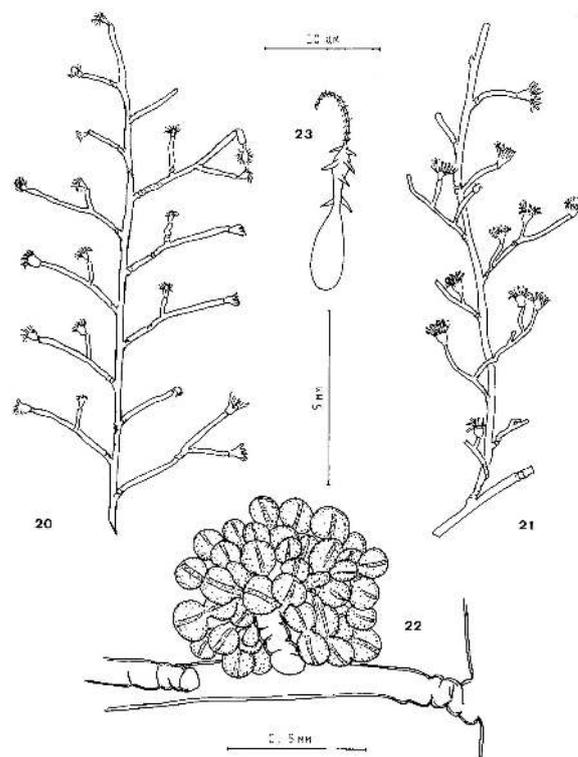


Figure 63. *Eudendrium terranovae*. 20, branch from holotype, North Cape, New Zealand ("Terra Nova" Expedition); 21, branch of colony from Clifty Is., Bass Strait, Vic. drawn to same scale; 22, mature male gonophores from Clifty Is. specimen; 23, microbasic eurytele from Clifty Is. specimen. From Watson (1985) figures 20-23.

Family Hydractiniidae L. Agassiz, 1862

Description Colony stolonial, hydrorhiza an encrusting mat, polyps divided into gastrozooids with one or several close whorls of oral tentacles, dactylozooids when present, without tentacles, gonophores borne on gonozooids, may be either medusae, medusoids, or eggs depending upon species.

Remarks In the Hydractiniidae the polyps (zooids) perform several functions: gastrozooids are concerned with feeding, dactylozooids protect the colony from predators and gonozooids are the reproductive organs. Although many species of Hydractiniidae are known around the world, few have been recorded from southern Australia. Encrusting colonies in the Hydractiniidae are often being associated with mobile substrates while reticulate colonies (such as *Hydractinia gelinea*) are usually associated with fixed substrates. The genus *Clava* is here included in the family Hydractiniidae following Schuchert (2004).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1601

Clava sp.

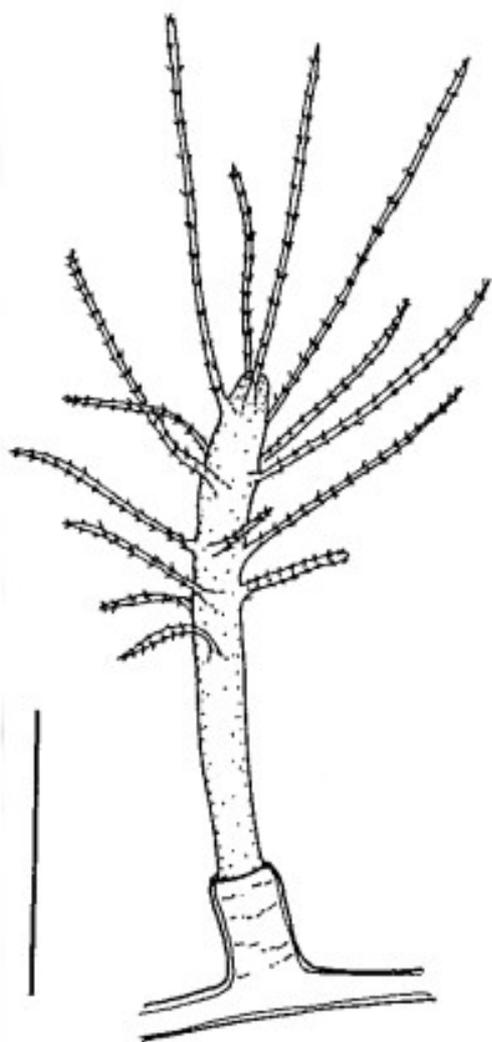


Figure 64. *Clava* sp. drawing: J.E. Watson from Watson & McInnes (1999) (scale bar 0.5 mm).

Description "Hydranths arising directly from a creeping stolon; stolon and hydranth pedicel covered

by thin perisarc. Hydranth cylindrical, young hydranth with four oral tentacles, probably moniliform, 0.3-0.4 mm long but tentacles not in a whorl; hypostome clavate. Tentacles increasing in number to 18, scattered over hydranth body, older (distal) tentacles up to 0.8 mm in length, proximal ones shorter. Hydranth up to 2 mm high at maturity, pedicel about 1.2 mm long. Hydranths colourless to grey." Watson & McInnes (1999, pp. 103-104).

Remarks It is not clear if this species is the same as the only other record of the genus *Clava* from Australia, *Clava simplex* Von Lendenfeld, 1885 (Von Lendenfeld, 1885).

Ecology On *Ecklonia* holdfasts.

Distribution Ricketts Point, Port Phillip Bay, Victoria.

References Watson & McInnes (1999).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117050

***Hydractinia betkensis* (Watson, 1978)**

Description Colony a fuzzy carpet on gastropod shells. Gastrozooids elongate, about 1.5 mm high, hypostome large, surrounded by a whorl of 8-15 filiform tentacles. Gonozooids smaller than gastrozooids, with about eight tentacles, bearing up to five gonophores on short stalks, mature female gonophore with up to 12 eggs. Colour: creamy white.

Remarks Recognition: carpet of tiny polyps on gastropod shell. Originally described as *Stylactis betkensis* Watson, 1978. Previously known as *Stylactaria betkensis*.

Ecology Habitat: found only on shells of the small shallow water nassariid gastropod *Tritia burchardi* (Dunker, 1849). Seasonality: colonies grow over summer but life history unknown.

Distribution Shallow water embayments from Port Phillip to New South Wales.

References Watson (1978).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284845

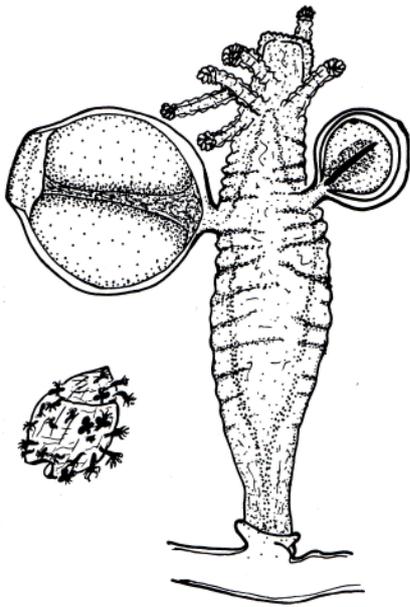


Figure 65. *Hydractinia betkensis* Colony on gastropod shell (left) and medusa (right). After Watson (1978, figure A-7).

Hydractinia gelinea Watson, 2015

Description "Colony comprising individuals and clusters of female polyps on a dead crustose bryozoan; no gastrozooids or dactylozooids present. Hydrorhiza ramified, firmly adherent to substrate, stolons narrow, tubular, perisarc thin and smooth. Gonozooids sessile, robust, with a whorl of 8-12 thick tentacles surrounding a prominent dome-shaped hypostome; tentacles with prominent whorls of nematocysts. Hypostome high dome-shaped. Gonophores fixed sporosacs borne in tight clusters of up to 15 on gonozooid well below tentacles. Immature female gonophore pyriform, containing many small ova, mature gonophore balloon-shaped to spherical, seated on a cushion-shaped pad on a short peduncle and enclosed in a thick gelatinous pellicle, surface of gonophore with abundant large scattered nematocysts. Nematocysts, probably euryteles of two sizes; none discharged: (i) capsule

bun-shaped, 18-21 × 9-10 μm, on gonophores and body of gonozooid, (ii) capsule ovoid, 9-12 × 6-7 μm, on gonozooid tentacles. Colour (recently preserved material): stolons yellow, gonozooids and gonophores flesh pink." From Watson (2015b).

Remarks So far known from a single colony.

Ecology Clustered in the pores of a dead bryozoan *Celleporaria* sp., some polyps encroaching onto a small sponge growing on the bryozoan.

Distribution Port Phillip Bay, Victoria.

References Watson (2015b).

Nomenclature https://biodiversity.org.au/afd/taxa/Hydractinia_gelinea

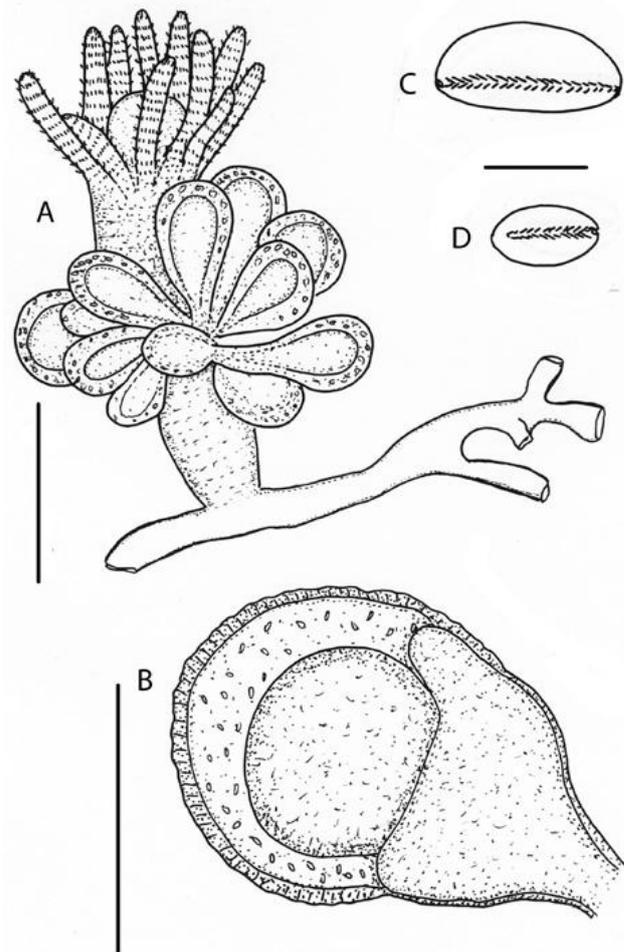


Figure 66. *Hydractinia gelinea*. From Watson (2015b).

Family Oceaniidae Eschscholtz, 1829

Description The Oceaniidae is a large family with many species world-wide, although only a few are known from southern Australia. Some species are large branched colonies and thus easily seen while many are very small and often only found among algae or other invertebrates. Oceaniidae are solitary or colonial hydroids. The hydranth is terminal, spindle- to club-shaped, with filiform tentacles scattered over the hydranth body. Depending upon the species gonophores may produce eggs or medusae.

Remarks The Oceaniidae includes many species formerly placed in the family Clavidae. Schuchert (2004) showed

that the genus *Clava* on which Clavidae is based belongs in the family Hydractiniidae and moved remaining genera in the former Clavidae to the family Oceaniidae. In addition to the species treated below, another Australian species of Oceaniidae, *Corydendrium parasiticum*, is known from Darwin (Watson, 2000).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=231678

***Cordylophora caspia* (Pallas, 1771)**

Description Colonies to 3 cm high, hydrorhiza creeping. Stems erect, loosely branched, mostly smooth, perisarc moderately thick. Hydranths terminal along branches, long, spindle-shaped, with 25-30 filiform scattered tentacles of varying length. Gonophore ovoid, borne at base of hydranth, eggs develop into planula larvae. Colour: white.

Remarks Recognition: large branching white colonies from non-marine environments. It is not yet clear whether *Cordylophora caspia* is closely related to other freshwater hydroids and in what family it should be placed (Cartwright *et al.*, 2008).

Ecology Habitat: brackish to fresh water. Seasonality: colonies probably present throughout year.

Distribution world-wide in brackish waters; common in Victorian western district and Mt Gambier lakes.

References (Schuchert, 2004).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117428

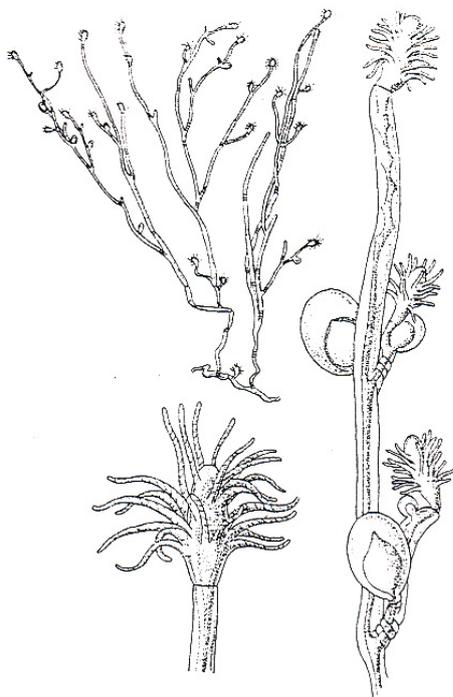


Figure 67. *Cordylophora caspia*. Illustration: J.E. Watson after Cornelius (1990)

***Merona operculata* Watson, 1978**

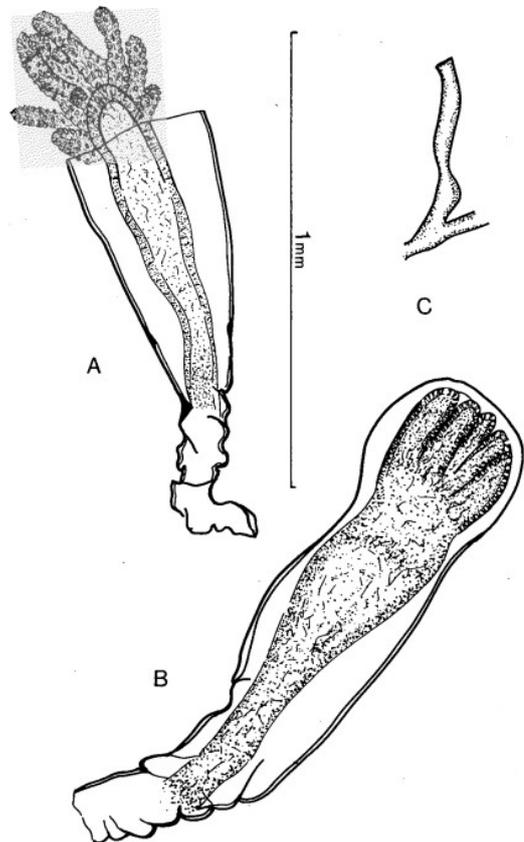


Figure 68. *Merona operculata* drawing: J.E. Watson from Watson (1978).

Description "Gastrozooids sheathed in a firm conical tube which may be straight or curved, perisarc of the tube moderately thick, strongly wrinkled proximally, smooth or a little undulated distally, aperture transverse. Length of tube 0.88—1.25 mm, width at aperture, 0.27-0.35 mm. Hydranth extensile, capable of contraction into tube, with about 10 filiform tentacles surrounding a club-shaped hypostome. Tentacles 0.15 mm long fully extended, with a clearly defined distal cap 0.04-0.05 mm wide richly armed with nematocysts (type unknown). Nematophores present, supported on a long tubular pedicel of perisarc 0.4 mm long arising from the hydrorhiza, distal end widening slightly to form nematotheca. Diameter of nematotheca 0.05 mm. No nematocysts present in empty nematotheca. Gonophores absent. Colour unknown." (Watson, 1978,

p. 309)

Remarks Schuchert (2023) recognises four species of *Merona*. *Merona operculata* is the only species known from Australia and the only record is the original description.

Ecology From the compound ascidian *Didemnum patulum* at a depth of 10 m.

Distribution Westernport, Victoria.

References Watson (1978).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284456

Turritopsis nutricula McCrady, 1857

Description Colonies bushy, to 3 cm high, growing from a hydrorhizal meshwork. Stems and branches straggling, composed of many agglutinated tubes (polysiphonic). Hydranths spindle-shaped, about 1 mm long, with 12-20 scattered filiform tentacles. Perisarc of stem in two layers - an inner wavy layer (seen only under the microscope) and an outer layer covered in fine sediment. Medusa buds are borne on short stalks on or just below the hydranth. Medusa small at release, stomach cylindrical, surrounded by four large gonads, mouth (manubrium) with four lobes, eight tentacles on the bell margin; over several weeks the medusa grows to 2 cm across the bell with up to 100 tentacles. Colour: colony buff to greyish, body of hydranth often rose pink, tentacles white. Medusa transparent, gonads rose red.

Remarks Recognition: untidy grey colonies, medusa rose red.

Ecology Common in sheltered areas, often on algae and jetty piles. Present in winter, medusa may swarm for several weeks in the summer plankton.

Distribution World-wide in temperate waters, widespread across southern Australia.

References Watson (1978).

Family Pandeidae Haeckel, 1879

Description Colony stolonial, usually a hydrocaulus supporting the hydranth. Hydranth spindle-shaped with one whorl of filiform tentacles, reproduction by medusae borne on hydrorhiza.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=15029

Amphinema dinema (Péron & Lesueur, 1810)

Description Small cylindrical hydrothecae scattered along a creeping hydrorhiza. Hydrocaulus covered by a rugose perisarc. Hydranth long, spindle-shaped, hypostome dome-shaped, surrounded by 8-10 long filiform, stiffly extended tentacles. Medusa bud globular, borne on short stalks along the hydrorhiza. At release, the medusa is deep bell-shaped to hemispherical with

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117440



Figure 69. *Turritopsis nutricula*. St Leonards Pier, Port Phillip Bay. Photograph: J.E. Watson.

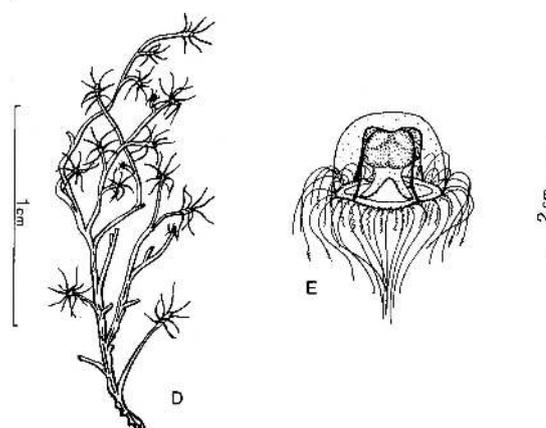


Figure 70. *Turritopsis nutricula* colony (left) and medusa (right). From Watson (1978) Figures 3D, 3E

two opposite tentacles on large bulbs, radial canals thin, a small wart at the base of each canal. Small nematocysts sparsely scattered over bell. Colour: hydrorhiza brown, hydranth body pale orange, bell of medusa colourless, tentacle bulbs and manubrium orange-brown.

Remarks Recognition: tiny colonies with orange hydranth in dead mussel shells and amongst other small

invertebrates.

Ecology Habitat: on dead mussel shells and solitary ascidians in shallow sheltered water, especially on jetty pilings. Seasonality: colonies grow summer to winter, fertile in summer.

Distribution Medusa in plankton world-wide. The hydroid colony is presently known from Port Phillip and New Zealand.

References Watson (2015b).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117778

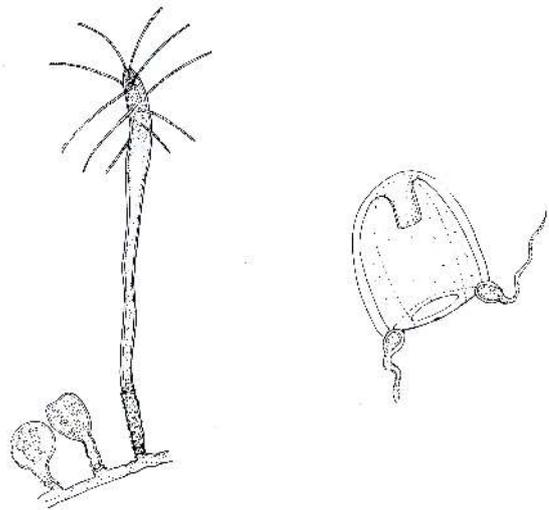


Figure 71. *Amphinema dinema* colony (left) and polyp (right). from Watson (2015b, figure 2).

Family Rathkeidae Russell, 1953

Description Colony stolonal, hydranths growing singly along a creeping hydrorhiza, hydranth with one whorl of a few filiform tentacles, hypostome dome-shaped, medusa buds borne on hydrorhiza.

Remarks Two medusa genera are known in Australia but the hydroid of only one genus, *Rathkea* is known.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=19485

Rathkea octopunctata (M.Sars, 1835)

Description Colonies minute, hydranth spindle-shaped, about 0.5 mm long, with four long thread-like oral tentacles armed with rings of nematocysts and connected at their base by a web of tissue. Medusa bud ovoid, 0.5 mm long, borne on a short stalk on the hydrorhiza. Medusa at release with two long tentacles on opposite sides of the bell. Colour: hydroid and medusa colourless.

Remarks Recognition: straggling tentacles with groups of nematocysts.

Ecology Habitat: grows inside the aperture of worm tubes buried in muddy seabed. Seasonality: life history unknown.

Distribution Port Phillip, probably southern Australia generally in suitable muddy habitat but is seldom seen. The medusa is well known world-wide.

References Watson (1998).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117848

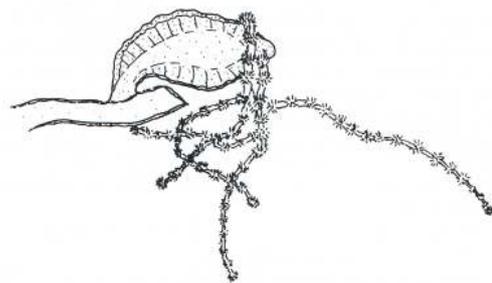


Figure 72. *Rathkea octopunctata*. Colony, Port Phillip Bay, Victoria, muddy bottom. Illustration: from Watson (1998, figure 3F).

Leptothecata

In the Leptothecata the polyp (hydranth) is protected by a chitinous cup (hydrotheca) into which it can withdraw when disturbed.

Some thecate hydroids can be found in shallow tide pools on rocky coasts but most prefer the subtidal habitat in good current flow where they grow on reef, rocks, algae, invertebrates including other hydroids and sometimes sand. The range of depth for hydroids is from the shallowest subtidal to the deepest ocean basins. In this guide, the commonest thecate species likely to be encountered between the low tide mark to 30 m depth are described.

Thecate species range in size from short, simple unbranched stems a few millimetres high with one to a few hydrothecae to multi-branched giant colonies to 1 m high bearing many thousands of hydrothecae. In general, the smaller species may be found in quiet water habitats while larger colonies prefer deeper ocean waters. Thecate hydroids range in colour from honey-brown to white, yellow, or red, and one local species, *Plumularia sulcata*, is black. Colour of each species is fairly constant, so it is a useful general character for identification in the field.

Currently, 43 families are recognised in the Order Leptothecata; of these at least 22 are known from southern Australia. Taxonomic revisions and especially the insights from molecular studies such as Choong *et al.* (2018); Maronna *et al.* (2016) and many others will continue to improve understanding of the taxonomic relationships. An overview of the current arrangement of families and genera known from southern Australia (excluding those known only as medusae) is provided in Table 1.

Table 1. Families of leptothecate hydroids recorded from southern Australia. Taxa marked with an asterisk are not treated further in the text.

Family	common genera	descriptive notes
Aequoreidae*	<i>Aequorea</i> *	Colony minute, stolonial or sparsely branched sympodial stems. Hydrotheca minute, pedicellate and free, radially symmetrical, operculum of many converging segments. Hydranth with inter-tentacular web. Known from five genera, three of which are recorded from Australia (Schuchert, 2023). Most members are known only from the medusa stage. A single cryptic species known from the hydroid colony is <i>Aequorea phillipensis</i> Watson, 1998, minute cryptic hydroids found on worm tubes on muddy sea floor. www.marinespecies.org/aphia.php?p=taxdetails&id=13553 <i>Aequorea eurhodina</i> Péron & Lesueur, 1809 from Bass Strait may be the medusa of this species (Watson, 1998).
Aglaopheniidae	<i>Aglaophenia</i> , <i>Gymnangium</i> , <i>Macrorhynchia</i> *	<i>Lytocarpia</i> *
Campanulariidae	<i>Campanularia</i> , <i>Gonothyraea</i> , <i>Obelia</i> , <i>Orthopyxis</i> , <i>Silicularia</i>	<i>Clytia</i> , Colony of simple or branched stems, hydrotheca bell-shaped on upper side of branch, margin usually cusped, median nematotheca attached to hydrotheca.
Campanulinidae*	<i>Campanulina</i> *, <i>Lafoeina</i> *	Colony stolonial or erect, hydrocaulus branched or unbranched; hydrotheca usually campanulate or cylindrical, with or without pedicel, always with operculum of several triangular flaps; sharply demarcated from hydrotheca or not; with or without diaphragm; with or without nematophores; gonophores as fixed sporosacs or free medusae. Four accepted species recorded from Australia (Schuchert, 2023; Watson, 2011a).

