

Smithsonian
National Museum of Natural History

Ministry for Primary Industries
Manatū Ahu Matua



NIWA
Taihoro Nukurangi

ANTIPATHARIA (BLACK CORALS) FOR THE NEW ZEALAND REGION

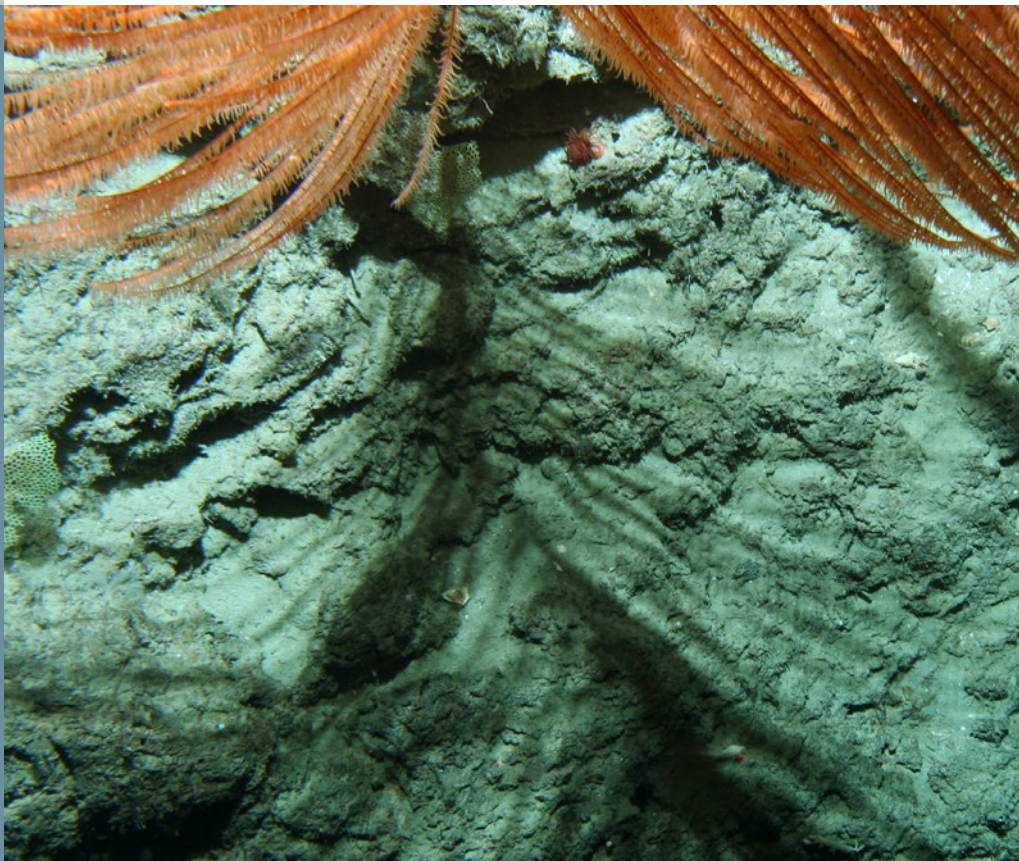
A field guide of commonly sampled New Zealand black corals including illustrations highlighting technical terms and black coral morphology.

Dennis Opresko, Di Tracey and Erika Mackay

New Zealand Aquatic Environment
and Biodiversity Report No. 131

ISSN 1176-9440 (print)
ISSN 1179-6480 (online)
ISBN 978-0-478-43262-6 (print)
ISBN 978-0-478-43261-9 (online)

2014



ANTIPATHARIA (BLACK CORALS) FOR THE NEW ZEALAND REGION. *A field guide of commonly sampled New Zealand black corals including illustrations highlighting technical terms and black coral morphology.*

Dennis Opresko¹
Di Tracey²
Erika Mackay² (Designer)

¹Research Associate, Department of Invertebrate Zoology,
National Museum of Natural History Smithsonian Institution,
Washington, D.C, USA

²National Institute of Water and Atmospheric Research
(NIWA), Private Bag 14901, Kilbirnie, Wellington,
New Zealand

Published by Ministry for Primary Industries (MPI)
Wellington
2014

ISSN 1176-9440 (print)
ISSN 1179-6480 (online)
ISBN 978-0-478-43262-6 (print)
ISBN 978-0-478-43261-9 (online)

© Smithsonian Institute, MPI and NIWA

Citation:

Opresko, D.; Tracey, D.; Mackay, E. (2014). ANTIPATHARIA (BLACK CORALS) FOR THE NEW ZEALAND REGION. *A field guide of commonly sampled New Zealand black corals including illustrations highlighting technical terms and black coral morphology.*

New Zealand Aquatic Environment and Biodiversity Report
No. 131. 20 p.

Preface

This guide builds on the 3rd edition of 'A guide to common deepsea invertebrates in New Zealand waters' (Tracey et al. 2011) and the 'Coral Identification Guide' (Tracey et al. 2008).

The authors wish to thank the various NIWA staff who have contributed to the at-sea sample collection, curation, and database extracts. Particularly we acknowledge Kareen Schnabel, Sadie Mills, Dean Stotter, Rob Stewart and Caroline Chin. We also especially thank Brent Wood who prepared the distribution plots for this report, David Fisher (NIWA) and the Data Management team (MPI) for providing MPI species codes. Dr Dennis Opresko, Research Associate at the National Museum of Natural History, was funded to visit NIWA by the U.S. Smithsonian Institution and we thank Stephen Cairns (Smithsonian Institution) for his support. This output builds on the New Zealand Joint Committee Meeting (JCM) on Science and Technology Cooperation and cross cutting theme 2.4: Marine and Ocean Research. Collaborations and activities under this theme will improve management of marine resources and marine conservation in the Pacific (MBIE13301).

Additional funding to help produce this report was provided by NIWA under Coasts and Oceans Research Programme 2 (2012/13 SCI). Project code COBR1302_Task 2 variation.

We thank Tina Molodtsova of P.P. Shirshov Institute of Oceanology, Moscow, Russia for a thorough review of this guide, NIWA Chief Scientist Barb Hayden (Coast and Oceans), Principal Scientists Malcolm Clark, Wendy Nelson and Michelle Kelly for the core funding support.

Finally we thank the Ministry for Primary Industries (MPI), particularly R. Ford, for supporting the printing of this guide, and Marianne Vignaux for her incisive editorial comments. The line drawings are copyright of Dennis Opresko and all images other than those named images, are copyright of NIWA.

ANTIPATHARIA (BLACK CORALS) FOR THE NEW ZEALAND REGION

INTRODUCTION

Antipatharians or black corals are colonial corals that form non-calcareous skeletons composed of protein and chitin that are quite flexible, spiny, tree-like, unbranched or branched. Unbranched colonies are straight and whip-like, curved irregularly, or corkscrew in shape. Branched colonies are bushy, or fan-shaped, or very symmetrically branched like a feather or bottlebrush. The spines that project from the surface of the hard skeleton are usually less than 0.5 mm tall and barely discernable to the naked eye; however, they can be felt by touch, and this is an easy way to distinguish the skeleton of an antipatharian coral from that of a gorgonian coral, the latter usually being smooth-surfaced.

The skeletons of black corals are covered with very small polyps (less than 1 cm in diameter), each possessing six unbranched tentacles. The thicker parts of the skeleton may be naturally lustrous, or rendered so after polishing.

All black corals (Antipatharia) are protected under the New Zealand Department of Conservation Wildlife Act 2010 (amendment of Schedule 7A of the Wildlife Act 1953).

