

## Phylum MOLLUSCA

*Chitons, bivalves, sea snails,  
sea slugs, octopus, squid,  
tusk shell*

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squid from Neil Bagley, Peter McMillan, Reyn Naylor,  
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## Phylum

# MOLLUSCA

*Chitons, bivalves, sea snails, sea slugs, octopus, squid, tusk shells*

The mollusca is the second most speciose animal phylum in the sea after Arthropoda. The phylum name is taken from the Latin (molluscus, soft), referring to the soft bodies of these creatures, but most species have some kind of protective shell and hence are called shellfish. Some, like sea slugs, have no shell at all. Most molluscs also have a strap-like ribbon of minute teeth — the radula — inside the mouth, but this characteristic Molluscan feature is lacking in clams (bivalves) and some deep-sea finned octopuses. A significant part of the body is muscular, like the adductor muscles and foot of clams and scallops, the head-foot of abalone, and the mantle and arms of squid and octopus, which makes molluscs an important food source.

New Zealand has 3666 marine molluscan species, of which more than a thousand await formal description. Most of these are minute “micromolluscs”, however.

The majority of species are endemic to New Zealand, being found nowhere else in the world. The uniqueness of the New Zealand Mollusca is also exemplified by certain kinds that are biologically or ecologically remarkable. The chiton *Cryptoconchus porosus* has its shell plates wholly internal, a character displayed by only one other species in the world, and *Pseudotonicia cuneata* lives permanently within soft sediments — rare for a chiton. New Zealand’s largest mesodesmatid clam, *Paphies ventricosa* (toheroa) is one of the largest in its family worldwide. The patellid limpet *Patella kermadecensis*, which can reach 150 millimetres or more in length and is endemic to the Kermadec Islands, is the only living representative of its family in the EEZ. New Zealand’s calliostomatid snails include several that are larger than any others in the world. More than 8.5% of the world’s estimated 750 chitons occur within the EEZ.

All seven classes of living Mollusca are found in New Zealand’s marine environment, including the deep sea. They are:

### Monoplacophora

This “living-fossil” group comprises tiny limpet-like species found on seamounts. There are 6 species, 0 undescribed.

### Polyplacophora

Chitons have 8 shell plates, rarely concealed, and a scaly “girdle” around the perimeter of the body in most species. There are 65 species, 10 undescribed.

### Aplacophora

In New Zealand, these are worm-like molluscs found in sandy mud. There is no shell. The tiny solenogasters have bristle-like spicules over almost the whole body, a groove on the underside of the body, and no gills. The more worm-like caudofoveates have a groove and fewer spicules but have gills. There are 10 species, 8 undescribed.

### Bivalvia

Clams, mussels, oysters, scallops, etc. The shell is in two halves (valves) connected by a ligament and hinge and anterior and posterior adductor muscles. Gills are well-developed and there is no radula. There are 680 species, 231 undescribed.

### Scaphopoda

Tusk shells. The body and head are reduced but there is a foot that is used for burrowing in soft sediments. The shell is open at both ends, with the narrow tip just above the sediment surface for respiration. There are 47 species, 36 undescribed.

### Gastropoda

Sea snails and sea slugs. The shell is typically coiled but both coiling and a shell may be lacking in some species. The head-foot is well developed and muscular and the radula is mostly well developed but can be greatly modified in ways that are peculiar to particular genera and families. There are 2738 species, 1017 undescribed.

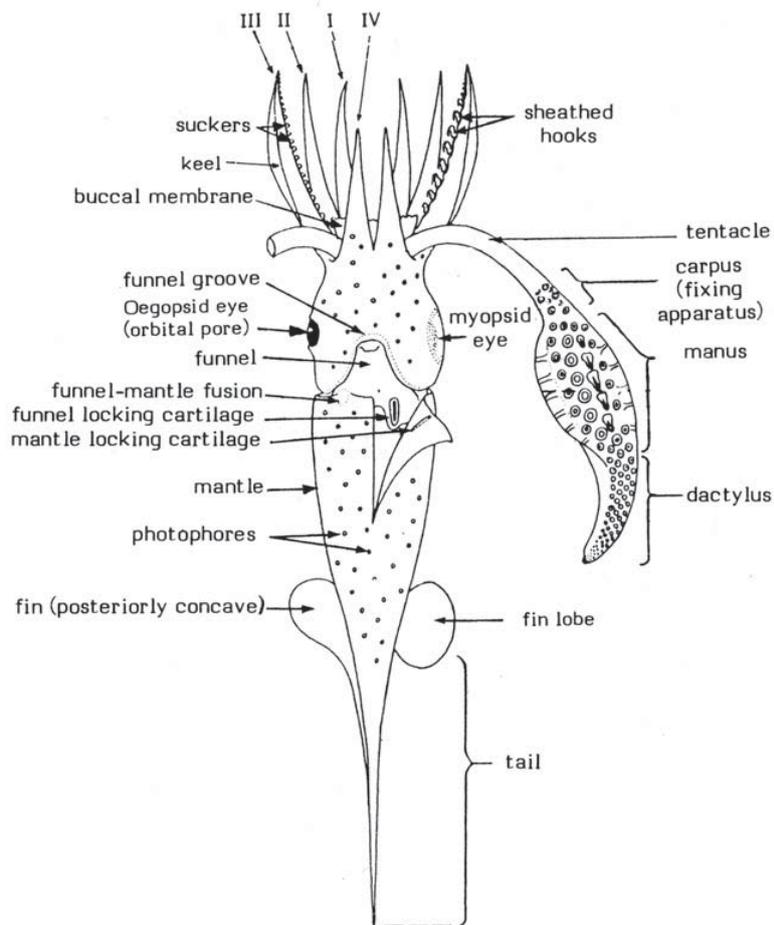
### Cephalopoda

Squid and octopus. Unlike tropical nautilus, with its well-developed external shell, squid have an internal shell or support (pen) that is horny, whereas octopods generally lack any internal support. The only real difference between an octopus and a squid is that squid have cuticular rings or hooks arming their suckers, whereas an octopus has suckers that are simple suction discs. Squids have 8 arms and usually 2 tentacles; octopods have 8 arms. In addition to a radula, there are beak-like jaws. The key diagnostic feature for squids are the arms and tentacles but often these can be missing in trawl-caught specimens, particularly from squids with tentacular clubs (hooks). There are 123 species, 23 undescribed, or for which the systematic status has yet to be confirmed.



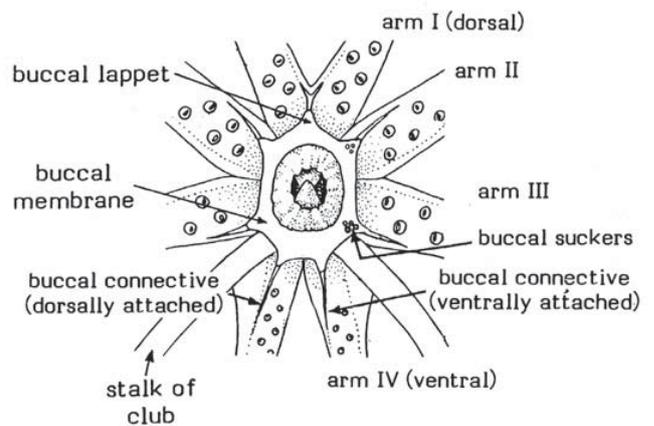
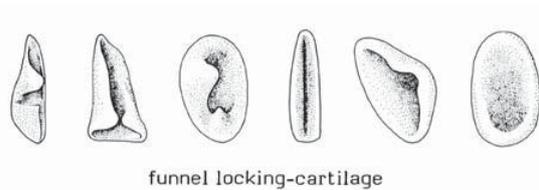
## Technical terms for Cephalopods

Reproduced from Roper, C.F.E.; Sweeny, M.J.; Nauen C.E. (1984). *FAO Species catalogue: 3 Cephalopods of the world*. 277p.



a composite diagram illustrating basic squid (teuthoid) features

ventral view





**Phylum** Mollusca  
**Class** Bivalvia  
**Order** Limoida  
**Family** Limidae

### ***Acesta maui* (Giant file shell) (AMA)**



**Distinguishing features:** Thin, rather fragile shell, externally with very fine longitudinal ridges near sides. Darker markings are due to the presence of a thin external skin, which is much softer than the shell and erodes away easily, especially in more dynamic environments. The external skin is typically best preserved in small to medium-sized specimens.