Continued on next page

Table 1 southern Australian leptotheccates (continued from previous page)

Family	common genera	descriptive notes
Cirrholoveniidae*	<i>Cirrholovenia</i> *	Colonies stolonial, of <i>Cuspidella</i> type; hydrothecae sessile, tubular, closed by a pyramidal operculum formed by numerous flaps meeting centrally and not clearly demarcated from the hydrothecae; no intertentacular membranous web. A poorly known family with three Australian species, two of which known only from medusa stage. Hydroid stage known for <i>Cirrholovenia tetranema</i> Kramp, 1959 (previously reported as <i>Lafoeina amirantensis</i> (Millard & Bouillon, 1973) from Port Phillip Bay by Watson (2016), but Migotto & Cabral (2005) showed that species to be the hydroid stage of the medusa <i>Cirrholovenia tetranema</i>).
Clathrozoidae	<i>Clathrozoön</i>	Colony arborescent, large, composed of interlocking chitinous tubes, hydrothecae embedded in tubes, hydranth contractile into hydrotheca, gonothecae embedded in tubes.
Eirenidae	<i>Eirene</i> , <i>Eutima</i> *, <i>Eutimalphes</i> *, <i>Helgicirrho</i> *, <i>Phalopsis</i> *	Includes ten genera; five genera and 14 species are recorded from Australia Schuchert (2023). Most members are known only from the medusa stage. A single cryptic species known from the hydroid colony is treated below, <i>Eirene troglodyta</i> Watson, 1998.
Haleciidae	<i>Halecium</i> , <i>Hydrodendron</i> *	Colony usually branched, hydrotheca shallow saucer-shaped, no operculum, too small for withdrawal of the hydranth. Hydrotheca may be replicated many times. Gonotheca usually lenticular.
Halopterididae	<i>Antennella</i> , <i>Halopteris</i> , <i>Gattya</i> *, <i>Monostaechus</i>	Colony branched, hydrotheca on main stem, cup-shaped, with three protective vase-shaped nematothecae.
Hebellidae	<i>Anthohebella</i> *, <i>Hebella</i>	Colony stolonial, hydrotheca campanulate, on a distinct pedicel, with a smooth marginal rim, with or without operculum, gonophores reproduce eggs or free medusae. Medusa with short manubrium with irregular lips.
Kirchenpaueriidae	<i>Halicornopsis</i> , <i>Kirchenpaueria</i> , <i>Pycnotheca</i>	Colony usually branched, plumose, hydrotheca cup-shaped, one very small nematotheca tucked below hydrotheca.
Lafoeidae	<i>Filellum</i>	Colonies stolonial or erect, hydrothecae tubular to campanulate, radially or bilaterally symmetrical, no operculum. Gonophores protected by gonothecae aggregated into a tufted structure (coppinia).
Lineolariidae	<i>Lineolaria</i>	Colony stolonial, hydrothecae sessile, minute, tubular, margin upturned, operculum thin, membranous. Female gonophores with eggs enclosed in a gonotheca attached to the substrate.
Lovenellidae*	<i>Hydranthea</i> *	Colonies stolonial or erect, sympodial; hydrotheca pedicellate, elongate, everted-conical to bell-shaped; operculum conical, formed either by many triangular plates on embayments in shallowly cusped hydrothecal margin and well demarcated from hydrothecal wall.
Phialellidae	<i>Phialella</i>	Colony either stolonial or branched, hydrotheca tubular, with operculum.
Phylactothecidae	<i>Hydrodendron</i>	Colonies stolonial or erect, arising from creeping hydrorhiza; hydrothecae shallow to bell-shaped, sessile or pedicellate, basal region with delicate diaphragm, with or without desmocytes; hydranths usually much larger than hydrothecae, with or without an intertentacular web.

Continued on next page

Table 1 southern Australian leptotheccates (continued from previous page)

Family	common genera	descriptive notes
Plumulariidae	<i>Cladacanthella*</i> , <i>Dentitheca</i> , <i>Monothecca</i> , <i>Nemertesia</i> , <i>Plumularia</i>	Colony branched, plumose, hydrotheca cup-shaped, with three protective vase-shaped nematothecae, no hydrotheca on main stem.
Sertularellidae	<i>Calamphora*</i> , <i>Sertularella</i>	Colonies are erect, mono- or polysiphonic, branched or unbranched, and hydrothecae have four marginal cusps and a pyramidal operculum with four triangular valves.
Sertulariidae	<i>Amphisbetia</i> , <i>Crateritheca</i> , <i>Diphasia</i> , <i>Gonaxia*</i> , <i>Salacia*</i> , <i>Sertularia</i> , <i>Stereotheca</i>	Colony simple or branched, hydrothecae tubular or flattened, usually with cusped margin, partially or completely attached to stem or branch.
Staurothecidae*	<i>Staurotheca*</i>	Tubular hydrothecae, with operculum and diaphragm arranged either in two longitudinal rows of opposite, sub-opposite or alternate hydrothecae or in decussate series. Male and female gonothecae are directly inserted at the hydrothecal base, with female gonothecae sometimes arranged on special supporting structures. The family Staurothecidae was established by Maronna <i>et al.</i> (2016) for the genus <i>Staurotheca</i> , previously part of the family Sertulariidae. The sole Australian species, <i>Staurotheca vanhoeffeni</i> , is extra-limital to this study (recorded from Macquarie Island – see Watson (2003)).
Symplectoscyphidae	<i>Symplectoscyphus</i>	Hydrothecal aperture with three cusps and an operculum of three valves. (Variable in colony morphology, branching pattern and gonotheca morphology.)
Syntheciidae	<i>Hincksella*</i> , <i>Synthecium</i>	Colony colonial, hydrothecae tubular, without operculum, bent outwards, attached to both sides of branch or stem of colony.
Thyroscyphiidae	<i>Parascyphus</i> , <i>Thyroscyphus</i>	Colonies branched or unbranched, monosiphonic, hydrothecae borne on a short stalk (pedicel), from stem, margin of hydrotheca with three or low four cusps, operculum pyramidal, gonothecae ovoid, borne on stem.
Tiarannidae*	<i>Modeeria*</i> , <i>Stegolaria*</i>	Colonies stolonial of <i>Stegopoma</i> type; hydrotheca pedicellate or sessile, deep, asymmetric-tubular; operculum formed by two pleated membranes which meet one another like a gabled roof, with straight ridges above and on the sides of hydrotheca, continuing up at each end, the all imparting a bilateral symmetry to the distal part of the hydrotheca; hydranths where known lacking intertentacular web; gonothecae resembling hydrothecae but larger, with free medusae or fixed sporosacs. Two species are known from Australia. <i>Modeeria rotunda</i> (Quoy & Gaimard, 1827), described below, is cosmopolitan, typically epizoic on other hydroids. The second species, <i>Stegolaria geniculata</i> (Allman, 1888), is a deep sea species unlikely to be encountered in shallow water. See Watson & Vervoort (2001).
Zygophylacidae	<i>Cryptolaria*</i> , <i>Zygophylax</i>	Nematothecae and gonothecae aggregated into coppinia or scapus.

Family Aglaopheniidae Marktanner-Turneretscher, 1890

Description Erect branched or unbranched plumose stems. Stems and hydrocladia divided into segments (internodes). Hydrocladia alternate on stem internodes. Hydrotheca more or less saccate, attached at base to hydrocladial internode, margin usually cusped. Three nematothecae attached to each hydrotheca, one tubular median with a terminal orifice, fused to upper wall of hydrotheca and twin laterals, one at each side of hydrotheca. Gonophores containing eggs and sperm, protected by a gonotheca, accessory protective structure (corbula) present in some genera.

Remarks The most graceful and spectacular hydroids in southern Australia belong to the Aglaopheniidae. With almost 60 Australian species, of which about half occur in southern Australia, the Aglaopheniidae includes *Aglaophenia*, *Gymnangium*, *Lytocarpia* and *Macrorhynchia* which differ by the complexity of their reproductive structures.

In the genus *Gymnangium*, the gonothecae are unprotected and borne in a close row along the main stem, in the other genera the gonothecae are further protected by the corbula a basket-like structure, bearing nematothecae and enclosing the gonothecae. In *Macrorhynchia* the corbula comprises only a few curved branches (pseudocorbula); in *Lytocarpia* the corbula usually consists of several leaflets each bearing a basal hydrotheca and a fringe of nematothecae while in *Aglaophenia* the corbula is large and complex, but the leaflets have no hydrothecae at their base.

In the following descriptions it is assumed that the hydrotheca is viewed laterally, that is, laying on its side on a microscope slide so that the marginal cusps (or teeth) along only one side are visible. If the hydrotheca is viewed anteriorly (that is, looking down into the hydrotheca) the cusps will be seen to be in opposite pairs.

Preliminary field identification of many species of the family can be made by observing colony size, structure and colour, and if present, the corbula. Provisional identification is possible by plucking several hydrocladia from a stem and laying them in a drop of water on a glass microscope slide, compressing them gently under a coverslip and then examining them microscopically. The important structures of the hydrocladium, hydrotheca and nematotheca can then be seen. Often however the dense and strongly coloured internal tissue (coenosarc) of this species group obscures diagnostic structures and in this case the coenosarc can be dissolved in a solution of domestic bleach (calcium hypochlorite) diluted in tap water. The specimen is soaked for a few minutes until the darker tissue begins to dissolve, then is quickly transferred to fresh water for a few minutes to wash out the bleach, leaving cleared perisarc behind. Specimens can then be mounted in a drop of water or glycerol under a coverslip on a microscope slide and examined under suitable magnification. For precise identification examination is best done using a compound light microscope.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1605

At least 57 species of Aglaopheniidae are known from Australia (Bax & Gershwin, 2022), 12 of which are likely to be encountered in southeastern Australian and are described below.

***Aglaophenia carinifera* Bale, 1914**

Description Colony of a few stems to 100 mm long. Hydrocladia alternate, to 10 mm long. Hydrotheca elliptical, deep, widening from base to margin, an oblique ridge from floor to top wall. Margin of hydrotheca with a conspicuous bifid (double) cusp at top, margin with three cusps, the first pair the longest.

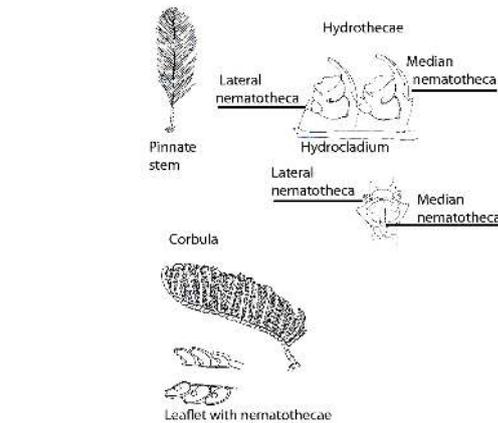


Figure 73. Aglaopheniidae general structure. Illustration: J.E. Watson.

Median nematotheca about two thirds the length of the hydrotheca, straight, lateral nematothecae tubular, protruding beyond hydrothecal margin. Colony colour honey brown.

Remarks Recognition: colonies of a few stems. Watson (2018) suggested that *Aglaophenia carinifera* Bale, 1914 may be synonym of the similar northern

hemisphere species *Lytocarpia crucialis* (Lamouroux, 1816) which also has a bifid hydrotheca rostrum.

Ecology Habitat: deeper ocean reef. Seasonality: unknown.

Distribution Southern Australia.

References Watson (2003, 2005, 2018, as *Lytocarpia carinifera*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284008

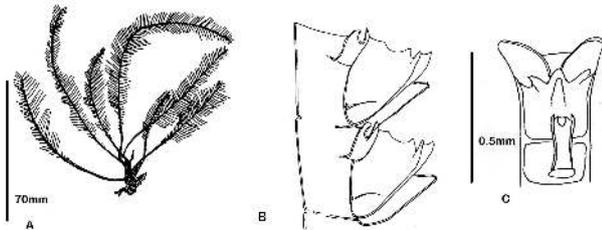


Figure 74. *Aglaophenia carinifera* modified after Watson (2018, figure 11). Illustration: J.E. Watson.

Aglaophenia cystifera Bale, 1915

Description Colonies tall, to 15 cm high, comprising clusters of polysiphonic stems arising from a root-like hydrorhiza. Stems may be branched and rebranched many times resulting in a bushy appearance. Hydrocladia moderately long, held out stiffly from front of branch. Hydrothecae close-set along the hydrocladia, cup-shaped, standing almost upright, a small ridge projecting backwards into the hydrotheca from the base and connecting with another in the hydrocladium below. Margin of hydrotheca with four sharp cusps. Median nematotheca upright, projecting above the hydrotheca, sometimes with a two terminal orifices, twin lateral nematothecae tubular, upright, each with a single orifice pointing forward; a row of large cyst-shaped nematothecae along stems and branches. Gonothecae protected by a long, open corbula of 15-20 pairs of arching leaflets armed with nematothecae. Colour: honey brown, corbula brown, gonothecae cream.

Remarks Recognition: large much branched honey-brown colonies with long corbulae.

Ecology Habitat: ocean reefs in good water flow. Seasonality: colonies grow from late spring to winter, fertile in autumn.

Distribution Endemic to southern Australia.

References Watson (2003, 2005, as *Aglaophenia divaricata cystifera* Bale, 1915).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284020



Figure 75. *Aglaophenia cystifera*. Photograph: J.E. Watson.

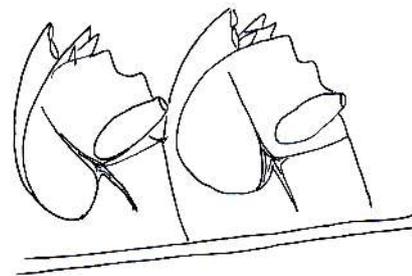


Figure 76. *Aglaophenia cystifera*. Illustration: J.E. Watson.

Aglaophenia divaricata (Busk, 1852)

Description Colonies usually large, comprising clusters of stems to 20 cm high borne on a mass of hydrorhizal tubes. Lower stems polysiphonic, bare, upper stems profusely branched forming a plumose canopy. Hydrocladia borne on front of stem and branches. Hydrotheca cup-shaped, almost upright, a small ridge projecting backwards into hydrotheca from its floor, connecting with one passing down into the hydrocladium. Margin of hydrotheca with three sharp cusps and a sharp median cusp at top. Median nematotheca upright, projecting above hydrotheca, twin lateral nematothecae tubular, upright, each with a single orifice pointing forward to level of hydrothecal margin. Gonothecae protected by an open corbula of 15-20 pairs of arching leaflets armed with nematothe-

cae. Note: While colonies of *Aglaophenia divaricata* are easily distinguished from *Aglaophenia cystifera* in the field, they are so similar microscopically that only very careful study and molecular (DNA) analysis can separate the two. Colour: colony charcoal grey to almost black, corbula black, gonothecae cream to black.

Remarks Recognition: large charcoal-grey to black plumose colonies. Distinguished from *Aglaophenia plumosa* by cusps on hydrothecal margin.

Ecology Habitat: common on deeper ocean reefs. Seasonality: colonies present throughout most of year, and fertile in autumn to winter.

Distribution Endemic to southern Australia.

References Watson (2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284020



Figure 77. *Aglaophenia divaricata*. Photograph: J.E. Watson.

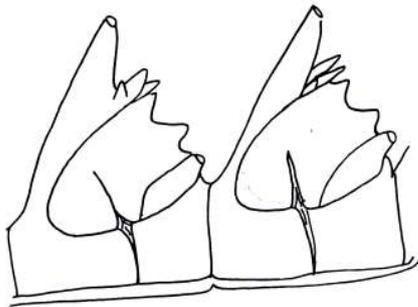


Figure 78. *Aglaophenia divaricata*. Illustration: J.E. Watson.

***Aglaophenia parvula* Bale, 1882**

Description Hydrorhiza creeping. Lower stems bare, monosiphonic, flexuous, upper stem plumosely branched, hydrocladia on branches short. Hydrotheca

cup-shaped, base flattened, an internal ridge passing up into hydrotheca from its base, connecting with a ridge down into the hydrocladium. Margin of hydrotheca deeply indented with four sharp cusps and a sharper cusp at top. Median nematotheca short, finger-shaped, reaching to margin of hydrotheca, twin lateral nematothecae tubular, bent sharply forward towards hydrothecal margin. Corbula closed, short and plump, leaflets armed with long nematothecae. Colour: stems and corbula variable greyish to yellowish brown, gonophores cream to pink.

Remarks Recognition: lax greyish to greenish brown colonies with abundant cream-coloured corbulae.

Ecology Habitat: on sponges and other invertebrates in sheltered embayments, often abundant below low water mark on jetty piles. Seasonality: colonies grow and become fertile spring to late summer.

Distribution Endemic to southern Australia.

References Watson (1994b).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117281



Figure 79. *Aglaophenia parvula*. Photograph: J.E. Watson.

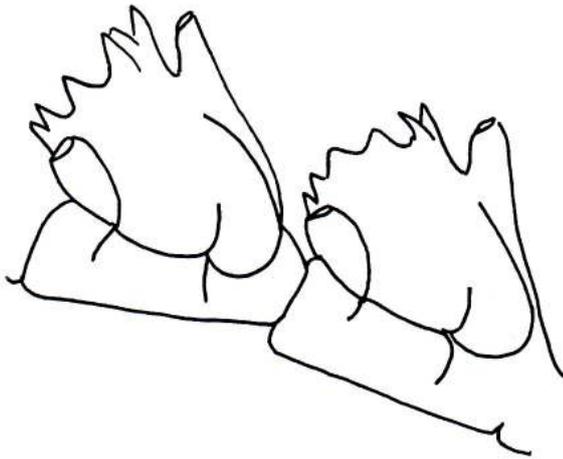


Figure 80. *Aglaophenia parvula*. Illustration: J.E. Watson.



Figure 81. *Aglaophenia plumosa*. Crawfish Rock, Western Port. Photograph: J.E. Watson.

Aglaophenia plumosa Bale, 1882

Description Plumose monosiphonic stems up to 5 cm high growing from a creeping hydrorhiza. Hydrocladia long, gracefully arched. Hydrotheca saccate, bent upwards, base laying flat along hydrocladium, a faint ridge passing upward into hydrotheca from base, connecting with a ridge down into the hydrocladium. Margin of hydrotheca a broad lobe with a sharp cusp at top. Median nematotheca projecting only a little above hydrotheca, twin laterals upright, with one small orifice, projecting beyond margin of hydrotheca. Gonothecae protected by an open corbula comprising 15-20 pairs of leaflets armed with long nematothecae. Colour: colony and corbula pale grey, gonothecae white to cream.

Remarks Recognition: greyish plumose colonies.

Ecology Habitat: on sponges and compound ascidians in sheltered waters. Seasonality: grows and becomes fertile in autumn to winter.

Distribution Sheltered southern Australian embayments and New Zealand.

References Watson (1973, 1975).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284020

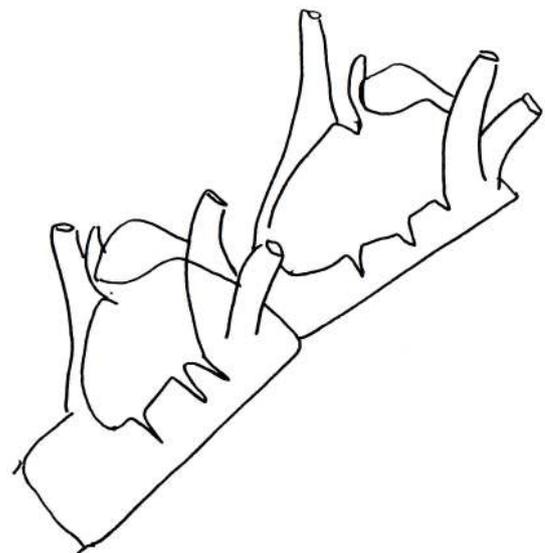


Figure 82. *Aglaophenia plumosa*. Illustration: J.E. Watson.

Aglaophenia sinuosa Bale, 1888

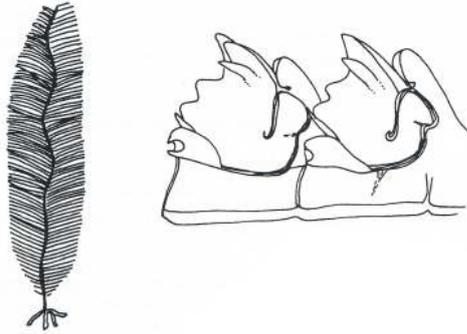


Figure 83. *Aglaophenia sinuosa*. Illustration: J.E. Watson.

Description "Flabellate colony of eight stems to 60 mm long with one corbula, hydrorhiza reptant on worm tube. Stems monosiphonic, subdichotomously branched once or twice, lower stem region and base of branches ahydrocladiate. Stem and branch internodes short, stout, nodes indistinct, transverse to weakly oblique. Hydrocladia to 10 mm long. Hydrotheca short, saccate, set at an angle of 20–30° to hydrocladial axis, widening from base to margin, abcauline wall straight, adcauline wall adnate to hydrocladium, shallowly convex, two intrathecal septa, one short, oblique in hydrotheca from near posterior base, the other long, strong, curving slightly forwards more than halfway into hydrotheca below base of median nematotheca, terminating in a strong twist of perisarc. Hydrothecal margin with a pointed bifid anterior rostrum flanked by three pairs of bluntly pointed cusps. Median nematotheca tubular, short, terminating in a short free section behind intrathecal septum, terminal orifice circular. Lateral nematotheca large, saccate, orifice circular, excavated back to hydrotheca, a short septum passing into nematotheca about halfway along adcauline wall. Two cauline nematothecae, one below hydrocladium, the other opposite axil of apophysis, body almost divided in two by septum, each section saccate with a small outwardly facing almost circular orifice. Corbula closed, with up to 10 leaflets, replacing a hydrocladium, first hydrocladial internode hydrothecate, leaflet with six to eight saccate marginal nematothecae with a keyhole-shaped orifice. Colour, honey brown (preserved material)." Watson (2018, p. 19).

Remarks *Aglaophenia bakeri* Bale, 1919 was made a junior synonym of this species by Watson (2018).

Ecology Shelf depths, 59–158 m.

Distribution Queensland and southeastern Australia

including Great Australian Bight, Lord Howe and Norfolk Islands.

References Vervoort & Watson (2003); Watson (1994b, 2018).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284053

Aglaophenia whiteleggei Bale, 1888

Description Colonies large and showy, comprising several polysiphonic stems up to 20 cm high arising from a root-like hydrorhiza. Lower stems unbranched, upper stems branched in a feathery plumose canopy. Hydrocladia long, on front of branches. Hydrotheca elongate, laying along hydrocladium, posterior end narrow, margin facing upward, an internal ridge passing vertically through the hydrotheca, margin with three pairs of lobate cusps. Median nematotheca narrow, projecting above hydrotheca, twin laterals long, tubular, with a circular terminal orifice level with hydrothecal margin. Gonothecae lenticular, a few on branches, protected by one or two curved ribs armed with nematocysts. Colour: colony silvery white.

Remarks Recognition: large silvery-white plumose colonies.

Ecology Habitat: ocean reefs in good water flow. Seasonality: late winter to early summer, fertile in winter.

Distribution Endemic to southern Australia, common at Port Phillip Heads.

References Watson (2011a, as *Macrorhynchia whiteleggei*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284062



Figure 84. *Aglaophenia whiteleggei*. Photograph: J.E. Watson.



Figure 85. *Aglaophenia whiteleggei*, close-up. Photograph: Andrew Newton.

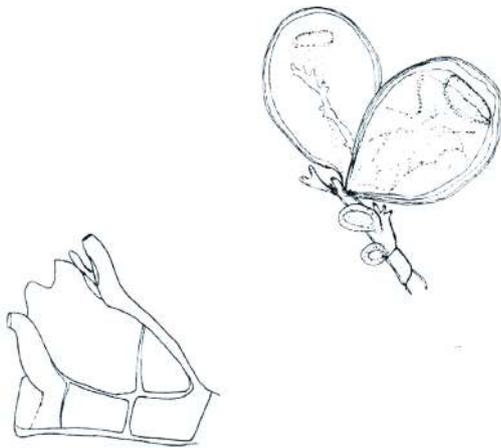


Figure 86. *Aglaophenia whiteleggei*. Illustration: J.E. Watson.

Gymnangium ascidioides Bale, 1882

Description Stems up to 10 cm high, single, pinnate, monosiphonic, unbranched, arising from tough hydrorhizal stolons. Hydrocladia long, hydrothecae close-set along hydrocladium, facing upward, a distinct ridge passing down from upper wall to middle of hydrotheca. Margin with two long inwardly bent cusps and a single long, inwardly bent cusp at top. Median nematotheca long, slender, bent abruptly forward over margin of hydrotheca, twin lateral nematothecae saccate with two orifices, one facing upwards to margin of hydrotheca and the other facing down. Gonotheca small, triangular, borne in a tight row along stem. Colour: colony deep amber brown, gonotheca cream.

Remarks Recognition: amber-brown plumes, deep cusps and long median nematotheca on margin of hy-

drotheca.

Ecology Habitat: deep ocean reefs in good current flow. Seasonality: colonies grow all year, fertile in late summer.

Distribution Southern Australia, New Zealand.

References Watson (2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284115



Figure 87. *Gymnangium ascidioides*. Popes Eye reef, Port Phillip Bay, 10 m. Photograph: J.E. Watson.

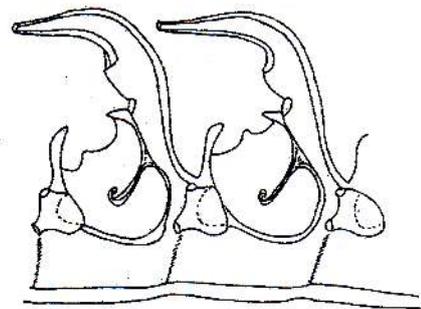


Figure 88. *Gymnangium ascidioides*. Illustration: J.E. Watson.

Gymnangium aureum (Watson, 1973)

Description Hydrorhiza tough and root-like. Colony a cluster of pinnate monosiphonic stems to 10 cm high. Stems single or sparsely branched in one plane. Hydrothecae crowded along hydrocladium, saccate,

upper wall with a deep ridge passing down into hydrotheca, margin facing upward with three prominent cusps the middle one the longest. Median nematotheca long, projecting well above hydrotheca, twin lateral nematothecae saccate, small, with two forward-facing orifices, not reaching hydrothecal margin. Gonothecae small, oval, flattened, in a row along stem. Colour: golden to amber, gonothecae flesh-coloured.

Remarks Recognition: sparsely branched amber coloured colonies. Distinguished from *Gymnangium ascidioides* by the shape of the hydrotheca.

Ecology Habitat: deep reefs in strong current flow. Seasonality: colonies present throughout year, fertile in summer.

Distribution Endemic to southern Australia.

References Watson (1973, as *Halicornaria aurea*). Watson (2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284116



Figure 89. *Gymnangium aureum*. Lonsdale Wall, Port Phillip Bay, 20 m. Photograph: J.E. Watson.

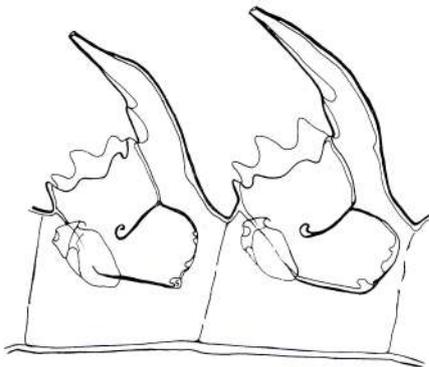


Figure 90. *Gymnangium aureum*. Illustration: J.E. Watson.

