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RISSOAFORM GASTROPODS FROM THE ANTARCTIC AND SUB-ANTARCTIC

The Eatoniellidae, Rissoidae, Barleeidae, Cingulopsidae,
Orbitestellidae and Rissoellidae (Mollusca: Gastropoda) of Signy
Island, South Orkney Islands, with a review of the Antarctic and
sub-Antarctic (excluding southern South America and the New
Zealand sub-Antarctic islands) species

By

W. F. PONDER

The Australian Museum, Sydney



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RISSEOAFORM GASTROPODS FROM THE ANTARCTIC AND SUB-ANTARCTIC:

The Eatoniellidae, Rissoidae, Barleeidae, Cingulopsidae, Orbitestellidae and Rissoellidae (Mollusca: Gastropoda) of Signy Island, South Orkney Islands, with a review of the Antarctic and sub-Antarctic (excluding southern South America and the New Zealand sub-Antarctic islands) species

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ABSTRACT

The Eatoniellidae, Rissoidae, Barleeidae, Cingulopsidae, Rissoellidae and Orbitestellidae of the Antarctic and sub-Antarctic (excluding the New Zealand sub-Antarctic and southern South America) are reviewed. The species of Signy Island, South Orkney Islands and Macquarie Island are described in detail. There are 15 valid species of Eatoniellidae from the Antarctic-sub-Antarctic, one of which has two geographic subspecies. Two additional taxa are of uncertain status. Five species of *Eatoniella* are recorded from Signy Island, two being new. Two additional new species are described, one from the Falkland Islands and one from off Enderby Land, Antarctica. Five species of *Onoba* and one of *Powellisetia* are recorded from Signy Island and an additional 20 species of Rissoidae in two genera (*Onoba* and *Powellisetia*) are listed for the rest of the Antarctic-sub-Antarctic, four of these species being new. One new species of *Onoba* is described from South Georgia and the Falkland Islands, and another is known only from Marion Island and off Enderby

Land. Two new species of *Powellisetia* are described from Îles Kerguelen. Two genera, including three species, of the Barleeidae (subfamily Anabathrinae) are found at Île St Paul and Île Amsterdam. A third genus, *Fictonoba*, is tentatively recognized from the Burdwood Bank. A new genus and species of Cingulopsidae is described from Signy Island. *Eatoniopsis* is shown to be a junior synonym of *Skenella* and a new species of *Skenella* is described from Signy Island, the Antarctic Peninsula and Terre Adélie. Four additional named Antarctic and sub-Antarctic species of *Skenella* are recognized and two unnamed species are recorded. Two species of Orbitestellidae are known from the region, one from the South Orkney Islands and Macquarie Island and one from the Davis Sea. A new species of *Rissoella* is described from Signy Island and the two named sub-Antarctic species are reviewed. An analysis of the distribution of the species taxa shows a high degree of endemism, particularly in the sub-Antarctic fauna.

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I. INTRODUCTION

1. *Scope of the report*

The classification of minute prosobranch gastropods has usually proved to be difficult and small gastropods loosely classified in the 'Rissoacea' were probably among the least understood. In the last 15 years a number of studies have improved the understanding of 'rissoaceans' so that a relatively reliable, phylogenetic classification can be adopted. Powell's (1960) checklist is the last attempt to compile a comprehensive list of Antarctic and sub-Antarctic Mollusca. Because of the major taxonomic changes that have occurred since the publication of that list, a review of the Antarctic and sub-Antarctic species of the families Eatoniellidae, Rissoidae, Barleeidae, Cingulopsidae, Orbitestellidae and Rissoellidae is attempted. The species from New Zealand sub-Antarctic and from the southern part of South America are excluded from this review. Powell (1960) included the species belonging to the families considered in this review in the Rissoellidae, Hydrobiidae, Rissoidae and Skeneopsidae.

Minute prosobranchs of the Rissoidae and Eatoniellidae are apparently significant in shallow-water, algal communities in the Antarctic and sub-Antarctic and some benthic rissoids in deeper water are the most abundant species of Mollusca in the Davis Sea (Egorova, 1978) and thus, possibly, in other parts of the Antarctic.

The primary impetus for this report was an excellent collection of material made by Dr Gordon Picken at Signy Island, South Orkney Islands. This could not be worked up satisfactorily in isolation so additional material was obtained for comparative purposes. It quickly became obvious that the Antarctic and sub-Antarctic rissoaceans and eatoniellids were badly in need of a major revision. I have attempted to do this by examining and reillustrating type material and by obtaining additional material from several sources. A large collection was made, chiefly by Dr J. K. Lowry during the summer of 1977-78, at Macquarie Island and consequently the Macquarie Island fauna has been reported in some detail. The classification of specimens collected, mainly from South Georgia, by the Swedish Antarctic Expedition (1901-03) and described by Strebel (1908), has been revised. Valuable material accumulated from a variety of Antarctic and sub-Antarctic locations by Dr P. Arnaud was generously made available for this study. In addition, the opportunity is taken to revise the species described by Vélain (1877) from Île St Paul, although this is not strictly a sub-Antarctic Island.

The aim of the report is to describe the Signy Island and Macquarie Island species and to review the remainder of the Antarctic and sub-Antarctic species (excluding those from the Antipodean and most of the Magellanic province), chiefly by examining type material. This has been done to facilitate identification in these difficult groups and, for the first time, to examine critically the species taxonomy in the families concerned. I have been able to examine type material for all of the species involved except that of Martens and Pfeffer.

A large collection from western South America is also in hand and is currently being described. This fauna does not appear to have any species in common with those included in

this report. The New Zealand sub-Antarctic fauna has not been revised because this has already been included within a taxonomic framework similar to the one adopted here (reviewed in Powell, 1979).

2. *Methods*

The methods used in mounting radulae and opercula are described by Ponder and Yoo (1976). Shells, opercula and radulae were examined, where possible, using a scanning electron microscope after coating with gold.

3. *Abbreviations*

AIM	Auckland Institute and Museum, Auckland.
AMS	Australian Museum, Sydney.
BMNH	British Museum (Natural History), London.
HUM	Museum für Naturkunde, Humboldt Universität, E. Berlin.
NHMP	Muséum National d'Histoire Naturelle, Paris.
NMNZ	National Museum, Wellington.
NMW	National Museum of Wales, Cardiff.
RSM	Royal Scottish Museum, Edinburgh.
SAM	South Australian Museum, Adelaide.
SEM	Scanning electron microscope.
SME	Station Marine d'Endoume, Marseilles.
SNHM	Naturhistoriska Riksmuseet, Stockholm.
stn	Station.
UMM	Museum, University of Manchester, Manchester.
USNM	National Museum of Natural History, Washington, DC.

4. *Essential characters of the families included in this report*

The brief diagnoses given below are primarily compiled from the references cited under each family, from publications cited in those references and, to a lesser extent, from unpublished information.

i. Eatoniellidae

Shell: Small to minute (usually less than 4 mm in length), elongate-conic to broadly-ovate, smooth or (rarely) spirally-sculptured, aperture usually with simple, retracted outer lip. Periostracum thin or apparently lacking.

Operculum: Thick, paucispiral, with peg arising from nucleus.

Radula: Taenioglossate, cusps relatively few and prominent on central, lateral and inner marginal teeth. Outer marginal teeth with several small cusps.

Head-foot: With or without an opercular tentacle arising laterally from opercular lobe on one or both sides. No metapodial or pallial tentacles. Cephalic tentacles long, tapering.

Anatomy: Style sac and oesophageal gland present; pallial genital ducts open in both male and female. Aphallate. Sexes separate.

References: Ponder, 1965a; Ponder and Yoo, 1978.

ii. Rissoidae

Shell: Small to minute (usually less than 10 mm), elongate-conic to broadly-ovate, smooth or variously sculptured.

Aperture often with thickened and/or varicose outer lip. Periostracum well developed to very thin or apparently lacking.

Operculum: Paucispiral, thick with peg arising from nucleus, or thin and simple.

Radula: Taenioglossate, cusps small, numerous.

Head-foot: With or without metapodial and pallial tentacles. No opercular tentacles. Cephalic tentacles strap-like.

Anatomy: Style sac present, oesophageal gland absent; pallial genital ducts closed in female, closed in male in most species. Phallate. Sexes separate.

Reference: Ponder, 1967.

iii. Barleeidae

Shell: Small to minute (usually less than 5 mm), elongate-pupoid to broadly-ovate, smooth or variously sculptured. Aperture with thin to thickened and sometimes varicose outer lip. Periostracum very thin or apparently lacking.

Operculum: Thin to thick, in one or two layers, smooth or with internal ridges, projections or peg.

Radula: Taenioglossate, cusps small to rather large, numerous to few.

Head-foot: Usually without pallial, metapodial or opercular tentacles. Cephalic tentacles long and slender to short and paddle-shaped.

Anatomy: Style sac present, oesophageal gland absent; pallial genital ducts closed. Phallate. Sexes separate.

Reference: Ponder, 1967.

Remarks: Ponder (1967) included the Barleeinae and Anabathrinae as subfamilies of the Rissoidae but recent (unpublished) anatomical work has shown that they require familial separation.

iv. Cingulopsidae

Shell: Small to minute (usually less than 4 mm in length); elongate-conic to depressed-heliciform, smooth or, rarely, spirally or axially sculptured. Aperture usually with simple, often retracted, outer lip. Periostracum thin or apparently lacking.

Operculum: Paucispiral, thick to thin, with peg arising from nucleus.

Radula: Taenioglossate, central teeth sometimes reduced or absent, cusps small to large.

Head-foot: No opercular, pallial or metapodial tentacles. Cephalic tentacles long, parallel-sided.

Anatomy: Crystalline style absent. Pallial genital ducts closed. Aphallate. Sexes separate.

Reference: Ponder and Yoo, 1980.

v. Orbitestellidae

Shell: Minute (usually less than 3 mm), discoidal, smooth or variously sculptured. Aperture with sinuate, thin outer lip. Periostracum thin or apparently lacking.

Operculum: Multi-spiral, with central nucleus, thin.

Radula: Modified taenioglossate with outer marginal teeth absent. Cusps very small.