**Colour:** Shell white, typically with a patchy, dull brownish external skin.

**Size:** Total height up to 185 mm.

**Distribution:** Cook Strait, eastern South Island, Fiordland, Chatham Rise, and Auckland and Campbell Islands.

**Depth:** 270 to 1170 m.

**Similar species:** *Acesta saginata* Marshall, 2001.

**References:** Marshall, B.A. (2001). The genus *Acesta* H. & A. Adams, 1858 in the southwest Pacific (Mollusca: Bivalvia: Limidae). In: Bouchet, P.; Marshall, B.A. (eds), Tropical deep-sea benthos 22. *Memoires de la Muséum National d'Histoire Naturelle* 185: 97–109.

**Phylum** Mollusca  
**Class** Bivalvia  
**Order** Limoidea  
**Family** Limidae

***Acesta saginata* (Acesta) (ASG)**

MOLLUSCA



**Distinguishing features:** Large, thin, rather fragile shell, externally covered with fine longitudinal grooves.

**Colour:** White.

**Size:** Total height up to 116 mm.

**Distribution:** Seamounts off northern North Island, off Chatham Islands, and Macquarie Ridge.

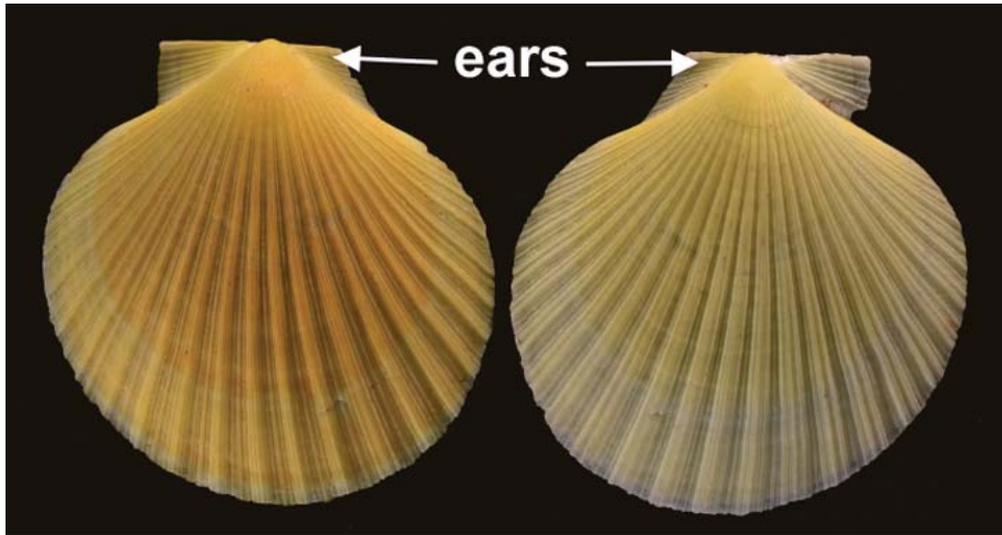
**Depth:** 1031 to 1650 m.

**Similar species:** *Acesta maui*.

**References:** Marshall, B.A. (2001). The genus *Acesta* H. & A. Adams, 1858 in the southwest Pacific (Mollusca: Bivalvia: Limidae). In Bouchet, P. and Marshall, B.A. (eds), Tropical deep-sea Benthos 22. *Memoires de la Muséum National d'Histoire Naturelle* 185: 97–109 (p. 103).

**Phylum** Mollusca  
**Class** Bivalvia  
**Order** Pectinoidea  
**Family** Pectinidae (scallops)

### **Zygochlamys delicatula (Queen scallop) (QSC)**



MOLLUSCA

**Distinguishing features:** Scallop or fan-shaped shell covered with longitudinal riblets, both valves (halves) inflated; ears on each valve of unequal size.

**Colour:** Yellow or red.

**Size:** Total height up to 97 mm.

**Distribution:** Eastern South Island, western Chatham Rise, Auckland, Bounty, and Campbell Islands, and Macquarie Island.

**Depth:** 60 to 549 m.

**Similar species:** *Veprichlamys kiwaensis*, *Talochlamys dichroa*, *T. zelandiae*, *Mesopeplum convexum*.

**References:** Beu, A. G. (1985). Pleistocene *Chlamys patagonica delicatula* (Bivalvia: Pectinidae) off southeastern Tasmania, and history of its species group in the Southern Ocean. In: Lindsay, J.M. (ed.). Stratigraphy, palaeontology, malacology. Papers in honour of Dr Nell Ludbrook. Department of Mines and Energy, South Australia, Special Publication 5. 1–11.

Jonkers, H.A. (2003). Late Cenozoic–Recent Pectinidae (Mollusca: Bivalvia) of the Southern Ocean and neighbouring regions. *Monographs of Marine Mollusca* 5. 91 p.

**Phylum** Mollusca  
**Class** Bivalvia  
**Order** Pectinoidea  
**Family** Pectinidae (scallops)

***Delectopecten fosterianus* (DFO)**

MOLLUSCA



**Distinguishing features:** Shell subcircular, fan-shaped, very thin, fragile and transparent, both valves (halves) inflated, ears on each valve of unequal size. Externally covered with thin, widely spaced, scaly, concentric threads (additional, much finer, more crowded radial threads can be clearly seen only under magnification).

**Colour:** Colourless and transparent.

**Size:** Total height up to 24 mm.

**Distribution:** Throughout the New Zealand EEZ living attached by threads to rocks, corals and glass sponges or hard substrata.

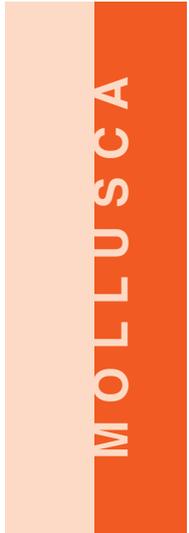
**Depth:** 376 to 1568 m.

**Similar species:**

**References:** Powell, A.W.B. (1979) New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland p. 379.

**Phylum** Mollusca  
**Class** Bivalvia  
**Order** Pectinoida  
**Family** Pectinidae (scallops)

### ***Veprichlamys kiwaensis* (VKI)**



**Distinguishing features:** Scallop or fan-shaped shell covered with fine longitudinal riblets, both valves (halves) inflated; ears on each valve of unequal size. Longitudinal riblets smooth near eared-end of shell; roughened with small, sharp scales near opposite end when shell is more than about 15 mm high (additional, much finer, more crowded radial threads between main riblets can be seen only under magnification).

**Colour:** White or pinkish white, longitudinal riblets pink.

**Size:** Total height up to 31 mm.

**Distribution:** Through the New Zealand EEZ, living attached by threads to corals and glass sponges on hard ground.

**Depth:** 263 to 1130 m.

**Similar species:** *Zygochlamys delicatula*, *Talochlamys dichroa*, *T. gemmulata*, *T. zelandiae*.

**References:** Powell, A.W.B. (1979) New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland p. 378.

**Phylum** Mollusca  
**Class** Bivalvia  
**Order** Pholadomyoidea  
**Family** Euciroidae

***Euciroa galathea* (EGA)**

MOLLUSCA



**Distinguishing features:** Shell more or less oval, swollen, sculptured with very fine radial ribs. Fresh uneroded specimens covered with a rough surface caused by densely crowded, minute granules.

**Colour:** Shell white or pale pink.

**Size:** Total height up to 63 mm.

**Distribution:** Eastern North and South Islands, Chatham Rise, and Auckland Islands.

**Depth:** 400 to 620 m.

**Similar species:** Hitherto unrecorded species with heavier, more circular shell, occurs on Challenger Plateau and northern seamounts.

**References:** Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Octopoda  
**Family** Octopodidae

***Benthoctopus* spp. (Deepwater octopus) (BNO)**



MOLLUSCA

**Distinguishing features:** Stocky-bodied octopus, with big head, short arms, suckers in two rows, and skin smooth. Ink sac absent.

**Colour:** Dark red on undersurface of mantle, head, arms, and web, and light red on other surfaces.

**Size:** Total length up to 50 cm.

**Distribution:** Challenger Plateau, Bay of Plenty, Wairarapa coast, south to Chatham Rise and Campbell Plateau.

**Depth:** 500 to 1750 m.

**Similar species:** Three *Benthoctopus* species occur in New Zealand waters: *B. teggimathae*, *B. clyderoperi* and *B. tangaroa*.