Gymnangium baileyi (Bale, 1884)

Description Hydrocaulus monosiphonic, 5-7 cm in height, branched; pinnae not close, alternate or sub-alternate, two on each internode. moth series directed forward. Hydrothecae sub-cylindrical, broader near the base, set at an angle of about 60°, and facing towards the front; a strong intrathecal ridge proceeding from the middle of the front of the cell obliquely downwards to about its centre; aperture with a small central tooth in front, and a broad free rounded lobe behind, three teeth on each side, the centre one large and pointed, everted horizontally, the other two often obsolete; aperture between cell and pinna with one or two minute slender denticles. Hydrothecal internode without constrictions. Mesial sarcotheca rising from the pinna, adnate to the front of the hydrotheca as far as the margin, free part about half as long as the hydrotheca, tapering, curved forward; terminal and lateral apertures distinct. Lateral sarcothecae adnate, saccate, with two circular apertures, one directed forwards, the other upwards, both more or less confluent with the wide lateral aperture. Cauline sarcothecae similar to the laterals; two on the stem in front, and one behind each pinna. Gonothecae unknown. Colour deep reddish brown. (from (Bale, 1884, pp. 177-178))

Remarks *Gymnangium furcatum* (Bale, 1884) is considered a junior synonym of *G. baileyi* by Vervoort *et al.* (2000-2007).

Distribution Endemic to southern and south-eastern Australia.

References Watson (1997, as *Gymnangium furcatum*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1444882

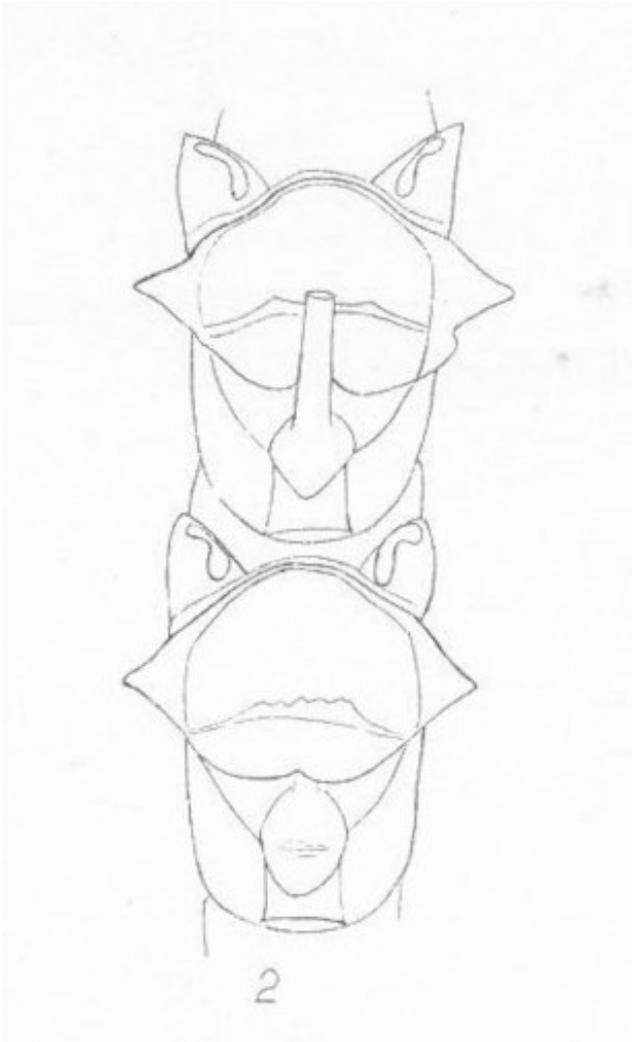


Figure 91. *Gymnangium baileyi* from (Bale, 1884, Plate XVI figure 2)

Gymnangium humile (Bale, 1884)

Description "Stems or hydrocladia, arise from a stolon creeping on the back of the host stem, stems and hydrocladial shoots usually occur between the hydrocladia of the host. Stem divided into distinct internodes by transverse septa; each internode with one almost terminal apophysis; apophyses alternately directed left or right. Each apophysis with three nematothecae: two on the front and one on back; nematothecae ovoid and with two terminal, circular apertures. Hydrocladia composed of 5–10 slender internodes separated by well marked transverse nodes. Hydrothecae fairly deep and slightly narrowing basally; hydropore in flat base of hydrotheca. Abcauline wall with a weakly developed carina running into a blunt but distinct median cusp. Hydrothecal rim with three pairs of cusps of which the abcauline pair best developed; the third, adcauline pair almost hidden by the lateral nematothecae. Marginal cusps blunt, separated by

shallow, rounded embayments. Median nematotheca basally in open contact with basal part of internode, following abcauline hydrothecal wall, but becoming free and curving smoothly upwards, over-reaching level of distal node by one-third of length of free part. Median nematotheca with circular foramen above junction with hydrothecal wall and a circular aperture at apex. Free, curved part of nematotheca narrowing only slightly and gradually. Lateral nematothecae with a single, downwardly directed, circular aperture on a neck and a large, oval foramen for communication with the internode. The median nematotheca in the hydrothecae of hydrocladia rising directly from the stolon is usually shorter. Gonothecae unknown." (Vervoort & Watson, 2003, p. 293).

Remarks Similar to *Gymnangium longirostre* (Kirchenpauer, 1872) but distinguished by shape of the hydrothecae and the median nematotheca (Vervoort & Watson, 2003, p. 293).

Ecology Epizooic on species of *Gymnangium* and *Aglaophenia*, shallow water to 59 m deep.

Distribution Victoria, NSW, Tasman Sea.

References Vervoort & Watson (2003).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284125

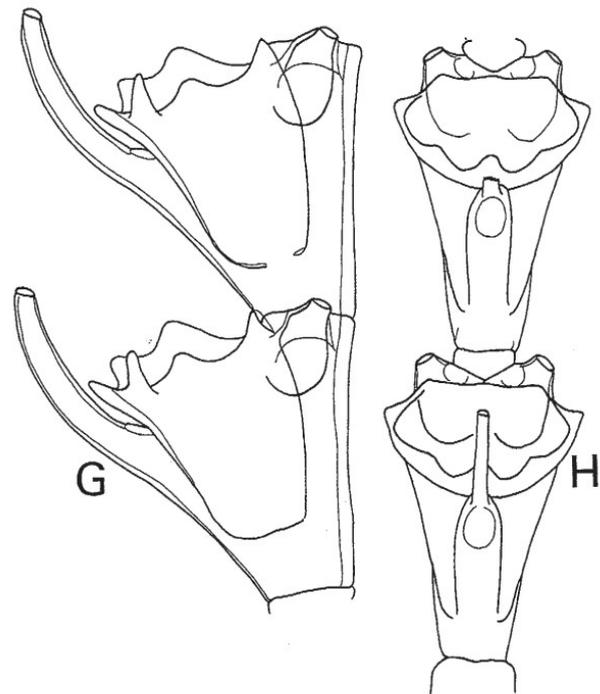


Figure 92. *Gymnangium humile* pair of hydrocladial hydrothecae: G lateral view H, frontal view (Lord Howe Island specimen, from (Vervoort & Watson, 2003, figure 69 G, H).

Gymnangium ilicistomum (Bale, 1882)

Description Colonies consisting of up to 10 lax, plumose, unbranched monosiphonic stems to 5 cm high, growing from a creeping hydrorhiza. Hydrocladia set densely along stem. Hydrothecae close-set along hydrocladia, cup-shaped, facing obliquely upward, margin with a large incurved cusp at top and six smaller cusps, some incurved, others everted. Median nematotheca long, curved over hydrotheca, lateral nematothecae small, saccate with a small orifice. Gonothecae small triangular capsules in a double row along stem. Colour: pale greyish white.

Remarks Recognition: small lax greyish colonies usually of a few stems.

Seasonality: colonies grow late summer to winter, fertile in winter.

Distribution Endemic to southern Australia.

References Watson (1994b, 2005).

Nomenclature https://biodiversity.org.au/afd/taxa/Gymnangium_ilicistomum



Figure 93. *Gymnangium ilicistomum*. Popes Eye reef, Port Phillip Bay, 6 m. Photograph: Andrew Newton.

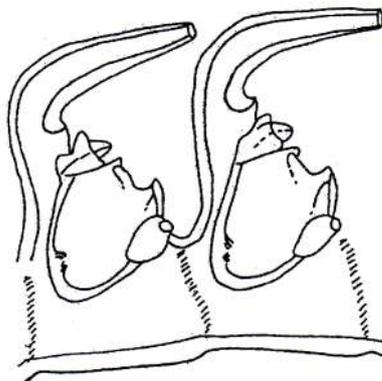


Figure 94. *Gymnangium ilicistomum*. Illustration: J.E. Watson.

Gymnangium longirostre (Kirchenpauer, 1876)

Description Hydorhiza of thin stolons growing along stems of another hydroid. Colonies comprising unbranched plumose stems up to 5 cm high. Hydrocladia close-set along stem, hydrothecae cup-shaped, narrow at base, facing obliquely upwards, margin with three long cusps and one long incurved cusp at top. Median nematotheca very long and thin, arching well over hydrotheca, twin lateral nematothecae small, saccate, with a small orifice on a short, outwardly facing tubular neck. Gonothecae small, button-shaped, borne in a row along stem. Colour: colonies pale greyish-white.

Remarks Recognition: short, delicate greyish-white plumes on other hydroids.

Ecology Habitat: usually on larger aglaopheniid hydroids; rarely on other invertebrates. Seasonality: colonies present most of year, fertile in spring to late summer.

Distribution Southern Australia, New Zealand.

References Watson (1973, 1975, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284131

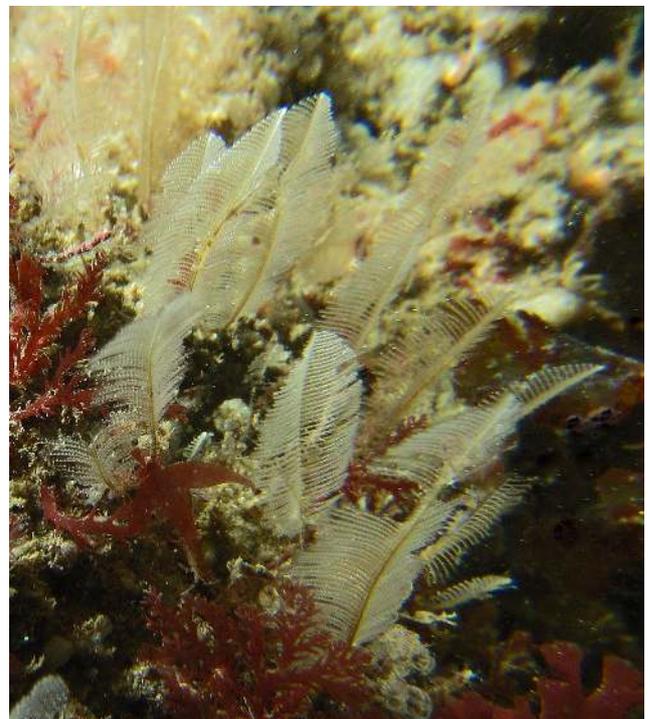


Figure 95. *Gymnangium longirostre*. Photograph: J.E. Watson.

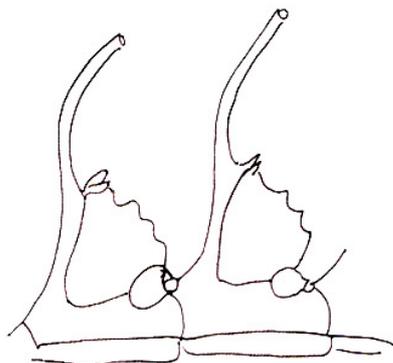


Figure 96. *Gymnangium longirostre*. Illustration: J.E. Watson.



Figure 97. *Gymnangium prolifer*. Popes Eye, Port Phillip Bay, 4 m. Photograph: J.E. Watson.

Gymnangium prolifer (Bale, 1882)

Description Colonies consisting of many monosiphonic plumes up to 15 cm long from a hydrorhiza of tough root-like stolons. Colonies of long unbranched to sparsely branched stems. Hydrocladia long, hydrothecae close-set along hydrocladium, cup-shaped, facing obliquely upward, margin with three shallow cusps and one long, sharp cusp at top. Median nematotheca moderately long, extending beyond the hydrotheca, twin laterals large, saccate with a downwardly facing tubular orifice. Gonothecae button-shaped, borne in a row along stem. Colour: colonies variable in colour from greyish-brown to honey-brown.

Remarks Recognition: tall greyish to brown plumes with harsh texture.

Ecology Habitat: ocean reefs in good water flow. Seasonality: colonies present throughout the year, fertile spring to summer.

Distribution Southern Australia, New Zealand.

References Watson (1973, as *Halicornaria prolifer*), Watson (2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284135

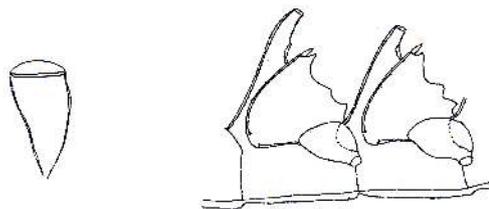


Figure 98. *Gymnangium prolifer*. Illustration: J.E. Watson.

Gymnangium superbum (Bale, 1882)

Description Colonies comprising tufts of unbranched monosiphonic plumes to 10 cm high arising from thick tubular hydrorhizal stolons. Hydrocladia long, closely alternate along stem segments. Hydrothecae close-set along hydrocladium, saccate, facing obliquely upwards, a ridge passing downward into hydrotheca from its upper wall almost dividing hydrotheca in two. Margin of hydrotheca with three moderately sharp cusps. Median nematotheca very long, arching over hydrotheca, twin laterals small, saccate, not reaching margin of hydrotheca, with two small orifices one facing forward and the other upward. Gonothecae small, button-shaped, borne in a row along main stem. Colour: colonies yellowish to greenish-brown, colour often becoming lighter in colour from the base to tip

of stem, gonothecae creamy white.

Remarks Recognition: graceful pale coloured plumes; sometimes exudes mucus when removed from the water.

Ecology Habitat: ocean reefs in good water flow. Seasonality: colonies present throughout year, fertile in summer.

Distribution Endemic to southern Australia.

References Watson (2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284140



Figure 99. *Gymnangium superbum*. Photograph: J.E. Watson.

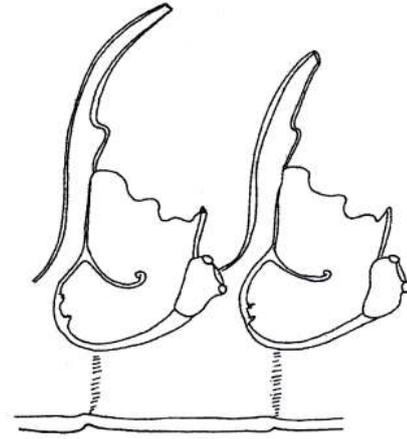


Figure 100. *Gymnangium superbum*. Illustration: J.E. Watson.

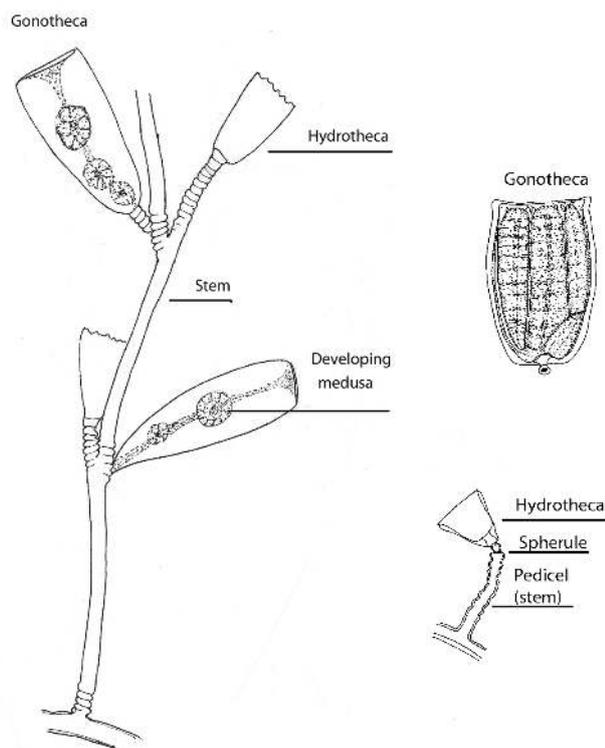


Figure 101. Campanulariidae general structure. Illustration: J.E. Watson.

Family Campanulariidae Johnston, 1836

Description Hydroids with a simple bell-shaped (campanulate) hydrotheca without an operculum. Margin of hydrotheca may be smooth, crenulated or cusped. Gonophores may be eumedusae or free swimming medusae.

Remarks Hydroids of the family Campanulariidae are distributed world-wide. Many species form large, spreading colonies of many simple stems while other species form large, lacy, multi-branched colonies. Medusae range in structure from primitive eumedusoids that can swim only feebly to fully formed free-swimming medusae.

The definition of some genera in the family is still disputed by some authorities. The most common genera found in southern Australia include: *Campanularia* (including members of the no longer recognised genus *Paracalix*), *Clytia*, *Orthopyxis*, *Silicularia* and *Obelia*. Microscopic examination is usually required to distinguish genera:

Campanularia – The almost conical hydrotheca is bent in the middle.

Clytia – Distinguished (microscopically) in having no spherule (spherical supporting structure) between the stem and the hydrotheca.

Obelia – Colonies usually branched, hydrotheca bell-shaped (campanulate), without a spherule between the stem and hydrotheca. Hydrotheca with a distinct diaphragm (internal transverse sheet of tissue) just above the base of hydrotheca.

Orthopyxis – Distinguished microscopically by lateral flattening of the hydrotheca the perisarc of the hydrothecal wall being thicker on one side than the other. A spherule of perisarc between stem and hydrotheca

Silicularia – Distinguished from *Orthopyxis* by the lop-sided hydrothecal wall, one side being shorter than the other.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1606

At least 36 species of Campanulariidae are known from Australia (Bax & Gershwin, 2022), 12 of which are likely to be encountered in southeastern Australian and are described below.

***Campanularia ambiplica* Mulder & Trebilcock, 1914**

Description Hydrorhiza creeping on substrate. Stems undulated to smooth. Hydrotheca deeply campanulate, a distinct bend in wall about halfway along length, often seen as one or two transverse lines across hydrotheca. Hydrothecal margin with 8-10 tongue-shaped cusps. Gonotheca large, lenticular in shape, borne on hydrorhiza, walls thick, slightly undulated, with a large circular terminal aperture. Colour: transparent white.

Remarks Recognition: sinuous bend in the hydrotheca.

Ecology Habitat: usually on red algae. Seasonality: colonies grow and become fertile in summer.

Distribution Endemic to southern Australia: South Australia, Tasmania, Victoria, Western Australia.

References Watson (1973, 1975), Watson (1997, as *Paracalyx ambiplica*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284308

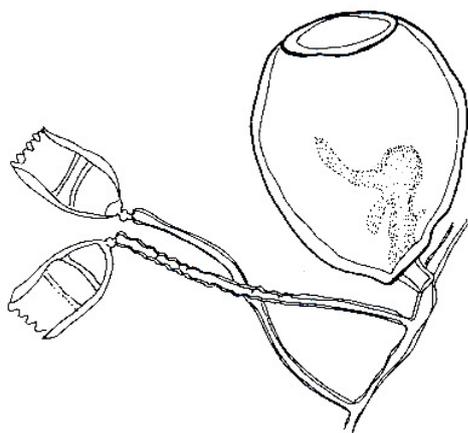


Figure 102. *Campanularia ambiplica*. Illustration: J.E. Watson.

***Clytia hemisphaerica* (Linnaeus, 1767)**

Description Colonies of a few to many usually unbranched stems to 5 mm high arising from a creeping hydrorhiza. Stems erect, annulated at base and below a small, campanulate hydrotheca at top of stem. Hydrotheca with a diaphragm, margin deeply cusped. Gonothecae borne on hydrorhiza, barrel-shaped, larger than hydrotheca, smooth to faintly corrugated, containing several developing medusae, the most mature at top. Medusa free swimming saucer-shaped, less than 1 mm in diameter with a fringe of short tentacles and a small mouth (manubrium) in the centre of the bell. Medusae swim jerkily inside-out. Colour:

hydroid and medusa transparent, colourless.

Remarks Recognition: tiny stems on substrate. Several small species are similar in structure and can only be distinguished from *Clytia hemisphaerica* with microscopic examination of the margin of the hydrotheca.

Ecology Habitat: on invertebrates and algae, usually in sheltered situations. Seasonality: colonies grow and are fertile most of year.

Distribution Cosmopolitan, occurs world-wide, common in ports. Australian records from Queensland, South Australia, Tasmania, Victoria, Western Australia.

References Watson (1994b, 2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117368

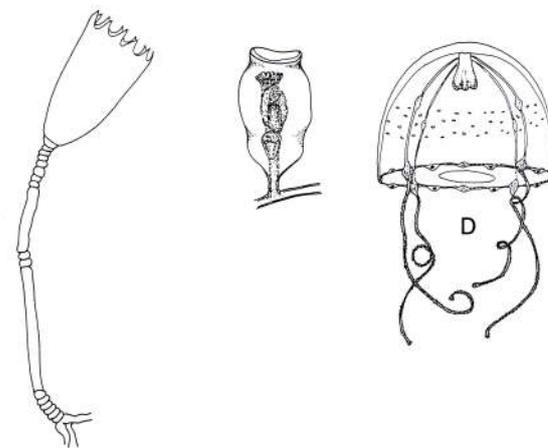


Figure 103. *Clytia hemisphaerica*. Illustration: J.E. Watson.

***Clytia paulensis* (Vanhöffen, 1910)**

Description Colonies comprising a few to many unbranched stems to 4 mm high arising from a creeping hydrorhiza. Stem of hydrotheca annulated at the base and below hydrotheca. Hydrotheca deeply conical, aperture with six pairs of bidentate cusps (cusp with two points separated by a deep U-shaped indentation, and a faint pleat passing down into the hydrotheca from the cusps). Gonothecae borne on the hydrorhiza, barrel-shaped, walls smooth, containing several developing medusae. Structure of the medusa unknown. Colour: hydroid and medusa transparent colourless.

Remarks Recognition: small colonies with faint longitudinal pleats on hydrotheca.

Ecology Habitat: grows on other hydroids and invertebrates. Seasonality: colonies grow and become fertile over summer.

Distribution World-wide including southern Australia.

References Watson (1994a, 1996).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117373

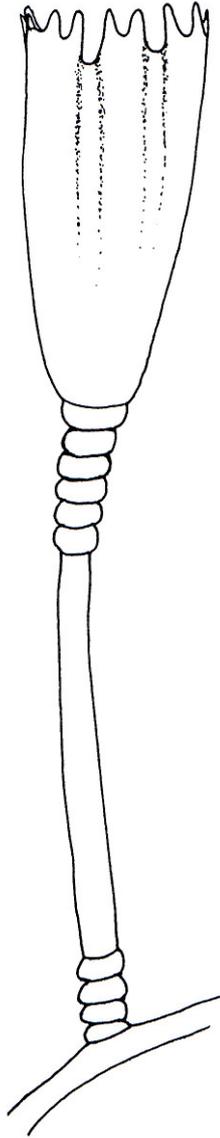


Figure 104. *Clytia paulensis*. Illustration: J.E. Watson.

***Clytia thornelyi* (Nutting, 1927)**

Description Hydrorhiza creeping on substrate, stems irregularly branched, to 15 mm high, hydrotheca on stems on on branches, each stem with about 10 deep annulations at base and several annulations below the hydrotheca. Hydrotheca campanulate, margin with about 14 shallowly scalloped cusps. Gonotheca and medusa unknown. Colour: transparent white.

Remarks Previously known as *Clytia stolonifera* Blackburn, 1938. Recognition: small, lax, branched, almost

transparent colonies.

Ecology Habitat: on seagrass and invertebrates. Seasonality: spring to summer.

Distribution Southern Australia and Indian Ocean.

References Watson (1996, 2005, as *Clytia stolonifera*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=536897

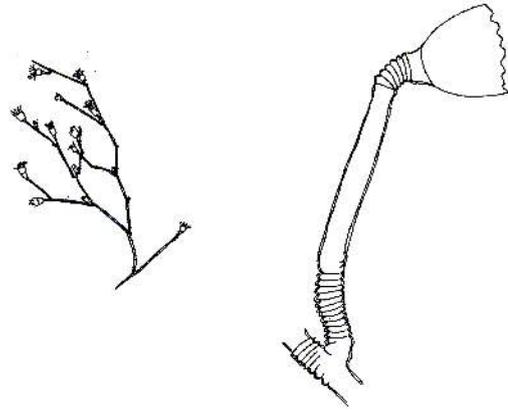


Figure 105. *Clytia thornelyi*. Illustration: J.E. Watson.

***Obelia dichotoma* (Linnaeus, 1758)**

Description Stems branched, often to 6 cm high, growing in lacy masses from a tubular hydrorhiza. Hydrothecae small, borne on short stalks on stems (pedicels) and branches. Pedicels smooth, annulated at base and below hydrotheca. Hydrotheca conical, margin circular, smooth. Gonotheca vase-shaped with a raised collar at top and containing many developing medusae, the oldest at top preparing to escape. Medusa very small at release, saucer-shaped with a fringe of short tentacles, swimming jerkily inside-out. Colour: colonies greyish white, older stems brownish, medusa transparent white.

Remarks Recognition: thick lacy white colonies with conical hydrothecae.

Ecology Habitat: on hard surfaces and invertebrates in shallow water, often on jetty piles. A common fouling species of mussel farms in Port Phillip. Seasonality: colonies grow from late summer and become mature in winter.

Distribution world-wide in temperate waters. New South Wales, Queensland, Tasmania, Victoria, common in southern Australia.

References Watson (2002, as *Obelia angulosa*), Watson (2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117386



Figure 106. *Obelia dichotoma*. Photograph: J.E. Watson.



Figure 107. *Obelia dichotoma* juvenile. Photograph: J.E. Watson.

