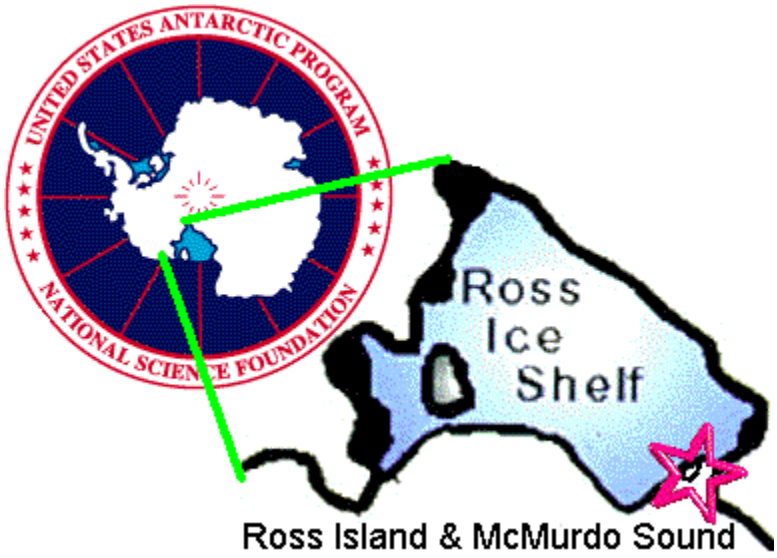
UNDERWATER FIELD GUIDE TO ROSS ISLAND & MCMURDO SOUND, ANTARCTICA, VOLUME 7: OTHER PHYLA

CTENOPHORA: comb jellies, ctenophores
NEMERTEA: proboscis worms
BRYOZOA: bryozoans
BRACHIOPODA: brachiopods, lamp shells
CHAETOGNATHA: arrow worms
ANNELIDA: polychaetes, bristle worms, featherduster worms, leeches

Peter Brueggeman

Photographs: Peter Brueggeman, Kathleen Conlan/Canadian Museum of Nature, Paul Cziko, Paul Dayton, Shawn Harper, Adam G Marsh, Jim Mastro, Rowan McLachlan, Bruce A Miller, Rob Robbins, Dirk Schories, M Dale Stokes & Norbert Wu



The National Science Foundation's Office of Polar Programs sponsored Norbert Wu on an Artist's and Writer's Grant project, in which Peter Brueggeman participated. One outcome from Wu's endeavor is this Field Guide, which builds upon principal photography by Norbert Wu, with photos from other photographers, who are credited on their photographs and above. This Field Guide aims to facilitate underwater/topside field identification from visual characters. Most organisms were identified from photographs with no specimen collection, so there can be uncertainty with these identifications.

Keywords: Antarctic, Antarctica, field guide, marine, Ross Island, McMurdo Sound, ctenophore, ctenophora, comb jelly, nemertea, nemertean, proboscis worm, bryozoa, bryozoan, brachiopoda, brachiopod, lamp shell, chaetognatha, chaetognath, arrow worm, annelida, annelid, polychaete, bristle worm, featherduster worm, leech

platyctenean ctenophore *Lyrocteis flavopallidus*

incertae familae* ctenophore *Callianira cristata

mertensiid ctenophore, family Mertensiidae

comb jelly *Beroe* sp. A

comb jelly *Beroe* sp.

proboscis worm *Parborlasia corrugatus*

cheilostomatous bryozoan *Camptoplites* sp.

cheilostomatous bryozoan *Cellarinella* sp.

cheilostomatous bryozoan *Cellaria* sp.

cheilostomatous bryozoan, possibly *Celleporella hyalina* or *Hippothoa divaricata*

cheilostomatous bryozoan *Reteporella* sp.

cheilostomatous bryozoan

cyclostomate bryozoan *Hornera* sp.

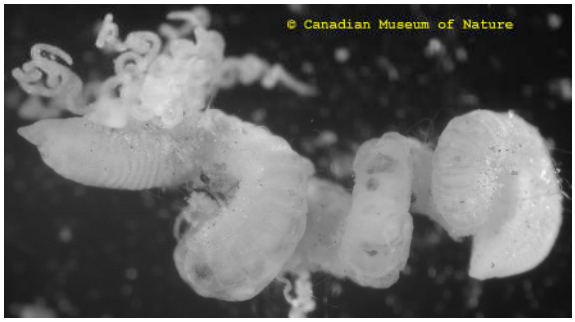
brachiopod *Liothyrella uva*

arrow worm *Pseudosagitta gazellae*

archiannelid polychaete *Protodriloides symbioticus*

capitellid polychaete *Capitella perarmata*

chaetopterid polychaete *Chaetopterus variopedatus*



cirratulid polychaete *Aphelochaeta* sp.

flabelligerid polychaete *Flabegraviera mundata*

hesionid polychaete *Psamathe fauveli*

maldanid polychaete *Axiothella antarctica*

nephtyid polychaete *Aglaophamus trissophyllus*

sand worm or opheliid polychaete *Ophelina breviata*

orbiniid polychaete *Leitoscoloplos kerguelensis*

polynoid polychaete or scale worm *Barrukia cristata*

polynoid polychaete or scale worm *Eulagisca corrientis*

polynoid polychaete or scale worm *Eulagisca gigantea*

polynoid polychaete or scale worm *Eulagisca puschkini*

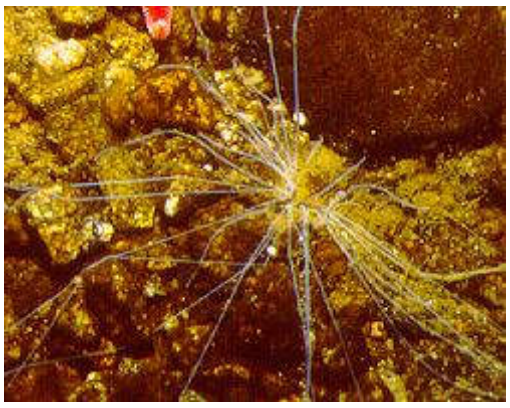
polynoid polychaete or scale worm, probably *Harmothoe* sp. 3

sabellid polychaete or featherduster worm sp., probably *Perkinsiana magalhaensis*

serpulid polychaete *Serpula narconensis*

spionid polychaete *Spiophanes tcherniai*

spionid polychaete *Laonice* sp.



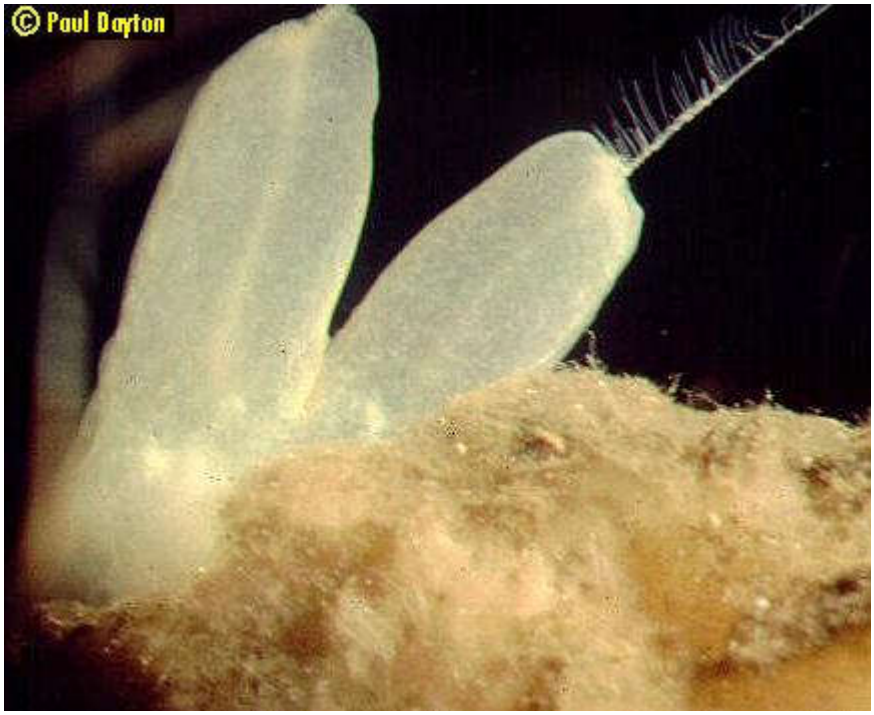
terebellid polychaete (family Terebellidae)

piscicolid leech

piscicolid leech eggs *Glyptonotobdella antarctica*

November 2021: Taxonomic names checked in Zoological Record and World Register of Marine Species

platyctenean ctenophore *Lyrocteis flavopallidus*

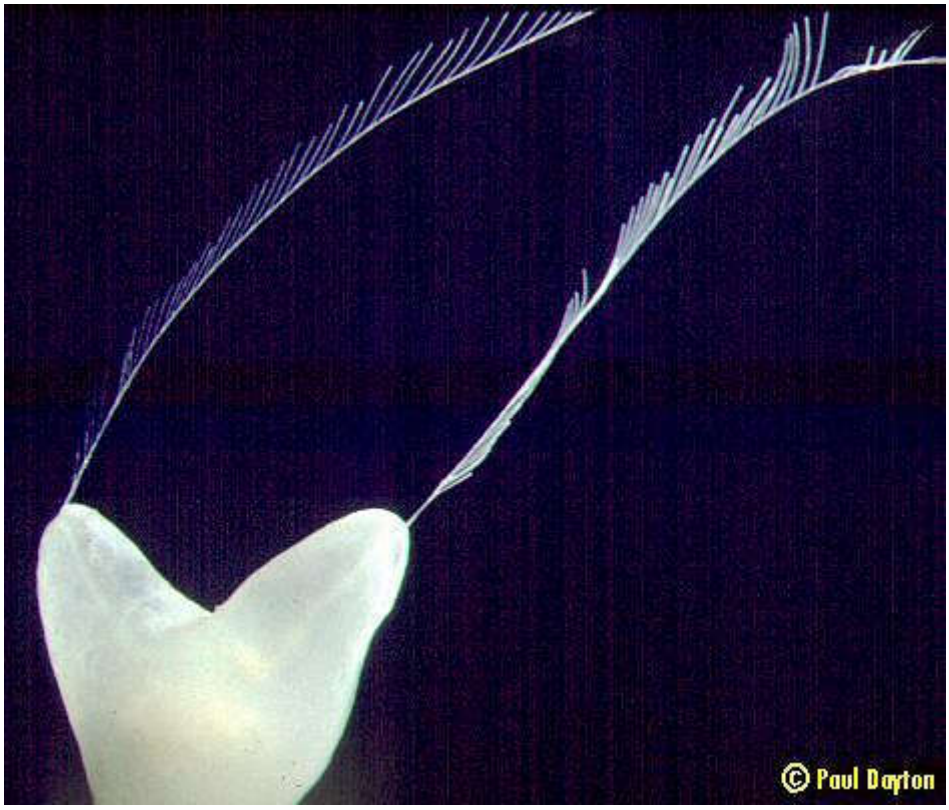


Lyrocteis flavopallidus has been found in Antarctica and South Shetland Islands at depths from 36 to 761+ meters [1,2,3,4,6].

Video transects of the Ross Sea observed *L. flavopallidus* rarely, and principally on shallow banks having a mean depth of 377 meters [5].

Lyrocteis flavopallidus is saddle-shaped, pale straw-yellow in color, and has been collected at sizes up to eleven centimeters high [1,4,7]. *L. flavopallidus* has been found perched on sponges (Rossellid sponges, *Antarctotetilla leptoderma*) or elevated surfaces, is soft and fragile, and secretes mucus when disturbed [1].

Lyrocteis flavopallidus sits with its oral end down and usually moves less than two to three centimeters over a long period of time [1]. One *L. flavopallidus* moved 35 centimeters in 24 hours onto a marker rod like this, probably to gain a higher perch for better filter feeding [1]. *L. flavopallidus* has a skirt on the base of its trunk around the oral area which it uses to glide forward [1].



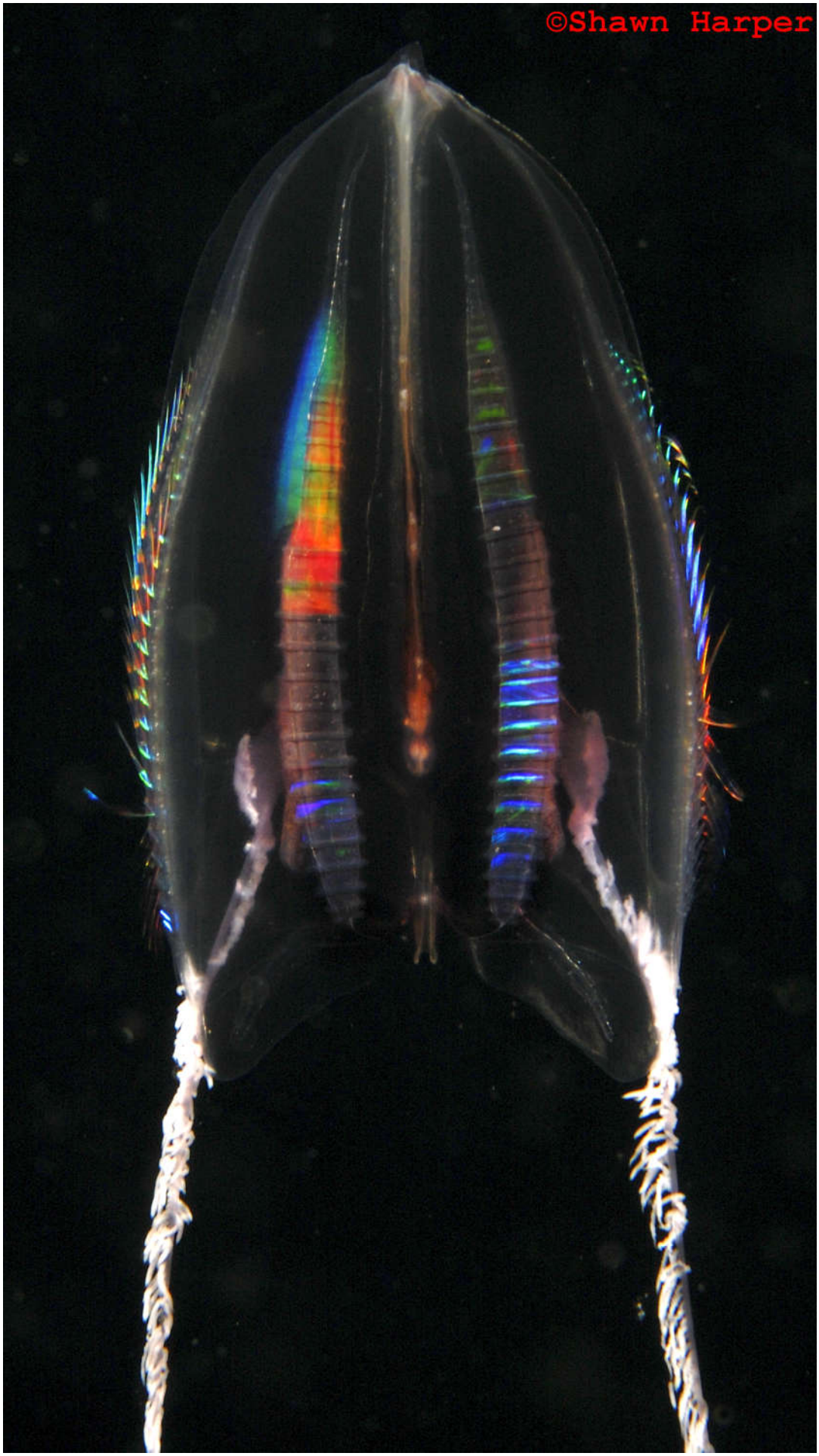
Lyrocteis flavopallidus has adhesive, retractile tentacles (branched on one side) which extend to lengths up to seventy centimeters [1]. Food is caught by the sticky tentacles and transferred to the mouth [1]. The body and arms of *L. flavopallidus* usually bend in the same direction of current flow with the tentacles streaming out [1]. *L. flavopallidus* adults do not have the characteristic ctene (comb) rows seen in many other ctenophores [1].