The NIWA Invertebrate Collection (NIC) of black corals now totals over 1200 specimens and includes 70 species of which as many as ten may be new to science and several are endemic. Several very rare species that have been discovered in New Zealand waters include only the second known specimen of *Saropathes scoparia*, originally collected from the Three Kings Islands in 1910 by the British Terra Nova Expedition (Totton, 1923), the first record of a new species in genus *Tetraphathes* established for a species described from a single specimen over 120 years ago in the report of the *Challenger* Expedition, and numerous specimens of *Cladopathes plumosa*, previously known from only a single specimen.

Technical Terms and Morphological Descriptions for Black Corals

Abpolypar spines. Those on the side of the skeletal axis opposite to the side bearing the polyps; not restricted to the immediate area of each polyp.

Actinopharynx. The stomodeum; a cylindrical involution of peristomal tissue descending into the coelenteron (the internal body cavity of the polyp) and supported by radial mesenteries (also referred to as septa in earlier literature).

Alternating (arrangement of pinnules). Pinnules in lateral rows offset from each other.

Anisomorphic spines. Unequal development of the spines in the immediate area of the polyps;

the hypostomal spines being reduced in size, the circumpolypar spines enlarged and the interpolypar spines of an intermediate size.

Basal. In a direction towards the attachment point of a pinnule, branchlet, branch, or stem.

Basal stem diameter. The diameter of the axis just above the attachment plate.

Branchlets. Small, usually peripheral, ramifications of a colony that are of varying size and not arranged in a regular order or orientation (compare with pinnules).

Circumpolypar spines. Those spines on the outer edge of the polyps, beneath the tentacles.

Corallum. Term used to describe the skeletal structure of a black coral colony.

Distal angle. The angle formed by the upper side of the spines, or branches, and the axis.

Distal lateral tentacles. The pair of tentacles at the end of the polyp furthest from the base of the branch/pinnule bearing the polyp.

Flabellate. Fan-shaped.

Hypostomal. The area on the axis directly below the mouth of the polyp.

Hypostomal spines. The spines on the axis directly below the mouth of the polyp.

Interpolypar. The area between the distal lateral tentacles of one polyp and the proximal lateral tentacles of the adjoining one.

Lateral tentacles. The pairs of tentacles at the distal and proximal extremities of a polyp.

Mesenteries. Six, ten or twelve partitions of tissue which extend across from the inside wall of the polyp to the actinopharynx in a radial pattern (when seen in cross sectional view).

Mutual distance (of spines). The average distance between the midpoints of the bases of adjacent spines or branches.

Monopodial (corallum). An unbranched coral skeleton consisting of a stem from which pinnules arise.

Oral cone. An elevated area of the polyp at the center of which is the mouth of the polyp.

Pinnulate. Having symmetrically arranged, simple or branched ramifications of subequal size on the stem and branches of the corallum.

Pinnules. Symmetrically arranged, simple or branched ramifications of nearly equal length located on the stem and branches of the corallum.

Polypar spines. Those spines on the side of the axis that bear the polyps; not restricted to the immediate area of each individual polyp.

Primary mesenteries (septa). The three pairs (technically couples) of mesenteries of a polyp which extend in an oral-aboral direction to the lower edge of the actinopharynx and radially across to the interior wall of the polyp, thereby defining the boundaries of the six tentacles.

Primary pinnules. Small branchlets of a colony which are usually of equal size and arranged in a symmetric pattern around the axis (they may bear secondary pinules).

Proximal lateral tentacles. The pair of tentacles on the side of the polyp closest to the base of the branch/pinnule bearing the polyp.

Sagittal axis. A plane through the center of the actinopharynx, perpendicular to the direction of the branch bearing the polyp.

Sagittal tentacles. The median pair of tentacles whose members are placed on either side of the mouth and in a plane which is perpendicular to the direction of the branch bearing the polyp.

Septa. See mesenteries.

Secondary mesenteries. Complete mesenteries which, however, are not attached all the way to the aboral edge of the actinopharynx.

Secondary pinnules. Very small ramifications that arise from the primary pinnules; often uniserially or bilaterally arranged. May give rise to tertiary pinnules.

Semispiral (arrangement of pinnules). Groups of pinnules (one from each of the longitudinal rows) on either side of a branch or stem which are offset so that they form a curved ascending or descending pattern around the circumference of the axis.

Siphonoglyph. A ciliary tract extending in an oral-aboral direction on the sagittal border of the actinopharynx.

Simple (pinnule). Without further subramifications.

Spines. Blister-like, thorn-like, or needle-like skeletal processes that project out from the axial surface and are usually regularly arranged in rows.

Subopposite (arrangement of pinnules). Pinnules in lateral rows grouped together in nearly opposite pairs.

Sympodial branching pattern. axis of colony formed from successive secondary axes.

Tertiary pinnules. Very small ramifications that arise from the secondary pinnules; usually uniserially arranged. May give rise to quaternary pinnules.

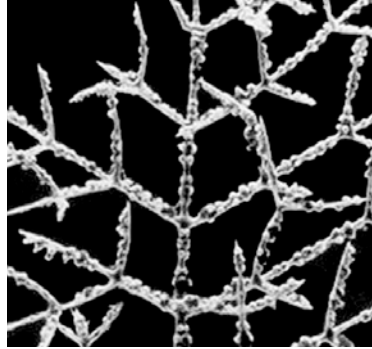
Transverse axis. A plane through the center of the actinopharynx in the direction of the branch bearing the polyp.

Verticillate (arrangement of pinnules). Pinnules grouped in whorls around the circumference of the axis.

ARRANGEMENTS OF PINNULES IN BLACK CORALS



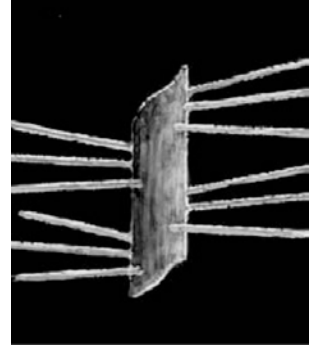
Two rows of pinnules; bilateral, alternating



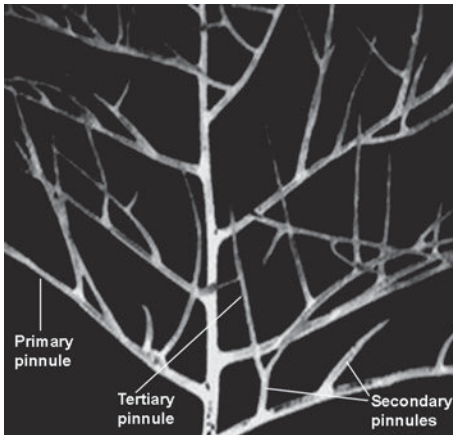
Two rows of pinnules; bilateral, subopposite



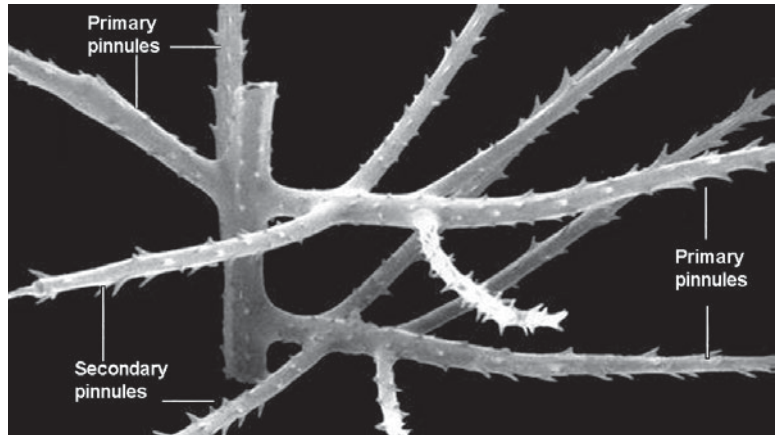
Four rows of pinnules; bilateral, alternating pairs