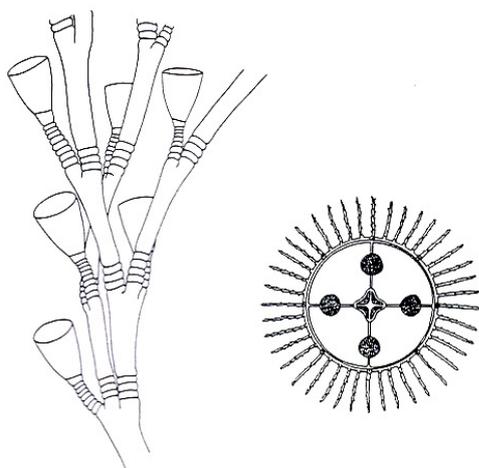


Figure 108. *Obelia dichotoma*. Illustration: J.E. Watson.

***Obelia geniculata* (Linnaeus, 1758)**

Description Colonies of many stems to 10 mm high attached to a creeping hydrorhiza. Stems unbranched, stem segments slightly zigzag, a short pedicel at top of each segment with one hydrotheca. Hydrotheca widely conical, margin circular. Gonothecae borne on stem below hydrothecae, urn-shaped with small tubular neck at top and containing many developing medusae. Medusa at release small, saucer-shaped with a fringe of short tentacles; swimming jerkily inside out. Colour: colourless to yellowish white, medusa colourless. Colonies bioluminesce blue if brushed at night.

Remarks Recognition: short stems with zigzag segments on brown algae.

Ecology Habitat: on fronds of the brown kelps *Phyllospora comosa*, *Macrocystis pyrifera*, *Ecklonia radiata* and *Sargassum*, always associated with brown algae. Seasonality: colonies grow and become fertile over summer.

Distribution World-wide including New South Wales, South Australia, Tasmania, Victoria, Western Australia.

References Watson (1994b, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117388



Figure 109. *Obelia geniculata*. Photograph: Andrew Newton.

***Obelia spongicola* Watson, 2011**

Description Hydrorhiza of thin, slender tubes, loosely adherent to sponges, supporting single hydrothecae or short, sparsely branched stems to 2 mm high. Hydrothecal stems (pedicels) ringed at the base and below hydrotheca. Hydrotheca conical, margin with 20-24 sharp cuspis arranged in pairs. Gonothecae borne on branches, urn-shaped, with circular aperture at top, containing several developing medusae. Medusae with a fringe of short tentacles, jerkily free-swimming at release. Colour: transparent white, medusa colourless.

Remarks Recognition: fuzzy fragile colonies on soft,

usually yellow or orange coloured sponges.

Ecology Habitat: on soft textured sponges in sheltered environments. Seasonality: colonies throughout year, fertile in summer.

Distribution southern Australia.

References Watson (2011a).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=590359



Figure 110. *Obelia spongicola*. Photograph: J.E. Watson.

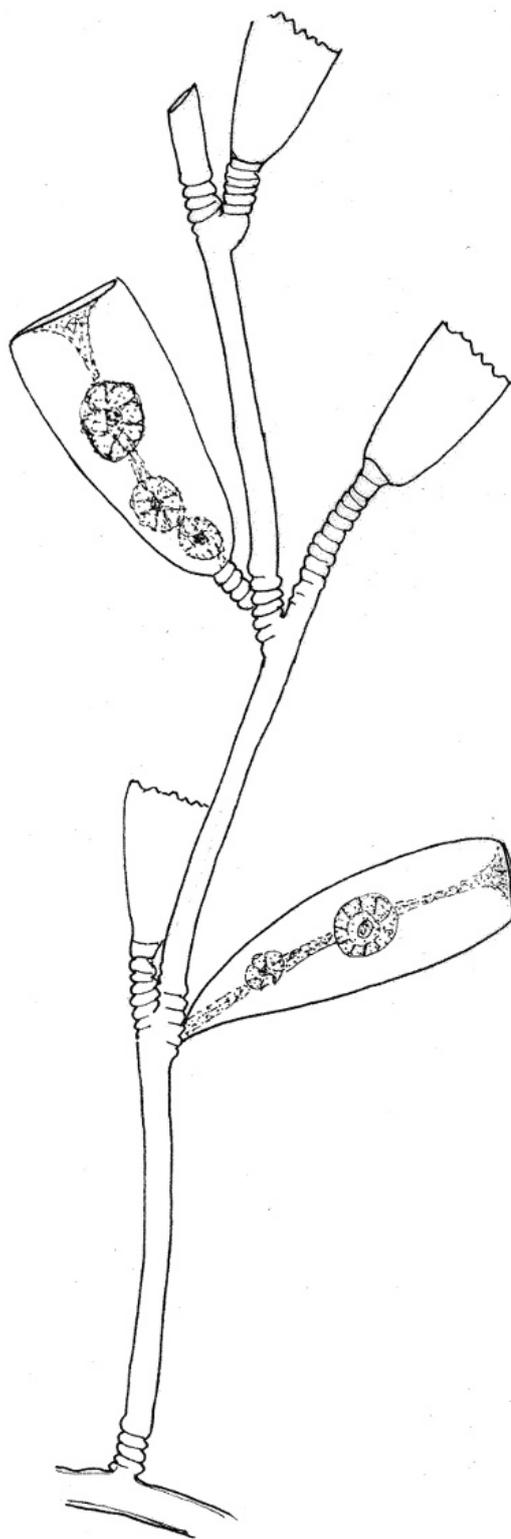


Figure 111. *Obelia spongicola*. Illustration: J.E. Watson.

Orthopyxis angulata Bale, 1919

Description Many single smooth stems to 3 mm high arise from a flat ribbon-like hydrorhiza. Hydrotheca campanulate, walls conspicuously thickened in one plane, a spherule between stem and hydrotheca. Hydrothecal margin faintly scalloped to smooth. Gonothecha larger than hydrotheca, borne on hydrorhiza, irregularly ovate, flattened to substrate, aperture terminal with a blunt spine at each side, female gonophore a primitive eumedusa with rows of eggs. Colour: colony white, gonothecha cream to white.

Remarks Recognition: the smooth stems distinguish it from *Orthopyxis caliculata*.

Ecology Habitat: on brown kelps in moderate shelter. Seasonality: colonies grow rapidly, fertile in summer.

Distribution Western Australia, South-eastern Australia, endemic to southern Australia.

References Watson (2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=754505

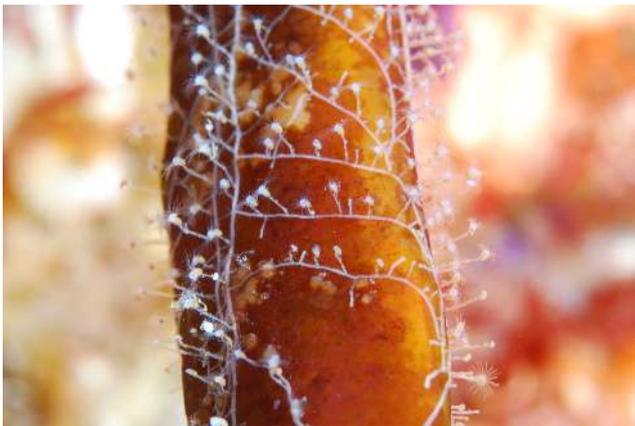


Figure 112. *Orthopyxis angulata*. Photograph: J.E. Watson.

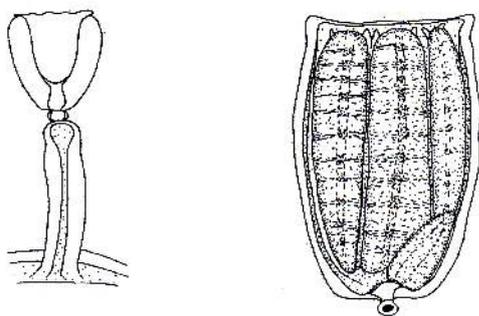


Figure 113. *Orthopyxis angulata*. Illustration: J.E. Watson.

Orthopyxis caliculata (Hincks, 1853)

Description Many single smooth stems to 3 mm high arise from a flat ribbon-like hydrorhiza loosely adherent to substrate. Stems spirally annulated throughout their length, a spherule between stem and hydrotheca. Hydrotheca campanulate, walls thickened in one plane, margin smooth. Gonothecha larger than hydrotheca, ovate, flattened on substrate. Female gonophore a primitive eumedusa with eggs. Colour: colonies transparent white, gonophores cream.

Remarks Recognition: spirally annulated pedicels which distinguish it from *Orthopyxis angulata*.

Ecology Habitat: on algae and invertebrates in moderate shelter. Seasonality: colonies grow rapidly and fertile spring to summer.

Distribution Tasmania, Victoria, Western Australia, endemic to southern Australia.

References Watson (1975, 2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=220580



Figure 114. *Orthopyxis caliculata*. Photograph: J.E. Watson.

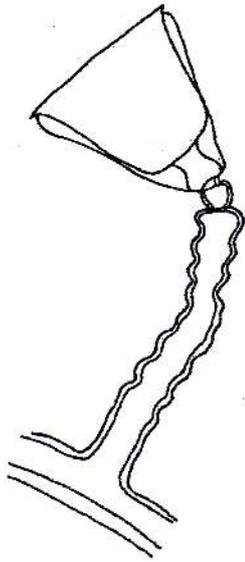


Figure 115. *Orthopyxis caliculata*. Illustration: J.E. Watson.

***Orthopyxis crenata* (Hartlaub, 1901)**

Description Hydrohiza creeping, firmly adherent to substrate. Single stems to 1 mm high arising along hydrohiza, faintly to distinctly corrugated. Hydrothecae small, campanulate, slightly flattened, marginal rim scalloped. Gonotheca larger than hydrotheca, ovoid, flattened on hydrohiza, female gonophore a primitive eumedusa with rows of eggs. Colour: colony white, gonophores cream.

Remarks Recognition: small hydrothecae with a scalloped margin.

Ecology Habitat: on other hydroids, invertebrates and algae. Seasonality: colonies grow and become fertile in summer.

Distribution southern Australia in sheltered bays and ocean: South Australia, Tasmania, Victoria, Western Australia.

References Watson (2003, 2005), Watson (1997, as *Campanularia delicata*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117391

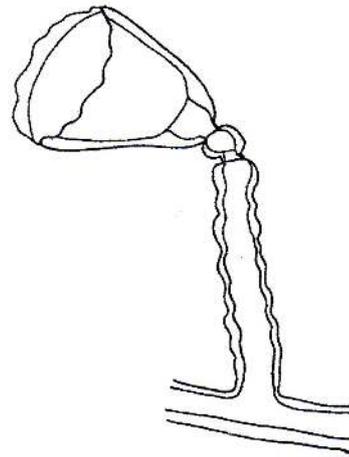


Figure 116. *Orthopyxis crenata*. Illustration: J.E. Watson.

***Silicularia rosea* Meyen, 1834**

Description Hydrohiza ribbon-like, firmly attached to substrate. Many hydrothecae along hydrohiza, stems short, smooth, a spherule between stem and hydrotheca. Hydrotheca with markedly thickened walls, one wall shorter and thicker than the other imparting a lopsided appearance, margin sloping so that hydranth is not completely retractable into hydrotheca. Female gonotheca tall, irregularly conical with a circular terminal aperture, male gonotheca smaller. Female gonophore releases a larva. Colour: colonies white.

Remarks Recognition: large lopsided hydrothecae on a smooth stem.

Ecology Seasonality: colonies grow and become fertile over summer. Habitat: on the large brown ocean kelps *Phyllospora comosa* and *Macrocystis pyrifera*.

Distribution south-eastern Australia, southern New Zealand and Antarctic.

References Watson (1975).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=225738

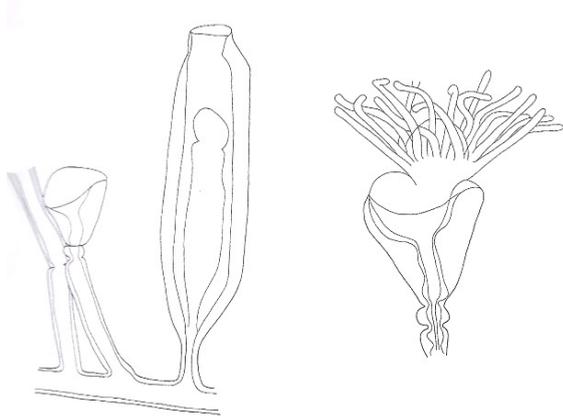


Figure 117. *Silicularia rosea*. Illustration: J.E. Watson.

***Silicularia undulata* (Mulder & Trebilcock, 1914)**

Description Hydrorhiza ribbon-like, firmly attached to substrate. Hydrothecal stems short, deeply corrugated, a spherule between stem and hydrotheca. Hydrotheca flattened, wider than deep lopsided bowl-shaped, Margin smooth. Gonotheca large, irregularly circular, borne flattened on hydrorhiza, perisarc ridged, with a circular terminal aperture. Colour: white.

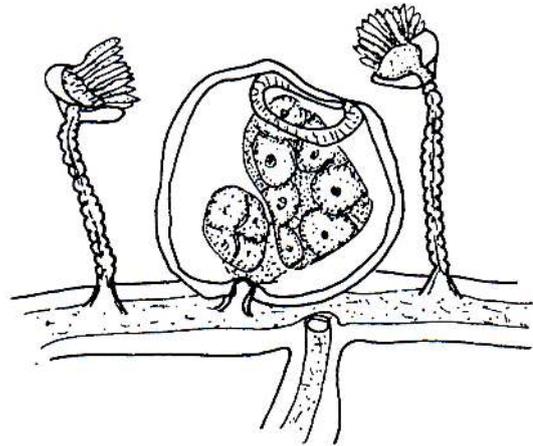


Figure 118. *Silicularia undulata*. Illustration: J.E. Watson.

Family Clathrozoidae Stechow, 1921

Description Colony arborescent, large, composed of interlocking chitinous tubes, hydrothecae embedded in tubes, hydranth contractile into hydrotheca, gonothecae embedded in tubes.

Remarks The family Clathrozoidae consists of two genera and three species. The type locality (place of original discovery of the family) is Port Phillip Heads where it was found in the late nineteenth century. It is also known from New Zealand, Japan and the Antarctic.

***Clathroozon wilsoni* Spencer, 1891**

Description Colonies usually large and basically fan-shaped, woody in appearance, up to 80 cm high, attached to rock by a thick plug-like hydrorhiza. Branching irregular and dense, branches often joined together in a meshwork (anastomoses). Hydrotheca immersed in a spiral pattern around branches. Gonotheca submerged in perisarc, gonophore releases a primitive bell-shaped eumedusa with eight rudimentary tentacles.

Colour: colonies dark purplish brown, hydranths white, medusa transparent white.

Remarks Recognition: one of the largest southern Australian hydroids, the woody colony is often mistaken for a brown gorgonian octocoral.

Ecology Habitat: deep water reef, often under ledges in good current flow. Common at Port Phillip Heads. Seasonality: colonies probably grow very slowly over many decades but the life span is unknown.

Distribution Deep water reefs from New South Wales to Western Australia.

References Spencer (1891), Watson (2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=289683



Figure 119. *Clathrozoön wilsoni*. Boarfish Reef, Point Lonsdale, Port Phillip Bay. Photograph: Andrew Newton.



Figure 120. *Clathrozoön wilsoni*. colony with extended hydranths. Photograph: Andrew Newton

Family Eirenidae Haeckel, 1879

Description "Colonies either stolonial, erect, ramified, or parasitic on bivalves, or comprising a single polyp budding totally into a single medusa (*Eirene hexanemalis*); young colonies of erect forms with cylindrical hydrothecae with diaphragm and folded pleated operculum formed by convergent flaps not demarcated from the hydrothecal rim (*Campanulina* type), in older colonies of this type, the operculum is generally lost and the hydrotheca is reduced to a perisarcial collar, looking like a haleciid hydrotheca; in stolonial colonies also the hydrotheca is usually reduced or absent, the hydranths, naked, being borne directly on hydrorhiza or on short pedicels (*Campanopsis* type); commensal species lack totally perisarc, they are affixed to host by a pedal disc, in all forms the hydranths are elongated, with filiform tentacles in a single amphi-coronate whorl; intertentacular web present; nematophores absent; gonophores on hydranths, hydrocaulus, or hydrorhiza, naked or more usually at least initially in a gonotheca." (Bouillon & Boero, 2000, p. 173, for the hydroid).

Remarks The family Eirenidae contains ten genera, five of which are recorded from Australia Schuchert (2023). However most members are known only from the medusa stage and are not treated here. A single cryptic species known from the hydroid colony is treated below, *Eirene troglodyta* Watson, 1998.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=15378

Eirene troglodyta Watson, 1998

Description "Colonies minute, hydrorhiza consisting of one or two short intersecting stolons creeping on inside of worm tube; stolons thin, knobby, transparent, sediment grains embedded in perisarc. hydrorhiza supporting one or two hydranths on pedicels of varying length, perisarc thin, varying from almost smooth to wrinkled or rugose, terminating in a swollen, collar-like gelatinous theca supporting the hydranth. hydranth long, spindle-shaped, very extensile; hypostome conical, mouth quadrate, surrounded by a single whorl of 14 long, moniliform tentacles, a large intertentacular web between bases of tentacles. hydranth with two kinds of nematocysts: 1) abundant small macrobasic mastigophores arranged in circlets around tentacles; capsule 6-7 microns x 1-1.5 microns, butt 10-12 microns long, tube long and thin. 2) larger, less abundant ?haplonemes in body of hydranth, around hypostome and

in pedicel; capsule 11-12 x 2-2.5 microns, tube insufficiently discharged for measurement. Medusa bud borne on a long pedicel below hydrotheca, proximal part of pedicel sheathed in perisarc, stalk thereafter long, naked; gonophore with a very thin, transparent ovoid sheath rounded apically, the developing medusa clearly visible inside. Colour. Colonies and medusa buds transparent and colourless." From Watson (1998, p. 249).

Remarks May represent the hydroid stage of another Australian *Eirene* species described from the medusa.

Ecology From worm tubes on a muddy bottom

Distribution Port Phillip Bay, Victoria.

References Watson (1998).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284596

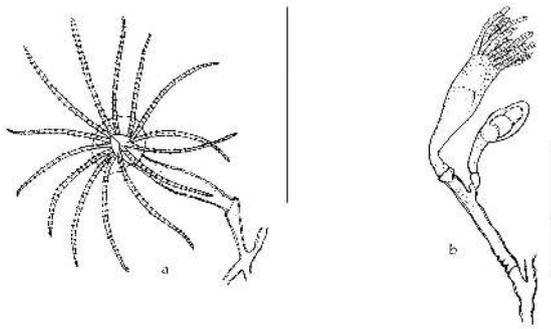


Figure 121. *Eirene troglodyta*. Illustration from Watson (1998)

Family Haleciidae Hincks, 1868

Description Colonies stolonial or erect, hydrotheca shallow, hydranth too large to fit in hydrotheca, nematophores present in some species, gonophores produce eggs, gonothecae large. Nematophores are small vase-shaped chitinous structures packed with nematocysts. Their purpose is to protect the permanently exposed hydranth. The number of nematophores is often very variable, many being present on some colonies while other colonies of the same species have very few. Many species have a ring of desmocytes (internal hooks for attachment of the hydranth) inside the hydrotheca.

Remarks Species of the Haleciidae range in size from minute single hydrothecae to tall bushy colonies. Many smaller species are cryptic, hidden in crevices while others grow in the open. Depth range of the family is from shallow waters to the deep sea. Presence or absence of nematophores distinguishes the two southern Australian genera: *Halecium* lacking nematophores and *Hydrodendron* with nematophores present.

Hydrodendron Hincks, 1874 has until recently been included within the Haleciidae but Maronna *et al.* (2016) and Choong *et al.* (2018) showed that this genus is not closely related to *Halecium*; following Choong *et al.* (2018), *Hydrodendron* is now placed within the Phylactothecidae Stechow, 1921. Maronna *et al.* (2016) left *Nemalecium lighti* unplaced as *incertae sedis* but their familiar placement within Haleciidae is retained here, probably temporarily. **Nomenclature** www.marinespecies.org/aphia.php?p=taxdetails&id=1608

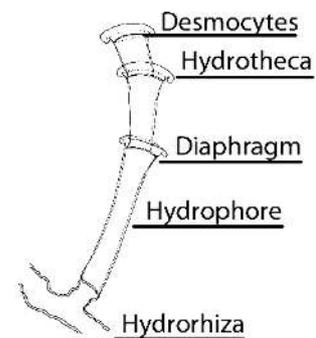


Figure 122. Haleciidae general structure. Illustration: J.E. Watson.

About 23 species of Haleciidae are recorded from Australian waters (Bax & Gershwin, 2022); four commonly encountered species of *Halecium* are treated below:

Halecium amphibolum Watson, 1993

Description Colony tiny, to 6 mm high, sparsely branched, arising from a thick tubular hydrorhiza on seagrass leaf. Stems and pedicels short, completely annulated, hydrotheca bowl-shaped, borne at summit of pedicel, sometimes two successive hydrothecae one growing from within another (replicated) on pedicel. Male and female gonothecae of same shape, ovoid, flattened, a circular aperture at top, female packed with large eggs. Colour: honey brown.

Remarks Recognition: colonies seen only with microscopic examination.

Ecology Habitat: on leaves of the oceanic seagrass *Amphibolis antarctica*. Seasonality: colonies present throughout year.

Distribution Victorian waters where the seagrass *Amphibolis antarctica* occurs.

References Watson (1993).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=xxx

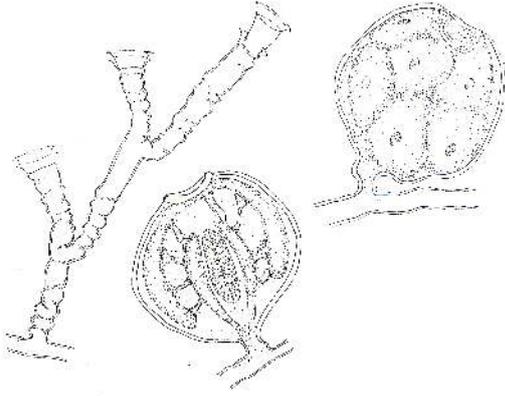


Figure 123. *Halecium amphibolum*. From Watson (1993)



Figure 124. *Halecium bruniensis*. Popes Eye, Port Phillip Bay, 10 m. Photograph: J.E. Watson.

Halecium bruniensis Watson, 1975

Description Colonies to 30 mm high, irregularly bushy, stems and lower branches polysiphonic. Hydrotheca on a short pedicel, shallow with an outrolled margin, a ring of desmocytes around the base. Gonothecae borne on branches, female large, lenticular, gonophore containing eggs, aperture circular, on side of gonotheca, male small, sausage shaped. Colour: colony straw-coloured, female gonophore often pink.

Ecology Habitat: on sponges and bryozoans. Seasonality: longevity unknown; colonies fertile over summer.

Distribution Tasmania and south-eastern Australia.

References Watson (1975).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284712

Colonies profusely branched, stems polysiphonic, lacy, up to 5 cm high, growing from a creeping hydrothiza. Hydrothecae shallow saucer-shaped, on a short cylindrical pedicel (hydrophore) on branches, margin circular, rim outrolled. Tentacles of hydranth stubby. Gonothecae numerous on stems, oval, flattened, at maturity female packed with eggs, an indentation in the summit; summit of male peaked. Colour: variable pale yellow to orange, gonothecae yellow, orange or pinkish. Habitat: quiet water on algae and invertebrates, often on sponges. Seasonality: colonies grow annually, become fertile spring to summer. Known distribution: temperate waters, common in southern Australia, often on jetty pilings. Recognition: graceful lacy yellow colonies. May be confused with similarly coloured *Halopteris campanula*. The saucer-shaped hydrothecae of *H. delicatulum* are distinctive.

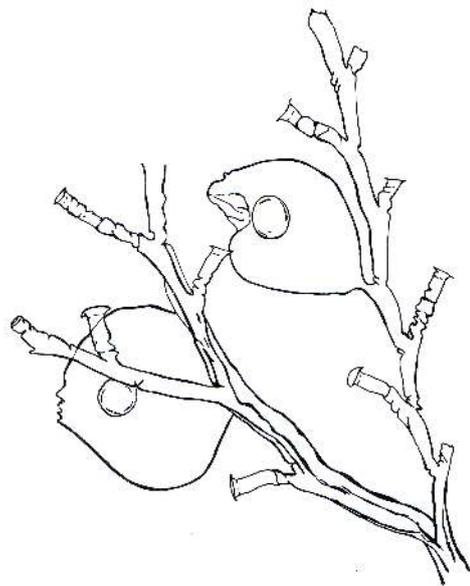


Figure 125. *Halecium bruniensis*. Figure from Watson (1975).

Halecium delicatulum Coughtrey, 1876

Description Colonies profusely branched, stems polysiphonic, lacy, up to 5 cm high, growing from a creeping hydrothiza. Hydrothecae shallow saucer-shaped, on a short cylindrical pedicel (hydrophore) on branches, margin circular, rim outrolled. Tentacles of hydranth stubby. Gonothecae numerous on stems, oval, flattened, at maturity female packed with eggs, an indentation in the summit; summit of male peaked.

Colour: variable pale yellow to orange, gonothecae yellow, orange or pinkish.

Remarks Recognition: graceful lacy yellow colonies. May be confused with similarly coloured *Halopteris campanula*. The saucer-shaped hydrothecae of *H. delicatulum* are distinctive.

Ecology Habitat: quiet water on algae and invertebrates, often on sponges. Seasonality: colonies grow annually, become fertile spring to summer.

Distribution Temperate waters, common in southern Australia, often on jetty pilings.

References Watson (1973, 1975, 1997, 2003).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117588

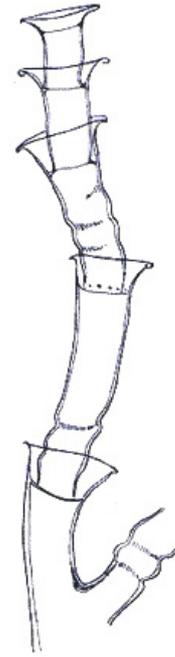


Figure 127. *Halecium delicatulum*. Illustration: J.E. Watson.



Figure 126. *Halecium delicatulum*. St Leonards, Port Phillip Bay. Photograph: J.E. Watson.

Halecium fragile Hodgson, 1950

Description Colonies tiny, to 10 mm long, straggling, stems simple, monosiphonic, sparsely branched, hydrothecal pedicels long, cylindrical with a small shallow dish-shaped hydrotheca at summit. Successive secondary pedicels grow out from below a hydrotheca. Hydrothecal margin circular, rim not everted. Gonotheca long, sausage-shaped to conical. Colour: transparent white.

