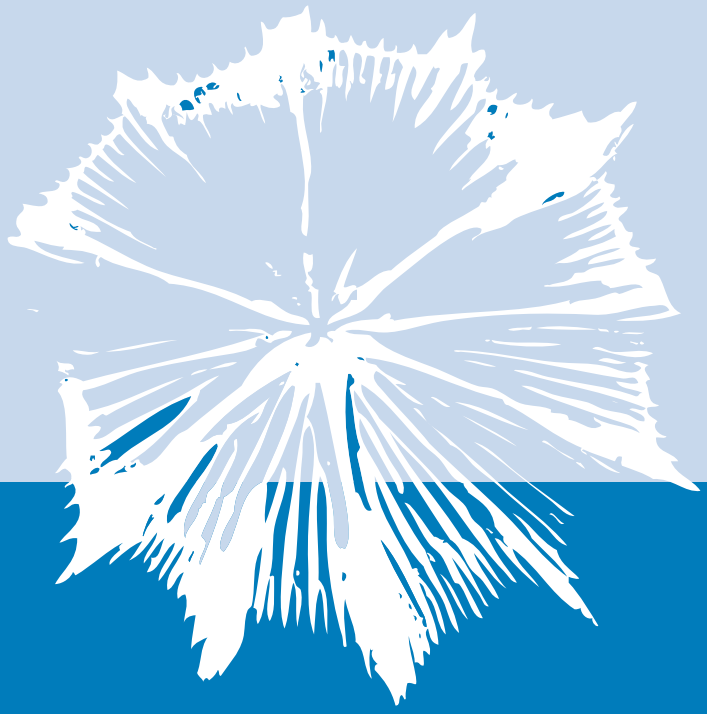
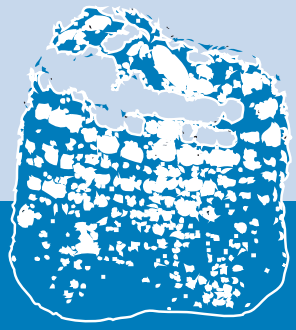
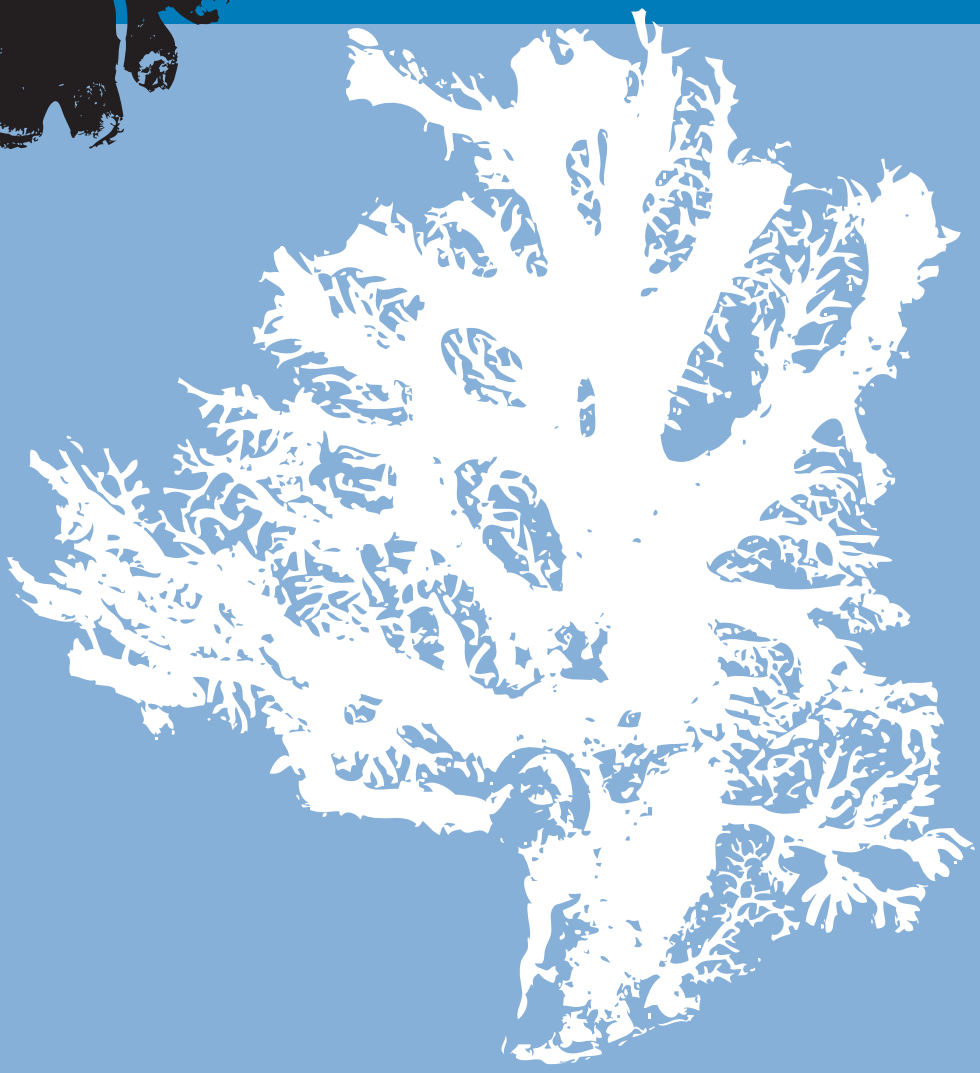




Phylum CNIDARIA

Anemones, corals, jellyfish, hydroids

Daphne Fautin, Dennis Gordon,
Dennis Opresko, Megan Oliver,
Juan Sanchez, Di Tracey



Phylum

CNIDARIA

Anemones, corals, jellyfish, and hydroids

Class Anthozoa — Corals, anemones, and kin

Anthozoans are the largest group of Cnidaria, with about 6000 living species worldwide. All are marine, and there is no medusa phase. The mouth opens into a stomach cavity that is partitioned by mesenteries (membranes) that expand the inner absorptive surface. There are two subclasses: the Octocorallia (Alcyonaria), which have eight mesenteries and tentacles, and the Hexacorallia (Zoantharia) with tentacles and mesenteries in multiples of six.

Corals are distinguished from their soft-bodied relatives like sea anemones, jellyfish, and hydroids by being calcified, i.e., incorporating calcium carbonate (lime) into their bodies to create a skeleton. Several kinds of cnidarians do this, and they can superficially resemble each other if they have a similar shape. The main kinds of calcified cnidarians in New Zealand waters are hydrocorals, gorgonians (octocorals), and stony corals.

Subclass Octocorallia

This subclass used to be divided into a number of orders, all but one colonial, in which the polyps are united by cords or sheets of tissue (coenenchyme). Octocorals, so-called because polyps have an 8-fold symmetry (8 tentacles and internal body partitions), can be relatively soft (sea pens and soft corals like dead-men's fingers) or, as in gorgonians, have an erect axis of calcareous spicules or of hardened protein impregnated with lime. In bamboo corals and some other gorgonians the axis may be jointed. Octocorals also lack the distinctive vertical radial partitions that characterise stony corals.

In the New Zealand EEZ, 243 octocoral species (187 undescribed) are known, divided among 103 genera in 28 families. These include 45 species of Order Alcyonacea (spreading runnerlike corals and soft octocorals), 167 species of Order Gorgonacea (gorgonians including the bubblegum corals), and 31 species of sea pens, Order Pennatulacea. The diversity of three families of deepwater calcified gorgonians (Isididae – bamboo corals, Primnoidae – bottlebrush corals, and Chrysogorgiidae – golden corals) is probably the highest in the world for a single country.

The stature of large gorgonian colonies is made possible by the enhanced development of skeletal material. In holaxonians, the axis is horny or woodlike, owing to the presence of a scleroprotein called gorgonin, and may be further strengthened by impregnation of calcium carbonate, but there are no sclerites in the axis. In bamboo corals (family Isididae) the axis is conspicuously jointed, with solid calcium carbonate between the joints. In isidids as well as in other highly calcified gorgonians such as Primnoidae and Chrysogorgiidae, the axes may give evidence of distinct growth rings in cross section.

Subclass Hexacorallia

Hexacorals may be solitary or colonial, soft or hard, the latter having rigid calcified skeletons. Soft hexacorals make up the Orders Ceriantharia (tube anemones), Actiniaria (sea anemones), Corallimorpharia (coral-like anemones), and Zoanthidea (zoanthid anemones). Hard hexacorals make up the Orders Scleractinia (stony corals) and Antipatharia (black corals). In the stony (or true) corals, calcification extends into the mesenteries, creating rigid septa that remain in the dead coral skeletons.

Order Ceriantharia

Tube anemones are solitary tube-dwelling hexacorals living in muddy bottoms. They are not a diverse group and the sole New Zealand species has not been characterised taxonomically.

Order Actiniaria (sea anemones)

New Zealand has a high diversity of soft hexacorals, especially of sea anemones (actinians). The deep-sea anemone fauna is widely distributed but poorly described. Sea anemones have 6 tentacles or multiples of 6 with nettle cells that sting and capture small or large prey. Some species are anchored in soft sediment, attached to rocks by their base, or can move slowly over the seabed. Many habitually grow on other creatures, including sponges, corals, and shells. Many species are distinguished by attributes of the nematocysts and muscles, so if there is more than one species of a genus in an area, the genus name is often the only name available.

