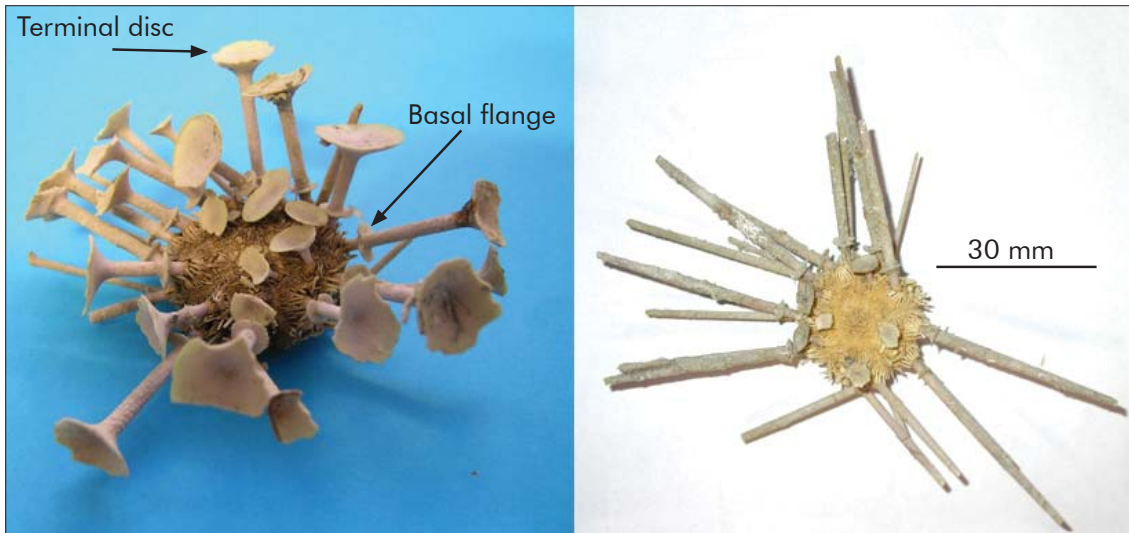


**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Cidaroida  
**Family** Cidaridae

### ***Goniocidaris parasol* (Parasol urchin) (GPA)**



**Distinguishing features:** Larger spines long and thick, often encrusted with sponges, polyzoa, and hydroids. Spines on the upper surface terminating in a large, umbrella-like disc and bearing a complete or partial disc or flange at their base. Variable in form with some (possibly younger) individuals having longer spines with smaller terminal discs.

**Colour:** Test and secondary spines pale brown/cream, primary spines cream.

**Size:** Diameter up to 30 mm (spines up to 50 mm).

**Distribution:** Common from the Chatham Rise to the Campbell Plateau, including the Bounty Plateau.

**Depth:** 200 to 1000 m.

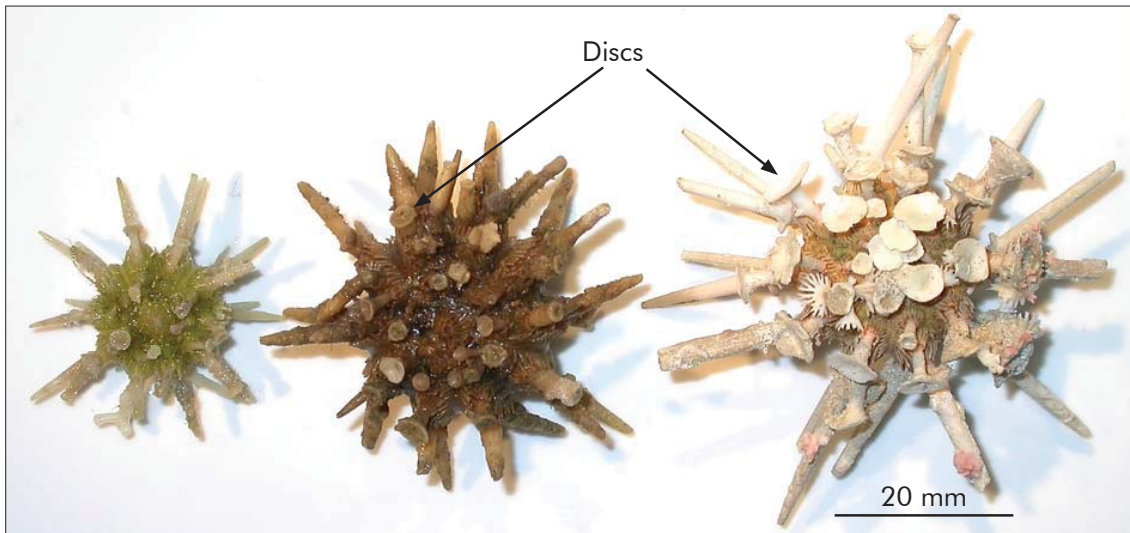
**Similar species:** May be confused with *G. umbraculum*, which also have (small) umbrella-like discs on their large spines, but the spines themselves are shorter and instead of a disc or flange bear spurs or thorns at the base. *G. umbraculum* is also more common in shallower waters, 20 to 200 m.

**References:** Fell, H.B. (1958). Deep-sea echinoderms of New Zealand. *Zoology Publications from Victoria University of Wellington* 24. 40 p.

Fell, H.B. (1960). Biological results of the Chatham Islands 1954 Expedition. Part 2. Archibenthal and littoral echinoderms. *NZOI Memoir* 5. 98 p.

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Cidaroida  
**Family** Cidaridae

### ***Goniocidaris umbraculum* (Umbrella urchin) (GOU)**



**Distinguishing features:** Primary spines short (generally less than the test diameter), thick, pale coloured, and often encrusted with sponges, polyzoa, and hydroids. Spines on upper surface bear small, umbrella-like discs at the outer end and spurs or thorns at the inner end.

**Colour:** Test often distinctly greenish on the upper surface. Larger spines brown, those at the circumference may be tinged with green near the base.

**Size:** Diameter up to 30 mm.

**Distribution:** Well known from Foveaux Strait where they were commonly caught in oyster dredges. Also found off the east coast of South Island up to Cook Strait and occasionally on the Chatham Rise.

**Depth:** 60 to 400 m.

**Similar species:** The larger spines of *G. parasol* are longer than those of *G. umbraculum* and have larger terminal umbrellas and a complete or partial disc or flange close to their base. *G. parasol* is more common over the Chatham Rise and elsewhere south of Cook Strait, in deeper waters. Other species of *Goniocidaris* and *Ogmocidaris benhami*, all found in northern waters, may also have umbrella-like spines.

**References:** Fell, H.B. (1960). Biological results of the Chatham Islands 1954 Expedition. Part 2. Archibenthal and littoral echinoderms. NZOI Memoir No. 5. 94 p.

Barker, M.F. (1984). Reproduction and development in *Goniocidaris umbraculum*, a brooding echinoid. *Proceedings of the 5th International Echinoderm Conference, Galway, 1984* : pp. 207–214.

<b>Phylum</b>	Echinodermata
<b>Class</b>	Echinoidea (sea urchins)
<b>Order</b>	Cidaroida
<b>Family</b>	Cidaridae

### **Ogmocidaris benhami (OBE)**



**Distinguishing features:** Test flattened. Peristome (bottom section) smaller than apical system (round, upper section). Apical system about 50% of test diameter. Larger spines with very short collar and neck (differentiated basal sections); spine shafts ornamented with fine granules and dense hairs. Spines around mouth flattened with serrated edges. Larger specimens may have small umbrella-like disks on short spines on the upper surface (as in *Goniocidaris* spp.), and longer spines may have a trumpet shaped tip.

**Colour:** Pale brown.

**Size:** Diameter up to 25 mm.

**Distribution:** Relatively common in northern New Zealand waters, also recorded from the Chatham Rise.

**Depth:** 200 to 800 m.

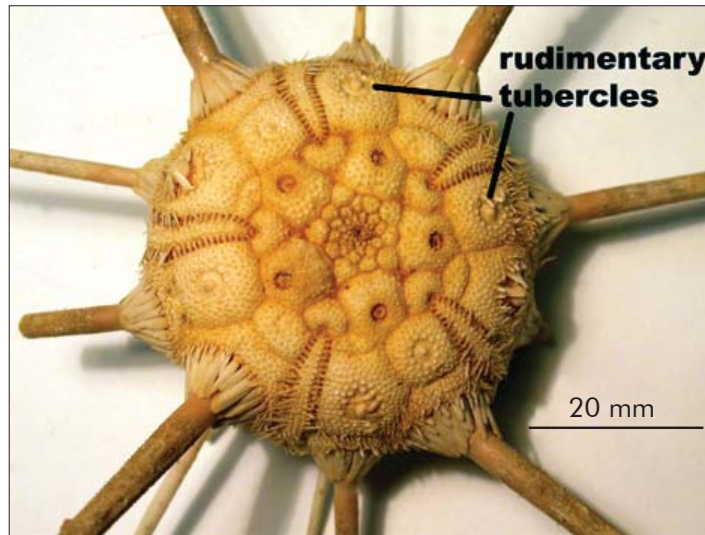
**Similar species:** Similar to other species in the same sub-family (*Goniocidarinae*), especially the 2 common *Goniocidaris* species, but the lack of basal flanges on the primary spines readily distinguishes *Ogmocidaris* from these. Could be confused with other small cidarid species, e.g., *Austrocidaris pawsoni* (apical system < 50% of test diameter), *Aporocidaris milleri* (apical system 56-75% of test diameter), *Prionocidaris* spp. (test hardly flattened), and *Rhopalocidaris* spp. (smaller).