References: 1: Canadian Journal of Zoology 50:47-53, 1972; **2:** Annales de l'Institut Oceanographique 73(2):139-158, 1997; **3:** Polar Biology 20(4):229-247, 1998; **4:** Guide to the Ctenophores of the Southern Ocean and Adjacent Waters. D O'Sullivan. ANARE Research Notes 36. Kingston, Australia: Australia Antarctic Division, 1986; **5:** Biogeochemistry of the Ross Sea. GR DiTullio & RB Dunbar, editors. Antarctic Research Series Volume 78. Washington, D.C.: American Geophysical Union, 2003. pp.327-354; **6:** Guia Marina Antarctica. D Schories. www.guiamarina.com; **7:** Antarctic Macrobenthos, a Field Guide of the Invertebrates Living at the Antarctic Seafloor. Martin Rauschert & Wolf Arntz. Arntz & Rauschert Selbstverlag, Wurster Nordseekueste, Germany, 2015. Page 28

incertae familae ctenophore *Callianira cristata*

Callianira cristata is found in Antarctica [1,2].

Ctenophores are commonly known as comb jellies, are biradially symmetrical with a transparent gelatinous ectomesoderm containing muscle fibers, have a nervous system and a separate muscular system, and have eight ciliary comb rows [1]. Ctenophores combs propel their movement; the comb rows beat in a regular sequence starting from the aboral end (away from the mouth) thus propelling the ctenophore with its mouth forward [1].



This ctenophore has two tentacles which it can extend; they have specialized adhesive structures to capture other zooplankton, including copepods, euphausiid larvae, mysids, and fish larvae. The tentacles are retracted towards the mouth to ingest the prey.

Taxonomic Note: The validity of the genus *Callianira* is uncertain, and a phylogenetic study of ctenophores including *C. antarctica* suggested that *Callianira* should be excluded from the family Mertensiidae and should be *incertae familae* until further revision [1,3].

References: 1: Biodiversity Data Journal 9: e69374, 2021 https://doi.org/10.3897/BDJ.9.e69374; **2:** Antarctic Journal of the United States 23(5): 135-136; **3:** Marine Biodiversity (2020) 50: 34 https://doi.org/10.1007/s12526-020-01049-9

mertensiid ctenophore, family Mertensiidae

This mertensiid ctenophore has caught a zooplankter. This mertensiid ctenophore has two tentacles which it can extend; they have specialized adhesive structures to capture other

zooplankton, including copepods, euphausiid larvae, mysids, and fish larvae. The tentacles are retracted towards the mouth to ingest the prey.

Ctenophores are commonly known as comb jellies, are biradially symmetrical with a transparent gelatinous ectomesoderm containing muscle fibers, have a nervous system and a separate muscular system, and have eight ciliary comb rows [1]. Ctenophores combs propel their movement; the comb rows beat in a regular sequence starting from the aboral end (away from the mouth) thus propelling the ctenophore with its mouth forward [1].

Taxonomic Note: These photos are of an undescribed species [2].

References: 1: Guide to the Ctenophores of the Southern Ocean and Adjacent Waters. D O'Sullivan. ANARE Research Notes No.36. Kingston, Tasmania: Australian National Antarctic Research Expeditions, 1986; **2:** Biodiversity Data Journal 9: e69374, 2021 https://doi.org/10.3897/BDJ.9.e69374

comb jelly *Beroe* sp. A

Beroe sp. A is oval with a body length about 2.4 times its body width, and comb row lengths about 2/3 of its body length [3]. *Beroe* sp. A has short spaces between its paddling comb plates, with the space between four comb plates about equal to the width of a comb plate [3]. *Beroe* sp. A has a brownish-orange stomodeum with its length nearly full body length; its diverticula are white and brownish-orange without anastomoses [3].

Ctenophores are commonly known as comb jellies, are biradially symmetrical with a transparent gelatinous ectomesoderm containing muscle fibers, have a nervous system and a separate muscular system, and have eight ciliary comb rows [1].

Beroe species can completely engulf prey as large as themselves; larger prey are bitten into pieces with bundles of fused cilia lining the inner lips [1].

The Antarctic sea spider *Colossendeis megalonyx* has been observed feeding on what is probably *Beroe* [2].

Ctenophores combs propel their movement; the comb rows beat in a regular sequence starting from the aboral end (away from the mouth) thus propelling the ctenophore with its mouth forward [1].

Taxonomic Note: Identification of *Beroe* species is difficult, with many being superficially described, and thus there are probably several synonyms [3]. Three *Beroe* species have been reported for the Southern Ocean: *compacta*, *cucumis* and *ovale*, and there are at least two undescribed *Beroe* species from McMurdo Sound [3].

References: 1: Guide to the Ctenophores of the Southern Ocean and Adjacent Waters. D O'Sullivan. ANARE Research Notes No.36. Kingston, Tasmania: Australian National Antarctic Research Expeditions, 1986; **2:** Invertebrate Biology, 2018. https://doi.org/10.1111/ivb.12210; **3:** Biodiversity Data Journal 9: e69374, 2021 https://doi.org/10.3897/BDJ.9.e69374

comb jelly *Beroe* sp.

Ctenophores are commonly known as comb jellies, are biradially symmetrical with a transparent gelatinous ectomesoderm containing muscle fibers, have a nervous system and a separate muscular system, and have eight ciliary comb rows [1]. *Beroe* species can completely engulf prey as large as themselves; larger prey are bitten into pieces with bundles of fused cilia lining the inner lips [1].

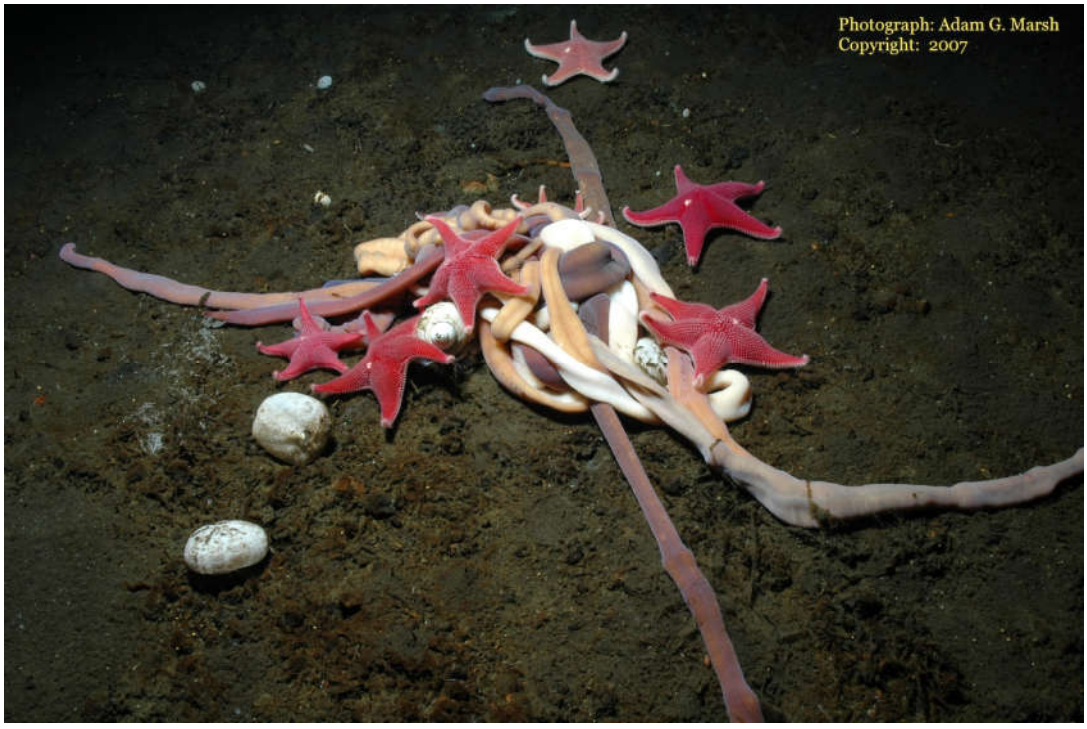
The Antarctic sea spider *Colossendeis megalonyx* has been observed feeding on what is probably *Beroe* [2].

Ctenophores combs propel their movement; the comb rows beat in a regular sequence starting from the aboral end (away from the mouth) thus propelling the ctenophore with its mouth forward [1].

Taxonomic Note: Identification of *Beroe* species is difficult, with many being superficially described, and thus there are probably several synonyms [3]. Three *Beroe* species have been reported for the Southern Ocean: *compacta*, *cucumis* and *ovale*, and there are at least two undescribed *Beroe* species from McMurdo Sound [3].

References: 1: Guide to the Ctenophores of the Southern Ocean and Adjacent Waters. D O'Sullivan. ANARE Research Notes No.36. Kingston, Tasmania: Australian National Antarctic Research Expeditions, 1986; **2:** Invertebrate Biology, 2018. https://doi.org/10.1111/ivb.12210; **3:** Biodiversity Data Journal 9: e69374, 2021 https://doi.org/10.3897/BDJ.9.e69374

proboscis worm *Parborlasia corrugatus*

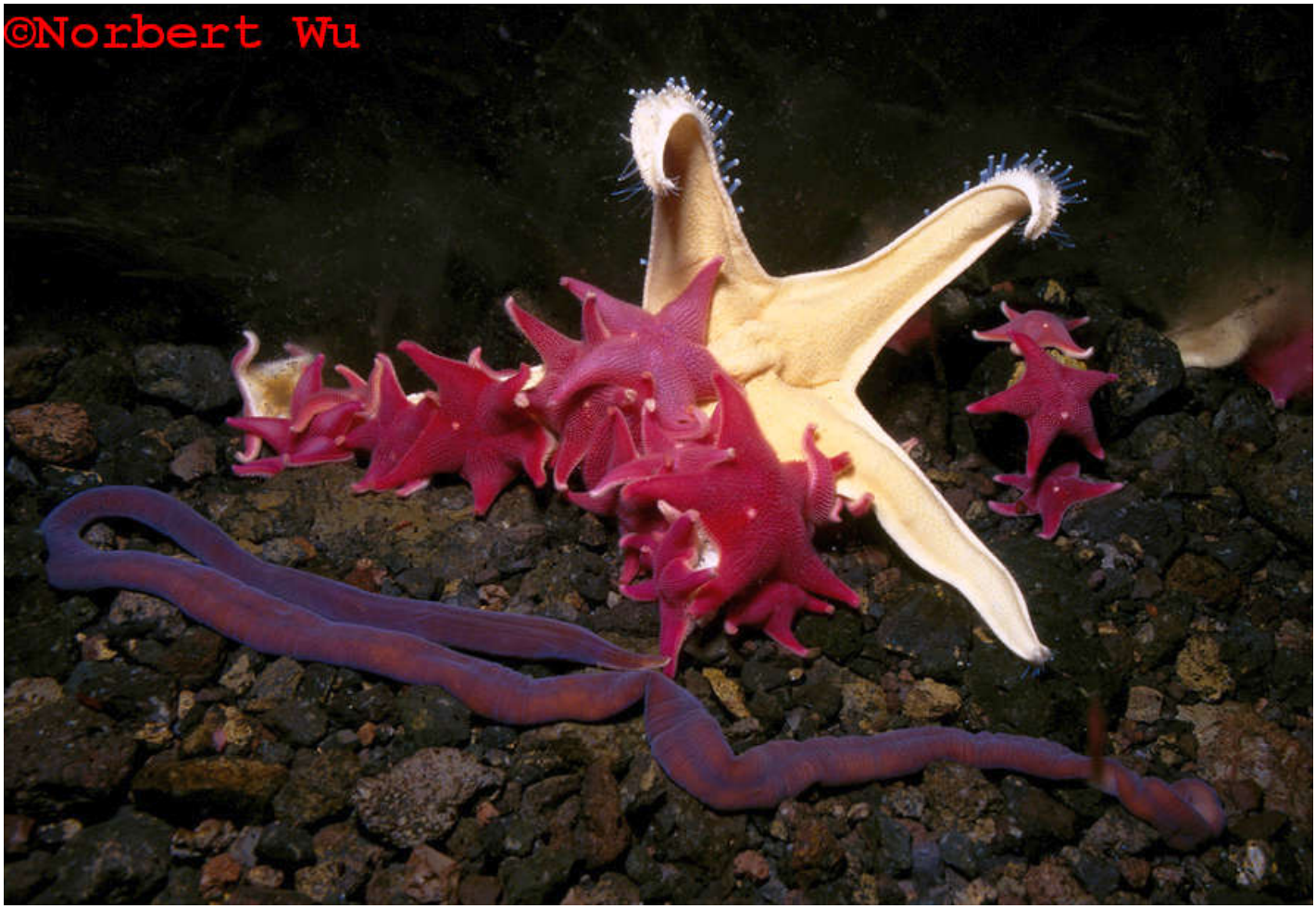


Parborlasia corrugatus is found throughout Antarctica and the Antarctic Peninsula, South Shetland Islands, South Orkney Islands, South Sandwich Islands, South Georgia Island, Bouvet Island, Kerguelen Island, Cargados Carajos Shoals in the Indian Ocean, Falkland Islands, Tierra del Fuego, southern Argentina, Peru, and Chile at depths from 0 to 3,590 meters [1,7,8].

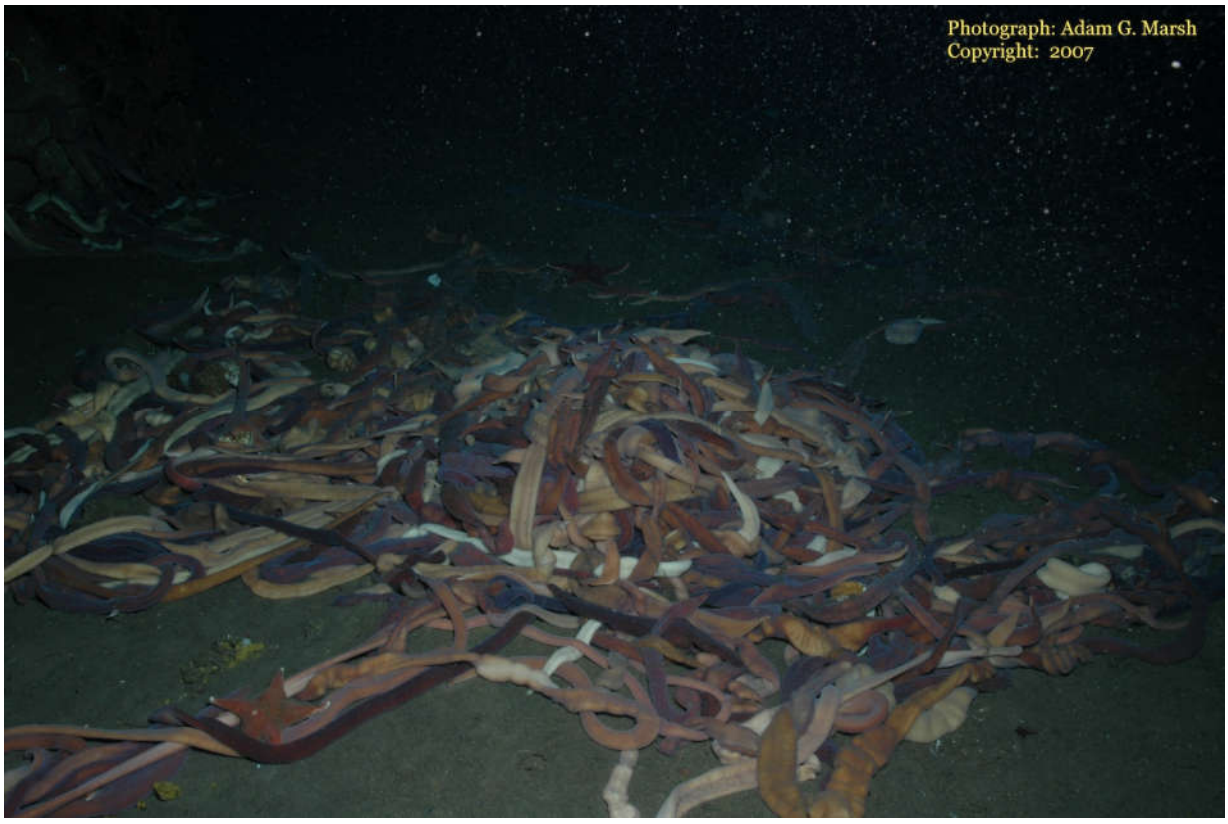
Parborlasia corrugatus has a smooth flattened body with variable coloration (cream through reddish-, greenish-, or grayish-brown to dark brownish-black) [1]. *P. corrugatus* grows to lengths of one to two meters, a diameter of two centimeters, and weighs up to 100 grams..... an example of Antarctic gigantism [1,6].