Head-foot: With pallial tentacles, no metapodial or opercular tentacles. Cephalic tentacles long and tapering.

Anatomy: Unknown.

Reference: Ponder, 1967.

vi. Rissoellidae

Shell: Small to minute (usually less than 4 mm), conic to helicoid, smooth. Aperture simple, with thin outer lip. Periostracum thin or apparently lacking.

Operculum: Thin, with nucleus in middle of columellar edge from which a short peg emerges.

Radula: Pseudotaenioglossate, central and lateral teeth sometimes asymmetrical. Outer marginal teeth lacking in several species. Cusps small to large, or absent.

Head-foot: No metapodial, pallial or opercular tentacles present. Cephalic tentacles short, blunt; snout produced into a pair of tentacle-like lobes.

Anatomy: Crystalline style and oesophageal gland absent. Pallial genital ducts closed. Phallate, penis folded in a groove. Hermaphrodite.

Reference: Ponder and Yoo, 1977.

II. TAXONOMY

1. Superfamily LITTORINACEA

1.1. Family EATONIELLIDAE

1.1.1. Genus *Eatoniella* Dall, 1876

Type species: *Eatonia kerguelenensis* Smith, 1875.

Remarks. This genus is used here as defined by Ponder and Yoo (1978). Ponder and Yoo list some of the Antarctic and sub-Antarctic Eatoniellidae. Additions and corrections to their list are as follows: *Eatoniella kerguelenensis* var. *contusa* Strebel, 1908, is a separate species and *E. kerguelenensis* forma *major* Strebel, 1908 is *E. glacialis* (Smith, 1907). *Rissoia regularis* Smith, 1915 is subspecifically separable from *Eatoniella kerguelenensis* and *Eatoniella inflata* Dall is not an eatoniellid. *Hydrobia georgiana* Pfeffer (in Martens and Pfeffer, 1886) may be an eatoniellid, whereas

Rissoa georgiana Pfeffer, 1886 is a rissoid. *Rissoa (Setia) marionensis* Watson, 1886 is an eatoniellid and appears to be conspecific with *Eatoniella subrufescens* (Smith, 1875) from comparison of type material. *Rissoa (Setia) australis* Watson, 1886 is not an eatoniellid, but is a rissoid which is placed in *Powellisetia* below. *Eatoniopsis ainsworthi* Hedley, 1916 and *Rissoia demissa* Smith, 1915 are both shown to be species of *Eatoniella* below.

Key to Antarctic and sub-Antarctic species and subspecies of *Eatoniella*

Remarks. This key should only be used with adult and, preferably, live-collected specimens. Correct identification to the genus *Eatoniella* can only be assured with the examination of the radula and operculum.

One doubtful species, *E. georgiana* (Pfeffer), is not included in this key.

1. Shell ovate-conic to depressed-ovate (length/width ratio less than 1.5) 2
Shell narrowly-conic (length/width ratio greater than 1.6) 9
2. Shell grey to purple or black 3
Shell white, yellowish-white, or white with brown inner chitinous layer 4
3. Shell greater than 1.3 mm in length *caliginosa*
Shell less than 1.1 mm in length *duperrei*
4. Length/width ratio 1.3–1.5 5
Length/width ratio less than 1.25 7
5. Shell with dark reddish-brown inner chitinous layer
subrufescens
Shell without dark inner chitinous layer 6
6. Shell 1.7–2 mm in length *demissa*
Shell less than 1.75 mm in length 7
7. Shell of about 3½ whorls and less than 1 mm in width
occulta
Shell of about 4½ whorls and greater than 1 mm in width
aff. *caliginosa*
8. Shell length/width ratio greater than 1.2–1.25 *hyalina*
Shell length/width ratio about 0.9 *minima*
9. Shell yellow, brown, grey or black 10
Shell white, or white with coloured inner chitinous layer 13
10. Shell more than 3 mm in length .. *kerguelenensis regularis*
Shell less than 3 mm in length 11
11. Shell length/width ratio less than 1.7 *contusa*
Shell length/width ratio 1.75–1.9 12
12. Shell yellowish to brownish, with thickened, white aperture *subgoniostoma*
Shell black to dark grey, with thin grey aperture
kerguelenensis kerguelenensis
13. Shell with varix on outer lip *varicifera*
Shell without varix on outer lip 14
14. Shell less than 1.5 mm in length *ainsworthi*
Shell more than 1.8 mm in length 15
15. Shell 2.9–3.8 mm in length *glacialis*
Shell 1.8–2.5 mm in length 16
16. Shell with grey inner chitinous layer, width greater than 1.1 mm, length greater than 2.1 mm *cana*
Shell without grey inner chitinous layer, width less than 1.03 mm, length less than 2.1 mm *alboelata*

i. Signy Island species

Eatoniella caliginosa (Smith, 1875). Figures 3h; 4a, b; 5a, b.

Eatonia caliginosa Smith, 1875, p. 71.

Eatoniella caliginosa (Smith); Dall, 1876, p. 43; Smith, 1877, p. 175, pl. 9, fig. 9; Watson, 1886, p. 614; Lamy, 1905, p. 480; Lamy, 1910, p. 321; Thiele, 1912, p. 236, pl. 14, figs 27, 27a; Ponder and Yoo, 1978, p. 641 (as *Eatoniella* (*Eatoniella*)).

Rissoina (*Eatoniella*) *smithii* (Dall ms) Tryon, 1887, p. 392, *nom nov. pro Eatonia caliginosa* Smith, 1875, *non Littorina caliginosa* Gould, unnecessary replacement name.

MATERIAL. Probable syntypes, 6, AMS, C2989, 2 probable syntypes, RSM; Îles Kerguelen. Type locality given as 'Swain's Bay, Kerguelen Island(s)' (Baie des Swains, Îles Kerguelen). Type material in BMNH not examined.

Borge Bay, Signy Island, South Orkney Islands, IV 1975, coll. G. Picken (many specimens) (NMW, 1979.002.36, AMS, C131202). 50 m N. of Billie Rocks, Borge Bay, Signy Island, 8 m, on algae on stony bottom, coll. G. Picken, 6 III 1977 (20 specimens) (NMW, 1979.002.34). Admiralty Bay, King George Island, South Shetland Islands, at low tide, 25X1977, Polish Antarctic Expedition (6 specimens) (SME). Macquarie Island, 3–20 m in 8 localities, coll. J. K. Lowry *et al.*, 1977–78 (AMS). Flandres Bay, Antarctic Peninsula (3 specimens) (NHMP), recorded by Lamy, 1905. Petermann Island, Antarctic Peninsula (9 specimens) (+1 juvenile *E. kerguelenensis regularis*) (NHMP), recorded by Lamy (1910). Gamma Island, Melchior Harbour, Antarctic Peninsula, 9 and 41 m, II 1963 (3 specimens) (USNM, 664533, 664490). Off Brialmont Cove, Alcock Island, Danco Coast, Antarctic Peninsula, shore, 11 II 1963 (1 specimen) (USNM, 664540).

DIAGNOSIS.

Shell: Small (maximum length 2.24 mm), broadly-ovate, conical, of up to 4½ whorls. Spire with straight outlines, whorls convex, periphery evenly-rounded. Protoconch of 1½ whorls, with extremely weak, close, spiral threads; teleoconch smooth except for axial growth lines and, typically, fine, and sometimes distinct, spiral striations. Sutures weakly-impressed, simple. Aperture circular, peristome sharp, inner lip moderately broad, its lower half separated from body whorl; outer lip weakly-excavated. Umbilical chink moderate. Periostracum exceedingly thin, colourless. Colour very dark grey, aperture and sometimes umbilical region, pale grey (Figs. 4a; 5a, b).

Operculum: Typical of genus, semi-opaque, pale-yellow; peg grooved longitudinally (Fig. 4b).

Radula: Typical of genus; central teeth $\frac{2-3+1+2-3}{1 \quad 1}$, median cusp large, blunt, rather broad; lateral teeth 2+1+2+(1), primary cusp large, blunt; inner marginal teeth 3+1+1, primary cusp large; outer marginal teeth with about 7 small, sharp cusps (Fig. 3h).

Head-foot: Dorsal mantle, dorsal head and sides of foot dark grey.

DIMENSIONS.

	Length (mm)	Width (mm)
Syntypes (RSM)	1.57	1.16
	1.44	1.10
(AMS)	1.59	1.23
	1.56	1.13
Figured syntype (AMS)	2.24	1.65
Signy Island	1.98	1.39
	1.94	1.44
	1.99	1.40
Figured specimen (SEM)	1.84	1.38
Macquarie Island	1.29	0.92
Figured specimen	1.36	1.01

REMARKS. This species resembles *E. contusa* Strebel, 1908 in the shape of the shell, although it is relatively broader and smaller. It belongs to a group of species with grey to black shells distributed around the Southern Hemisphere. They include *E. olivacea* (Hutton) (New Zealand), *E. melanochroma* (Tate) (southern Australia), *E. nigra* (Krauss) (South Africa) and *E. latina* Marinovich (Chile). *Eatoniella caliginosa* is unusual in typically having distinct spiral striations on the shell, although these are not very obvious in the South Orkney material.

The Signy Island material is similar to the type series from Îles Kerguelen in the size of the shell but the Macquarie Island specimens are relatively smaller (cf. Figs. 5a, b). Their shells are, however, virtually identical in all other respects.

DISTRIBUTION. Îles Kerguelen, Macquarie Island, Antarctic Peninsula, South Orkney Islands and South Shetland Islands.

Eatoniella aff. *caliginosa* (Smith, 1875). Figures 4c–e; 5h, i.

Eatoniella kerguelenensis forma *contusa*; Strebel, 1908, p. 57 (in part).

MATERIAL. Borge Bay, Signy Island, South Orkney Islands (1 specimen) (NMW, 1979.002.37). Swedish Antarctic Expedition stn 25, South Georgia, 54° 22'S, 36° 27'W, 24–52 m (many specimens) (SNHM, 2445); stn 27, South Georgia, 54° 22'S, 36° 27'W, 20 m, 24 V 1902 (10 specimens) (SNHM, 2798).

