

The benthic Mollusca and Brachiopoda of subantarctic Marion and Prince Edward Islands:

1) Illustrated keys to the species

2) Records of the 1982-1989 University of Cape Town Surveys

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Part 1 presents illustrated keys for the identification of the benthic molluscan and brachiopod fauna (excluding the non-shelled gastropods) of the subantarctic Marion and Prince Edward Islands. These are based on both published records and unpublished collections made by the Marion-Dufresne 1974-1976 and the University of Cape Town 1982-1989. There were 85 species of Mollusca consisting of 32 Bivalvia (3 unidentified species, 13 new records) 46 Gastropoda (4 unidentified species, 24 new records), 4 Polyplacophora (1 unidentified), 1 Scaphopoda, 1 Solenogastres (a new unidentified record) and 1 Cephalopoda. There were 3 species of Brachiopoda. The new species are included in the keys but not designated specific names as they will be described in a later paper. In part 2 records of the dredging, scuba-diving and intertidal surveys undertaken by the University of Cape Town (1982-1989) are summarised, for the Mollusca and Brachiopoda in relation to abundance, depth, substratum and community-grouping.

Deel 1 toon die geïllustreerde sleutels vir die identifikasie van die benthiese molluske en brachiopode fauna (behalwe die skulplose gastropodes) van subantarktiese Marion- en Prins Edward-eiland. Dit is gebaseer op gepubliseerde lyste en ongepubliseerde versamelings deur die Marion-Dufresne 1974-1976 en die Universiteit van Kaapstad 1982-1989. Daar was 85 spesies Mollusca bestaande uit 32 Bivalvia (3 ongeïdentifiseerde spesies, 13 nuut aangeteken), 46 Gastropoda (4 ongeïdentifiseerde spesies, 24 nuut aangeteken), 4 Polyplacophora (1 ongeïdentifiseer), 1 Scaphopoda, 1 Solenogastres (nuut, ongeïdentifiseer) en 1 Cephalopoda. Daar was 3 spesies Brachiopoda. Die nuwe spesies is ingesluit in die sleutel, maar sal in 'n volgende manuskrip bespreek en benoem word. In Deel 2 word rekords van die baggerwerk, onderwaterduik en tussengetyopnames van die Universiteit van Kaapstad (1982-1989) opgesom vir die Mollusca en Brachiopoda, in verhouding tot volophheid, diepte, substratum en gemeenskapsgroepering.

Introduction

The two islands of the Prince Edward group are of particular interest because of their relative youth and extreme isolation. Both are summits of recent volcanoes

just off the crest of the mid-Atlantic ridge. They arose about 250 000 years ago (McDougal 1971). Marion Island (46°54'S, 37°45'E) is 290 km², while Prince Edward Island (46°38'S, 37°57'E) is one-seventh its size and lies 22 km NNE of Marion. Biogeographically both islands form part of the Kerguelen Province of subantarctic islands which includes the Crozet archipelago (925 km eastward), as well as the Kerguelen Islands and Heard Island (Powell 1960). The nearest continental land mass is southern Africa, with Cape Town lying 2300 km to the north-west.

There have been several expeditions to the Prince Edward Islands which have sampled the marine fauna and flora, including those of the British *Challenger* (1873-1876) and *Discovery* (1935), and subsequent surveys by the French ship *Marion-Dufresne* (1976). South African research began with land-based surveys that concentrated on the intertidal and shallow-water benthos and included work by Fuller (1967), De Villiers (1976) and Blankley & Grindley (1985). More recently, this research was extended offshore by the University of Cape Town, with dredging being undertaken from the SA *Agulhas* over the period 1984-1989.

The identification of benthic species has posed a major problem during each of the recent surveys, despite the fact that the material from successive expeditions has been referred to international taxonomic authorities. Previous work has been undertaken by scientists from a large number of countries and over a protracted period of time. Isolated detailed monographs reviewing particular groups have appeared, but these remain largely inaccessible to the more generalist worker. Furthermore many are now out-of-date in terms of the nomenclature employed. This situation prompted the present series of identification guides, which is intended to synthesise information on the benthic invertebrate fauna of Marion and Prince Edward Islands and to present it in a manner that will allow relatively easy identification.

The guides are designed in the form of a series of illustrated keys, limited to live material, covering the major

invertebrate groups. Specific characteristics are noted but the key is more or less artificial and can be used properly only for Marion and Prince Edward Islands and does not provide definitive identification. The most important monographs which need to be consulted to obtain more detailed descriptions are given in the reference list. Undescribed species are included in the keys under their South African Museum catalogue number (SAM), although they are named only to generic level: They will be formally described in later monographs.

Part 1 of this particular paper covers the Brachiopoda and Mollusca including only the Solenogastres, Bivalvia, shelled Gastropoda, Polyplacophora, Scaphopoda and benthic Cephalopoda collected during the following surveys: *Challenger*, 1873-76 (Davidson 1880, Smith 1885, Bergh 1886, Watson 1886, Haddon 1886) and *Discovery*, 1935 (Dell 1964b, Ponder 1983, Salvini-Plawen 1978), material from both of which is housed in the British Museum (Natural History); the South African littoral samplings of 1965-66 (Fuller 1967, Gaillard 1971) and 1972-73 (De Villiers 1976) and the 1976 cruise MD 08 (Arnaud & Hureau, 1979) of the *Marion-Dufresne* (material now housed at Station marine d'Endoume, Marseille and later at Laboratoire de Malacologie, Museum national d'Histoire naturelle, Paris). Material from intertidal and subtidal surveys undertaken in 1982, quantitative subtidal scuba-sampling in 1989 (Beckley & Branch 1992), and extensive recent offshore surveys by the University of Cape Town over the period 1984-89 (GM Branch *et al* 1992) are all housed in the South African Museum, Cape Town.

The illustrations where possible were taken from actual specimens collected by the University of Cape Town, but others were adapted from depictions in the existing literature.

Species found

Mollusca

46 Gastropoda, (4 unidentified species, 24 new records).

32 Bivalvia, (3 unidentified species, 13 new records).

4 Polyplacophora, (1 unidentified).

1 Scaphopoda.

1 Cephalopoda.

1 Solenogastres.

Total of 85 living species.

Brachiopoda

3 Species, (1 unidentified).

New species will be described in a later monograph.

Certain species were found only as empty and very rare shells. There is no proof that they are still part of the living fauna of Marion Island. There is the remote possibility that they could be part of an ancient fauna (eliminated as a result of the Quaternary latitudinal displacements of the convergence) although it is unlikely as they were not particularly "old" or weathered. The possibility of their being drift shells transported for example by floating kelps is unlikely due to the nature of the shells and extreme isolation of the islands. They are therefore included but separated in the species lists and key.

Part 2 of the paper reports the previously unpublished

records for Mollusca and Brachiopoda for the Prince Edward Islands, derived from the University of Cape Town surveys, 1982-1989, in relation to abundance, depth, substratum and habitat. An analysis and description of community patterns for the invertebrates as a whole appears in GM Branch *et al* 1992.

M L Branch was responsible for the overall compilation of the manuscript. P M Arnaud and J Cantera identified all the species of Bivalvia, Gastropoda, Scaphopoda and Polyplacophora used in the keys and helped to compile the key. D Gianakouras was responsible for the 1984-1989 dredge surveys and together with M L Branch sorted and identified the specimens used in Part 2 of the paper.

Acknowledgements

This research was carried out under the supervision of Prof G M Branch with funding provided by the South African Scientific Committee for Antarctic Research (SASCAR) and the Department of Environment Affairs. The Department of Environment Affairs also provided logistic support, and the Captains of the *SA Agulhas* are thanked for continual support. The South African offshore sampling was done under the leadership of Diane Gianakouras, and the scuba-programme was led by Dr Lynnath Beckley. Many staff members and students of the University of Cape Town participated in both the collection and sorting of this material. In this connection, special thanks are due to Gillian Burbidge and Colin Attwood who provided the computer analysis for Table 1. The Brachiopoda were identified by Dr C Emig, the octopus by M Roeleveld of the South African Museum and the Solenogastres by Dr L von Salvini-Plawen. Elizabeth Hoenson and the staff of SA Museum are gratefully acknowledged for the smooth transfer of the massive collection to the South African Museum. Material collected at Marion Island during the cruise MD.08 of *M/S Marion-Dufresne* was obtained thanks to the logistic support of Terres Australes et Antarctiques Francaises, Paris.

Systematic list of species

* = New records

‡ = New species (included in the keys but not named beyond generic level)

Page numbers refer to pages in the keys

Phylum Brachiopoda

	Page
<i>Liothyrella</i> sp. SAM A37653	49
<i>Magellania kerguelensis</i> (Davidson, 1880)	49
<i>Platydia anomioides</i> Scacchi, 1844	49

Phylum Mollusca

Class Solenogastres

* SAM A37651 & SAM A37652	48
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Class Bivalvia