**References:** Mortensen, T. (1922). Papers from Dr. Th. Mortensen's Pacific Expedition 1914–16. VIII. Echinoderms of New Zealand and the Auckland-Campbell Islands. I. Echinoidea. *Vid. Medd.* 73. 139–198.

O'Shea, S.; McKnight, D.G., Clark, M.R. (1999). Bycatch-the common, unique, and bizarre. *Seafood New Zealand, June 1999.* pp 45–51.

**Phylum** Echinodermata  
**Class** Echinodea (sea urchins)  
**Order** Cidaroida  
**Family** Cidaridae

### **Stereocidaris spp. (STC)**



**Distinguishing features:** These are typically large, robust urchins with sturdy spines. All plates are densely covered in spines. The top one or two test plates in each double series bears only a rudimentary tubercle, with no spine. The primary spines are highly variable, often cylindrical, cigar, club, or even oar shaped and often have thorny narrow ribs.

**Colour:** Test and spines generally pale yellowish to dull, light brown. Neck (innermost section) of primary spines a bright shining pink in one species at least.

**Size:** Diameter up to 80 mm. Spines up to 100 mm

**Distribution:** Records come mainly from Hawke Bay, the Bay of Plenty, the southern Kermadec Ridge and Three Kings Ridge.

**Depth:** 400 to 1000 m.

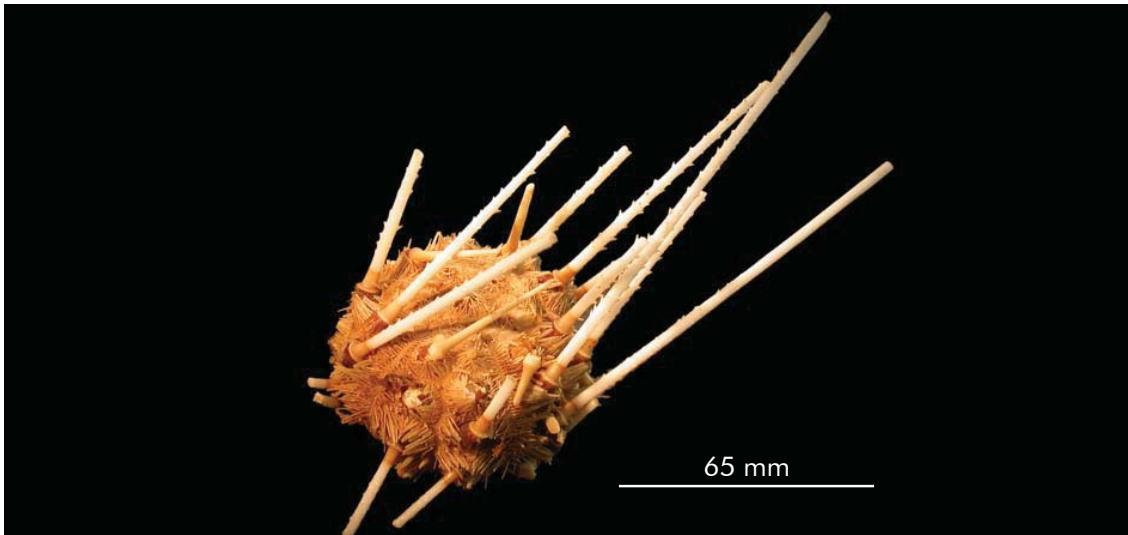
**Similar species:** Includes *S. sceptriferoides*, *S. microtuberculata*, and possibly one other species. The only other large deepwater cidarid sea urchins in New Zealand waters that *Stereocidaris* could be confused with are *Histocidaris* spp., which have large naked areas on the genital plates and fully formed uppermost primary spines.

**References:** Mortensen, T. (1928). Monograph of the echinoidea, I. Cidaroida. Copenhagen.

Pawson, D.L. (1965). Some echinozoans from northern New Zealand. *Transactions of the Royal Society of New Zealand*. 5(15). 198–224.

<b>Phylum</b>	Echinodermata
<b>Class</b>	Echinoidea (sea urchins)
<b>Order</b>	Cidaroida
<b>Family</b>	Histocidaridae

### ***Histocidaris* spp. (HIS)**



**Distinguishing features:** The apical plates (central group of plates on upper side) bear few spines, leaving large naked areas. Primary spines long and cylindrical, and can be either smooth or thorny depending on species. Tubercles (spine attachment points on the test) are crenulated (toothed) rather than smooth as in most other cidarid species, but this feature is difficult to see without first removing the spine and bleaching away the muscle tissue. The spines around the mouth are short, curved and strongly serrated.

**Colour:** Spines mostly white or pale coloured, test brownish.

**Size:** Diameter up to 70 mm. Spines can be longer than 120 mm

**Distribution:** Recorded from the Macquarie Ridge and Campbell Plateau in the south, and widespread in areas of seamounts from Hawkes Bay north. Not recorded from the Chatham Rise.

**Depth:** 150 to 2300 m.

**Similar species:** Five species are present in New Zealand. *H. australiae* (pictured), *H. elegans*, *H. variabilis*, *H. acutispinus*, and *H. recurvata*. Large specimens could be confused with *Stereocidaris* or *Poriocidaris* but the genital plates on these species are densely spined. Without close inspection, smaller specimens could also be confused with these, and other, genera.

**References:** Schultz, H. (2005). Sea urchins – a guide to worldwide shallow water species. Scientific Publications, Germany. 484 p.

Mortensen, T. (1928). Monograph of the echinoidea, I. Cidaroida. Copenhagen.

Miskelly, A. (2002). Sea urchins of Australia and the Indo-Pacific. Capricornia Publications, Sydney. 180 p.

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Cidaroida  
**Family** Histocidaridae

### *Poriodaridaris purpurata* (PCD)

ECHINODERMATA



**Distinguishing features:** A large, robust, sea urchin with sturdy spines up to 2.5 times the diameter of the test. The primary spines are either uniformly pale and tapered with a long brown collar extending up from the base or, in some individuals, the collar is a rich purple colour and swollen making the spine fusiform (cigar) shaped. The pedicellariae (tiny pincers scattered over the surface of the test) are unique among sea urchins in that they are large and of a flattened, two-valved form.

**Colour:** Test and secondary spines, light brown; collar of primary spines brown or purplish, shaft pale or white, or purplish near collar.

**Size:** Diameter from 10 to 65 mm excluding spines. Spines up to 100 mm.

**Distribution:** Known from the Bay of Plenty, Kermadec Ridge, Hawke Bay, and north Chatham Rise. Mainly associated with seamounts.

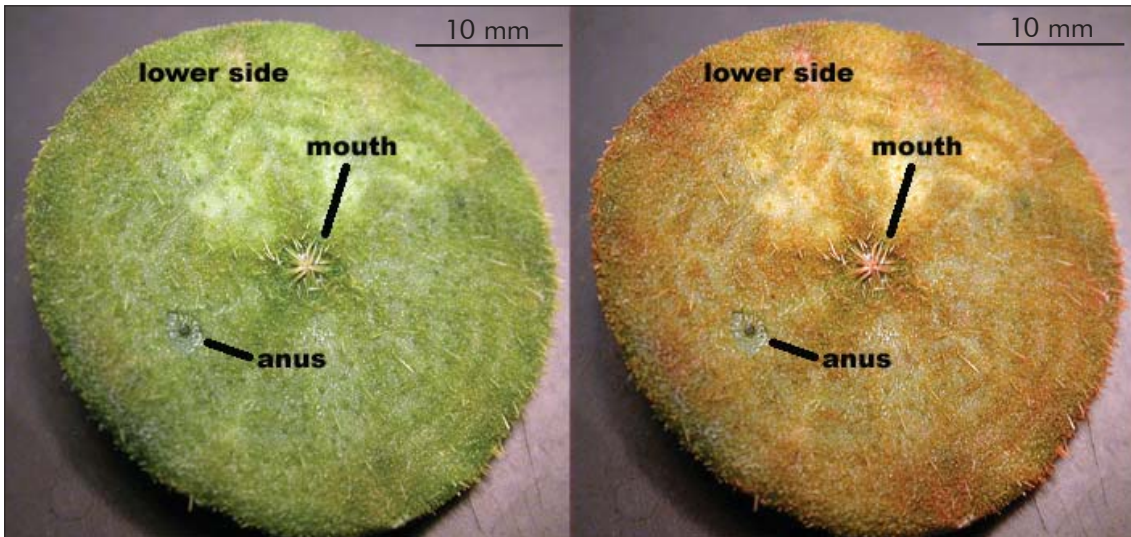
**Depth:** 600 to 1800 m.

**Similar species:** The closest relatives to this (monospecific) genus are in the genus *Histocidaridaris*, of which up to 5 species may be represented in the New Zealand region. *Histocidaridaris* species differ in that they tend to have long, slender, sometimes thorny, spines, and bear very large (up to 5 mm) three-valved pedicellariae.

**References:** Mortensen, T. 1928. Monograph of the echinoidea, I. Cidaroida. Copenhagen

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Clypeasteroidea (sand dollars)  
**Family** Laganidae

***Peronella hinemoae* (PHI)**



ECHINODERMATA

**Distinguishing features:** Test flat, disc-like, more or less circular, with a rounded edge. Anus on lower side, somewhat in from the test edge. Pores of the madreporite (sieve plate) are scattered over the genital plates and are individually visible. Spines of upper side short and dense. Spines of lower side longer and more scattered.

**Colour:** Test and spines red, but turn green and fade on preservation. Dead test white to straw coloured.

**Size:** Diameter up to 45 mm.

**Distribution:** Known from around North Island from Cape Egmont to the Bay of Plenty and from seamounts further north, and also from Fiordland and the Stewart-Snares shelf.