Six rows of pinnules; bilateral, alternating semispiral groups of 3

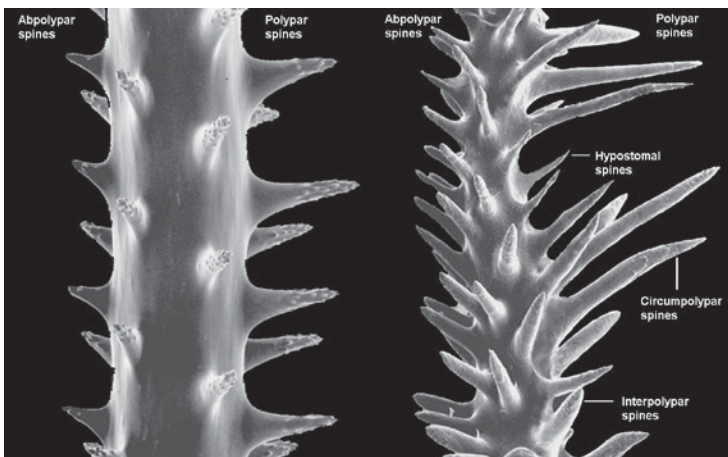


Two rows of primary pinnules with secondary and tertiary pinnules

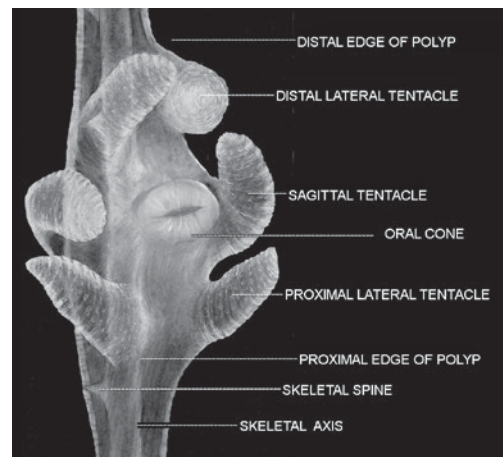


Four rows of primary pinnules with secondary pinnules

SKELETAL SPINES



ANTIPATHARIAN POLYP



Species of Antipatharian corals known from New Zealand waters are listed in Table 1.

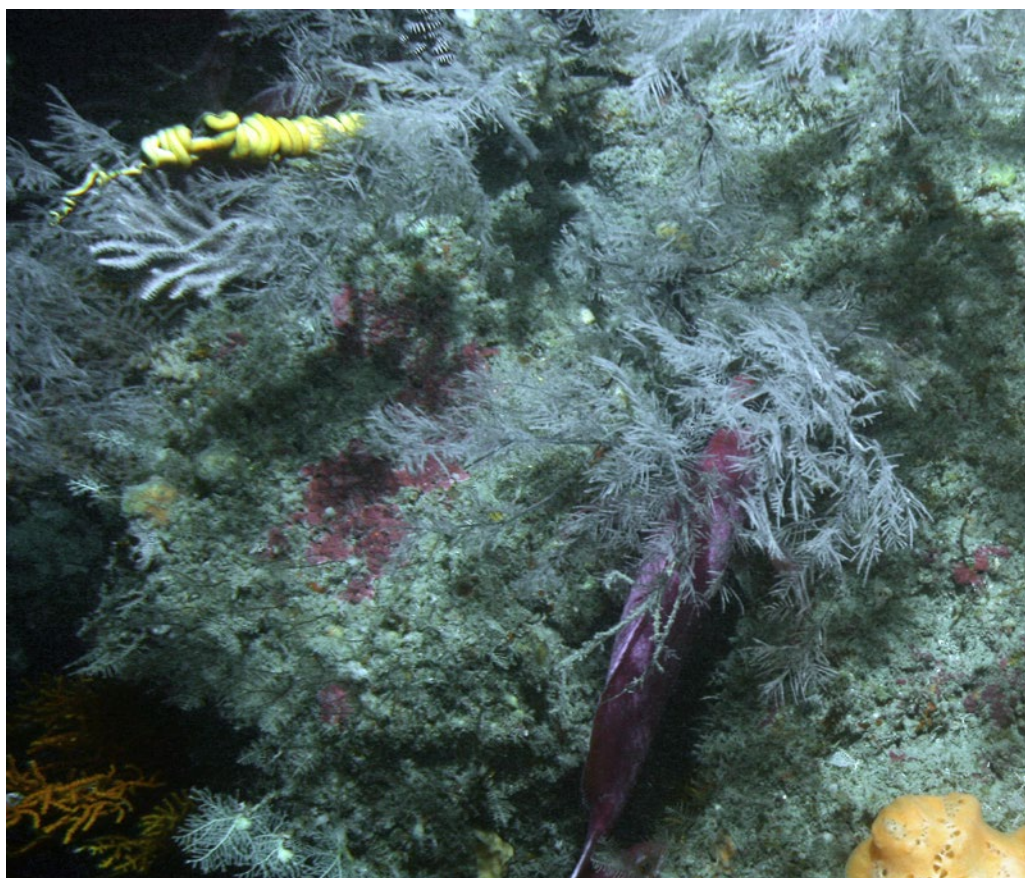
Table 1. SPECIES OF ANTIPATHARIANS FROM NEW ZEALAND WATERS