**References:** O'Shea, S. (1999). The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). *NIWA Biodiversity Memoir* 112. 280 p.

Spencer, H.G.; Willan, R.C.; Marshall, B.A.; Murray, T.J. (2002). Checklist of the Recent Mollusca described from the New Zealand Exclusive Economic Zone. <http://toroa.otago.ac.nz/pubs/spencer/Molluscs/index.html>

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Octopoda  
**Family** Octopodidae

***Enteroctopus zealandicus* (Yellow octopus) (EZE)**

MOLLUSCA



**Distinguishing features:** Large smooth-bodied octopus with broad, ovoid mantle, arms subequal in length; all arm pairs with suckers of similar, large size.

**Colour:** Yellow to orange.

**Size:** Total length to 140 cm.

**Distribution:** East coast South Island, Chatham Rise, Southern Plateau.

**Depth:** 50 to 600 m; deep in northern; littoral in southern extent of range.

**Similar species:** *Enterocotopus megalocyathus*.

**References:** O'Shea, S. (1999). The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). *NIWA Biodiversity Memoir* 112. 280 p.

Spencer, H.G.; Willan, R.C.; Marshall, B.A.; Murray, T.J. (2002). Checklist of the Recent Mollusca described from the New Zealand Exclusive Economic Zone. <http://toroa.otago.ac.nz/pubs/spencer/Molluscs/index.html>

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Octopoda  
**Family** Octopodidae

**Graneledone spp. (Deepwater octopus) (DWO)**



MOLLUSCA

**Distinguishing features:** Clusters of cartilage-like processes on the head, mantle, and arms; single row of suckers down each arm. Ink sack absent.

**Colour:** Red, variable; maroon to red.

**Size:** Total length up to 68 cm. Moderate to large size.

**Distribution:** Primarily east coast North Island, East Cape to Chatham Rise.

**Depth:** 450 to 1500 m.

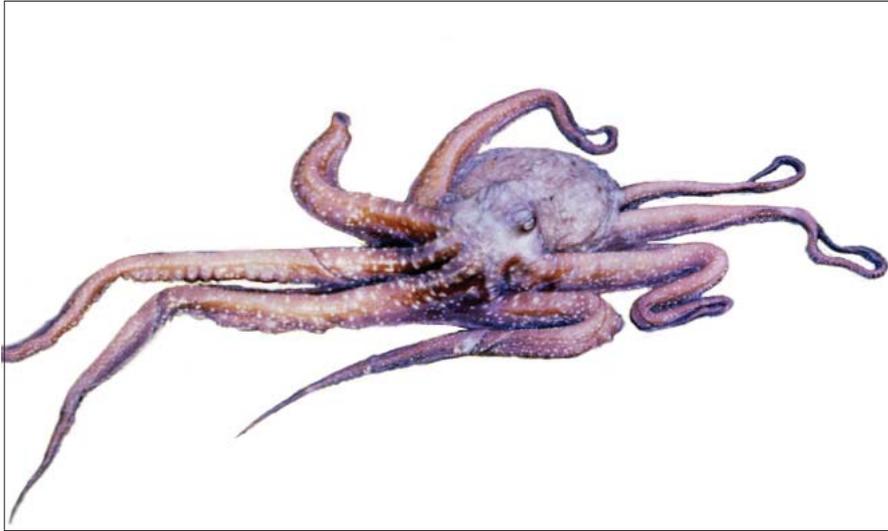
**Similar species:** Two species and one subspecies of *Graneledone* are known from the New Zealand EEZ: *Graneledone challengerii*, and *G. taniwha taniwha*, and *G. taniwha kubodera*.

**References:** O'Shea, S. (1999). The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). *NIWA Biodiversity Memoir 112*. 280 p.

Spencer, H.G.; Willan, R.C.; Marshall, B.A.; Murray, T.J. (2002). Checklist of the Recent Mollusca described from the New Zealand Exclusive Economic Zone. <http://toroa.otago.ac.nz/pubs/spencer/Molluscs/index.html>

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Octopoda  
**Family** Octopodidae

***Pinnoctopus cordiformis* (Common octopus) (OCT)**



MOLLUSCA

**Distinguishing features:** Attains massive size; arms slender, tapering to delicate tips. Suckers on dorsal arms largest, progressively decreasing in diameter from dorsal to ventral arms, with those on the ventral arm pair half the diameter of those on the dorsal arm pair.

**Colour:** Light to dark brown or red.

**Size:** Total length up to 150 cm.

**Distribution:** North, South, Stewart, and Chatham Islands.

**Depth:** 5 to 400 m.

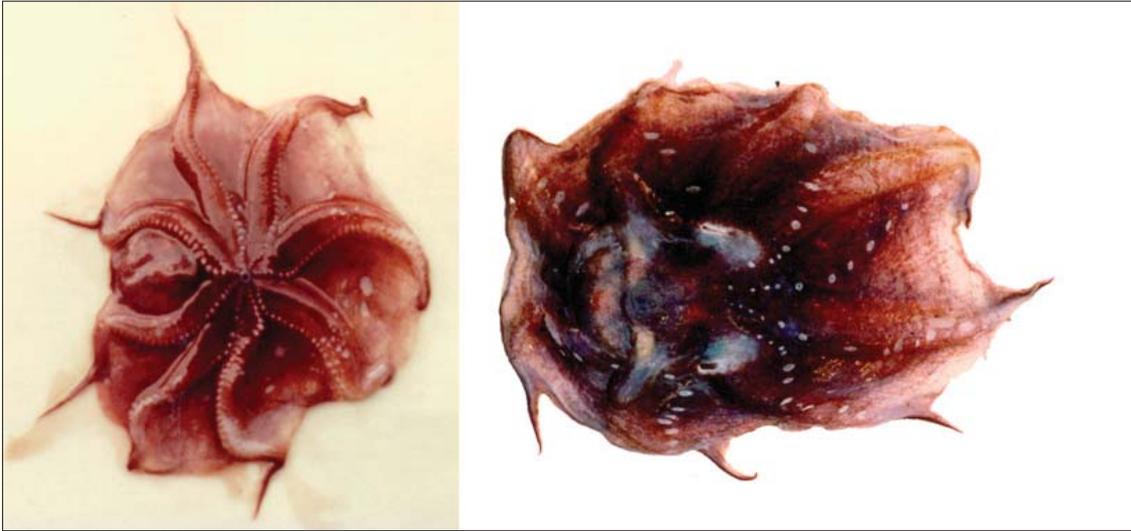
**Similar species:** *Pinnoctopus kermadecensis*.

**References:** O'Shea, S. (1999). The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). *NIWA Biodiversity Memoir* 112. 280 p.

Spencer, H.G.; Willan, R.C.; Marshall, B.A.; Murray, T.J. (2002). Checklist of the Recent Mollusca described from the New Zealand Exclusive Economic Zone. <http://toroa.otago.ac.nz/pubs/spencer/Molluscs/index.html>

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Octopoda  
**Family** Opisthoteuthididae

**Opisthoteuthis spp. (Umbrella octopus) (OPI)**



MOLLUSCA

**Distinguishing features:** Moderate-sized octopus with very compressed bell- or disc-shaped body. Arms long and deeply embedded in gelatinous web of the mantle tissue; spots can be visible over mantle. Fins small and flap-like.

**Colour:** Purplish red to pink.

**Size:** Total length up to 12 cm.

**Distribution:** North and South Island (both east and west coasts), Chatham Rise, Campbell Plateau.

**Depth:** 360 to 1700 m.

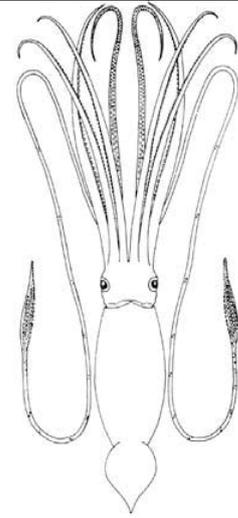
**Similar species:** Three species recognised in New Zealand waters: *Opisthoteuthis mero*, *O. robsoni* and *O. chathamensis*.

**References:** O'Shea, S. (1999). The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). *NIWA Biodiversity Memoir* 112. 280 p.