Order Zoanthidea

Twelve species are listed for the New Zealand region. Zoanthids are anemone-like hexacorals with a colonial lifestyle. One of them is *Epizoanthus*, which settles on shells occupied by hermit crabs. As it grows it envelopes the shell. Almost nothing is known about zoanthid biology other than the association of several species with sponges, hydroids, and molluscs. A striking yellow species of *Parazoanthus* is frequently encountered on Fiordland black coral.
There is also a new species of Gerardiidae from New Zealand, a family able to generate its own skeleton.

Order Antipatharia (black corals)

About 58 black coral species are known in New Zealand waters. Black corals are distinguished by their erect, often bushy, habit of growth and hard proteinaceous skeleton that bears tiny polyps.

Although the depth and geographic distribution of the Antipatharia have not been analysed in detail, it appears that most species live in the deep sea and on seamounts at between 200 and 1000 metres depth. All New Zealand black coral species are strictly protected, (see box).

Order Corallimorpharia

Some seven species and subspecies are known in the New Zealand EEZ. The commonest is the colourful jewel anemone, *Corynactis australis*, found in low-tidal rock pools and shallow depths. The species looks like a spreading colonial sea anemone. Each tentacle is tipped with a characteristic white knob that is densely and minutely studded with nettle cells. Other corallimorpharian species occur in deep water.

Order Scleractinia (stony corals)

New Zealand has a diverse fauna of 127 stony coral species, 110 of which are azooxanthellate, (i.e., lacking symbiotic algae) comprising over 16% of known azooxanthellate species. Azooxanthellates/ahermatypes are sometimes called 'deepwater corals' or 'solitary corals' and are usually small and slower growing, and do not form reefs like their zooxanthellate reef counterparts.

Stony corals are calcified hexacorals, i.e., having body parts in multiples of 6. Coral polyps may be thought of as skeleton-forming anemones. The internal membranes (mesenteries) that partition the bodies of sea anemones are calcified in corals so that, when all soft tissues are removed, the polyp skeleton is seen to have distinctive vertical radii (septa), often divided into cycles of major and minor ones.

An entire coral, called a corallum, may consist of a single individual or a colony of many individuals. The skeleton (corallite) of an individual polyp has a cup-shaped opening (calyce) that is typically round or oval as in New Zealand's cold-water corals, but in tropical corals neighbouring corallites can be fused and conjoined, resulting in large compound calyces.

Class Scyphozoa — jellyfish

The Scyphozoa is a small group of cnidarians numbering only about 250 living species worldwide. Notwithstanding the low species diversity, this minor group has caused some major problems recently around the world and in New Zealand. Understanding of jellyfish bloom dynamics remains incomplete, but large financial losses resulting from jellyfish invasions continue to be reported.

Scyphozoans are entirely marine, with a reduced or absent polyp phase and generally a large and conspicuous medusa phase. Unlike those of hydrozoans and anthozoans, scyphozoan polyps are more or less unattached to one another and do not share nutrients with other colony members. Medusa formation is by a form of budding, called strobilation, with the polyp typically remaining to continue budding and even to strobilate again. Scyphozoans are present from the shallowest intertidal to at least benthopelagic depths. There are three orders — Coronatae, easily distinguished by the presence of a coronal groove on the outer umbrella surface; Semaeostomae, typically with long, flowing oral arms and marginal tentacles; and Rhizostomeae, which lack true marginal tentacles as well as a central mouth, instead having numerous tiny mouths on the edges of the oral arms. Stalked jellyfish (upside-down jellyfish) are now regarded as a separate class (Staurozoa).

Class Hydrozoa — hydroids and their medusae

Hydrocorals (stylasterids) all belong to the Order Hydroida family Stylasteridae. Hydroids are generally small and non-calcified, so hydrocorals are unusual in this respect. Like other hydroids, hydrocorals have tiny polyps. Some of these function like stomachs (gastrozooids) while the non-feeding polyps are tentacle-like and used for food-capture (dactylozooids) or for reproducing (gonozooids). New Zealand hydrocorals are erect and branching, and may be white or red.

Their skeletons are distinguished from those of stony corals by being generally much smaller and less robust, and minutely porous and pitted with small holes for the various polyps. These holes (openings) lack the distinctive vertical radial partitions that characterise stony corals.

Hydrozoans are remarkably varied. They may be solitary or colonial, with polyp and medusa phases, or either phase may be lacking altogether.

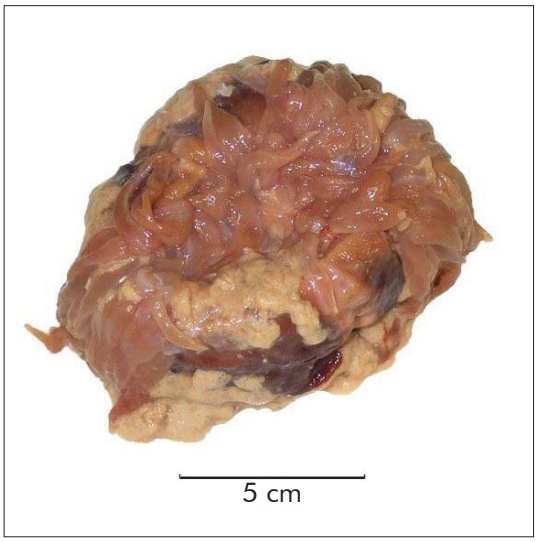
PROTECTED SPECIES

The group of organisms collectively known as 'black corals', (Cnidaria, Antipitharia pages 57 & 58) are currently protected under the Wildlife Act 1953. Incidental catches of black corals need to be reported via non-fish bycatch forms.

'Red corals' are also listed as protected under the Wildlife Act 1953. At present only *Errina* (page 67) is being interpreted as a protected species by the Ministry of Fisheries and Department of Conservation. Users of this guide should note that the definition of "red corals" is under review by the Department of Conservation at the time of writing, and may be extended to other species or groups, including bubblegum coral, precious corals and bamboo corals. If in doubt please contact the Department of Conservation (csp@doc.govt.nz).

Phylum Cnidaria
Class Anthozoa
Order Actiniaria (anemones)
Family Actiniidae

Bolocera spp. (Deepsea anemones) (BOC)



Distinguishing features: A flat spherical body form with several tentacles visible around edge. Currently identified to genus level only.

Colour: Red, brown.

Size: Up to 20 cm.

Distribution: This genus is widely distributed around the world, but poorly described.

Depth: 200 to 1500 m.

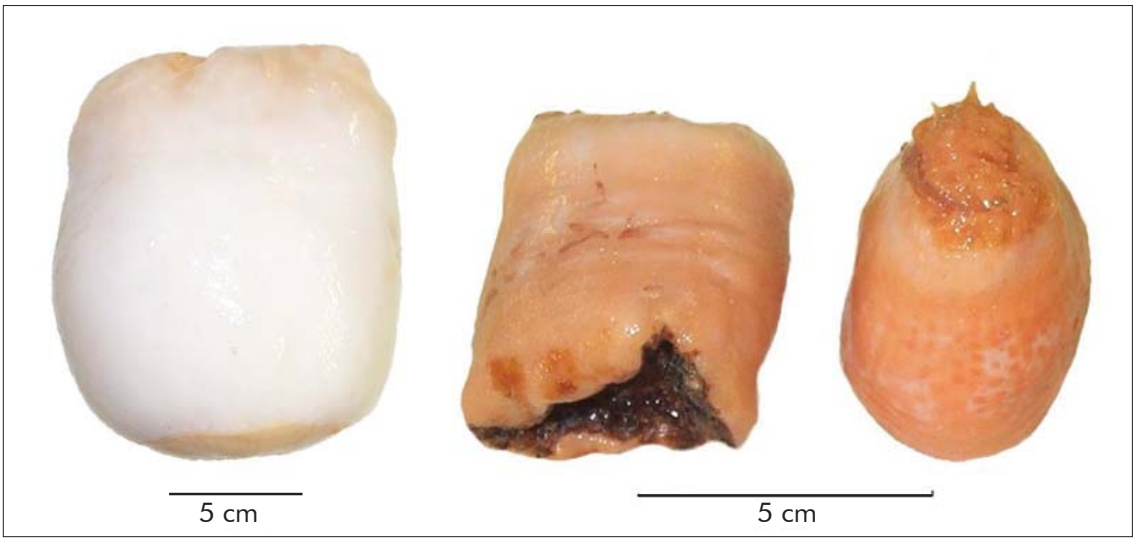
Similar species: *Liponema* spp.

References: Dunn, D. F. (1983). Some Antarctic and Sub-Antarctic sea anemones. (Coelenterata: Ptychodactiaria and Actiniaria). *Biology of the Antarctic Seas XIV Antarctic Research Series 39(1)*: 1–67.

Fautin, D. G. (1984). More Antarctic and Sub-Antarctic sea anemones. (Coelenterata: Corallimorpharia and Actiniaria). *Biology of the Antarctic Seas XVI Antarctic Research Series 41(1)*. 42 p.

Phylum Cnidaria
Class Anthozoa
Order Actiniaria (anemones)
Family Actinostolidae (smooth deepsea anemones)

(Smooth deepsea anemones) (ACS)



Distinguishing features: A smooth, cylindrical body form, with thickened walls and often with a reddish brown base. Tentacles mostly or completely hidden. Currently identified to family level only.

Colour: White, creamy white, or brown.

Size: Up to 20 cm.

Distribution: The family has worldwide distribution, but is poorly described.

Depth: 200 to 1500 m.

Similar species: Members of the Actinostolidae family (smooth deepsea anemones).