‡ <i>Acesta</i> sp. SAM A37648	50
<i>Adacnarca marionensis</i> (Smith, 1885)	52

	Page		Page
	53	<i>Falsilunatia soluta</i> (Gould, 1847)	56
++ <i>Astarte longirostris</i> d'Orbigny, 1846	53	= <i>Natica fertilis</i> (Watson, 1881)	
* <i>Condylocardia</i> sp.	51	* <i>Eumetula macquariensis</i> Tomlin, 1948	58
* <i>Cuspidaria kerguelenensis</i> Smith, 1885	51	‡ <i>Eumetula</i> sp. SAM A37645	59
* <i>Cuspidaria</i> cf. <i>tenella</i> , Smith 1907	51	<i>Falsilunatia soluta</i> (Gould, 1847)	56
<i>Cyclopecten aviculoides</i> Smith, 1885	50	= <i>Natica fertilis</i> (Watson, 1881)	
* <i>Escalima goughensis</i> (Melvill & Standen, 1907)	50	<i>Fusitriton magellanicus</i> (Roeding, 1798)	58
* <i>Gaimardia adamsiorum</i> Osorio & Arnaud, 1984	52	= <i>Triton cancellatum</i> Lamarck, 1816	
<i>Gaimardia trapesina</i> (Lamarck, 1819)	52	" <i>Jeffreysia</i> " <i>edwardiensis</i> (Watson, 1886)	57
<i>Hiatella solida</i> (Sowerby, 1834)	51	<i>Kerguelenella lateralis</i> (Gould, 1849)	55
<i>Kellia nukulina</i> Martens, 1881	54	<i>Laevilitorina caliginosa</i> (Gould, 1848)	57
<i>Kidderia minuta</i> Dall, 1876	52	<i>Margarella expansa</i> (Sowerby, 1838)	56
= <i>Modiolarca bicolor</i> Martens, 1885		* <i>Margarella porcellana</i> Powell, 1951	56
<i>Kidderia oblonga</i> (Smith, 1898)	52	* <i>Marseniopsis pacifica</i> Bergh, 1886	55
<i>Lasaea consanguinea</i> Smith, 1877	54	* <i>Microdiscula subcanaliculata</i> (Smith, 1875)	55
* <i>Laternula elliptica</i> King & Broderip, 1831	51	<i>Nacella delesserti</i> (Philippi, 1849)	55
<i>Limatula pygmaea</i> (Philippi, 1845)	50	<i>Omalogyra</i> cf. <i>atomus</i> (Philippi, 1841)	55
* <i>Limatula simillima</i> Thiele, 1912	50	<i>Onoba transenna</i> (Watson, 1886)	57
<i>Limopsis marionensis</i> Smith 1885	53	<i>Onoba paucicarinata</i> (Ponder, 1983)	57
<i>Lissarca miliaris</i> (Philippi, 1845)	53	* <i>Pareuthria regulus</i> Watson, 1883	59
<i>Myonera fragilissima</i> Smith, 1885	51	<i>Powellisetia principis</i> (Watson, 1886)	57
* <i>Mysella charcoti</i> (Lamy, 1906)	54	<i>Probuccinum edwardiensis</i> (Watson, 1882)	59
<i>Neolepton umbonatum</i> Smith, 1885	54	<i>Puncturella conica</i> (d'Orbigny, 1841)	55
* <i>Nucula kerguelenensis</i> Thiele, 1912	53	‡ <i>Retusa</i> sp. SAM A37646	58
<i>Palliolum clathratum</i> Martens, 1881	51	* <i>Sinezona</i> sp.	58
= <i>Pecten distinctus</i> Smith, 1885		<i>Skenella edwardiensis</i> (Watson, 1886)	57
* <i>Philobrya barbata</i> Thiele 1912	52	* <i>Solariella infundibulum</i> (Watson, 1879)	56
<i>Philobrya kerguelenensis</i> (Smith, 1885)	52	* <i>Spirotropis studeriana</i> (Martens, 1878)	58
<i>Philobrya quadrata</i> Thiele, 1912	52	= ? <i>Typhlomangelia fluctuosa</i> (Watson, 1881)	
‡ <i>Pteria</i> sp. SAM A37650	50	* <i>Tectonatica impervia</i> (Philippi, 1845)	57
<i>Thracia meridionalis</i> Smith, 1885	51	<i>Toledonia limnaeaeformis</i> (Smith, 1877)	56
<i>Thyasira marionensis</i> Smith, 1885	53	* <i>Torellia angulifera</i> Waren, Arnaud & Cantera, 1986	56
* <i>Yoldiella profundorum</i> Melvill & Standen, 1912	53	<i>Trophon declinans</i> Watson, 1882	59
Shells only:		* <i>Trophon septus</i> Watson, 1882	59
<i>Dosinia</i> cf. <i>pubescens</i> SAM A37656	54	* <i>Turbonilla lamyi</i> Hedley, 1916	57
<i>Limopsis lilliei</i> Smith, 1915	54	<i>Typhlodaphne platamodes</i> (Watson, 1881)	59
<i>Lyonsiella</i> cf. <i>radiata</i> Dall, 1889 SAM A37655	54	<i>Typhlodaphne translucida</i> (Watson, 1881)	59
		Shells only:	
Class Gastropoda (Shelled species only)		<i>Balcis</i> sp. SAM A37658	
* <i>Admete specularis</i> (Watson, 1882)	59	<i>Bathydromus</i> sp. SAM A37659	
* <i>Amauropsis anderssoni</i> Strebel, 1906	57	<i>Prosipho</i> sp. SAM A37660	
* <i>Amauropsis prasina</i> (Watson, 1881)	56	<i>Solariella</i> sp. SAM A37657	56
= <i>Natica suturalis</i> Watson, 1881		<i>Toledonia elata</i> Thiele, 1912	56
* <i>Anatoma euglypta</i> (Pelseneer, 1903)	58		
* <i>Balcis ambliia</i> (Watson, 1883)	57	Class Polyplacophora (Chitons)	
<i>Banzarecolpus austrina</i> (Watson, 1881)	57	<i>Hemiarthrum setulosum</i> Dall, 1876	60
* <i>Brookula</i> cf. <i>crassicostata</i> (Strebel, 1908)	56	<i>Lepidopleurus dorsuosus</i> Haddon, 1886	60
* <i>Calliostoma delli</i> McLean & Andrade, 1982	56	<i>Lepidopleurus kerguelenensis</i> (Haddon, 1886)	60
* <i>Cerithiella</i> cf. <i>werthi</i> Thiele, 1912	59	= <i>Leptochiton kerguelenensis</i> Haddon 1886	
‡ <i>Cerithiopsilla</i> sp. SAM A37644	59	‡ ? aff <i>Placiphorella</i> sp. SAM A37647	60
* <i>Chlanidotella modesta</i> (Martens, 1885)	59		
* <i>Diaphana kerguelenensis</i> Thiele, 1912	58	Class Scaphopoda (Tusk shells)	
* <i>Eatoniella kerguelenensis regularis</i> (Smith, 1915)	57	<i>Fissidentalium</i> sp. SAM A37649	48
<i>Eatoniella subrufescens</i> (Smith, 1875)	57	= ? <i>Dentalium entalis</i> var. <i>orthrum</i> Watson, 1879	
* <i>Eumetula macquariensis</i> Tomlin, 1948	58		
‡ <i>Eumetula</i> sp. SAM A37645	59	Class Cephalopoda (Octopus, etc)	
		<i>Octopus magnificus</i> Villaneuva et al 1991	
		= <i>Octopus dofleini</i> (Wülker, 1910) partim	

Mollusca and Brachiopoda of Marion and Prince Edward Islands

Key to the phyla and classes

- 1 Body bilaterally symmetrical with a large ciliated lophophore for filter feeding; bivalve shell formed of a dorsal and ventral valve; attached by a stalk, the pedicel; (lamp shells).
Phylum: **Brachiopoda** A (p 49)

Soft-bodied animal typically possessing a head, muscular foot, visceral hump and a mantle fold covering the gills; shell usually present, if bivalved then comprised of two lateral valves; occasionally worm-shaped, imbedded with calcareous spicules and with a mid-ventral groove.

- Phylum: **Mollusca** 2

- 2 Worm-shaped body, imbedded with calcareous spicules; foot reduced to a mid-ventral, longitudinal groove; head poorly developed.
Class: **Solenogastres**

Recorded from Marion Island in the deep rocky-bottomed stations which are rich in octocorals and hydroids.

SAM A37651 & SAM A37652

Body not worm-shaped; usually protected by an external shell; where shell is absent or internal, the animal is slug-like or octopus-like with 8 to 10 tentacles 3

- 3 Shell composed of a series of 8 valves surrounded by a mantle; foot broad and flat.
Class: **Polyplacophora** (Chitons) D (p 60)

Shell absent or single or composed of two valves; foot various shapes. 4

- 4 Hinged bivalve shell; foot wedge-shaped and usually hidden; head and radula absent.
Class: **Bivalvia** B (p 50)

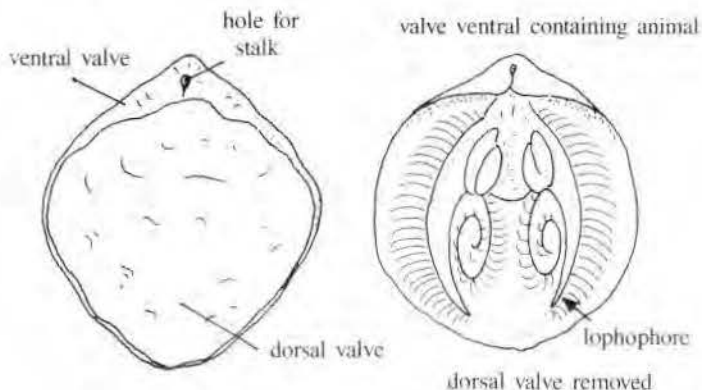
Shell single or absent; head obvious, radula present. 5

- 5 Single tusk-shaped, tubular shell; foot small; gills absent; head with several long, thin tentacles.
Class: **Scaphopoda** (Tusk-shells)
One species recorded at Marion Island; shell white with fine longitudinal ridges.

Fissidentalium sp. SAM A37649

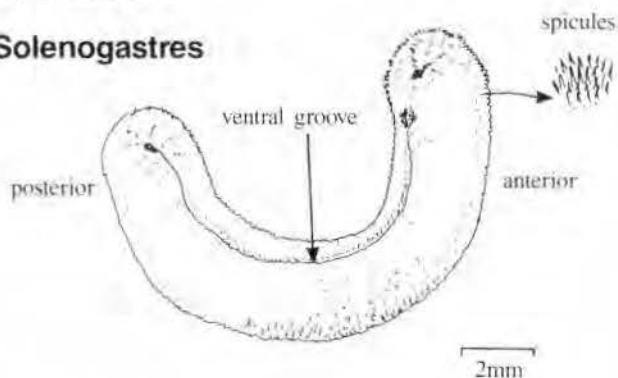
(=?*Dentalium entalis* var. *orthrum* Watson, 1879)

BRACHIOPODA

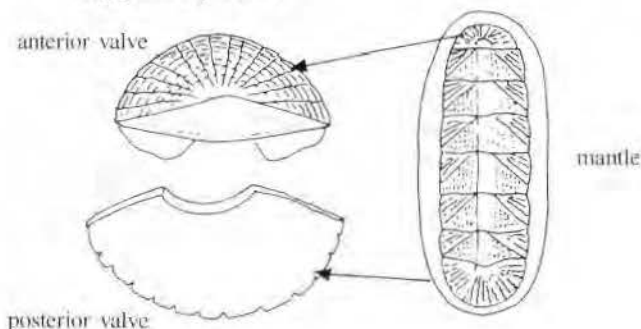


MOLLUSCA

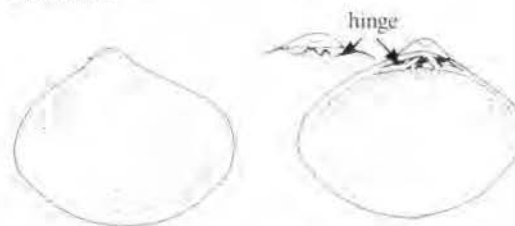
Solenogastres



Polyplacophora



Bivalvia



Scaphopoda



Shell not tusk-shaped, either coiled, cap-shaped or internal.
..... 6

- 6 Shell absent or internal; foot forming 8 to 10 suckered tentacles around the mouth.

Class: **Cephalopoda** (cuttle-fish, squid and octopuses)

One large *Octopus* is the only benthic species recorded at Marion Island.

Octopus magnificus Vilanueva, Sanchez & Roeleveld, 1991

= *Octopus dofleini* (Wülker, 1910) partim.

Shell single, usually coiled or cap-shaped, sometimes internal or absent; body usually asymmetrical; foot broad and flat.

Class: **Gastropoda** (winkles, whelks, limpets and slugs).

Only shelled forms included in the key.
..... C (p 55)

A Phylum Brachiopoda (Lamp shells)

- 1 Shell delicate, oval, length at least 1.5x width, surface finely pitted; ventral valve with a hole where the stalk emerges; dorsal valve very much shorter than ventral valve.

Liothyrella sp. SAM A37653

Shell almost circular in outline, length almost equal to width; surface pitted in juveniles.
..... 2

- 2 Shell large, coarse; ventral valve curves dorsally at the hinge forming a small hole and groove, where the stalk emerges; dorsal valve with a central bulged hinge area on upper edge, and two lateral attachments for the animal; juveniles transparent with a finely pitted surface; common.

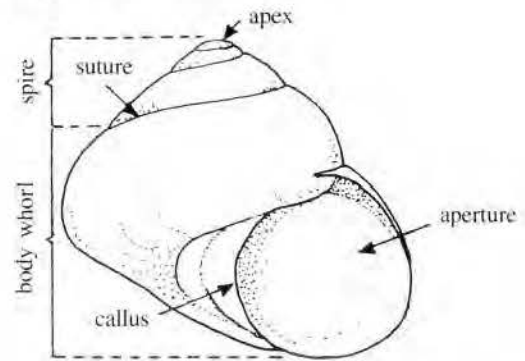
Magellania kerguelenensis (Davidson, 1880)

Small, semitransparent, with a pitted surface; stalk emerges between the upper and lower valve and not through a hole in the ventral valve; dorsal valve with a concave margin at the stalk; a large central and two small lateral attachments for the animal.