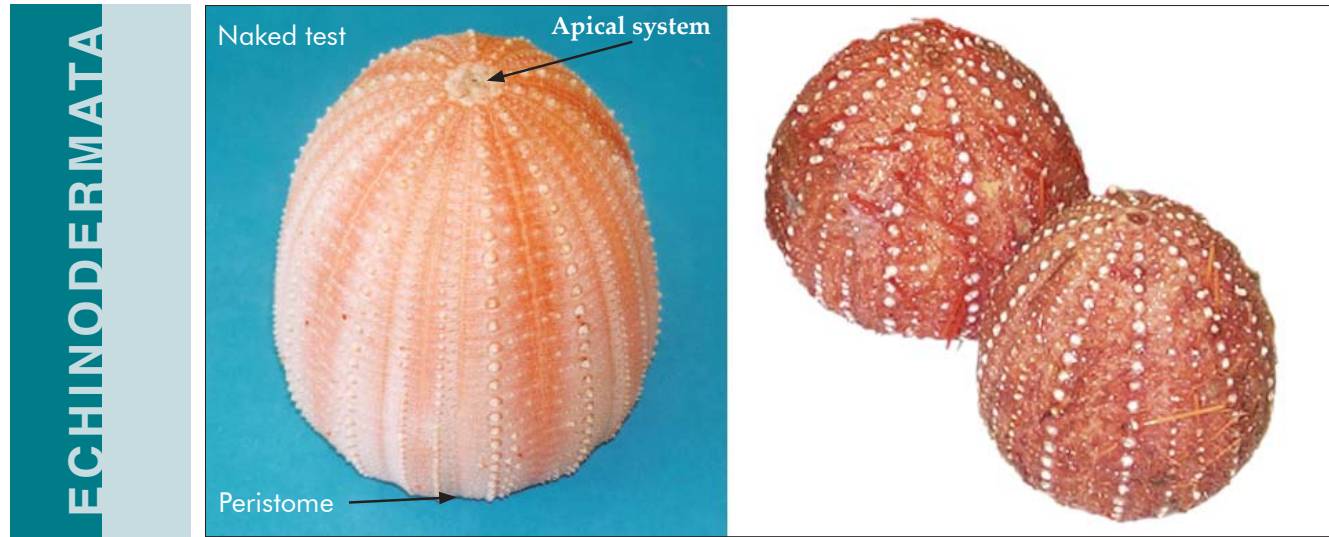
**Depth:** 17 to 775 m.

**Similar species:** There are six other species in this order known from New Zealand. The three species of *Clypeaster* are oval to pentagonal in outline and have the anus adjacent to the edge of the test. *Fellaster zelandiae* is also round in outline, but has a sharp edge and the anus adjacent to it. *Echinocyamus polyporus* is similar but very small (less than 10 mm), less flattened, and paler than *Peronella*.

**References:** McKnight, D.G. (1969). An outline distribution of the New Zealand shelf fauna. Benthos survey, station list, and distribution of the echinoidea. NZOI Memoir No. 47.

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Echinoidea  
**Family** Echinidae

### ***Dermechinus horridus* (Deepsea urchin) (DHO)**



**Distinguishing features:** Test height the largest of any sea urchin (to over 130 mm) and (in large specimens) usually greater than the test diameter. Apical system and peristome very small and of similar size. Larger spines long and slender, forming vertical series. Secondary spines very numerous, fine, bearing thorns, and terminating in a hook.

**Colour:** Test dull to bright red/orange, primary spines orange, smaller spines sometimes whitish.

**Size:** Diameter up to 110 mm. Test height 30 to 130 mm.

**Distribution:** Circumpolar (South Africa, South America, South Australia). Widespread in New Zealand (Northland, Challenger Plateau, Bay of Plenty, west coast South Island, Kaikoura, and the Chatham Rise).

**Depth:** 200 to 1200 m.

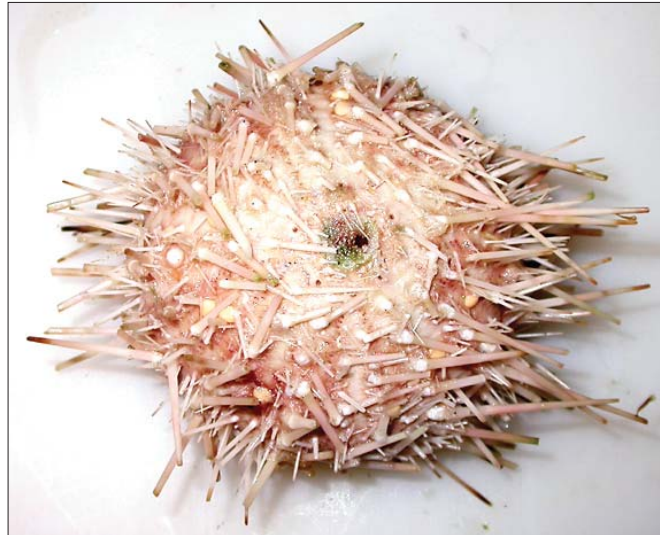
**Similar species:** The only other New Zealand species in this family, *Gracilechinus multidentatus*, is unlikely to be confused with *D. horridus* due to its much paler colour and more numerous and robust primary spines. Smaller specimens, which have not yet become very tall, could be confused with *Pseudechinus flemingi*, but the peristome and apical system of this species are relatively large.

**References:** McKnight, D.G. (1974). Some echinoids new to New Zealand waters. *New Zealand Oceanographic Institute Records* 2(3): 27–44.



**Class** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Echinoida  
**Family** Echinidae

### ***Gracilechinus multidentatus* (Deepsea kina) (GRM)**



ECHINODERMATA

**Distinguishing features:** Large test, variable in ratio of test diameter to height. Larger spines 30 to 35 mm long and tapered. Probably the most common species of sea urchin in trawl bycatch in the New Zealand region; often caught in large numbers, especially on the south Chatham Rise. The roe are edible when ripe (late August-early September on the Chatham Rise).

**Colour:** Test colour variable but always very pale, either pink, cream, or light brown. Spines are pink/white and darker at the tips.

**Size:** Diameter up to 100 mm. Spines about equal in length to test diameter.

**Distribution:** Widespread around the New Zealand region, from the Lord Howe Rise, Kermadec Ridge, and Bay of Plenty in the north, to the Auckland Islands in the south. Particularly common on the south Chatham Rise.

**Depth:** 250 to 1400 m.

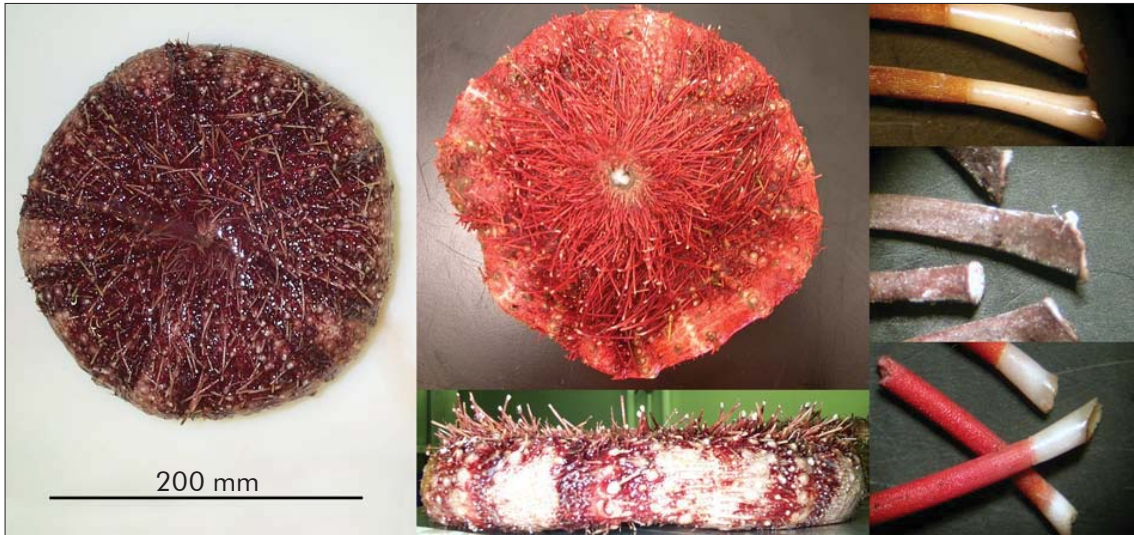
**Similar species:** The only other member of the family in New Zealand, *Dermechinus horridus*, is bright orange.

**References:** McKnight, D.G. (1968). Additions to the echinoid fauna of New Zealand. *New Zealand Journal of Marine and Freshwater Research* 2 : 90–110.

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Echinothurioida (Tam O'Shanters)  
**Family** Echinothuriidae

**(Tam O'Shanters) (ECT)**

**ECHINODERMATA**



**Distinguishing features:** Test flexible, discus-shaped, usually compressed flat in the trawl. Larger (primary) spines usually less numerous on upper surface than lower, where they terminate in a whitish hoof which, along with the spines, readily brush off on capture. Handle with care as some species deliver a painful sting.

**Colour:** Several species are dark purple, two are more or less bright red, and one or two are brownish. Hoofs are always a shade of white.

**Size:** Diameter from 30 to 200 mm.

**Distribution:** Widespread locally, throughout the New Zealand region.

**Depth:** 200 to 3000 m. Possibly deeper.

**Similar species:** At least 7 species (in 5 genera) are known from New Zealand waters, although the exact identity of three or more species is still uncertain. *Phormosoma* spp. are similar, but can usually be distinguished by their light brown colour, sharply pointed teeth, large sunken tubercles, and lack of terminal glassy hoofs on the large spines of the lower surface.