ANTIPATHIDAE	MYRIOPATHIDAE
<i>Antipathes</i> cf. <i>chamaemorus</i> (Pax & Tischierek, in Pax, 1932)	<i>Antipathella</i> <i>aperta</i> (Totton, 1923)
<i>Antipathes</i> cf. <i>densa</i> (Silberfeld, 1909)	<i>Antipathella</i> <i>fiordensis</i> (Grange, 1990)
<i>Antipathes</i> <i>fruticosa</i> (Gray, 1857)	<i>Antipathella</i> <i>strigosa</i> (Brook, 1889)
<i>Antipathes</i> <i>glutinata</i> (Totton, 1923)	<i>Antipathella</i> cf. <i>subpinnata</i> (Ellis & Solander, 1786)
<i>Antipathes</i> cf. <i>gracilis</i> (Gray, 1860)	<i>Cupressopathes</i> cf. <i>abies</i> (Linnaeus, 1758)
<i>Antipathes</i> cf. <i>grandis</i> (Verrill, 1928)	<i>Cupressopathes</i> cf. <i>cylindrica</i> (Brook, 1889)
<i>Antipathes</i> cf. <i>pauroclema</i> (Pax & Tischierek, in Pax, 1932)	<i>Myriopathes</i> <i>catharinae</i> (Pax, 1932)
<i>Antipathes</i> cf. <i>spinulosa</i> (Schultze, 1896)	<i>Myriopathes</i> <i>japonica</i> (Brook, 1889)
<i>Antipathes</i> sp.	<i>Myriopathes</i> <i>stechowi</i> (Pax, 1932)
<i>Cirrhipathes</i> <i>propinqua</i> (Brook, 1889)	<i>Myriopathes</i> <i>myriophylla</i> (Pallas, 1766)
<i>Cirrhipathes</i> <i>spiralis</i> (Linnaeus, 1758)	<i>Myriopathes</i> <i>ulex</i> (Ellis & Solander, 1786)
<i>Cirrhipathes</i> sp.	<i>Myriopathes</i> sp.
<i>Stichopathes</i> <i>variabilis</i> (van Pesch, 1914)	<i>Plumapathes</i> cf. <i>pennacea</i> (Pallas, 1766)
<i>Stichopathes</i> sp.	SCHIZOPATHIDAE
<i>Stichopathes</i> cf. <i>paucispina</i> (Brook, 1889)	<i>Bathypathes</i> <i>alternata</i> (Brook, 1889)
APHANIPATHIDAE	<i>Bathypathes</i> <i>bifida</i> (Thomson, 1905)
<i>Acanthopathes</i> <i>undulata</i> (van Pesch, 1914)	<i>Bathypathes</i> <i>patula</i> (Brook, 1889)
<i>Aphanipathes</i> cf. <i>sarothamnoides</i> (Brook, 1889)	<i>Bathypathes</i> sp.
<i>Aphanipathes</i> sp.	<i>Dendrobathypathes</i> <i>grandis</i> (Opresko, 2002)
<i>Asteriopathes</i> sp.	<i>Dendrobathypathes</i> <i>isocrada</i> (Opresko, 2002)
<i>Phanopathes</i> sp.	<i>Dendrobathypathes</i> sp.
<i>Rhipidipathes</i> cf. <i>colombiana</i> (Opresko & Sanchez, 1997)	<i>Dendropathes</i> <i>intermedia</i> (Brook, 1889)
<i>Rhipidipathes</i> cf. <i>reticulata</i> (Esper, 1795)	<i>Lillipathes</i> sp.
<i>Tetrapathes</i> sp.	<i>Lillipathes</i> <i>lilliei</i> (Totton, 1923)
CLADOPATHIDAE	<i>Lillipathes</i> <i>ritamariae</i> (Opresko & Breedy, 2010)
<i>Cladopathes</i> <i>plumosa</i> (Brook, 1889)	<i>Parantipathes</i> <i>helicosticha</i> (Opresko, 1999)
<i>Cladopathes</i> sp.	<i>Parantipathes</i> <i>wolffi</i> (Pasternak, 1977)
<i>Heteropathes</i> sp.	<i>Parantipathes</i> sp.
<i>Sibopathes</i> sp.	<i>Saropathes</i> <i>scoparia</i> (Totton, 1923)
<i>Trissopathes</i> <i>pseudotristicha</i> (Opresko, 2003)	<i>Saropathes</i> sp.
<i>Trissopathes</i> <i>tetracrada</i> (Opresko, 2003)	<i>Schizopathes</i> <i>affinis</i> (Brook, 1889)
<i>Trissopathes</i> <i>tristicha</i> (van Pesch, 1914)	<i>Stauropathes</i> sp.
<i>Trissopathes</i> sp.	<i>Umbellapathes</i> sp.
LEIOPATHIDAE	STYLOPATHIDAE
<i>Leiopathes</i> cf. <i>acanthophora</i> (Opresko, 1998)	<i>Stylopathes</i> cf. <i>columnarus</i> (Duchassaing, 1870)
<i>Leiopathes</i> <i>bullosa</i> (Opresko, 1998)	<i>Stylopathes</i> <i>tenuispina</i> (Silberfeld, 1909)
<i>Leiopathes</i> <i>secunda</i> (Opresko, 1998)	<i>Triadopathes</i> cf. <i>triadocrada</i> (Opresko, 1999)
<i>Leiopathes</i> sp.	

The most commonly sampled black coral genera in the New Zealand region are listed below:

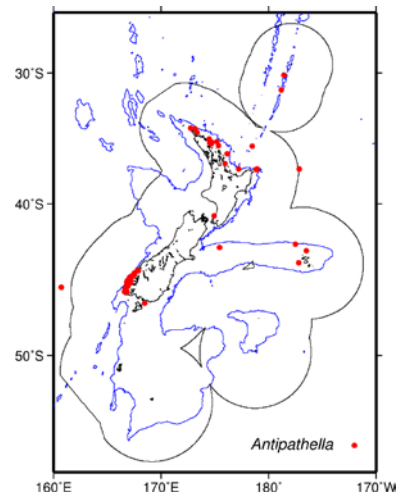
Common shallow water genera (generally less than 200 m depth)	Common deep-sea genera (generally greater than 200 m depth)
<ul style="list-style-type: none">• <i>Antipathella</i>• <i>Antipathes</i>• <i>Stichopathes</i>	<ul style="list-style-type: none">• <i>Bathypathes</i>• <i>Dendrobathypathes</i>• <i>Dendropathes</i>• <i>Leiopathes</i>• <i>Lillipathes</i>• <i>Parantipathes</i>• <i>Stylopathes</i>• <i>Triadopathes</i>

These genera are described in the following pages with the shallow-water genera followed by the deep-sea genera.



Colony of the black coral *Antipathella*, (NIWA DTIS image OS2020, Ranfurly Bank, 100 metres). A pink maomao (*Caprodon longimanus*) shelters under the black coral branches.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Myriopathidae



Antipathella spp. AHL



Distinguishing features: Bushy colonies with relatively thin, straight or curved, small branchlets arranged bilaterally or irregularly on the branchlets.

Colour: Polyps usually white when alive.

Size: Up to 5 m.

Distribution: *Antipathella fiordensis*, previously known as *Antipathes fiordensis*, is endemic to New Zealand's fiords. Other species of *Antipathella* e.g., *A. aperta* (Totton 1923) are found off the coast of the North Island.

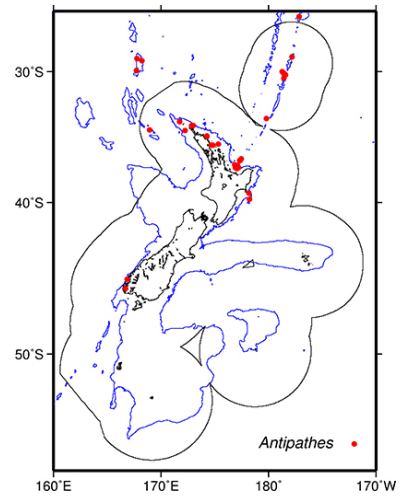
Depth: 1 to 514 m usually less than 200 m. In New Zealand fiords found in very shallow water (less than 10 m).

Similar species: Some species of *Antipathes* can have the same general appearance as colonies of *Antipathella* (see next page).

References: 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.

Totton, A.K. (1923). Coelenterata. Part III. Antipatharia (and their Cirripede commensals). British Antarctic (Terra Nova) Expedition. 1910–1913. *Natural History Reports, Zoology.*, 5:97–120, 2 pls, 18 figs.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Antipathidae



***Antipathes* spp. ATP**



Distinguishing features: Colonies can be bushy or flabellate (fan shaped); branching can be sparse or very dense; branchlets can be short or long, curved or straight.

Colour: Polyps white, red or orange when alive.

Size: Up to several metres.

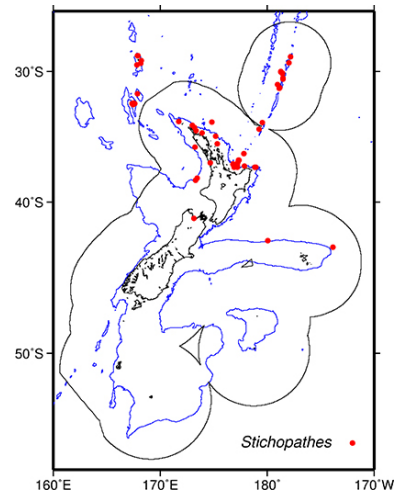
Distribution: Primarily found off the north coast of the North Island and along the Kermadec Ridge.

Depth: 10–1534 m; mostly less than 400 m.

Similar species: Some species of *Antipathella* can have the same general appearance as bushy colonies of *Antipathes*. Some species of *Rhipidipathes* and *Acanthopathes* can have the same general appearance as flabellate colonies of *Antipathes*.

References: Cairns, S.D., Vervoort, W., Watson, J.E., Pugh, P., Gershwin, L., Opresko, S.M. et al. (2009). The Phylum Cnidaria, Corals, Medusae and Hydroids. In: *New Zealand Inventory of Biodiversity*, volume 1. Kingdom Animalia, Canterbury University Press, Christchurch, New Zealand.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Antipathidae



Stichopathes spp. STI



Distinguishing features: Colonies are unbranched and whip-like; stem can be straight, curved or coiled (spiral).

Colour: Polyps orange or white when alive.

Size: Up to several metres long.