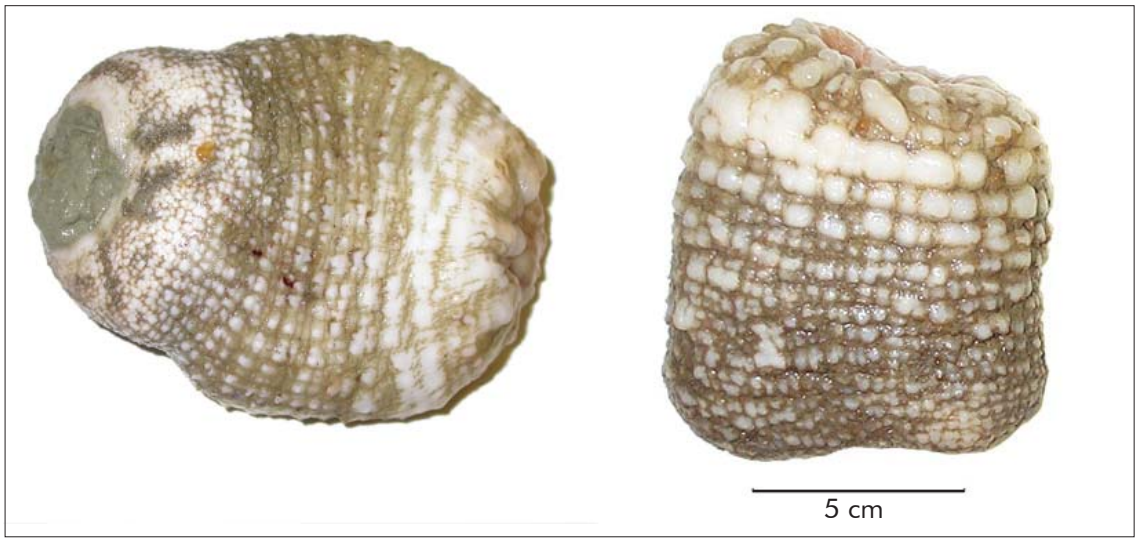
References: Dunn, D. F. (1983). Some Antarctic and Sub-Antarctic sea anemones. (Coelenterata: Ptychodactiaria and Actiniaria). *Biology of the Antarctic Seas XIV Antarctic Research Series 39(1)*. 67 p.

Fautin, D. G. (1984). More Antarctic and Subantarctic sea anemones. (Coelenterata: Corallimorpharia and Actiniaria). *Biology of the Antarctic Seas XVI Antarctic Research Series 41(1)*. 42 p.

Cairns, S. D. et al. (In press). Phylum Cnidaria-corals, medusae, and hydroids. *In*: Gordon, D. P. (ed.), The inventory of biodiversity. Volume 1. Kingdom Animalia - Radiata, Lophotrochozoa, and Deuterostomia. Canterbury University Press.

Phylum Cnidaria
Class Anthozoa
Order Actiniaria (anemones)
Family Hormathiidae

(Warty deepsea anemone) (HMT)



Distinguishing features: An irregularly shaped body made up of longitudinal and circumferential furrows which give a warty appearance. Tentacles mostly or completely hidden. Currently identified to family level only.

Colour: White, creamy white, or brown.

Size: Up to 20 cm.

Distribution: The family has worldwide distribution, but is poorly described.

Depth: 200 to 1500 m.

Similar species: Members of the Actinostolidae family (smooth deepsea anemones).

References: Dunn, D. F. (1983). *Some Antarctic* and Sub-Antarctic sea anemones. (Coelenterata: Ptychodactiaria and Actiniaria). *Biology of the Antarctic Seas XIV Antarctic Research Series 39(1)*. 67 p.

Fautin, D. G. (1984). More Antarctic and Subantarctic sea anemones. (Coelenterata: Corallimorpharia and Actiniaria). *Biology of the Antarctic Seas XVI Antarctic Research Series 41(1)*. 42 p.

Phylum Cnidaria
Class Anthozoa
Order Actiniaria (anemones)
Family Liponematidae

Liponema spp. (Deepsea anemones) (LIP)

Distinguishing features: A firm, squat spherical body form. Several short, white and rust coloured radially arranged tentacles visible. Currently identified to genus level only.

Colour: Cream and rust red.

Size: Up to 20 cm.

Distribution: This genus is widely distributed around the world, but poorly described.

Depth: 200 to 1500 m.

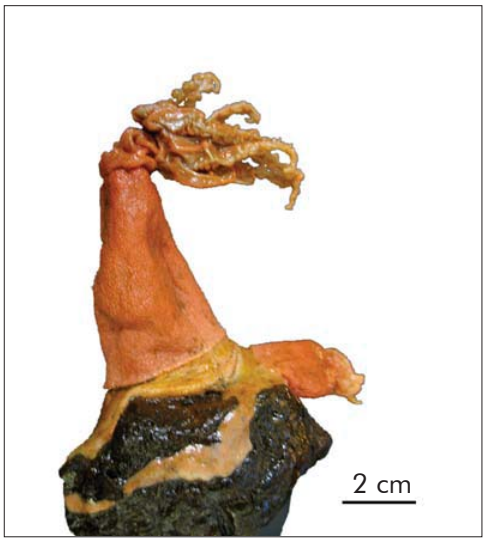
Similar species: *Bolocera* spp.

References: Dunn, D. F. (1983). Some Antarctic and Sub-Antarctic sea anemones. (Coelenterata: Ptychodactiaria and Actiniaria). *Biology of the Antarctic Seas XIV Antarctic Research Series 39(1)*. 67 p.

Fautin, D. G. (1984.) More Antarctic and Subantarctic sea anemones. (Coelenterata: Corallimorpharia and Actiniaria). *Biology of the Antarctic Seas XVI Antarctic Research Series 41(1)*. 42 p.

Phylum Cnidaria
Class Anthozoa
Order Alcyonacea (soft corals)
Family Alcyoniidae

Anthomastus (Bathyalcyon) robustus (Gigantic coral) (ARO)



Distinguishing features: Comprises a single very large and fleshy polyp (autozooid) positioned on a conic semi hard calyx with numerous apertures for the tiny reproductive polyps (siphonozooids). Elliptical encrusting base usually strongly attached to hard substrate or debris.

Colour: Bright red.

Size: Up to 15 cm.

Distribution: Uncommon, located on Bay of Plenty seamounts.

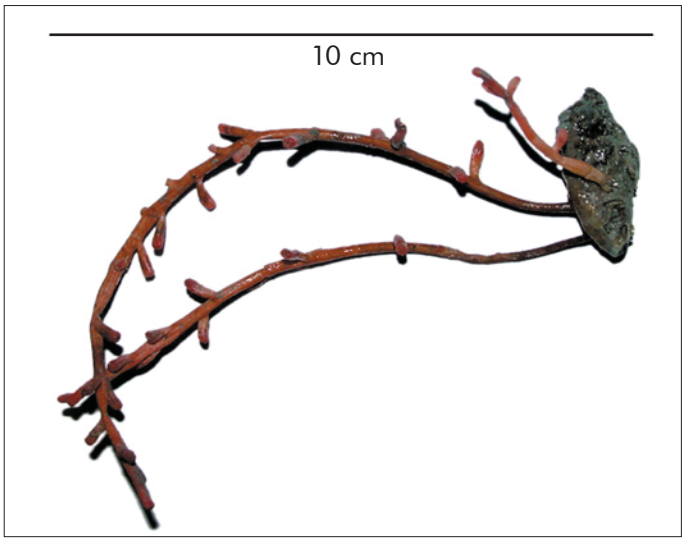
Depth: 200 m.

Similar species: Other *Anthomastus* species have smaller multiple feeding polyps and a mushroom-like shape.

References: Bayer, F.M. (1993). Taxonomic status of the octocoral genus *Bathyalcyon* (Alcyoniidae: Anthomastinae) with descriptions of a new subspecies from the Gulf of Mexico and a new species of *Anthomastus* from Antarctic waters. *Precious Corals & Octocorals Research 1*: 3–13.

Phylum Cnidaria
Class Anthozoa
Order Alcyonacea (soft corals)
Family Clavulariidae

Telesto spp. (Long polyp soft corals) (TLO)



Distinguishing features: Semi rigid, long axial polyps with shorter lateral polyps, occasional branching and budding giving rise to several axial polyps. Polyp wall exhibiting longitudinal branching rows.

Colour: Red, pink, or beige.

Size: Up to 20 cm.

Distribution: Worldwide.

Depth: 5 to 1000 m.

Similar species: *Coelogorgia* spp. and *Telestula* spp. Microscopic examination of sclerites is required for a reliable identification.

References: Bayer, F.M. (1981). On some genera of stoloniferous octocorals (Coelenterata: Anthozoa) with descriptions of new taxa. *Proceedings of the Biological Society of Washington 94(3)*: 878–901.

PROTECTED under the Wildlife Act 1953

Phylum Cnidaria
Class Anthozoa
Order Antipatharia
Family Leiopathidae

Leiopathes secunda (Black coral) (LSE)

Distinguishing features: Large, mostly fan-shaped colony; main branches usually appearing somewhat crooked in shape; small branchlets curved and often arising on the outer convex side of the next lower order branchlet. End branchlets short and thin. Thickest branches appearing polished and smooth.

Colour: Orange when alive; whitish after preservation in alcohol. Underlining skeleton black, sometime visible on living colonies in places where the soft tissue has been lost.

Size: Up to 2 m or more

Distribution: In New Zealand waters known primarily from off the east and west coasts of the North Island.

Depth: Primarily from depths of 600 to 1000m.