Parborlasia corrugatus is a scavenger and a predator with a voracious appetite, and will eat almost anything; its diet includes sponges (e.g. *Homaxinella balfourensis*), jellyfish (it's eating *Desmonema glaciale* in above photo), diatoms, seastars, anemones, polychaete worms, molluscs (e.g. the clam *Laternula elliptica* and the scallop *Adamussium colbecki*), crustaceans, and fish [1,2,5,9].

Parborlasia corrugatus may be eating that sponge in the above photo.

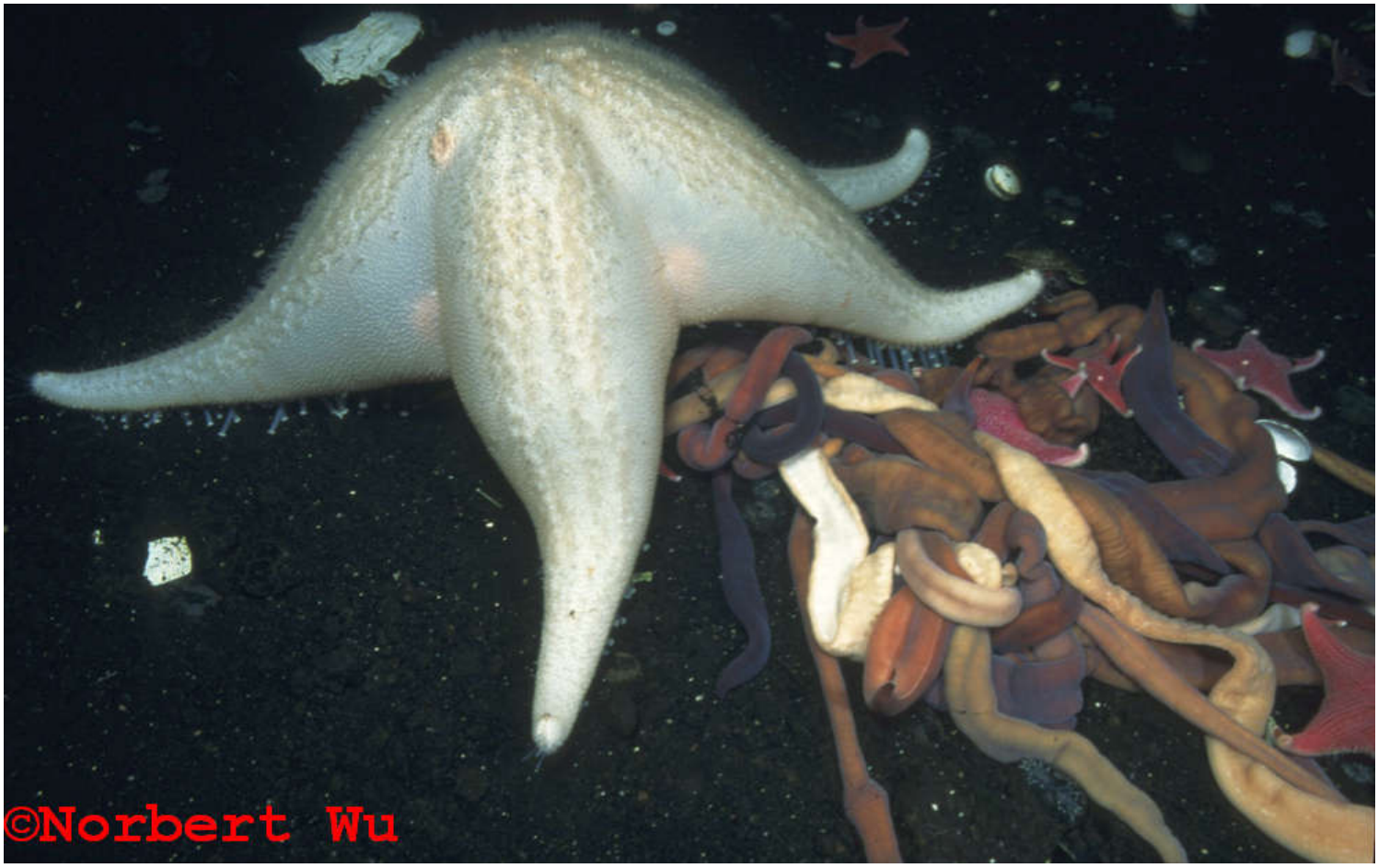


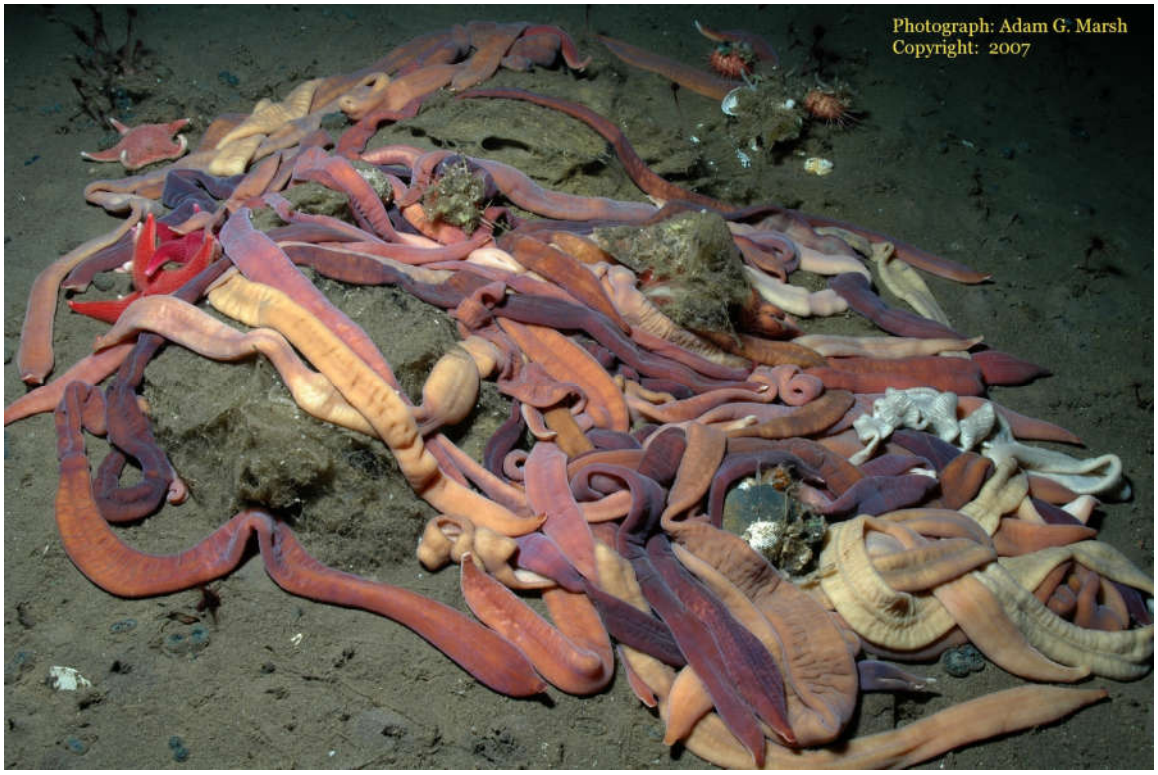
Parborlasia corrugatus joins in on the feeding frenzy when the small seastar *Odontaster validus* attacks en masse the large seastar *Acodontaster conspicuus* [3].



Feeding pile-ups of up to 22 *Parborlasia corrugatus* have been observed [4].

Parborlasia corrugatus can detect food at a distance with an efficient chemotactic sense and its large mouth and flexible body can engulf food almost as large as itself [1].





Parborlasia corrugatus lacks a respiratory system, absorbing oxygen through its skin [6]. Ordinarily, such a large animal would have difficulty getting sufficient oxygen through its skin, but its success is afforded by its low metabolic rate coupled with the high oxygen level of the cold Antarctic waters [6]. If the oxygen level drops in the water, *P. corrugatus* becomes more flattened and elongated; this facilitates oxygen uptake by increasing its skin area and minimizes the distance that oxygen must diffuse into its body [6].

The cephalic slits on the head of *Parborlasia corrugatus* are yellowish-white in color, and usually two white patches just before the end of those cephalic slits [8]. Like other proboscis or nemertean worms, the wedge-shaped head of *P. corrugatus* has a fluid-filled cavity used to rapidly shoot a proboscis which the worm uses to capture prey and defend itself [1]. This proboscis has adhesive secretions which secure prey.

Parborlasia corrugatus is chemically defended by an acidic mucus (pH 3.5) which potential predators avoid [4].

Here *Parborlasia corrugatus* worms are eating eggs of the naked dragonfish *Gymnodraco acuticeps*.

Parborlasia corrugatus has a one-way gut with a large mouth (shown here) and a closed circulatory system; nemertean worms are the simplest animals with a circulatory system.

Taxonomic Note: Earlier genus was *Lineus* [1,11]. There are two cryptic species of *Parborlasia* . *corrugatus* in the Antarctic and Sub-Antarctic region [10,12].

References: 1: Biology of the Antarctic Seas XIV, Antarctic Research Series 39(4):289-316, 1983; **2:** Science 245:1484-1486, 1989; **3:** Ecological Monographs 44(1):105-128, 1974; **4:** Journal of Experimental Marine Biology and Ecology 153(1):15-25, 1991; **5:** Antarctic Science 10(4):369-375, 1998; **6:** Polar Biology 25(3):238-240, 2002; **7:** Polar Biology 29(2):106-113, 2006; **8:** Marine Benthic Fauna of Chilean Patagonia. V Haussermann, G Forsterra. Puerto Montt, Chile: Nature in Focus, 2009. p. 379; **9:** Ecological Applications 29(1), 2019, e01823; **10:** Molecular Ecology 17(23):5104-5117, 2008; **11:** Zoological Journal of the Linnean Society 83(2):95-227, 1985; **12:** Polar Biology 46(3):215-234, 2023, DOI: 10.1007/s00300-023-03117-9

cheilostomatous bryozoan *Camptoplites* sp.

This *Camptoplites* sp. bryozoan could be among six or so species [1,2].

Camptoplites bryozoans have their greatest diversity on the Antarctic Shelf and are also known from the abyss of the Indian, Atlantic, and Pacific Oceans [1]. *Camptoplites* colonies are erect, have dichotomous branching at regular intervals, may exceed five centimeters in height, and develop slender, open branched forms, dense feathery tuft forms, or highly-branched fan-shaped forms [1]. 81% (215 of 264) of Antarctic Cheilostomatous bryozoan species are endemic to Antarctica; nine of the ten Antarctic species of *Camptoplites* are endemic to Antarctica [1].

A closer view of *Camptoplites* sp. bryozoan.

Bryozoans are sedentary animals that form colonies of individuals (zooids) by budding. The external skeletal walls of bryozoans are made with calcium carbonate (calcareous). Bryozoan zooids sit in the equivalent of a calcified box with a gated opening from which a feeding structure is protruded to capture small plankton; food is carried to the mouth with cilial hairs and then sucked into the stomach for digestion. Sea slugs and sea spiders are their usual predators.

References: 1: Antarctic Cheilostomatous Bryozoa. PJ Hayward. Oxford: Oxford University Press, 1995; **2:** PJ Hayward, personal communication, 1999

cheilostomatous bryozoan *Cellarinella* sp.

This *Cellarinella* sp. bryozoan could be among six or so species [2,3].

Cellarinella bryozoans are almost exclusively found in Antarctica (fourteen of the fifteen known species) [2]. The flat branches of this cellarinellid bryozoan have strong transverse growth checks or discontinuities; these growth checks may occur at times of the year when food supply is lowest [1].

A closer view of *Cellarinella* sp. bryozoan.

A short distance between two cellarinellid bryozoan growth checks may be due to a year in which food supply was minimal thus retarding normal growth [1]. There appears to be a delay between maximum abundance of phytoplankton in surface water (late December - January) and bryozoan growth initiation; cellarinellid bryozoans initiate growth in early winter (July) and continue growth into late winter months [1]. Antarctic *Cellarinella* species grow about ten times more slowly than temperate *Cellarinella* species and are among the slowest growing bryozoans known [4].

81% (215 of 264) of Antarctic Cheilostomatida bryozoan species are endemic to Antarctica [1]. Bryozoans are sedentary animals that form colonies of individuals (zooids) by budding. The external skeletal walls of bryozoans are made with calcium carbonate (calcareous). Cellarinellid bryozoan zooids sit in the equivalent of a calcified box with an opening from which a feeding structure is protruded to capture small plankton; food is carried to the mouth with cilial hairs and then sucked into the stomach for digestion [1]. Sea slugs and sea spiders are their usual predators.

References: 1: Bulletin of Marine Science 33(3):688-702, 1983; **2:** Antarctic Cheilostomatous Bryozoa. PJ Hayward. Oxford: Oxford University Press, 1995; **3:** PJ Hayward, personal communication, 1999; **4:** Polar Biology 30(8): 1069-1081, 2007

cheilostomatous bryozoan *Cellaria* sp.

Cellaria forms erect, tufted, dichotomous-branching colonies attached to the substrate by chitinous rhizoids [1].

Cellaria moniliorata is abundant in the Ross Sea below fifty meters depth [2].

Bryozoans are sedentary animals that form colonies of individuals (zooids) by budding. The external skeletal walls of bryozoans are made with calcium carbonate (calcareous). Bryozoan zooids sit in the equivalent of a calcified box with a gated opening from which a feeding structure is protruded to capture small plankton; food is carried to the mouth with cilial hairs and then sucked into the stomach for digestion.

Sea slugs and sea spiders are the usual predators of bryozoans.

References: 1: Antarctic Cheilostomatous Bryozoa. PJ Hayward. Oxford: Oxford University Press, 1995; **2:** Biology and Palaeobiology of Bryozoans: Proceedings of the 9th International Bryozoology Conference, School of Biological Sciences, University of Wales, Swansea, 1992. PJ Hayward, JS Ryland and PD Taylor, eds. Fredensborg, Sweden: Olsen & Olsen, 1994. pp. 205-210

cheilostomatous bryozoan, possibly *Celleporella hyalina* or *Hippothoa divaricata*

Celleporella sp. is shown in close-up on the leg of a sea spider.