Distribution: Primarily off the north coast of the North Island.

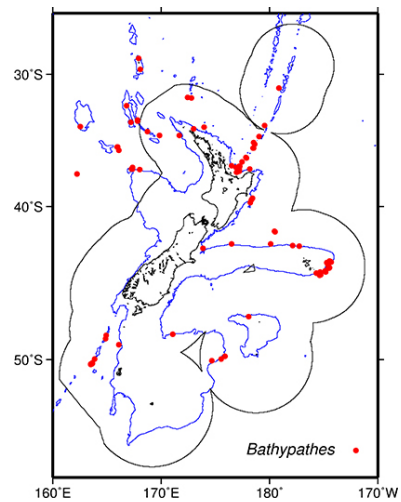
Depth: Found in shallow and deep water; 53 to 1930 m.

Similar species: Species of *Cirripathes* and *Pseudocirripathes* are also unbranched.

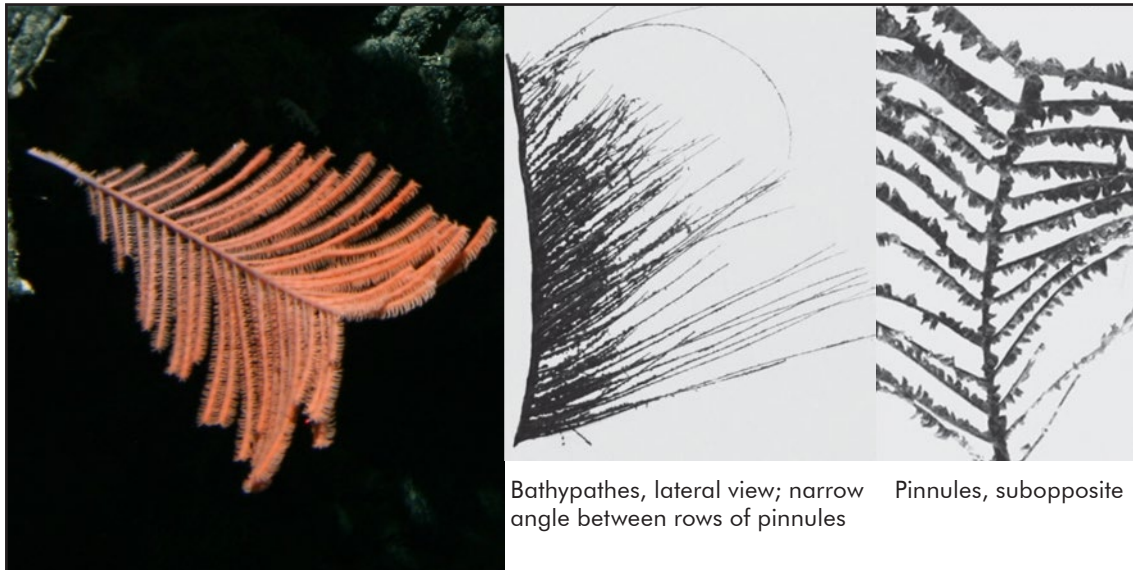
References: Opresko, D.M.; Genin, A. (1990). A new species of antipatharian (Cnidaria: Anthozoa) from the seamounts in the eastern North Pacific. *Bulletin of Marine Science* 46(2):301–310.

Brook, G. (1889). Report on the Antipatharia. *Reports of the Scientific Results of the Voyage of the 'Challenger'*, Zoology 32:1–222, 15 pls.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Schizopathidae



Bathypathes spp. BTP



Bathypathes; in situ; wide angle between the two rows of pinnules

Bathypathes, lateral view; narrow angle between rows of pinnules

Pinnules, subopposite angle between rows of pinnules

Distinguishing features: Colonies usually with a single stalk (stem) or with sparse branching; stem and branches with short to long pinnules arranged in two rows as in a feather with wide or narrow interior angle. Pinnules without subpinnules.

Colour: Polyps often orange, red, or yellow when alive.

Size: Generally less than 0.5 m; sometimes several metres tall.

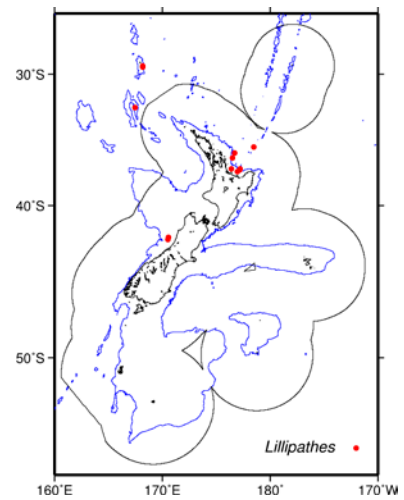
Distribution: Very abundant along the edges of plateaus, ridges and rises.

Depth: 168–4077 m; mostly greater than 500 m.

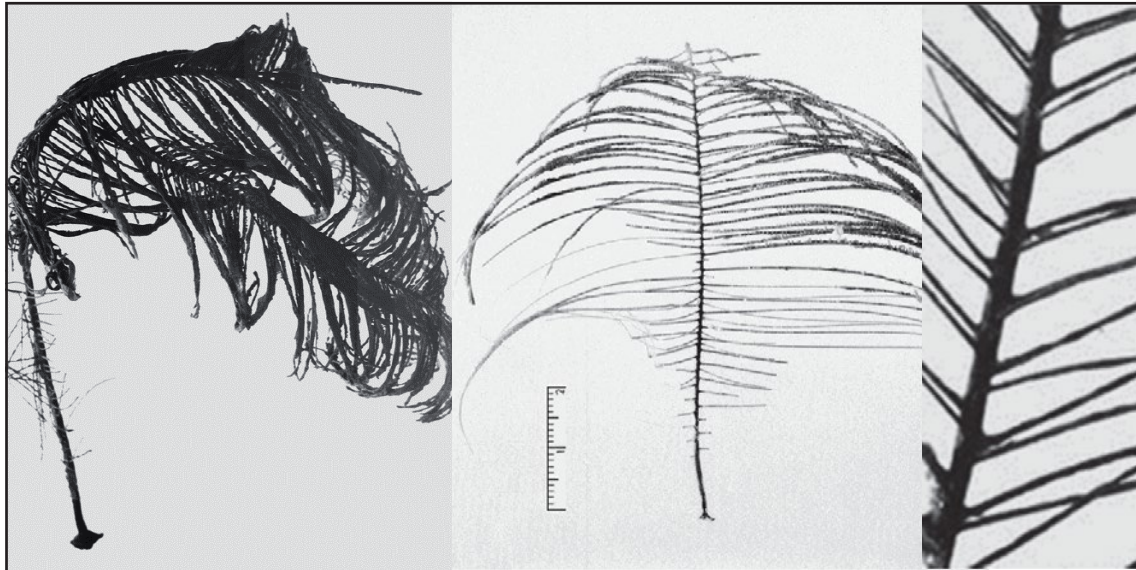
Similar species: Some young colonies of *Umbellapathes* may have the same general appearance as colonies of *Bathypathes* but with the lower non-pinnulated portion of the stem much longer. Young *Lillipathes* colonies may also appear similar but have four rows of pinnules (which are also grouped in pairs along the stem and branches; see next page).

References: Opresko, D.M. (2002). Revision of the Antipatharia (Cnidaria: Anthozoa). Part II. Schizopathidae. *Zoologische Mededelingen, Leiden*. 76:411–442.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Schizopathidae



Lillipathes spp. LIL



Lillipathes lillei

Lillipathes sp. young colony

Pinnules

Distinguishing features: Colonies monopodial (when young), sparsely branched, or flabellate; stem and branches with short to long pinnules arranged bilaterally in four rows (two on each side of axis) and also in alternating pairs. Pinnules without subpinnules.

Colour: Colour when alive most likely white.

Size: Up to several metres tall.