Similar species: Two other species of *Leiopathes* are known from the area; *Leiopathes acanthophora*, and *Leiopathes bullosa*. In *L. acanthophora* the smallest branchlets are generally straighter, longer and not as regularly arranged as those in *L. secunda*. *Leiopathes bullosa* has a branching pattern somewhat intermediate between that of *L. secunda* and *L. acanthophora;* however, it differs from the other two species primarily in the shape of the skeletal spines, which are more spherical.

References: Opresko, D.M. 1998. Three new species of *Leiopathes* (Cnidaria: Anthozoa: Antipatharia) from Southern Australia. *Records S. Austral. Mus. 31(1)*:99-111.

PROTECTED under the Wildlife Act 1953

Phylum Cnidaria
Class Anthozoa
Order Antipatharia (black corals)
Family Antipathidae, Myriopathidae, Aphanipathidae, Stylopathidae, Schizopathidae, Cladopathidae

(Black corals) (COB)

Distinguishing features: Erect, unbranched, bushy, fan-shaped, bottle brush, or pinnulate habit of growth, with a hardened proteinaceous and spiny skeleton that bears tiny polyps usually not more that 6 mm wide and having only six simple tentacles. The skeleton can be naturally lustrous, or rendered so after polishing.

Colour: In life, generally white owing to the external layer of "skin" and polyps although the living material in some species can be yellow or green, orange and red. The skeleton may be brown or black.

Size: Up to 5 m.

Distribution: Antipatharia are found in deep water throughout the EEZ from 200 to at least 1000 m. *Antipathella fiordensis*, previously known as *Antipathes fiordensis*, is endemic to New Zealand's fiords.

Depth: 200 to 1000 m. In New Zealand fiords found in very shallow waters (<10 m).

Similar species: There are numerous genera among the 58 species. Some gorgonians are similar, but these tend to lack the fine spines of black corals.

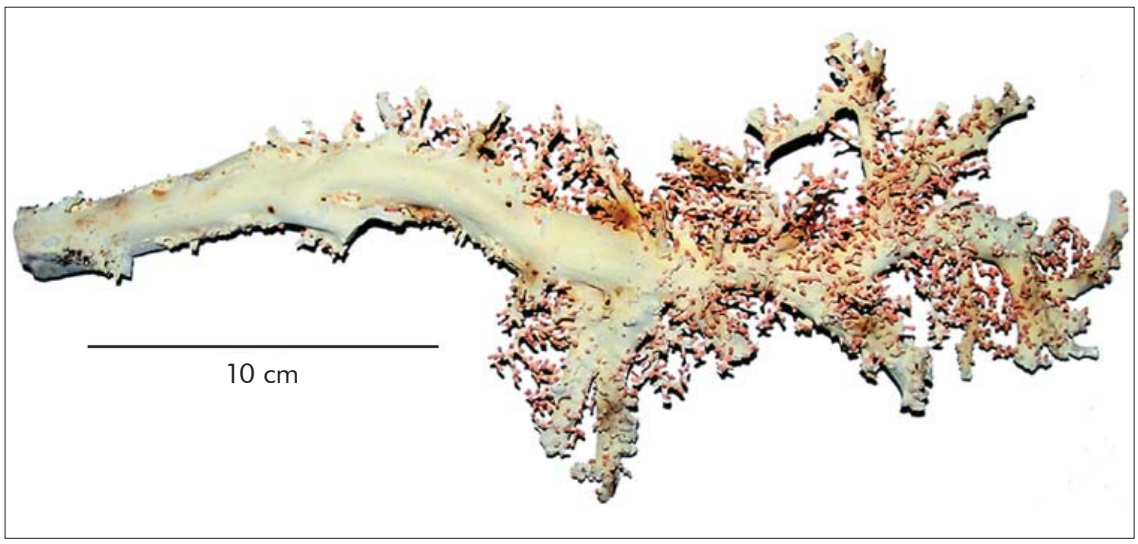
References: Grange, K.R. (1985). Distribution, standing crop, population structure, and growth rates of black coral in the southern fiords of New Zealand. *New Zealand Journal of Marine and Freshwater Research 19*: 467–475.

Grange, K.R. (1990). Antipathes fiordensis, a new species of black coral (Coelenterata: Antipatharia) from New Zealand. *New Zealand Journal of Zoology 17*: 279–282.

Opresko, D.M. (2001). Revision of the Antipatharia (Cnidaria: Anthozoa). Part 1. *Establishment of a new family, Myriopathidae. Zoologische Mededelingen Leiden 75*: 343-370.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea (gorgonian corals)
Family Coralliidae

Corallium spp. (Precious corals) (CLL)



Distinguishing features: Densely branched coral, usually flattened, with a solid calcareous supporting axis and slender and short terminal branches. Tiny polyps fully retractile in conical apertures sometimes forming bulb-like clusters. See page 50 for clarification of protected species status.

Colour: Pale yellow, pink, or red.

Size: Up to 50 cm.

Distribution: Worldwide (deepwater).

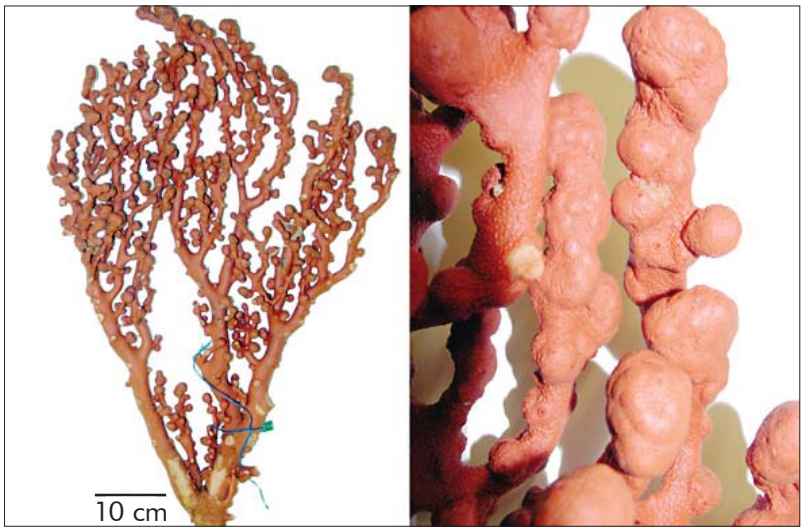
Depth: 100 to 1000 m.

Similar species: Species of *Paracorallium* are indistinguishable from *Corallium* spp. Microscopic examination of sclerites is required for a reliable identification.

References: Bayer, F.M. (1996). Three new species of precious coral (Anthozoa: Gorgonacea, genus *Corallium*) from Pacific waters. *Proceedings of the Biological Society of Washington 109*: 205–228.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea (gorgonian corals)
Family Paragorgiidae

Paragorgia arborea (Bubblegum coral) (PAB)



Distinguishing features: Robust tree-like colonies with bubble-like concentrations (bulbs) of polyps placed throughout the branches. Colonies up to several metres high (trunk ~ 20–30 cm in diameter). This could be the tallest sessile invertebrate ever found in deepwater. See page 50 for clarification of protected species status.

Colour: Reddish orange.

Size: Up to 5 m.

Distribution: Worldwide. Widely distributed in New Zealand deepsea region.

Depth: 200 to 800 m.

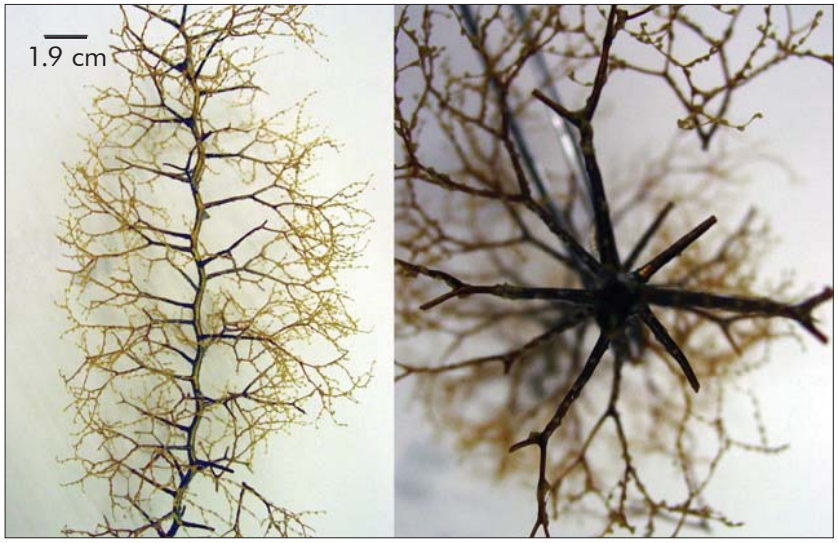
Similar species: There are six more species of *Paragorgia* in New Zealand (e.g., *Paragorgia wahine*) none of them attaining more than 50 cm height.

References: Grasshoff, M. (1979). Zur bipolaren Verbreitung der Oktokoralle *Paragorgia arborea* (Cnidaria: Anthozoa: Scleraxonia). *Senckenbergiana Maritima 11*: 115–137.

Sanchez, J. A. (2005). Systematics of the bubblegum corals (Cnidaria : Octocorallia : Paragorgiidae) with description of new species from New Zealand and the Eastern Pacific. *Zootaxa (1014)*: 3-72.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea (gorgonian corals)
Family Chrysogorgiidae

Chrysogorgia spp. (Golden corals) (CHR)



Distinguishing features: Dark, highly calcified colonies with bottlebrush branching arising from a regular single and ascending spiral around the main branch. Polyps large, relative to branch width, soft, few in number and well spaced from each other.

Colour: Black axis with brilliant metallic lustre from amber to golden colour.