Remarks Recognition: small fragile colonies, usually seen only with microscopic examination.

Ecology Habitat: shallow to deep water on algae and invertebrates, often on sponges. Seasonality: unknown.

Distribution Subantarctic and southern Australia. Moderately common.

References Watson & McInnes (1999); Watson & Vervoort (2001).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284730

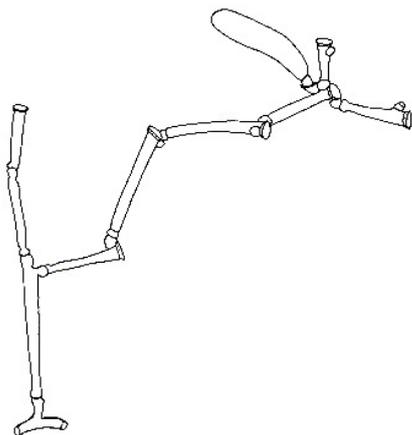


Figure 128. *Halecium fragile*. Illustration: J.E. Watson.

Family Halopterididae Millard, 1962

Description Colony erect, branched or unbranched, monosiphonic or polysiphonic, hydrothecae cup-shaped, borne on stem and hydrocladia. Hydrotheca with a minimum of three nematothecae arranged around hydrotheca. Gonophores with eggs and sperm contained in a gonotheca, usually with nematothecae.

Remarks The nematothecae associated with the hydrotheca are similar to those of the Plumulariidae, usually two-chambered and wine-glass shaped, comprising a small dish-shaped upper chamber containing nematocysts on a conical base attached to stem or hydrocladium.

The family Halopterididae encompasses four genera which are commonly encountered in southern Australia: *Antennella*, *Halopteris* and *Monostaechus*, in addition to the genus *Gattya*, which until recently was classified under Plumulariidae. In *Antennella* the colony is of simple unbranched stems, hydrotheca cup-shaped, three protective vase-shaped nematothecae associated with the hydrotheca).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=22795

About 16 species of Halopterididae are recorded from Australian waters (Bax & Gershwin, 2022), five of which are described below.

Antennella campanuliformis (Mulder & Trebilcock, 1909)

Description Colonies consisting of short, erect, unbranched stems (hydrocladia) up to 5 mm long arising from a creeping hydrorhiza, hydrocladia divided into alternate thecate (with a hydrotheca) and athecate (without a hydrotheca) segments (internodes). Athecate internodes with one nematotheca on upper sur-

face, thecate internodes with a cup-shaped hydrotheca with thick walls and a slightly asymmetrical margin, one nematotheca behind hydrotheca and two short lateral nematothecae at margin. Female gonotheca globular, with two nematothecae near base, with a single egg that develops into a crawling larva.

Remarks Distinguished from *A. secundaria* by its more robust, yellow stems and thicker walls of the hy-

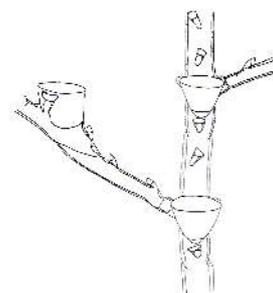


Figure 129. Halopterididae general structure. Illustration: J.E. Watson.

drotheca.

Ecology Grows on algae and invertebrates in ocean and bays over summer.

Distribution Southern Australia.

References Watson (1973, 1975, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284810

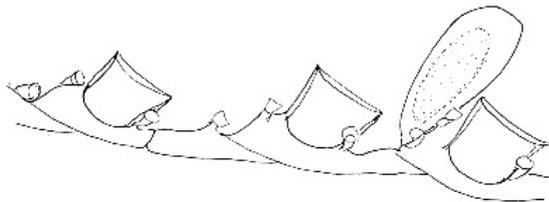


Figure 130. *Antennella campanuliformis*. Illustration: J.E. Watson.



Figure 131. *Antennella secundaria*, fertile colony. St Leonards, Port Phillip Bay. Photograph: J.E. Watson.

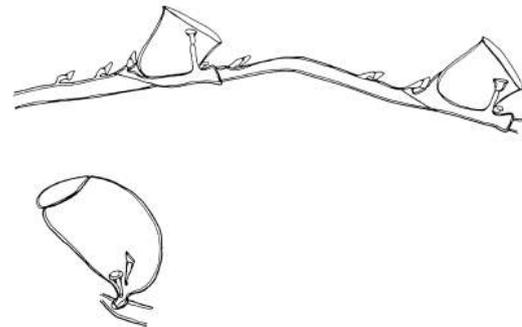


Figure 132. *Antennella secundaria*. Illustration: J.E. Watson.

Antennella secundaria (Gmelin, 1791)

Description Colonies consisting of short, erect, unbranched stems (hydrocladia) up to 10 mm long arising directly from a creeping hydrorhiza. Hydrocladia divided into alternate thecate (with a hydrotheca) and athecate (without a hydrotheca) segments (internodes). Athecate internodes with two nematothecae on upper surface, thecate internodes with a cup-shaped hydrotheca, one nematotheca behind hydrotheca and two long lateral nematothecae at margin, and a tiny nematotheca tucked below margin. Gonotheca large, pear-shaped, female with two nematothecae near base. A crawling larva is released from the female. Colour: pale yellowish green.

Remarks Recognition: fuzzy, yellowish-green colonies.

Ecology Habitat: on algae and invertebrates in sheltered ocean and bays, often on jetty piles. Seasonality: colonies grow and become fertile in summer.

Distribution World wide, common around Australia.

References Watson (1973, 2000, 2002, 2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117628

Halopteris campanula (Busk, 1852)

Description Colonies lacy, of groups of irregularly branched stems up to 10 cm high. Stem with a row of hydrothecae, one at base of each branch (hydrocladium). Hydrothecae cup-shaped, borne on stem and hydrocladia, each with three nematothecae, one behind base of hydrotheca and two tall nematothecae (twin laterals), one at each side at front of hydrotheca. Gonotheca large ovate, borne on branches, female larger than male, with a large terminal aperture closed by an operculum, female with two nematothecae near base, male with one. Colour: yellow to orange.

Remarks Recognition: lacy yellow to orange colonies.

Ecology Habitat: ocean reef in good water flow. Seasonality: colonies grow over winter and become fertile in summer.

Distribution Southern Australia, New Zealand.

References Cox & Young (1973); Watson (1975).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=287296



Figure 133. *Halopteris campanula*. Castle Rock, Port Phillip Heads, 16 m. Photograph: J.E. Watson.

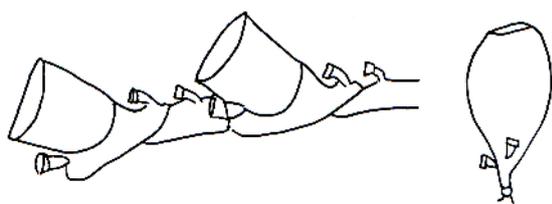


Figure 134. *Halopteris campanula*. Illustration: J.E. Watson.

Halopteris glutinosa (Lamouroux, 1816)

Description Colonies of many unbranched plumose stems to 10 cm long. Hydrocladia (branches) alternate, a cup-shaped hydrotheca on stem at base of hydrocladium and along hydrocladia, a nematotheca behind base of hydrotheca and one on each side (twin laterals) at front of hydrotheca and one, tiny, scoop-shaped, tucked below margin of hydrotheca. Gonothecae large, scattered along stem, female much larger than hydrotheca, pear-shaped, triangular in section, walls smooth with nematothecae scattered over surface; male smaller than female with two nematothecae near base. Colour: scarlet.

Remarks Recognition: brilliant scarlet colonies.

Ecology Habitat: oceanic reefs in good water flow. Seasonality: colonies may live for several years, fertile in late winter.

Distribution Southern and south-western Australia, Indonesia.

References Watson (2005, 2012).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117633



Figure 135. *Halopteris glutinosa*. Western Port. Photograph: J.E. Watson.

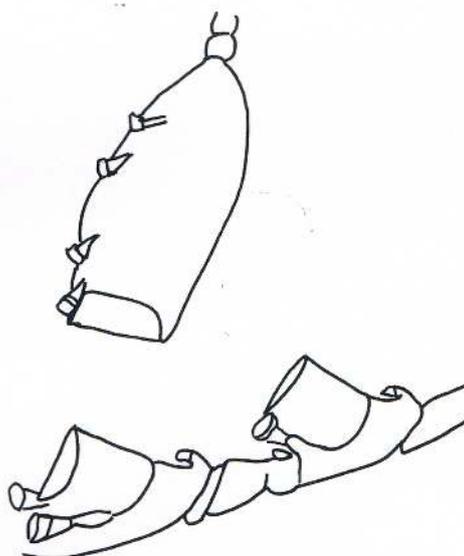


Figure 136. *Halopteris glutinosa*. Illustration: J.E. Watson.

Monostaechas quadridens McCrady, 1859

Description Colonies comprising bunches of branches to 100 mm high. Stems monosiphonic, branched dichotomously (forked). Branch internodes alternately athecate (without hydrothecae) and thecate (with a hydrotheca), athecate internode with one or two nematothecae, thecate internode with a nematotheca behind hydrotheca and one at each side (twin laterals) in front

of hydrotheca. Hydrotheca deep cup-shaped, margin circular, rim slightly everted. Male and female gonothecae borne on same branch, kidney-shaped, male smaller than female, with one nematotheca at base, female with two at base, female rupturing at top to release a large crawling larva. Colour: purplish grey, gonothecae brown, larva creamy yellow.

Remarks Recognition: wiry purple-greyish clustered colonies. Colonies of species of *Monostaechus* have many branches but lack a main stem.

Ecology Habitat: reef in good water flow in and ocean and on jetty piles. Seasonality: colonies grow and fertile spring to summer.

Distribution World-wide, recently recorded from southern Australia.

References Watson (2011a, 2015a).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117635



Figure 137. *Monostaechas quadridens*. Blairgowrie, Port Phillip Bay. Photograph: J.E. Watson.

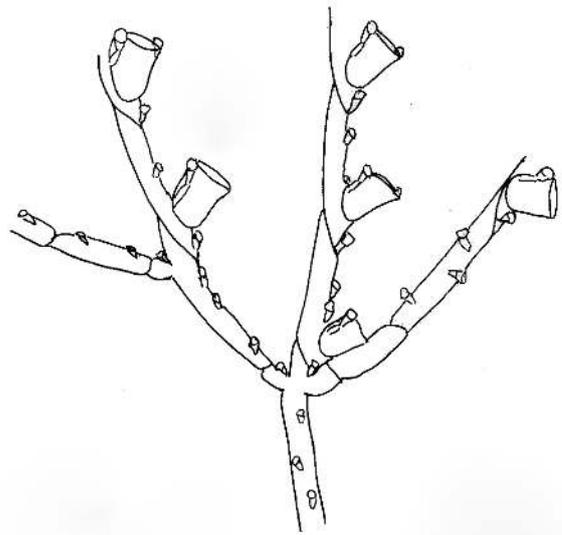


Figure 138. *Monostaechas quadridens*. Illustration: J.E. Watson.

Family Hebellidae Fraser, 1912

Description Colony stolonial, hydrotheca campanulate, on a distinct pedicel, with a smooth marginal rim, with or without operculum, gonophores reproduce eggs or free medusae. Medusa with short manubrium with irregular lips.

Remarks Two genera and seven species are recorded from Australia. The genus *Anthohebella* are recorded from northern Australia. The commonly occurring genus in southern Australia is *Hebella*, recognised by having hydrotheca with operculum and producing free medusa. Two commonly encountered species of *Hebella* are described below.

Hebella albida Watson, 2011

Description Hydrorhiza a stolon running along stem and branches of hydroid host. Hydrotheca on a short stalk (pedicel), conical, margin circular, slightly everted. Gonothecae borne along hydrorhiza, similar in shape but considerably larger than hydrotheca, top closed by a thin dome of tissue. Gonophore with up to 10 developing medusae, at release about 1 mm in diameter with two long tentacles and nematocysts scattered on the bell.

Remarks Recognition: large white hydrothecae running along stems of host hydroid.

Ecology Habitat: creeping on stems and branches of hydroids of the family Aglaopheniidae. Seasonality: colonies grow and become fertile in summer.

Distribution Southern Australia.

References Watson (2011a).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=590367



Figure 139. *Hebella albida*. Photograph: J.E. Watson.

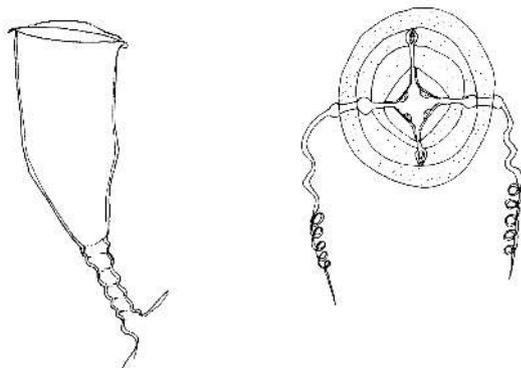


Figure 140. *Hebella albida*. From Watson (2011a)

Hebella scandens (Bale, 1888)

Description Hydrorhiza a tubular stolon firmly attached to substrate. Hydrotheca on a short stalk (pedicel), tubular, bent outwards about halfway along its length, margin circular, rim slightly everted, perisarc thin, closed by a thin dome of tissue. Gonotheca conical, much larger than the hydrotheca. Colour: colourless to white.

Remarks Recognition: numerous small bent hydrothecae in lines along host.

Ecology Habitat: creeping on other hydroids often *Synthecium* or *Symplectoscyphus*, sometimes on algae. Seasonality: colonies present and fertile over summer.

Distribution World-wide, including southern Australia, New Zealand.

References Watson (1994a, 1996).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117699

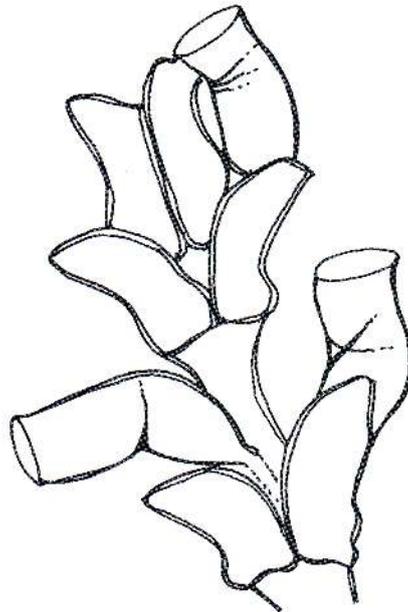


Figure 141. *Hebella scandens*. Illustration: J.E. Watson.

Family Kirchenpaueriidae Stechow, 1921

Description Colony branched or unbranched, hydrocladia alternate, hydrothecae small, without twin lateral nematothecae, gonophores with eggs, gonothecae large.

Remarks Three genera and five species are known from Australia. The genera can be distinguished as follows: *Halicornopsis* - Large multi-branched colonies; known from only one species which close resembles members of the family Aglaopheniidae. Distinguished from that family by the absence of lateral nematothecae associated with the hydrotheca.

Kirchenpaueria - Relatively small plumose colonies, hydrotheca similar to those of *Plumularia* but distinguished by absence of wine-glass shaped nematothecae.

Pycnotheca - Relatively small plumose colonies; colony monosiphonic, hydrocladia alternate, hydrotheca cup-shaped with an internal ridge, one nematotheca behind hydrotheca and one in front.

(*Kirchenpaueria* is a senior synonym of *Ventromma*.)

Four species occurring in southern Australia are described below.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=22796

Halicornopsis elegans Lamarck, 1816)

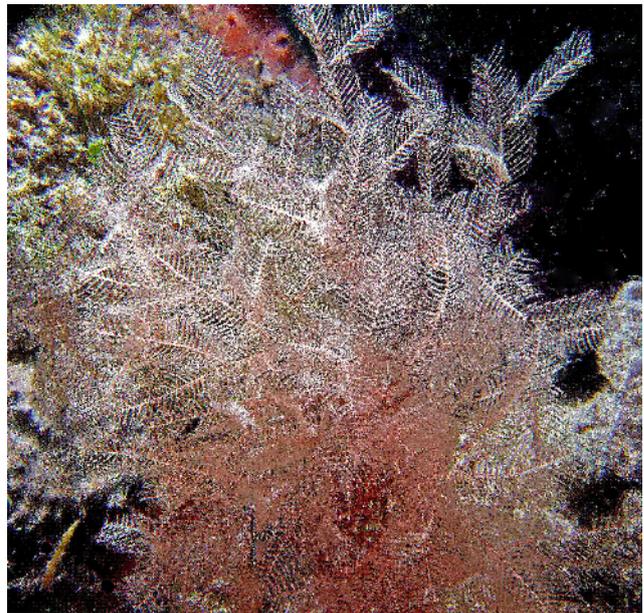


Figure 142. *Halicornopsis elegans*, Lonsdale Wall, Port Phillip Heads, 20 m. Photograph: J.E. Watson.

Description Colonies often tall, to 20 cm high, prolifically branched from a main stem, branches up to 2 cm long, forming a feathery plumose canopy. Hydrocladia on branches moderately long. Hydrothecae facing obliquely forward along hydrocladium, shallow cup-shaped, margin with a large outwardly pointing cusp over the margin and a ridge passing down into the hydrotheca from the margin. Median nematotheca short, completely attached to the hydrotheca, no twin lateral nematothecae. Gonothecae small capsules borne in a row along stem. Colour: flesh-coloured, sometimes a pale green tinge, gonothecae cream.

Remarks Recognition: flesh-coloured feathery canopy; absence of lateral nematothecae.

Ecology Habitat: under ledges on ocean reefs. Seasonality: colonies live for several years, becoming fertile summer to autumn.

Distribution Southern Australia; doubtful records from the Indian Ocean and New Zealand.

References Watson (1973, 1975, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=290071

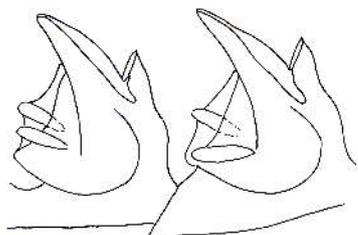


Figure 143. *Halicornopsis elegans*. Illustration: J.E. Watson.



Figure 144. *Kirchenpaueria bellarensis*, Clifton Springs, Port Phillip Bay. Photograph: J.E. Watson.

Kirchenpaueria bellarensis (Watson, 2011)

Description Colony of plumose stems to 5 cm high, older stems and branches polysiphonic. Hydrotheca at beginning of each hydrocladial segment, shallow cup-shaped. One tiny scoop-shaped nematotheca one about halfway along hydrocladial segment, and another in front of hydrotheca, others the same on stem. Male and female gonothecae on borne different colonies, on lower stems and branches, barrel-shaped, walls corrugated, top closed by an operculum torn aside at release of contents. Female gonophore packed with eggs. Colour: pale buff to brown, gonophores white.

Remarks Recognition: may be mistaken for *Plumularia setaceoides* but the pale buff colour of the colony and tiny nematothecae are distinctive. A second species in the genus, *Kirchenpaueria irregularis* Millard, 1958, is known from the Northern Territory (Watson, 2000).

Ecology Habitat: jetty piles and sheltered reef. Seasonality: colonies from early winter becoming fertile in summer.

Distribution Port Phillip Bay, probably more widespread in southern Australia.

References Watson (2011a, as *Ventromma bellarensis*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=590378

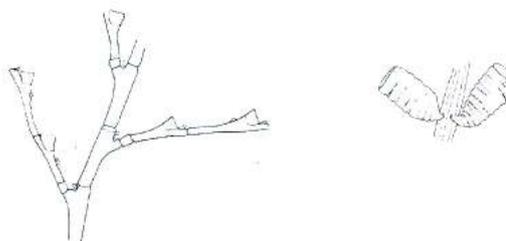


Figure 145. *Kirchenpaueria bellarensis*. Illustration: J.E. Watson.

Pycnotheca mirabilis (Allman, 1883)

Description Hydrorhiza loosely attached to substrate, stems monosiphonic, to 2 cm high, alternate, long and flexuous. Hydrotheca occupying much of hydrocladial segment, scoop-shaped, a ridge passing down into hydrotheca from upper wall, margin sub-circular, rim everted. A vestigial median nematotheca behind hydrotheca and a small median pore below hydrothecal margin. Gonothecae large, barrel-shaped, standing erect from hydrorhiza, surface ridged, female gonophore containing eggs. Colour: stems pale brown, gonotheca white.

Remarks Recognition: distinguished from *Pycnotheca producta* by habitat and large free-standing gonothecae.

Ecology Habitat: on sponges and other invertebrates, sometimes on algae. Seasonality: colonies grow and become fertile over summer.

Distribution Southern Australia.

References Watson (1973, 1975, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=220596

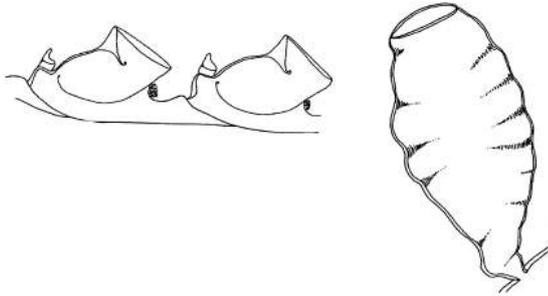


Figure 146. *Pycnotheca mirabilis*. Illustration: J.E. Watson.



Figure 147. *Pycnotheca producta*, on seagrass *Heterozostera nigricaulis*, St Leonards jetty Port Phillip Bay, 1 m. Photograph: J.E. Watson.

***Pycnotheca producta* (Bale, 1881)**

Description Hydrorhiza creeping, stems plumose, monosiphonic, to 2 cm high. Hydrocladia (branches) alternate along stem. Hydrothecae scoop-shaped, occupying most of the hydrocladial segments, a ridge passing down into the hydrotheca from its upper wall, margin upturned. One vestigial nematotheca behind the hydrotheca. Gonothecae borne on hydrorhiza, large, irregularly ovoid, laying on substrate, surface ridged, female gonophore with many small eggs. Colour: white, often with a faintly luminescent bluish tinge when seen in the water.

Remarks Recognition: stems often have a faint bluish iridescence in water; backwardly curved hydrocladia.

Ecology Habitat: on leaves of the seagrasses *Heterozostera nigricaulis* and *Posidonia* spp. Seasonality: colonies grow and become fertile late spring to summer.

Distribution On the leaves of the shallow water seagrasses in southern Australia.

References Watson (1997, 2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=287734



Figure 148. *Pycnotheca producta*, close-up, on seagrass *Heterozostera nigricaulis*, St Leonards jetty Port Phillip Bay, 1 m. Photograph: J.E. Watson.

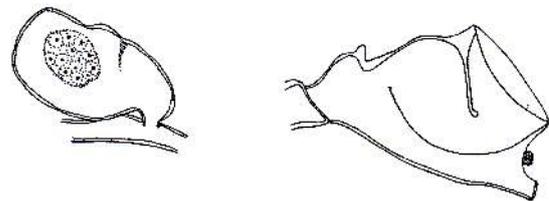


Figure 149. *Pycnotheca producta*. Illustration: J.E. Watson.

Family Lafoeidae Hincks, 1868

Description Colonies stolonal or erect, hydrothecae tubular to campanulate, radially or bilaterally symmetrical, no operculum. Gonophores protected by gonothecae aggregated into a tufted structure (coppinia).

Remarks The genera and species of the Lafoeidae vary widely in size and complexity, ranging from creeping forms to tall much-branched colonies. The smaller creeping (stolonal) species are common in shallow water while larger branched species are usually found in the deeper ocean.

Species formerly assigned to the genera *Corystolona* Watson, 2002 and *Reticularia* Thomson, 1853 now belong to *Filellum* Hincks, 1869 (Schuchert, 2023).

Seven genera and 26 species are recorded from Australia, many from deep water habitats off southeastern Australia and New Zealand, but *Filellum serpens* is the one most likely to be encountered in southern Australia.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1609

***Filellum serpens* (Hassall, 1848)**

Description Colony stolonal, hydrorhiza creeping, hydrothecae borne singly along the hydrorhiza, sessile, top part bent upwards, margin circular without operculum. If fertile, many gonothecae aggregated together into a coppinia. Colour: colourless and transparent.

Remarks Recognition: colourless minute creeping colonies usually only visible under magnification. Distinguished from *Lineolaria* by absence of an operculum.

Ecology Habitat: on algae and invertebrates, often other hydroids. Seasonality: colonies present throughout the year. Seldom fertile.

Distribution Widespread including southern Australia - Bass Strait and southern Port Phillip Bay.

References Watson (1994a, 1999).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117690

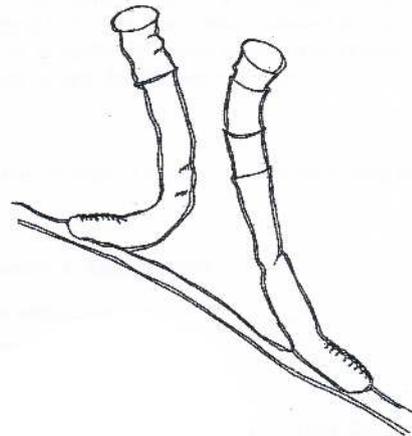


Figure 150. *Filellum serpens*. Illustration: J.E. Watson.

Family Lineolariidae Allman, 1864

Description Colony stolonal, hydrothecae sessile, minute, tubular, margin upturned, operculum thin, membranous. Female gonophores with eggs enclosed in a gonotheca attached to the substrate.

Remarks The family consists of only three species, two of which are endemic to southern Australia.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=266957

***Lineolaria flexuosa* Bale, 1884**

Description Hydrorhiza broad and flat, strongly adherent to substrate. Hydrotheca also attached to substrate, minute, shape rectangular to saccate, margin oval, upturned from substrate and closed by a delicate membranous operculum. Gonotheca larger than hydrotheca, oval, flattened and strongly adherent to substrate by a wide peripheral flange, aperture circular, facing upwards, surface of gonotheca with a few small spines. Colour: white to yellowish, gonophores cream.

Remarks Recognition: almost invisible colonies on algal fronds.

Ecology Habitat: on red and brown algae. Seasonality: colonies grow and fertile late spring through summer.

Distribution southern Australia.