DIMENSIONS.

	Length (mm)	Width (mm)
Stn 25, South Georgia	1.59	1.07
	1.75	1.25
	1.48	1.13
	1.70	1.19
	1.59	1.16
	1.37	1.01
Figured specimen	1.59	1.14
Signy Island (figured)	1.68	1.29

REMARKS. The above material probably represents an undescribed species and was identified as *Eatoniella kerguelenensis* forma *contusa* by Strebel (1908). The shells (Figs. 4c; 5h, i) are similar to *E. caliginosa* in shape and size but are yellowish-white, not grey or black in colour. They differ from the shell of *E. contusa* in being much smaller and yellowish-white in colour. The shell sculpture, radula (Fig. 4e) and operculum (Fig. 4d) are all closely similar to those of *E. caliginosa*. The shell of the single specimen from Signy Island (Fig. 5i) has slightly less convex whorls than the South Georgia material, but is otherwise similar.

Eatoniella cana n. sp. Figures 3d–g; 5c.

Eatoniella kerguelenensis forma *contusa*; Strebel, 1908, p. 58 (in part).

MATERIAL. Holotype, NMW, 1979.002.31, and many paratypes, NMW, 1979.002.32; AMS, C131200; off Billie Rocks, Borge Bay, Signy Island, South Orkney Islands, 5 m, VI 1975, coll. G. Picken. 12 paratypes, NMW, 1979.002.33, AMS, C131201; Borge Bay, Signy Island, 2–10 m, XI 1975, coll. G. Picken, several paratypes, NMW, 1979.002.35, AMS, C131203; 50 m off Billie Rocks, 8 m, 6 III 1977, on algae, rocky bottom.

Port Louis, Falkland Islands, Swedish Antarctic Exped. stn 47c (4 specimens) (SNHM, 2442) identified by Strebel (1908) as *E. kerguelenensis* and stn 43 (many specimens) (SNHM, 2443), identified by Strebel (1908) as *E. kerguelenensis* forma *contusa*. South Georgia, 1–2 m (no stn given) (many specimens) (SNHM, 2797), identified by Strebel (1908) as *E. kerguelenensis* forma *contusa*.

DIAGNOSIS.

Shell: Small (maximum length 2.5 mm), solid, conical, of 5½–6 whorls. Spire with straight outlines, whorls very weakly convex; periphery subangled. Protoconch of 1½ whorls, sculptured with exceedingly fine spiral striations (Fig. 3f); teleoconch smooth except for axial growth lines. Sutures moderately impressed, simple. Aperture oval, subangled posteriorly, peristome thin, inner lip narrow, outer lip moderately retracted. Umbilical chink very small to absent. Periostracum very thin, transparent. Colour white, spire grey in fresh material due to dark grey inner chitinous shell layer in spire whorls (Figs 3d, f; 5c).

Operculum: Typical of genus; thick, semi-opaque, pale yellow, with a stout, longitudinally grooved peg arising from nucleus (Fig. 3e).

Radula: Typical of genus; central tooth $\frac{(1)+1+1+1+(1)}{1 \quad 1}$, median cusp short, blunt and very broad; outer lateral cusps very small. Lateral teeth 1+1+1–2, median cusp small. Inner marginal teeth 1+1+(2), outermost cusps very small. Marginal teeth S-shaped, with about 5 small, sharp cusps, the outermost the largest (Fig. 3g).

Head-foot: Mantle black, foot with some grey smudges laterally and head and snout also with some dark grey pigmentation.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	2.37	1.32
Paratypes	2.39	1.29
	2.51	1.38
	2.34	1.35
	2.32	1.38
	2.30	1.31
Figured paratype	2.45	1.34
South Georgia	2.20	1.29
(2797)	2.33	1.32
	2.20	1.38
	2.22	1.41
Falkland Islands	2.20	1.18
(2443)	2.30	1.31
	2.11	1.26
	2.26	1.30

REMARKS. The new species does not appear to be closely related to any described Antarctic or sub-Antarctic species. It is distinguished from all other described *Eatoniella* by its solid, white, evenly-conical shell with the dark grey visceral coil of the animal showing through, and rather small aperture. Of the previously described Antarctic species only the shells of *Eatoniella glacialis* (Smith) and *Eatoniella demissa* (Smith) are similar in being white. *Eatoniella glacialis* has a larger, thinner shell with more convex whorls and the shell of *E. demissa* is smaller, thinner, relatively broader and has more convex whorls.

DISTRIBUTION. Falkland Islands, South Georgia and South Orkney Islands.

Eatoniella kerguelensis regularis (Smith, 1915). Figures 2b; 3a-c.

Eatoniella kerguelensis; Lamy, 1905, p. 480; Melvill and Standen, 1907, p. 134; Lamy, 1910, p. 321; Lamy, 1911, p. 11; Hedley, 1916a, p. 46; Gaillard, 1954b, p. 680; Arnaud, 1972, p. 118 (in part), figs. 9 and 12 (*non* Smith, 1875).

Eatoniella kerguelensis forma *major*; Melvill and Standen, 1912, p. 351 (*non* Strebel, 1908).

Rissoia regularis Smith, 1915, p. 65, pl. 1, fig. 5.

Eatoniella kerguelensis major; Powell, 1951, p. 110 (*non* Strebel, 1908).

Eatoniella (Eatoniella) regularis; Ponder and Yoo, 1978, p. 641.

MATERIAL. Syntypes, 2, BMNH, 1915.4.18.69-71; *Terra Nova* stn 220, off Cape Adare, mouth of Robertson's Bay, 82-92 m, 3 I 1912; 2, BMNH, 1915.4.18.66-68; *Terra Nova* stn 316, McMurdo Sound, 348-457 m, 9 II 1911.

50 m N. of Billie Rocks, Borge Bay, Signy Island, South Orkney Islands, 8m, 6 III 1977, on stony bottom on algae, coll. G. Picken (several specimens) (NMW, 1979.002.8, AMS, C131199). False Bay, Livingston Island, South Shetland Islands, 31 m, 25 II 1963 (1 specimen) (USNM, 664551). Commonwealth Bay, George V Land, Antarctica, 82-91 m and 45 m (many specimens) 2 lots (AMS), recorded by Hedley (1916a) as *E. kerguelensis*. Cap Margerie, Terre Adélie, 10-15 m (3 specimens), 10-12 m (2+1 juvenile); 100 m (several specimens) and Cap Découverte, 30 m (1 specimen) (all NHMP), all identified as *E. kerguelensis* by Gaillard, 1954b. N.W. coast Île des Pétreils, Terre Adélie, 31 m, in *Phyllogigas* holdfast, 23 IX 1962, P. M. Arnaud (several specimens) (SME). Petermann Island, Antarctic Peninsula, Expédition Antarctique Française (1908-10) (4 specimens) (NHMP), recorded by Lamy (1910) as *E. kerguelensis*. Booth Island, ('Île Wandel') Antarctic Peninsula, 40m, Expédition Antarctique Française (1904-5) (17 specimens) (NHMP), recorded by Lamy (1905) as *E. kerguelensis*. Off Wiencke Island, Port Lockroy, Anvers Island, Antarctic Peninsula, 0 and 37m (5 specimens) (USNM, 664510, 664515). Hero Inlet, ('Bonaparte Inlet') Arthur Harbour, Anvers Island, 7m (several specimens) (USNM, 664507). Gamma Island, Melchior Harbour,

Antarctic Peninsula, 22 and 46m (USNM, 664533, 664491) (7 specimens).

DIAGNOSIS.

Shell: Small (maximum length about 4.5 mm), conical, solid, of about 6½ whorls. Spire with straight outlines, whorls lightly convex; periphery rounded in adult, subangled in juveniles. Protoconch of 1½ whorls, smooth; teleoconch smooth except for axial growth lines and traces of exceedingly fine spiral scratches. Sutures impressed, simple. Aperture rather large, circular, with sharp peristome, outer lip retracted, inner lip extended forwards anteriorly. Umbilical chink very small. Periostracum exceedingly thin, colourless, transparent. Colour of protoconch white, first whorl of teleoconch white to grey, remainder of shell dark grey to black; aperture and lower base white (Figs. 2b; 3a).

Operculum: Opaque pale yellowish, with pale brown edges (sometimes appear to be black in preserved material). Peg long, longitudinally grooved (Fig. 3c).

Radula: Typical of genus, central teeth $\frac{(1)+2+1+2+(1)}{1 \quad 1}$, outermost cusps very small, median cusp rather narrow, blunt. Lateral teeth 2+1+3 (-4), primary cusp moderate, blunt, rounded; inner marginal teeth with 4 prominent cusps and, on their outer edges several minute denticles. Outer marginal teeth with several (c. 8) small, sharp cusps (Fig. 3b).

DIMENSIONS.

	Length (mm)	Width (mm)
Syntypes	3.21	1.81
	3.22	1.78
	3.23	1.91
Figured syntype Signy Island	3.43	1.99
	4.24	2.39
Figured specimen	4.32	2.48
	4.43	2.61
	3.88	2.08
	4.12	2.34

REMARKS. Ponder and Yoo (1978) indicated that *Rissoia regularis* was virtually identical to *E. kerguelensis* from examination of the types in the BMNH. Subsequent examination of the types and additional material has shown them to be distinct, with *E. kerguelensis* s.s. probably restricted to Îles Kerguelen and *regularis* having a western Antarctic distribution. Differences in the shells between the two forms are small but appear to be consistent. They are here regarded as geographic subspecies. *Eatoniella kerguelensis regularis* has been recorded from the South Orkneys by Melvill and Standen (1907; 1912) and Powell (1951) as *E. kerguelensis major*. It differs from *E. kerguelensis kerguelensis* in having a shell that is usually larger (*E. kerguelensis kerguelensis* does not appear to exceed 3.4 mm in length and is usually less than 3 mm), and in having a thicker shell with flatter whorls and a heavier aperture. The Signy Island specimens are significantly larger than the syntype series but agree in all other characters.

The material recorded as *E. kerguelensis* from Cap Margerie by Gaillard (1954b) includes specimens of *Eatoniella kerguelensis regularis* mixed with *Eatoniella demissa* (Smith), *Powellisetia deserta* (Smith) and *Onoba kergueleni* (Smith).