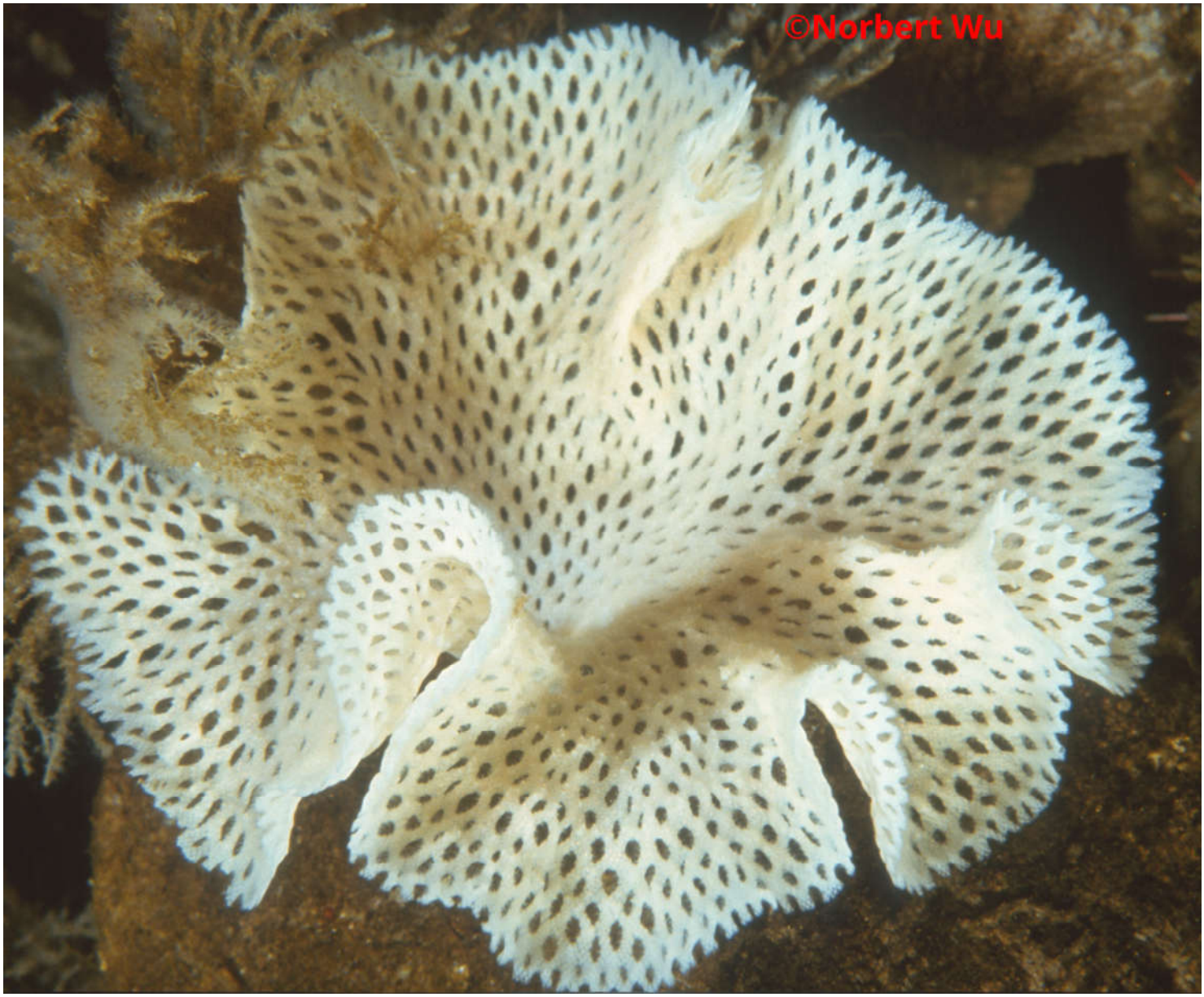
This could be *Celleporella hyalina* (a cosmopolitan species) or *Hippothoa divaricata* [1].

Bryozoans are sedentary animals that form colonies of individuals (zooids) by budding. The external skeletal walls of bryozoans are made with calcium carbonate (calcareous). Bryozoan zooids sit in the equivalent of a calcified box with a gated opening from which a feeding structure is protruded to capture small plankton; food is carried to the mouth with cilial hairs and then sucked into the stomach for digestion.

Sea slugs and sea spiders are the usual predators of bryozoans. Here's a twist… bryozoans living on sea spider legs.

References: 1: John C Ljubenkov, personal communication, 2004. Said *Celleporella hyalina* (a cosmopolitan species) or *Celleporella divaricata*

cheilostomatous bryozoan *Reteporella* sp.



Reteporella spp. are abundant in the Ross Sea in shallow and deeper water [3]. Species is not discernible at this magnification [1,2].

Reteporella bryozoans have erect netted colonies with their branches fusing at regular intervals leaving elongated spaces between [1]. *Reteporella* colonies can be like a tree, a netted cup, or folded sheets [1].

A closer view of *Reteporella* sp. bryozoan.

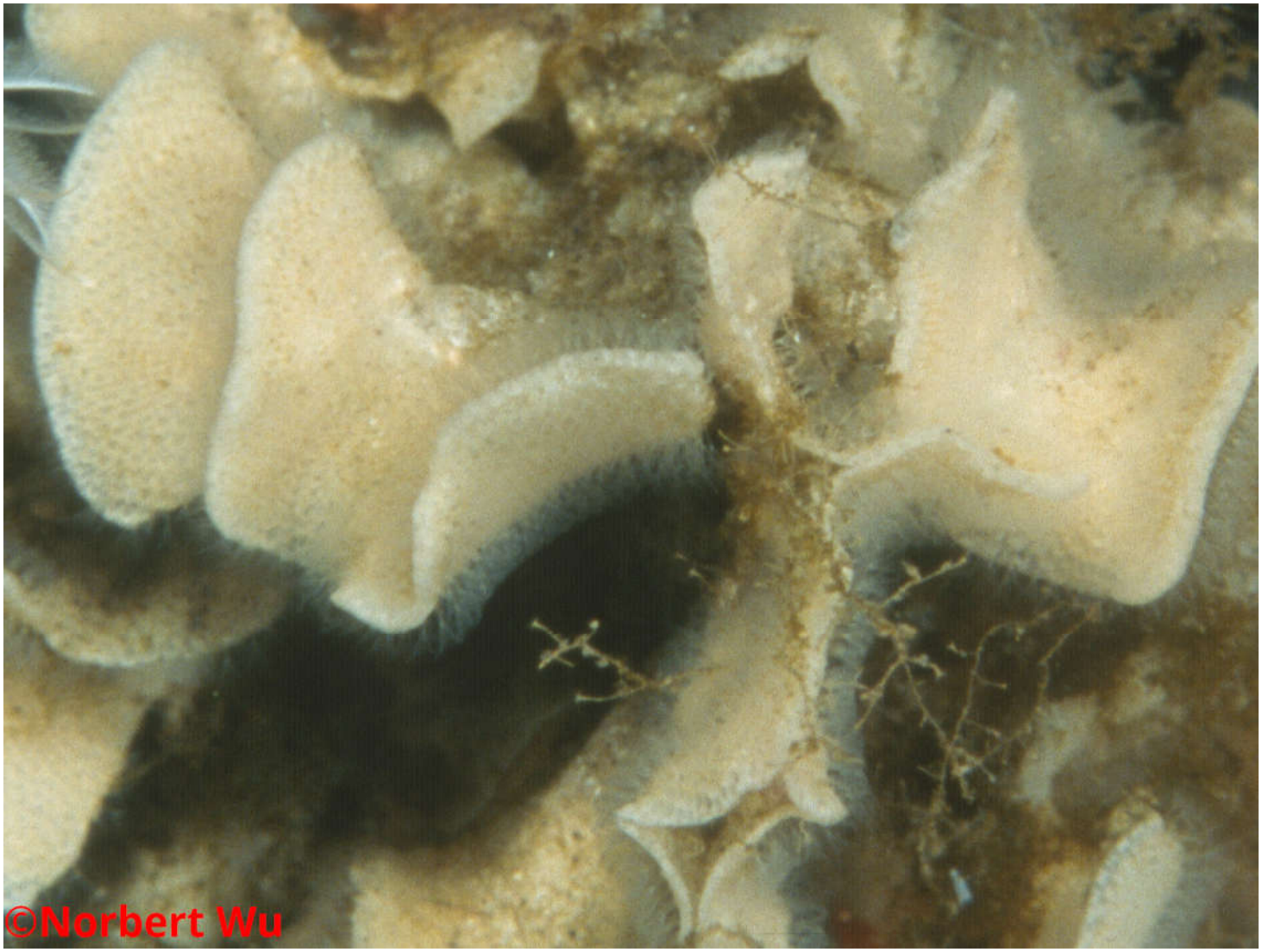
81% (215 of 264) of Antarctic Cheilostomatida bryozoan species are endemic to Antarctica [1]. Bryozoans are sedentary animals that form colonies of individuals (zooids) by budding. The external skeletal walls of bryozoans are made with calcium carbonate (calcareous). Bryozoan zooids sit in the equivalent of a calcified box with a gated opening from which a feeding structure is protruded to capture small plankton; food is carried to the mouth with cilial hairs and then sucked into the stomach for digestion. Sea slugs and sea spiders are the usual predators of bryozoans.

Taxonomic Note: Genus changed to *Reteporella* from *Sertella*; it was *Retepora* before that [1]. *Retepora* may be misspelled *Terepora* in some older ecological articles.

References: 1: Antarctic Cheilostomatous Bryozoa. PJ Hayward. Oxford: Oxford University Press, 1995; **2:** PJ Hayward, personal communication, 1999; **3:** Biology and Palaeobiology of Bryozoans: Proceedings of the 9th International Bryozoology Conference, School of Biological Sciences, University of Wales, Swansea, 1992. PJ Hayward, JS Ryland and PD Taylor, eds. Fredensborg, Sweden: Olsen & Olsen, 1994. pp. 205-210

cheilostomatous bryozoan

About ten genera of Antarctic cheilostomatous bryozoans have this growth form [1,2].

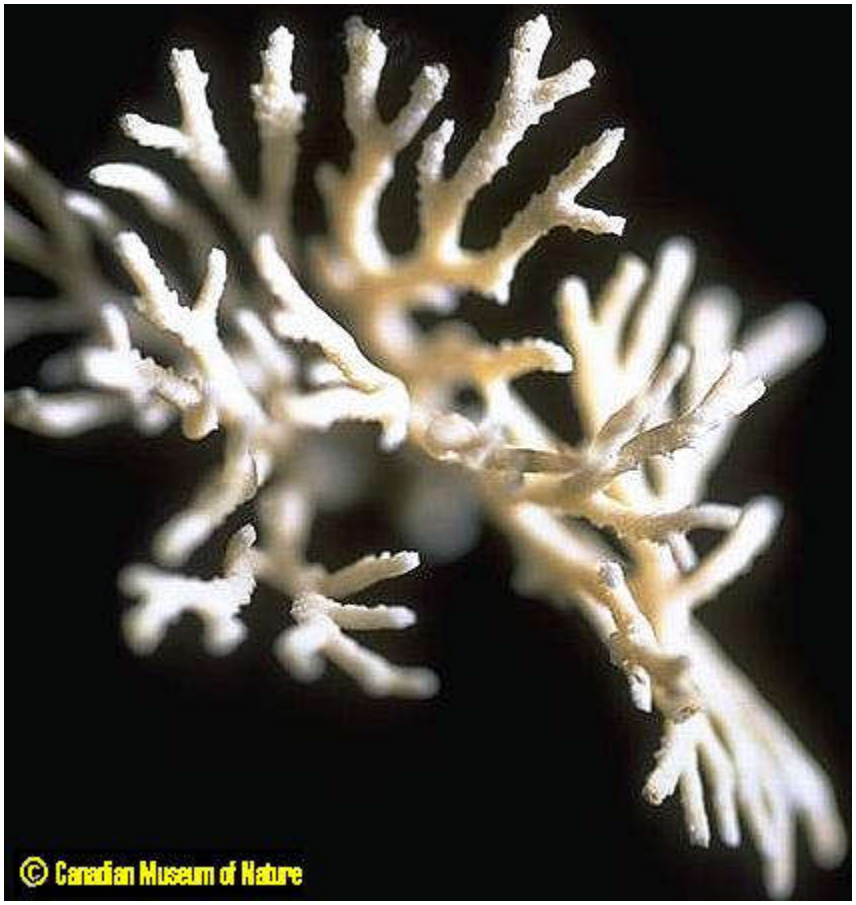


A closer view of this cheilostomatous bryozoan.

Bryozoans are sedentary animals that form colonies of individuals (zooids) by budding. The external skeletal walls of bryozoans are made with calcium carbonate (calcareous). Bryozoan zooids sit in the equivalent of a calcified box with a gated opening from which a feeding structure is protruded to capture small plankton; food is carried to the mouth with cilial hairs and then sucked into the stomach for digestion. Sea slugs and sea spiders are the usual predators of bryozoans.

References: 1: Antarctic Cheilostomatous Bryozoa. PJ Hayward. Oxford: Oxford University Press, 1995; **2:** PJ Hayward, personal communication, 1999

cyclostomate bryozoan *Hornera* sp.



Antarctic species of *Hornera* are found throughout Antarctica, Antarctic Peninsula, subantarctic islands, Tierra del Fuego, and Auckland Islands [1].

Bryozoans are sedentary animals that form colonies of individuals (zooids) by budding. The external skeletal walls of bryozoans are made with calcium carbonate (calcareous). Bryozoan zooids sit in the equivalent of a calcified box with a gated opening from which a feeding structure is protruded to capture small plankton; food is carried to the mouth with cilial hairs and then sucked into the stomach for digestion.

Sea slugs and sea spiders are the usual predators of bryozoans.

Hornera is a cyclostomate bryozoan. Cyclostomates are roughly 30% of the Ross Sea bryozoans shallower than fifty meters and 12% deeper than fifty meters [2]. Compared to cyclostomates, cheilostomate bryozoans are much more numerous in Antarctica where they comprise 85% of bryozoan taxa [2].

References: 1: Biological Reports of the Soviet Antarctic Expedition, 1955-1958. Volume 4. (Rezultaty Biologicheskikh Issledovanii Sovetskoi Antarkticheskoi Ekspeditsii, 1955-1958) Chief editor: EP Pavlovskii. Edited by AP Andriyashev and PV Ushakov. Jerusalem, Israel : Program for Scientific Translations, 1970. pp. 33-83; **2:** Biology and Palaeobiology of Bryozoans: Proceedings of the 9th International Bryozoology Conference, School of Biological Sciences, University of Wales, Swansea, 1992. PJ Hayward, JS Ryland and PD Taylor, eds. Fredensborg, Sweden: Olsen & Olsen, 1994. pp. 205-210

brachiopod *Liothyrella uva*

Liothyrella uva is found in Antarctica and the Antarctic Peninsula, subantarctic islands, and southernmost South America, from 15 to 860+ meters depth [1,3,7,8]. *L. uva* shell length is up to two centimeters [1].

Liothyrella uva is benthic, attached by a pedicle, and filters out phytoplankton for food [2]. *L. uva* has been found attached to stylasterine corals, principally *Errina*, and less often to stony bryozoans [1]. Females brood their larvae [2].

The muricid gastropod *Trophonella longstaffi* is a predator of *Liothyrella uva* [5]. *L. uva* appears to be chemically defended from many predators, in addition to having calcareous spicules in its tissues, and being enclosed by a shell [4]. *Liothyrella uva* has growth lines implying lifespans of decades [4]. Brachiopods are also called lamp shells because they resemble early Roman oil lamps. Brachiopods occur in all oceans and, though no longer numerous, were once one of the most abundant forms of life.

Taxonomic Note: *Liothyrella uva* has synonymized subspecies [1,6,8].

References: 1: Recent Antarctic and Subantarctic Brachiopods. MW Foster. Antarctic Research Series Volume 21. Washington: American Geophysical Union, 1974; **2:** Marine Biology 132(1):153-162, 1998; **3:** Jim Mastro, personal communication, 1999 (dive from 15-27 meters at McMurdo Station salt water intake jetty); **4:** Journal of Experimental Marine Biology and Ecology 169(1):103-116, 1993; **5:** Polar Biology 26(3):208-217, 2003; **6:** World Brachiopoda database. Accessed through: World Register of Marine Species at http://www.marinespecies.org/aphia.php?p=taxdetails&id=231830 on 2021-11-07; **7:** Marine Biodiversity 49(4): 1667-1681, 2019; **8:** Journal of Paleontology 63(3):268-301, 1989

arrow worm *Pseudosagitta gazellae*

Arrow worms are predatory marine worms that are planktonic except for one genus [1,3]. The arrow worms in these photos were about ten centimeters long [2]. This ten centimeter length and location in McMurdo Sound south of the Antarctic Convergence, indicates they are *Pseudosagitta gazellae*, which has lengths up to 10.5 centimeters in Antarctic waters [3,6].

Pseudosagitta gazellae is found in Antarctic and subantarctic waters, southeastern Australia, Tasmania, and New Zealand [6]. Here's a line drawing of *P. gazellae* [6].

Chaetognaths swim/glide and float, with their fins being flotation devices, not propulsion; when the worm sinks, longitudinal muscles contract rapidly, and the worm darts forward [3]. Copepods are the main prey of chaetognaths [4].

Taxonomic Note: Genus was changed to *Pseudosagitta* from *Sagitta* [5].