**References:** Mortensen, T. (1935). Monograph of the echinoidea, II. Bothriocidaroida, Melonechinoidea, Lepidocentroida, and Stirodonta. Copenhagen.

Baker, A.N. (1972). *Araeosoma coriaceum* (A. Agassiz) and *Pseudoboletia indiana* (Michelin), new to New Zealand, with notes on other echinoids from the Bay of Plenty, New Zealand. *Records of the Dominion Museum* 8(2): 9–19.

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Echinothurioida (Tam O'Shanters)  
**Family** Echinothuriidae, Phormosomatidae

### (Tam O'Shanters) (TAM)



ECHINODERMATA

**Distinguishing features:** Test flexible, usually compressed into a disc or frisbee-like shape when captured. Larger spines usually more numerous on lower surface than upper; larger spines terminate in a whitish hoof-like piece or a glandular bag. In many species these large spines readily brush off with capture, making identification difficult. Handle with care as some species deliver a painful sting.

**Colour:** Purple, sometimes streaked with white, bright-reddish, or brown.

**Size:** Diameter up to 250 mm.

**Distribution:** Widespread throughout the New Zealand region.

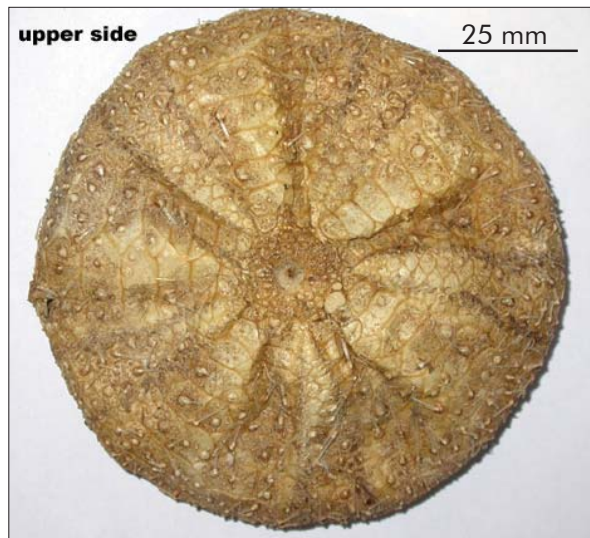
**Depth:** 200 to 3000 m. Possibly deeper.

**Similar species:** At least 9 species are known from New Zealand waters, and more may be expected, as this group of echinoderms is not well studied.

**References:** Baker, A.N. (1972). *A raeosoma coriaceum* (A. Agassiz) and *Pseudoboletia indiana* (Michelin), new to New Zealand, with notes on other echinoids from the Bay of Plenty, New Zealand. *Records of the Dominion Museum* 8(2): 9–19.

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Echinothurioida (Tam O'Shanters)  
**Family** Phormosomatidae

### **Phormosoma spp. (PHM)**



**Distinguishing features:** Test flexible, discus-shaped, usually compressed flat in the trawl. Larger (primary) spines usually less numerous on upper surface than lower, where they terminate in a glandular sac. Spines readily brush off with capture. Handle with care as some Tam O'Shanters deliver a painful sting.

**Colour:** Brownish or orange-yellow.

**Size:** Diameter from 40 to 120 mm.

**Distribution:** *P. bursarium* is widely distributed throughout the Indo-Pacific, *P. rigidum* is known only from New Zealand, off the Bay of Plenty.

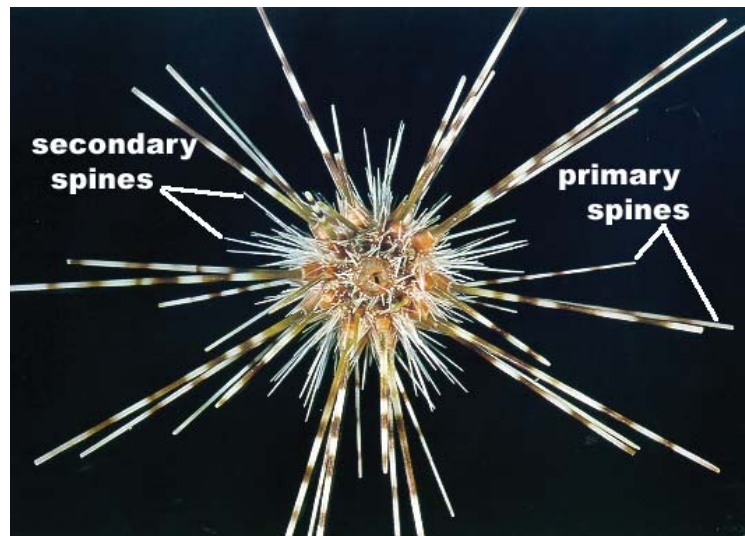
**Depth:** 170 to 2340 m. *P. rigidum* known only from 1260 m.

**Similar species:** Two species are recognised from New Zealand, with microscopic differences. The tube feet on the upper side are arranged in distinct arcs of three in *P. bursarium* whereas in *P. rigidum* the tube feet are less well developed and formed into single columns. *Phormosomas* differ from other Tam O'Shanters in that areoles of their tubercles (spine bases) are large and deeply sunk into the test, the teeth are strongly pointed, and (although often lost on capture) the primary spines of the lower surface terminate in a gelatinous sac rather than a glassy hoof.

**References:** Mortensen, T. (1935). Monograph of the echinoidea, II. Bothriocidaroida, Melonechinoidea, Lepidocentroida, and Stirodonta. Copenhagen

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Pedinoidea  
**Family** Pedinidae

### ***Caenopedina novaezelandiae* (Banded-spine urchin) (CNO)**



**Distinguishing features:** Test height about half of the test diameter. Primary spines up to 3 times test diameter with broad colour bands (up to about 5 mm wide). Secondary spines long and generally white, sometimes with green-tinged tips. All spines bear numerous spinelets.

**Colour:** Larger spine bands green (especially near base), white, and reddish brown. Shorter spines generally white, sometimes with green-tinged tips. Test white/brownish-green; apical system (centre of upper surface) green.

**Size:** Diameter up to 30 mm.

**Distribution:** Bay of Plenty north.

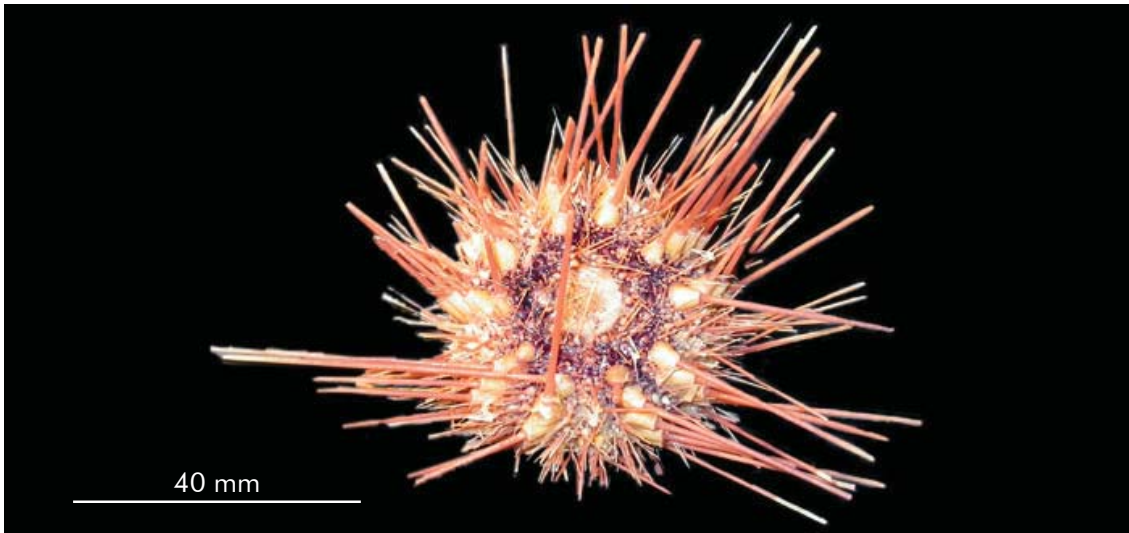
**Depth:** 300 to 500 m.

**Similar species:** Two other species of *Caenopedina* are known from the New Zealand region, both are more or less uniform reddish-brown in colour. One is known from near Norfolk Island, the other from off Dunedin.

**References:** Pawson, D.L. (1964). The genus *Caenopedina* in New Zealand. *Transactions of the Royal Society of New Zealand* 5(5): 63–70.

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Pedinoidea  
**Family** Pedinidae

### ***Caenopedina otagoensis* (CAO)**



**Distinguishing features:** The primary spines are long (up to twice the diameter of the test), slender, and tapering, with longitudinal striations and very fine teeth. Internally, the supports for the jaw muscles which ring the opening on the lower surface consist of 5 pairs of peglike “auricles” and are not joined at the outer end as in most other species of sea urchins.

**Colour:** Test and spines reddish brown, apical system dark purplish, nearly black. Spines may be lighter in colour towards the tip.

**Size:** Diameter from 15 to 40 mm.

**Distribution:** Known only from off the southeast coast of South Island, but likely to be more widespread.

**Depth:** 1200 to 1300 m. Range likely to widen with more records.

**Similar species:** None of the three or four other *Caenopedina* species have the reddish brown test and spines, along with the dark apical system (round set of plates at centre top). Skeletal differences (mostly internal) separate this order from other sea urchins.