References Watson (1973, 1992b).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=290300

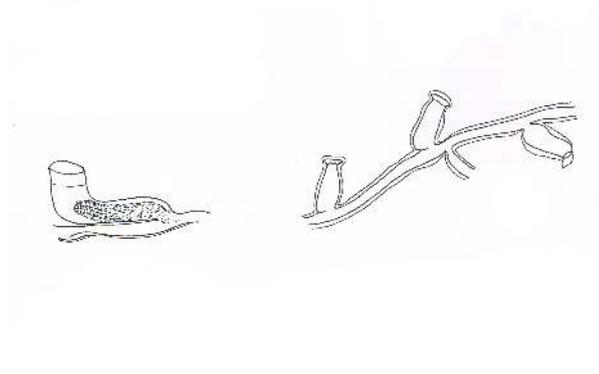


Figure 151. *Lineolaria flexuosa*. From Watson (1992b, figure 1C,D).

***Lineolaria spinulosa* Hincks, 1861**

Description Colony stolonial, hydrorhiza broad and flat, strongly attached to substrate. Hydrotheca minute, more or less rectangular in shape, laying flat and adherent to substrate, a small upright spine at base. Margin of hydrotheca oval, upturned, with two opposite lobes and closed by a delicate membranous operculum. Gonotheca much larger than hydrotheca, oval, flattened, strongly adherent to substrate by a wide peripheral flange, surface of gonotheca with many small spines. Colour: transparent white, gonophore cream.

Remarks Recognition: colonies are transparent and almost invisible but can be seen by twisting the seagrass leaf towards the light. Distinguished from *L. flexuosa*

by the basal spine on the hydrotheca and the many small spines on the gonotheca.

Ecology Habitat: found only on the leaves of the seagrasses *Posidonia* and *Amphibolis*. Seasonality: present most of year, fertile in summer.

Distribution southern Australia.

References Watson (1992a).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=290301

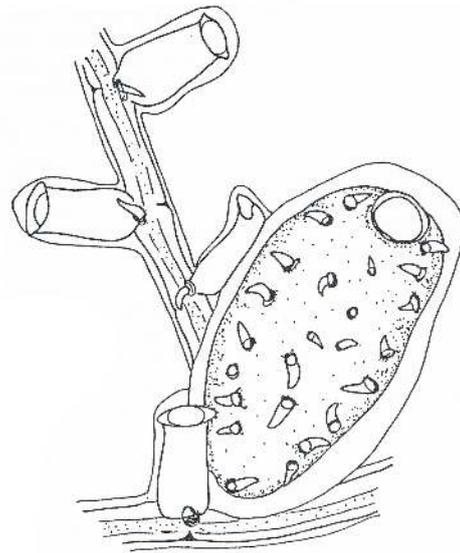


Figure 152. *Lineolaria spinulosa*. Illustration: J.E. Watson.

Family Phialellidae Russell, 1953

Description Colony stolonial or erect, branched, stem and hydrothecal pedicels annulated, hydrotheca minute, bell-shaped with operculum of several flaps. Gonophore a free medusa protected by a gonotheca borne on hydrorhiza or stem.

Remarks The Phialellidae is represented by only one species in Australia.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1612

***Phialella quadrata* (Forbes, 1848)**

Description Colonies comprising single hydrothecae borne on a creeping hydrorhiza interspersed with small branched stems to 1 cm high. Stems with close-set, short, upwardly directed entirely annulated hydrothecal pedicels. Hydrotheca bud-shaped, aperture closed by a conical operculum of several flaps. Gonotheca larger than hydrotheca, inverted conical, containing a medusa that swims away at release. Colour: white.

Remarks Recognition: tiny white colonies, large gonothecae, free swimming medusae.

Ecology Habitat: on algae and invertebrates. Seasonality: colonies grow and become fertile during winter.

Distribution World-wide, common in southern Australia, often on jetty pilings.

References Watson (1994a, 1999). Records of *Opercularella humilis* (Bale, 1924) from Queensland may refer to *Phialella quadrata* (Forbes, 1848), see Bax & Gershwin (2022).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117804

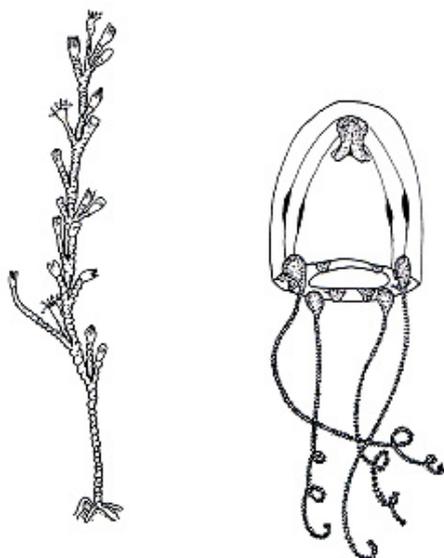


Figure 153. *Phialella quadrata*. Watson (1994a) 1B-G.

Family Phylactothecidae Stechow, 1921

Description "Colonies stolonial or erect, arising from creeping hydrorhiza; hydrocauli monosiphonic or polysiphonic; hydrothecae shallow to bell-shaped, sessile or pedicellate, basal region with delicate diaphragm, with or without desmocytes; hydranths usually much larger than hydrothecae, with or without an inter-tentacular web. Nematophores present, with variably reduced nematothecae. Gonophores fixed sporosacs; gonothecae solitary or aggregated to form a glomulus." (Choong *et al.*, 2018, p. 60)

Remarks The family contains a single genus, *Hydrodendron* Hincks, 1874, which until recently was included within the Haleciidae but has now been shown to be unrelated to *Halecium* and is now placed within the Phylactothecidae Stechow, 1921 (for further discussion see Choong *et al.* (2018)).

Ophiodissa Stechow, 1919, *Phylactotheca* Stechow, 1913 and *Scoresbia* Watson, 1969 are all synonyms of *Hydrodendron* (see Schuchert (2023)).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1060743

Six species of *Hydrodendron* are known from Australia (Bax & Gershwin, 2022), three of which are described below.

Hydrodendron armatum (Stechow, 1924)

Description Hydrorhiza broad and flat. Stems to 15 mm high, sometimes sparingly branched, monosiphonic, perisarc thick and deeply corrugated. Hydrotheca saucer-shaped, widening to a circular margin. Nematophores small urn-shaped, one borne on branch below hydrotheca and sometimes on hydrorhiza. Gonothecae large, flattened conical, borne on a pedicel on the hydrorhiza. Colour: colony white to yellow.

Remarks Recognition: small stems on algae, nematophores on stems.

Ecology Habitat: colonies borne thickly on large brown kelps and red algae. Seasonality: grows and

becomes fertile late winter to summer.

Distribution Southern and north-western Australia.

References Watson (1973, 1975, as *Phylactotheca armata*) Watson (1997, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284781

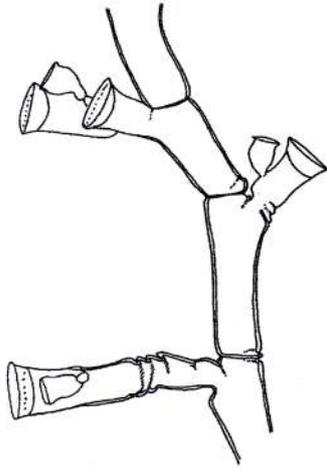


Figure 154. *Hyrodendron armatum*. Illustration: J.E. Watson.

***Hyrodendron australe* (Bale, 1919)**

Description Stems polysiphonic, branched, to 8 cm high, growing from a hydrorhiza loosely attached to substrate. Hydrothecae shallow saucer-shaped with a smooth circular margin. Nematophores urn-shaped, one beside hydrotheca, sometimes also on the hydrorhiza. Gonothecha large, barrel-shaped, borne on hydrorhiza, female gonophore containing eggs, male with sperm. Colour: white to greenish, often with internal black patches from

Remarks Recognition: bushy colonies, stems white to blackish.

Ecology Zooxanthellae (microscopic plants) living in the coenosarc. Habitat: luxuriant colonies on sponges or in crevices in ocean waters. Seasonality: winter to late spring.

Distribution Southern and north-western Australia.

References Watson (1997, 2003).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284782



Figure 155. *Hyrodendron australe*. Popes Eye, Port Phillip Bay. Photograph: J.E. Watson.

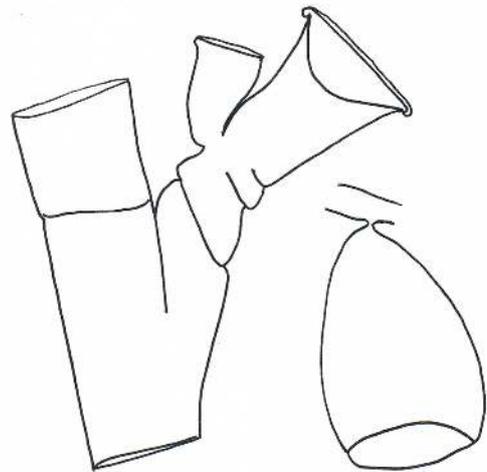


Figure 156. *Hyrodendron australe*. Illustration: J.E. Watson.

***Hyrodendron daidalum* (Watson, 1969)**

Description Colony minute, stems about 2 mm high, borne on a flat ribbon-like hydrorhiza firmly attached to algal substrate. Stem deeply corrugated, hydrotheca at top, bowl-shaped, margin circular and slightly out-rolled, usually facing forward, not upward, a small vase-shaped nematophore on hydrorhiza beside hydrotheca. Gonothecae borne thickly along hydrorhiza, quadrangular, flattened, very large in comparison with hydrotheca. Colour: transparent white.

Remarks Recognition: minute colonies growing over alga.

Ecology Habitat: luxuriant colonies on small brown alga *Zonaria*. Seasonality: colonies grow and are fertile spring to summer.

Distribution Southern and north-eastern Australia.

References Watson (1969, as *Scoresbia daidala*), Watson (2002, 2003).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284787

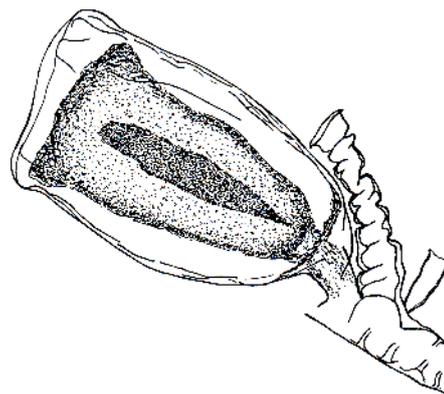


Figure 157. *Hydrodendron daidalum*. Illustration: J.E. Watson.

Family Plumulariidae Agassiz, 1862

Description Colonies branched or unbranched, pinnate, with alternate hydrocladia, hydrotheca cup-shaped, nematothecae wine-glass shaped, one behind (inferior) hydrotheca and one (twin laterals) on each side in front (superior) of hydrotheca. Gonophores protected by a gonotheca, female gonophore producing eggs.

Remarks The validity of the genus *Monotheca* Nutting, 1900 remains unclear – Leclère *et al.* (2007) synonymises *Monotheca* with *Plumularia* Lamarck, 1816. Nevertheless the treatment below follows Watson (2011b) who recognised that *Monotheca* is probably an artificial grouping but retained it here for utility of identification. Only species which always have monothecate hydrocladia are included in *Monotheca*. Schuchert (2023) notes that *Monotheca* may be valid but a more complete taxon sampling of molecular data are required.

The Plumulariidae is a large family with about five recognised genera and over 30 species recorded from Australia (Bax & Gershwin, 2022). Ten species likely to be encountered in southern Australia are treated below.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1613

Dentitheca asymmetrica (Bale, 1914)

Description Colonies tall, to 50 cm high, growing from a thick matted hydrorhiza. Stems thick at base, sparingly branched, hydrocladia alternate on stems, bearing numerous hydrothecae. Athecate internodes (without hydrotheca) on hydrocladia very short with one nematotheca, thecate internode (with hydrotheca) entirely occupied by a small sausage-shaped hydrotheca with marginal rim extended into two lobes, one longer than the other. Nematothecae very short one just behind hydrotheca and two in front. Gonothecae small, pear-shaped, with very thin perisarc. Colour: pale greenish-white.

Remarks Recognition: tall sparsely branched colonies usually overgrown by colonies of mauve-coloured zoanthids.

Ecology Habitat: on sandy bottom in deeper ocean waters. Seasonality: colonies may live for several years, fertile in summer.

Distribution Southern and Western Australia.

References Watson (1973, as *Plumularia asymmetrica*), Watson (2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1055772

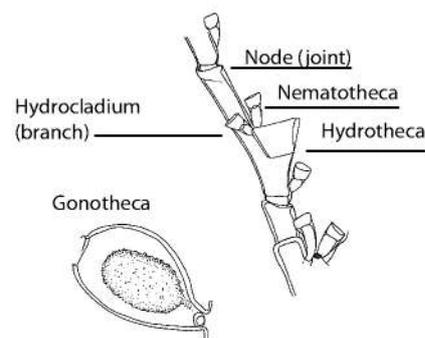


Figure 158. Plumulariidae general structure. Illustration: J.E. Watson.

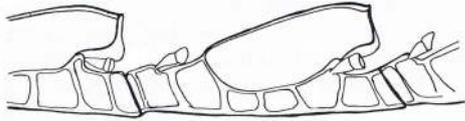


Figure 159. *Dentitheca asymmetrica*. Illustration: J.E. Watson.

***Monotheca flexuosa* (Bale, 1894)**

Description Colonies of many simple pinnate segmented stems up to 1 cm long borne on a creeping hydrorhiza. Hydrotheca cup-shaped. Nematothecae wineglass-shaped, one behind and one (twin laterals) at each side. Gonothecae borne on the lower stem, large, barrel-shaped with an obliquely truncated orifice. Female gonophore with eggs. Colour: white, gonophores often iridescent white to yellow.

Remarks Recognition: delicate lacy white colonies; single hydrotheca on hydrocladium. Distinguished from *Plumularia setaceoides* which has several hydrothecae on hydrocladium

Ecology Habitat: abundant on algae and other invertebrates; common on jetty piles. Seasonality: colonies grow seasonally and become fertile late winter to summer.

Distribution sheltered embayments and ocean around Australia and New Zealand.

References Watson (1973, as *Plumularia flexuosa*), Watson (2000, 2003, 2005, 2011b).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=292366



Figure 160. *Monotheca flexuosa*. Clifton Springs, Port Phillip Bay, 1 m. Photograph: J.E. Watson.

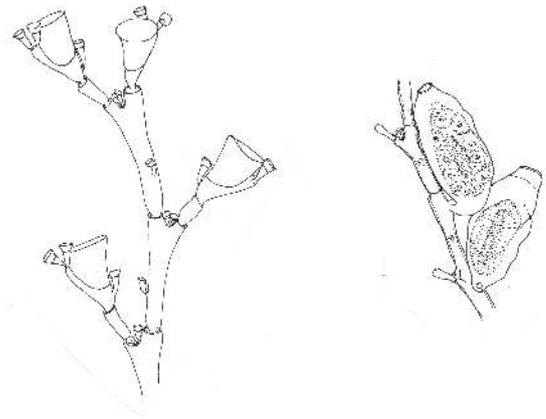


Figure 161. *Monotheca flexuosa*. Illustration: J.E. Watson.

***Monotheca spinulosa* (Bale, 1882)**

Description Colonies comprising groups of short erect stems to 5 mm high. Hydrocladia bearing a single hydrotheca. Hydrotheca bowl-shaped, compressed, margin facing forward, a deep internal ridge in hydrotheca, a short spine projecting beyond the margin. Three wine-glass shaped nematothecae on the hydrocladium, one behind hydrotheca and one at each side of margin. Gonothecae borne on lower stem region, larger than hydrotheca, inverted conical. Colour: white.

Remarks Recognition: delicate white colonies. Resembles *P. flexuosa* but can be distinguished by the sparser colonies and microscopically by the spine at base of the hydrotheca.

Ecology Habitat: usually found on red algae in sheltered water. Seasonality: colonies grow and become fertile over summer.

Distribution Southern Australia, New Zealand, South Africa.

References Watson (1973, as *Plumularia spinulosa*), Watson (1997, 2003, 2005, 2011b).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=152135

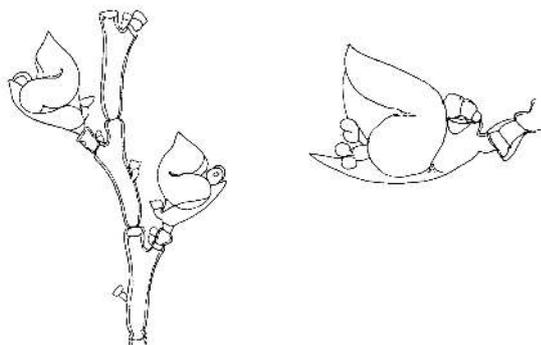


Figure 162. *Monotheca spinulosa*. Illustration: J.E. Watson.



Figure 163. *Plumularia filicaulis* on brown alga, Eagle Hawk, Tasmania, 10 m. Photograph: J.E. Watson.

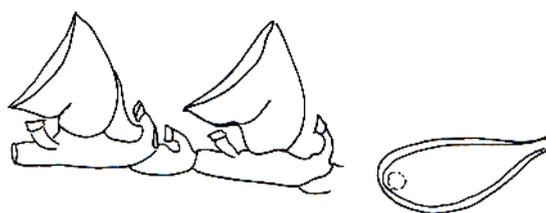


Figure 164. *Plumularia filicaulis*. Illustration: J.E. Watson.

Plumularia filicaulis Kirchenpauer, 1876

Description Hydorrhiza broad and ribbon-like with distinct transverse markings (flexion joints). Colony erect, stems pinnate, to 8 mm high. Hydrocladia short, hydrotheca cup-shaped, a strong indentation in lower wall causing hydrotheca to face forward, margin peaked. One wine-glass shaped nematotheca behind hydrotheca and twin laterals one each side, another on a short athecate internode between the thecate internodes. Gonotheca large, irregularly ovate to sausage-shaped, flattened and strongly attached to the substrate, upper side corrugated sometimes with small nematothecae, orifice small, circular, facing upwards. Colour: colonies white to yellow.

Remarks Recognition: hydorrhiza often yellow; large flat gonothecae firmly attached to alga.

Ecology Habitat: on seagrasses and brown algae. Seasonality: colonies grow and become fertile over summer.

Distribution Southern and Western Australia, Chile.

References Watson (1975, 1997, 2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=212494

Plumularia procumbens Spencer, 1891

Description Colonies a single large, thick, fan-shaped stem to 30 cm high. Stem irregularly branched and rebranched, composed of many polysiphonic tubes, growing from a thick fibrous hydorrhiza. Hydrocladia on branches short, each bearing a few hydrothecae. Hydrotheca very small, cup-shaped, one side attached to the hydrocladium. Nematothecae wine-glass shaped, one behind hydrotheca and twin laterals one each side of the hydrotheca. Gonotheca oval, with a flat summit, borne thickly along the branches. Colour: stem and branches greyish brown, gonothecae white.

Remarks Recognition: large fan-shaped, bristly greyish brown colonies.

Ecology Habitat: deeper reefs in good water flow; abundant in Western Port and Port Phillip Heads. A magnificent undescribed species of aeolid nudibranch is an apparently obligate predator on this hydroid (R. Burn, pers. comm.). Seasonality: colonies live for several years, fertile in winter.

Distribution southern Australia, probably New Zealand.

References Watson (1973).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285284



Figure 165. *Plumularia procumbens*. Boarfish Reef, Port Phillip Bay. Photograph: J.E. Watson.

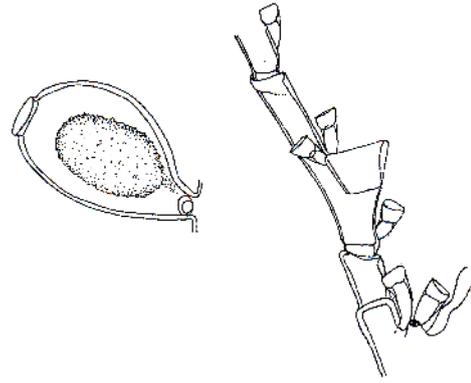


Figure 167. *Plumularia procumbens*. Illustration: J.E. Watson.



Figure 166. *Plumularia procumbens* close-up. Boarfish Reef, Port Phillip Bay. Photograph: J.E. Watson.

Plumularia rotunda Mulder & Trebilcock, 1911

Description Colony creeping on underside of alga. Hydromorpha tubular with internal joints. Stems straight, monosiphonic, to 7 mm high. Hydrocladia alternate, in one plane, one or two hydrothecae on hydrocladium. Hydrotheca elongate oval, upper wall convexly inflated, a thick ridge passing down to hydrothecal margin. Margin facing obliquely backwards, rim weakly scalloped. One median nematotheca on base of hydrotheca, and twin laterals below hydrotheca but not reaching the hydrothecal margin. Gonotheca borne near base of stem, large, barrel-shaped, surface strongly corrugated.

Remarks Recognition: tiny stems hidden below flat algal thallus.

Ecology Habitat: on sheltered underside of the leathery brown alga *Peysonnelia* in deeper ocean. Seasonality: grows and becomes fertile over summer.

Distribution Victorian coastal waters.

References Watson (2015b).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285290

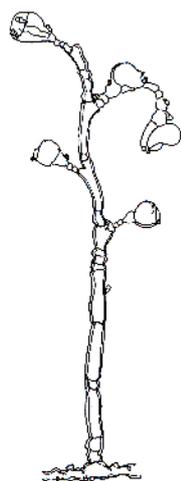


Figure 168. *Plumularia rotunda*. Illustration: J.E. Watson.

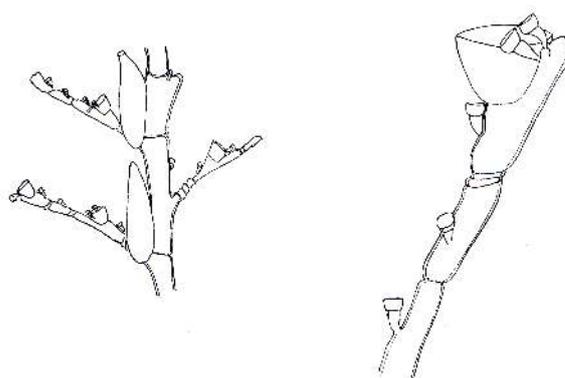


Figure 169. *Plumularia setacea*. Illustration: J.E. Watson.

Plumularia setacea (Linnaeus, 1758)

Description Stems pinnate, to 10 cm high, growing singly or in clusters from a creeping hydrorhiza. Hydrocladia about 5 mm long, with many hydrothecae. Hydrotheca cup-shaped, one side attached to hydrocladium, margin circular, facing forward. One nematotheca behind hydrotheca and one each at side of margin. Gonothecae borne in a row along stem, narrow flask-shaped, male with a long, tubular neck, sometimes bent, neck of female shorter. Female gonophore with eggs. Colour: stems white to pale brown, hydrocladia and gonothecae white.

Remarks Recognition: white stems and flask-shaped gonothecae. Can be confused with *Plumularia wattsi* and *Plumularia setaceoides* but the spiral hydrocladia of *P. wattsi* and the barrel-shaped gonotheca of *P. setaceoides* are distinctive.

Ecology Habitat: sheltered embayments, often on jetty piles. Seasonality: colonies seasonal, fertile over summer.

Distribution World-wide, possibly distributed by ships.

References Watson (2000, 2005)

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117824

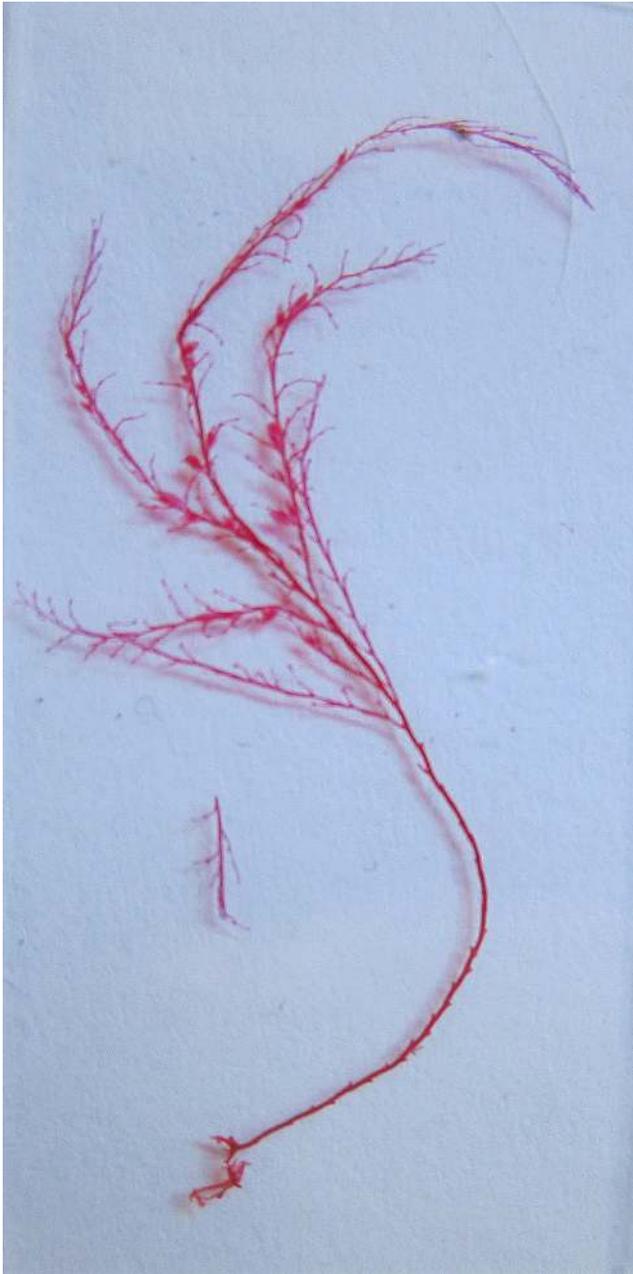


Figure 170. *Plumularia setacea*. Laboratory photograph. Photograph: J.E. Watson.

***Plumularia setaceoides* Bale, 1882**

Description Hydrorhiza creeping, stems to 5 cm high, pinnate, hydrocladia often recurved, with alternate thecate and atehcate internodes. Hydrotheca cup-shaped, facing obliquely upward, lower wall partly free of internode, aperture circular, a nematotheca behind hydrotheca and one at each side (twin laterals), a nematotheca on atehcate internode. Gonothecae borne on lower part of stem, much larger than hydrotheca, barrel-shaped, wall smooth to rugose, female with eggs. Colour: white.

Remarks Recognition: graceful pinnate white colonies.

One of commonest southern Australian hydroids.