References: 1: Antarctic Chaetognatha: United States Antarctic Research Program Eltanin cruises 10–23, 25, and 27, Paper 2. Biology of the Antarctic Seas XIV. Antarctic Research Series 39(2):69-204, 2013; **2:** McMurdo Oceanographic Observatory on Twitter @MOOAntarctica 19 July 2018; **3:** A guide to the chaetognaths of the Southern Ocean and adjacent waters. David O'Sullivan. ANARE Research Notes 2. Australia Department of Science and Technology, Antarctic Division, Information Services Division. 1984; **4:** Polish Polar Research 37(2):303-324, 2016; **5:** R. Bieri. Systematics of the Chaetognatha. IN: The Biology of Chaetognaths. Edited by: Bone Q, Kapp H, Pierrot-Bults AC. 1991, Oxford University Press, Oxford, pp122-136; **6:** Marine Fauna of New Zealand: Chaetognatha (Arrow Worms). Sigrid Lutschinger. New Zealand Oceanographic Institute Memoir 101, 1993

archiannelid polychaete *Protodriloides symbioticus*

Protodriloides symbioticus occurs in McMurdo Sound and the North Sea [1,2].

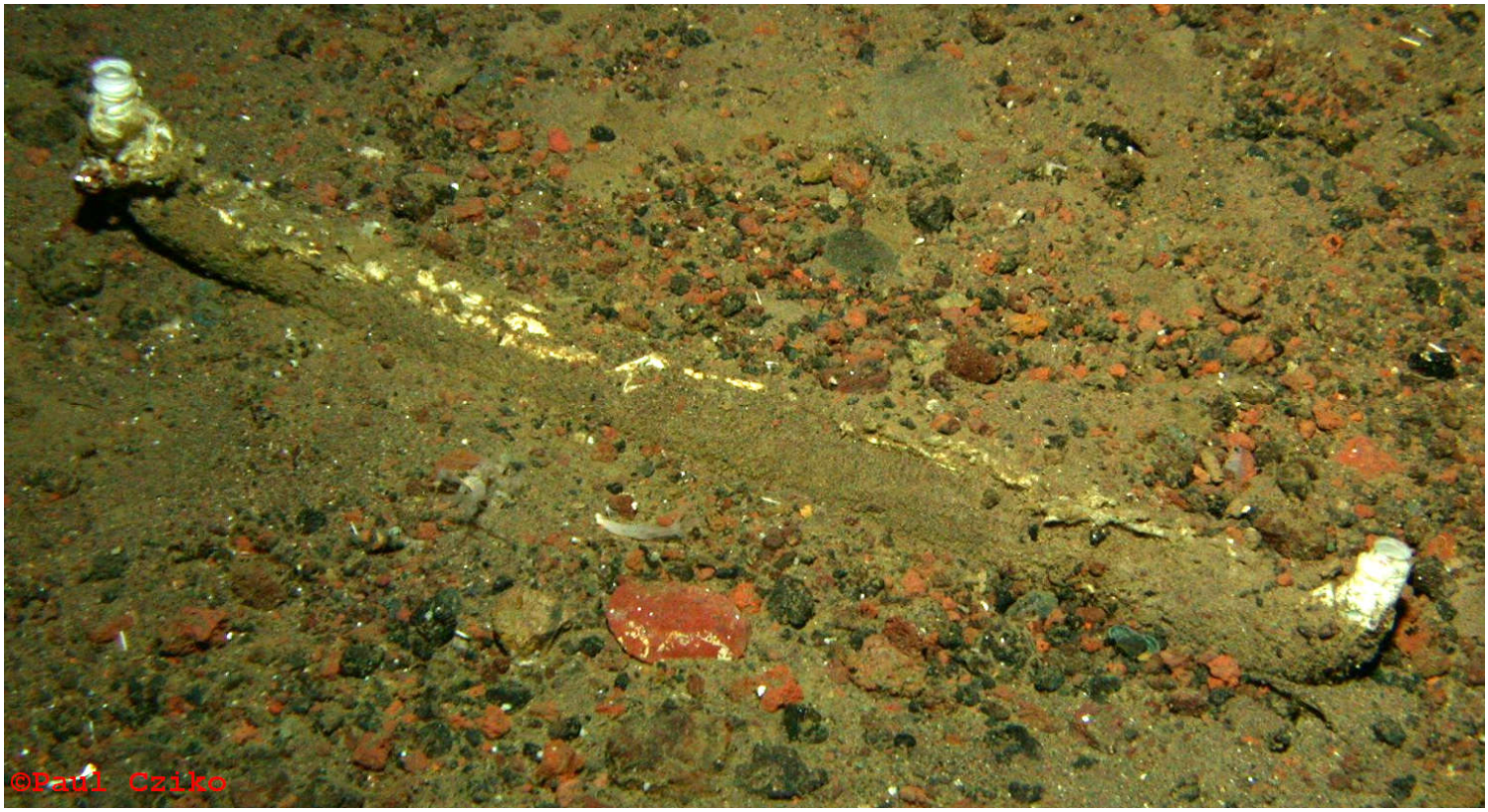
References: 1: Marine Pollution Bulletin 49(1-2):43-60, 2004; **2:** Marine Biology 63(3):257-267, 1981

capitellid polychaete *Capitella perarmata*

Capitella perarmata occurs in McMurdo Sound and in the Antarctic Peninsula, South Georgia Islands, Kerguelen Islands, and southern Australia [1,2].

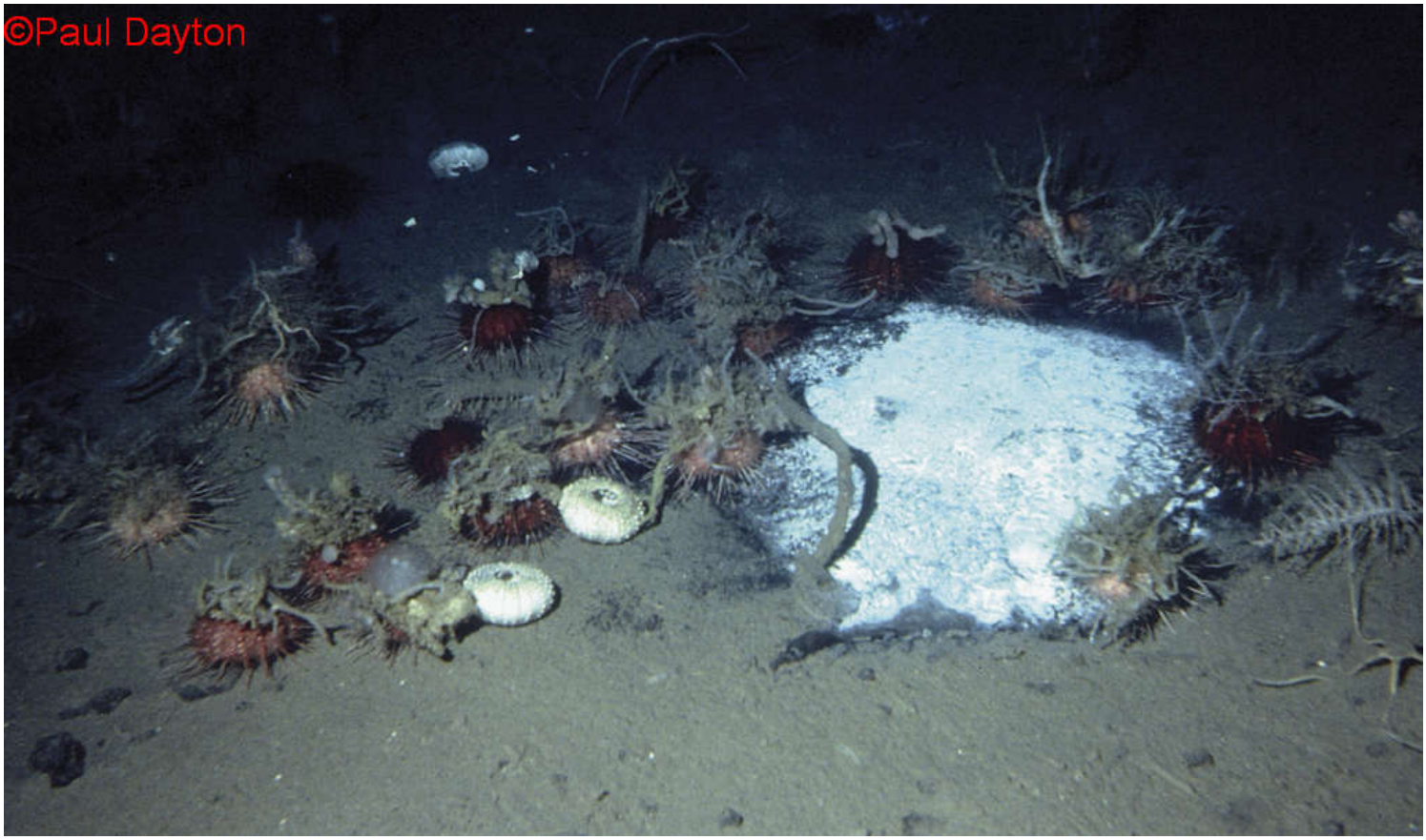
References: 1: Journal of Zoology 180:195-209, 1976; **2:** Marine Pollution Bulletin 49(1-2):43-60, 2004

chaetopterid polychaete *Chaetopterus variopedatus*



Chaetopterus variopedatus occurs worldwide, and in Antarctica has been found in the Weddell Sea, Antarctic Peninsula, Strait of Magellan, Cape Horn, Falkland Islands, Bouvet Island, and Kerguelen Islands from 1 to 585 meters depth [1,2].

Chaetopterus variopedatus can be found solitary or in prairies of many of them, in sand, in cracks between rocks, or stuck to rocky bottoms [4].

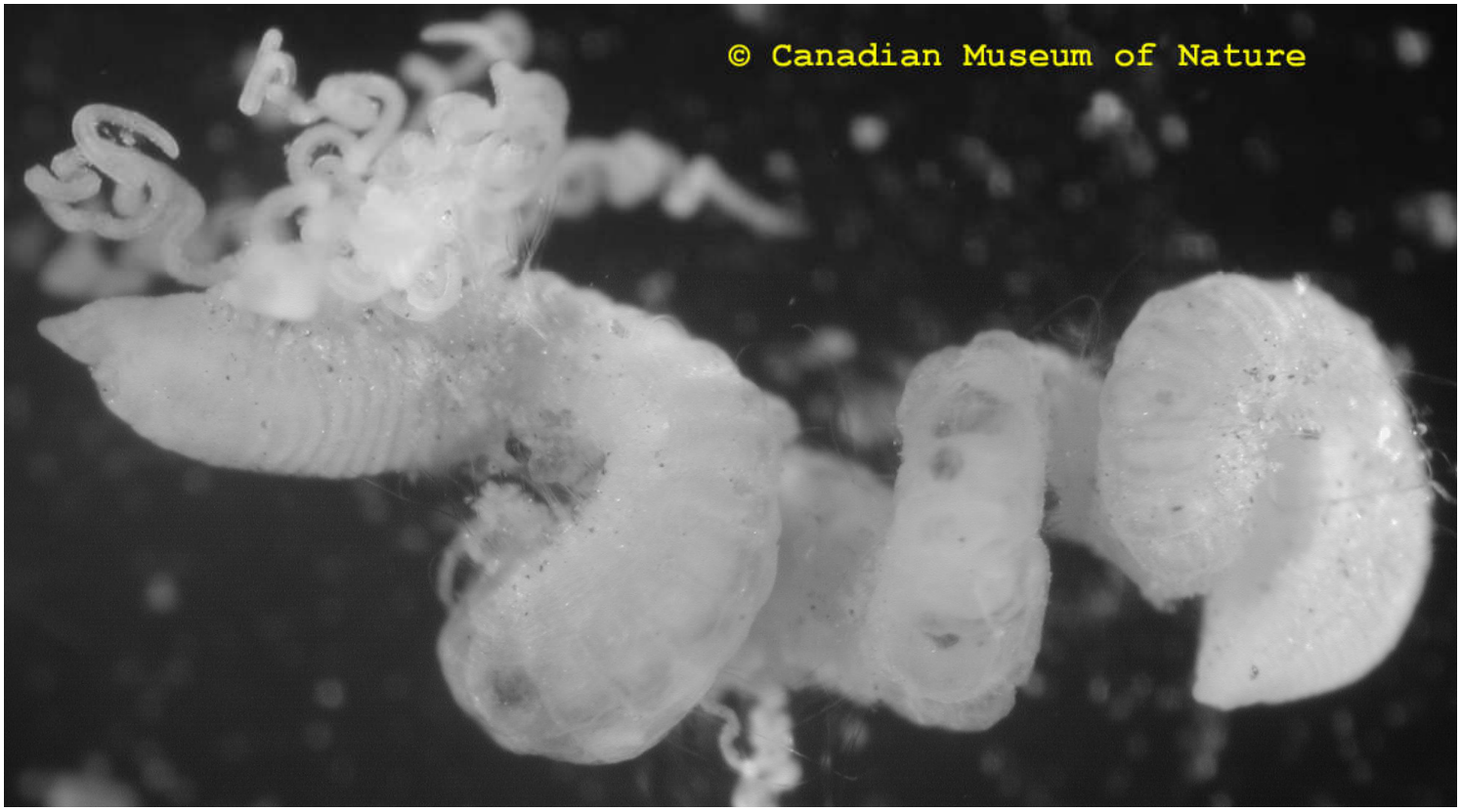


Chaetopterus variopedatus has been observed to be mobile; there were several unburied worms located almost two meters away from an algal mat at Salmon Bay which was a study subject with repeated visits [5,6]. The algal mats at Salmon Bay had developed a layer of sulphate-reducing bacteria covered by *Beggiatoa*/*Thioploca*-like bacteria, and a *Chaetopterus* worm (the brown tube between 7 o'clock and 10 o'clock positions on the white algal mat) apparently moved to this particular algal mat between visits, where it is apparently feeding on the bacteria in the water above the mat [5,6].

Chaetopterid polychaetes are called parchment worms and live inside a parchment-like tube they construct. The *Chaetopterus variopedatus* worm is up to 25 centimeters long [2]. The worm's three disk-shaped parapods near its mid-section beat in a coordinated motion, pumping water through the tube [3]. The worm continuously secretes a mucus film, rolling it into a deep mesh-like bag through which the pumped water passes on its way through the tube [3]. Particles suspended in the water are retained by the mucus and end up in a spherical mucus pellet in the mucus bag [3]. When this food ball is large enough, the worm stops pumping water and secreting mucus, and transports the food ball along a dorsal groove using cilia to its mouth for consumption [3].

References: 1: Polychaeta Myzostomidae and Sedentaria of Antarctica. O Hartman. Washington D.C.: American Geophysical Union, National Academy of Sciences, National Research Council, 1966; **2:** Polar Invertebrate Catalog, US National Museum, Smithsonian Institution; **3:** Marine Biology 72(1):27-33, 1982; **4:** Marine Benthic Fauna of Chilean Patagonia. V Haussermann, G Forsterra. Puerto Montt, Chile: Nature in Focus, 2009. p. 551; **5:** Antarctic Science 31(1):13-15, 2019, see page 3, figure 3; **6:** Paul Dayton, personal communication, 2019

cirratulid polychaete *Aphelochaeta* sp.



Aphelochaeta sp. occurs in McMurdo Sound [1].

References: 1: Marine Pollution Bulletin 49(1-2):43-60, 2004

flabelligerid polychaete *Flabegraviera mundata*

Flabegraviera mundata occurs throughout Antarctica and the Antarctic Peninsula, South Georgia Island, Shag Rock, Bouvet Island, Falkland Islands, and New Zealand in depths from 6 to 850 meters [1,6,8,9,10,11].

Flabegraviera mundata can be up to ten centimeters long with a width of three centimeters [1,4,6].

Antarctic polychaetes have a much higher percentage of unique species than polychaete faunas in other parts of the world [3].

Flabegraviera mundata is light yellow to transparent and is covered with a thick, gelatinous semi-opaque sheath [1,6]. *F. mundata* is an example of gigantism in the Antarctic fauna [2].

Here is the mouth of *Flabegraviera mundata*.

Flabelligerid polychaetes are surface deposit feeders, collecting food particles with their palps [7].

Here are the remains of *Flabegraviera mundata* on the sea urchin *Sterechinus neumayeri*. The giant Antarctic isopod *Glyptonotus antarcticus* is a predator of *F. mundata*, eating out the insides and leaving an empty body shell as shown here [5].