DISTRIBUTION. Antarctic Peninsula to Terre Adélie and South Orkney and South Shetland islands.

Eatoniella varicifera n. sp. Figures 4f–h; 5d.

MATERIAL. Holotype, NMW, 1979.002.38 and many paratypes, NMW, 1979.002.39, AMS, C131204; Borge Bay, Signy Island, South Orkney Islands, 4–10 m, 30 VIII 1975, coll. G. Picken. Several paratypes, NMW, 1979.002.40; same data, III 1976, coll. G. Picken. 2 paratypes, NMW, 1979.002.41; same data, III 1977. 2 paratypes, AMS C131205; 50 m N. of Billie Rocks, Borge Bay, Signy Island, 8 m, 6 III 1977, rocky bottom on algae, coll. G. Picken. Several paratypes, NMW, 1979.002.42, AMS C131206; Borge Bay, Signy Island, coll. G. Picken.

DIAGNOSIS.

Shell: Small (maximum length 2.15 mm), solid, conical, of 5½ whorls. Spire with straight outlines, whorls weakly convex; periphery subangled. Protoconch of about 1½ whorls, apparently smooth, teleoconch smooth except for axial growth lines. Sutures moderately impressed, simple. Aperture almost circular, weakly subangled posteriorly, inner lip rather narrow; outer lip almost orthocline but very slightly excavated anteriorly; a very weak varix externally. Umbilical chink absent. Periostracum very thin, yellowish-brown. Colour of shell white, rendered pale brown by periostracum (Figs. 4f; 5d).

Operculum: Typical of genus, opaque, pale yellowish-brown to yellowish-white muscle insertion area; peg pale reddish-brown and longitudinally grooved (Fig. 4h).

Radula: Typical of genus; central teeth $\frac{3+1+3}{1\ 1}$, median cusp small, narrow, blunt; lateral teeth 2–3+1+2; inner marginal teeth 4+1 (+3 denticles); outer marginal teeth with several small cusps (Fig. 4g).

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	2.10	1.19
Paratypes	2.10	1.19
	2.05	1.12
	2.15	1.23
	2.03	1.25
	1.95	1.26
Figured paratype	2.14	1.38

REMARKS. This species differs from most known species of *Eatoniella* in its shell having a weak apertural varix and in lacking an excavated outer lip. In possessing these characters it bears a superficial resemblance to rissoid genera such as *Powellisetia* but, because it has a radula and operculum typical of *Eatoniella*, it is not separated generically. *Eatoniella*

cana has a shell of similar size and shape but can be easily separated by its colour and the absence of an apertural varix.

DISTRIBUTION. Known only from the South Orkney Islands.

ii. Macquarie Island species

Remarks. *Eatoniella caliginosa* (above) is recorded from Macquarie Island.

Eatoniella ainsworthi (Hedley, 1916). Figures 6a–c.

Eatoniopsis ainsworthi Hedley, 1916a, p. 46, pl. 7, fig. 74.

Ovirissoa ainsworthi (Hedley), Ponder, 1965b, p. 124; Powell, 1979, p. 114.

MATERIAL. Holotype and 8 paratypes, AMS, C46611a and C46611b; Aerial Cove, Macquarie Island, on worm tube.

DIAGNOSIS.

Shell: Elongate-conic, solid, minute (maximum length 1.4 mm), of 4½–4¾ whorls. Spire with very lightly convex outlines, whorls convex; periphery evenly-rounded. Protoconch of about 1½ whorls, apparently smooth. Teleoconch smooth except for weak axial growth lines. Sutures weakly impressed, simple. Aperture circular, peristome sharp, inner lip narrow, thickened; outer lip weakly-excavated. Umbilical chink weak. Periostracum very thin, yellowish-white. Inner chitinous layer renders upper whorls pale brownish (Fig. 6a).

Operculum: Typical of genus, thick, semi-opaque, with a weak ridge along columellar face; peg stout, prominent, grooved, colour of peg and inner (columellar) half pale orange-brown, yellow-brown to colourless on outer half (Fig. 6c).

Radula: Typical of genus, central teeth $\frac{(1)+2+1+2+(1)}{1\ 1}$, median cusp narrow, sharp; lateral teeth 3+1+2, primary cusp narrow, sharp; inner marginal teeth 5+1+1–2, outermost cusps rudimentary, primary cusp narrow, sharp; outer marginal teeth with several small, sharp cusps (Fig. 6b).

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	1.45	0.84
Paratypes	1.20	0.67
	1.26	0.64
	1.17	0.58
	1.29	0.61
	1.17	0.65
Figured paratype	1.35	0.80

REMARKS. This species was incorrectly placed in *Ovirissoa* by Ponder (1965b) on the basis of the original illustration. Examination of the holotype shows it to be an *Eatoniella* close to *E. atervisceralis* Ponder, 1965 from southern New Zealand. It differs from that species in having a shell that is slightly larger and relatively narrower, and in the operculum being orange-brown, not yellowish.

This species was, curiously, not re-collected by the 1977-78 expedition, despite numerous collections being made in Aerial Cove.

A single shell from 18 m in Passe Royale, Îles Kerguelen, collected by P. Arnaud (SME) is similar to *E. ainsworthi* but is more evenly-conical in shape. This specimen represents an undescribed species and is possibly related to *E. ainsworthi*.

DISTRIBUTION. Macquarie Island.

Eatoniella hyalina Thiele, 1912. Figures 6d-f.

Eatoniella hyalina Thiele, 1912, p. 236, pl. 14, fig. 28.

Eatoniella (Eatoniella) hyalina (Thiele); Ponder and Yoo, 1978, p. 641.

MATERIAL. Aerial Cove, Macquarie Island, coll. A. Hamilton (4 specimens) (AMS, C46660 (part)), identified as *Eatoniopsis ainsworthi* in part by Hedley (1916a). 4 localities, Macquarie Island, 0-14 m, coll. J. K. Lowry *et al.*, 1977-78 (several specimens) (AMS).

TYPE LOCALITY. Baie de l'Observatoire, Îles Kerguelen.

DIAGNOSIS.

Shell: Minute (maximum length 1.35 mm), depressed-ovate, thin, translucent, of 3½ whorls. Spire and whorls convex, periphery rounded. Protoconch relatively large of 1½ smooth whorls; teleoconch sculptured with weak axial growth lines. Aperture oval, weakly-angled posteriorly, peristome thin, inner lip broad; outer lip evenly-retracted. Umbilical chink small to moderate. Periostracum very thin, transparent. Colour white to colourless (Fig. 6d).

Operculum: Typical of genus, pale yellow (Fig. 6f).

Radula: Typical of genus; central teeth $\frac{3+1+3}{1\ 1}$, median

cusps long, broad, blunt; lateral teeth 2-4+1+2+(1), outermost and innermost (when present) cusps very small, primary cusp moderately long; inner marginal teeth 3+1+1-2, primary cusp very large; outer marginal teeth with 6-8 small, sharp cusps (Fig. 6e).

Animal: Head-foot unpigmented, mantle dark grey to black.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype (from original description)	1.0	0.8
S. of Tern Rock, Macquarie Island	1.26	1.01
	1.35	1.08
	1.19	0.93
	1.29	1.02
	1.13	0.91
Figured specimen	1.26	1.03

REMARKS. It has not been possible to compare Îles Kerguelen and Macquarie Island specimens of this species but the Macquarie Island material, on which the above description is based, agrees closely with Thiele's description and figure. Thiele's type specimen from Baie de l'Observatoire, Îles

Kerguelen, has been destroyed by corrosion (HUM, 63067). This species differs from all other Antarctic and sub-Antarctic species in its very small size, and its ovate, thin, transparent shell. Its nearest relatives are *E. depressa* Ponder and Yoo, 1978 from southern Australia and *E. atervisceralis* from New Zealand.

DISTRIBUTION. Îles Kerguelen and Macquarie Island.

iii. Additional Antarctic and sub-Antarctic species of *Eatoniella*.

Eatoniella alboelata n. sp. Figure 6g.

MATERIAL. Holotype, AMS, C129465, and 11 paratypes C129466; off Enderby Land, Antarctica, 66°10'S, 49°41'E, 300 m, BANZARE stn 39. In addition 2 paratypes each have been presented to NMW, NHMP and NMNZ. Holotype coated with gold.

DIAGNOSIS.

Shell: Minute (maximum length 2.1 mm), elongate-conic, solid, shining, of 5¾ whorls. Spire outlines straight, whorls lightly convex, periphery subangled except over last half whorl where it is convex. Protoconch of 1½ whorls, dome-shaped, apparently smooth. Teleoconch smooth except for weak, axial growth lines. Aperture oval, slightly angled posteriorly, rounded anteriorly when mature, angled at base of columella when immature. Inner lip narrow, slightly thickened, reflected over a very narrow umbilical depression which it almost covers; outer lip thin, prosocline. Colour white (Fig. 6g).

Animal, radula and operculum: unknown.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	2.04	0.99
Paratypes	1.89	0.95
	2.05	1.01
	1.93	1.02
	2.09	1.01

REMARKS. The shell of this species resembles that of *E. glacialis* which is larger (2.9-3.7 mm in length) and yet has a similar number of whorls, and tends to be relatively broader (average length/width ratio of *E. glacialis* 1.83 cf. 2.01). The only other similar species is *Eatoniella cana* which is slightly larger, with a thick shell and has a dark grey inner chitinous layer. The shell characters are distinctive enough to erect a new species and to place it with reasonable certainty in the genus *Eatoniella*.

Eatoniella contusa Strebel, 1908. Figures 5f; 6h, i; 7a.

Eatoniella kerguelenensis; Martens and Pfeffer, 1886, p. 94, pl. 2, fig. 5a, b (*non* Smith).

Eatoniella kerguelenensis forma *contusa* Strebel, 1908, p. 57, pl. 4, fig. 58a-c.

Eatoniella contusa Strebel; Thiele, 1912, p. 236.

Eatoniella (Eatoniella) kerguelenensis confusa [sic!] Strebel; Ponder and Yoo, 1978, p. 641.