Ecology Habitat: on algae, seagrass and other invertebrates, prefers semi-shelter, common under jetties. Seasonality: colonies grow and become fertile in winter.

Distribution Common in southern Australia, New Zealand.

References Watson (1997, 2005), Watson (1975, 2015b, as *Plumularia wilsoni*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285294



Figure 171. *Plumularia setaceoides*. St Leonards pier, Port Phillip Bay, 2 m. Photograph: Andrew Newton.

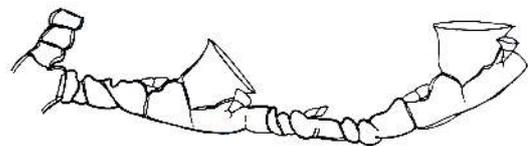
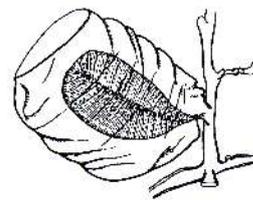


Figure 172. *Plumularia setaceoides*. Illustration: J.E. Watson.

***Plumularia sulcata* (Lamarck, 1816)**

Description Colonies to 50 cm high. Stems brittle, woody, of many polysiphonic tubes, usually with

several large pinnate branches, more or less in the same plane. Hydrotheca crowded along hydrocladium, deep cup-shaped, nematothecae large, one behind hydrotheca, and twin lateral nematothecae, one at each side of hydrotheca. Gonothecae large, cylindrical, borne in a row along hydrocladium. Colour: colony black from colour of zooxanthellae living in tissue. Gonothecae bright red.

Remarks Recognition: large branched colonies; the only black hydroid known from southern Australia.

Ecology Habitat: deeper ocean waters. Seasonality: colony probably lives for several years, fertile in summer.

Distribution Endemic to southern Australia; common at Port Phillip Heads.

References Watson (1973, 1996, 2005)

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=287321



Figure 173. *Plumularia sulcata*. Lonsdale wall, Port Phillip Heads, 20 m. Photograph: J.E. Watson.

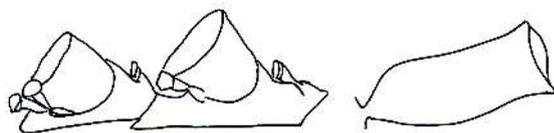


Figure 174. *Plumularia sulcata*. Illustration: J.E. Watson.

Plumularia wattsi Bale, 1887

Description Colony branched but not pinnate, hydrocladia growing in whorls around the stem and branches. Colonies to 15 cm high, usually comprising one to several thin, flexuous stems with numerous short branches arranged in a spiral pattern around stem. Hydrocladia about 1 mm long on branches. Hydrotheca cup-shaped with three wine-glass shaped nematothecae, one behind hydrotheca and one on each side (twin laterals) of hydrothecal margin. Gonothecae borne thickly along the branches, amphora-shaped, with a long narrow neck. Female gonophore with eggs. Colour: stem and main branches shining pale brown to white.

Remarks Recognition: tall, flexuous, spirally branched stems.

Ecology Habitat: on pebbles and old shell in good current flow. Seasonality: colonies seasonal, becoming fertile in winter.

Distribution Southern Australia.

References Watson (1994b, as *Nemertesia wattsi* (Bale 1887)), Vervoort & Watson (2003).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285312



Figure 175. *Plumularia wattsi*. Symonds Channel, Port Phillip Bay. Photograph: J.E. Watson.

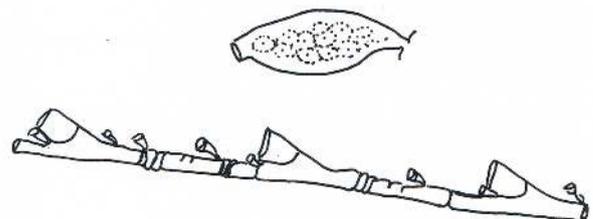


Figure 176. *Plumularia wattsi*. Illustration: J.E. Watson.

Family Sertularellidae Maronna et al., 2016

Description "Colonies are erect, mono- or polysiphonic, branched or unbranched, and hydrothecae have four marginal cusps and a pyramidal operculum with four triangular valves." (Maronna *et al.*, 2016, p. 15)

Remarks Maronna *et al.* (2016) established the family Sertularellidae for three genera previously placed within the Sertulariidae: *Calamphora* Allman, 1888 and *Sertularella* Gray, 1848, both of which are represented in Australia, and *Xingyurella* Song et al., 2018 which is only known from the North Pacific.

Fourteen species of *Sertularella* are recorded from Australia (Bax & Gershwin, 2022), with three commonly occurring species are described below.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1041929

***Sertularella pinnata* (Lamouroux, 1816)**

Description Colonies comprising clusters of pinnate stems up to 20 cm long, often with side branches growing from a large tangled hydrorhizal mat. Stems polysiphonic, hydrocladia alternate, up to 2 cm long. Hydrothecae alternate on hydrocladium, large, tubular, entirely adnate (fixed to hydrocladium), margin with four small, indistinct cusps, operculum pyramidal. Gonothecae large, barrel-shaped, faintly ridged, in a flattened row along hydrocladium, aperture circular, at top. Colour: yellow to orange.

Remarks Recognition: large stiffly pinnate orange-yellow colonies.

Ecology Habitat: usually deeper water in good current flow, but in shallower water in Western Port. Seasonality: colonies live for several years, fertile early to late summer.

Distribution Southern Australia.

References Gordon *et al.* (1998); Watson (2000, 2003).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=156423



Figure 177. *Sertularella pinnata*. Castle Rock, Port Phillip Heads, 16 m. Photograph: J.E. Watson.

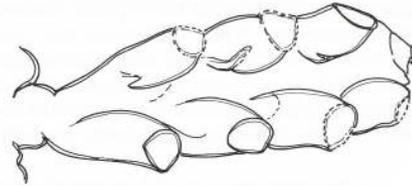


Figure 178. *Sertularella pinnata*. Illustration: J.E. Watson.

***Sertularella quasiplana* Trebilcock, 1928**

Description Hydrorhiza creeping. Colonies usually unbranched, to 1 cm high. Hydrothecae alternate, bases fixed (adnate) to stem, free part pointing outwards, usually concentrically ridged, margin with four low cusps and three small bracket-like pegs inside the margin between the cusps. Gonotheca barrel-shaped, on lower stem, concentrically ridged, summit with a neck and three or four upwardly pointing short spines. Female gonophore with many eggs which are extruded in an acrocyt, a pouch of thin tissue through the aperture of the gonotheca. Colour: pale honey brown to yellow.

Remarks Recognition: short pale-coloured stems, growing thickly on substrate. The species closely resembles *Symplectoscyphus indivisus* from which it is distinguished by the four marginal cusps of the hydrotheca. *Sertularella quasiplana* is a replacement name for *Sertularella robusta* which is a homonym (a name which had already been applied to a different species).

Ecology Habitat: on algae and invertebrates in sheltered waters. Seasonality: colonies grow throughout the year, fertile in summer.

Distribution Southern Australia, common in sheltered ocean and bays.

References Watson (1973, 1975, 2003).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=1554220



Figure 179. *Sertularella quasiplana* on sponge, Popes Eye reef, Port Phillip Bay, 6 m. Photograph: J.E. Watson.



Figure 180. *Sertularella quasiplana* on sponge, Popes Eye reef, Port Phillip Bay. Photograph: J.E. Watson.

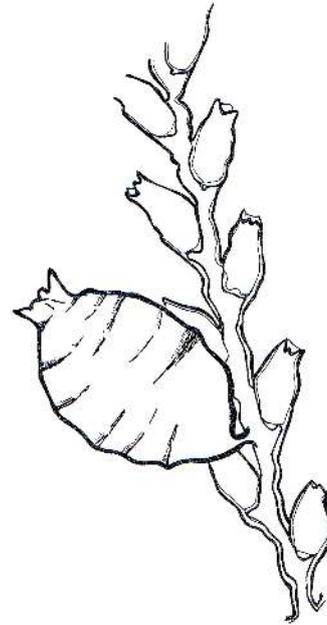


Figure 181. *Sertularella quasiplana*. Illustration: J.E. Watson.

Family Sertulariidae Lamouroux, 1812

Description Colonies branched or unbranched, always with a row of tubular hydrothecae on opposite sides of stem or branch. Hydrothecae attached (adnate) by part of their length, bilaterally symmetrical, with a cusped margin and with a segmented operculum. Hydranth with one whorl of filiform tentacles. Female gonophore producing eggs, male producing sperm, protected by a gonotheca.

Remarks The family Sertulariidae includes many genera and species and is world-wide in distribution ranging from the tropics to high latitudes. Species occur in all habitats from the intertidal zone to the deepest ocean. Species range from simple small stems with a few hydrothecae to large, complexly branched pinnate (feathery) colonies with thousands of hydrothecae. The family is abundant in cool temperate southern Australia. The genus *Staurotheca*, previously part of the family Sertulariidae, was moved to the family Staurothecidae by Maronna *et al.* (2016).

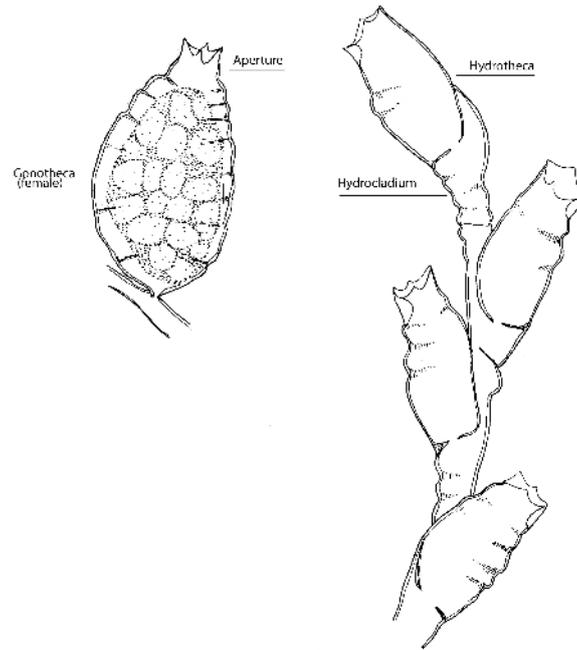


Figure 182. Sertulariidae general structure. Illustration: J.E. Watson.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117105

Sixteen genera and 96 species of Sertulariidae are recorded from Australian waters (Bax & Gershwin, 2022). Eleven species likely to be encountered in southern Australia are treated below.

***Amphisbetia maplestonei* (Bale, 1884)**

Description Hydrorhiza creeping. Stems pinnate to 1 cm high, with alternate side branches (hydrocladia). Hydrothecae borne on stem and branches, tubular, facing outwards and narrowing to margin with two opposite sharply pointed cusps. Gonothecae borne on lower part of stem, oval, perisarc thick, aperture circular, at top, surrounded by a raised collar flanked by a pair of spines, a row of small internal denticles below collar. Colour: honey brown, gonophores often creamy pink.

Remarks Recognition: small branched brown stems,

usually on red algae. *Amphisbetia maplestonei* is part of a group of several branched species that can only be separated with microscopic examination.

Ecology Habitat: ocean, on red algae and sometimes on brown algae. Seasonality: colonies grow in spring, become fertile in summer.

Distribution Endemic to southern Australia.

References Watson (1973, 2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285396

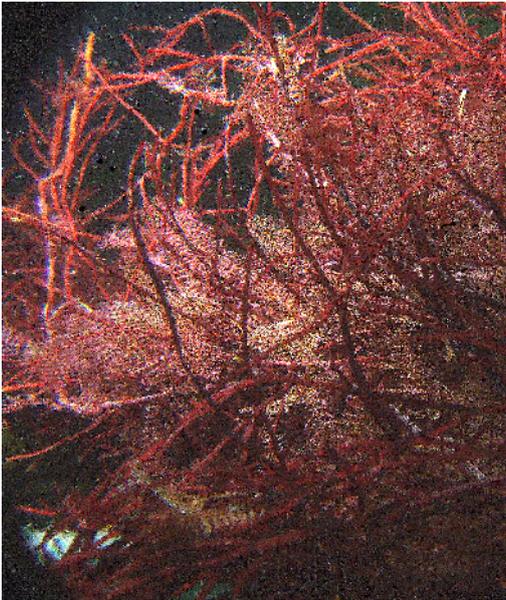


Figure 183. *Amphisbetia maplestonei*. Photograph: J.E. Watson.

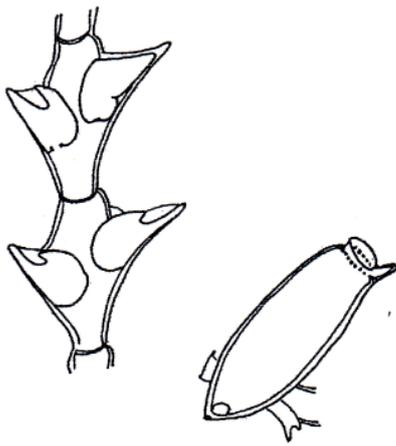


Figure 184. *Amphisbetia maplestonei*. Illustration: J.E. Watson.

Amphisbetia minima (Thompson, 1879)

Description Colonies of many simple, unbranched stems to 1 cm high growing from a creeping tubular hydrorhiza. Stem with opposite pairs of hydrothecae, their bases touching across stem, upper body of hydrotheca bent outwards, margin with two long, opposite cusps. Gonotheca large, ovoid, flattened, borne on hydrorhiza or lower stem, aperture circular, at top, surrounded by a low collar and flanked by a pair of blunt spines, female gonophore with eggs. Colour: buff to yellow, gonophores cream to yellow.

Remarks Recognition: whiskery fuzz on algal fronds. **Ecology** Habitat: a common sheltered water epiphyte on red and brown algae, especially Sargassum. Seasonality: colonies grow in late winter and become fertile in spring through summer.

Distribution Southern Australia, New Zealand.

References Watson (1973, 2003), Watson (1975, as *Amphisbetia minima* var. *intermedia*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285399



Figure 185. *Amphisbetia minima*. Photograph: J.E. Watson.

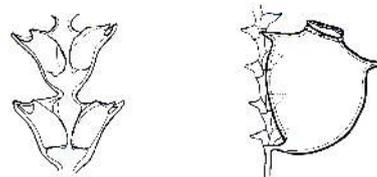


Figure 186. *Amphisbetia minima*. Illustration: J.E. Watson.

Amphisbetia operculata (Linnaeus, 1758)

Description Colonies to 25 cm high, wiry, composed of tangled branches, lacking a main stem. Hydrothecae opposite on branches, tubular but not touching, margin with two opposite, upwardly pointed sharp cusps. Gonothecae scattered along branches, pear-shaped with a circular aperture at top surrounded by a raised collar. Colour: colony pale greenish to honey brown, often pinkish from a thin coating of coralline algae. Habitat: on rubble on seabed or reef in strong water flow.

Remarks Recognition: large bushy colonies without a main stem, harsh wiry texture. A species reported from New Zealand, *Amphisbetia fasciculata* (Kirchenpauer, 1864), is virtually indistinguishable from *A. operculata* and may actually be that species. *Amphisbetia pulchella* (Thompson, 1879) is a junior synonym of *Amphisbetia operculata*.

Ecology Habitat: on rubble on seabed or reef in strong water flow. Seasonality: colonies may live for several years, becoming fertile in winter and spring.

Distribution southern Australia; worldwide in temperate seas.

References Watson (1975) Watson (1973, 2005, as *Amphisbetia pulchella*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117874

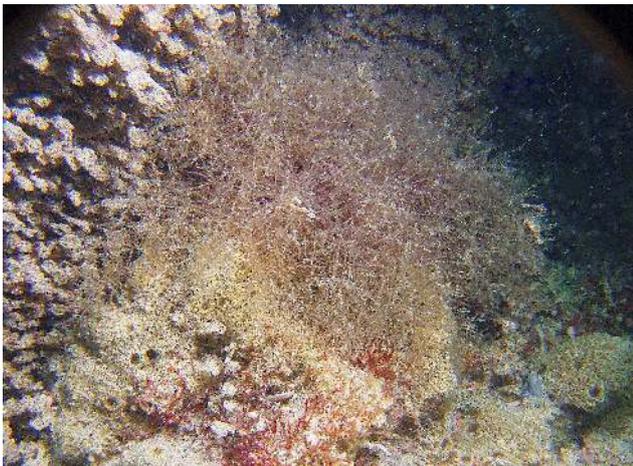


Figure 187. *Amphisbetia operculata*. Photograph: J.E. Watson.

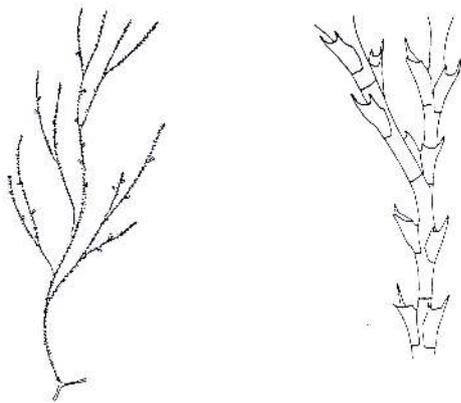


Figure 188. *Amphisbetia operculata*. Illustration: J.E. Watson.

***Crateritheca crenata* (Bale, 1884)**

Description Hydorhiza creeping, stems to 2 cm, monosiphonic, pinnate, hydrocladia alternate, hy-

drothecae alternate, opposite on stem and branches, facing obliquely upward, cylindrical or slightly expanding, a small internal ridge about halfway up hydrotheca, margin with many small sharply pointed cusps. Gonotheca narrow balloon-shaped, borne in a row along stem. Colour: buff to dark brown.

Remarks Recognition: hydrotheca with many sharp marginal cusps. Distinguished from *Stereotheca elongata* by the much smaller stems and balloon-shaped gonotheca without spines.

Ecology Habitat: on algae in ocean waters. Seasonality: colonies grow and become fertile in winter. Known distribution: southern Australia.

Distribution South Australia

References Watson (1973).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=289728



Figure 189. *Crateritheca crenata*, Castle Rock. Photograph: J.E. Watson.

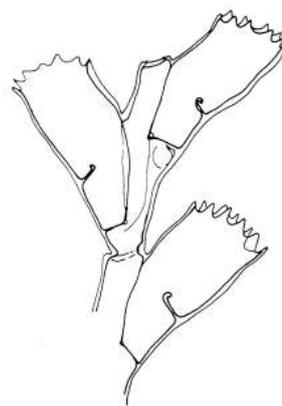


Figure 190. *Crateritheca crenata*. Illustration: J.E. Watson.

Diphasia subcarinata (Busk, 1852)

Description Stems monosiphonic, unbranched, to 5 cm high, borne on a creeping hydrorhiza. Hydrothecae opposite on stem, long, tubular, upper half bent outwards, expanding in diameter to margin. Margin spout-shaped, a distinct ridge running full length of hydrotheca from margin to base, aperture with three large lobate cusps, operculum of one flap. Gonothecae ovoid, borne in a row pressed to stem, balloon-shaped, covered in short spines. Colour: purplish-brown.

Remarks Recognition: purplish brown saw-toothed stems, spinous gonothecae.

Ecology Habitat: among holdfasts of algae and on other invertebrates in ocean waters. Seasonality: colonies grow throughout the year, become fertile spring to late summer.

Distribution southern Australia and New Zealand.

References Watson (1973).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285428

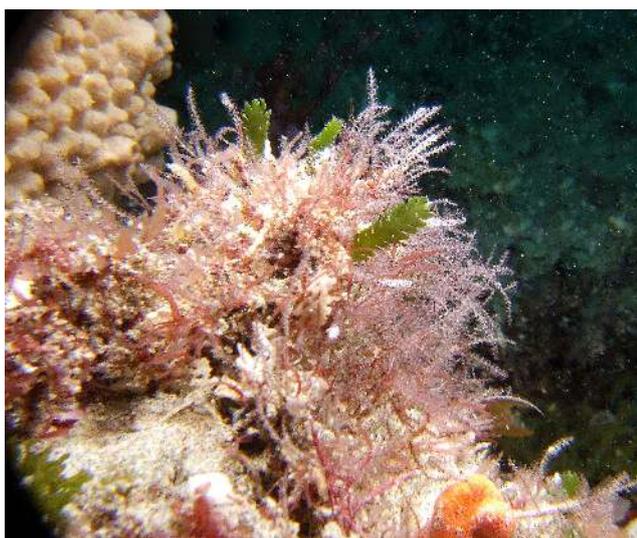


Figure 191. *Diphasia subcarinata*, Popes Eye reef, Port Phillip Bay, 12 m. Photograph: J.E. Watson.

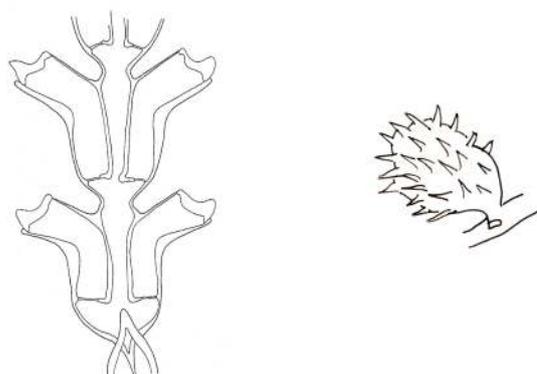


Figure 192. *Diphasia subcarinata*. Colony detail (left), gonotheca (right). Illustration: J.E. Watson.

Sertularia macrocarpa Bale, 1884

Description Colonies large, of clusters of erect unbranched pinnate monosiphonic stems to 10 cm long. Branches (hydrocladia) alternate on stems, to 2 cm long. Hydrothecae long, saccate, in almost opposite pairs along hydrocladium, pointing upwards, tapering from base to a narrow margin with a pair of opposite somewhat lobate cusps. Gonotheca large, barrel-shaped, indistinctly corrugated, attached along stem and hydrocladia, aperture circular, at top, surrounded by a low collar. Perisarc of colony thick. Colour: charcoal grey, hydrocladia grading to white at tips.

Remarks Recognition: tall graceful greyish-white colonies with luminously white tips.

Ecology Habitat: deeper ocean reefs. Seasonality: colonies may live for several seasons, fertile in summer.

Distribution Southern Australia, Western Australia.

References Watson (1973, 1975, 1994b, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285395



Figure 193. *Sertularia macrocarpa*. offshore reef, Ninety Mile Beach, Bass Strait, 20 m. Photograph: J.E. Watson.

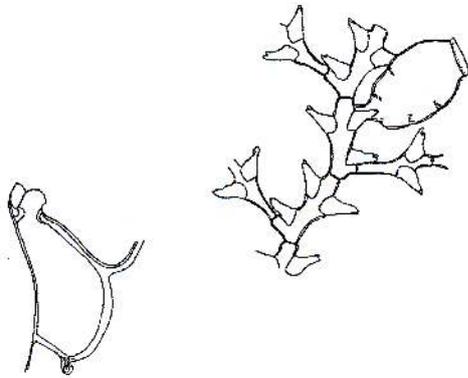


Figure 194. *Sertularia macrocarpa*. Illustration: J.E. Watson.

Sertularia tenuis Bale, 1884

Description Hydrorhiza creeping, stems pinnate, monosiphonic, unbranched, to 2 cm long, a distinct joint at base of stem. Hydrocladia alternate, hydrothecae in opposite pairs on stem and hydrocladia, tubular, sides in contact, body narrowing to a margin with a pair of lateral cusps, and a tent-shaped operculum. Gonothecae borne on stem, pear-shaped to barrel-shaped, surface smooth, aperture circular, at top, surrounded by a low collar with an internal row of denticles. Colour: dark grey to almost black.

Remarks Recognition: short, dark grey to black pinnate stems, often backwardly curved.

Ecology Habitat: on algae, especially the brown alga *Sargassum* and invertebrates in shallow, sheltered water. Abundant on jetty piles. Seasonality: colonies grow and become early spring to autumn.

Distribution Western Australia, South-eastern Australia, New Zealand.

References Watson (1996).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285631



Figure 195. *Sertularia tenuis*, on worm tube, Clifton Springs, Port Phillip Bay, 2 m. Photograph: J.E. Watson.



Figure 196. *Sertularia tenuis*, on worm tube (close-up), Clifton Springs, Port Phillip Bay, 2 m. Photograph: J.E. Watson.

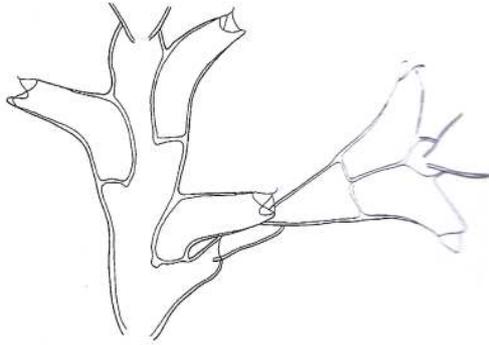


Figure 197. *Sertularia tenuis*. From Vervoort & Watson (2003).



Figure 198. *Sertularia unguiculata*. Popes Eye, Port Phillip Bay, 6 m. Photograph: J.E. Watson.

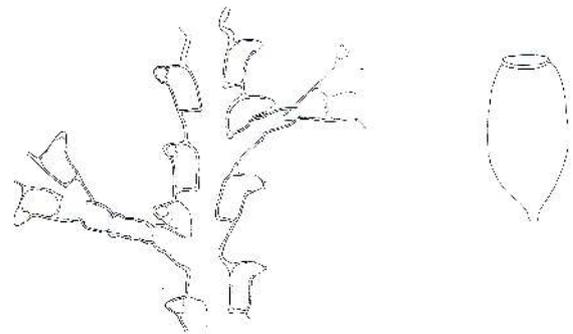


Figure 199. *Sertularia unguiculata*. From Vervoort & Watson (2003).

Sertularia unguiculata Busk, 1852

Description Hydrorhizal creeping. Stems to 4 cm long, pinnate, curved slightly backwards, hydrocladia alternate along stem. Hydrothecae opposite on hydrocladia, tubular, almost touching across hydrocladium, free part bent abruptly outwards, tapering to margin, aperture with a pair of blunt lateral cusps. Gonothecae borne along stem, large, barrel-shaped, smooth, with a circular aperture at top surrounded by a short raised collar. Colour: golden-brown.

Remarks Recognition: colonies of gracefully arched golden brown stems.

Ecology Habitat: on sponges and other invertebrates in sheltered ocean waters. Sometimes on jetty piles. Seasonality: colonies grow in winter, become fertile spring to summer.

Distribution Southern Australia, New Zealand.