Taxonomic Note: Genus changed from *Flabelligera* to *Flabegraviera* [9]. *Flabegraviera mundata* closely resembles *F. profunda*, but differs in neurohooks, and the tunic of *Flabegraviera mundata* being mostly without sediment particles, whereas the tunic of *F. profunda* is coated with fine sediment particles [9]. *Flabegraviera profunda* is a deep-water species whereas *F. mundata* is found in shallower water on rocky or mixed bottoms [9].

References: 1: Polychaeta Myzostomidae and Sedentaria of Antarctica. O Hartman. Antarctic Research Series Volume 7. Washington DC: American Geophysical Union of the National Academy of Sciences - National Research Council, 1966; **2:** Advances in Marine Biology 10:1-216, 1972; **3:** Adaptations within Antarctic Ecosystems, Proceedings of the Third SCAR Symposium on Antarctic Biology. GA Llano, ed. Washington, DC: Smithsonian Institution, 1977. pp.1111-1127; **4:** Biology of the Antarctic Seas 6(4):125-223, 1978. Antarctic Research Series Volume 26; **5:** Peter Brueggeman, personal communication (observed *Glyptonotus antarcticus* eating *F. mundata*, leaving an empty sheath), 1999; **6:** Marine Fauna of the Ross Sea: Polychaeta. GA Knox & DB Cameron. NIWA Biodiversity Memoir 108. Wellington, New Zealand: National Institute of Water and Atmospheric Research, 1998; **7:** Marine Invertebrates of Southern Australia, Part 1. SA Shepherd & IM Thomas. Adelaide, South Australia: DJ Woolman Government Printer, 1982; **8:** Tethys 6(3):631-653, 1974; **9:** Zootaxa 3203:1-64, 2012; **10:** Zootaxa 4221(4):477-485, 2017; **11:** Frontiers in Marine Science 7:595303, 2021

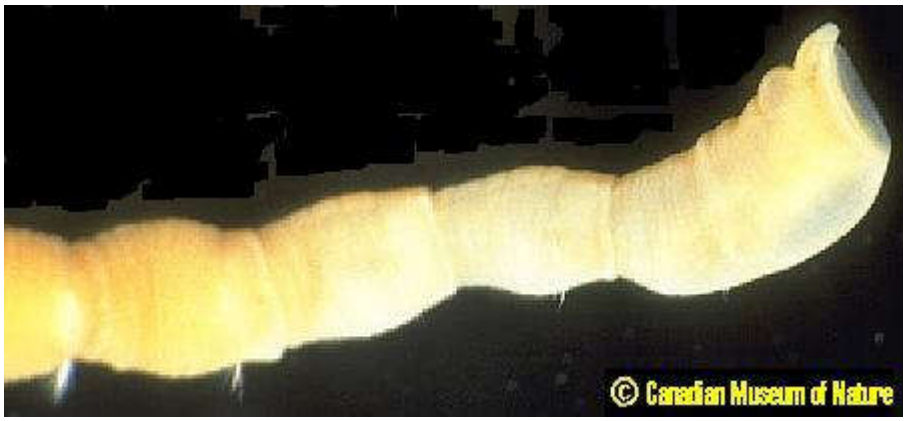
hesionid polychaete *Psamathe fauveli*

Psamathe fauveli is found in Antarctica and the Antarctic Peninsula at depths from 6 to 1,040 meters [1,3,4,7]. *P. fauveli* is abundant on hard bottoms in Terra Nova Bay, particularly from 12-16 meters depth, in association mainly with the algae *Phyllophora antarctica* [6]. Hesionid polychaetes are active worms; many are carnivorous [5].

Taxonomic Note: Sometimes reported as *Kefersteinia fauveli* [4,7]. The relationship between the genera *Kefersteinia* and *Psamathe* is confused; the genus *Kefersteinia* is synonymous with *Psamathe*, with *Psamathe* being older and available [2].

References: 1: Polychaeta Errantia of Antarctica. O Hartman. Antarctic Research Series Volume 3. Washington DC: American Geophysical Union, 1964; **2:** Zoologica Scripta 27(2):89-163, 1998; **3:** Polychaeta from the Weddell Sea Quadrant, Antarctica. O Hartman. Washington DC: American Geophysical Union, 1978. Biology of the Antarctic Seas 6, Paper 4. Antarctic Research Series volume 26, number 4; **4:** Ross Sea Ecology: Italiantartide Expeditions (1987-1995). FM Faranda, L Guglielmo, A Ianora, eds. Berlin: Springer, 2000. pp. 530-538; **5:** Marine Invertebrates of Southern Australia, Part 1. SA Shepherd & IM Thomas. Adelaide, South Australia: DJ Woolman Government Printer, 1982; **6:** Ross Sea Ecology: Italiantartide Expeditions (1987-1995). FM Faranda, L Guglielmo, A Ianora, eds. Berlin: Springer, 2000. pp. 551-561; **7:** Tethys 6(3):631-653, 1974

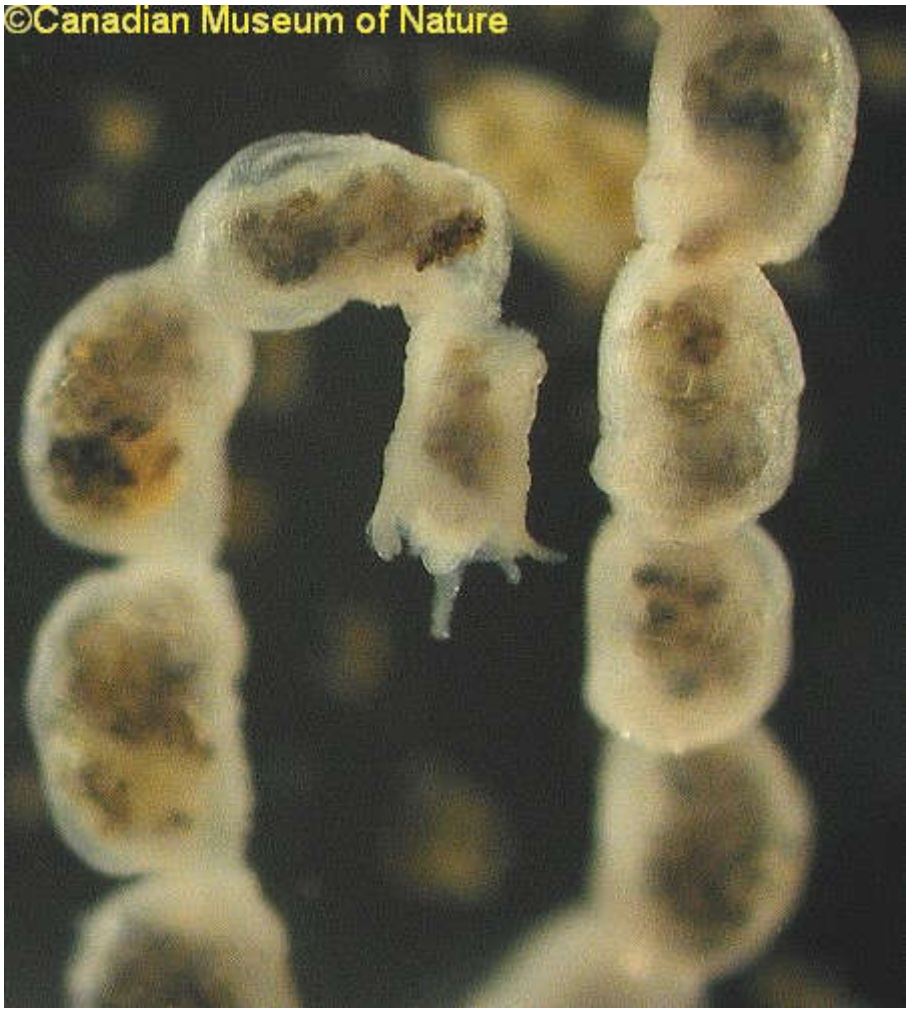
maldanid polychaete *Axiothella antarctica*



Axiothella antarctica is found in Antarctica, Peter I Island and South Orkney Islands at depths from 18 to 344 meters [1,3,4,5].

Axiothella antarctica has an oblique head plate with a continuous edge (shown here) [6].

Axiothella sp. is a deposit feeder and can be found in the McMurdo jetty soft-bottom community, living head-down in a tube buried in the sediment [8]. A study examined the gut contents of *Axiothella* sp. and found diatoms, sediment, and amorphous material [8].



Here is the tail end of *Axiothella antarctica*.

Maldanid polychaetes incubate their eggs in mucus cocoons attached to the entrance of their burrows [7].

Antarctic polychaetes have a much higher percentage of unique species than polychaete faunas in other parts of the world [2].

References: 1: Polychaeta Myzostomidae and Sedentaria of Antarctica. O Hartman. Antarctic Research Series Volume 7. Washington DC : American Geophysical Union of the National Academy of Sciences - National Research Council, 1966; **2:** Adaptations within Antarctic Ecosystems, Proceedings of the Third SCAR Symposium on Antarctic Biology. GA Llano, ed. Washington, DC: Smithsonian Institution, 1977. pp.1111-1127; **3:** Kathleen Conlan, personal communication, 2000; **4:** Polar Biology 17(3):199-210, 1997; **5:** Proceedings of the Biological Society of Washington 102(4):866-871, 1989; **6:** Discovery Reports 2:1-222, 1930; **7:** Marine Invertebrates of Southern Australia, Part 1. SA Shepherd & IM Thomas. Adelaide, South Australia: DJ Woolman Government Printer, 1982; **8:** Ophelia 24(3):155-175, 1985

nephtyid polychaete *Aglaophamus trissophyllus*

Aglaophamus trissophyllus is found in Antarctica and the Antarctic Peninsula, South Shetland Islands, South Sandwich Islands, South Georgia Island, Falkland Islands, Kerguelen Island, and Patagonian Chile from 6 to 1,400 meters depth [1,3,4,5,6,8,9,12]. *A. trissophyllus* is up to twenty centimeters long, up to seven millimeters wide, with up to 200 segments [1,8]. Growth of *A. trissophyllus* is very slow and longevity explains its gigantism; its life span is three to seven times longer than taxonomically related species from temperate areas [6]. *A. trissophyllus* can be flesh- colored to dark purple to nearly black, or pale with a purplish brown midventral stripe [1,8].

Aglaophamus trissophyllus digs into the substrate and is a herbivore; its gut contents have been found to be plant debris and diatoms [6]. *A. trissophyllus* has been found in the stomach contents of the fish *Trematomus pennellii* and *Trematomus bernacchii* [10,11].

Nephtyid polychaetes dig with their pharynx and are commonly found in muddy sand, although some species live in clean sand; they are carnivores or selective omnivores [7]. Antarctic polychaetes have a much higher percentage of unique species than polychaete faunas in other parts of the world [2].

Taxonomic Note: *Aglaophamus ornatus* is a synonym for *Aglaophamus trissophyllus* [8].

References: 1: Polychaetous Annelids Collected by the USNS Eltanin and Staten Island Cruises, Chiefly from Antarctic Seas. O Hartman. Allan Hancock Monographs in Marine Biology Number 2. Los Angeles: Allan Hancock Foundation, University of Southern California, 1967; **2:** Adaptations within Antarctic Ecosystems, Proceedings of the Third SCAR Symposium on Antarctic Biology. GA Llano, ed. Washington, DC : Smithsonian Institution, 1977. pp.1111-1127; **3:** Peter Brueggeman, personal communication (collected by divers at Cape Armitage), 2000; **4:** United States National Museum Polar Invertebrate Catalog at www.nmnh.si.edu/iz/usap/usapdb.html; **5:** Antarctic Science 5(2):161-167, 1993; **6:** Le Benthos du Plateau Continental des Iles Kerguelen, Resultats Scientifiques de la Campagne MD04/Benthos du "Marion Dufresne" et des Prospections de 1972 a 1975 de "La Japonaise". A Guille & J Soyer, eds. Comite National Francais des Recherches Antarctiques, CNFRA. Number 42, 1977. pp.135-172; **7:** Marine Invertebrates of Southern Australia, Part 1. SA Shepherd & IM Thomas. Adelaide, South Australia: DJ Woolman Government Printer, 1982; **8:** Marine Fauna of the Ross Sea: Polychaeta. GA Knox & DB Cameron. Wellington: National Institute of Water and Atmospheric Research, 1998. NIWA Biodiversity Memoir 108; **9:** Tethys 6(3):631-653, 1974; **10:** Ross Sea Ecology: Italiantartide Expeditions (1987-1995). FM Faranda, L Guglielmo, A Ianora, eds. Berlin: Springer, 2000. pp. 457-468; **11:** Polar Biology 27(11):721-728, 2004; **12:** Anales Instituto Patagonia 45(2):51-91, 2017

sand worm or opheliid polychaete *Ophelina breviata*

Ophelina breviata is found in Antarctica and the Antarctic Peninsula, Peter I Island, South Orkney Islands, and South Georgia Island from 20 to 1,079 meters depth [1,4,7]. *O. breviata* is up to 3.4 centimeters long, with a width up to two millimeters, and 24 to 28 segments [1].

Another view of *Ophelina breviata*.

Its predators include the fish *Trematomus bernacchii* [6].

Opheliid polychaetes may be short and grub-like, long and smooth like a nematode, or have visible parapodia and setae (lobed projections and bristles) [1,2]. Opheliid polychaetes live in soft substrates and are deposit feeders [5].

Antarctic polychaetes have a much higher percentage of unique species than polychaete faunas in other parts of the world [3].

Taxonomic Note: An older name is *Ammotrypane breviata* [1].

References: 1: Polychaeta Myzostomidae and Sedentaria of Antarctica. O Hartman. Antarctic Research Series Volume 7. Washington DC: American Geophysical Union of the National Academy of Sciences - National Research Council, 1966; **2:** Biology of the Antarctic Seas 6(4):125-223, 1978. Antarctic Research Series Volume 26; **3:** Adaptations within Antarctic Ecosystems, Proceedings of the Third SCAR Symposium on Antarctic Biology. GA Llano, ed. Washington, DC: Smithsonian Institution, 1977. pp.1111-1127; **4:** United States National Museum Polar Invertebrate Catalog at http://www.nmnh.si.edu/iz/usap/usapdb.html; **5:** Marine Invertebrates of Southern Australia, Part 1. SA Shepherd & IM Thomas. Adelaide, South Australia: DJ Woolman Government Printer, 1982; **6:** Polar Biology 13:291-296, 1993; **7:** Frontiers in Marine Science 7:595303, doi: 10.3389/fmars.2020.595303

orbiniid polychaete *Leitoscoloplos kerguelensis*

Leitoscoloplos kerguelensis is found in Antarctica and the Antarctic Peninsula, South Shetland Islands, South Orkney Islands, South Georgia Island, Falkland Islands, Marion and Prince Edward Islands, Kerguelen Islands, South America, Australia, and South Africa, from intertidal to 1,400 meters depth [1,2,3,4,5]. *L. kerguelensis* can be up to four centimeters long with a width up to 2 millimeters [1,4]. *L. kerguelensis* can be a dominant species in a soft bottom community; in the sublittoral soft bottom of Admiralty Bay in the South Shetland Islands, *L. kerguelensis* constituted 20% of all collected polychaetes [2].

Taxonomic Note: In Antarctica, *L. kerguelensis* is closely related to *L. geminus* and *L. mawsoni* and separated with difficulty [4]. Older genus is *Haploscoloplos*.

References: 1: Marine Fauna of the Ross Sea: Polychaeta. GA Knox & DB Cameron. National Institute of Water and Atmospheric Research Biodiversity Memoir 108. Wellington, New Zealand: NIWA, 1998; **2:** Polish Polar Research 21(3-4):153-169, 2000; **3:** South African Journal of Antarctic Research 24(1-2):3-52, 1994; **4:** Zootaxa 4218(1):1-145, 2017; **5:** Frontiers in Marine Science 7:595303, 2021

polynoid polychaete or scaleworm *Barrukia cristata*

Barrukia cristata is found in Antarctica and the Antarctic Peninsula, Peter I Island, South Shetland Islands, South Orkney Islands, South Sandwich Islands, and Bouvet Island from 5 to 1,120 meters depth [1,3,10]. *Barrukia cristata* is up to 6.5 centimeters long and 1.6 centimeters wide [10].

