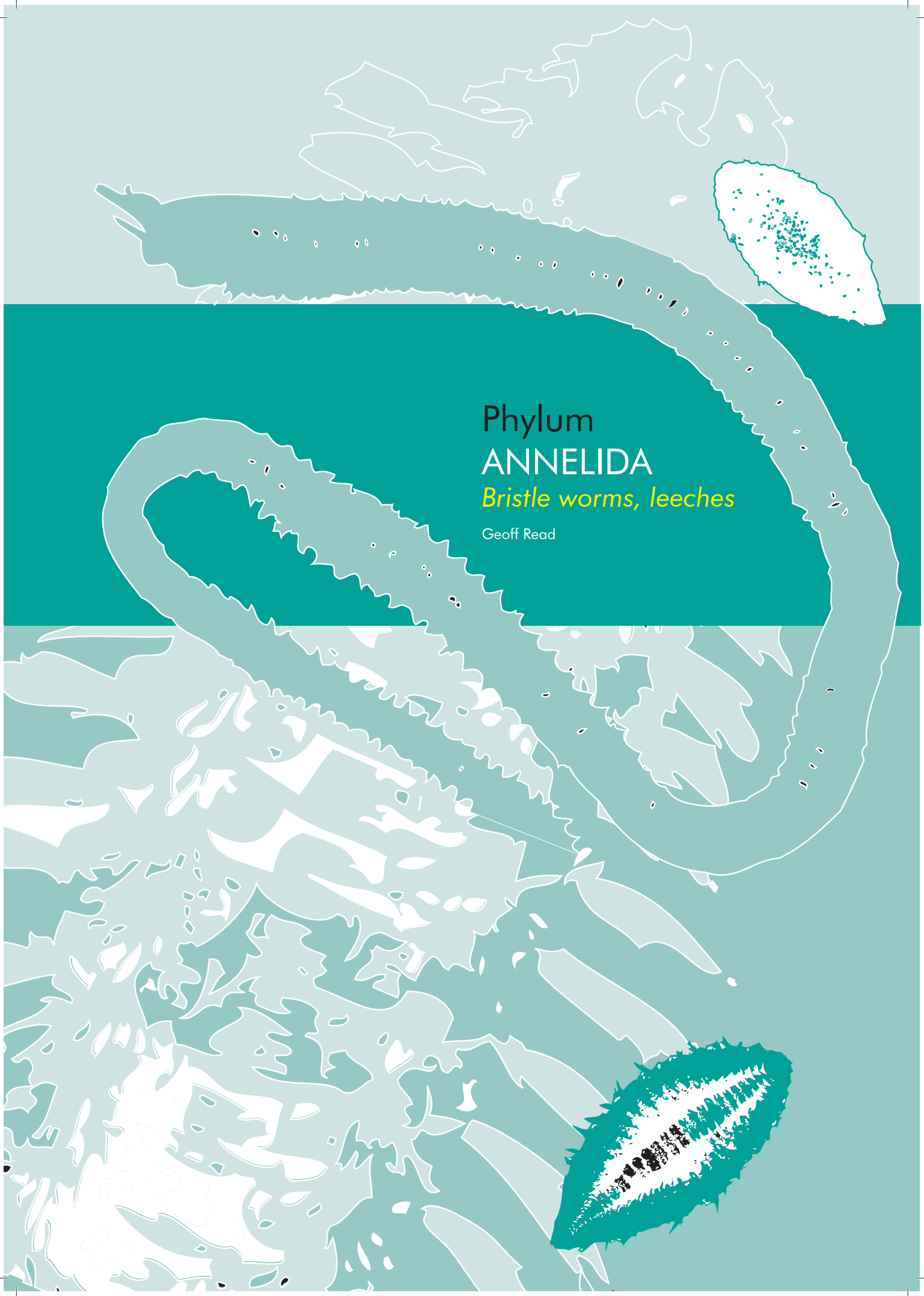


Phylum ANNELIDA

Bristle worms, leeches

Geoff Read

Phylum

ANNELIDA

Bristle worms and leeches

Class Polychaeta

Polychaetes are segmented marine worms that have evolved a wide variety of forms in adaptation to many different lifestyles. They can occur in great abundance and are usually a major component of the deep sea benthos. Polychaetes are particularly common crawling and burrowing on or in bottom sediments, but also live in tubes attached to rock surfaces or within growths of sponges, corals, and hydroids. However, polychaetes are relatively small animals that are good at hiding themselves, and thus, with some exceptions, epifaunal worms caught up in trawl bycatch are mostly not easily seen unless carefully looked for.