References Watson (1973).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=292384

Stereothea elongata (Lamouroux, 1816)

Description Hydrorhiza creeping. Colony of many flexuous, pinnate stems to 8 cm long. Hydrocladia alternate along stem, hydrothecae tubular, sub-alternate on stem and hydrocladia, attached by two-thirds of length, free part bent outwards, margin with six to eight sharply pointed cusps. Gonothecae borne on stem and hydrocladia, large, triangular, flattened, with a small circular aperture at top with a raised collar flanked by two long spines. Colour: dark brown, older stems often overgrown by pink coralline algae.

Remarks Recognition: long elegant flexuous stems with a harsh texture. Stems are often cast up on ocean beaches and do not shrivel when dry.

Ecology Habitat: on holdfasts of algae and stems of *Amphibolis* seagrasses. Seasonality: colonies grow and become fertile throughout the year.

Distribution Southern Australia and New Zealand.

References Watson (1973, 1975, 2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=291130



Figure 200. *Stereotheca elongata*. Popes Eye reef, Port Phillip Bay, 10 m. Photograph: J.E. Watson.

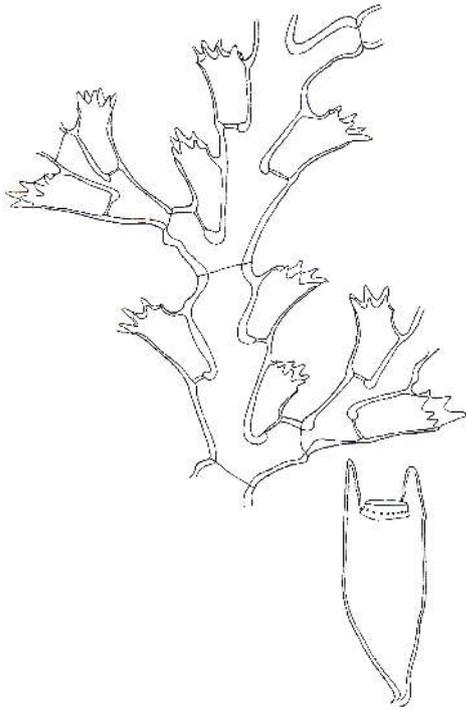


Figure 201. *Stereotheca elongata*. From Vervoort & Watson (2003).

***Tridentata marginata* (Kirchenpauer, 1864)**

Description Stems pinnate, short, to 3 cm high, monosiphonic, sometimes branched, arising from a creeping hydrorhiza. Hydrocladia alternate along stem, hydrotheca opposite on hydrocladium, saccate,

lower half attached to hydrocladium, bases almost touching across hydrocladium, margin facing outwards with two lateral cusps. Gonotheca large, borne on stem, barrel-shaped, deeply ridged, circular aperture at top. Colour: white.

Remarks Recognition: white pinnate stems. Previously known as *Sertularia marginata*.

Ecology Habitat: on red algae and invertebrates. Seasonality: colonies present and fertile winter to spring.

Distribution Southern Australia, circumglobal in temperate seas.

References Vervoort & Watson (2003) (as *Sertularia marginata*).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=418905



Figure 202. *Tridentata marginata*. Popes Eye reef, Port Phillip Bay, 6 m. Photograph: J.E. Watson.

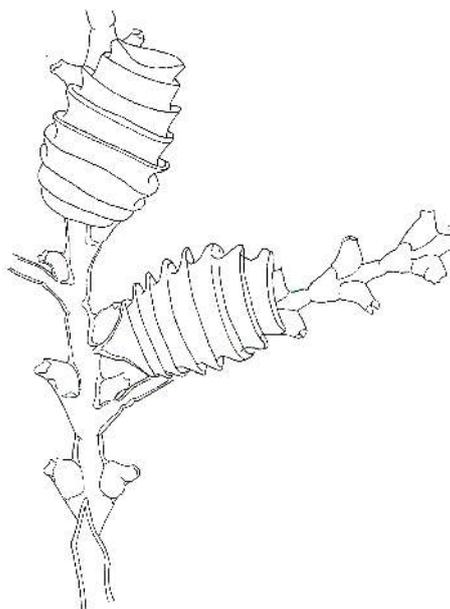


Figure 203. *Tridentata marginata*. From Vervoort & Watson (2003).

Family Symplectoscyphidae Maronna et al., 2016

Description "Hydrothecal aperture provided with three cusps and by an operculum of three valves." From (Maronna *et al.*, 2016, p. 14) (Variable in colony morphology, branching pattern and gonotheca morphology.)

Remarks Maronna *et al.* (2016) established the family Symplectoscyphidae for three genera: *Antarctoscyphus* Pena Cantero, Garcia Carrascosa & Vervoort, 1997, *Bicaularia* Song *et al.*, 2019 and *Symplectoscyphus* Marktanner-Turneretscher, 1890; only *Symplectoscyphus* occurs in Australia, with 18 species recorded (?); four of these are described below.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=955659

Symplectoscyphus indivisus (Bale, 1882)

Description Hydrorhiza creeping. Stems to 2 cm high, older stems sometimes with one or two branches. Hydrothecae alternate along stem and branches, tubular, lower part attached to branch, widest at base, narrowing slightly to margin, body slightly corrugated, margin with three sharp equidistant cusps. Gonothecae borne along stem, larger than hydrotheca, barrel-shaped, deeply concentrically ridged, narrowing to apex with three spines. Gonophore with eggs. Colour: colony white, buff or yellow, eggs yellow to pink.

Remarks Recognition: hydrotheca with three cusps; saw-tooth arrangement of hydrothecae on stem. Resembles *Sertularella robusta* but the hydrotheca of *S. robusta* has four marginal cusps.

Ecology Habitat: abundant on algae and invertebrates. common in bays and sheltered ocean. Seasonality:

colonies present throughout the year, become fertile in summer.

Distribution Southern Australia, New Zealand.

References Watson (1973, 1994b, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285662



Figure 204. *Symplectoscyphus indivisus*. Portsea Hole, Port Phillip Bay, 15 m. Photograph: J.E. Watson.



Figure 205. *Symplectoscyphus indivisus* close-up. Portsea Hole, Port Phillip Bay, 15 m. Illustration: J.E. Watson from Vervoort & Watson (2003)

***Symplectoscyphus neglectus* (Thompson, 1879)**

Description Hydrorhiza creeping, stems to 5 cm long, pinnate, branched, hydrocladia alternate on stem and branches. Hydrothecae on both sides of stem and branches, long and slender, facing forward and upward in overlapping rows, walls faintly corrugated, narrowing to margin. Margin with three long equidistant cusps. Gonothecae large, sausage-shaped, body long, sausage-shaped, walls corrugated. Male and female borne on same stem. Colour: colony yellow to honey brown, female gonophore creamy pink.

Remarks Recognition: small curved brown stems, overlapping hydrothecae and large sausage-shaped gonothecae.

Ecology Habitat: usually on firm-textured red algae in ocean waters. **Seasonality:** colonies grow and become fertile over summer.

Distribution Southern Australia and New Zealand.

References Watson (1973, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285683

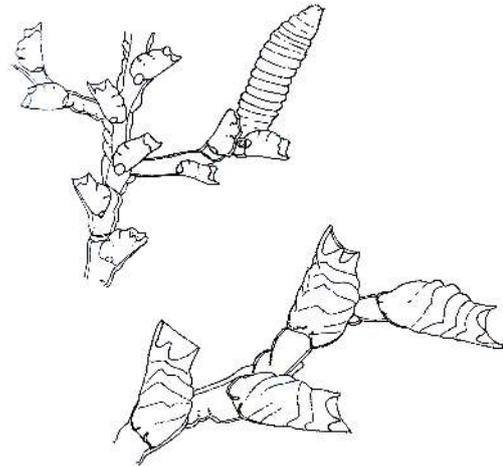


Figure 206. *Symplectoscyphus neglectus*. Illustration: J.E. Watson.

***Symplectoscyphus rostratus* Watson, 1973**

Description Hydrorhiza loosely adherent to substrate, stems to 5 mm long, unbranched, bearing several hydrothecae. Hydrotheca small, body widely corrugated, narrowing to margin with three blunt cusps. Gonotheca larger than hydrotheca, ovoid, borne on a short stalk below a hydrotheca, body of gonotheca loosely corrugated, aperture at top with three blunt cusps. Colour: white to buff.

Remarks Recognition: small colonies on larger hydroids. Corrugated hydrotheca.

Ecology Habitat: grows on stems and hydrocladia of oceanic aglaopheniid hydroids. **Seasonality:** colonies fertile over summer.

Distribution Southern Australia.

References Watson (1973).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285701



Figure 207. *Symplectoscyphus rostratus*. Photograph: J.E. Watson.

attached by most of length, cylindrical, facing upwards, margin with three equidistant cusps separated by deep hollows, operculum pyramidal. Gonothecae borne thickly on lower branches, barrel-shaped, deeply corrugated, aperture at top, trumpet- to funnel-shaped and bent to one side. Funnel of male narrower than that of female. Perisarc of colony thick. Colour: buff to dark greyish-brown.

Remarks Recognition: dark coloured tangled stems; sometimes partly overgrown by pink coralline alga.

Ecology Habitat: tidal channels and reef in good current flow. Seasonality: colonies present throughout the year, become fertile in winter.

Distribution South-eastern Australia and New Zealand.

References Watson (1973, 1994b, 2003, 2018).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=174552

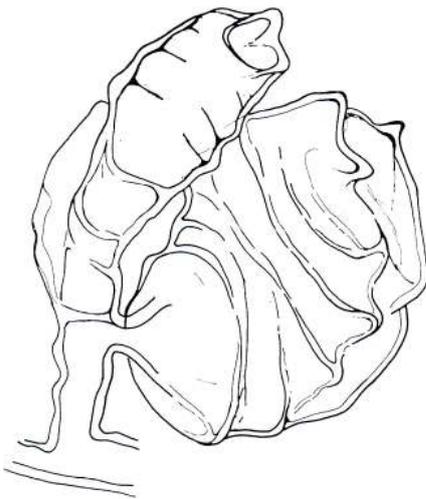


Figure 208. *Symplectoscyphus rostratus*. Illustration: J.E. Watson.

***Symplectoscyphus subdichotomus* (Kirchenpauer, 1884)**

Description Colonies comprising tufts of loosely branched, often entangled stems to 8 cm high borne on a creeping hydrorhiza. Stems monosiphonic, untidily branched, hydrothecae alternate on stem and branches,



Figure 209. *Symplectoscyphus subdichotomus*. Western Port channel colony. Photograph: J.E. Watson.

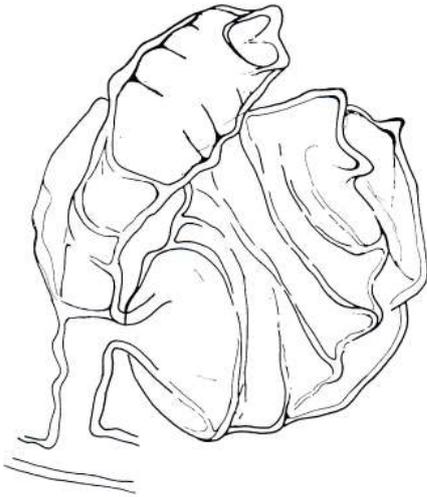


Figure 210. *Synplectoscyphus subdichotomus*. Illustration: J.E. Watson.

Family Syntheciidae Marktanner-Turneretscher, 1890

Description Hydroids with tubular hydrothecae attached to stem or branch for part of their length, margin of hydrotheca circular without operculum. Gonophores with eggs and sperm, protected by a gonotheca which grows from inside the hydrotheca.

Remarks Two genera and nine species of Syntheciidae are recorded from Australia (Bax & Gershwin, 2022). Although not common, species of *Synthecium* include several highly coloured species widely distributed around Australia. In *Synthecium* the gonotheca from inside hydrotheca is usually opposite on stem or branch. The two most common species are treated below.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=22963

Synthecium campylocarpum Allman, 1888

Description Colonies of erect pinnate stems to 3 cm high. Branches (hydrocladia) almost perpendicular to main stem. Hydrothecae opposite on stem and branches, long, tubular, attached for two-thirds of their length then bent outwards, margin circular. Gonothecae on lower branches growing out of the of a hydrotheca, ovoid, slightly flattened, surface strongly ridged, with a tubular terminal neck. Colour: yellow.

Remarks Recognition: small pinnate yellow stems. Colour and smaller size of colonies distinguishes it from the larger purple *Synthecium patulum*.

Ecology Habitat: pebbles, old shell and on the ascid-



Figure 211. Syntheciidae general structure. Illustration: J.E. Watson.

ian *Herdmania grandis* (Heller, 1878) in deeper ocean waters. Seasonality: unknown.

Distribution Victorian deeper water, southern Australia generally.

References Watson (2000, 2002).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285918

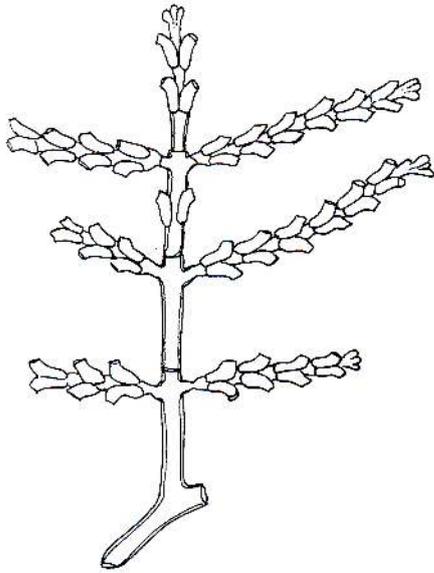


Figure 212. *Syntheceium campylocarpum*. Illustration: J.E. Watson.

Syntheceium patulum (Busk, 1852)

Description Hydrorhiza creeping. Colonies comprising tufts of stiffly erect monosiphonic pinnate stems to 5 cm high. Branches (hydrocladia) alternate. Hydrothecae tubular, opposite on stem and branches, attached for two-thirds of their length then almost perpendicularly bent outwards. Margin circular. Gonotheca growing from inside a hydrotheca on lower stem and branches, more or less ovoid, slightly flattened, deeply ridged with a tubular neck. Colour: purple.

Remarks Recognition: bushy purple colonies on open seabed.

Ecology Habitat: on pebbles and old shell in strong current flow. Seasonality: colonies probably live for several years, fertile in summer.

Family Thyroscyphidae Stechow, 1920

Description Colonies branched or unbranched, monosiphonic, hydrothecae borne on a short stalk (pedicel), from stem, margin of hydrotheca with three or low four cusps, operculum pyramidal, gonothecae ovoid, borne on stem.

Remarks The stalked (pedicellate) hydrotheca distinguishes the family from the Sertulariidae in which the body of the hydrotheca is directly attached (adnate) to the stem and branches. The family includes a few species most of which form large colonies found in tropical waters. Colonies of the southern Australian species are much smaller. Three genera and six species are known from Australia (Bax & Gershwin, 2022). Two southern Australian species are treated below.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=233224

Distribution Tidal channels in Port Phillip Bay, Western Port and southern Australia generally.

References Watson (1975, 2000, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=285931



Figure 213. *Syntheceium patulum*. North Arm channel, Western Port, 15 m. Photograph: J.E. Watson.

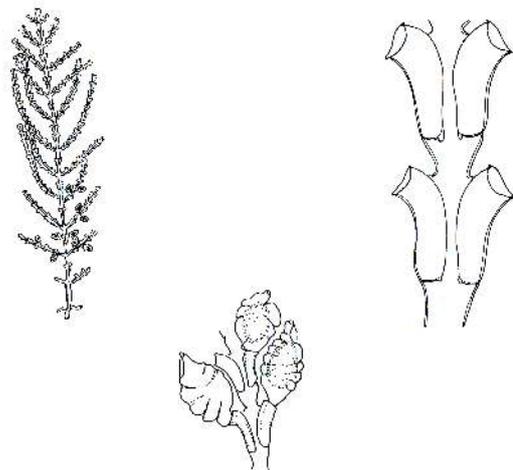


Figure 214. *Syntheceium patulum*. Illustration: J.E. Watson.

Parascyphus simplex (Lamouroux, 1816)

Description Hydrorhiza creeping on substrate. Stem monosiphonic, to 2 cm high, usually unbranched, hydrotheca tubular, on a short stalk, pointing upwards to front of stem, margin with three conspicuous cusps. Gonothecae borne near base of stem, large, irregularly ovoid, perisarc thin, with a circular aperture at top. Gonophore contains eggs that are extruded through the aperture, often in a thin sac-like "marsupium" from which the eggs are expelled. Colour: white.

Remarks Recognition: small white stems, hydrothecae on sort stalk free of stem.

Ecology Habitat: on other invertebrates including hydroids. Seasonality: colonies grow and become fertile in late summer.

Distribution Southern Australia, New Zealand, South Africa.

References Watson (1973, 2003, 2005).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=290680

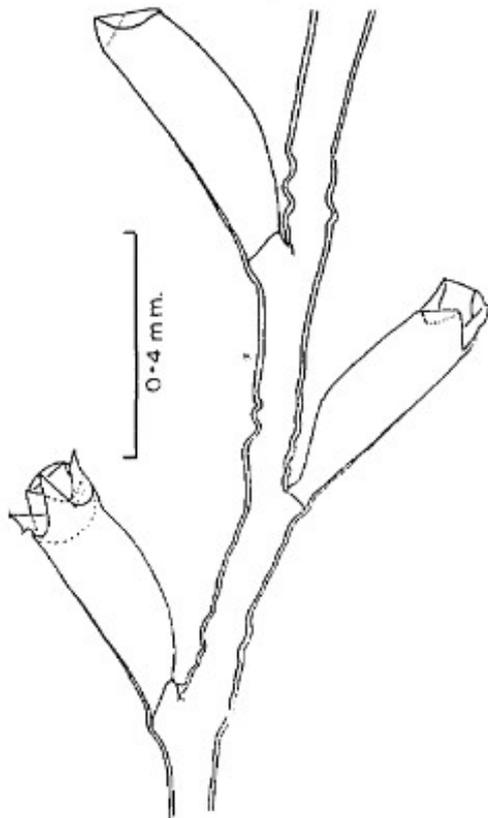


Figure 215. *Parascyphus simplex*, from Ralph (1961, fig. 1b).

Family Tiarannidae Russell, 1940

Description "Where known, colonies stolonial of *Stegopoma* type; hydrotheca pedicellate or sessile, deep, asymmetric-tubular; operculum formed by two pleated membranes which meet one another like a gabled roof, with straight ridges above and on the sides of hydrotheca, continuing up at each end, the all imparting a

Thyroscyphus macrocyttarus (Lamouroux, 1824)

Description Hydrorhiza loosely attached to substrate. Stems straggling, to 1 cm long, unbranched, bearing three or four stalked hydrothecae. Hydrotheca large, bell-shaped (campanulate), margin circular with a thick rim and four low equidistant cusps. Perisarc very thick. Gonotheca similar in shape but larger than hydrotheca. The species was described as *Campanularia marginatus* by Bale in 1884 but to avoid taxonomic confusion but almost a century later it was renamed *Thyroscyphus balei* by Calder in 1983 before subsequently being shown to be a synonym of *Thyroscyphus macrocyttarus* (Lamouroux, 1824). Colour: honey brown, often pink from a coating of coralline alga.

Remarks Recognition: row of large, tough bell-shaped hydrothecae.

Ecology Habitat: algae in intertidal rock pools and in the shallow subtidal. Seasonality: colonies present most of year. Fertile period unknown. Known distribution:

Distribution Endemic to southern Australia; not common.

References Watson (1994b, 2000, 2003, 2005). Calder (1983, as *Thyroscyphus balei*)

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=287752

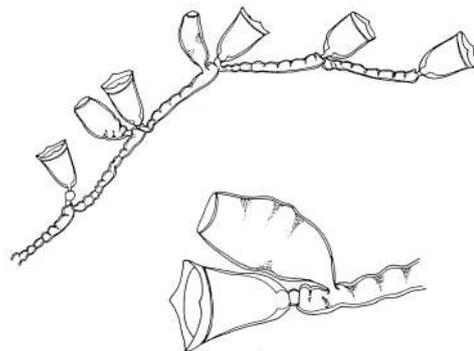


Figure 216. *Thyroscyphus macrocyttarus*. Illustration: J.E. Watson.

bilateral symmetry to the distal part of the hydrotheca; hydranths where known lacking intertentacular web; gonothecae resembling hydrothecae but larger, with free medusae or fixed sporosacs."(Bouillon & Boero, 2000, p. 202).

Remarks Two species are known from Australia. *Modeeria rotunda* (Quoy & Gaimard, 1827), described below, is cosmopolitan, typically epizoic on other hydroids. The second species, *Stegolaria geniculata* (Allman, 1888), is a deep sea species unlikely to be encountered in shallow water. See Watson & Vervoort (2001).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=22767

Modeeria rotunda (Quoy & Gaimard, 1827)

Description "Hydroid a stolonial colony, typically epizootic on other hydroids, with spindle-shaped hydrotheca rising from a tubular, often anastomosing stolon. Size of hydranth variable, 0.6–2 mm; length of pedicel also varied, almost non-existent to surpassing that of hydrotheca, generally smooth; proximal part of hydrotheca either gradually tapering into pedicel or with rounded base. Distal part of hydrotheca with characteristic gabled roof formed by 2 pleated, semicircular opercular plates suspended between 2 triangularly produced stiff extensions of the hydrothecal

wall. The pleated plates open by pressure from the hydranth inside to permit its passage. Hydranth not particularly long, with about 12 tentacles in uniconate whorl around conical proboscis. Gonothecae of same general shape as hydrothecae but much bigger, pedicel varied in length; 4 medusa buds, apical most advanced in development." (Vervoort & Watson, 2003, p. 32).

Ecology Commonly epizoic on other hydroids.

Distribution Circum-global.

References Vervoort & Watson (2003).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=117970

Family Zygophylacidae Quelch, 1885

Description Presence of nematothecae and gonothecae aggregated into coppinia or scapus. (Maronna *et al.*, 2016, p. 15)

Remarks Most earlier authors have included Zygophylacidae within the Lafoeidae. Two genera and nine species of Zygophylacidae are recorded from Australia (Bax & Gershwin, 2022), in two genera, *Cryptolaria* and *Zygophylax*. Most are from deep water; only *Zygophylax antipathies* is treated here.

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=955661

Zygophylax antipathies (Lamarck, 1816)



Figure 217. *Zygophylax antipathies* (laboratory photograph) Photograph: J.E. Watson.

Description Colonies to 5 cm high, stiffly branched, usually in one plane. Hydrothecae alternate, on short stalks (pedicels) standing out in rows along the branches. Hydrotheca tubular, increasing in diameter upwards from the pedicel, bent forwards about halfway along length, aperture facing forward, margin circular, a small vase-shaped nematotheca often present. Colonies to 5 cm high, stiffly branched, usually in one plane. Hydrothecae alternate, on short stalks (pedicels) standing out in rows along the branches. Hydrotheca tubular, increasing in diameter upwards from the pedicel, bent forwards about halfway along length, aperture facing forward, margin circular, a small vase-shaped nematotheca often present on the hydrothecal pedicel. Many small gonothecae embedded in a furry coppinia on lower stem and branches. Colour: dark reddish brown.

Remarks Recognition: stiff reddish brown colonies, bent hydrothecae.

Ecology Habitat: Ocean reefs. Seasonality: Unknown but colonies may live over several seasons.

Distribution Deeper waters of southern Australia.

References Watson (1973).

Nomenclature www.marinespecies.org/aphia.php?p=taxdetails&id=284987

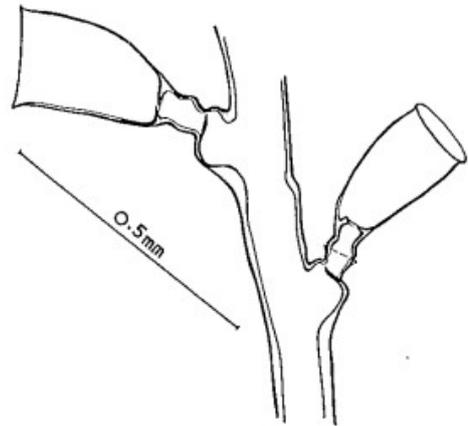


Figure 218. *Zygophylax antipathies*. From Watson, 1973: fig. 9.

Acknowledgements

The author was ever grateful to a long list of family, friends and colleagues who assisted her in the life-long research that culminated in the present work. Notably her children Avril, Ian and Neil and their families, her late husband Alf, Jan Carey, Harry Houridis, Bob Burn and David Staples. At Museums Victoria, Melanie Mackenzie, Genefor Walker-Smith, Chris Rowley and Jo Taylor worked extensively (and still do) to access Jan Watson's specimens into the Museum collections and manage loans. Museums Victoria librarians Hayley Webster, Gemma Steele and Olga Hionis were endlessly helpful with references and literature. Bob Burn and Jan Carey read and made corrections to the manuscript. Other vital contributors include photographers and diver photographers Leon Altoff, John Chuk, Trevor McMurrich and Andrew Newton.

Editor's note

The author, Dr Jeanette E. (Jan) Watson AM, died on 7 November 2021 aged 93 after a long career in which she established herself as Australia's principal authority on the taxonomy of Hydrozoans (hydroids). She was also a pioneer scientific SCUBA diver in Australia which led to her interest in collecting, photographing and researching hydroids. Jan was Honorary Associate of Museums Victoria for over 50 years, was still diving in her 80s and described at least 176 species (about one third of the currently known Australian hydroid fauna).

This work was originally conceived as a field guide to common hydroid species aimed at SCUBA divers and other interested naturalists. The manuscript evolved through many versions before arriving on the current format which also attempts to partially satisfy the needs of professional marine biologists.

In her last months Jan was not well enough to review final versions and subsequent comparison with the World Register of Marine Species (WoRMS) (Schuchert, 2023) revealed a number of taxonomic changes that would need to be incorporated. I paused the project. However, it was unsatisfactory to abandon so much work and I have now made edits to be as consistent as possible with WoRMS. Mostly these edits were to family and genus placements, to reflect recent synonymies and to add relevant recent literature. Links at the end of each species account redirect to a web page at WoRMS where the accepted classification and nomenclature of the day will be shown, so readers can discover taxonomic re-assignments I may have missed, as well as future changes. There is nothing remotely similar to this work for Australian hydroids, and so publishing with these caveats and safeguards is preferable to not publishing at all.

Robin Wilson March 11, 2024

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