Here's the underside of *Barrukia cristata*.

Barrukia cristata has three generations per year, with germination taking place in December/January, June/July, and September/October [5]. *B. cristata* has a life span probably not more than 1.5 years [5]. *B. cristata* is well disguised in the sediment, having a body covered with scales with protuberances like sand grains and hairy setae [8]. *B. cristata* is abundant in moderately deep soft bottoms in Terra Nova Bay [9].

Barrukia cristata is an ambush predator, capturing food with an eversible armed pharynx [5,6]. *B. cristata* has been found in the stomach contents of the fish *Trematomus loennbergi*, *T. pennellii*, and *T. bernacchii* [4,7,11].

Here is a posterior view of *Barrukia cristata*, crawling under a rock.

Antarctic polychaetes have a much higher percentage of unique species than polychaete faunas in other parts of the world [2].

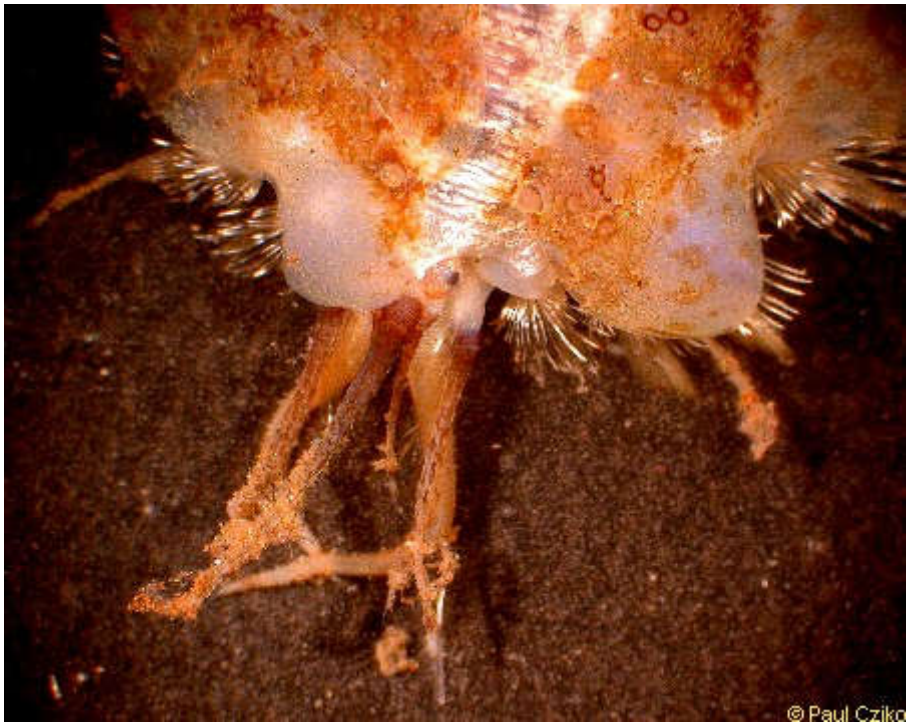
References: 1: Polychaeta Errantia of Antarctica. O Hartman. Antarctic Research Series Volume 3. Washington DC: American Geophysical Union, 1964; **2:** Adaptations within Antarctic Ecosystems, Proceedings of the Third SCAR Symposium on Antarctic Biology. GA Llano, ed. Washington, DC: Smithsonian Institution, 1977. pp.1111-1127; **3:** Polychaetous Annelids Collected by the USNS Eltanin and Staten Island Cruises, Chiefly from Antarctic Seas. O Hartman. Allan Hancock Monographs in Marine Biology Number 2. Los Angeles: Allan Hancock Foundation, 1967; **4:** Antarctic Science 6(1):61-65, 1994; **5:** Adaptations within Antarctic Ecosystems, Proceedings of the Third SCAR Symposium on Antarctic Biology. GA Llano, ed. Washington, DC: Smithsonian Institution, 1977. pp.239-251; **6:** Marine Invertebrates of Southern Australia, Part 1. SA Shepherd & IM Thomas. Adelaide, South Australia: DJ Woolman Government Printer, 1982; **7:** Polar Biology 17(1):62-68, 1997; **8:** Polar Biology 23(8):580-588, 2000; **9:** Ross Sea Ecology: Italiantartide Expeditions (1987-1995). FM Faranda, L Guglielmo, A Ianora, eds. Berlin: Springer, 2000. pp. 551-561; **10:** Marine Fauna of the Ross Sea: Polychaeta. GA Knox & DB Cameron. Wellington: National Institute of Water and Atmospheric Research, 1998. NIWA Biodiversity Memoir 108; **11:** Ross Sea Ecology: Italiantartide Expeditions (1987-1995). FM Faranda, L Guglielmo, A Ianora, eds. Berlin: Springer, 2000. pp. 457-468

polynoid polychaete or scale worm *Eulagisca corrientis*

Eulagisca corrientis has a barred dorsum flecked with brown and is 30 to 80 mm in length [2,3,4,5].

Eulagisca corrientis has been collected in the Ross Sea, Peter I Island, Heard and Kerguelen Islands, Falkland Islands, and southern South America at 93 to 2,012 meters depth [4,5].

The name "polychaete" means "many bristles." These bristles, the setae, project from side appendages on the worm called parapods. Some polychaete species like this one have leg-like parapods used in walking, with the setae assisting in locomotion.



The polychaete's head from above.

Antarctic polychaetes have a much higher percentage of unique species than polychaete faunas in other parts of the world [1].

The polychaete's head from below

References: 1: Adaptations within Antarctic Ecosystems, Proceedings of the Third SCAR Symposium on Antarctic Biology. GA Llano, ed. Washington, DC: Smithsonian Institution, 1977. pp.1111-1127; **2:** Antarctic Macrobenthos, a field guide to the invertebrates living at the Antarctic seafloor. Rauschert, Martin & Wolf Arntz. Wurster Nordseekueste, Germany: Arntz & Rauschert Selbstverlag, 2015, p.52; **3:** Polychaeta Errantia of Antarctica. Hartman, Olga. Washington DC: American Geophysical Union, 1964. p. 20; **4:** Marine Fauna of the Ross Sea, Polychaeta. GA Knox, DB Cameron. Wellington, NZ; National Institute of Water and Atmospheric Research, 1997. NIWA Biodiversity Memoir 108; **5:** Distribution and Biology of the Aphroditides and Polynoids (Polychaeta) in the eastern Weddell Sea and the Lazarev Sea (Antarctica). Stiller, Michael. Ber. Polarforsch. 185, 1996

polynoid polychaete or scale worm *Eulagisca gigantea*

Eulagisca gigantea has been collected in Antarctica, Antarctic Peninsula, Drake Passage, Bransfield Strait, South Shetland Islands, and South Orkney Islands at depths from 30 to 920 meters [1,4,5,6,8].

Eulagisca gigantea has a large flattened colorless body with traces of brown transverse bands with golden setae [8].

Eulagisca gigantea is up to 220 mm long [4,5].

Eulagisca gigantea has been seen at Turtle Rock and McMurdo Station jetty in diving depths, e.g. 20 meters [3,7].


©Rob Robbins

Taxonomic Note: Rob Robbins photos look like *Eulagisca gigantea* [2].

References: 1: Rauschert, Martin & Wolf Arntz. Antarctic Macrobenthos, a field guide to the invertebrates living at the Antarctic seafloor. Wurster Nordseekueste, Germany: Arntz & Rauschert Selbstverlag, 2015, p.52; **2:** Greg Rouse, personal communication, 2017; **3:** Rob Robbins, personal communication, 2019; **4:** Marine Fauna of the Ross Sea, Polychaeta. GA Knox, DB Cameron. Wellington, NZ; National Institute of Water and Atmospheric Research, 1997. NIWA Biodiversity Memoir 108; **5:** Distribution and Biology of the Aphroditides and Polynoids (Polychaeta) in the eastern Weddell Sea and the Lazarev Sea (Antarctica). Stiller, Michael. Ber. Polarforsch. 185, 1996; **6:** Polychaeta Errantia of Antarctica. Hartman, Olga. Washington DC: American Geophysical Union, 1964. p. 20; **7:** Rowan McLachlan, personal communication, 2023; **8:** Proceedings of the Biological Society of Washington 110(4):537-551, 1977

polynoid polychaete or scaleworm *Eulagisca puschkini*

Eulagisca puschkini was first collected in the Davis Sea on a rocky bottom at 32 meters depth, among sponges and hydroids [1]. That specimen of *Eulagisca puschkini* was 175 mm long [1]. The elytra (dorsal scales) of *Eulagisca puschkini* lack border and surface papillae and have a red-brown iridescent spot on the medial half [1].

This *Eulagisca puschkini* was photographed at Turtle Rock, with a featherduster worm tube at lower right, above the polychaete.

References: 1: Proceedings of the Biological Society of Washington 110(4):537-551, 1997.

polynoid polychaete or scaleworm *Harmothoe* sp. 3

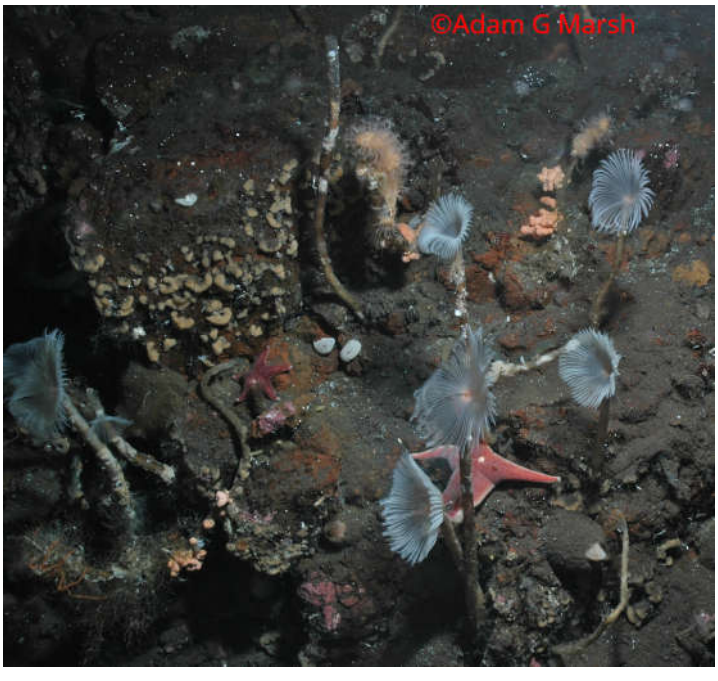
Looks like "*Harmothoe* sp. 3" in Rauschert and Arntz' Antarctic Macrobenthos [1].

References: 1: Rauschert, Martin & Wolf Arntz. Antarctic Macrobenthos, a field guide to the invertebrates living at the Antarctic seafloor. Wurster Nordseekueste, Germany: Arntz & Rauschert Selbstverlag, 2015. p.52

sabellid polychaete or featherduster worm *Perkinsiana* sp., probably *Perkinsiana magalhaensis*

Perkinsiana magalhaensis is found throughout Antarctica and the Antarctic Peninsula, the South Shetland Islands, and the Magellan Strait, from 3 to 800 meters depth [1,2,4,5,6].

P. magalhaensis is up to twenty centimeters long, reaching the largest size for the genus [1].



The tentacular crown of *Perkinsiana magalhaensis* has feathery radioles, from completely red to completely white, with some specimens having reddish or gray bands [1,6].

Using its tentacular radioles as a food-gathering net for its suspension feeding, the outspread feathery radioles are covered with hairlike cilia that carry small food particles down to the worm's central mouth.

The Ross Sea species of *Perkinsiana* live within tubes that are translucent, irregularly spiralled, and encrusted [1].

Here's a completely red color morph.

Perkinsiana magalhaensis feeds on diatoms, dinoflagellates, formaniferans, tintinnids, radiolarians, ciliates, and harpacticoid copepods [4].

Antarctic polychaetes have a much higher percentage of unique species than polychaete faunas in other parts of the world [3].

Taxonomic Note: Specimens of an earlier name *Potamilla antarctica* were sorted out into several species of *Perkinsiana* [1]. *Perkinsiana littoralis* was synonymized to *Perkinsiana magalhaensis* [6].

References: 1: Zoologica Scripta 26(3):267-278, 1997; **2:** Bulletin of Marine Science 67(1):299-309, 2000; **3:** Adaptations within Antarctic Ecosystems, Proceedings of the Third SCAR Symposium on Antarctic Biology. GA Llano, ed. Washington, DC : Smithsonian Institution, 1977. pp.1111-1127; **4:** Berichte zur Polarforschung 301: 83-94, 1999; **5:** Polar Biology 15:295-302, 1995; **6:** Zootaxa 4283(1):1-64, 2017

serpulid polychaete *Serpula narconensis*

Serpula narconensis is found throughout Antarctica, the Antarctic Peninsula and subantarctic islands, South Georgia Island, Kerguelen Islands, Heard Island, Tierra del Fuego and Argentina, from intertidal waters down to 1,599 meters [1,2].

Tubes of large *Serpula narconensis* specimens measure to 130 mm long by 8 mm wide, often tinged with yellow, sometimes with successive raised rings [1].

Serpula narconensis worm tubes are massed or solitary [1]. Reef formations of these worms have been reported at Terra Nova Bay at Antarctica's Ross Sea, Ellis Fjord at Antarctica's Vestfold Hills, and Clerke Rocks at South Georgia Island [4].

The worm's operculum is on a long peduncle that is distally funnel-like and extending beyond tips of its radioles [1].

Serpula narconensis can have a small gastropod *Capulus subcompressus* with a cap-like shell, living on its calcareous tube close to the opening of the tube [3]. The *Capulus subcompressus* gastropod uses its pseudoproboscis to steal mucous particles collected by the worm [3].