Distribution: Found primarily off the northern coast of the North Island.

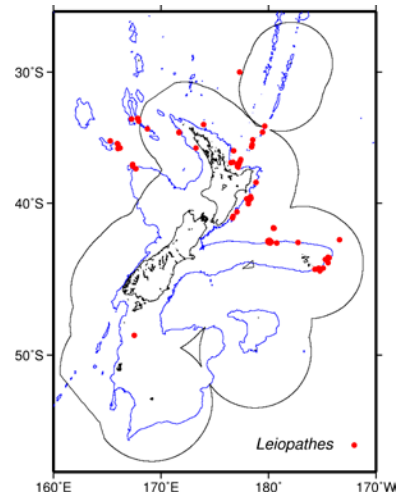
Depth: 155 to 1746 m; mostly 300 to 1000 m.

Similar species: Young *Lillipathes* colonies are similar in appearance to small colonies of *Bathypathes*; the latter, however, have only two rows of pinnules (See preceding page).

References: Totton, A.K. (1923). Coelenterata. Part III. Antipatharia (and their Cirripede commensals). British Antarctic (Terra Nova) Expedition. 1910–1913. *Natural History Reports, Zoology.*, 5:97–120, 2 pls, 18 figs.

Opresko, D.M. (2002). Revision of the Antipatharia (Cnidaria: Anthozoa). Part II. Schizopathidae. *Zoologische Mededelingen, Leiden.* 76:411–442.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Leiopathidae



Leiopathes spp. LEI



Left image: *Leiopathes secunda* (LSE) Opresko

Distinguishing features: Small to large, bushy or fan-shaped sympodial colonies. Main branches usually appearing somewhat crooked in shape; small branchlets curved, and often arising on the outer convex side of the next lower order branchlets. End branchlets short and thin. Thickest branches appearing polished and smooth.

Colour: Orange, red or white when alive; whitish after preservation in alcohol.

Size: Up to 2 metres or more.

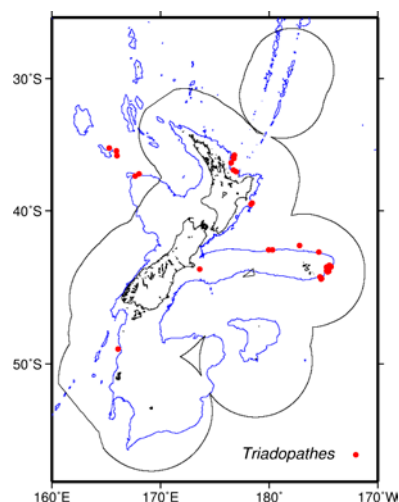
Distribution: Off the north coast of the North Island and along the Lord Howe and Chatham Rises.

Depth: 254 to 1608 m.

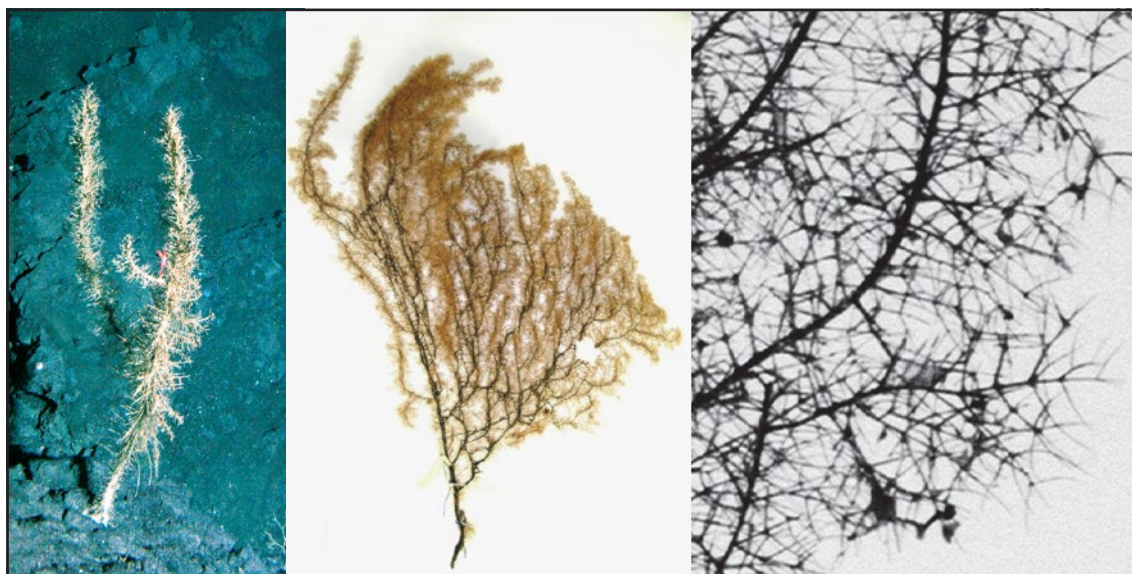
Similar species: Three species of *Leiopathes* (*L. secunda* (LSE see image above), *L. acanthophora*, and *L. bullosa*) occur in New Zealand waters. In *L. acanthophora* the smallest branchlets are straighter, longer and not as regularly arranged as those in *L. secunda*. *Leiopathes bullosa* has a 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 of the South Australian Museum* 31(1):99–111.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Stylopathidae



Triadopathes spp. TDP



Distinguishing features: Colonies flabellate but thick. Stem and branches often fused together especially on the lower parts of the corallum. Simple pinnules arranged in groups of two, three or four, and extending out from all sides of the branches.

Colour: Polyp colour light brown.

Size: Up to several metres tall.

Distribution: Common along the edges of the Lord Howe and Chatham Rises.

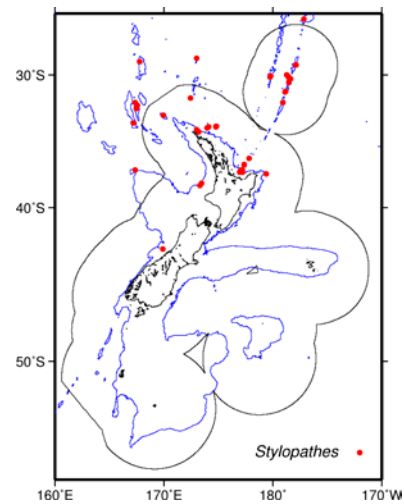
Depth: 115 to 1186 m; mostly greater than 600 m.

Similar species: The growth form of *Triadopathes* is unique, although juvenile colonies might be mistaken for colonies of *Stylopathes* (see next page).

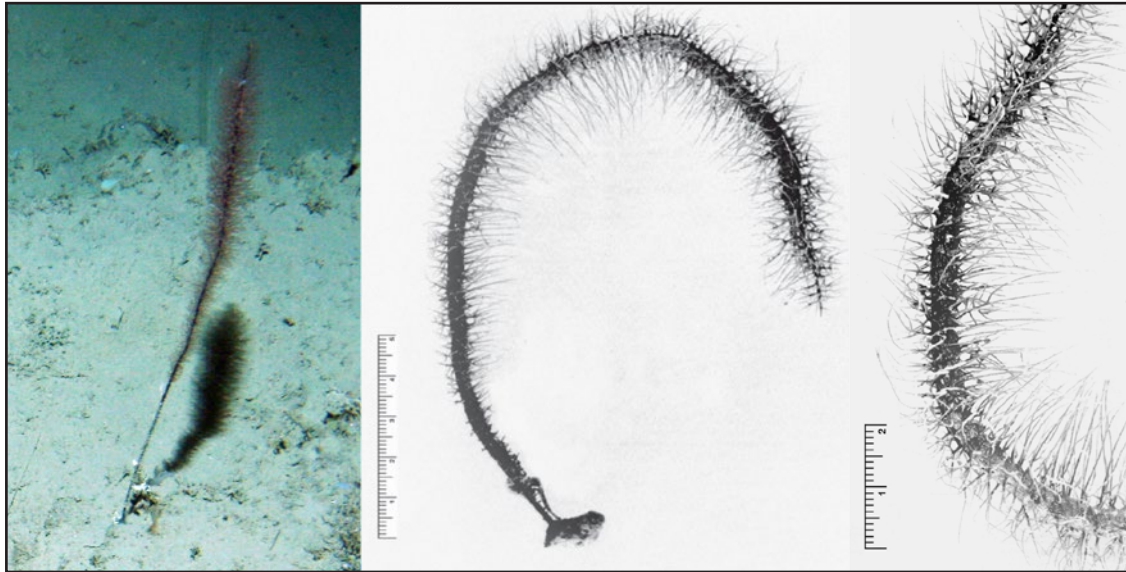
References: Opresko, D.M. (1999). New species of *Antipathes* and *Parantipathes* (Cnidaria: Anthozoa: Antipatharia) from coastal waters of South Australia and Tasmania. *Records of the South Australian Museum* 32(2):143–154.