Size: Up to 1 m.

Distribution: Worldwide. Widely distributed in New Zealand deepsea region.

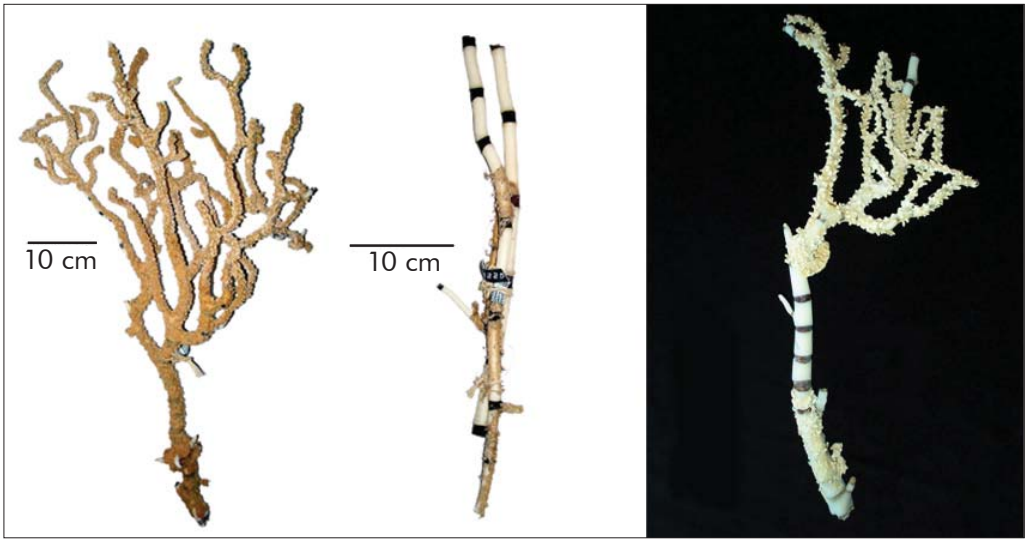
Depth: 80 to 2000 m.

Similar species: There are several *Chrysogorgia* species in New Zealand waters ranging in appearance from bottlebrush to sea fan colonies. Fan shape colonies could resemble the apical part of *Metallogorgia* spp.

References: Cairns, S.D. (2001). Studies on western Atlantic Octocorallia (Coelenterata: Anthozoa). Part 1: The genus Chrysogorgia Duchassaing & Michelotti, 1864. *Proceedings of the Biological Society of Washington 114*: 746–787.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea (gorgonian corals)
Family Isididae

Keratoisis spp. (Branching bamboo coral) (BOO)



Distinguishing features: Bamboo-like coral, with a conspicuously jointed skeleton comprising white calcareous internodes alternating with horny dark gorgonin (hardened protein) nodes. Branching from the proteinaceous nodes only. Bioluminescent on contact. See page 50 for clarification of protected species status.

Colour: White with dark nodes, living tissue pale yellow to brown.

Size: Up to 3 m.

Distribution: Widely distributed in New Zealand deep-sea region, on hard seafloor e.g. deep-sea reef.

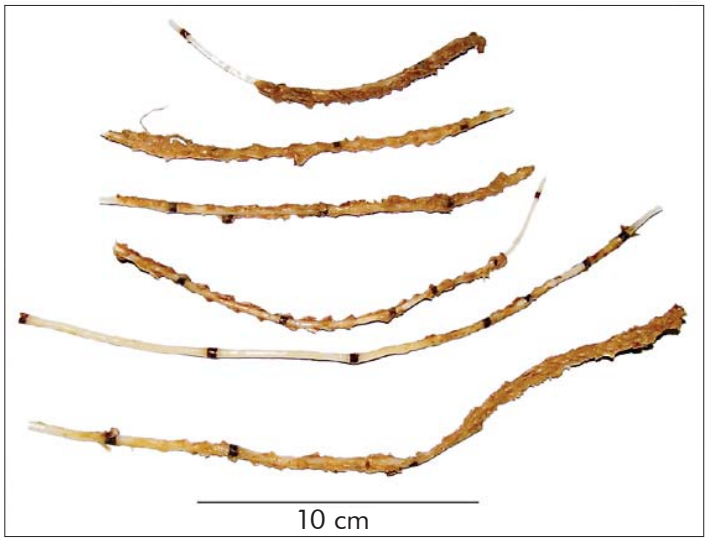
Depth: 200 m.

Similar species: The whip-like bamboo coral *Lepidisis* spp. is very similar in appearance but does not branch.

References: Grant, R. (1976). The marine fauna of New Zealand: Isididae (Octocorallia: Gorgonacea) from New Zealand and the Antarctic. *New Zealand Oceanographic Memoir 66*: 1–56.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea
Family Isididae

Lepidisis spp. (Bamboo coral) (LLE)



Distinguishing features: Whip-like, bamboo-like coral, spiral growth. Has a conspicuously jointed skeleton comprising white calcareous internodes alternating with horny dark gorgonin (hardened protein) nodes. Bioluminescent on contact. See page 50 for clarification of protected species status.

Colour: White with dark nodes, living tissue pale yellow.

Size: Up to 4 m.

Distribution: Widely distributed in New Zealand deep-sea region, on hard seafloor e.g. deep-sea reef.

Depth: 200 m.

Similar species: Single and long branches of the branching bamboo coral *Keratoisis* spp. are similar in appearance to *Lepidisis* spp.

References: Muzik, K. (1978). A bioluminescent gorgonian, Lepidisis olapa , new species (Coelenterata: Octocorallia) from Hawaii. *Bulletin of Marine Science 28*: 735–741.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea (gorgonian corals)
Family Isididae

(Bamboo corals) (ISI)

Distinguishing features: Bamboo-like coral, white calcareous internodes with horny (hardened protein) nodes. See page 50 for clarification of protected species status.

Colour: White with dark nodes, living tissue pale yellow to brown.

Size: Up to 3 m.

Distribution: Widely distributed in New Zealand deepsea region on hard seafloor.

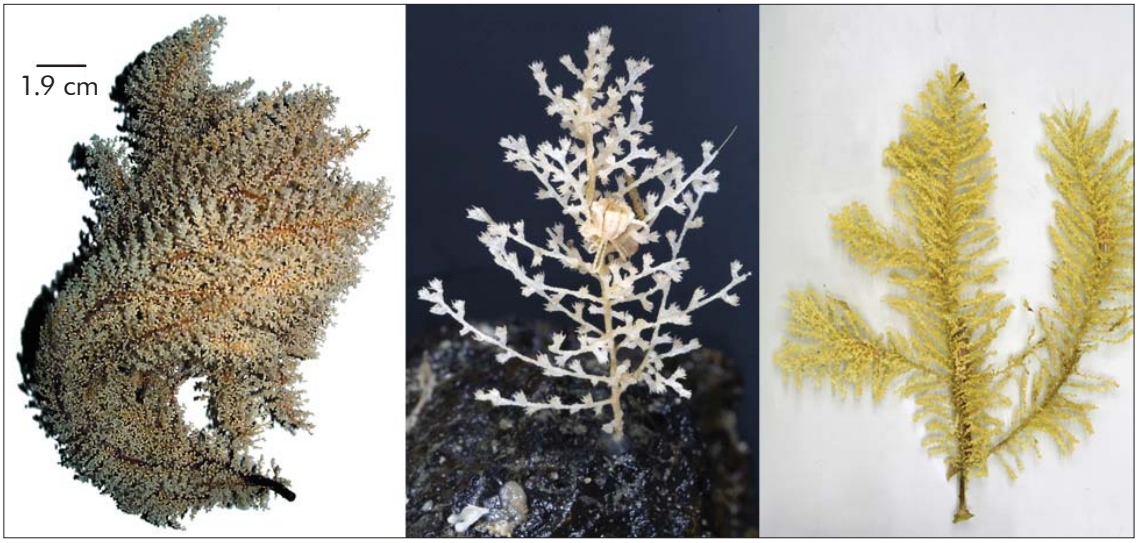
Depth: 200 to 2000 m.

Similar species: The bamboo coral species can be difficult to identify. The genera *Keratoisis*, *Acanella*, and *Lepidisis* are very similar.

References: Grant, R. (1976). The marine fauna of New Zealand: Isididae (Octocorallia: Gorgonacea) from New Zealand and the Antarctic. *New Zealand Oceanographic Institute Memoir 66*. 56 p.

Phylum Cnidaria
Class Anthozoa
Order Gorgonacea (gorgonian corals)
Family Primnoidae

Thouarella spp. (Bottlebrush coral) (THO)



Distinguishing features: Main branch (or branches) producing short, slender branches all around, like a bottlebrush. Polyps and branches covered with tiny scale like skeletal fragments.

Colour: White to pale yellow or brown.

Size: Up to 50 m.

Distribution: Worldwide. Widely distributed in New Zealand deep-sea region.

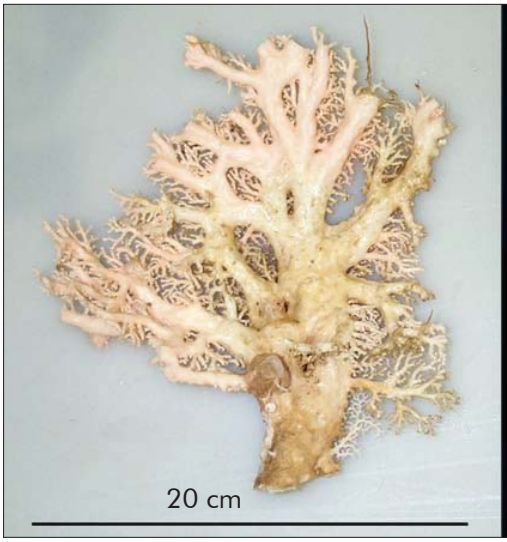
Depth: 100 m.