Spencer, H.G.; Willan, R.C.; Marshall, B.A.; Murray, T.J. (2002). Checklist of the Recent Mollusca described from the New Zealand Exclusive Economic Zone. <http://toroa.otago.ac.nz/pubs/spencer/Molluscs/index.html>

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Teuthoidea  
**Family** Architeuthidae

### **Architeuthis spp. (Giant squids) (GSQ)**



**Distinguishing features:** Very large (overall length up to 13 m); 8 arms with 2 rows of small suckers, and 2 very long tentacles, expanded at their ends into ending with paddle-like clubs with enlarged suckers. No hooks on either arms or tentacles.

**Colour:** Light pink to red.

**Size:** Up to about 13 m total length overall. Mantle length up to 2.25 m.

**Distribution:** Around New Zealand and worldwide.

**Depth:** About 200 to 1000 m; most frequently captured at about 500 m.

**Similar species:** *Taningia danae* is also very large but is dark red to purple, arms and head combined are shorter than the mantle, and has large hooks on each arm. *Idioteuthis cordiformis* also very large, but is dark red to maroon, and has very large ovoid fins down most of mantle. *Moroteuthis* spp. also large, but is brown to orange, and with diamond-shaped fins on top half of warty mantle, and hooks on clubs of short tentacles.

**References:** Roper, C.F.E.; Sweeny, M.J.; Nauen C.E. (1984). *FAO Species catalogue: 3 Cephalopods of the world.* 277p.

O'Shea, S. (1977). Giant squid in New Zealand waters. *Seafood New Zealand.* 5 (10). 32–34.

Forch, E.C. (1998). The marine fauna of New Zealand: Cephalopoda: Oegopsida: Architeuthoidea (giant squid). *NIWA Biodiversity Memoir 110.* 113p.

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Teuthoidea  
**Family** Cranchiidae

### Cranchiidae (Glass squids) (CHQ)



MOLLUSCA

**Distinguishing features:** A diverse family distinguished by the mantle being fused to the head around the neck region, and to the funnel at the back corners. Usually with four rows of hooks on tentacle clubs. Photophores present but no pigment spots (chromatophores).

**Colour:** Most species transparent (juveniles) to translucent or red (adults).

**Size:** Mantle length up to 25 cm.

**Distribution:** Widely distributed in New Zealand waters. The largest, *Mesonychoteuthis hamiltoni*, circumpolar in Antarctic waters.

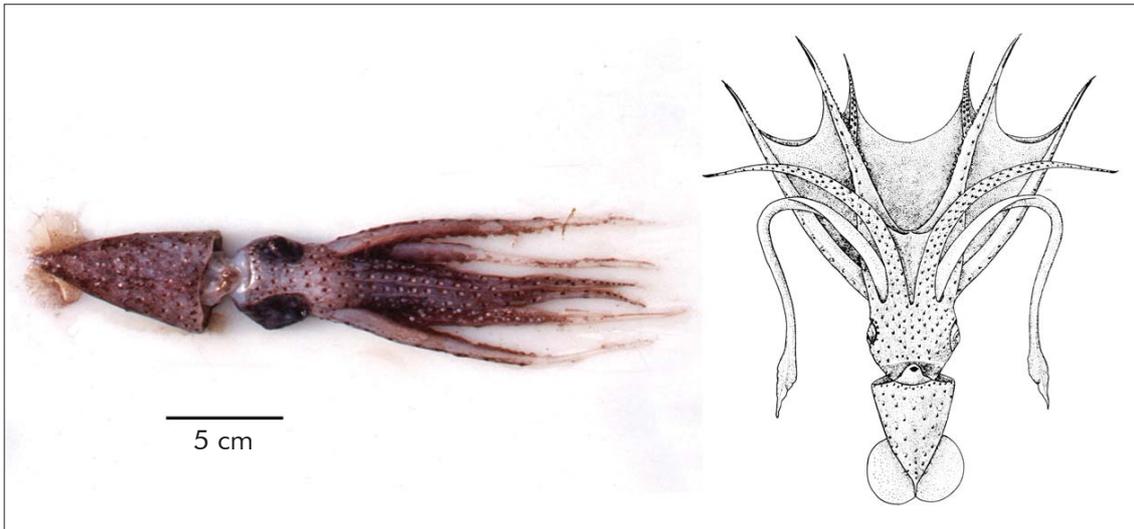
**Depth:** 200 to 1500 m.

**Similar species:** This is a diverse group of squid, and the systematics of most species occurring in New Zealand waters has not been adequately resolved.

**References:** Roper, C.F.E.; Sweeney, M.J.; Nauen C.E. (1984). FAO Species catalogue: 3 Cephalopods of the world. 277p.

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Teuthoidea  
**Family** Histioteuthidae

### **Histioteuthis spp. (Violet squids) (VSQ)**



**Distinguishing features:** Mantle and arms with numerous photophores (light organs) that are usually large and distinct. Left eye much larger than right.

**Colour:** Mantle, head and arms coloured dark red to violet.

**Size:** Mantle length up to 30 cm.

**Distribution:** Widely distributed in deepwater around New Zealand.

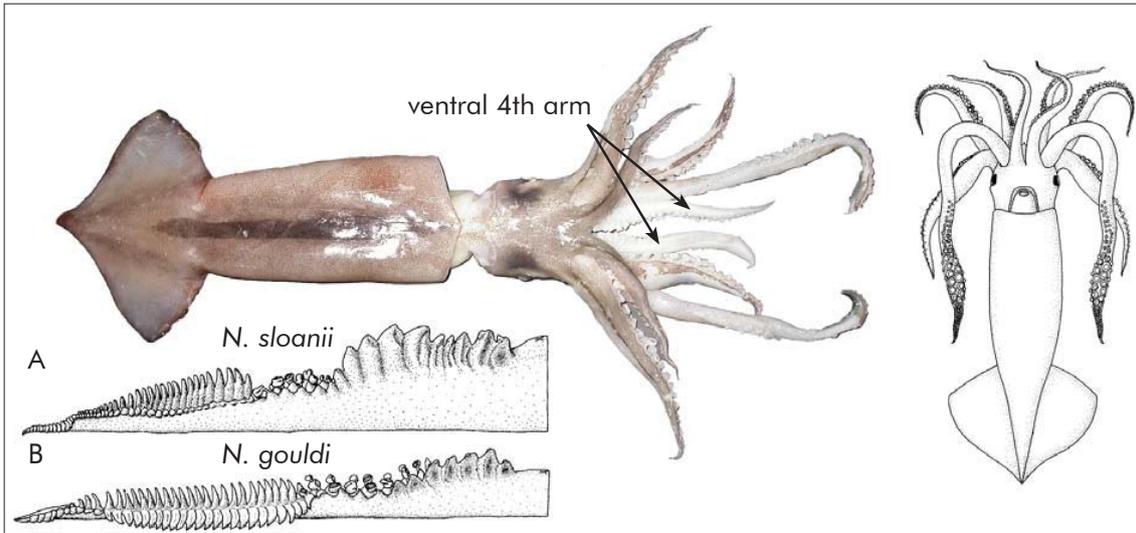
**Depth:** Adults recorded from 300 to 1400 m (juveniles in surface waters).

**Similar species:** 7 to 9 species of *Histioteuthis* in New Zealand waters. Distinguished from other families by presence of photophores on mantle and arms.

**References:** Voss, N.A.; Nesis, K.N.; Rodhouse, P.G. 1998. The Cephalopod family Histioteuthidae (Oegopsida): systematics, distribution, and biogeography. *Smithsonian Contributions to Zoology*, 586. 293-372.

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Teuthoidea  
**Family** Ommastrephidae

**Nototodarus gouldi (Gould's arrow squid) (NOG)**



**Distinguishing features:** Cylindrical body, tapering towards fins, arrow-head shaped. 51 or fewer pairs of suckers on arm 1 (middle left arm in dorsal view, looking towards tentacles). 14 to 16 regularly spaced teeth on largest tentacular sucker ring. Has central pocket but lacks side pocket in funnel groove. Males have 4 to 6 enlarged proximal tubercles on hectocotylised arm. See figure **B**. Both ventral 4th arms are hectocotylised in males.