**References:** McKnight, D.G. (1968). Additions to the echinoid fauna of New Zealand. *N.Z. Journal of Marine and Freshwater Research* 2 : 90–110

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Pedinoidea  
**Family** Pedinidae

### **Caenopedina sp. (CAL)**



**Distinguishing features:** Large and uniformly dark brown. The order Pedinoidea is differentiated from more modern sea urchins mostly by internal skeletal structures, especially the primitive nature of the jaw parts (which are not joined at the top), jaw muscle supports (pairs of unjoined peg-like structures), and teeth (grooved rather than t-shaped). The secondary spines are hollow.

**Colour:** Spines and test rich, dark brown.

**Size:** Diameter from 20 to 100 mm.

**Distribution:** Bay of Plenty northward.

**Depth:** 400 to 1700 m. Range possibly wider.

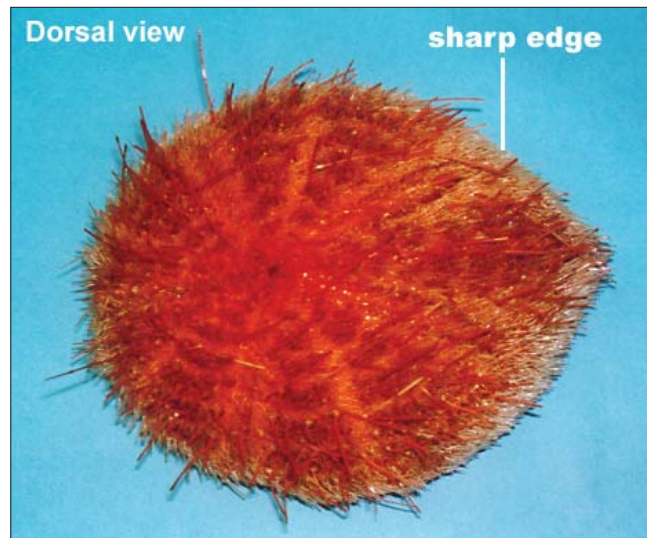
**Similar species:** There are 2 described species of *Caenopedina* known from the New Zealand region and at least one or two more yet to be described. This species is by far the largest. *C. novaezelandiae* is paler coloured with long spines banded green, red and brown. The test and spines (unbanded) of *C. otagoensis* are light reddish brown, test darker on top.

**References:** None for this species.

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Spatangoida (heart urchins)  
**Family** Spatangidae

### ***Paramaretia peloria* (Microsoft mouse) (PMU)**

ECHINODERMATA



**Distinguishing features:** Test ovate and low, lower surface very flat to concave and upper surface evenly rounded. Frontal notch absent. Edge of upper surface sharp. Upper surface densely covered in tubercles, strongly sunken into the test. Spines slightly curved but usually broken.

**Colour:** Test dull grey, spines reddish-brown above, paler on sides.

**Size:** Total length up to 90 mm.

**Distribution:** S.E. Australia (NSW, Victoria, Tasmania), widespread in New Zealand from Stewart Island to Three Kings Islands, including the Chatham Rise.

**Depth:** 50 to 700 m.

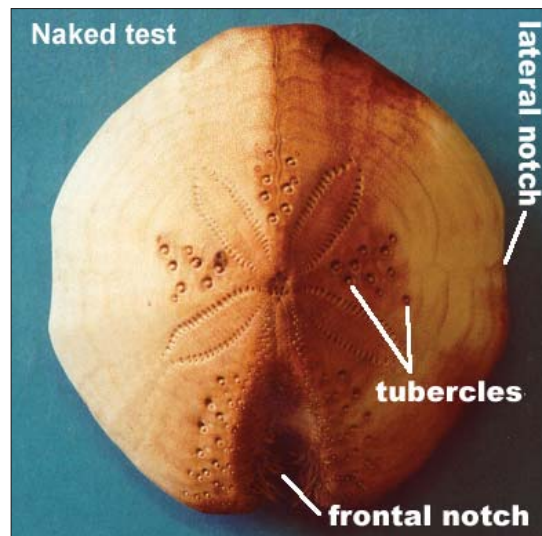
**Similar species:** *Paramaretia tuberculata*, although less common, has a similar distribution in New Zealand. It can be distinguished from *P. peloria* by the much fewer number of large tubercles on the upper surface and the more rounded test edge.

**References:** Baker, A.N.; Rowe, F.W.E. (1990). Atelostomatid sea urchins from Australian and New Zealand waters (Echinoidea: Cassiduloidea, Holasteroidea, Spatangoida, Neoplampadoidea). *Invertebrate Taxonomy* 4: 281–316.



<b>Phylum</b>	Echinodermata
<b>Class</b>	Echinoidea (sea urchins)
<b>Order</b>	Spatangoida (heart urchins)
<b>Family</b>	Spatangidae

### *Spatangus mathesoni* (Matheson's heart urchin) (SMT)



ECHINODERMATA

**Distinguishing features:** Test large, heart-shaped in outline and tent-shaped in profile with a deep frontal notch and shallow lateral notches. The upper surface is not inflated (i.e., flat rather than convex). On upper surface large, sunken, spine bearing tubercles are limited to the area between the petaloid ambulacra. Upper surface also covered by a dense coat of small spines. On the lower surface the spines are longer but less dense.

**Colour:** Deep reddish-brown, purple in preserved specimens.

**Size:** Diameter up to 110 mm.

**Distribution:** Challenger Plateau, east and west coasts of the North Island, Chatham Rise.

**Depth:** 650 to 1050 m.

**Similar species:** *Spatangus multispinus* has numerous larger spines all over the inflated upper surface; *S. lutkeni* has fewer spines but is also quite strongly inflated on the upper surface.

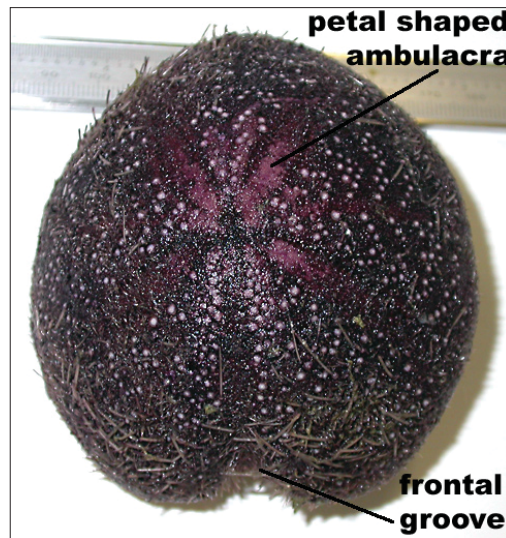
**References:** Baker, A.N.; Rowe, F.W.E. (1990). Atelostomatid sea urchins from Australian and New Zealand waters (Echinoidea: Cassiduloidea, Holasteroidea, Spatangoida, Neoplampadoidea). *Invertebrate Taxonomy* 4: 281–316.

McKnight, D.G. (1968). Additions to the echinoid fauna of New Zealand. *New Zealand Journal of Marine and Freshwater Research* 2: 90–110.

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Spatangoida (heart urchins)  
**Family** Spatangidae

### ***Spatangus multispinus* (Purple-heart urchin) (SPT)**

ECHINODERMATA



**Distinguishing features:** Broadly oval-heart-shaped large test with a deep frontal notch. The distinct, petaloid (petal-shaped) ambulacra lie close to flush with the surface of the test. Primary spines long, erect, and fairly dense on upper surface.

**Colour:** Test and spines a deep, rich violet fading to mauve after preservation.

**Size:** Diameter up to 100 mm.

**Distribution:** Found throughout New Zealand, especially off the east coasts of the North and South Islands, the Chatham Rise, and Stewart Island.

**Depth:** 30 to 1000 m.

**Similar species:** *Spatangus mathesoni* tends to be larger and have a sharper latero-ventral margin. Also *S. lutkeni* (very similar, but less common) and *S. capensis* (rare). These species generally have fewer larger tubercles, limited on the upper surface to the areas between the petaloid ambulacra.

**References:** Baker, A.N.; Rowe, F.W.E. (1990). Atelostomatid sea urchins from Australian and New Zealand waters (Echinoidea: Cassiduloidea, Holasteroidea, Spatangoida, Neoplampadoidea). *Invertebrate Taxonomy* 4: 281–316.

McKnight, D.G. (1969). An outline of the New Zealand shelf fauna: benthos survey, station list, and distribution of the Echinoidea. *New Zealand Oceanographic Institute Memoir* 47. 86 p.

**Phylum** Echinodermata  
**Class** Echinoidea (sea urchins)  
**Order** Temnopleuroida  
**Family** Temnopleuridae

### ***Pseudechinus flemingi* (Fleming's urchin) (PFL)**



**Distinguishing features:** Long, fine, densely matted larger spines of length up to equal the test diameter. Test slightly flattened, especially on lower surface. Peristome (membranous area at centre of lower surface) is wider than the apical system (area at centre of upper surface).

**Colour:** Spines a rich orange-red or deep salmon colour, test a rich rose red with paler rose tubercles (spine supports).