Similar species: There are numerous species of *Thouarella* all with bottlebrush appearance, the size of the polyps is highly variable.

References: Bayer, F.M. (1956). Octocorallia. *In* : Moore, R.C. (ed) Treatise of Invertebrate Paleontology. Part F Coelenterata. Pp. F166–F231. University of Kansas Press, Lawrence.

Phylum Cnidaria
Class Hydrozoa
Order Anthoathecata (hydroids)
Family Stylasteridae

Calyptopora reticulata (White hydrocoral) (CRE)



Distinguishing features: Forms uniplanar colonies with sinuous and robust main branches and many thin and intricate side branches. Branching occurs in one plane. Branches bear circular structures (termed ciclosystems) which are oriented towards only one side of the colony. Commensal polychaete worms are common on the hydrocoral surface, creating canals and deformities of branches.

Colour: Bright white although some are pink or beige.

Size: Up to 6 cm.

Distribution: Widespread in New Zealand deepwater.

Depth: 600 to 1400 m.

Similar species: In general most stylasterids other than some such as *Errina* spp., are very similar and difficult to tell apart with the naked eye. C. *reticulata* is very similar to *Stylaster* spp., the latter however have visible bump-like reproductive ampullae towards one side of the colony that are not present in *Calyptopora* spp. Some large white colonies of the precious coral *Corallium* spp. can be confounded with stylasterids. *Corallium* spp. have a distinctive thin, almost loose, layer of tissue that can be easily removed by scraping the branches, and are harder than stylasterids. *Corallium* spp. do not have the small side branches of C. *reticulata*. Some branching bryozoans can have similar shapes but are somewhat crystalline, have thinner branches, and are without robust main branches.

References: Cairns. S.D. (1991). The marine fauna of New Zealand: Stylasteridae (Cnidaria: Hydroida). *New Zealand Oceanographic Institute. Memoir 103*: 179 pp., including 77 pls.

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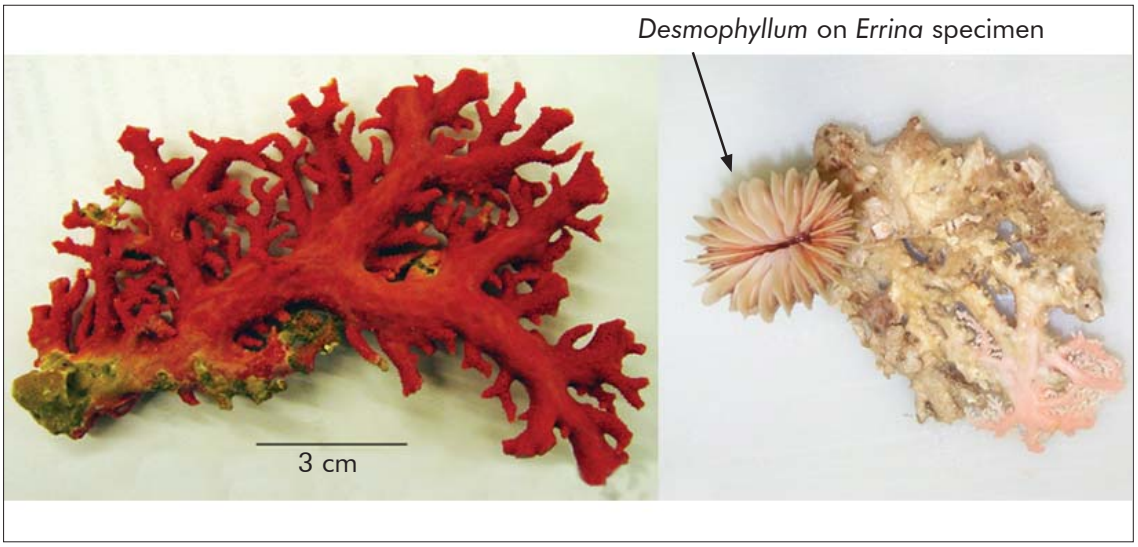
Phylum Cnidaria
Class Hydrozoa
Order Anthoathecata (hydroids)
Family Stylasteridae

Errina spp. (Red hydrocorals) (ERR)



Distinguishing features: Branching corals, often massive with polyps contained in visible pores usually adjacent to spine-like processes.

Colour: Pink to red, however some species can be white.

Size: Up to 30 cm.

Distribution: The genus is found worldwide. There are many species endemic to New Zealand. Commonly found on the Subantarctic slope Campbell Plateau region, Fiordland and Antarctica.

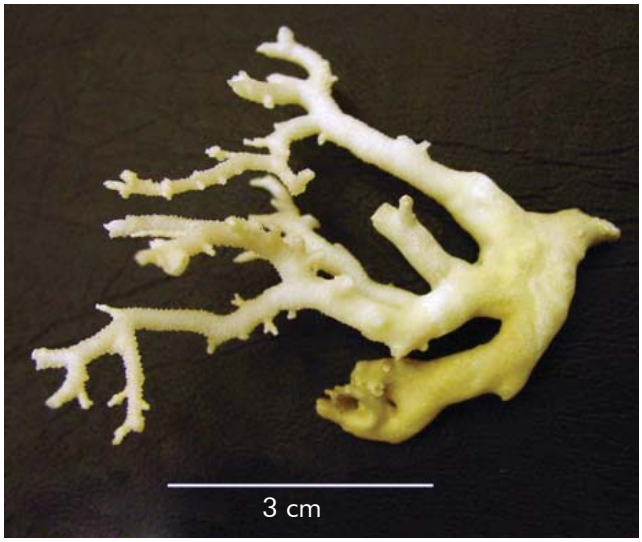
Depth: 10 to 1800 m.

Similar species: Most members of *Errina* appear similar to the naked eye. Microscopic examination is required for reliable identification. Note that some large white colonies of the precious coral *Corallium* spp. can be confounded with stylasterids including *Errina*. *Corallium* spp. have a distinctive thin, almost loose, layer of tissue that can be easily removed by scraping the branches, and are harder than stylasterids. Some branching bryozoans can have similar shapes but are somewhat crystalline, have thinner branches, and are without robust main branches.

References: Cairns, S.D. (1991). The marine fauna of New Zealand: Stylasteridae (Cnidaria: Hydroida). *New Zealand Oceanographic Institute Memoir 98*. 179 p.

Phylum Cnidaria
Class Hydrozoa
Order Anthoathecata (hydroids)
Family Stylasteridae

Lepidotheca spp. (Spiny white hydrocorals) (LPT)



Distinguishing features: Robust branching corals with tiny feeding polyps and stinging polyps. Colony surface has a series of long spines.

Colour: White.

Size: Up to 6 cm.

Distribution: The genus is found worldwide. There are many species endemic to New Zealand.

Depth: 80 to 2010 m.

Similar species: Most members of the Family Stylasteridae appear similar to the naked eye (and can resemble some bryozoans). Microscopic examination is required for reliable identification.

References: Cairns, S.D. (1991). The marine fauna of New Zealand: Stylasteridae (Cnidaria: Hydroida). *New Zealand Oceanographic Institute Memoir 98*. 179 p.

Phylum Cnidaria
Class Anthozoa
Order Pennatulacea (sea pens)
Family Pteroeididae

Gyrophyllum sibogae (Siboga sea pen) (GYS)

Distinguishing features: This unusual sea pen is relatively short and robust with highly modified and very fleshy polyp leaves arranged on both sides of the colony axis.

Colour: Ochre to brown.

Size: Up to 15 cm.

Distribution: Widespread in New Zealand waters, where they are found erect on soft and muddy bottoms.

Depth: 500 to 1200 m.

Similar species: Other sea pens such as *Pennatula*, can also have short and robust colonies but they are never as fleshy and thick as *G. sibogae*.

References: Williams, G.C. (1995). Living genera of sea pens (Coelenterata: Octocorallia: Pennatulacea): illustrated key and synopses. *Zoological Journal of the Linnean Society 113*: 93-140.

Williams, G.C. (1995d). The enigmatic sea pen genus *Gyrophyllum* - a phylogenetic reassessment and description of *G. sibogae* from Tasmanian waters (Coelenterata: Octocorallia). *Proceedings of the California Academy of Sciences 48 (15)*: 1-13.

Reyes F, Arda A, Martin R, Fernandez R, Rueda A, Montalvo D, Gomez C, Jimenez C, Rodriguez J, Sanchez-Puelles JM. (2004). New cytotoxic cembranes from the sea pen *Gyrophyllum sibogae*. *Journal of Natural Products 67(7)*: 1190-1192.

Phylum Cnidaria
Class Anthozoa
Order Pennatulacea (sea pens)
Family Pennatulidae

Pennatula spp. (Purple sea pen) (PNN)

Distinguishing features: Short sea pen with red to purple fan-like leaves of polyps. The polyps have needle-like ends. Sea pens are adapted to soft and muddy bottom, where they are found standing erect.

Colour: Beige to white stalk with red to purple polyp leaves.

Size: Up to 20 cm.

Distribution: Widespread in New Zealand waters, found erect on soft and muddy bottom.

Depth: 500 to 1200 m.

Similar species: Among the short sea pens, *Pennatula* is the only genus with complex and sharp leaves of polyps. Other sea pens are usually thick and fleshy (e.g., *Gyrophyllum*).