**Colour:** Reddish brown.

**Size:** Mantle length up to 40 cm.

**Distribution:** Temperate to subtropical Australian waters, around New Zealand, north of the subtropical convergence.

**Depth:** Recorded from about 50 to 700 m, most commonly around 300 m.

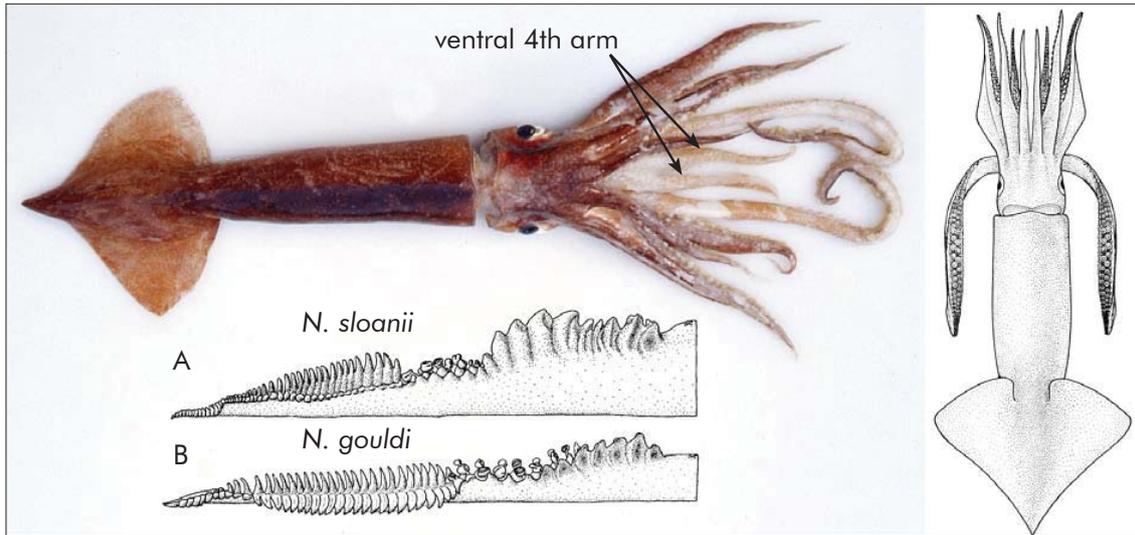
**Similar species:** *Nototodarus sloanii* is similar, but has 11 to 13 regularly spaced teeth on the largest tentacular sucker ring, 60 or more pairs of suckers on arm 1, and is usually found south of the subtropical convergence. Note that both species of *Nototodarus* can be found over Chatham Rise. Adult males of each species of *Nototodarus* also can be distinguished by the structure of the hectocotylus (see above Figure of hectocotylus of right ventral arm of **A** *N.sloanii* and **B** *N. gouldi*). If it is too difficult to distinguish these two species, especially when females are involved, the code SQU can be used.

**References:** Roper, C.F.E.; Sweeny, M.J.; Nauen C.E. (1984). FAO Species catalogue: 3 Cephalopods of the world. 277p.

Smith, P.J., Mattlin, R.H., Roeleveld, M. A., Okutani, T. (1987) Arrow squids of the genus *Nototodarus* in New Zealand waters: systematics, biology, and fisheries. *New Zealand Journal of*

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Teuthoidea  
**Family** Ommastrephidae

**Nototodarus sloanii (Sloan's arrow squid) (NOS)**



**Distinguishing features:** Cylindrical body, tapering towards fins, arrow-head shaped. 60 or more pairs of suckers on arm 1 (middle left arm in dorsal view, looking towards tentacles). 11 to 13 regularly spaced teeth on largest tentacular sucker ring. Has central pocket but lacks side pocket in funnel groove. Males have 9 to 11 enlarged proximal tubercles on hectocotylied arm. See figure **A**. Both ventral 4th arms are hectocotylied in males.

**Colour:** Reddish brown.

**Size:** Mantle length up to 40 cm.

**Distribution:** South of the subtropical convergence on the east coast of the South Island, and east to the Chatham Islands.

**Depth:** From about 30 to 800 m, most commonly around 300 m.

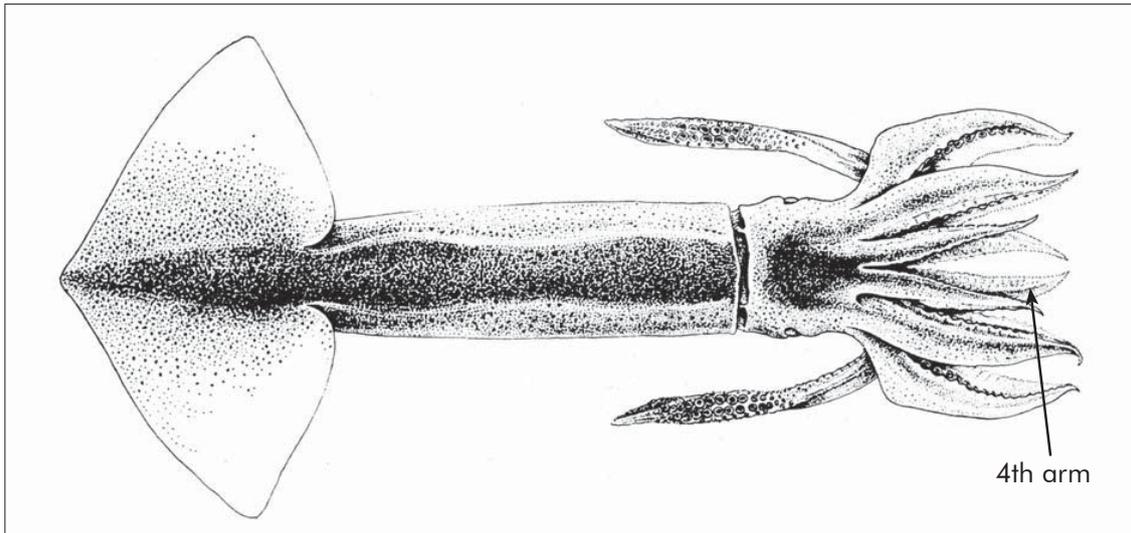
**Similar species:** *Nototodarus Gouldi* is similar, but has 14 to 16 regularly spaced teeth on the largest tentacular sucker ring, 51 or fewer pairs of suckers on arm I, and is usually found north of the subtropical convergence. Note that both species of *Nototodarus* can be found over Chatham Rise. Adult males of each species can also be distinguished by the structure of the hectocotylied arm (see above Figure of hectocotylus of right ventral arm of **A** *N. sloanii* and **B** *N. Gouldi*). If it is too difficult and distinguish these species the code SQU can be used.

**References:** Roper, C.F.E.; Sweeny, M.J.; Nauen C.E. (1984). FAO Species catalogue: 3 Cephalopods of the world. 277p.

Smith, P.J.; Mattlin, R.H.; Roeleveld, M. A.; Okutani, T. (1987) Arrow squids of the genus *Nototodarus* in New Zealand waters: systematics, biology, and fisheries. *New Zealand Journal of Marine and Freshwater Research*, 1987, Vol. 2, 315–326.

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Teuthoidea  
**Family** Ommastrephidae

### **Ommastrephes spp. (Ommastrephid squid) (OMM)**



MOLLUSCA

**Distinguishing features:** Robust mantle, and not drawn out into a pointed tail. Has a central pocket and several side pockets in the funnel groove. One or two small, round, light organs near ink sac in some species, but without pinkish luminous stripe on ventral midline. *Ommastrephes bartrami* (RSQ) has a long golden or silvery stripe along the ventral midline. There are 4 pairs of proximal tubercles (suckers) on hectocotyliised arm in males and the distal tubercles are not pronounced. The hectocotyliised arm is either the 4th left or right arm, but not both.

**Colour:** Reddish brown.

**Size:** Mantle length to about 30 cm in males, 40 cm in females.

**Distribution:** Worldwide in subtropical and temperate oceanic waters except the south-east Pacific; not common off the east coast of New Zealand.

**Depth:** From the surface to about 1400 m.

**Similar species:** *Ommastrephes* specimens can be confused with *Todarodes* and large *Nototodarus* spp. but some species of *Ommastrephes* have photophores near the ink sac and a central pocket in the funnel groove.

**References:** Dunning, M., Brandt, S. B. (1985). Distribution and life history of deep-water squid of commercial interest from Australia. *Australian Journal of Marine and Freshwater Research*. 36. 343–359.

Roper, C.F.E.; Sweeny, M.J.; Nauen C.E. (1984). *FAO Species catalogue: 3 Cephalopods of the world*. 277p.