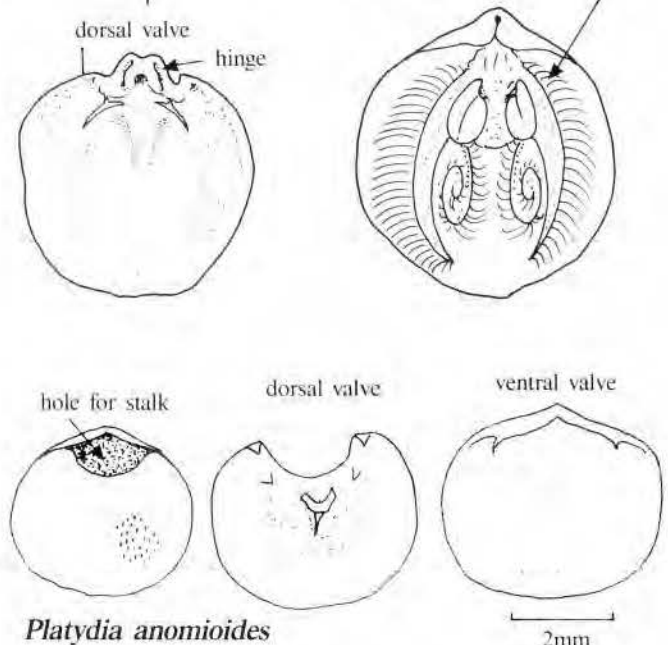
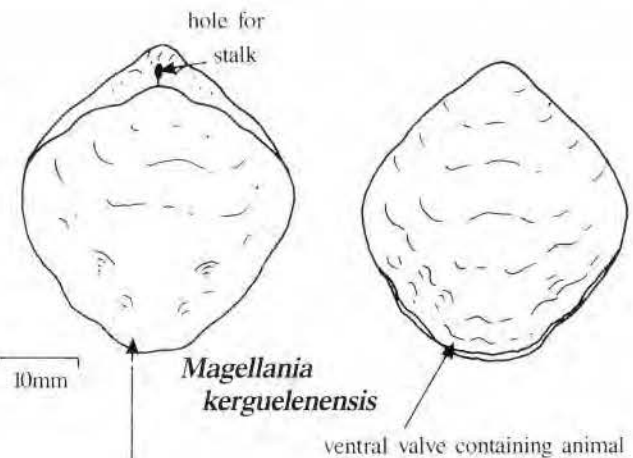
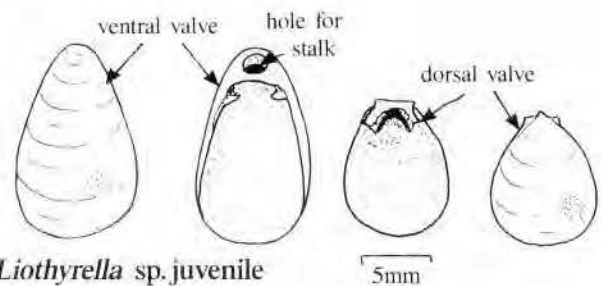
Platydia anomioides Scacchi, 1844

(= *P. appressa* Forbes, 1844)

Gastropoda



BRACHIOPODA



B Living Bivalvia

- 1 Shell expanded laterally, either on both sides or, more rarely, on one side of the umbo to form a straight hinge.
..... 2

Shell lacking lateral expansion; hinge usually angular.
..... 8

- 2 Shell valves the same (equivalve).
..... 3

Shell valves differ (inequivalve); anterior auricle well developed and rounded, posterior one small and triangular.
..... 7

- 3 Valves flattened; posterior auricle long, anterior one short and triangular; (shell transparent, a little nacreous, small, 4-6 mm; attached to the hydrozoan *Plumularia insignis*)
Pteria sp. SAM A37650

Valves inflated; auricles poorly developed 4

- 4 Valves equilateral or subequilateral 5

Valves inequilateral 6

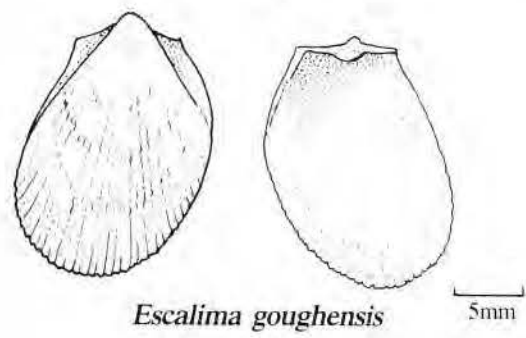
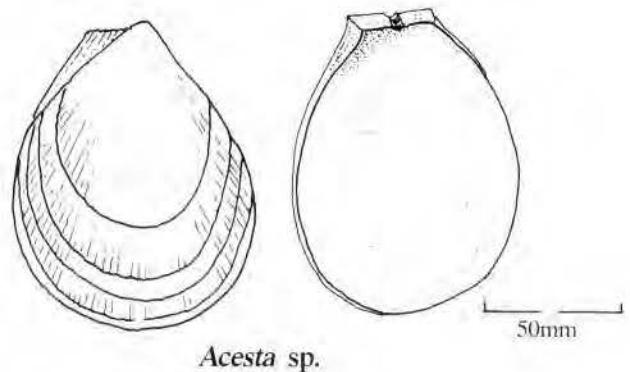
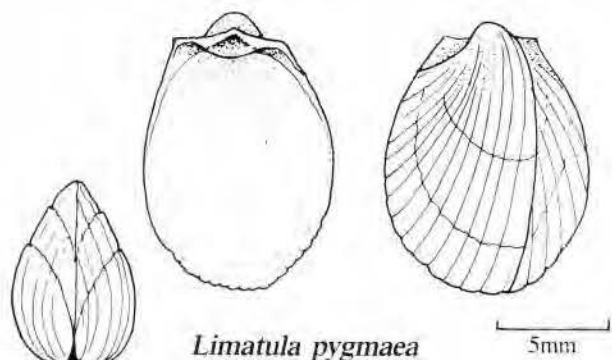
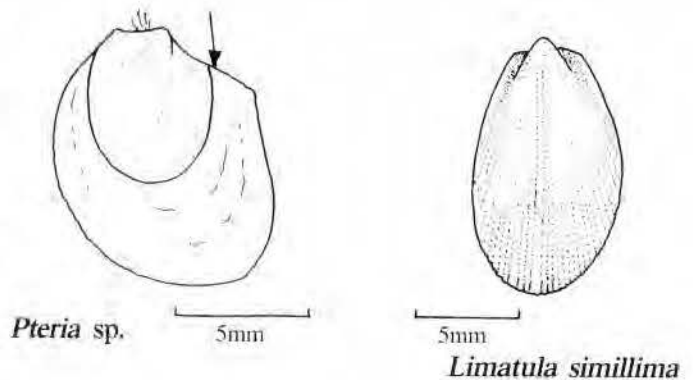
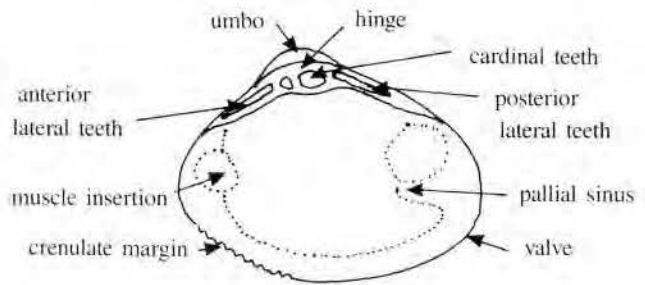
- 5 (Shell narrowly ovate, light radial ornamentation, regular except a larger interspace near the middle of the valve, white with white flammulations more or less conspicuous, 10-15 mm).
Limatula simillima Thiele, 1912

(Shell broadly ovate, radial ridges crossed by growth rings, white, 15 mm); common.
Limatula pygmaea (Philippi, 1845)

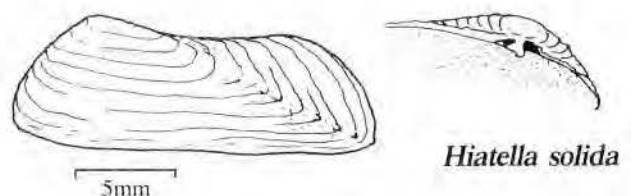
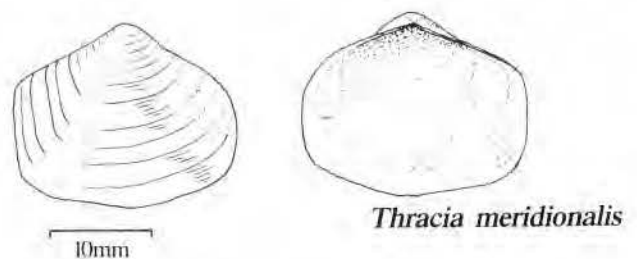
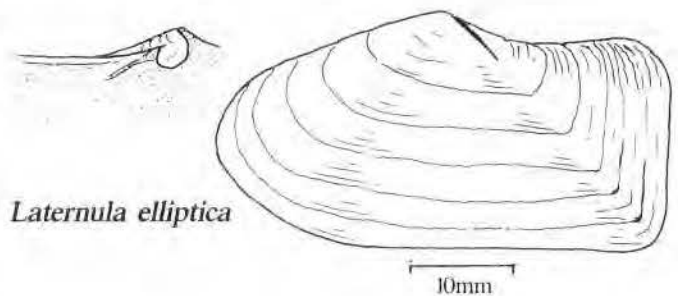
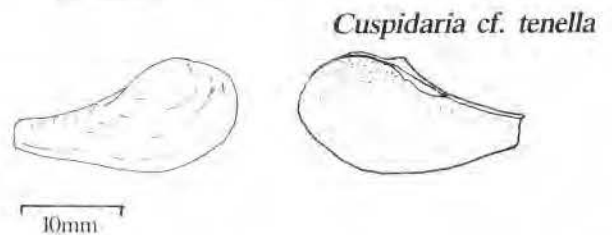
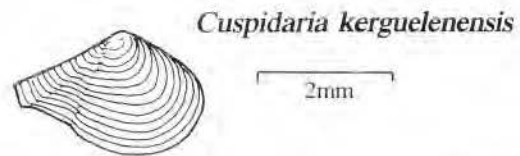
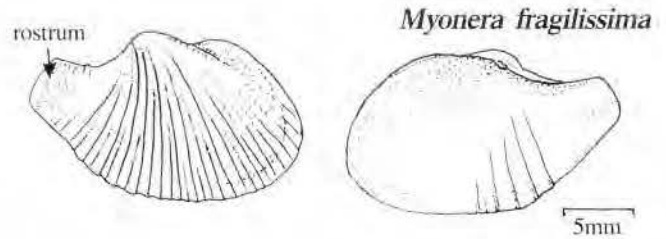
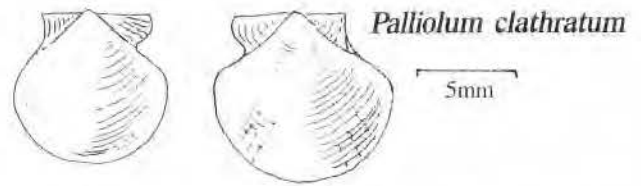
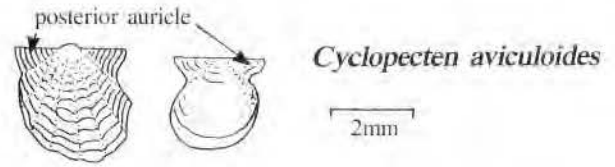
- 6 Margins not crenulate; (large shell, up to 100 mm, white, glossy and translucent with faint irregular flat ribs, marked growth ridges; hinge thick, length = about 1/4 shell length).
Acesta sp. SAM A37648

Margins crenulate; (shell moderate sized, 20 mm, whitish, fine regular radial ornamentation of alternating weak and heavier riblets crossed by growth rings resulting in a scaly appearance).
Escalima goughensis (Melvill & Standen, 1907)

Bivalve shell

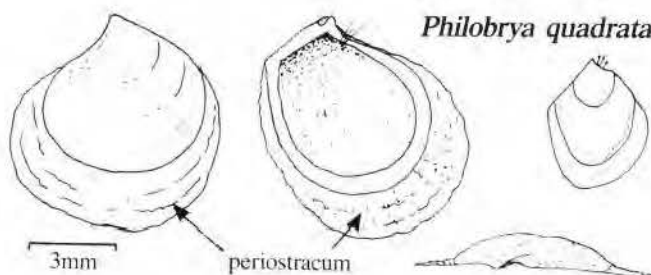


- 7 Dissymmetric valves, left one, regular facets with pronounced radial ridges and concentric ribs; right one with a much lighter sculpturing, (2 mm whitish); auricles as long as the shell.
Cyclopecten aviculooides Smith, 1885
- Valves almost circular, left one sculptured with concentric ridges and tiny radials, right one with fine ornamentation; (shell whitish, sometimes with white flammulations, thin and translucent, 10 mm).
Palliolium clathratum Martens, 1881 = *Pecten distinctus* Smith, 1885
- 8 Shell spoon-shaped, posterior margin drawn out to form a truncated rostrum 9
Shell not spoon-shaped 11
- 9 Shell ornamentation of radial ribs, (very fragile and transparent, 30 mm).
Myonera fragilissima Smith, 1885
- Shell smooth or with concentric ridges.
..... 10
- 10 Shell ornamentation of concentric ridges, very conspicuous in the juvenile and becoming more and more obsolete with age; beak straight and angular; (shell 5-20 mm, yellowish or whitish).
Cuspidaria kerguelensis Smith, 1885
- Shell smooth apart from fine concentric growth rings; beak long and curved, (chalky-white, 10-20 mm).
Cuspidaria cf. tenella Smith, 1907
- 11 Shell truncated at posterior side 12
Shell not truncated at posterior side 13
- 12 Shell elongate and inflated, with a large posterior gap for a big siphon; umbo a little posterior to the middle of the shell; (shell 50-70 mm, whitish).
Laternula elliptica King & Broderip, 1831
- Shell shorter, not gaping at the posterior edge, and relatively flattened with a subcentral umbo; (chalky pinkish-white, about 15 mm).
Thracia meridionalis Smith, 1885
- 13 Shell elongate, slightly gaping, with two rows of tubercles radiating to the postero-ventral edge, frequently distorted; (chalky white, up to 25 mm).
Hiatella solida (Sowerby, 1834)
- Shell not elongate and gaping 14
- 14 Byssus threads present; hinge usually smooth.
..... 15
Byssus threads absent; hinge toothed..... 22