**Size:** Diameter up to 50 mm.

**Distribution:** Found on the Chatham Rise, especially the south flanks and around the Mernoo Bank, and off Otago.

**Depth:** 90 to 600 m.

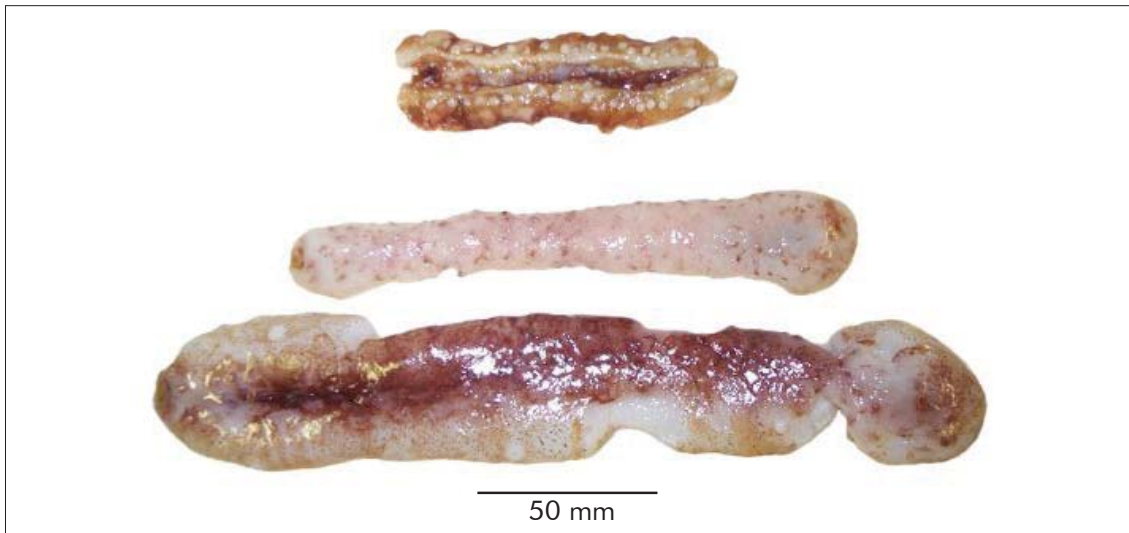
**Similar species:** The 4 other species of *Pseudechinus* found in the New Zealand region are of a similar size and shape, but are duller in colour, and generally found in shallower water. *Dermechinus horridus* is a similar colour but has shorter spines, a taller test (in large specimens), and smaller, even sized, apical systems and peristomes.

**References:** Fell, H.B. (1958). Deep-sea echinoderms of New Zealand. *Zoology Publications from Victoria University of Wellington* 24. 40 p.

McKnight, D.G. (1969). An outline distribution of the New Zealand shelf fauna. *New Zealand Oceanographic Institute Memoir* 47. 91 p.

**Phylum** Echinodermata  
**Class** Holothuroidea (sea cucumbers)  
**Order** Aspidochirotida  
**Family** Synallactidae

### ***Bathyplores moseleyi* (BAM)**



**Distinguishing features:** Body wall fungiform (with low white wart-like discs on the end of thin stalks) and with brown spots. Fragile (often collapses on collection). Body wall may peel off and separate into 1 to 2 strips. Has 18 to 20 tentacles, often damaged.

**Colour:** White with brown spotting. Tentacles orange with white stalks.

**Size:** Length up to 250 mm.

**Distribution:** South East Pacific off Chile, Southern Japan, China Sea, Antarctica, New Zealand and Australia.

**Depth:** About 220 to 480 m around New Zealand, elsewhere to about 800 m.

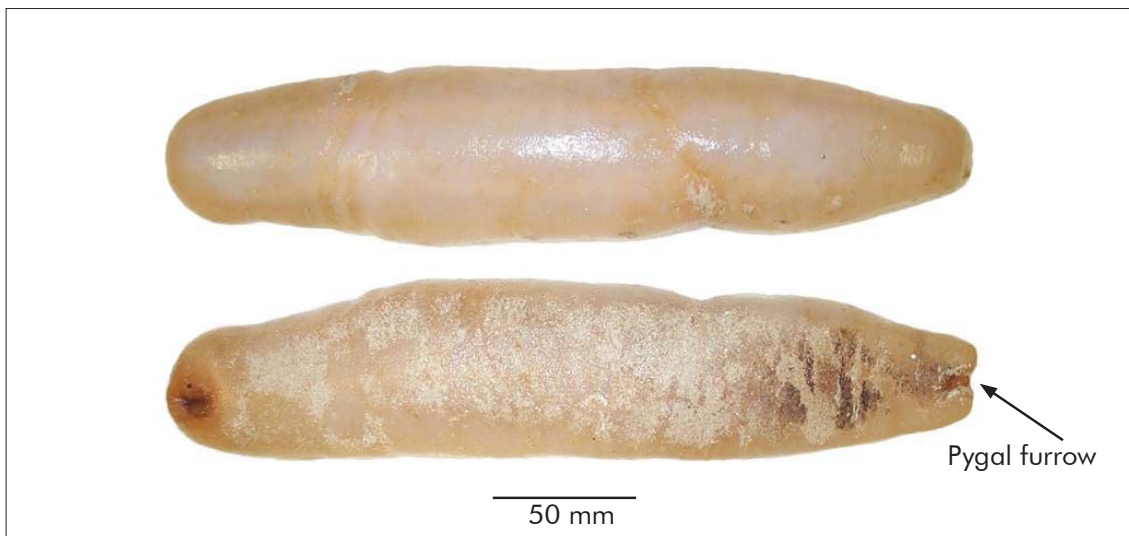
**Similar species:** Fungiform warts and brown spots distinguish this species from others of the genus.

**References:** Pawson, D. (1965). The Bathyal Holothurians of the New Zealand Region. *Zoology Publications from Victoria University of Wellington* No. 39. 33 p.

Pawson, D. (1970). The Marine fauna of New Zealand: Sea Cucumbers (Echinodermata: Holothuroidea). *NZOI Memoir no.52*. 69 p.

**Phylum** Echinodermata  
**Class** Holothuroidea (sea cucumbers)  
**Order** Aspidochirotida  
**Family** Synallactidae

### ***Pseudostichopus mollis* (PMO)**



**Distinguishing features:** Distinctly cylindrical often holding its shape after collection and preservation. Thick leathery body wall. Tube feet small and often inconspicuous. Pygal furrow (5 lobes around anus) visible on some specimens.

**Colour:** Pale brown to creamy white body wall often covered with grit.

**Size:** Length up to 225 mm.

**Distribution:** North and South Pacific Ocean, southern Indian Ocean, eastern Australian continental slope, Antarctic ocean, Western Antarctica, Weddell Sea.

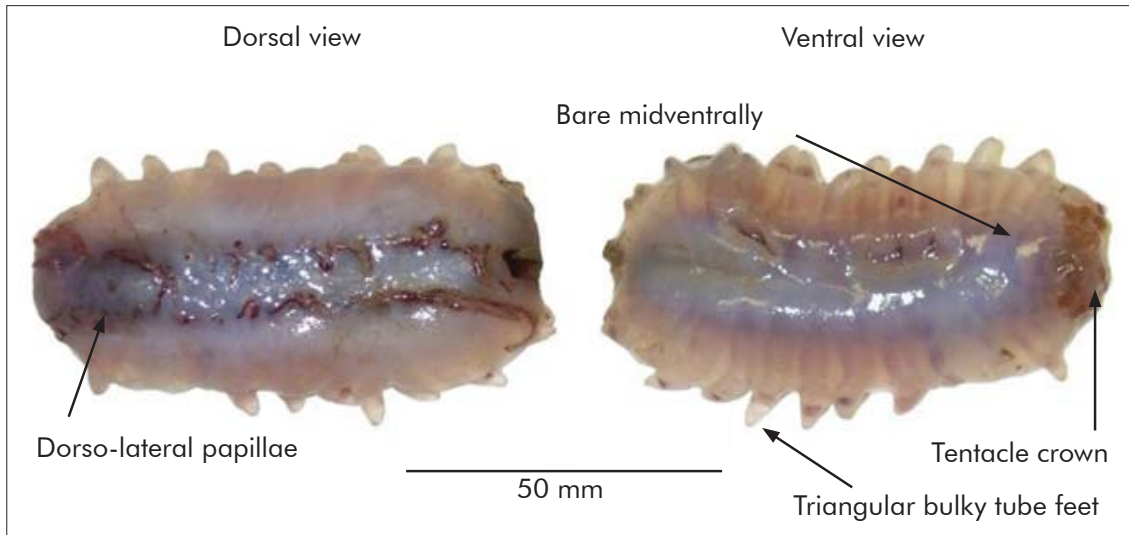
**Depth:** Usually 200-500 m, 91-1587 m in Antarctic Ocean.

**Similar species:**

**References:** O'Loughlin, P.M., Ahearn, C. (2005). A review of pygal-furrowed Synallactidae Echinodermata: Holothuroidea), with new species from the Antarctic, Atlantic and Pacific oceans. *Memoirs of Museum Victoria* 62 (2): 147-179

**Phylum** Echinodermata  
**Class** Holothuroidea (sea cucumbers)  
**Order** Elasipodida  
**Family** Laetmogonidae

### **Laetmogone sp. (LAG)**



**Distinguishing features:** Short thick body with a gelatinous texture. Shape holds well before and after preservation. Triangular bulky tube feet with a small sucking end disc on ventro-lateral edge. No tube feet mid-ventrally and a distinct tentacle crown at the anterior end with 15 tentacles. Dorso-lateral papillae in 1 or 2 rows.