References: Williams, G.C. (1995). Living genera of sea pens (Coelenterata: Octocorallia: Pennatulacea): illustrated key and synopses. *Zoological Journal of the Linnean Society 113*: 93-140.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Caryophyliidae

Stephanocyathus platypus (Solitary bowl coral) (STP)

Distinguishing features: Circular to elliptical bowl-shaped solitary coral, star-like with 12 pointy and prominent septa. Very fleshy when specimen is live. The largest circular solitary coral found in New Zealand waters.

Colour: Brown to purplish when live. Visible parts of the skeleton are bright white.

Size: Up to 9 cm in diameter.

Distribution: Widespread from Lord Howe Rise, eastern Chatham rise, and Bounty Plateau.

Depth: 700 to 900 m.

Similar species: *Desmophyllum dianthus*, however, *S. platypus* is clearly star-like with pointy and prominent septa. The cup corals *Caryophyllia* spp. are smaller, more robust, and their oral cavity not concave as in *S. platypus*. There are other *Stephanocyathus* spp. in New Zealand waters but these not as large or as abundant as *S. platypus*.

References: Cairns, S. D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute. Memoir 103*: 139 pp., 44 pls.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Caryophylliidae

Caryophyllia spp. (Carnation cup coral) (CAY)

Distinguishing features: Small solitary cup coral with two unique characteristics: a twisted conical base that ends with a cylinder-like flat top and septa arranged as concentric radial structures in the centre of the oral cavity. A spongy structure called columella forms a circle of twisted filaments.

Colour: White with slightly coloured (pink to orange) base.

Size: From 1 to 4 cm. Up to 5 cm high.

Distribution: Worldwide.

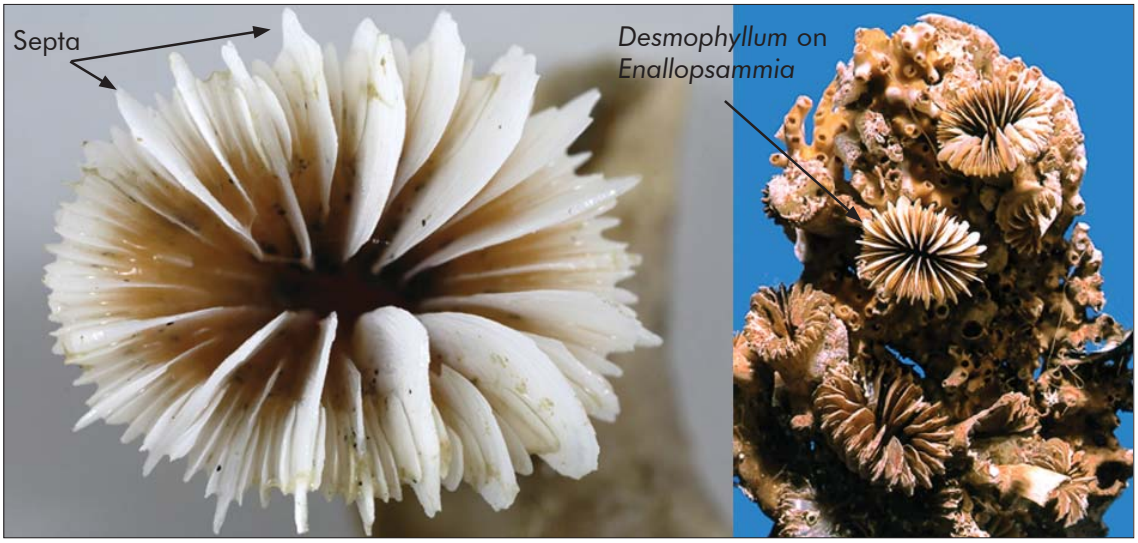
Depth: 700 to 900 m.

Similar species: The twisted conical base and the flat top with centered rings of radial septae make *Caryophyllia* spp. different to other cup corals such as *Desmophyllum*, *Flabellum* and *Stephanocyathus* that all have septa that extend from the coral edge to the center of the cup where a small oral cavity is present.

References: Cairns, S.D. (1995). The Marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*: 1–210.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Caryophylliidae

Desmophyllum dianthus (Crested cup coral) (DDI)



Distinguishing features: Solitary coral. Highly variable forms from cylindrical and serpentine to robust and massive. Radial structures (septa) are oriented from the centre of the cup to edge. Usually fixed to other corals or gorgonian bases and clumped with other individuals.

Colour: White, pale ochre tissue (if present).

Size: Up to 10 cm.

Distribution: Worldwide, except off continental Antarctica and the northern Pacific.

Depth: 35 to 2460 m.

Similar species: *Desmophyllum striatum* is the other valid species of the genus, but it is only found in the western Atlantic.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Caryophylliidae

Goniocorella dumosa (Bushy hard coral) (GDU)

Distinguishing features: Comprises large bushy colonies with complex branching. Each branch bearing a terminal coral polyp. Most of the branches bud at right-angles with branching occurring from the stem in an intricate way. A key feature is that the branches are reinforced by slender and smooth tubular bridges intersecting the branches.

Colour: Brown to ochre (when alive) with orange polyps.

Size: Up to 40 cm.

Distribution: Widely distributed in New Zealand deepsea region and Indo-Pacific.

Depth: 300 to 1500 m.

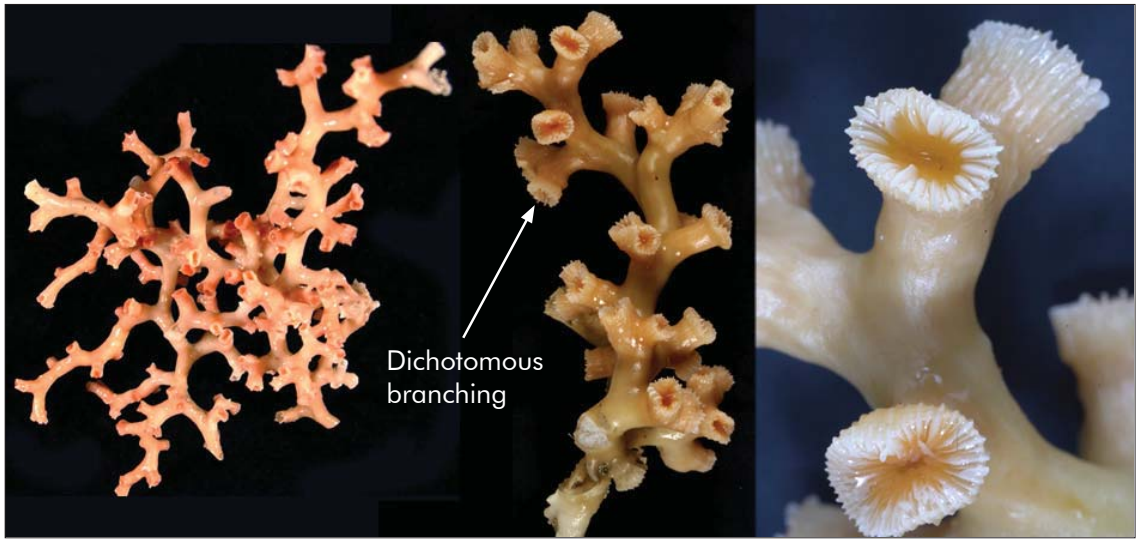
Similar species: Similar to other colonial corals such as *Madrepora oculata*, *Solenosmilia variabilis*, and *Enallopsamia rostrata*. *E. rostrata* can also form bushy colonies, but branches in a particular uniplanar way and it lacks the tubular bridges distinctive in *G. dumosa*.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Tracey, D.M.; Rowden, A.R ; Mackay, K.A. (in prep). Distribution of habitat-forming scleractinian corals in the New Zealand region.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Caryophylliidae

Solenosmilia variabilis (Deepwater branching coral) (SVA)



Distinguishing features: *S. variabilis* form large bushy colonies with equal, three-dimensional branching. A key identification feature is that dichotomous (divides in two or bifurcates) branching occurs from the calyces or polyps in multiple directions.

Colour: Pink (when alive).

Size: Up to 20 cm.

Distribution: Widely distributed in New Zealand deepsea region and found worldwide.

Depth: 220 to 2165 m.

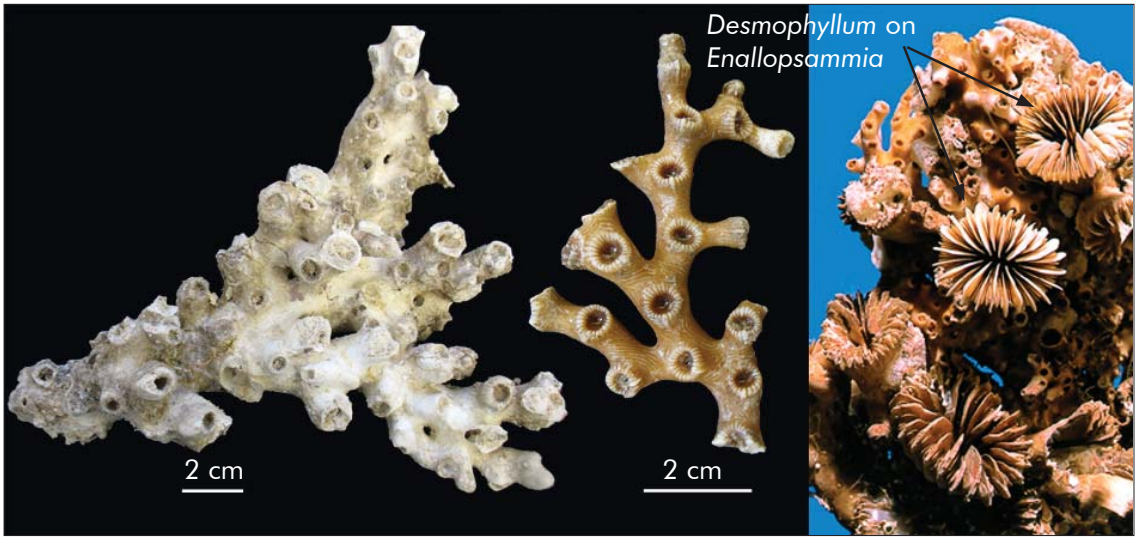
Similar species: Similar to *Goniocorella* but *S. variabilis* is thicker with branches developing from the calyces and has no tubular bridges. Although also similar to *Madrepora oculata* the equal, dichotomous (intratentacular) branching is very distinctive in *S. variabilis*.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Tracey, D.M.; Rowden, A.R ; Mackay, K.A. (in prep). Distribution of habitat-forming scleractinian corals in the New Zealand region.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Dendrophylliidae