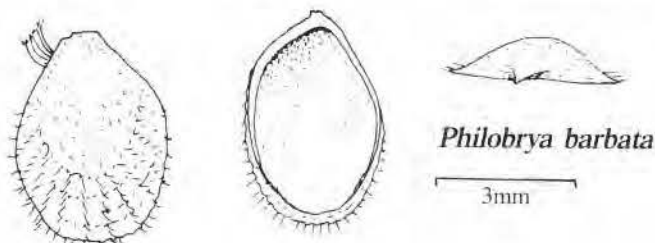


- 15 Periostracum brownish, forming lamellae or hairs in fresh specimens; shell small and white. 16
- Periostracum not projecting from the surface or the margin of the shell. 18

- 16 Shell pinctadoid (oyster-like with the right valve shallower than the left); lamellar periostracum projecting ventrally beyond the shell margin. *Philobrya quadrata* Thiele, 1912

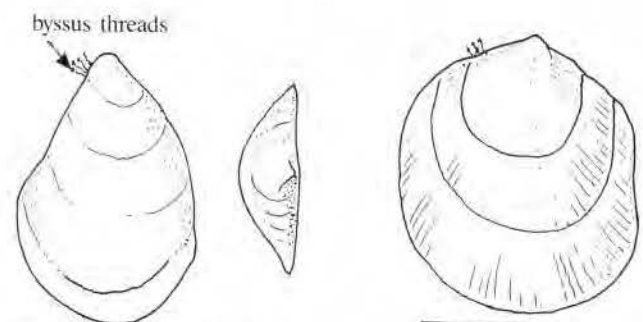


- Shell mytiloid (mussel-like with equal valves); periostracum not extending beyond the shell margin. 17

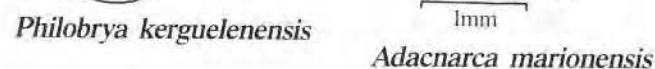


- 17 (Hairy periostracum forming radial crests in juvenile). *Philobrya barbata* Thiele, 1912

- (Lamellar periostracum; shell characteristic shape). *Philobrya kerguelensis* (Smith, 1885)

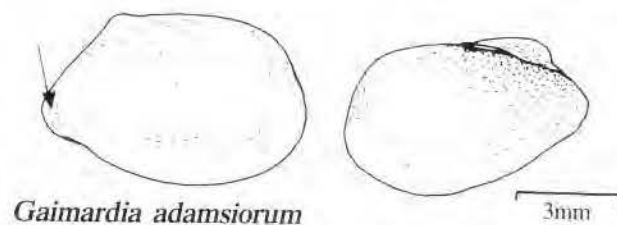


- 18 Shell circular, fine concentric and radial riblets, tiny row of denticles along the cardinal edge, (glossy white, 5 mm). *Adacnarca marionensis* (Smith, 1885)



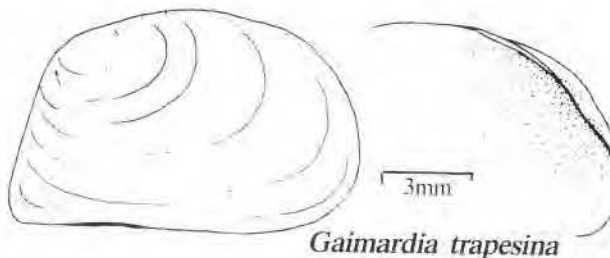
- Shell not circular 19

- 19 Hinge smooth; shell outline irregular with a weak anterior rostrum; periostracum brightly coloured. 20



- Hinge with one or two cardinal teeth; shell elongate, lacks a rostrum, 3-5 mm; periostracum reddish or pinkish with fine growth lines 21

- 20 Rostrum protruding; shell globose, small, 3-4 mm, (dark pink, attached to algae). *Gaimardia adamsiorum* Osorio & Arnaud, 1984

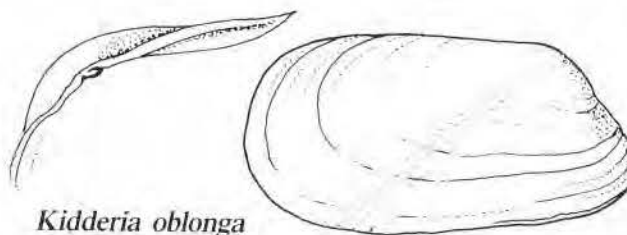


- Rostrum less pronounced; shell not globose, large, up to 25 mm, (pinkish-yellow, attached to the blades of the kelp *Macrocystis pyrifera*). *Gaimardia trapesina* (Lamarck, 1819)

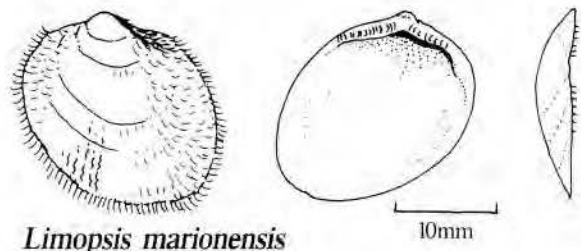
- 21 No radial ornamentation; shell very transverse, (frequently bicoloured, whitish/ochraceous). *Kidderia minuta* Dall, 1876 = *Modiolarca bicolor* Martens, 1885



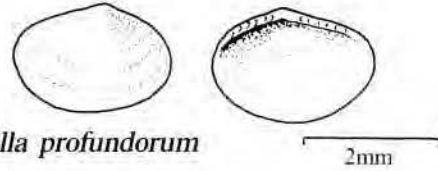
- Some tiny riblets radiating from the umbo to the mid-ventral edge; shell less transverse, (light pinkish). *Kidderia oblonga* (Smith, 1898)



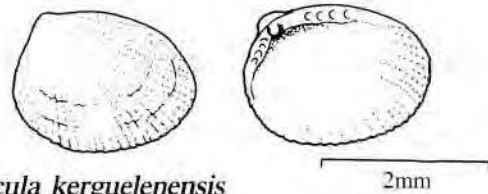
- 22 Hinge taxodont (=numerous teeth) 23
 Hinge with diversified teeth including laterals.
 26
- 23 Shell hidden by a yellowish-brown, hairy periostracum when fresh; (shell large, 30-50 mm, obliquely ovoid, with fine radial and concentric ornamentation), small pointed umbo; hinge with 15 or more teeth.
Limopsis marionensis Smith 1885
- Shell without projecting periostracum.
 24
- 24 Margin not crenulate; shell elongate ovoid, sub-equilateral, (thin, bright yellowish, small, 2-3 mm).
Yoldiella profundorum Melvill & Standen, 1912
- Margin more or less crenulate 25
- 25 Shell ovoid, inequilateral, small 1-2 mm, nacreous and shining, with tiny radiating lines; margin crenulate.
Nucula kerguelenensis Thiele, 1912
- Shell obliquely ovate, small, 2-3 mm; margin crenulate, except ventrally; (attached by byssus thread to algae).
Lissarca miliaris (Philippi, 1845)
- 26 Shell with coarse and regular concentric ornamentation, small, 1 mm.
Condylocardia sp.
- Shell smooth or with only tiny lines.
 27
- 27 Umbo forming a long curved rostrum; (shell with a bright yellow periostracum).
Astarte longirostris d'Orbigny, 1846
- Shell not rostrate 28
- 28 Shell circular with a radial furrow indenting the posterior side of the shell. (translucent and whitish, 1 mm).
Thyasira marionensis Smith, 1885
- Shell lacks the radial furrow on the posterior side of the shell 29
- 29 Shell inequilateral, pink or yellow 30
 Shell almost equilateral, white 31



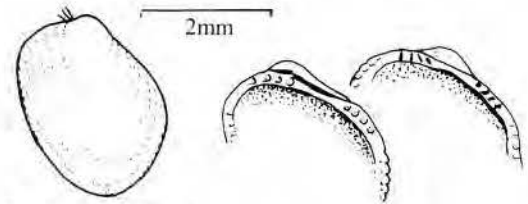
Limopsis marionensis



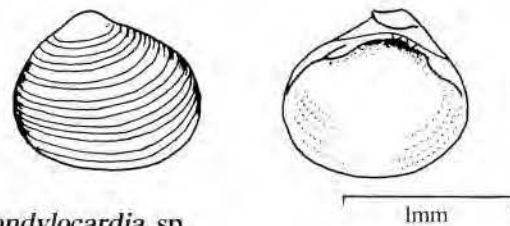
Yoldiella profundorum



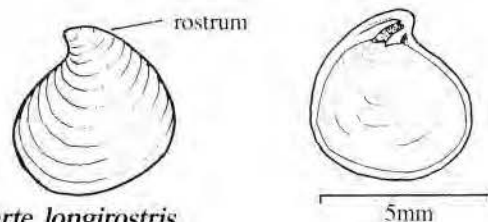
Nucula kerguelenensis



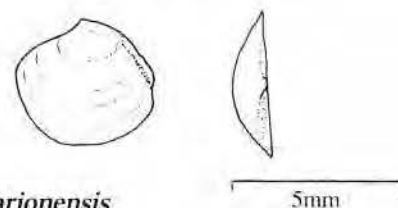
Lissarca miliaris



Condylocardia sp.

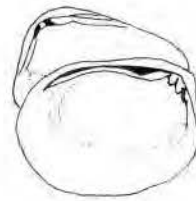


Astarte longirostris



Thyasira marionensis

- 30 Shell triangular, (thick and yellowish, 1-2 mm), umbo small; hinge, two large cardinal teeth in one valve and none in the other.
Mysella charcoti (Lamy, 1906)

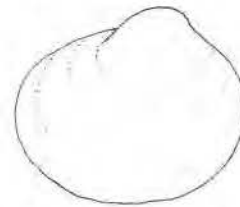


Mysella charcoti

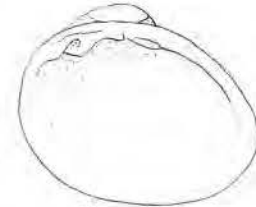
1mm

Shell circular, inflated, pink, 2-3 mm, umbo bluntly rounded; hinge stout with cardinal teeth; (intertidal).
Lasaea consanguinea (Smith, 1877)

- 31 Shell noticeably longer than high, a little inflated (glossy yellowish-white), 8 mm; umbo prominent, rounded; subtidal.
Neoleptum umbonatum Smith, 1885



Lasaea consanguinea



1mm

Shell higher and less inflated (whitish), 3 mm; umbo pointed; common intertidal and subtidal.
Kellia nuculina Martens, 1881

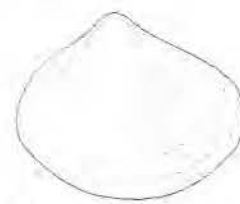
Shells were collected of:

Limopsis lilliei Smith, 1915

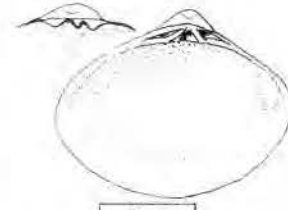
Shell thick, white, concentric ridges, 8 mm; hinge thick with 4 anterior- and 4 posterior-lateral teeth.