**Colour:** Transparent, off white, shades of lavender. Dark red/violet dorsal papillae.

**Size:** Length up to 110 mm.

**Distribution:** Pacific, Atlantic, Antarctica (very cosmopolitan).

**Depth:** 250 to 1800 m.

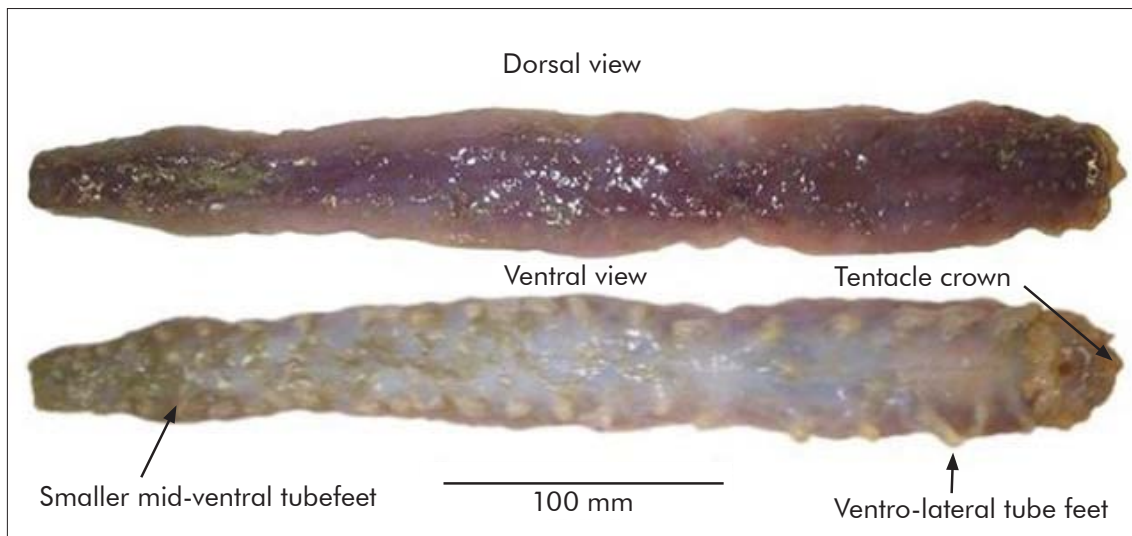
**Similar species:** Only identified to genus, 9 species in genus, all similar in external appearance. Species identification requires microscopic examination.

**References:** Hansen, B., (1975). Systematics and biology of the deep sea holothurians. Part 1. *Elasipoda*. *Galathea Report 13*: 1-262, pls 1-14.

Pawson, D. (1970). The Marine fauna of New Zealand: Sea Cucumbers (Echinodermata: Holothuroidea). *NZOI Memoir no.52*. 69 p.

**Phylum** Echinodermata  
**Class** Holothuroidea (sea cucumbers)  
**Order** Elasipodida  
**Family** Laetmogonidae

### ***Pannychia moseleyi* (PAM)**



**Distinguishing features:** Body gelatinous and slimy. Can be quite long and flimsy. Often in poor condition after collection. Ventral tentacle crown with 20 tentacles. Ventro-lateral tube feet more prominent and larger than the mid ventral tube feet.

**Colour:** Greyish lavender with off-white tube feet.

**Size:** Length up to 250 to 300 mm.

**Distribution:** Pacific Ocean coasts and Tasman Sea. From Australia and New Zealand to Peru, and off the Hawaiian and Galapagos Islands.

**Depth:** About 210 to 2600 m.

**Similar species:** *Laetmogone* sp. may be similar but lack mid-ventral tube feet. Body of *Pannychia moseleyi* also longer and thinner, skin slimy and flimsy, and tube feet being less bulky.

**References:** Hansen, B., (1975). Systematics and biology of the deep sea holothurians. Part 1. Elasipoda. *Galathea Report 13*: 1-262, pls 1-14.

Pawson, D. (1970). The Marine fauna of New Zealand: Sea Cucumbers (Echinodermata: Holothuroidea). *NZOI Memoir no.52*. 69 p.

**Phylum** Echinodermata  
**Class** Holothuroidea (sea cucumbers)  
**Order** Elasipodida  
**Family** Pelagothuridae

### ***Enypniastes eximia* (EEX)**

ECHINODERMATA



**Distinguishing features:** Transparent body with sediment filled intestine, other internal organs readily visible. Jellyfish-like body form, fragile and usually destroyed on removal from water. Anterior tentacles clearly visible in a circle around the mouth. Transparent cape-like structure around the anterior. Cape often destroyed or partially damaged in dead specimens.

**Colour:** Live specimens pale pink to brownish red, off white to pale pink in alcohol preserved specimens.

**Size:** Length up to 250 mm.

**Distribution:** World wide in bathyal to abyssal depths.

**Depth:** About 500 to 5700 m. Usually near the bottom where they burrow and eat in the sand/mud. Have been found several hundred feet off bottom.

**Similar species:** The only species in the family Pelagothuriidae known from New Zealand waters.

**References:** Miller, J.E., Pawson, D.L. (1990). Swimming Sea Cucumbers (Echinodermata: Holothuroidea): a survey, with analysis of swimming behavior in four bathyal species. *Smithsonian contributions to the Marine Sciences* ; no. 35. 17 pages.



**Phylum** Echinodermata  
**Class** Holothuroidea (sea cucumbers)  
**Order** Elasipodida  
**Family** Psychropotidae

### ***Benthodytes* sp. (BTD)**



ECHINODERMATA

**Distinguishing features:** Specimens of this genus large. Body flat out of water. Body wall thick and soft. Lateral tube feet fused into a brim that surrounds the body. Also a row of tube feet mid-ventrally. Anus dorsal, a ring of papillae around the tentacles. Tentacles (15) retractable and often not visible.

**Colour:** Frequently distinctive, from deep violet through to various shades of lavender/grey. Tentacle crown and tube feet often deeper violet than rest of body.

**Size:** New Zealand specimens up to 300 mm.

**Distribution:** Recorded from north Chatham Rise.

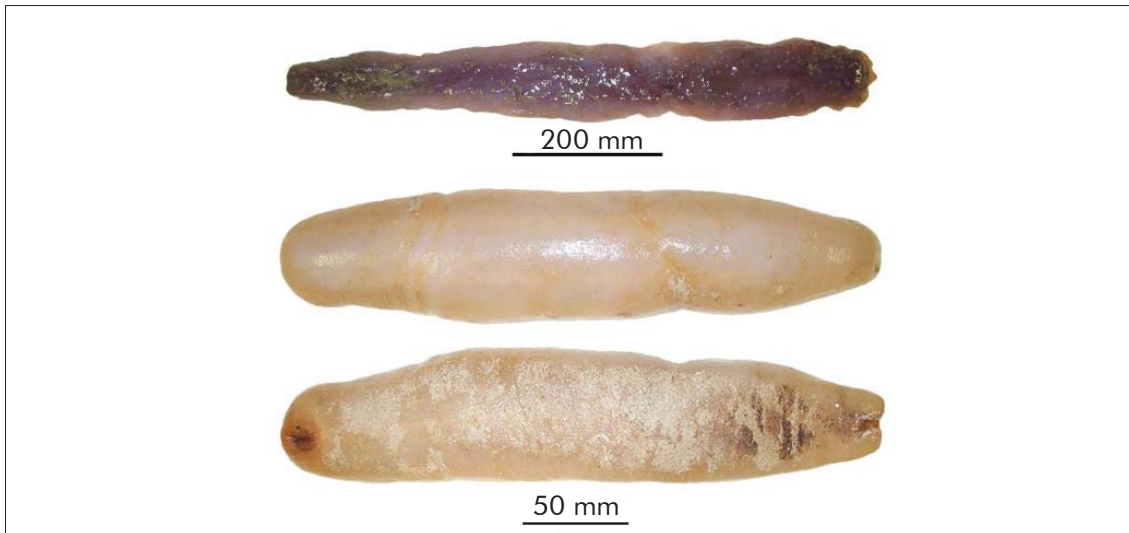
**Depth:** Most commonly around 3000 m, but occasionally in excess of 5000 m.

**Similar species:** The circum-oral papillae and dorsal anus distinctive for the genus. Identification to species level requires microscopic examination.

**References:** Hansen, B., 1975. Systematics and biology of the deep sea holothurians. Part 1. Elasipoda. *Galathea Report 13*: 1-262, pls 1-14.

**Phylum** Echinodermata  
**Class** Holothuroidea (sea cucumbers)  
**Order**  
**Family**

### (Sea cucumbers) (HTH)



**Distinguishing features:** Holothurians generally have a soft, cylindrical, body with the mouth and anus at opposite ends; mouth surrounded by feeding tentacles, usually retracted on capture; 5 rows of tube feet, absent in the order Apodida. The calcite skeleton, common to all echinoderms, reduced to mostly microscopic plates embedded in the body wall. These plates are used to differentiate between species, and for that reason a laboratory examination is usually required for identification.

**Colour:** Usually pale, brownish, or reddish.

**Size:** Up to 300 mm.

**Distribution:** Throughout the New Zealand region, from the intertidal to abyssal depths, where they may make up to 90% of the benthic biomass.

**Depth:** 0 to 3000 m.

**Similar species:** More than 100 species, with representatives of all 6 orders of holothurians, have been recorded from the New Zealand region. Pictured is a species of the order Molpadiida, in which the posterior end of the body is narrowed to a tail. Known commercially as *bêche-de-mer*.

**References:** McKnight, D.G.; Eagle, M.K.; Pawson, D.L.; Ameziane, N.; Vance, D.J.; Baker, A.N.; et al (in press): Phylum Echinodermata - sea-stars, brittlestars, sea urchins, sea cucumbers, sea lilies, and kin. In: Gordon, D.P. (ed.), The New Zealand inventory of biodiversity. Volume 1. Kingdom Animalia - Radiata, Lophotrochozoa, and Deuterostomia. Canterbury University Press.