MATERIAL. 6 lots, South Georgia, Swedish Antarctic Expedition stns 19D (several specimens) (SNHM, 2444); 19F (5 specimens) (SNHM, 2795); 21D (7 specimens) (SNHM, 2796), 21E (1 specimen) (SNHM, 2446); 30 (1 specimen) (SNHM, 2799); no stn no. (several specimens) (SNHM, 2447).

A specimen from stn 19D is here chosen as the lectotype (Fig. 5f); the remainder of the material can thus be regarded as paralectotypes

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype	2.62	1.62
Paralectotypes	2.60	1.59
(stn 19D)	2.83	1.68
	2.60	1.58
	2.71	1.62
	2.67	1.62
Figured paralectotype	2.60	1.67

REMARKS. This species differs from *E. kerguelenensis kerguelenensis* in having a relatively broader shell, with a much more thickened aperture, and in having distinct spiral striae on the shell surface. *Eatoniella kerguelenensis regularis* has a relatively taller, larger shell which has flatter whorls. *Eatoniella contusa* is closest to *E. caliginosa* in most shell features but is much larger. The available shells are paler in colour, possibly due to being bleached to yellow or brownish through preservation in alcohol. The opportunity is taken to figure the radula (Fig. 7a), operculum (Fig. 6i) and the shell (Figs. 5f; 6h) of this species.

The specimens recorded by Strebel as *contusa* from stn 43 are *E. cana* nov. and from stns 25 and 27 *E. aff. caliginosa*.

Eatoniella demissa (Smith, 1915). Figures 2d; 7b-d.

Rissoia demissa Smith, 1915, p. 65, pl. 1, fig. 4.

Subonoba deserta; Hedley, 1916a, p. 48; Powell, 1957, p. 185 (? in part) (*non* Smith).

Rissoa deserta; Hedley, 1916b, p. 86 (in part) (*non* Smith).

Eatoniella subrufescens; Gaillard, 1954b, p. 681 (in part) (*non* Smith).

Eatoniella glacialis; Arnaud, 1972, p. 118, figs. 8, 11 (*non* Smith).

MATERIAL. Lectotype (here chosen), BMNH, 1915.4.18.65; *Terra Nova* stn 316, McMurdo Sound, 348-457 m, 9 II 1911. Paralectotype (damaged), BMNH, 1915.4.18.64; *Terra Nova* stn 220, off Cape Adare, mouth of Robertson's Bay, 82-92 m, 3 I 1912.

Commonwealth Bay, George V Land, Antarctica, 46-91 m, Australian Antarctic Expedition (recorded by Hedley (1916a) as *Subonoba deserta* in part) (several specimens

(AMS, 4 lots) and BANZARE (stn and depth not given) (several specimens) (AIM), identified by Powell (1957) as *Subonoba deserta*. Off Enderby Land, 66°10'S, 49°41'E, 300 m, BANZARE stn 39 (7 specimens) (AMS, C131207). Cape Royds, Antarctica, raised beach (5 specimens) (AMS, C31462), recorded in part as *R. deserta* by Hedley (1916b). Cap Margerie, Terre Adélie, 10-15 m (1 specimen) and 10-12 m (1 specimen) (NHMP) recorded by Gaillard (1954b) as *Eatoniella kerguelenensis* (in part). Cap Margerie, 100 m (9 specimens) (NHMP) recorded by Gaillard (1954b) as *Eatoniella subrufescens* (in part). N.W. coast of Île des Pétrés, 31 m, in *Phyllogigas* holdfast, 23 IX 1962, P. M. Arnaud (several specimens) (SME), identified by Arnaud (1972) as *E. glacialis*.

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype	2.01	1.35
Paralectotype	1.71	1.19

REMARKS. This species has been incorrectly identified by both Hedley (1916a, b) and Powell (1957) as *Subonoba deserta* (Smith). Examination of the radula and operculum (Fig. 7c, d) has shown that it is an *Eatoniella*. It differs from the other Antarctic species of similar size in having a white shell with convex whorls and a convex periphery (Figs. 2d; 7b). Arnaud (1972) incorrectly identified this species as *E. glacialis* and figured the radula and the operculum.

Eatoniella duperrei (Vélain, 1877). Figure 2e.

Paludestrina duperrei Vélain, 1877, p. 115, pl. 3, figs. 18, 19.

Eatoniella (Eatoniella) duperrei (Vélain); Ponder and Yoo, 1978, p. 641.

MATERIAL. Syntypes, 5, NHMP; Île St Paul.

DIMENSIONS.

	Length (mm)	Width (mm)
Figured syntype	1.09	0.79
Syntypes	1.04	0.74
	1.07	0.78

REMARKS. This species name was incorrectly used by Thiele (1912) for a species of *Rissoella* which, by subsequent designation by Robertson (1961), was made the type species of *Jeffreysiopsis* Thiele, 1912, now regarded as a synonym of *Rissoella*. Thiele's species of *Rissoella* is *Lacuna heberti* Vélain, 1877.

The species is very small and its shell (Fig. 2e) is grey in colour. It is similar to *E. caliginosa* in the shape of its shell but it is smaller and has fewer whorls.

Eatoniella (?) georgiana (Pfeffer, 1886).

Hydrobia georgiana Pfeffer (in Martens and Pfeffer) 1886, p. 91, pl. 2, fig. 2.

Eatoniella (Eatoniella) georgiana Ponder and Yoo, 1978, p. 641 (*non Rissoa georgiana* Pfeffer).

MATERIAL. None.

TYPE LOCALITY. South Georgia.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype (from original description)	2.0	1.0

REMARKS. This species has not been recognized since its original description. It is possibly an *Eatoniella* judging from the description and figure. Its shell apparently possesses a thin, smooth, grey periostracum, an atypical feature of *Eatoniella*. Two specimens identified as '*Rissoa georgiana* Pfeffer' in the HUM and possibly originating from Martens or Pfeffer are *Eatoniella contusa*. It is thus possible that *Hydrobia georgiana* may be an earlier name for *E. contusa* although there are some discordant features in the description.

Eatoniella glacialis (Smith, 1907). Figures 2c; 5e.

Rissoia glacialis Smith, 1907, p. 9, pl. 2, fig. 4; Hedley, 1961b: 86 (as *Rissoa*).

Eatoniella kerguelenensis forma *major* Strebel, 1908, p. 57, pl. 4, fig. 56a-c.

Subonoba glacialis (Smith); Hedley, 1916a, p. 48.

Eatoniella (Eatoniella) glacialis (Smith); Ponder and Yoo, 1978, p. 641.

MATERIAL. Lectotype (here chosen). BMNH, 1905.9.25.83; *Discovery* Winter Quarters, Cape Armitage, McMurdo Sound, No. 10 hole, 18 VI 1903, 130 fathoms (238 m). Paralectotype, BMNH, 1905.9.25.82; *Discovery* Winter Quarters, 29 VIII 1903.

Syntypes of *E. kerguelenensis* forma *major*: Swedish Antarctic Expedition stn 6, Graham Land, 64°36'S, 57°42'W, 125 m (2 specimens) (SNHM, 2449); stn 95, Astrolabe Island, 63°9'S, 58°17'W, 95 m (2 specimens) (SNHM, 2448); stn 28, South Georgia, 12-15 m (1 specimen) (SNHM, 2450); stn 33, South Georgia, 22 m (1 specimen) (SNHM, 2451) (here chosen as lectotype).

Commonwealth Bay, George V Land, 25-50 fathoms (46-91 m), Australian Antarctic Exped. (2 lots, 5 specimens) (AMS), recorded by Hedley (1916a). Cape Royds, Antarctica, from raised beach (8 specimens) (AMS, C31461), recorded by Hedley (1916b). 76°S, 164°E, McMurdo Sound, Antarctica, 121 fathoms (221 m) (1 specimen) (AMS, C31488).

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype of <i>R. glacialis</i>	2.94	1.81
Paralectotype	3.52	1.96
Lectotype of <i>E. kerguelenensis</i> forma <i>major</i>	3.77	1.82

REMARKS. Comparison of the shells of the types of *R. glacialis* (Fig. 2c) and *E. kerguelenensis* forma *major* (Fig. 5e) shows them to be inseparable specifically. Strebel (1908) records two specimens from stn 33 and gives their shell dimensions. Only one specimen is now in this sample and this is chosen as the lectotype. Arnaud (1972) incorrectly identified *E. demissa* as this species.

Eatoniella kerguelenensis kerguelenensis (Smith, 1875). Figures 2a; 7e, f.

Eatonia kerguelenensis Smith, 1875, p. 70.

Eatoniella kerguelenensis (Smith); Dall, 1876, p. 42 (in part); Smith, 1877, p. 174, pl. 9, fig. 10; Thiele, 1912, p. 235, pl. 14, fig. 26, pl. 16, fig. 1 (radula); Powell, 1957, p. 185; Arnaud, 1972, p. 118 (in part); Ponder and Yoo, 1978, p. 641 (as *Eatoniella (Eatoniella)*).

Eatoniella caliginosa; Dall, 1876, p. 43 (*non* Smith, 1875).

MATERIAL. Syntypes, 32, BMNH, 76.8.28.37; Passe Royale, Îles Kerguelen, on sponge in 40 fathoms (73 m).

Îles Kerguelen (USNM, 1899), identified as *E. caliginosa* by Dall (1876). Îles Kerguelen (6 specimens) (AMS, C31840). Baie de la Table, Îles Kerguelen ('S. Kerguelen Island'), 23 m, 23 II 1975, *Marion-Dufresne* cruise MD.04, stn C29 (6 specimens) (SME). Baie des Swains, Îles Kerguelen ('S. Kerguelen Island'), 22 m, 23 II 1975, *Marion-Dufresne* cruise MD.04, stn B8 (several specimens) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Figured syntype	3.03	1.70
Syntypes	2.77	1.59
	2.33	1.45
Baie des Swains, Îles Kerguelen, 22 m	2.88	1.68
	2.90	1.69
	2.66	1.64
	2.65	1.59
	2.79	1.71
	2.75	1.64

REMARKS. The typical form of this species appears to be confined to Îles Kerguelen. A larger, similar form common in the Antarctic has been misidentified as *E. kerguelenensis* by most previous workers and appears to be subspecifically separable (see remarks under *Eatoniella kerguelenensis regularis* above). Another subspecies of *E. kerguelenensis*, *E. kerguelenensis chiltoni* (Suter, 1909), from southernmost New Zealand and the New Zealand sub-Antarctic islands was recognized by Ponder (1965a) and this relationship is upheld here. This subspecies is usually slightly smaller, its shell relatively narrower with a relatively smaller aperture and less strongly convex whorls than that of the typical subspecies.