Opresko, D.M. (2006). Revision of the Antipatharia (Cnidaria: Anthozoa). Part V. Establishment of a new family, Stylopathidae. *Zoologische Mededelingen, Leiden*. 80–4 (11):109–138.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Stylopathidae



***Stylopathes* spp. SLP**



Distinguishing features: Colonies usually with a single stalk (stem) or with a few elongate branches; stem and branches with short to long pinnules extending out in all directions as in a bottlebrush pattern. Pinnules with short subpinnules often arranged in groups of three or four.

Colour: Brownish-grey when alive.

Size: Generally less than 0.5 metres.

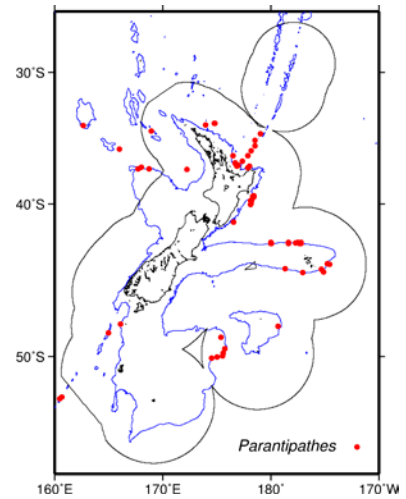
Distribution: Found primarily off the north coast of the North Island and along the Kermadec Ridge and northern ridges.

Depth: 88 to 1270 m; mostly deeper than 200 m.

Similar species: Species of *Parantipathes* (see next page) have a similar bottle brush appearance as colonies of *Stylopathes*.

References: Opresko, D.M. (2006). Revision of the Antipatharia (Cnidaria: Anthozoa). Part V. Establishment of a new family, Stylopathidae. *Zoologische Mededelingen, Leiden*. 80–4 (11):109–138.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Schizopathidae



Parantipathes spp. PTP



Distinguishing features: Colonies with a single stalk (stem) or with a few to many elongate branches; stem and branches with short to long pinnules arranged in a bottlebrush pattern in six to twelve rows and also arranged in bilateral semispiral groups. Pinnules without subpinnules.

Colour: Polyps usually white or brown when alive.

Size: Generally less than 0.5 m; sometimes several metres tall.

Distribution: Common along the edges of the Kermadec Ridge and the Chatham Rise.

Depth: 335 to 1583 m.

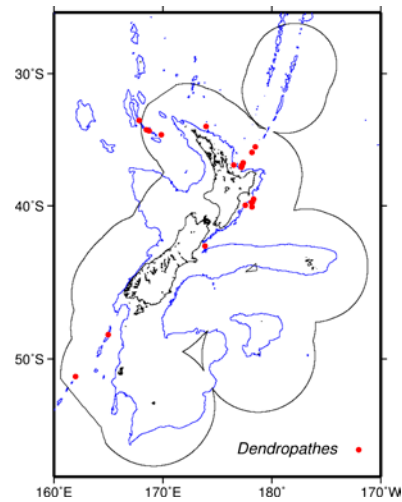
Similar species: Some species of *Stylopathes* (see preceding page) have a bottlebrush appearance similar to that of *Parantipathes*.

References: Opresko, D.M. (2002). Revision of the Antipatharia (Cnidaria: Anthozoa). Part II. Schizopathidae. *Zoologische Mededelingen, Leiden*. 76:411–442.

Molodtsova, T. N. and F.A. Pasternak, (2005). Redescription of *Parantipathes evantha* (Pasternak, 1958) (Anthozoa: Antipatharia) from Kurile-Kamchatka Trench. *Invertebrate Zoology*, 2(2): 169–179.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Schizopathidae

***Dendropathes* spp. DDP**



Distinguishing features: Colonies branched and pinnulate; stem and branches with short pinnules arranged in four rows and in a somewhat bottlebrush pattern. Pinnules without subpinnules.

Colour: Polyp colour not known.

Size: Up to 1 metre or more tall.

Distribution: Mostly off the north and northeast coasts of the North Island, and also found along the Macquarie Ridge.

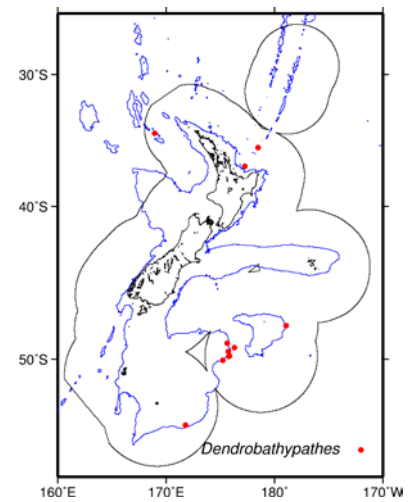
Depth: 505–1327 m.

Similar species: Some species of *Dendrobathypathes* (see next page) can be mistaken for *Dendropathes*.

References: Opresko, D.M. (2002). Revision of the Antipatharia (Cnidaria: Anthozoa). Part II. Schizopathidae. *Zoologische Mededelingen, Leiden*. 76:411–442.

Opresko, D.M. (2005). New genera and species of antipatharian corals (Cnidaria:Anthozoa) from the North Pacific. *Zoologische Mededelingen, Leiden*. 79–2 (7): 129–165.

Phylum Cnidaria
Class Anthozoa
Subclass Hexacorallia
Order Antipatharia (black corals)
Family Schizopathidae



***Dendrobathypathes* spp. DEN**



Distinguishing features: Colonies branched and pinnulate; stem and branches with short uniserial or bilateral alternating pinnules. Primary pinnules may have short, uniserial subpinnules on one side. Tertiary pinnules present in some species.

Colour: Polyp colour orange.

Size: Generally less than 1 metre tall.

Distribution: Common on the northeast corner of the Campbell Plateau.

Depth: 525 to 1300 m.

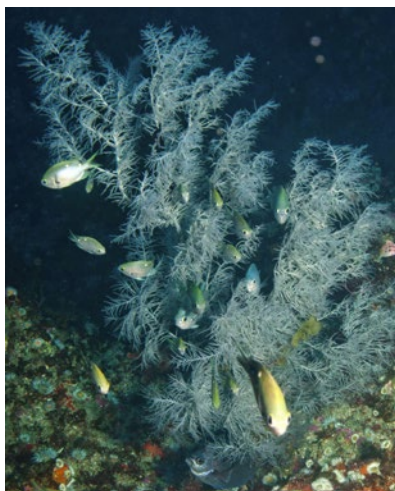
Similar species: Some species of *Dendropathes* and *Leiopathes* can be mistaken for species of *Dendrobathypathes*.

References: Opresko, D.M. (2002). Revision of the Antipatharia (Cnidaria: Anthozoa). Part II. Schizopathidae. *Zoologische Mededelingen, Leiden*. 76:411–442.