Lyonsiella cf. *radiata* Dall, 1889

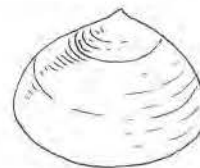
Shell pearly white, marked radial ribs, flattened anteriorly and posteriorly, 20 mm; umbo curved to one side, pointed; periostracum yellow.
SAM A37655



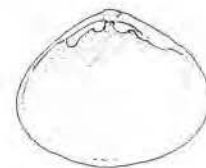
Neoleptum umbonatum



3mm



Kellia nuculina



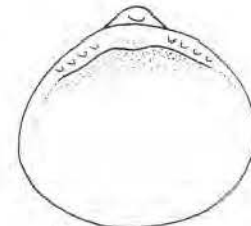
2mm

Dosinia cf. *pubescens*

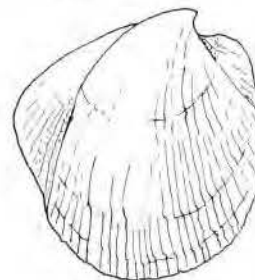
Shell with concentric ridges, prominent curved umbo, 20 mm; hinge with two cardinal teeth.
SAM A37656



Limopsis lilliei

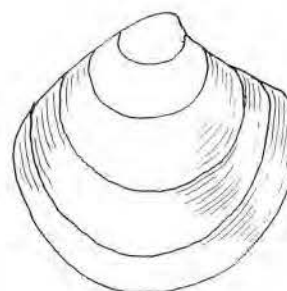


5mm



Lyonsiella cf. *radiata*

10mm



Dosinia cf. *pubescens*

10mm

C Living Gastropods

1 Shell internal; (animal globose, soft, with scattered nodules, reddish yellow or white with red dots, 12 mm).

Marseniopsis pacifica Bergh, 1886

Shell external 2

2 Patelloid (limpet like) shell 3

Coiled shell 5

3 Shell perforate at the apex, (radially ribbed with punctuations, white, 10 mm).

Puncturella conica (d'Orbigny, 1841)

Shell without such hole 4

4 Shell symmetrical, muscle scar interrupted anteriorly; (shell with radiating black lines, 60 mm; littoral).

Nacella delesserti (Philippi, 1849)

Shell asymmetrical, muscle scar interrupted laterally, (pulmonate, dark brown, 15 mm; intertidal).

Kerguelenella lateralis (Gould, 1849)

5 Shell discoid, (flattened coil or very short spire, 1-2 mm).

..... 6

Shell not discoid, (with a spire), small to large.

..... 7

6 Shell horny and brownish, planispiral with a horizontal aperture, 1 mm.

Omalogyra cf. *atomus* (Philippi, 1841)

Shell not horny, whitish, anticlockwise coil with an oblique, round aperture, 1 mm.

Microdiscula subcanaliculata (Smith, 1875)

7 Aperture entire 8

Aperture not entire 29

8 Shell short-spined 9

Shell long-spined 27

9 Shell trochoid (shaped like a top shell).

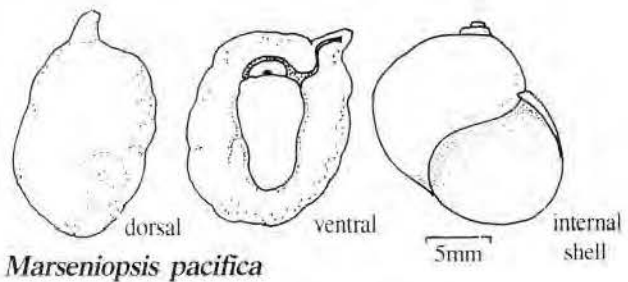
..... 10

Shell globose (rounded).

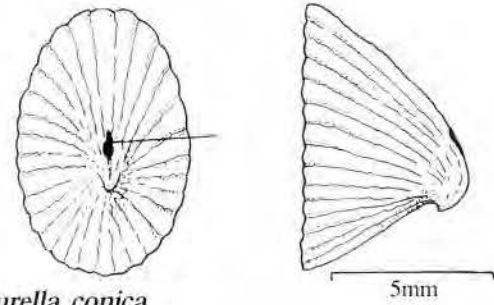
..... 14

10 Surface smooth 11

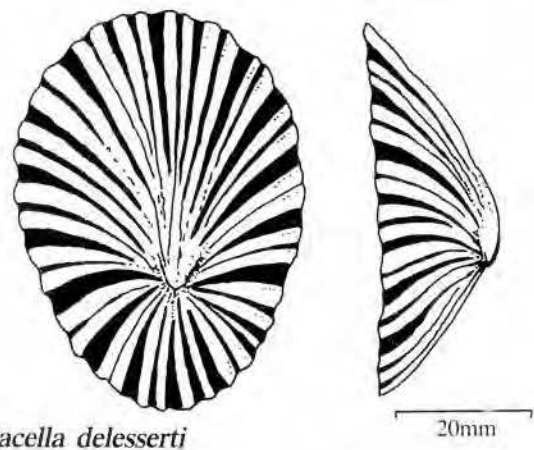
Surface sculptured 12



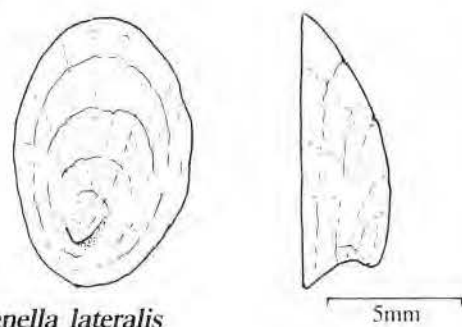
Marseniopsis pacifica



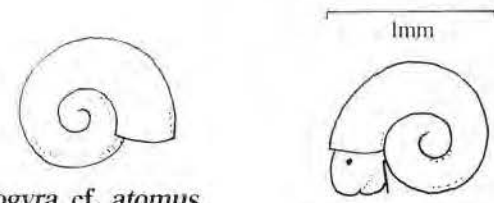
Puncturella conica



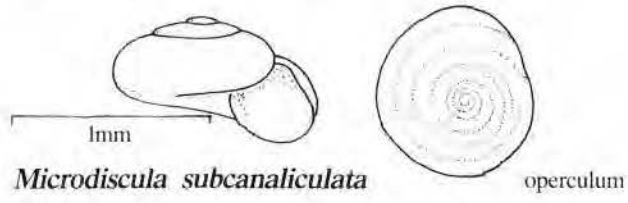
Nacella delesserti



Kerguelenella lateralis



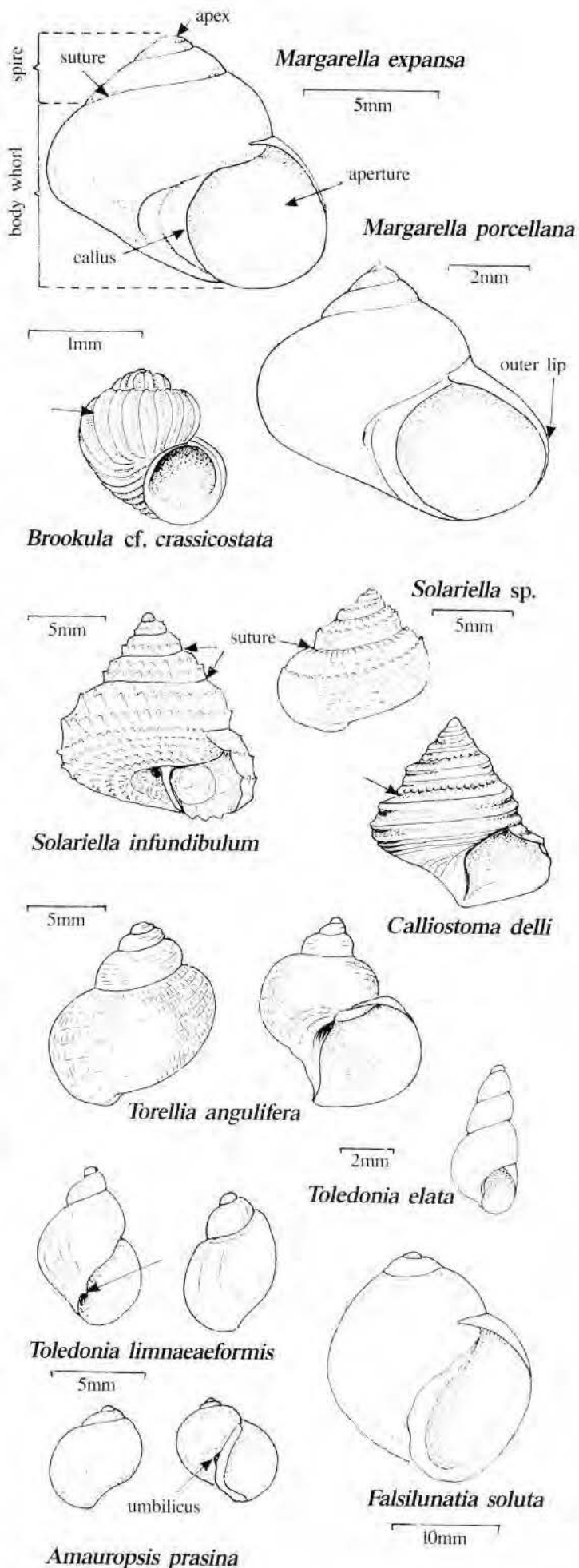
Omalogyra cf. *atomus*



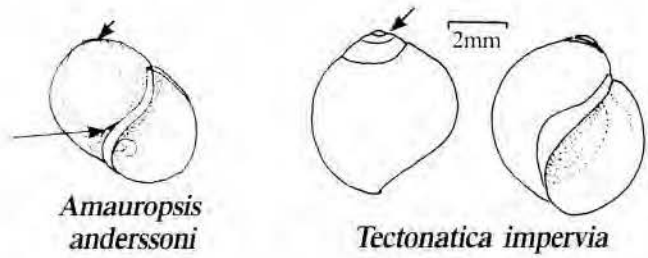
Microdiscula subcanaliculata

operculum

- 11 Pinkish ochre with a white callus; (subtidal, common in kelp beds).
Margarella expansa (Sowerby, 1838)
- Polished nacreous white; (subtidal).
Margarella porcellana Powell, 1951
- 12 Shell, axial ribs, (white, 1 mm).
Brookula cf. *crassicostata* (Strebel, 1908)
- Shell sculptured with spiral cords and tubercles.
..... 13
- 13 Suture impressed, without subsutural cord, tubercles along the upper cord, more than one spiral of tubercles; aperture scalloped.
Solariella infundibulum (Watson, 1879)
(*Solariella* sp. SAM A37657 shell collected with single spiral cord of tubercles; aperture smooth.)
- Suture not impressed, one small and granulose subsutural cord; aperture scalloped.
Calliostoma delli McLean & Andrade, 1982
- 14 Operculum concentric, nucleus apical; (shell soft; periostracum thick, forming spiral rows; 20 mm).
Torellia angulifera Waren, Arnaud & Cantera, 1986
- Operculum absent or paucispiral; shell not soft; periostracum without spiral rows. 15
- 15 Operculum absent; columella tooth present; shell smooth, whitish and translucent; spire 3 whorls.
Toledonia limnaeaeformis (Smith, 1877)
(Shells of *Toledonia elata* were collected with a longer spire of 4 whorls.)
- Operculum paucispiral; columellar tooth absent.
..... 16
- 16 Callus present, with or without umbilicus; shell medium sized 17
- Callus and umbilicus absent; shell small, less than 5 mm 20
- 17 Callus not reaching the upper part of the aperture; periostracum olive yellow, thin; shell more than 10 mm).
Falsilunatia soluta (Gould, 1847)
= *Natica fertilis* (Watson, 1881)
- Callus reaching the upper part of the aperture; shell about 10 mm 18
- 18 Umbilicus well marked, semicircular; (periostracum greyish).
Amauropsis prasina (Watson, 1881)
= *Natica suturalis* Watson, 1881
- Umbilicus more or less closed by the callus 19



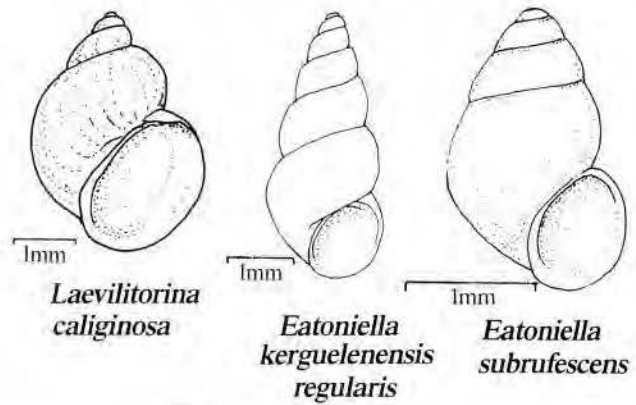
19 Umbilicus circular, partly closed; spire flat.
Amauropsis anderssoni Strebel, 1906



Umbilicus closed; spire relatively high.
Tectonatica impervia (Philippi, 1845)