The radula and operculum (Fig. 7e, f) and the shell of a syntype (Fig. 2a) are figured for comparison with *E. kerguelenensis regularis*.

Dall (1876) misidentified *E. kerguelenensis* as *E. caliginosa* and his *E. kerguelenensis* (USNM, 11898) is *Laevilitorina*

caliginosa (Gould, 1852). Dall was uncertain about his identification and provided the new name *Eatoniella inflata* for these specimens in case they proved not to be *E. kerguelensis*, which, at that time, had not been figured. *Eatoniella inflata* has been regarded by previous workers to be a synonym of *E. kerguelensis* but must now be included in the synonymy *Laevilitorina caliginosa* (Gould).

Tomlin (1948) recorded this species from Macquarie Island but this record appears to be based on *Powellisetia cf. demissa* (Smith) (see below).

Eatoniella minima (Thiele, 1925).

Skenella sp. Thiele, 1912, p. 277, pl. 19, fig. 16.

Skenella minima Thiele, 1925, p. 89.

MATERIAL. Île Amsterdam, from *Jasus* stomach contents, 5-10 m, 12 II 1972, coll. J. Beurois (2 specimens) (SME).

TYPE LOCALITY. Île Amsterdam [formerly Neu-Amsterdam].

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype (from original description)	0.4	0.45

REMARKS. Thiele (1912) indicates that the radula of this species is similar to that of *Eatoniella*. The two specimens seen from Île Amsterdam which appear to be this species are in poor condition but are almost certainly eatoniellids as far as can be judged from shell characters.

The type species of the genus *Skenella*, with which this species has been associated, proves to be a cingulopsid (see below). The New Zealand species, *Skenella pfefferi* Suter, which Ponder (1965a) regarded as being typical of *Skenella*, is an eatoniellid which differs from *Eatoniella* s.s. mainly in the depressed spire and wide umbilicus of its shell and in the operculum having a slightly weaker peg and lacking an opaque muscle insertion area. This species is the only eatoniellid known to have these features but, because they can be interpreted as being readily derived from character states seen in *Eatoniella*, a new genus-group taxon is not proposed for *S. pfefferi*.

Eatoniella occulta n. sp. Figures 2f; 8a-c.

Rissoia inornata; Strebel, 1908, p. 53 (in part).

MATERIAL. Holotype and 13 paratypes, SNHM, 1060 (part); Carénage Creek, Port Louis, East Falkland Island, Falkland Islands, 51°32'S, 58°7'W, 1 m, sand and *Codium*, 9 VIII 1902.

DIAGNOSIS.

Shell: Minute (maximum length 1.4 mm), ovate, thin, translucent of about 3½ whorls. Spire very lightly convex, whorls convex, periphery rounded. Protoconch relatively large, of 1½ whorls; teleoconch smooth except for incon-

spicuous growth striae. Aperture oval, weakly-angled posteriorly, peristome thin, inner lip rather narrow; outer lip thin, evenly-retracted. Umbilical chink small. Periostracum thin. Colour (of material stored in alcohol) pale yellowish-white (probably shell white in life) (Figs. 2f; 8a).

Operculum: Typical of genus; muscle insertion area opaque-white (Fig. 8c).

Radula: Typical of genus; central teeth $\frac{(1)+2+1+2+(1)}{1 \quad 1}$,

median cusp large, blunt; lateral teeth 2+1+3, primary cusp rather small, triangular; inner marginal teeth 4+1+1-2, primary cusp very large, broad, blunt; outer marginals with about six small, sharp cusps (Fig. 8b).

Animal: Head-foot unpigmented, mantle with some black or dark grey pigmentation dorsally. Visceral mass brownish-yellow.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	1.14	0.85
Paratypes	1.23	0.89
	1.28	0.92
	1.38	0.97
	1.31	0.89
	1.20	0.88
Figured paratype	1.39	0.99

REMARKS. This species resembles *E. hyalina* but differs in having a more elongate shell with a relatively smaller umbilicus. It differs from all other Antarctic and sub-Antarctic species in its small size and white shell. There is a similarity to *E. atervisceralis* from southern New Zealand but that species is slightly smaller, has a black visceral mass and its shell has slightly more convex whorls. The species referred to above as *E. aff. caliginosa* is similar to *E. occulta* in general features but is larger, has more whorls (about 4½) and has indistinct spiral striae.

Eatoniella occulta was included amongst Strebel's specimens of *Rissoia inornata*. They can be immediately separated on shell characters, the retracted outer lip of the aperture of the eatoniellid being in sharp contrast to the orthocline outer lip of *R. (=Powellisetia) inornata*. The shell dimensions of the minute, white *Eatoniella* species are contrasted in Table I.

TABLE I

Means of shell dimensions and their ratios of five species of small, white *Eatoniella*. The numbers in parentheses are the number of individuals measured.

	Length	Width	Length/ Width
<i>Eatoniella occulta</i> n. sp. (6)	1.26	0.90	1.40
<i>E. ainsworthi</i> (Hedley) (6)	1.27	0.68	1.87
<i>E. aff. caliginosa</i> (Smith) (6)	1.58	1.13	1.40
<i>E. atervisceralis</i> (3)	1.07	0.75	1.43
<i>E. hyalina</i> Thiele (5) (Macquarie Is)	1.24	0.99	1.25

Eatoniella subgoniostoma Strebel, 1908. Figures 5g; 8d-f.

Eatoniella subgoniostoma Strebel, 1908, p. 59, pl. 4, figs 57a-d; Ponder and Yoo, 1978, p. 641 (as *Eatoniella* (*Eatoniella*)).

MATERIAL. Syntypes (many), SNHM, 2453; Swedish Antarctic Expedition, stn 33, South Georgia, 54°22'S, 36°28'W, 22 m; 1 syntype SNHM, 2452; stn 37, South Georgia, 54°22'S, 36°28'W, 20 m.

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype	2.42	1.28
Paralectotypes	2.33	1.28
	2.38	1.23
	2.32	1.21
Figured paralectotype	2.50	1.38

REMARKS. Known only from South Georgia, this species can be distinguished by its yellow to brownish solid shell which has a tall spire, convex whorls and thickened, white aperture. It has a smaller and relatively narrower shell than *E. contusa*, which also occurs at South Georgia, but was apparently not collected together with this species. The shell, radula and operculum are figured (Figs. 5g; 8d-f) for comparison with other Antarctic and sub-Antarctic species.

Eatoniella subrufescens (Smith, 1875). Figures 2h, i; 8g-i.

Eatonia subrufescens Smith, 1875, p. 71.

Rissoa (*Setia*) *marionensis* Watson, 1886, p. 607, pl. 44, fig. 12.

Eatoniella subrufescens (Smith); Powell, 1960, p. 138.

Cingula marionensis (Watson); Gaillard, 1971, p. 297.

Eatoniella (*Eatoniella*) *subrufescens* (Smith); Ponder and Yoo, 1978, p. 641.

MATERIAL. Syntypes, 4, RSM; Passe Royale, Îles Kerguelen, on sponge, 7 fathoms (13 m). Types in BMNH not examined.

R. marionensis, holotype, BMNH, 87.2.9.1997; between Marion and Prince Edward islands, 140 fathoms (256 m).

DIMENSIONS.

	Length (mm)	Width (mm)
<i>E. subrufescens</i> (syntype)	1.39	0.92
<i>R. marionensis</i> (holotype)	1.48	1.00

REMARKS. Comparison of type material of *E. subrufescens* (Fig. 2i) with the holotype of *R. marionensis* (Fig. 2h) shows no essential differences and consequently they are regarded as synonyms. The brownish colour of the shell of this species is imparted by a well-developed inner chitinous layer, the shell itself being yellowish-white to white. The radula (Fig. 8h, i) and operculum (Fig. 8g) are typical of *Eatoniella*.

Gaillard's (1954b) record of this species from Cap Margerie in 100 m consists of a mixture of *Eatoniella demissa*, *E. kerguelenensis regularis*, *Powellisetia deserta* and *Onoba kergueleni*.

2. Superfamily RISSOACEA

2.1. Family RISSOIDAE

Remarks. Of the Antarctic and sub-Antarctic species originally assigned to the Rissoidae, a few belong to families not dealt with in this review. One Antarctic species, *Rissoa inflata* Pelseneer, 1903, cannot be satisfactorily assigned to the Rissoidae or to any genus known to the writer. The shell of the type has been completely destroyed by corrosion but the animal remains intact (Dr J. van Goethem, personal communication). Pelseneer's name is preoccupied by *Rissoa inflata* Andrzejowski, 1835 but a replacement name is not provided because of the absence of any satisfactory type material. *Rissoa lartetia* Thiele, 1912 is an *Odostomia* s.l. (Pyramidellidae) from examination of the type and *Rissoa bythinella* Thiele, 1912 (Figs. 21g; 29d-f) is also a pyramidellid from examination of the animal and shells from Îles Kerguelen. *Rissoa ovata* Thiele, 1912 (Fig. 21h) is closely related to *R. bythinella* as far as can be judged from shell characters. *Ovirissoa nivosa* Powell, 1957 (Fig. 21f) is also a pyramidellid, probably related to the last two species, as noted below.

A few species recorded by Melvill and Standen (1907) are European and were, presumably, accidentally included in their Antarctic material. These species are:

Rissoa (*Onoba*) *scotiana* Melvill and Standen, 1907 (fig. 14i) = *Onoba semicostata* (Montagu, 1803) from the examination of the holotype (RSM, 1921.143.634; dimensions 3×1.4 mm).