Class Polychaeta also includes hydrothermal vent and cold seep tube-dwelling worms nourished solely by symbiotic bacteria, apparently unsegmented, and until recently regarded as part of a separate phylum called Pogonophora. Some species of this group occur in New Zealand waters. At least 800 polychaete species in 68 families occur in the New Zealand area, with about 50% of the formally described species endemic. Altogether worldwide there are about 13000 polychaetes known in 83 families.

Typically each polychaete worm segment has many chaetae (bristles)—hence the class name. The chaetae erupt in upper and lower groups from variably developed fleshy lateral lobes or 'feet' called parapodia. It is important to study chaetae when identifying worms as each family has characteristic types, with many of the chaetae intricately and distinctively sculptured. The polychaete head region in wandering agile species often bears eyes, unique chemosensory structures called nuchal organs, and pairs of antennae, palps, and cirri. These may also be present in related tube-dwelling forms, but typically the permanent tube-dwellers have additional feeding and respiratory appendages, such as the tentacular crowns of Sabellidae, whereas sediment-eating burrowing forms generally have much reduced head appendages. Food in many polychaetes is ingested with the aid of an eversible mouth bulb called the proboscis, and this may be armed with pincer-like jaws, particularly in predatory forms.

Polychaetes filter-feed, graze on organic debris, bulk-ingest sediment, or prey on other small animals. They are short-lived, mostly having annual or shorter life spans; their reproductive strategies include free spawning by separate sexes, hermaphroditism, and various degrees of brood care, and polychaete larvae are common in the plankton. Polychaetes are an important part of the deepsea food chain and their soft bodies provide nutritious food for fish and many other predators.

Class Clitellata

Clitellata is the current class name for leeches and oligochaetes as a group, formerly treated separately within Annelida as Classes Hirudinea (comprising all leech families) and Oligochaeta (comprising aquatic oligochaete families plus earthworms). No marine oligochaetes are large enough to be noticed in trawl bycatch, but ectoparasitic fish leeches up to a few centimetres long may occasionally be seen, either detached from their hosts or still affixed. Marine fish leeches belong to the family Piscicolidae; chaetae and lack the cutting jaws of terrestrial leeches, have anterior and posterior suckers and a fixed number of segments, and all are hermaphroditic. There are six species currently reported for New Zealand, but little is known about their ecology or preferred hosts. Additional undescribed species are likely to occur.

Phylum Annelida
Class Polychaeta (bristle worm)
Order Amphinomida
Family Amphinomidae

Chloeia inermis (Fire worm) (CIM)

Distinguishing features: Spindle-shaped with profuse, siliceous, spicule-like chaetae (body lateral view left inset). Head small, sunken, with a cockscomb-like pleated caruncle (right inset). Whip-like dorsal cirri from segment one. Dorsal stalked branched gill pairs from segment 5.

Colour: Believed to be pale. Dorsal cirri ends are a conspicuous purple in preserved specimens.

Size: Total length up to 90 mm.

Distribution: New Zealand wide, especially Chatham Rise and offshore northwest of the South Island.

Depth: 70 to 1050 m. Shelf and slope.

Similar species: Unique. Other bottom-dwelling amphinomids are much smaller and in different genera. Large amphinomids also may occur on floating objects colonised by goose barnacles.

References: Kudenov, J. D. 1993 (1992). Amphinomidae and Euphrosinidae (Annelida: Polychaeta) principally from Antarctica, the southern ocean, and subantarctic regions. *Antarctic Research Series 58*: 93–150.