**Phylum** Echinodermata  
**Class** Ophiuroidea (brittle stars)  
**Order** Euryalinida (basket stars)  
**Family** Asteroschematidae

### ***Ophiocreas sibogae* (OSI)**



**Distinguishing features:** Disc moderately large, with 5 very long arms; rounded above, flat or concave below and often coiled; disc and arms covered by skin, with minute granules sometimes present. Conspicuous radial ribs extend from either side of arm base to centre of disc. On the lower surface large genital clefts are clearly visible. Two armspines over most of the arm, placed at lower edges and pointing downwards; thickened towards tip.

**Colour:** Light brown, occasionally darker in patches, with the radial ribs usually much lighter. Rarely part or all of a specimen is reddish.

**Size:** Diameter up to 15 mm. Arms up to 300 mm.

**Distribution:** Widespread in the New Zealand region, from the Three Kings Rise to the Campbell Plateau, and often found coiled in branches of larger Gorgonacean corals. It is also known from southern Australia and Indonesia.

**Depth:** 200 to 2000 m.

**Similar species:** There are 4 other species of *Ophiocreas* recorded locally, as well as 2 in the somewhat similar genus *Astrobrachion*. They are all difficult to determine at sea, and require microscopic examination.

**References:** McKnight, D.G. (2000). The marine fauna of New Zealand. Basket-stars and snake-stars. (Echinodermata:Ophiuroidea: Euryalinida). *NIWA Biodiversity memoir* 115.

**Phylum** Echinodermata  
**Class** Ophiuroidea (brittle stars)  
**Order** Euryalinida (basket stars, snake stars)  
**Family** Gorgonocephalidae

***Astrothorax waitei* (Waite's snake-star) (AWA)**

ECHINODERMATA



**Distinguishing features:** Five unbranched arms. Disc inflated above, flat on underside; upper surface completely covered with larger and smaller tubercles, those on the underside with finer, uniform granulation. Arms with transverse bands of granules, interspersed with narrow, smooth, depressed bands; 5 to 10 short, thorny, armspines at outer margins of underside of arms. Mouth with distinct spines along margins; genital slits present at edge of disc, between the arms.

**Colour:** Creamy white to pinkish-orange.

**Size:** Up to 20 mm (disc diameter). Arms up to 100 mm.

**Distribution:** Widespread throughout the New Zealand region, near Norfolk Island to the Chatham Rise. Also known from Australia and South Africa.

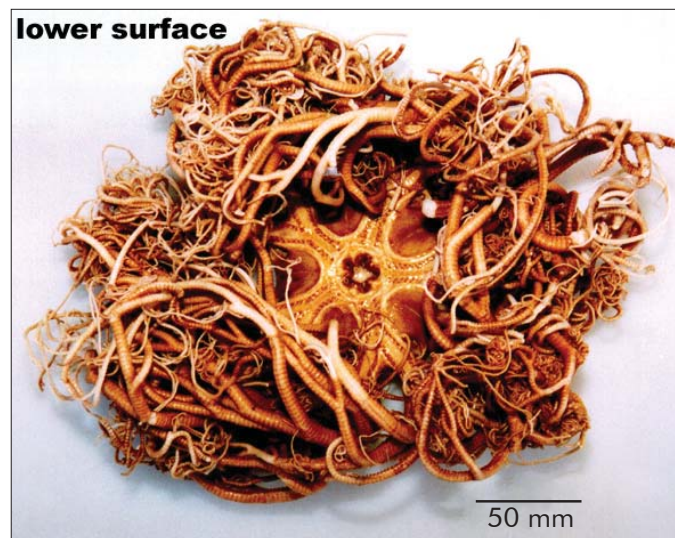
**Depth:** 120 to 1200 m.

**Similar species:** At least 6 other snake-star species are recorded in this family.

**References:** McKnight, D.G. (2000). The marine fauna of New Zealand. Basket-stars and snake-stars (Echinodermata: Ophiuroidea: Euryalinida). *NIWA Biodiversity Memoir 115*: 61–63.

**Phylum** Echinodermata  
**Class** Ophiuroidea (brittle stars)  
**Order** Euryalinida (basket stars, snake stars)  
**Family** Gorgonocephalidae

### **Gorgonocephalus spp. (Gorgon's head basket-stars) (GOR)**



**Distinguishing features:** Five long arms, branching extensively (up to 10 or more times) from near the disc or within the disc margin. The arms are deciduous and a large tangled mass of arms may be the only sample taken. Upper side of disc with 5 pairs of conspicuous radial ribs. Six species with branching arms are recorded from the New Zealand region, and 4 of these (in 2 genera) may be present in trawl catches. Laboratory examination is required to determine the species.

**Colour:** Creamy white to dull or pale brown. Radial ribs on disc usually paler.

**Size:** Up to 70 mm (disc diameter).

**Distribution:** *Gorgonocephalus chilensis*, mainly Chatham Rise; *G. dolichodactylus* mainly Bay of Plenty; *G. pustulatum* and *G. sundanus* rare but widespread.

**Depth:** 70 to 1400 m.

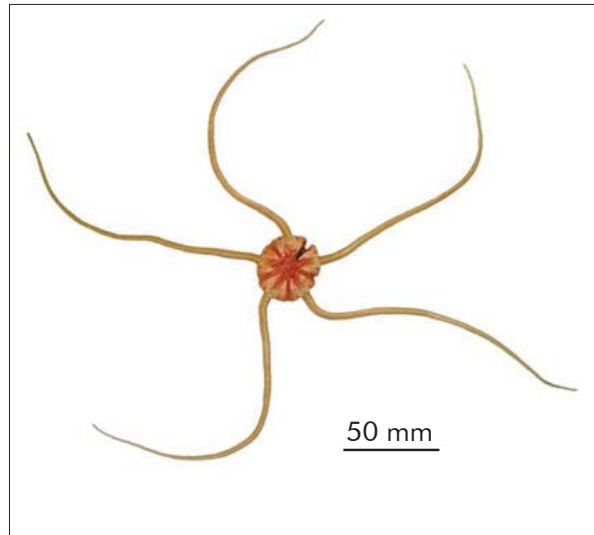
**Similar species:** None.

**References:** McKnight, D.G. (2000). The marine fauna of New Zealand. Basket-stars and snake-stars (Echinodermata: Ophiuroidea: Euryalinida). *NIWA Biodiversity Memoir* 115: 45–53.

**Phylum** Echinodermata  
**Class** Ophiuroidea (brittle stars)  
**Order** Ophiurida  
**Family** Ophiodermatidae

### ***Bathypectinura heros* (Deepsea brittle star) (BHE)**

ECHINODERMATA



**Distinguishing features:** Arms long sharply set off from disc, often intact or only broken near tip. Upper side of disc covered with small granules, rarely with a few plates exposed; lower side of disc also covered except around the mouth, where plates are naked. Arms more or less smooth, with small armspines closely pressed against the sides.

**Colour:** Reddish or brown.

**Size:** Up to 50 mm (disc diameter). Arms may be over 200 mm.

**Distribution:** Present in almost all oceans, and widespread around New Zealand.

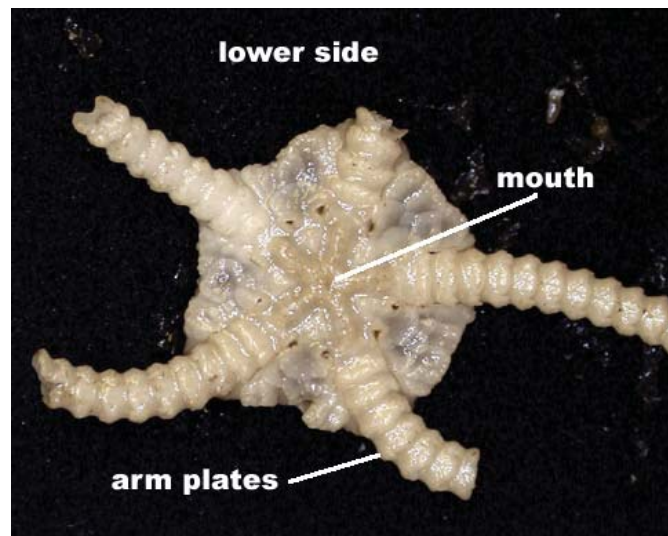
**Depth:** 200 to 2500 m.

**Similar species:** None in the deeper waters. *Ophiopsammus maculata* is similar but is more or less confined to the continental shelf.

**References:** Paterson, G.L.J. (1985). The deep-sea Ophiuroidea of the North Atlantic Ocean. *Bulletin of the British Museum (Natural History)* 49. 162 p.

**Phylum** Echinodermata  
**Class** Ophiuroidea (brittle stars)  
**Order** Ophiurida  
**Family** Ophiuridae

### ***Ophiomusium lymani* (OLY)**



**Distinguishing features:** Disc and arms rigid, the arms often broken. Upper side of disc with distinct plates and radial ribs, with smaller plates or scales around and between them; lower side also covered with distinct plates, sides of mouth with a row of fused papillae. Arms covered with distinct plates, swollen between the joints, and bearing very small, closely pressed armspines.

**Colour:** Whitish, cream, or light brown.

**Size:** Up to 30 mm (diameter of central disc)

**Distribution:** Widespread throughout the New Zealand region, also known from temperate regions of the Pacific, Indian, and Atlantic oceans.

**Depth:** 130 to 4000 m. This species is often very abundant on fine sediments in depths of 900–1500 m.

**Similar species:** There are several species in this genus and in other closely related genera present in New Zealand waters.

**References:** Baker, A.N. (1979). Some Ophiuroidea from the Tasman Sea and adjacent waters. *New Zealand Journal of Zoology*. 6 : 21-51

McKnight, D.G.; Probert, P.K. (1997). Epibenthic communities on the Chatham Rise, New Zealand. *New Zealand Journal of Marine Freshwater Research*. 31 : 505–513