Rissoa (*Cingula*) *cingillus* Montagu, 1803 = *Cingula trifasciata* (J. Adams, 1800).

Rissoa parva (Da Costa, 1778).

Rissoa edgariana Melvill and Standen, 1907 (fig. 21d) = *Rissoa parva* (Da Costa, 1778) from the examination of the holotype (RSM, 1921.143.628; dimensions 3.5×1.8 mm, and 2 paratypes, UMM).

Rissoa (*Manzonia*) *zetlandica* Montagu, 1815 = *Manzonia zetlandica* (Montagu).

2.1.1. Genus *Onoba* H. and A. Adams, 1852

Type species: *Turbo striatus* J. Adams, 1797, non Da Costa, 1778, = *Turbo semicostatus* Montagu, 1803.

Remarks. It will be shown elsewhere that this genus has a world-wide distribution and encompasses a number of genera currently recognized as being distinct. *Subonoba* Iredale, 1915 is one of several genus-group names that should be regarded as synonyms of *Onoba*.

Species of *Onoba* have elongately ovate-conic to ovate shells with or without spiral sculpture and, in some species, weak axial sculpture. The shell surface is, in some species, clothed in a distinct periostracum. The aperture is rounded anteriorly and subangled posteriorly and the outer lip is

varicose and opisthocline in most species. The protoconch has a distinct microsculpture of spiral lines, irregular wavy or short lines usually arranged spirally, or minute, raised dots either arranged in spiral series or scattered over the surface. The radula is typical of the Rissoidae in having numerous cusps on all teeth and a single pair of basal denticles on the central teeth. The operculum is paucispiral and simple.

Key to Antarctic and sub-Antarctic species and subspecies of *Onoba*

Remarks. This key should only be used with adult shells in good condition. A few specimens of several undescribed species of *Onoba* are available but are inadequate for description. When using the key the existence of these additional species should be considered.

1. Shell surface with distinct spiral sculpture 2
Shell surface smooth, periostracum smooth or with weak spirals 17
2. Shell broadly-umbilicate *inflatella*
Shell narrowly-umbilicate to imperforate 3
3. Shell brown, with broad, flat-topped spiral cords ... *grisea*
Shell white or yellowish-white, with narrow or flat-topped spiral ridges 4
4. Shell with less than 5 spiral cords on penultimate whorl 5
Shell with more than 5 spiral cords on penultimate whorl 7
5. Shell with 2-3 spirals on penultimate whorl and 5-6 on body whorl *paucicarinata*
Shell with 4 spirals on penultimate whorl and 6-10 on body whorl 6
6. Shell with shining surface, 6 (+1 weak) spirals on body whorl *paucilirata*
Shell with dull surface, 9-10 spirals on body whorl *delecta*
7. Shell with spiral ridges wider than interspaces *steineni*
Shell with spiral ridges narrower than interspaces or of about same width 8
8. Protoconch with distinct spiral ridges 9
Protoconch lacking distinct spiral ridges 11
9. Shell with shouldered whorls *lantzi*
Shell with evenly-convex whorls 10
10. Shell solid, spiral sculpture on teleoconch subobsolete to distinct, protoconch with flat-topped spiral cords
sanctipauli
Shell rather thin, spiral sculpture well-developed, protoconch with narrow spiral ridges *transenna*
11. Shell with 6-8 spirals on penultimate whorl 12
Shell with more than 9 spirals on penultimate whorl 13
12. Shell broadly-ovate, about 6 spirals on penultimate whorl *gelida*
Shell ovate-conic, 8 spirals on penultimate whorl ... *suavis*
13. Shell elongate-conic, with interspaces between flat-topped spiral ribs thread-like *turqueti*
Shell conic to ovate-conic, interspaces between sharp spiral ribs approximately equal to, or wider than ribs ... 14
14. Shell with spiral sculpture thread-like, most interspaces 2-3 times wider than spiral threads *schraderi*
Shell with spiral sculpture of spiral ridges, interspaces about equal in width to spiral ridges 15

15. Shell with internally-thickened aperture, adult length less than 2.4 mm *filostria*
Shell without internally-thickened aperture, adult length more than 2.4 mm 16
16. Shell of 4½ whorls *subantarctica subantarctica*
Shell of 3½ whorls *subantarctica wilkesiana*
17. Shell with well-developed periostracum bearing spiral sculpture, surface dull 18
Shell lacking obvious periostracum, surface smooth and shining *kerqueleni*
18. Shell less than 1.7 mm in length *anderssoni*
Shell more than 2 mm in length 19
19. Shell length/width ratio greater than 1.8, periostracal spiral sculpture very indistinct *melvilli*
Shell length/width ratio usually less than 1.8, periostracal spiral sculpture distinct *georgiana*

i. Signy Island species

Onoba filostria (Melvill and Standen, 1912). Figures 9a-e; 13g.

Rissoa (Onoba) filostria Melvill and Standen, 1912, p. 349, plate (unnumbered), fig. 9.

MATERIAL. Holotype, RSM, 1921.143.629; Scotia Bay, South Orkney Islands, 9-10 fathoms (16-18 m).

Borge Bay, Signy Island, South Orkney Islands, coll. G. Picken (many specimens) (NMW, 1979.002.9, AMS, C131172).

DIAGNOSIS.

Shell: Small (maximum length 2.4 mm), broadly conic, thin to thick, of 4-4½ whorls. Spire with lightly-convex outlines, whorls strongly convex; periphery evenly-rounded. Protoconch of 1½ whorls, sculptured with very fine spiral wrinkles and irregularly scattered raised dots (Fig. 9e); teleoconch with spiral cords separated by grooves of approximately equal width, about 13 (12-14) spirals on penultimate whorl, rather uniform in strength over entire surface including base; microsculpture of weak, close axial and fine spiral threads (Fig. 9b). Aperture oval, weakly subangled posteriorly, outer lip with very shallow sinus at suture, remainder weakly to moderately opisthocline; inner lip narrow, firmly to loosely attached to parietal wall; periostome thin to considerably thickened within; external varix broad, low. Umbilical chink small. Periostracum very thin, transparent. Colour semitranslucent-white; dead shells opaque-white (Figs. 9a, b, e; 13g).

Operculum: Thin, horny, paucispiral (Fig. 9c).

Radula: Similar to *O. kerqueleni* (see below), central teeth 4-5+1+4-5 (Fig. 9d).

DIMENSIONS.	Length	Width
	(mm)	(mm)
Holotype	2.28	1.63
Signy Island	2.34	1.48
	2.39	1.48
	2.30	1.51
	2.30	1.54
Figured specimen	2.30	1.50

REMARKS. The holotype (Fig. 13g) of this species has a thickened aperture and specimens similar to it were obtained in the Signy Island collections. These coexisted with thinner-shelled specimens (Fig. 9a) which resemble *Onoba subantarctica* (Thiele), although they are not as thin-shelled as that species. *Onoba subantarctica* also differs from *O. filostria* in having a more distinct microsculpture of fine, close, spiral striae over the surface of the teleoconch, in probable protoconch microsculpture differences (cf. Figs. 9e; 15h) and in being slightly larger. The only other named Antarctic species that is similar is *Onoba gelida* (Smith) but the shell of that species has fewer, stronger spiral cords.

DISTRIBUTION. Known only from the South Orkney Islands.

Onoba georgiana (Pfeffer, 1886). Figures 9f-h; 10a-h.

Rissoa georgiana Pfeffer (in Martens & Pfeffer) 1886, p. 92, pl. 2, fig. 3.

Rissoia georgiana Pfeffer; Strebel, 1908, p. 54.

Rissoia insignificans Strebel, 1908, p. 55, pl. 4, figs. 53a, b.

Ovirissoa georgiana (Pfeffer); Hedley, 1916a, p. 47; Powell, 1951, p. 110; Ponder, 1966, p. 171, pl. 2, figs. 12-14.

MATERIAL. Lectotype (here chosen) and many paralectotypes of *Rissoia insignificans*, SNHM, 910; Swedish Antarctic Expedition, stn 28, South Georgia, 54°22'S, 36°28'W, 12-15 m. Lectotype coated in gold.

Borge Bay, Signy Island, South Orkney Islands (many specimens) (NMW, 1979.002.18; AMS, C131180). Same locality, 4-10 m (many specimens) (NMW, 1979.002.10; AMS, C131173). *Discovery* stn WS25, Undine Harbour, South Georgia, 18-27 m (several specimens) (AIM, NMNZ). *Discovery* stn 28, 168 m, South Georgia (several specimens) (AIM). Swedish Antarctic Expedition, South Georgia, stns 25 and 27, 24-52 m (several specimens) and 20 m (6 specimens); one other lot with no stn given (6 specimens) (SNHM, 2425, 2802 and 2426).

TYPE LOCALITY (of *R. georgiana*). South Georgia.

DIAGNOSIS.

Shell: Minute (maximum length 2.7 mm), surface dull, almost smooth, ovate-conic, thin, semitranslucent, of 4½-5 whorls. Spire with straight to very lightly convex outlines, whorls convex, periphery evenly rounded. Protoconch of 1½ whorls sculptured with fine, rather irregular, close-set spiral wrinkles with irregular subaxial threads between (Figs. 9g, h; 10d). Teleoconch smooth except for fine axial growth lines and few, indistinct, weak, raised, spiral lines developed in periostracum. Sutures impressed, simple. Aperture subcircular, subangled posteriorly; peristome with sharp edge, thickened within; outer lip with weak external varix; inner lip narrow, attached to parietal wall. Outer lip with shallow sinus in upper ⅓, remainder of lip very slightly opisthocline. Umbilical chink small to absent. Periostracum well-developed, transparent, colourless to pale-yellowish, with few (about 6 on body whorl) weak, raised spiral lines. Colour translucent-white to pale-yellowish (Figs. 9f-h; 10d-f).

Operculum: Thin, horny, paucispiral (Figs. 10b, h).

Radula: Very similar to that of *O. kergueleni* (see below); central teeth $\frac{5-6+1+5-6}{1 \quad 1}$ (Fig. 10a, c, g). Outer marginal teeth finely cusped.