References: 1: Antarctic Invertebrates, Smithsonian National Museum of Natural History, http://invertebrates.si.edu/antiz/ ; 2: Polychaetes of the Southern Ocean http://polychaetasouthocean.lifedesks.org/pages/809 ; 3: Polar Biology 23:11-16, 2000; 4: Remote Sensing in Ecology and Conservation, July 2023 doi: 10.1002/rse2.358

spionid polychaete *Spiophanes tcherniai*

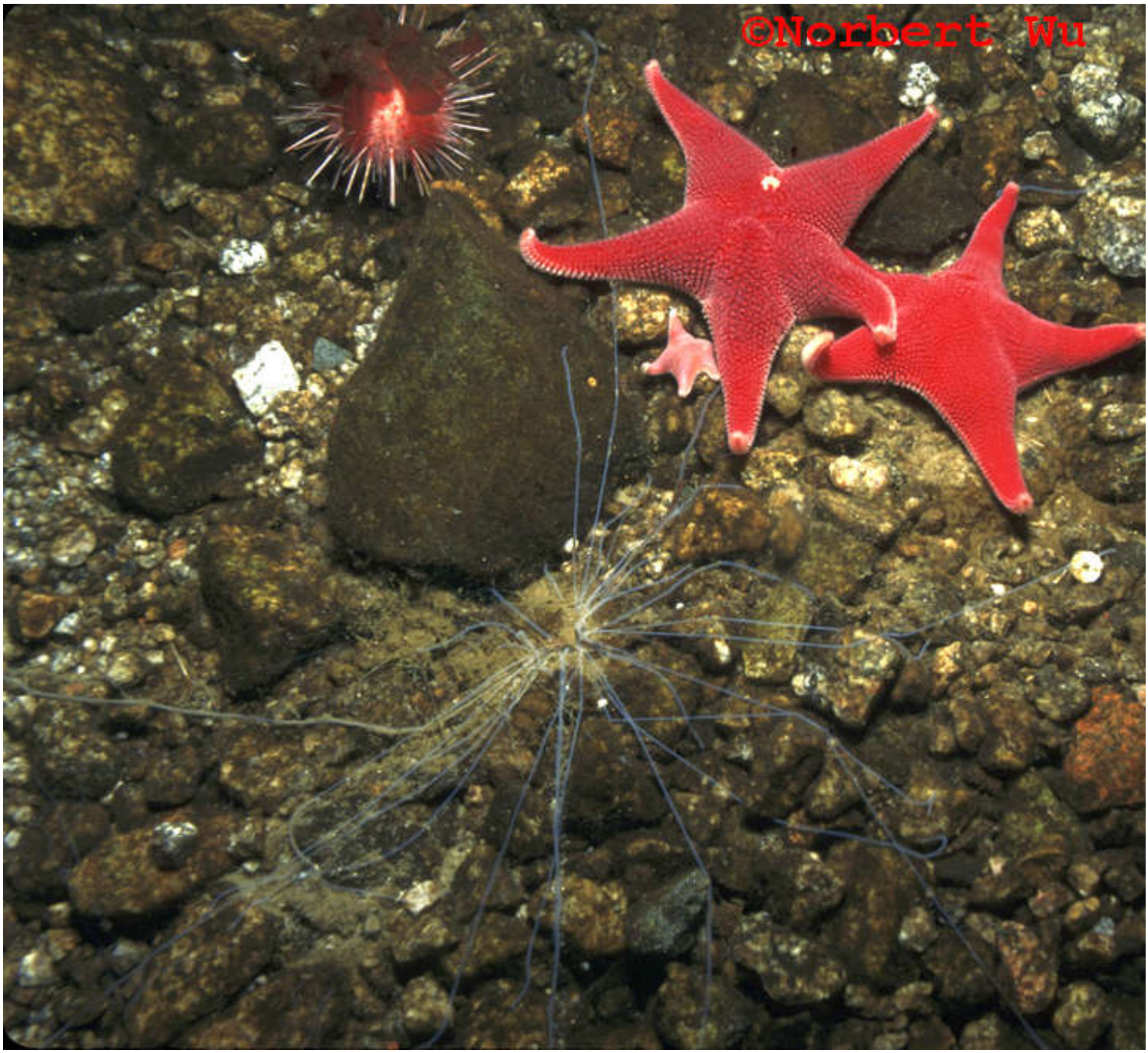
Spiophanes tcherniai is found in Antarctica and the Antarctic Peninsula, South Shetland Islands, South Orkney Islands, and Kerguelen Island from intertidal to 851 meters depth [1,2,4,5,10]. *S. tcherniai* can be up to four centimeters long with a width up to 0.7 centimeters, with the number of body segments over 90 [2,4,10]. *S. tcherniai* is a dominant species in the McMurdo jetty soft-bottom macrofaunal community, with a measured 3,584 individuals per square meter [7]. Below 100 meters in Terra Nova Bay, *S. tcherniai* is a dominant species, with a measured 3,000 individuals per square meter [8,9]. *S. tcherniai* is a suspension feeder, living in a mucus-lined tube and extending its prehensile, long palps from the tube to gather food particles [6,7]. A study examined the gut contents of *S. tcherniai* and found diatoms, amorphous organic material, and gelatinous egg masses [7]. Its predators include the anemone *Edwardsia meridionalis* and the fish *Trematomus bernacchii* and *Trematomus hansoni* [7].

Antarctic polychaetes have a much higher percentage of unique species than polychaete faunas in other parts of the world [3].

References: 1: Polychaeta Myzostomidae and Sedentaria of Antarctica. O Hartman. Antarctic Research Series Volume 7. Washington DC: American Geophysical Union of the National Academy of Sciences - National Research Council, 1966; **2:** Polychaetous Annelids Collected by the USNS Eltanin and Staten Island Cruises, Chiefly from Antarctic Seas. O Hartman. Allan Hancock Monographs in Marine Biology Number 2. Los Angeles: Allan Hancock Foundation, 1967; **3:** Adaptations within Antarctic Ecosystems, Proceedings of the Third SCAR Symposium on Antarctic Biology. GA Llano, ed. Washington, DC: Smithsonian Institution, 1977. pp.1111-1127; **4:** Marine Fauna of the Ross Sea: Polychaeta. GA Knox & DB Cameron. National Institute of Water and Atmospheric Research Biodiversity Memoir 108. Wellington, New Zealand: NIWA, 1998; **5:** United States National Museum Polar Invertebrate Catalog, www.nmnh.si.edu/iz/usap/usapdb.html **6:** Marine Invertebrates of Southern Australia, Part 1. SA Shepherd & IM Thomas. Adelaide, South Australia: DJ Woolman Government Printer, 1982; **7:** Ophelia 24(3):155-175, 1985; **8:** Scientia Marina 63(Supplement 1):113- 121, 1999; **9:** Ross Sea Ecology: Italiantartide Expeditions (1987-1995). FM Faranda, L Guglielmo, A Ianora, eds. Berlin: Springer, 2000. pp. 551-561; **10:** Marine Fauna of the Ross Sea: Polychaeta. GA Knox & DB Cameron. Wellington: National Institute of Water and Atmospheric Research, 1998. NIWA Biodiversity Memoir 108

spionid polychaete *Laonice* sp.

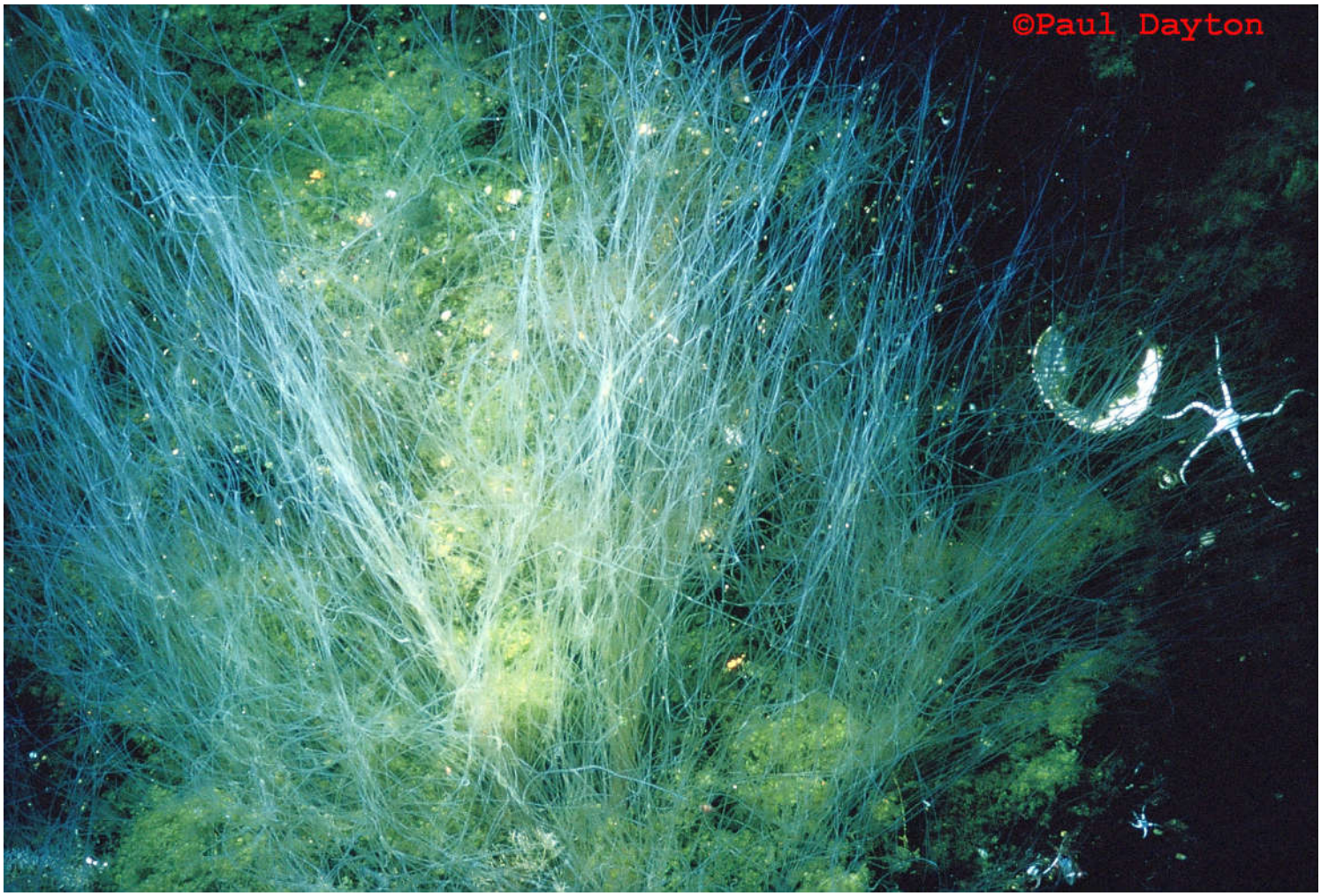
terebellid polychaete (family Terebellidae)



This terebellid polychaete burrows into the bottom and then extends long feeding tentacles from its head end to capture tiny plants and animals. Food particles are moved to the mouth by cilia on the tentacles or by shortening the tentacles.

Here is a ventral view of an exhumed Antarctic terebellid polychaete, with its feeding tentacles extended; you can see some of its characteristic polychaete spines in the middle section of its body.

Here is a dorsal view of an exhumed Antarctic terebellid polychaete, with its feeding tentacles extended; you can see its dark red dendritic gills (branchiae).



Ross Sea Terebellidae genera include *Amphitrite*, *Lanicides*, *Leaena*, *Lysilla*, *Nicolea*, *Pista*, *Polycirrus*, *Streblosoma*, *Terebella*, *Thelepus*, and *Thelepides* [3,4].

Terebellid polychaetes have been found in the stomach contents of the fish *Trematomus bernacchii* [2].

Antarctic polychaetes have a much higher percentage of unique species than polychaete faunas in other parts of the world [1].

References: 1: Adaptations within Antarctic Ecosystems: Proceedings of the Third SCAR Symposium on Antarctic Biology. George A. Llano, ed. Washington: Smithsonian Institution; Houston, Tex. : distributed by Gulf Pub. Co., 1977. pp.1111-1127; **2:** Bulletin de l'Institut Oceanographique 66(1368), 1966; **3:** Marine Fauna of the Ross Sea: Polychaeta. GA Knox & DB Cameron. NIWA Biodiversity Memoir 108. Wellington, New Zealand: National Institute of Water and Atmospheric Research, 1998; **4:** Polychaeta Myzostomidae and Sedentaria of Antarctica. O Hartman. Antarctic Research Series Volume 7. Washington DC: American Geophysical Union of the National Academy of Sciences - National Research Council, 1966

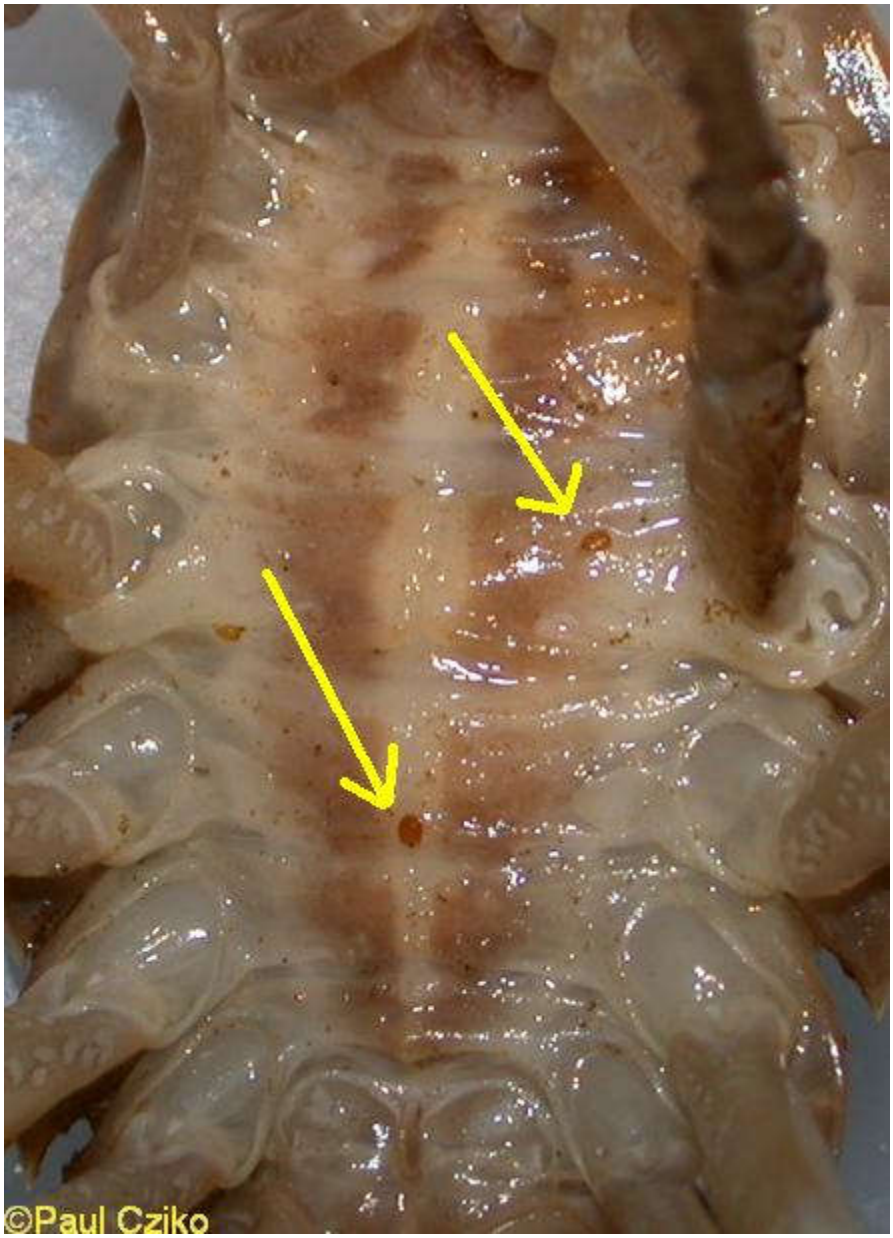
piscicolid leech

Two piscicolid leeches on *Trematomus bernacchii*, a fish which dwells on the bottom. Leeches parasitize bottom (benthic) fish or bottom feeding fish because leeches deposit their cocoons on the bottom or on animals living on the bottom [5]. Twenty-one species of fish leeches (Piscicolidae) have been recorded from Antarctic seas [5]. Piscicolid leeches are different from other leeches in that their suckers are clearly marked off from their body [5].

This leech is attached to the fish *Trematomus loennbergii* [1]. The color of this leech identifies it as a blood sucker. The most frequently found leeches on five species of Antarctic nototheniid and channichthyid fish were *Glyptonotobdella antarctica* and *Trulliobdella capitis* [2]. *Glyptonotobdella antarctica* has fourteen bands of red-brown pigment on its urosome, which is the posterior part of the leech as seen in this photo [3,5]. *Trulliobdella capitis* is smooth surfaced and yellowish-gray, and is not banded [4,5].

References: 1: Paul Cziko, personal communication, 2004; **2:** Meeresforschung 28(2-3): 146-156, 1980; **3:** Polar Biology 13(5):347-354, 1993; **4:** Proceedings of the Helminthological Society of Washington 50(1): 138-142, 1983; **5:** Antarctic Piscicolid Leeches. Andrei Y. Utevsky. Bonner Zoologische Monographien Number 54. Bonn: Zoologisches Forschungsmuseum Alexander Koenig, 2007.

piscicolid leech eggs *Glyptonotobdella antarctica*



The piscicolid leech *Glyptonotobdella antarctica* is known to move between the giant Antarctic isopod *Glyptonotus antarcticus*, *Sterechinus* sea urchins, and some species of the octopus *Pareledone*, and has been collected from the fish *Chionodraco* sp. and *Chaenocephalus aceratus* [1,2].

As shown here, egg cocoons of this leech can be found on the ventral (under) side of the giant Antarctic isopod *Glyptonotus antarcticus* [1].

A closer view of a leech egg cocoon.

Most likely the leech *Glyptonotobdella antarctica* moves between different hosts and their potential prey [1].

References: 1: Polar Biology 13(5):347-354, 1993; **2:** Antarctic Piscicolid Leeches. Andrei Y. Utevsky. Bonner Zoologische Monographien Number 54. Bonn: Zoologisches Forschungsmuseum Alexander Koenig, 2007