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Teuthoidea  
**Family** Ommastrephidae

***Todarodes filippovae* (Todarodes squid (TSQ))**

MOLLUSCA



**Distinguishing features:** Long, narrow, muscular mantle. Tentacles very large and robust, with expanded clubs over most of their length. 12 to 14 rows of sucker rings on widest part of tentacle near the midline, each with 7 to 13 sharp teeth. Short arms with 10 sharp teeth on sucker rings. Has central pocket but lacks side pocket in funnel groove; photophores not present. In males the hectocotylished arm is the 4th right arm.

**Colour:** Deep red or carmine.

**Size:** Mantle length up to 50 cm, usually between 20 and 40 cm.

**Distribution:** Southern North Island south, circumpolar in the Southern Ocean.

**Depth:** About 300 to 1200 m.

**Similar species:** *Todarodes angolensis* is similar, but tentacles and clubs are narrower; tentacle club with 14 to 18 transverse rows of four sucker, with the rings on sucker in the central portion of the club each having 13-16 sharp-pointed teeth.

**References:** Dunning, M.C.; Wormuth, J.H. 1998. The ommastrephid squid genus *Todarodes*: a review of systematics, distribution, and Biology (Cephalopoda: Teuthoidea). *Smithsonian Contributions to Zoology*, 586. 385–391.

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Teuthoidea  
**Family** Onychoteuthidae

***Moroteuthis ingens* (Warty squid ) (MIQ)**



MOLLUSCA

**Distinguishing features:** Mantle covered with fleshy warts, robust, broad, thick, and heavily muscled, not drawn out into a sharp tail. Fins large and broad, covering around 45% of the mantle length.

**Colour:** Light reddish-brown to pale orange.

**Size:** Mantle length to about 55 cm.

**Distribution:** Widespread in New Zealand and sub-Antarctic waters.

**Depth:** Most commonly between 250 and 1500 m.

**Similar species:** Can be confused with *Moroteuthis robsoni* but this latter species has acutely tapered fins and a very long and slender mantle.

**References:** Bolstad, K.S. (in press). Review of the systematics, diversity, and spatial and temporal distribution of the New Zealand onychoteuthid fauna (Cephalopoda: Onychoteuthidae). Reviews in Fish Biology and Fisheries.

Roper, C.F.E.; Sweeny, M.J.; Nauen C.E. (1984). FAO Species catalogue: 3 Cephalopods of the world. 277p.

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Teuthoidea  
**Family** Onychoteuthidae

***Moroteuthis robsoni* (Warty squid ) (MRQ)**



MOLLUSCA

**Distinguishing features:** Mantle covered with fleshy warts, long and slender. Fins narrow, the tip drawn out into a long, sharp, lance-like tail.

**Colour:** Light reddish-brown to pale orange.

**Size:** Mantle length to about 90 cm.

**Distribution:** Widespread in New Zealand and sub-Antarctic waters.

**Depth:** Most commonly between 250 and 1500 m.

**Similar species:** Can be confused with *Moroteuthis ingens*, but *M. ingens* has blunt and broad fins, and a robust, broad, thick mantle.

**References:** Bolstad, K.S. (in press). Review of the systematics, diversity, and spatial and temporal distribution of the New Zealand onychoteuthid fauna (Cephalopoda: Onychoteuthidae). Reviews in Fish Biology and Fisheries.

Roper, C.F.E.; Sweeny, M.J.; Nauen C.E. (1984). *FAO Species catalogue: 3 Cephalopods of the world*. 277p.

**Phylum** Mollusca  
**Class** Cephalopoda  
**Order** Teuthoidea  
**Family** Pholidoteuthidae

***Pholidoteuthis massyae boschmai* (Large red scaly squid) (PSQ)**



**Distinguishing features:** Large and muscular with papillate tubercles covering the mantle. Arm suckers have 10 to 15 sharp teeth on the distal half of the inner ring.

**Colour:** Reddish brown on mantle and arms.

**Size:** Mantle length to about 60 cm.

**Distribution:** Around New Zealand, circumglobal in subtropical to cold temperate waters.

**Depth:** Recorded from about 650 m.

**Similar species:** The only species of the genus recorded from New Zealand waters. Distinguished from species of *Moroteuthis* by the shape of the warts, lack of warts on the mantle, and lack of hooks on the tentacles and arms; arm sucker rings in species of *Moroteuthis* lack teeth, whereas those on *Pholidoteuthis* have well-developed teeth.

**References:** O'Shea, S.; Jackson, G.; Bolstad, K.S. (2007). The nomenclatural status, ontogeny and morphology of *Pholidoteuthis massyae* (Pfeffer, 1912) new comb (Cephalopoda: Pholidoteuthidae). *Reviews in Fish Biology & Fisheries* 17: 425–435

Vecchione, Michael and Young, Richard E. 1999. *Pholidoteuthis boschmai* Adam, 1950. ([http://tolweb.org/Pholidoteuthis\\_boschmai/19854/1999.01.01](http://tolweb.org/Pholidoteuthis_boschmai/19854/1999.01.01))

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Littorinimorpha  
**Family** Capulidae

***Malluvium calcareum* (Cap limpet) (MCC)**

MOLLUSCA



**Distinguishing features:** Cap-shaped, hooked apex, no pronounced ledge inside. Typically smaller individuals on or beside larger ones (smallest individuals are males: sex changes to female with increasing size).

**Colour:** White.

**Size:** Total height up to 20 mm.

**Distribution:** Common throughout the New Zealand EEZ living clustered around apertures on outsides of shells of gastropods occupied by hermit crabs. Occasionally found attached to shells of living gastropods.

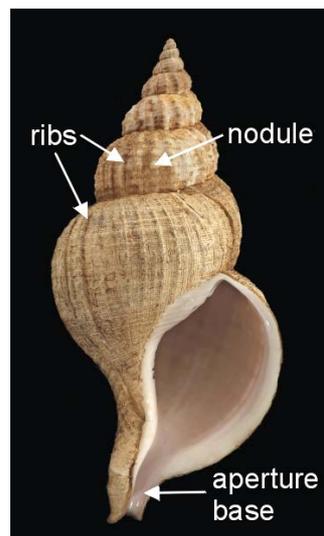
**Depth:** 110 to 1019 m, though rarely taken shallower than 200 m.

**Similar species:** *Capulus neozelanicus* (larger and lives exclusively on *Acesta* species).

**References:** Powell, A.W.B. (1979) New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland p. 146.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Littorinimorpha  
**Family** Ranellidae (tritons)

### ***Fusitriton magellanicus* (FMA)**



MOLLUSCA

**Distinguishing features:** Shell sculptured with fine longitudinal and spiral ribs bearing small, rounded nodules. Base of aperture extending as a twisted canal of moderate length. Fresh specimens with a rather thick, yellowish brown, furry outer skin (periostracum).

**Colour:** Shell whitish, typically with yellowish brown, furry outer periostracum skin; aperture white or lavender within.

**Size:** Total height up to 120 mm.

**Distribution:** Throughout the New Zealand region.

**Depth:** 300 to 1000 m.

**Similar species:** This species is also known in the literature as *Fusitriton laudandum* or *F. retiolus*.

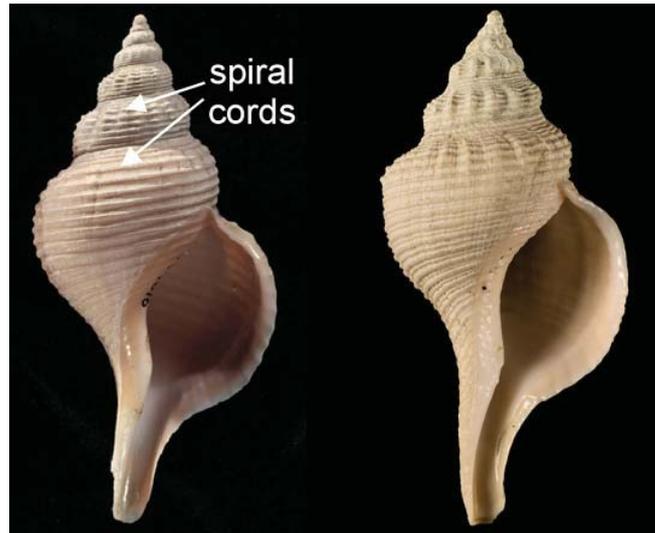
**References:** Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

Beu, A.G. 1978. The marine fauna of New Zealand: the molluscan genera *Cymatona* and *Fusitriton* (Gastropoda, Family Cymatiidae). New Zealand Oceanographic Institute Memoir 65. 44p.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Neogastropoda  
**Family** Buccinidae (whelks)

### ***Aeneator recens* (AER)**

MOLLUSCA



**Distinguishing features:** Shell covered with well developed, rather widely spaced spiral cords, and with longitudinal ribs of variable development; no nodules where the ribs cross one another. Base of aperture extended as a rather straight but oblique canal of moderate length.