20 Shell coloured 21
Shell white or whitish 23

21 No opercular peg; (shell thin and brown; intertidal).
Laevilitorina caliginosa (Gould, 1848)



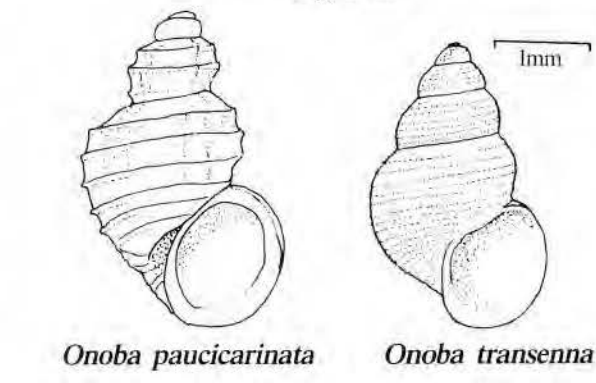
Opercular peg present; shell not very thin.
..... 22

22 Shell brown or blackish; (subtidal).
Eatoniella kerguelensis regularis (Smith, 1915)

Shell pale; (subtidal).
Eatoniella subrufescens (Smith, 1875)

23 Shell spiral sculptured 24
Shell smooth 25

24 Shell thin with about 15 spiral cords.
Onoba transenna (Watson, 1886)

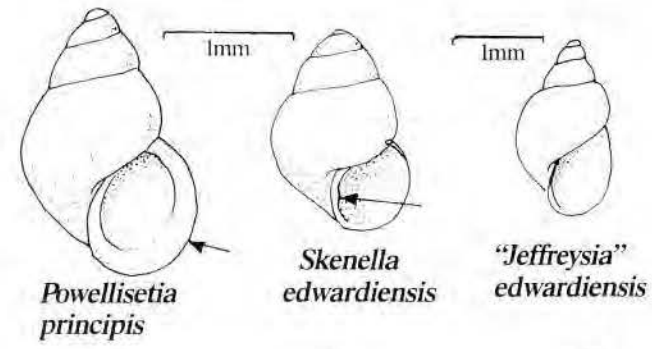


Shell heavier with about 5 spiral cords.
Onoba paucicarinata (Ponder, 1983)

25 Aperture circular with thickened, splayed, outer lip.
Powellisetia principis (Watson, 1886)

Aperture oval, outer lip not thickened 26

26 Columella bulging; (shell yellow-white).
Skenella edwardsensis (Watson, 1886)

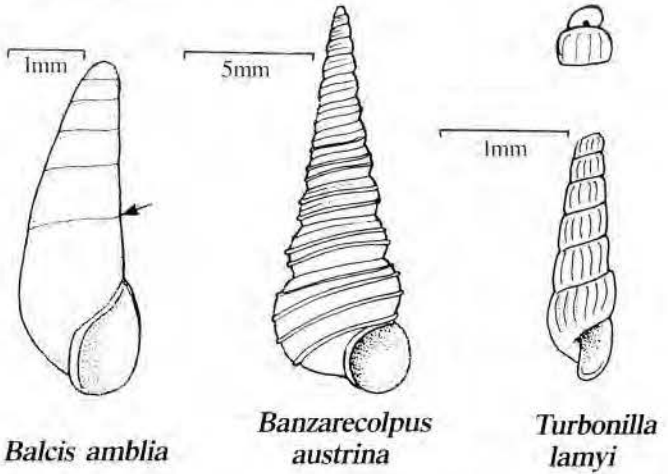


Columella not bulging; (shell glossy white, outer lip sharp).
"Jeffreysia" edwardsensis (Watson, 1886)

27 Surface smooth, no constriction along the suture, (glossy white, 7 mm).
Balcis ambliia (Watson, 1883)

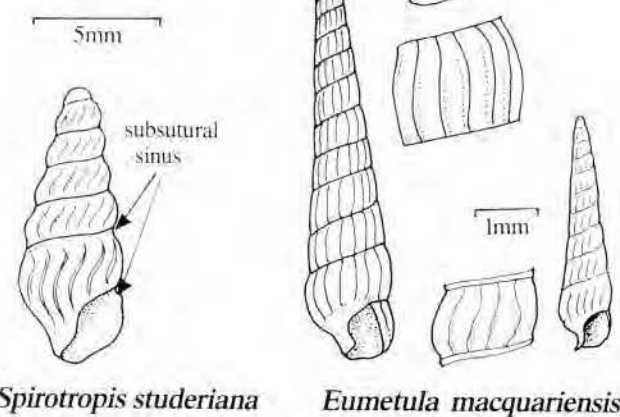
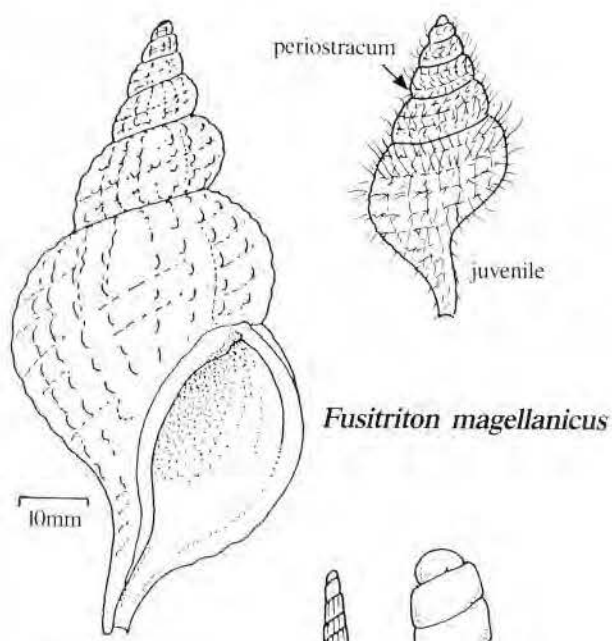
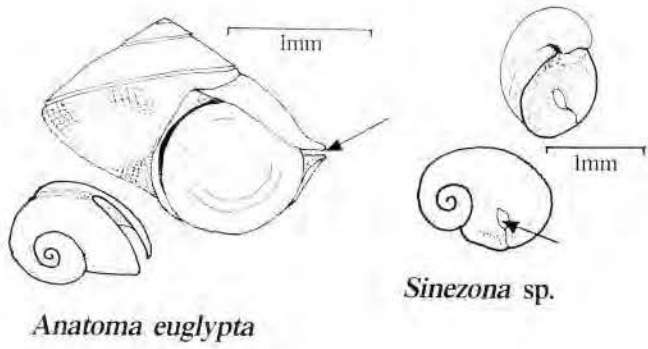
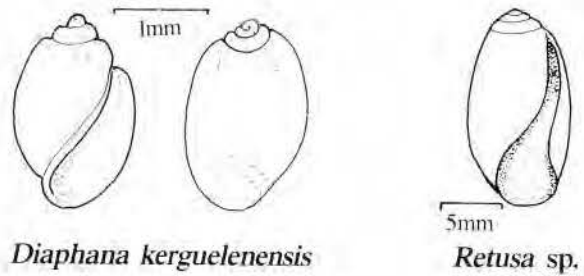
Surface sculptured 28

28 Shell sculpture, two long spiral ridges and two small intermediate ones. (white, aperture small, round, 15 mm).
Banzarecolpus austrina (Watson, 1883)



Shell sculpture, axial ribs, (white, aperture square, apex blunt, 3 mm).
Turbonilla lamyi Hedley, 1916

- 29 Shell cylindrical, spire reduced. 30
 Shell conical 31
- 30 Whorls shouldered; aperture reaching about 2/3 of the height of the shell; (fragile, white, 2 mm).
Diaphana kerguelensis Thiele, 1912
- Whorls without shoulder; aperture higher than 2/3 the height of the shell; (fragile, white, 10 mm).
Retusa sp. SAM A37646
- 31 No siphonal canal; shell with low spire; apertural slit present. 32
 Siphonal canal present; shell with high spire; no apertural slit, but may have a subsutural sinus. 33
- 32 Shell trochoid, sculpturing of oblique, axial, fine ribs crossed by spiral lines, 5 mm.
Anatoma euglypta (Pelseneer, 1903)
- Shell globose, axial riblets only 3 mm; (apertural slit evolved into a marginal perforation in the adult).
Sinezona sp.
- 33 Parietal tooth present; periostracum thick and hairy; (shell large, 100 mm, sculpture of riblets and fine spiral lines with tubercles at their crossing).
Fusitriton magellanicus (Roeding, 1798)
 = *Triton cancellatum* Lamarck, 1816
- Parietal tooth absent; periostracum not thick and hairy. 34
- 34 Shell narrow with a long spire, length > 2.5x width. 35
 Shell with short spire, length < 2x width. 39
- 35 Shell with a subsutural sinus, (wavy axial ribs issued from subsutural blunt tubercles, white, 15 mm).
Spirotropis studeriana (Martens, 1878)
 = ? *Typhlomangelia fluctuosa* (Watson, 1881).
- Subsutural sinus absent 36
- 36 Strong axial ribs and weak spiral lines; up to 20 mm. 37
 Spiral lines dominant on axial ornamentation; up to 10 mm 38
- 37 (Less than 20 axial ribs on the body whorl).
Eumetula macquariensis Tomlin, 1948



(More than 20 axial ribs on the body whorl, crossed by spiral threads, except on the first two whorls).
Eumetula sp. SAM A37645

38 Shell with two to three spiral threads with tubercles, except on the body whorl, yellowish.
Cerithiella cf. *werthi* Thiele, 1912

Shell with three or four flat, spiral ridges, (white).
Cerithiopsilla sp. SAM A37644

39 Axial ornamentation dominant 40
 No axial ornamentation; 7-12 mm 44

40 Axial lamellae; 15-20 mm 41
 Axial ribs 42

41 (Lamellae sharp, angulose at the shoulder, subsutural tubercles).
Trophon septus Watson, 1882

(Lamellae without shoulder and tubercles).
Trophon declinans Watson, 1882

42 Shell with subsutural sinus, (light subsutural shoulder, axial ribs crossed by spiral lines; 12 mm).
Typhlodaphne platamodes (Watson, 1881)

No subsutural sinus; (7 mm) 43

43 Whole surface sculptured.
Pareuthria regulus Watson, 1833

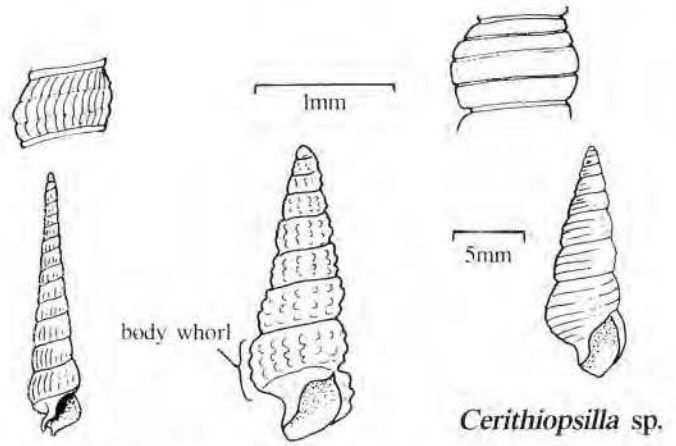
Body whorl without axial ribs.
Probuccinum edwardiensis (Watson, 1882)

44 Shell glossy white.
Typhlodaphne translucida (Watson, 1881)

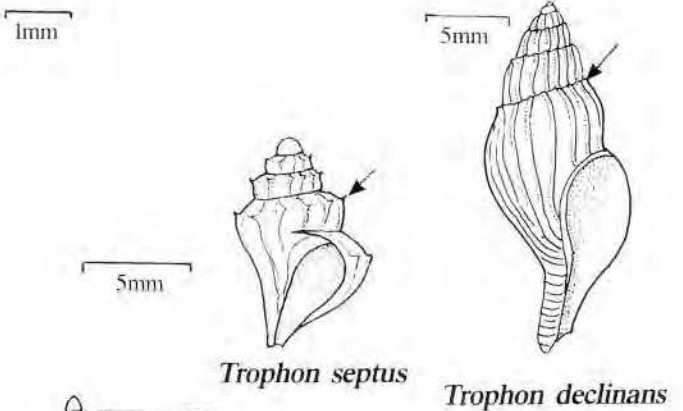
Shell with spiral ornamentation 45

45 Columellar teeth present; (spiral lines on the whole shell surface).
Admete specularis (Watson, 1882)

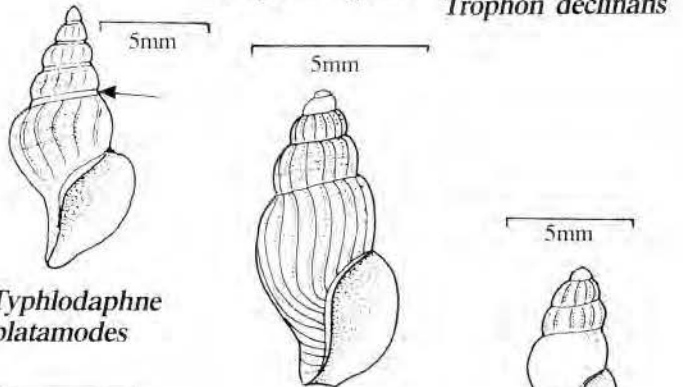
Columellar tooth absent; (shell with weak spiral lines in the spire and on the upper part of the body whorl only).
Chlanidotella modesta (Martens, 1885)