Phylum Annelida
Class Polychaeta (bristle worm)
Order Eunicida
Family Eunicidae

Eunice (undescribed) (Eunice sea-worm) (EUN)

Distinguishing features: Head with 2 cushion-like palps, 5 head antennae, followed by another pair of antennae. Mouth with white plate-like mandibles below a series of toothed jaw plates. Small comb-like pink gills above each lateral 'foot' from 8th segment to end of body.

Colour: Light chocolate brown with paler underside.

Size: Total length up to 220 mm.

Distribution: Chatham Rise and Bay of Plenty region.

Depth: 200 to 250 m.

Similar species: There are a number of described and undescribed *Eunice* in New Zealand waters of various sizes, all superficially rather similar, but varying in body colour, gill development, and morphology of jaw elements and chaetae (bristles erupting on each segment).

References: Fauchald, K. (1992). A review of the genus *Eunice* (Polychaeta: Eunicidae) based upon type material. *Smithsonian Contributions to Zoology 523*. 422 p.

Phylum Annelida
Class Polychaeta (bristle worm)
Order Eunicida
Family Onuphidae

Hyalinoecia tubicola (Quill worm) (HTU)

Distinguishing features: Onuphid worms occupy a tapering quill-like horny tube with protective internal valves at either end (see mid left specimen inside tube). Tube is translucent and circular in cross-section. Worm is an active crawler, dragging tube "house" along.

Colour: Light brown tube and body.

Size: Total length up to 300 mm (tube length).

Distribution: Common on the surface of sediments of New Zealand continental slope.

Depth: 50 to 2800 m. 80% of records occur in the depth zone 100 to 600 m.

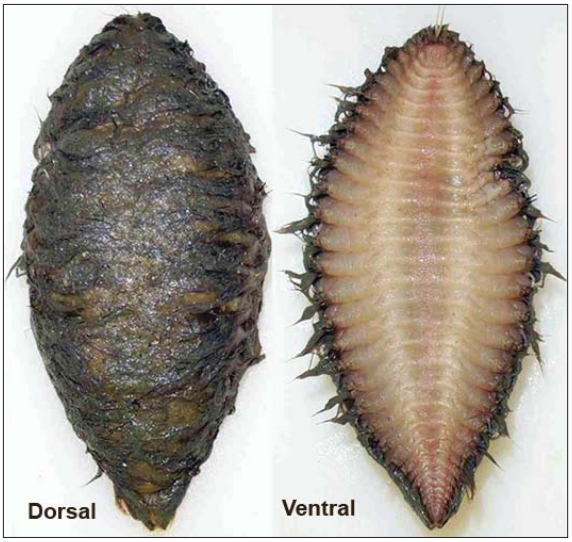
Similar species: *Hyalinoecia incubans*, a smaller species, is very similar. *Leptoecia oxyrhincha* is also smaller and occupies a similar, although flattened, "quill" tube. *H. tubicola* is "cosmopolitan," with the New Zealand form a treated as subspecies, *H. tubicola longibranchiata*, although further evaluation of its status is needed.

References: McIntosh, W.C. (1885). Report on the Annelida Polychaeta collected by H.M.S. 'Challenger' during the years 1873–76. *Report of the Scientific Results of the Exploring Voyage of H.M.S. Challenger 1873–76 12*. 554 p.

Read, G.B. ; Clark, H.E.S. (1999). Ingestion of quill-worms by the astropectinid sea-star *Proserpinaster neozelanicus* (Mortensen). *New Zealand Journal of Zoology 26*: 49–54.

Phylum Annelida
Class Polychaeta (bristle worm)
Order Phyllodocida
Family Aphroditidae

Aphrodita spp. (Sea mouse) (ADT)



Distinguishing features: Body oval in outline, dorsally covered by a matted felt of fine hair, and with intermingled bronze chaetae, as well as 15 pairs of elytra (scales). Ventrally without felt, with finely papillated surface. Facial tubercle present between paired palps on head. Thin median antenna present or absent.

Colour: Grey or brown.