**Colour:** Shell pinkish white.

**Size:** Total height up to 72 mm.

**Distribution:** Eastern North and South Islands, Stewart Island, and Chatham Rise.

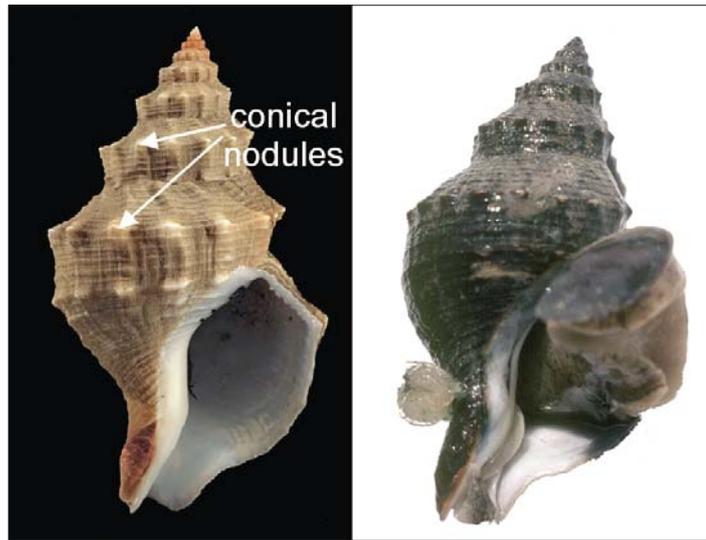
**Depth:** 300 to 700 m.

**Similar species:** *Aeneator otagoensis*. Note *Aeneator benthicola* is the same species.

**References:** Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Neogastropoda  
**Family** Buccinidae (whelks)

***Austrofuscus glans* (KWH) Knobbed whelk**



MOLLUSCA

**Distinguishing features:** Shell sculptured with fine spiral ribs and rounded longitudinal ribs, and 2 rows of rounded or conical nodules (1 on middle of each turn on spire, 2 or 3 on last turn). Base of aperture extending as a short, twisted canal. Fresh specimens with a thin, yellowish brown or blackish outer periostracum skin (see image on right).

**Colour:** Shell whitish or yellowish brown beneath (fresh specimens) thin, outer yellowish-brown or blackish periostracum skin.

**Size:** Total height up to 93 mm.

**Distribution:** North, South, Stewart, and Chatham Islands.

**Depth:** 0 to 420 m.

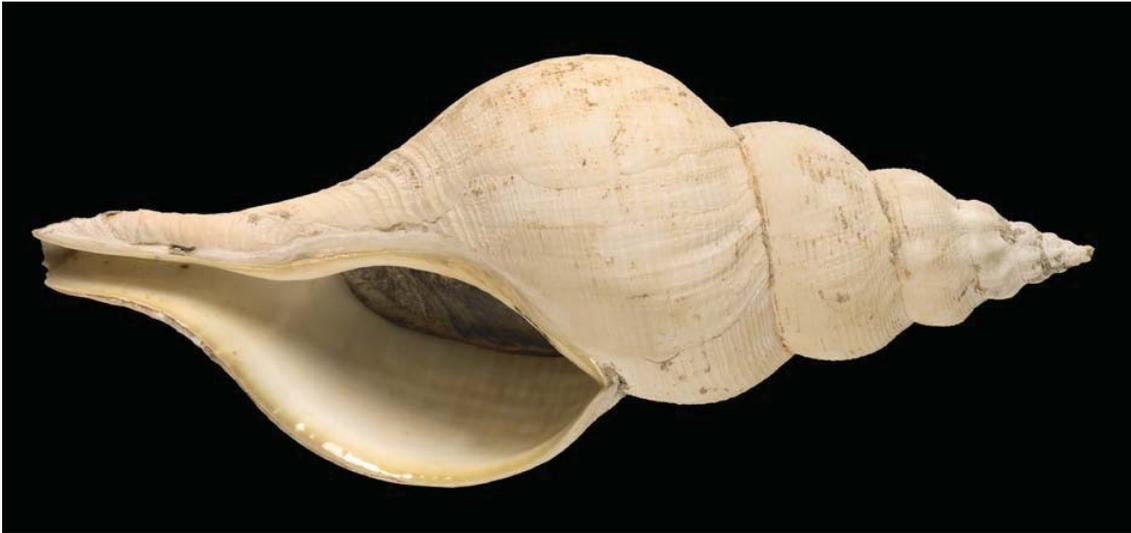
**Similar species:** None.

**References:** Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Neogastropoda  
**Family** Buccinidae (whelks)

***Penion chathamensis* (PCH)**

MOLLUSCA



**Distinguishing features:** Shell higher than wide, spire about as high as aperture. Externally covered with numerous, fine, irregular spiral threads; early whorls additionally with strong, rounded longitudinal ribs. Canal of moderate length. Aperture smooth within.

**Colour:** Exterior dirty white or yellowish. Interior of aperture polished white, rim sometimes yellowish.

**Size:** Total height up to 240 mm.

**Distribution:** North-eastern South Island and Chatham Rise.

**Depth:** 112 to 420 m.

**Similar species:** *Penion benthicolus*, *P. cuvierianus*, *P. fairfieldae*, *P. jeakingsi*, *P. ormesi*, *P. sulcatus*.

**References:** Powell, A.W.B. (1979) New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland p. 201.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Neogastropoda  
**Family** Turbinellidae

### **Coluzea mariae (Pagoda shell) (CMR)**



**Distinguishing features:** Conical spire sculptured with longitudinal and spiral ribs, with small, sharp, conical nodules where the ribs cross. Base of aperture extended as a very long, straight canal.

**Colour:** Shell typically whitish or greyish white.

**Size:** Total height up to 98 mm.

**Distribution:** Eastern South Island, Chatham Rise, and Auckland Islands.

**Depth:** 180 to 700 m.

**Similar species:** *Coluzea spiralis*, *C. wormaldi*, *C. altocanal*, *Columbarium veridicum*.

**References:** Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Neogastropoda  
**Family** Turridae (turrids)

***Comitas onokeana vivens* (COV)**



MOLLUSCA

**Distinguishing features:** Shell high and narrow, spire higher than aperture. On spire, upper third of each whorl smooth and concave, lower third of each whorl with oblique, rounded ribs. Upper part of aperture deeply notched. Aperture smooth within. Canal short.

**Colour:** Chalky or greyish white.

**Size:** Total height up to 75 mm.

**Distribution:** Palliser slope, eastern South Island, Chatham Rise and Campbell Plateau.

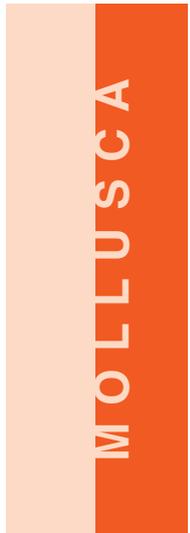
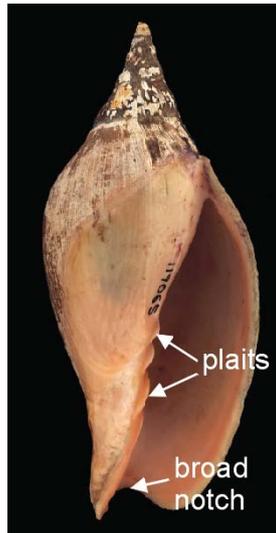
**Depth:** 420 to 1000 m. On soft bottoms.

**Similar species:** None in Guide.

**References:** Powell, A.W.B. (1979) New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland p. 229.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Neogastropoda  
**Family** Volutidae (volutes)

### ***Alcithoe larochei* (ALL)**



**Distinguishing features:** Typically no nodules on the spire. Broad notch at base of aperture; 5 or 6 rounded plaits on wall of left (inner) side of the aperture.