Eumetula sp. *Cerithiella* cf. *werthi*



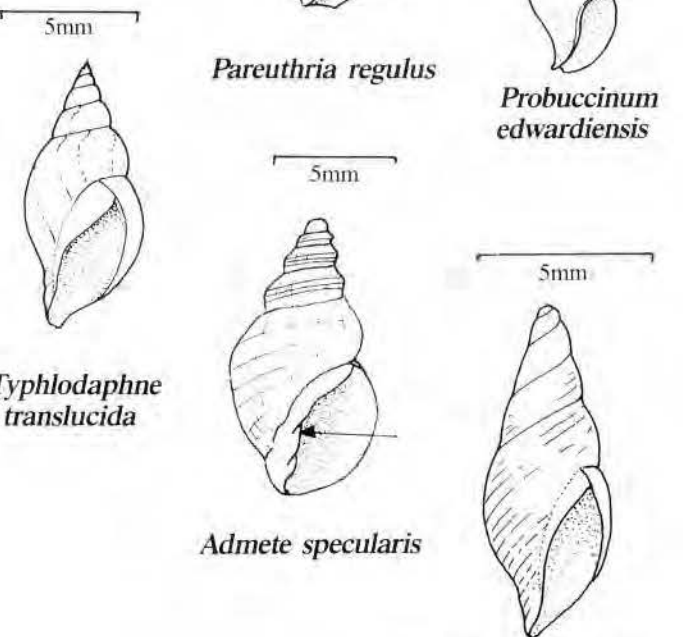
Trophon septus *Trophon declinans*



Typhlodaphne platamodes

Pareuthria regulus

Probuccinum edwardiensis



Typhlodaphne translucida

Admete specularis

Chlanidotella modesta

D Living Polyplacophora (Chitons)

Shell composed of a series of eight valves surrounded by a mantle; foot broad and flat; radula present.

- 1 Girdle greatly expanded anteriorly, almost twice as long as the shell length, surface granular with spinose papillae on the surface and at the margin; valves wide and flat, whitish; occurs at over 360 m depth.

? *Placiphorella* sp. SAM A37647

Girdle forms a narrow margin around the valves.
..... 2

- 2 Girdle chestnut brown with small tufts of white spicular scales in the angles between the valves; valves dark brown; intertidal.

Hemiarthrum setulosum Dall, 1876

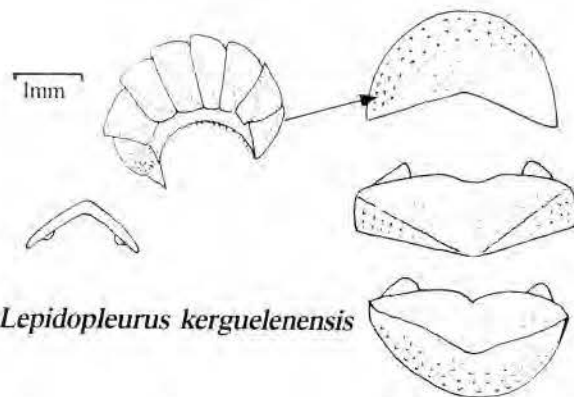
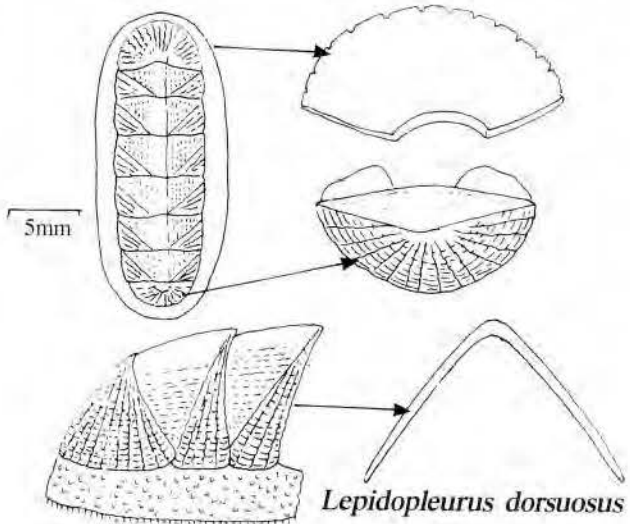
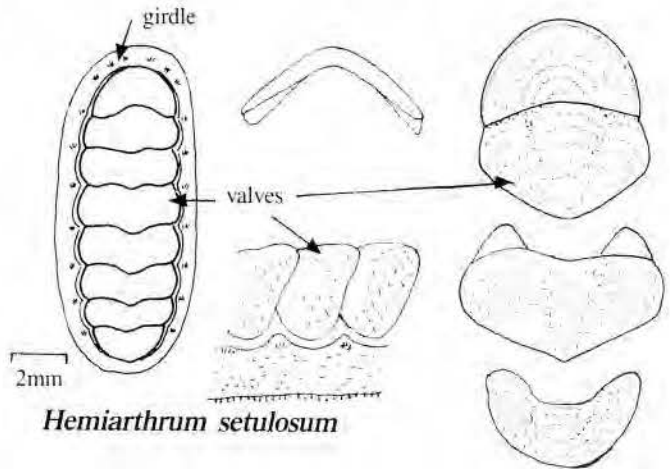
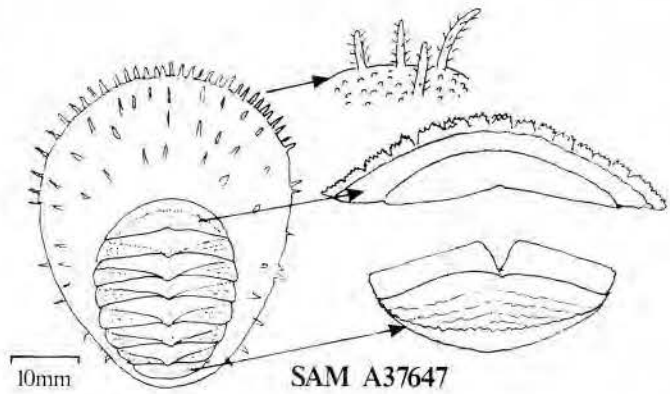
Girdle covered with small, overlapping scales; valves white.
..... 3

- 3 Valves with distinct radial sculpturing; anterior valve insertion plate fissured (like teeth); valves compressed laterally, form angle of 75°; large about 20 mm long; occurs at over 100 m depth.

Lepidopleurus dorsuosus Haddon, 1886

Valves smooth with scattered tubercles; insertion plate with a smooth margin; valve sides meet at an angle of 100°; small about 3 mm long.

Lepidopleurus kerguelenensis (Haddon, 1886)



Discussion

The benthic molluscan fauna of Marion Island comprises 85 living species, including 46 gastropods, 32 bivalves, 4 polyplacophorans and single representatives of the Cephalopoda, Solenogastres and Scaphopoda. Of these, 38 are recorded here for the first time. Of the 85 species, 76 are identified to specific level in this guide, the remaining 9 have been identified to genus and await identification or description of new species. Three brachiopods have been recorded. One of them, *Magellania kerguelenensis*, is common to abundant at almost all stations sampled except in the intertidal and very shallow subtidal zone. The molluscan fauna is made up predominantly of small, white shelled species 20 mm or less in length, notable exceptions being the common intertidal limpet *Nacella delesserti*, the large whelk *Fusitriton magellanicus* and the large white bivalves *Laternula elliptica* and *Acesta* sp. Several of the small shallow-water bivalves that are usually attached to algae are various shades of pink to orange, namely *Gaimardia adamsiorum*, *Lasaea consanguinea* on the filaments of *Rama antarctica*, *Gaimardia trapesina* attached to the kelp *Macrocystis laevis*, and *Kidderia minuta* and *Kidderia oblonga*.

A Brey-Curtis similarity analysis of the entire benthic invertebrate collection (Branch *et al* 1992) identified several communities around the Islands. These are largely influenced by depth and substratum. The dredged collections from soft substrates were very uniform while those from rocky areas were more patchy, due to the dredge bouncing on the rock surface and not taking consistent samples. Seven communities were recognised in analysing the molluscan and brachiopod fauna; these were 5 benthic communities (sampled by dredging) (1-5), an intertidal community (6), and a subtidal community (sampled by scuba-diving) (7). The results are summarised in Table 1 (p 62 & 63).

The benthic communities shown on the map (Fig 1, p 64) were characterised as follows:

Group 1. A heterogeneous inshore community around the Islands to a depth of about 50 m. This was rich in species but among the molluscs only *Trophon declinans*, *Margarella expansa* and *Kellia nukulina* were common.

Group 2. A large community between the Islands, occurring on soft substrate at depths of about 50-150 m, contained an abundance of filter-feeding bivalves namely *Limatula pygmaea*, *Thracia meridionalis*, *Hiatella solida* and *Astarte longirostris* together with the common brachiopod *Magellania kerguelenensis*. The carnivorous whelk *Trophon declinans* was also abundant and, judging by the number of bivalves with drill holes, it probably feeds on bivalves. The abundant gastropod *Margarella porcellana* and the common keyhole limpet *Puncturella conica* are probably detritus feeders.

Group 3. A deeper, 150-300 m, soft-substrate community between and to the east of the Islands contained the same bivalves and brachiopods as group 2 with the omission of *Thracia meridionalis* and the addition of *Limopsis marionensis*. Several different detritivorous gastropods were recorded but none of these were common.

Group 4. This community was found in a deep (300-500 m) rocky locality to the south-west of Prince Edward Island and again to the south-east of Marion Island where there were dense colonies of octocorals and hydrozoans. The common gastropods were *Pareuthria regulus*, *Tectonatica impervia*, *Trophon declinans* and *Eumetula macquariensis*. The chiton *Lepidopleurus dorsuosus* was also common. There were fewer bivalves, including *Hiatella solida*, *Limopsis marionensis* and *Pterria* sp. attached to *Plumularia insignis*. The Solenogastres were recorded only in this group, with 9 specimens on the hydrozoan *Symplectoscyphus subarticulatus*.

Group 5. This community characterised the deepest locality sampled at over 500 m depth at sites with a sloping and predominantly rocky floor. There were very few molluscs apart from shells and a few live specimens of a large bivalve *Acesta* sp., the gastropods *Solariella infundibulum*, *Pareuthria regulus* and a single specimen of the unusual large-girdled chiton *Placiphorella* sp. all of which are new records.

Group 6. The intertidal from Marion Island was investigated by de Villiers (1976) and the 8 intertidal collections taken in 1982 present similar patterns to those reported by de Villiers. The pulmonate limpet *Kerguelenella lateralis* was particularly common in the intertidal above the bull kelp (*Durvillea antarctica*) zone. *Laevitorina caliginosa* was most common around high tide pools. The bivalves *Lasaea consanguinea* grew attached to the alga *Rama antarctica*. In the *Durvillea* zone *Kidderia minuta* (= *K. bicolor*) "hid" in crevices beneath the kelp and *Hemiarthrum setulosum* and *Nacella delesserti* were common on encrusting corallines.

Group 7. The scuba-sampling between 5-15 m depths was quantitative and a much finer sampling method than dredging (Beckley and Branch 1992). Thirty four species of mollusc were recorded. The bivalves *Kellia nukulina* and *Kidderia minuta* were abundant and *Gaimardia trapesina* was attached to the kelp *Macrocystis laevis* in large numbers. There were three species of small *Philobrya* mussels, with *Philobrya barbata* being the most common. The chiton *Hemiarthrum setulosum* was abundant and the smaller *Lepidopleurus kerguelenensis* was also present in this zone. *Pareuthria regulus* and *Trophon declinans* were common whelks. The limpet *Nacella delesserti* was abundant on lithothamnion closer inshore and the minute "*Jeffreysia*" *edwardiensis* was collected in large numbers.