Opresko, D.M. (2005). New genera and species of antipatharian corals (Cnidaria:Anthozoa) from the North Pacific. *Zoologische Mededelingen, Leiden*. 79–2 (7): 129–165.

REFERENCES

- Brook, G. (1889). Report on the Antipatharia. *Reports of the Scientific Results of the Voyage of the 'Challenger'*, Zoology 32:1–222, 15 pls.
- Cairns, S.D., Vervoort, W., Watson, J.E., Pugh, P., Gershwin, L., Opresko, S.M. et al. 2009. The Phylum Cnidaria, Corals, Medusae and Hydroids. In: *New Zealand Inventory of Biodiversity*, volume 1. Kingdom Animalia, Canterbury University Press, Christchurch, New Zealand.
- Duchassaing, P. (1870). *Revue des Zoophytes et des Spongiaires des Antilles*, 52 p., 2 pls. Paris.
- Ellis, J.; Solander, D. (1786). The Natural History of Many Curious and Uncommon Zoophytes Collected by the Late John Ellis, Systematically Arranged and described by the Late Daniel Solander, xii + 208 p., 63 pls. London.
- Esper, E.J.C. (1788–1830) 'Die Pflanzenthier in Abbildungen nach der Natur mit Farben erleuchtet nebst Beschreibungen', vol. 1–3, pp. xii + 320; 304; 285+, Fortsetzung, vols 1–2. pp. 230; 48, 420 pls. Nürnberg.
- Grange, K. (1990). *Antipathes fiordensis*, a new species of black coral (Coelenterata:Antipatharia) from New Zealand. *New Zealand Journal of Zoology* 17:279–282.
- Gray, J.E. (1857). Synopsis of the families and genera of axiferous zoophytes or barked corals. *Proceedings of the Zoological Society of London* 25:278–294, pl. 9.
- Gray, J.E. (1860). Notice of new corals from Madeira discovered by J.Y. Johnson, Esq., *Annals and Magazine of Natural History (Series 3)*, 6:311.
- Linnaeus, C. (1758). *Systema Naturae per Regna Tria Naturae*. Editio decima, reformata. Tome 1. Holmiae, 824 p.
- Milne-Edwards, H.; Haime, J. (1857). *Histoire Naturelle des Coralliaires ou Polypes Proprement Dits*. 1–34+326 p., Paris.
- Molodtsova, T. N.; Pasternak, F.A. (2005). Redescription of *Parantipathes evantha* (Pasternak, 1958) (Anthozoa: Antipatharia) from Kurile-Kamchatka Trench. *Invertebrate Zoology*, 2(2): 169–179.
- Opresko, D.M. (1998). Three new species of *Leiopathes* (Cnidaria: Anthozoa: Antipatharia) from Southern Australia. *Records of the South Australian Museum* 31(1):99–111.
- Opresko, D.M. (1999). New species of *Antipathes* and *Parantipathes* (Cnidaria: Anthozoa: Antipatharia) from coastal waters of South Australia and Tasmania. *Records of the South Australian Museum* 32(2):143–154.
- Opresko, D.M. (2001). Revision of the Antipatharia (Cnidaria: Anthozoa). Part I. Establishment of a new family, Myriopathidae. *Zoologische Mededelingen* 75:147–174.
- Opresko, D.M. (2002). Revision of the Antipatharia (Cnidaria: Anthozoa). Part II. Schizopathidae. *Zoologische Mededelingen, Leiden*. 76:411–442.
- Opresko, D.M. (2003). Revision of the Antipatharia (Cnidaria: Anthozoa). Part III. Cladopathidae. *Zoologische Mededelingen, Leiden*. 77:495–536.
- Opresko, D.M. (2005). New genera and species of antipatharian corals (Cnidaria:Anthozoa) from the North Pacific. *Zoologische Mededelingen, Leiden*. 79–2 (7): 129–165.
- Opresko, D.M. (2006). Revision of the Antipatharia (Cnidaria: Anthozoa). Part V. Establishment of a new family, Stylopathidae. *Zoologische Mededelingen, Leiden*. 80–4 (11):109–138.
- Opresko, D.M.; Breedy, O. (2010). A new species of antipatharian coral (Cnidaria: Anthozoa: Antipatharia: Schizopathidae) from the Pacific coast of Costa Rica. *Proceedings of the Biological Society of Washington*, 123(3):234–241.
- Opresko, D.M.; Genin, A. (1990). A new species of antipatharian (Cnidaria: Anthozoa) from the seamounts in the eastern North Pacific. *Bulletin of Marine Science* 46(2):301–310.
- Opresko, D.M.; Sanchez, J.A. (1997). A new species of antipatharian coral (Cnidaria: Anthozoa) from the Caribbean coast of Colombia. *Caribbean. Journal of Science* 33:75–81.
- Pallas, P.S. (1766). 'Elenchus Zoophytorum Sistens Generum Adumbrationes Generaliores et Specierum Cognitarum Succinctas Descriptiones cum Selectis Auctorum Synonymis'. xvi + 28 + 451 pp. Hagae-Comitum.
- Pasternak, F.A. (1977). Antipatharia. *Galathea Report* 14:157–164.
- Schultze, L.S. (1896). Beitrag zur Systematik der Antipatharien. *Abhandlungen der Senckenbergischen naturforschenden Gesellschaft* 23:1–40.
- Silberfeld, E. (1909). Diagnosen neuer Japanischer Antipatharien aus der Sammlung von Herrn Prof. Doflein. *Zoologischer Anzeiger* 34:760–763.
- Thomson, J. (1905). Report on the Antipatharians, Scotia Collection. *Proceedings of the Royal Physical Society of Edinburgh* 16(3):70–79.
- Totton, A.K. (1923). Coelenterata. Part III. Antipatharia (and their Cirripede commensals). British Antarctic (Terra Nova) Expedition. 1910–1913. *Natural History Reports, Zoology* 5:97–120, 2 pls, 18 figs.
- Tracey, D.; Mackay, E.; Gordon D.; Sanchez, J.; Opresko, D. (2008). A Guide to Deepsea Coral. Report prepared for CSP Unit, Department of Conservation, DOC08309 Project (Objective 3). 15 p.
- Tracey, D.M.; Anderson, O.F.; Naylor, J.R. (Comps.). (2011). A guide to common deepsea invertebrates in New Zealand waters. *New Zealand Aquatic Environment and Biodiversity Report No. 86*. 317 p.
- van Pesch, A.J. (1914). The Antipatharia of the Siboga Expedition. *Siboga Expeditie Monographie* 17:1–258.
- Verrill, A.E. (1928). Hawaiian shallow-water Anthozoa. *Bulletin of the Bishop Museum* 49:1–30, 5 pls, 3 figs.



Page 8, *Antipathella* spp.



Page 9, *Antipathes* spp. ATP



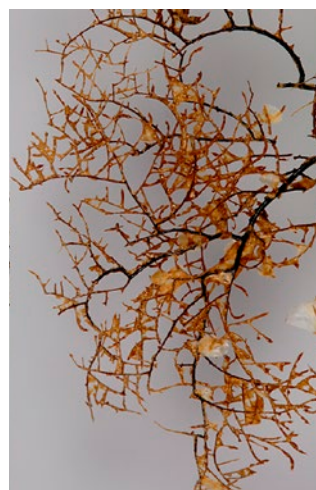
Page 10, *Stichopathes* spp. STI



Page 11, *Bathypathes* spp. BTP



Page 12, *Lillipathes* spp. LIL



Page 13, *Leiopathes* spp. LEI



Page 14, *Triadopathes* spp.



Page 15, *Stylopathes* spp.



Page 16, *Parantipathes* spp. PTP



Page 17, *Dendropathes* spp.



Page 18, *Dendrobathypathes* spp. DEN