**Colour:** Whitish shell, typically more or less covered with blackish skin.

**Size:** Total height up to 165 mm.

**Distribution:** Eastern North Island and northeastern South Island.

**Depth:** 200 to 650 m.

**Similar species:** *Alcithoe jaculoides*, *A. arabica*, *A. fissurata*, *A. benthicola*, *A. fusus*, *A. wilsonae*.

**References:** Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Neogastropoda  
**Family** Volutidae (Volutes)

### ***Alcithoe wilsonae* (AWI)**

MOLLUSCA



**Distinguishing features:** Shell narrowly elongate. Typically with elongate nodules on the spire, though some specimens are completely smooth. Narrow notch at base of the aperture; 5 or 6 rounded plaits on wall of left (inner) side of the aperture.

**Colour:** Shell uniform cream or chalky white; or yellowish with dark, irregular zigzag colour pattern.

**Size:** Total height up to 130 mm.

**Distribution:** Chatham Rise, eastern South Island, Snares Shelf and Campbell Plateau.

**Depth:** 124 to 585 m. On soft bottoms.

**Similar species:** *Alcithoe arabica*, *A. benthicola*, *A. fissurata*, *A. fusus*, *A. larochei*, *A. lutea*.

**References:** Bail, P., Limpus, A. (2006). The recent volutes of New Zealand, with a revision of the genus *Alcithoe*

H. & A. Adams, (1853). A conchological iconography. Conchbooks, Hackenheim (p. 55).

Powell, A.W.B. (1979) New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland p. 209.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Neogastropoda  
**Family** Volutidae (Volutes)

***Provocator mirabilis* (Golden volute) (GVO)**



MOLLUSCA

**Distinguishing features:** Highly polished and smooth. No nodules on the spire. Small notch at base of aperture; no plaits on wall of left (inner) side of the aperture.

**Colour:** Typically orange, occasionally white.

**Size:** Total height up to 160 mm.

**Distribution:** Eastern North and South Islands, Chatham Rise, and Auckland Islands.

**Depth:** 250 to 790 m.

**Similar species:** *Alcithoe* spp.

**References:** Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Nudibranchia  
**Family**

**(Sea slug, Nudibranch) (NUD)**



**Distinguishing features:** The shell may be completely lacking (compared with other gastropods) or very small and concealed within the body. They may be brilliantly coloured and decorated with numerous fleshy, spike-like projections called cerata.

**Colour:** Can be red, yellow, pink, orange, green, blue, spotted, white, purple in life, but lose colour when preserved.

**Size:** Total height from 20 to 150 mm.

**Distribution:** Worldwide.

**Depth:** Intertidal to deepwater.

**Similar species:** Could be mistaken for sea cucumbers, but can be distinguished by their strong, muscular snail-like foot.

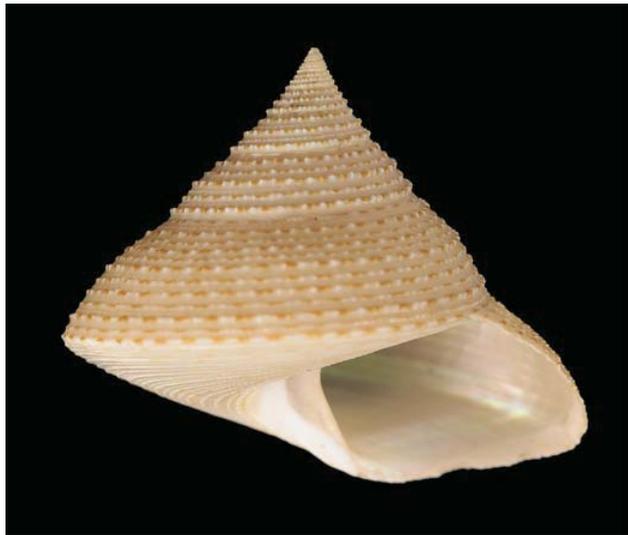
**References:** Willan, R.C. (1983). New Zealand side-gilled sea slugs (Opisthobranchia: Notaspidea: Pleurobranchidae). *Malacologia* 23: 221–270.

Willan, R.C.; Coleman, N. (1984). Nudibranchs of Australasia. Australasian Marine Photographic Index, Sydney. 56 p.

Willan, R.C.; Morton, J.E. (1984). Marine molluscs Part 2: Opisthobranchia. University of Auckland, Leigh Marine Laboratory, Leigh, New Zealand. 106 p.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Vetigastropoda  
**Family** Calliostomatidae (top shells)

### **Calliostoma selectum (Maurea) (CSS)**



**Distinguishing features:** Shell top-shaped, edge angulate, sculptured with narrow spiral threads covered with many small nodules.

**Colour:** Spire pinkish white or pale yellowish brown, with yellowish brown and white spots and streaks on spiral threads. Base (aperture side) whitish. Aperture pearly within.

**Size:** Diameter up to 70 mm.

**Distribution:** North, South, Stewart and Chatham Islands.

**Depth:** 27 to 274 m.

**Similar species:** *Calliostoma waikanae*, *C. pellucidum*, *C. turnerarum*

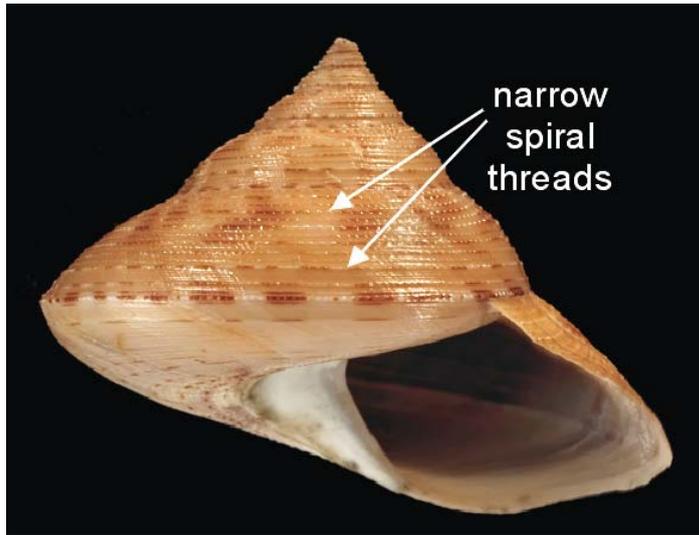
**References:** Marshall, B.A., (1995). A revision of the recent Calliostomatidae of New Zealand (Mollusca: Gastropoda: Trochoidea). *The Nautilus* 108: 83–126 (p. 108).

Powell, A.W.B. (1979) New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland p. 61.

**Phylum** Mollusca  
**Class** Gastropoda  
**Order** Vetigastropoda  
**Family** Calliostomatidae (top shells)

### ***Calliostoma turnerarum* (CTN)**

MOLLUSCA



**Distinguishing features:** Shell top-shaped, edge angulate, sculptured with narrow spiral threads covered with many small nodules.

**Colour:** Spire yellowish brown or light orange brown with reddish brown and white spots and streaks. Base (aperture side) whitish with yellowish to reddish brown streaks. Aperture pearly within.

**Size:** Diameter up to 85 mm.

**Distribution:** Three Kings Islands, northeastern North Island as far south as Cape Runaway, and off Ninety Mile Beach.

**Depth:** 230 to 530 m.

**Similar species:** *Calliostoma selectum*, *C. waikanae*.

**References:** Marshall, B.A. (1995). A revision of the recent Calliostomatidae of New Zealand (Mollusca: Gastropoda: Trochoidea). *The Nautilus* 108: 83–126.

**Phylum** Mollusca  
**Class** Amphineura (chitons)  
**Order**  
**Family**

### (Chiton) (CHT)



MOLLUSCA

**Distinguishing features:** Symmetrical with an ovoid body and no eyes or tentacles. The shell is divided into 8 overlapping plates. Will be attached to some form of hard substrate.

**Colour:** Generally dull brown or greenish, but may be red or brighter colours.

**Size:** From 20 to 110 mm.

**Distribution:** Worldwide.

**Depth:** Intertidal to deepwater

**Similar species:** A generic image of a chiton is shown. There are several genera found in the New Zealand region.

**References:** Powell, A.W.B. (1979). New Zealand Mollusca. Marine, land and freshwater shells. Collins, Auckland.