Size: Up to 120 mm. About twice as long as wide.

Distribution: Widely distributed on the continental shelf, including the Chatham Rise, with some deep water records to the east of Mahia Peninsula.

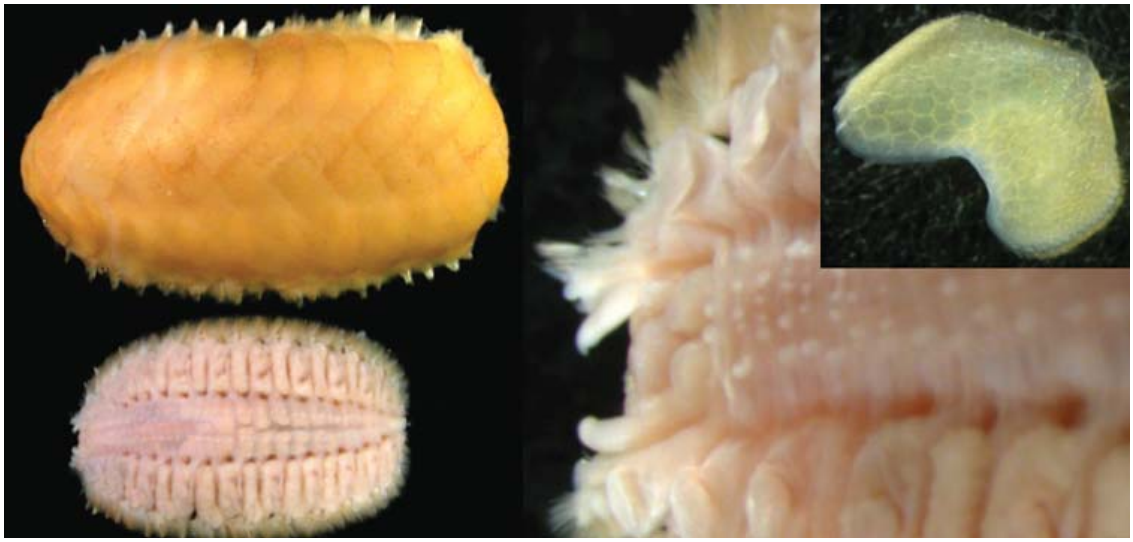
Depth: 20 to 2700 m.

Similar species: There may be four or more *Aphrodita* species in New Zealand waters. Also there are several similar genera differing mainly in details of chaetal morphology and arrangement.

References: Hutchings, P.A.; McRae, J. (1993). The Aphroditidae (Polychaeta) from Australia, together with a redescription of the Aphroditidae collected during the Siboga expedition. *Records of the Australian Museum 45*: 279-363.

Phylum Annelida
Class Polychaeta (bristle worm)
Order Phyllodocida
Family Polynoidae

Thermiphione (undescribed) (Thermiphione scale-worm) (THE)



Distinguishing features: Scale-worm with thirteen pairs of overlapping tough dorsal scales, each with a polygonal surface pattern (inset top right). Dorsal surface under scales (absent in left lower specimen and head-closeup, right image) with near-midline papillae. Head without eyes or antennae, with pair of palps.

Colour: Golden dorsal scales. Body reportedly green in life.

Size: Total length up to 30 mm. About twice as long as wide.

Distribution: Eastern New Zealand on actively volcanic seamounts.

Depth: 230 to 730 m.

Similar species: No other member of genus recorded in New Zealand. However, many Polynoidae look superficially the same if dorsal scales are intact. If unsure use Polynoidae code PYN.

References: Hartmann–Schröder, G. (1992). Zur Polychaetenfauna in rezenten hydrothermalen Komplexmassivsulfiderzen ('Schwarze Raucher') am Ostpazifischen Rucken bei 21° 30' S. *Helgoländer Meeresuntersuchungen 46* : 389–403.

Miura, T. (1994). Two new scale-worms (Polynoidae, Polychaeta) from the Lau Back-Arc and North Fiji Basins, south Pacific Ocean. *Proceedings of the Biological Society of Washington 107*: 532–543.