The brachiopod *Magellania kerguelenensis* occurred throughout the sampling zones and was abundant at depths of 100-500 m. Limpets and chitons were largely confined to the intertidal and subtidal where they dominated. The bivalves were divided into two groups; those that were associated with algae in the intertidal to depths of 15 m and the sand-dwelling forms concentrated between the two Islands.

Table 1

Summary of all species of Mollusca and Brachiopoda recorded from Marion and Prince Edward Islands during the 1982-89 University of Cape Town Surveys.

Species	No of Records			Depth m		Modal abundance in substrates						Abundance in communities						
	Int	Dv	Dr	Min	Max	rock			sand			Offshore		Int	Div			
						A	B	C	D	E	F	1	2	3	4	5	<5 m	5-15m
BRACHIOPODA																		
<i>Liothyrella</i> sp.	—	5	3	10	527	1	0	0	0	0	0	—	—	—	r	r	—	r
<i>Magellania kerguelenensis</i>	—	6	35	10	510	2	1	1	1	2	1	r	a	a	a	r	—	r
<i>Platydia anomioides</i> SAM A 37643	—	—	3	255	527	1	0	0	4	0	0	—	—	—	p	—	—	—
MOLLUSCA																		
GASTROPODA																		
<i>Admete specularis</i>	—	4	7	49	228	0	0	0	2	1	1	r	p	r	—	—	—	p
<i>Amauropsis prasina</i>	—	2	4	10	527	1	0	1	0	1	0	—	r	p	p	—	—	r
<i>Anatoma euglypta</i>	—	—	3	355	420	2	0	0	0	0	1	—	—	r	p	—	—	—
<i>Balcis ambliia</i>	—	3	1	510	510	2	0	0	0	0	0	—	—	—	p	—	—	r
<i>Banzarecolpus austrina</i>	—	—	6	85	228	1	0	0	0	4	0	—	p	p	p	—	—	—
<i>Cerithiella</i> cf. <i>werthi</i>	—	8	1	10	102	0	0	1	0	0	0	—	r	—	—	—	—	p
<i>Cerithiopsisilla</i> sp. SAM A37644	—	—	1	49	59	0	0	0	1	0	0	r	—	—	—	—	—	—
<i>Chlanidotella modesta</i>	1	9	10	0	510	1	0	0	0	1	1	r	p	p	p	—	r	p
<i>Diaphana kerguelenensis</i>	—	4	—	10	10	—	—	—	—	—	—	—	—	—	—	—	—	r
<i>Eatoniella kerguelenensis regularis</i>	—	23	—	10	10	—	—	—	—	—	—	—	—	—	—	—	—	r
<i>Eumetula macquariensis</i>	—	—	7	151	697	1	0	0	0	1	1	—	r	—	c	r	—	—
<i>Eumetula</i> sp. SAM A37645	—	—	1	355	355	1	0	0	0	0	0	—	—	—	—	—	—	—
<i>Falsilunatia soluta</i>	—	—	1	31	31	0	0	0	0	0	1	—	—	—	—	—	—	—
<i>Fusitriton magellanicus</i>	—	—	2	290	475	1	1	0	0	0	0	—	—	—	p	—	—	—
" <i>Jeffreyia</i> " <i>edwardiensis</i>	—	27	1	5	45	1	0	0	0	0	0	r	—	—	—	—	—	a
<i>Kerguelenella lateralis</i>	3	—	—	0	10	—	—	—	—	—	—	—	—	—	—	—	c	—
<i>Laevilitorina caliginosa</i>	5	3	—	0	10	—	—	—	—	—	—	—	—	—	—	—	a	r
<i>Margarella expansa</i>	—	1	12	10	102	3	0	2	5	1	1	a	r	—	—	—	—	r
<i>Margarella porcellana</i>	—	1	11	10	151	2	0	1	1	2	2	r	a	—	—	—	—	r
<i>Marseniopsis pacifica</i>	—	—	1	147	147	0	1	0	0	0	0	—	—	—	—	—	—	—
<i>Microdiscula subcanaliculata</i>	—	1	—	10	10	—	—	—	—	—	—	—	—	—	—	—	—	r
<i>Nacella delesserti</i>	4	20	—	0	15	—	—	—	—	—	—	—	—	—	—	—	c	a
<i>Omalogyra</i> cf. <i>atomus</i>	—	5	1	5	145	0	0	0	0	1	0	—	—	r	—	—	—	r
<i>Onoba transenna</i>	—	—	2	52	90	0	0	0	0	0	1	r	r	—	—	—	—	—
<i>Pareuthria regulus</i>	1	8	12	0	527	1	0	1	1	1	1	r	p	r	a	r	r	c
<i>Powellisetia principis</i>	—	—	1	102	102	0	0	1	0	0	0	—	r	—	—	—	—	—
<i>Puncturella conica</i>	—	4	13	5	355	1	0	0	1	1	2	r	c	p	—	—	—	r
<i>Retusa</i> sp. SAM A37646	—	—	4	151	210	0	0	0	0	1	1	—	r	p	—	—	—	—
<i>Sinezona</i> sp.	—	8	—	5	5	—	—	—	—	—	—	—	—	—	—	—	—	p
<i>Skenella edwardiensis</i>	—	—	2	120	355	1	0	0	0	0	1	—	r	—	—	—	—	—
<i>Solariella infundibulum</i>	—	—	2	45	750	2	0	0	0	0	0	—	—	—	—	r	—	—
<i>Spirotropis studeriana</i>	—	—	4	140	204	0	0	0	0	1	1	—	r	p	—	—	—	—
<i>Tectonatica impervia</i>	—	—	9	38	420	1	0	1	2	1	2	p	p	—	c	—	—	—
<i>Torellia angulifera</i>	—	—	2	474	527	1	1	0	0	0	0	—	—	—	p	—	—	—
<i>Toledonia elata</i>	—	—	1	460	560	1	0	0	0	0	0	—	—	—	r	—	—	—
<i>Trophon declinans</i>	2	23	15	5	527	1	0	2	3	2	2	c	a	r	c	—	p	c
<i>Trophon septus</i>	—	—	2	140	200	0	0	0	0	1	1	—	r	r	—	—	—	—
<i>Typhlodaphne translucida</i>	—	1	2	210	355	1	0	0	0	0	0	—	—	—	p	—	—	r
<i>Typhlodaphne platomodes</i>	—	—	1	140	140	0	0	0	0	1	0	—	r	—	—	—	—	—
POLYPLACOPHORA																		
<i>Hemiarthrum setulosum</i>	4	33	2	0	45	2	0	0	0	0	0	p	—	—	—	—	c	a
<i>Lepidopleurus dorsuosus</i>	—	—	6	355	697	1	1	0	0	0	2	—	—	p	c	r	—	—
<i>Lepidopleurus kerguelenensis</i>	2	8	1	0	102	0	0	1	0	0	0	—	r	—	—	—	p	p
? <i>Placiphorella</i> SAM A37647	—	—	1	340	400	1	0	0	0	0	0	—	—	—	—	r	—	—
SCAPHOPODA																		
<i>Fissidentalium</i> sp. SAM A37649	—	—	5	139	420	0	0	0	0	1	1	—	r	p	r	—	—	—
BIVALVIA																		
<i>Acesta</i> sp. SAM A37648	—	—	1	697	697	1	0	0	0	0	0	—	—	—	—	r	—	—
<i>Adacnarca marionensis</i>	—	—	1	200	200	0	0	0	0	0	1	—	—	r	—	—	—	—
<i>Astarte longirostris</i>	—	—	17	52	370	1	0	4	0	1	1	r	c	p	—	—	—	—
<i>Cuspidaria</i> cf. <i>tenella</i>	—	—	1	139	139	0	0	0	0	1	0	—	r	—	—	—	—	—
<i>Cyclopecten aviculoides</i>	—	4	1	10	63	0	0	0	0	1	0	—	r	—	—	—	—	r

Table 1 (continued)

Species	No of Records			Depth m		Modal abundance in substrates						Abundance in communities						
	Int	Dv	Dr	Min	Max	rock						Offshore						
						A	B	C	D	E	F	shallow deep					Int	Div
												1	2	3	4	5	<5 m	5-15m
MOLLUSCA																		
BIVALVIA																		
<i>Gaimardia adamsiorum</i>	4	5	3	0	52	1	0	0	0	0	0	p	—	—	—	—	p	p
<i>Gaimardia trapesina</i>	—	12	1	5	200	0	0	0	0	0	1	—	—	r	—	—	—	p
<i>Hiatella solida</i>	—	1	29	15	474	2	1	3	2	2	3	p	a	a	c	—	—	r
<i>Kellia nukulina</i>	—	25	10	5	106	3	0	4	1	1	1	c	p	—	—	—	—	a
<i>Kidderia minuta</i>	4	24	—	0	10	—	—	—	—	—	—	—	—	—	—	—	c	a
<i>Kidderia oblonga</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Lasaea consanguinea</i>	3	—	1	0	52	0	0	0	0	0	1	r	—	—	—	—	p	—
<i>Limatula pygmaea</i>	—	3	27	38	240	1	0	2	0	4	1	p	a	c	—	—	—	r
<i>Limopsis marionensis</i>	—	—	16	106	527	1	3	0	0	1	1	—	p	c	a	—	—	—
<i>Mysella</i> sp.	—	1	—	10	10	—	—	—	—	—	—	—	—	—	—	—	—	r
<i>Neolepton umbonatum</i>	—	2	7	10	750	1	0	0	0	1	3	p	r	r	p	—	—	r
<i>Nucula kerguelenensis</i>	—	2	—	15	15	—	—	—	—	—	—	—	—	—	—	—	—	r
<i>Palliolium clathratum</i>	—	—	13	106	474	0	1	0	0	1	2	—	c	c	p	—	—	—
<i>Philobrya barbata</i>	—	17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	c
<i>Philobrya kerguelenensis</i>	—	3	—	5	10	—	—	—	—	—	—	—	—	—	—	—	—	r
<i>Philobrya quadrata</i>	—	13	4	5	208	1	0	0	0	1	3	—	r	c	—	—	—	p
<i>Pteria</i> sp. SAM A37650	—	—	2	210	475	1	0	0	0	0	0	—	—	—	p	—	—	—
<i>Thracia meridionalis</i>	—	1	8	15	120	0	0	4	0	4	3	p	a	—	—	—	—	r
<i>Thyasira marionensis</i>	—	—	3	31	145	0	0	0	0	1	3	—	r	r	—	—	—	—
<i>Yoldiella profundorum</i>	—	—	1	228	228	0	0	0	0	1	0	—	—	r	—	—	—	—
CEPHALOPODA																		
<i>Octopus magnificus</i>	—	6	5	10	474	1	1	1	0	1	0	r	p	—	p	—	—	p
SOLENOGASTRES																		
SAM A37651	—	—	2	50	527	2	0	0	0	0	0	—	—	—	p	—	—	—

The number of stations at which each species was recorded is given for intertidal (Int), scuba-diving (Dv) and dredging (Dr) surveys. For these three survey methods 8, 44 and 57 stations were sampled, respectively. Maximum and minimum depths are given. The modal abundance of each species is shown in relation to substratum where the modal abundance is expressed as follows: 0= absent, 1=1-5, 2=6-15, 3=16-30, 4=31-50, 5=51-100 individuals per sample. Substrate types are: A=>60% rock, B=10-60% rock, C=>50% gravel, D=sand with 5%-50% gravel, E= sand with >5% mud, F= 100% sand.

Abundance is also summarised in relation to five community groups recognised by similarity analyses of the offshore dredged material (community groups 1-5, see map in Fig 1) or for intertidal (Int, group 6 <5m depth) and shallow-water scuba-samples (Dv, group 7, 5-15m). Abundance was ranked as: —= absent, r=rare, p=present, c=common, a=abundant. Ranking was assigned on the basis of the product of the modal abundance and the percentage of stations within a community group at which the species was collected.

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Fig 1
Map of Prince Edward Islands showing station positions and community groups

Key to community groups

- ★ 1 <50m, inshore heterogenous group
- ▲ 2 50-150m, soft bottomed, sheltered
- 3 150-300m, sand
- 4 300-500m, rocky
- ◆ 5 > 500m, sloping
- * Stations not used in analysis — show little similarity to any other stations
- Diving stations