Enallopsammia rostrata (Deepwater branching coral) (ERO)



Distinguishing features: Forms large uniplanar colonies with occasional branch anastomosis (e.g., branch fusion). Polyp calices (opening of corallite in which polyp is situated) are visible, circular to elliptical, and confined to only one plane of the coral. Of the four branching corals described, *E. rostrata* has the largest polyps. The image shows the crested cup coral *Desmophyllum* colonising *Enallopsammia*.

Colour: Brown to ochre (when alive).

Size: Up to 40 cm.

Distribution: Worldwide.

Depth: 200 to 1500 m.

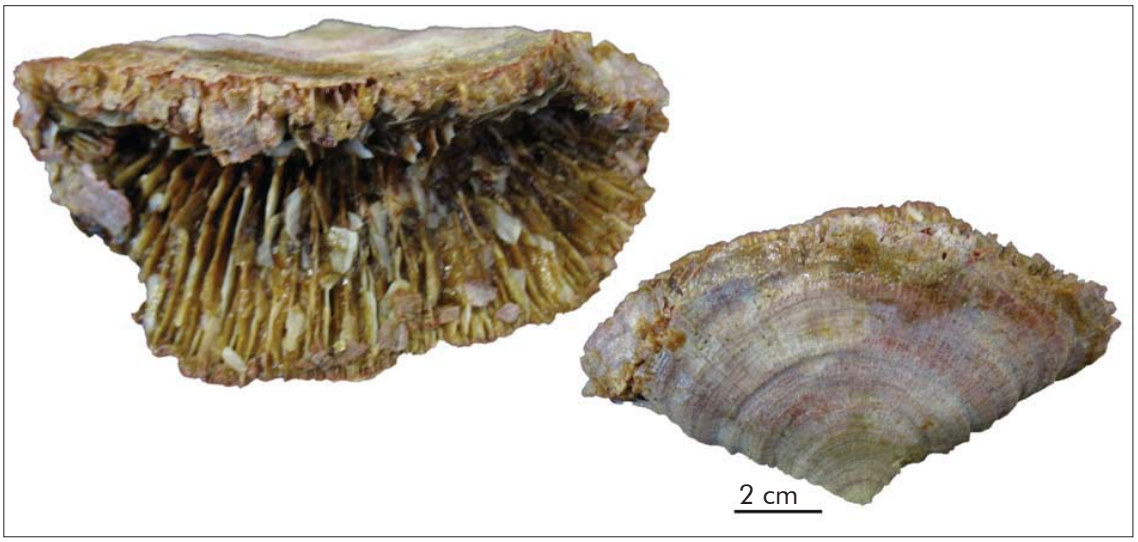
Similar species: Most similar to *Goniocorella dumosa*, but *E. rostrata* has uniplanar branching and no bridges among branches.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Tracey, D.M.; Rowden, A.R ; Mackay, K.A. (in prep). Distribution of habitat-forming scleractinian corals in the New Zealand region.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Flabellidae

Flabellum spp. (Flabellum cup corals) (COF)



Distinguishing features: Solitary corals, fixed or free with bell-like or compressed form. Growth ridges evident along the external wall. Coral edges can be either continuous or jagged.

Colour: White, tissue pale ochre.

Size: Up to 5 cm.

Distribution: Worldwide. New Zealand has several endemic species.

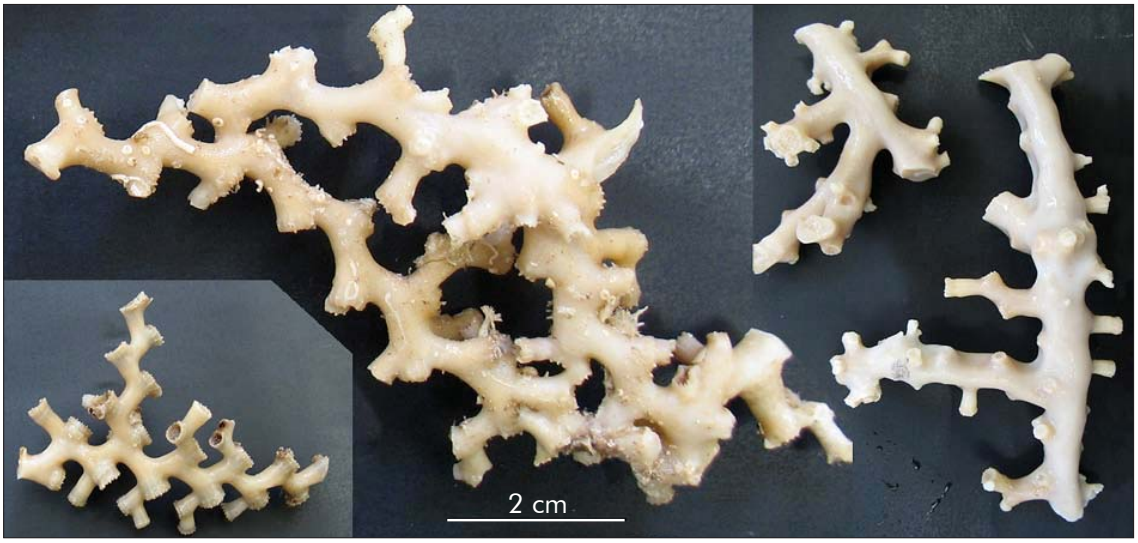
Depth: 250 to 1500 m.

Similar species: *Rhizotrochus* spp. Microscopic examination is required for reliable identification to species level.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Oculinidae

Madrepora oculata (Madrepora coral) (MOC)



Distinguishing features: Branching coral, has many forms, is usually bushy and is distinguished from other branching corals by having multiple small circular coral cups (calyces) or polyps. Branching occurs just below the calyx. There are 3 different morphs or shapes in New Zealand waters. One morph (right hand image) has calyces that alternate sympodially on each side of thick branches in a flute-like orientation. Diameter of polyps ranges from 1.9 to 2.2. mm. Often associated with commensal polychaetes.

Colour: White, with light brown living tissue.

Size: Up to 15 cm.

Distribution: Worldwide, except Antarctica. Within New Zealand waters is commonly found on the Chatham Rise.

Depth: 150 to 1500 m.

Similar species: *Oculina virgosa* is a similar but more sparsely and irregularly branched species with larger cup diameter (2.5 to 4.5 mm), and found in northern parts of New Zealand only. Microscopic examination is required for reliable identification to species level.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Tracey, D.M.; Rowden, A.R ; Mackay, K.A. (in prep). Distribution of habitat-forming scleractinian corals in the New Zealand region.

Phylum Cnidaria
Class Anthozoa
Order Scleractinia (stony corals)
Family Oculinidae

Oculina virgosa (Deepwater branching coral) (OVI)

Distinguishing features: Branching coral, sometimes sparsely over hard substrate. Terminal branches with sympodially arranged circular calyces.

Colour: Red when alive.

Size: Up to 14 cm.

Distribution: Endemic to New Zealand.

Depth: 30 to 880 m.

Similar species: *Madrepora oculata* is similar to *O. virgosa*, but *M. oculata* is thicker with alternate and well separated calyces. Microscopic examination is required for reliable identification to species level.

References: Cairns, S.D. (1995). The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). *New Zealand Oceanographic Institute Memoir 103*. 210 p.

Tracey, D.M.; Rowden, A.R ; Mackay, K.A. (in prep). Distribution of habitat-forming scleractinian corals in the New Zealand region.

Phylum Cnidaria
Class Anthozoa (subclass Hexacorallia)
Order Zoanthidea
Family Epizoanthidae

Epizoanthus sp. (Zoanthid anemone) (EPZ)

Distinguishing features: A relative of anemones and corals, this leathery anemone-like zoanthid hexacoral settles on shells occupied by hermit crabs. As it grows it envelopes the shell. The budding polyps radiate outwards, giving the colony a cog-like appearance. Tentacles and mesenteries are in multiples of six.

Colour: Colour purple to pink or brown

Size: From 6 to 10 cm.

Distribution: Widely distributed in the New Zealand region.

Depth: 500 to 2000 m. Wide depth range.

Similar species: Twelve species of Zoanthids are listed for the New Zealand region.

References: Cairns, S.D.; Gershwin, L.; Brook, F.J.; Pugh, P.; Dawson, E.W.; Ocaña, O.; et al. (In press). Phylum Cnidaria - corals, medusae, and hydroids. *In*: Gordon, D.P. (ed.), The New Zealand Inventory of Biodiversity. Volume 1, Kingdom Animalia: Radiata, Lophotrochozoa, and Deuterostomia. Canterbury University Press, Christchurch.