DIMENSIONS.

	Length (mm)	Width (mm)
Syntypes (from original description)	2.4-2.8	
Lectotype of <i>R. insignificans</i>	2.60	1.42
Paralectotypes	2.36	1.35
	2.45	1.38
South Georgia (<i>Discovery</i> stn 25)	2.68	1.56
	2.54	1.41
	2.30	1.33
	2.30	1.27
Figured specimen, Swedish Antarctic Exped. stn 25, South Georgia	2.47	1.38
Signy Island	2.24	1.32
	2.00	1.29
	2.10	1.27
	2.02	1.32
	2.48	1.51
Figured specimen	2.49	1.44

REMARKS. Pfeffer's type material has not been examined. The material examined here is the species determined as *Rissoia georgiana* by Strebel. There is nothing in the original description to suggest that this identification is erroneous.

This species is abundant at Signy Island and South Georgia and probably has a wider distribution than recognized at present. *Onoba georgiana* is similar to *Powellisetia australis* (Smith) but the shell of *P. australis* is smaller and lacks periostracal sculpture. *Onoba melvilli* (Hedley) is also very similar, differing mainly in its relatively narrower shell and it may prove to be only subspecifically distinct. *Onoba schraderi* (Strebel) is very closely related to *O. georgiana* and is distinguished below.

The Signy Island material may be subspecifically separable from the typical South Georgia form. The shells (Fig. 9f) have more convex whorls, usually a more distinct umbilical chink and are white rather than yellowish. The protoconch microsculpture appears to be coarser in the South Georgia material (cf. Figs. 9g and 10d) although the material examined was badly eroded.

The type material of *R. insignificans* consists of a mixture of *O. georgiana* and *O. schraderi*, there being more of the latter. Strebel's figure is clearly *O. georgiana* and a specimen of that species is here chosen as the lectotype of *Rissoia insignificans* (Fig. 10f).

One specimen identified by Strebel as *R. georgiana* from the Swedish Antarctic Expedition material from Port Louis, Falkland Islands, is an unidentified species of *Onoba* of the 'Subonoba group' with fine spiral shell sculpture (SNHM, 2427).

DISTRIBUTION. South Georgia and South Orkney Islands.

Onoba grisea (Martens, 1885). Figures 11a–e; 14f.

Rissoa grisea Martens, 1885, p. 92; Martens and Pfeffer, 1886, p. 92, pl. 2, fig. 4.

Rissoia sulcata Strebel, 1908, p. 56, pl. 6, fig. 86a–c (*non Rissoia sulcata* T. Brown, 1844; *non Rissoia nana* var. *sulcata* Pezant, 1908).

Rissoa fraudulenta; Melvill and Standen, 1907, p. 133 (in part) (*non* Smith, 1907).

MATERIAL. Holotype of *R. sulcata*, SNHM, 921; Swedish Antarctic Exped. stn 28, South Georgia, 54°22'S, 36°18'W, 12–15 m, 24 V 1902.

50 m N. of Billie Rocks, Borge Bay, Signy Island, South Orkney Islands, 8 m, coll. G. Picken, 6 III 1977 (several specimens) (NMW, 1979.002.11; AMS, C131175). Borge Bay, Signy Island, 4–10 m, coll. G. Picken, V 1977 (many specimens) (NMW, 1979.002.12; AMS, C131174). Scotia Bay, South Orkney Islands, Royal Scottish Antarctic Expedition (1 specimen) (NMW, 1955.158, Melvill–Tomlin colln), identified as *R. fraudulenta* by Melvill and Standen (1907). Off Brialmont Cove, Alcock Island, Danco Coast, Antarctic Peninsula, shore, 11 II 1963 (1 specimen) (USNM, 664540 (part)).

TYPE LOCALITY (*of R. grisea*). South Georgia.

DIAGNOSIS.

Shell: Small (maximum length 2.52 mm), ovate, rather solid, of 4½ whorls. Spire with slightly convex outlines, whorls strongly-convex, periphery rounded. Protoconch of 1½ whorls, sculptured with close, spiral rows of minute, raised dots (Fig. 11b); teleoconch with broad, flat, spiral ridges separated by narrow grooves; 6–7 spiral ridges on penultimate whorl, 9–11 on body whorl (including base). Microsculpture (Fig. 11e) of close, axial threads crossed by fine spiral threads over whole surface of teleoconch. Aperture subcircular, subangled posteriorly, inner lip rather narrow, separated from parietal wall in lower half; outer lip forming a distinct sinus posteriorly, with a wide varix externally. Umbilical chink small. Periostracum very thin. Colour brown, aperture pale yellow-brown, protoconch often paler brown than spire (Figs. 11a, b, e; 14f).

Operculum: Thin, horny, paucispiral (Fig. 11c).

Radula: As for *O. kergueleni* (see below) but with 4–5 cusps on each side of the median cusp on each central tooth. Outer marginal teeth probably finely cusped (Fig. 11d).

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype of <i>R. grisea</i> (from original description)	2.25	1.50
Holotype of <i>R. sulcata</i>	2.31	1.53
Signy Island	2.45	1.56
	2.33	1.51
	2.34	1.47
	2.36	1.48
Figured specimen	2.52	1.51

REMARKS. Both the species names in the synonymy were based on material from South Georgia. The holotype of *R. sulcata* (Fig. 14f) agrees exactly with the South Orkney material. The original description of *R. grisea* is sufficiently detailed to leave little doubt that Martens described the species named *sulcata* by Strebel, but that it is not the species identified by Strebel (1908) as *grisea*. The specimens consist of two dead shells of two species of *Onoba*, one too worn to identify with certainty, but is probably *O. georgiana*, and the other is a new species described below.

DISTRIBUTION. Antarctic Peninsula, South Georgia and South Orkney Islands.

Onoba turqueti (Lamy, 1905). Figures 11f, g; 12a–e; 14c–e.

Rissoia (Ceratia) turqueti Lamy, 1905, p. 479, fig. 3; Melvill and Standen, 1912, p. 336, 350 (as *Rissoia*).

Rissoia fraudulenta Smith, 1907, p. 9, pl. 2, fig. 3; Melvill and Standen, 1907, p. 133 (in part, as *Rissoia*); Thiele, 1912, p. 194, pl. 11, fig. 35 (as *Rissoia*).

Subonoba bickertoni Hedley, 1916a, p. 47, pl. 7, fig. 76.

Rissoa sp.; Hedley, 1916b, p. 86.

Subonoba fraudulenta (Smith); Powell, 1951: 110.

Rissoa turqueti (Lamy); Gaillard, 1954b, p. 680.

Subonoba turqueti (Lamy); Arnaud, 1972, p. 121.

MATERIAL. Syntypes, 2 dry shells and 3 wet, NHMP; Booth Island ('Île Wandel'), Antarctic Peninsula.

Syntypes of *Rissoia fraudulenta* Smith, BMNH, 1905.9.25.65–67; Discovery Winter Quarters, Cape Armitage, McMurdo Sound, 'D net', 15 VI 1902 (2 of the 3 specimens now lost. The figured specimen remains and is here chosen as the lectotype).

Holotype of *Subonoba bickertoni* Hedley, AMS, C46663; Commonwealth Bay, Antarctica, 82–91 m, 14 XII 1913. Hedley (1916a) records only one specimen from this locality (the holotype). A second specimen bearing this name and the same registered number and locality as the type is in the AMS which must have been added to the collection after Hedley completed his report.

50 m N. of Billie Rocks, Borge Bay, Signy Island, South Orkney Islands, 5 m, rocky bottom on algae, coll. G. Picken, 10 III 1977 (several specimens) (NMW, 1979.002.13; AMS, C131176). Borge Bay, Signy Island, coll. G. Picken (many specimens) (NMW, 1979.002.14; 1979.002.15; AMS, C131177); as last, 4–10 m (3 specimens) (NMW, 1979.002.19). Scotia Bay, South Orkney Islands, Royal Scottish Antarctic Expedition (1 specimen) (NMW 1955.158, Melvill–Tomlin colln), identified as *R. fraudulenta*. Admiralty Bay, King George Island, South Shetland Islands, 30–50 m, 1 VI 1977, coll. P. Presler, Polish Antarctic Expedition (3 specimens) (SME). Cape Royds, Antarctica, on raised beach (1 specimen) (AMS, C31465), recorded by Hedley (1916b) as *Rissoa* sp. Arthur Harbour, Anvers Island, Antarctic Peninsula, 17 m (13 specimens) (NMNZ). Cove S.E. of Bonaparte Point, Anvers Island, 64°46.62'S, 64°03.85'W, rocks and red algae, 10 m, from stomach of *Notothenia*, coll.

J. Dearborn, P. M. Arnaud, *et al.* (several specimens) (SME). Commonwealth Bay, George V Land, Antarctica, 46 m, Australian Antarctic Expedition (several specimens) (AMS, C46662), recorded by Hedley (1916a) as *S. bickertoni*. Cap Margerie, Terre Adélie, 10–12 m (2 specimens) (NHMP), recorded by Gaillard (1954b). Cap Découverte, Terre Adélie, 30 m (1 specimen) (NHMP), recorded by Gaillard (1954b) as *Eatoniella kerguelensis*, in part. Between Île des Pétrels and Île Rostand, Terre Adélie, rocks, 20 m, in roots of *Phyllogigas*, 14 II 1965, coll. P. M. Arnaud (9 specimens) (SME), recorded by Arnaud (1972).

DIAGNOSIS.

Shell: Small (maximum length 3.1 mm) elongate, moderately solid, of about 4½ whorls. Spire with slightly convex outlines, whorls convex; periphery rounded. Protoconch of 1½ whorls, sculptured with very fine, irregular, spirally-arranged lines (Fig. 12d). Penultimate whorl of teleoconch with about 10 weak, flat-topped, spiral cords variable in strength and separated by narrow, shallow grooves; micro-sculpture (Fig. 12e) of minute spiral threads over whole surface; major sculpture sometimes almost absent. Aperture oval, weakly-subangled posteriorly, outer lip slightly projected forward below, a very shallow sinus at suture; inner lip narrow, attached to parietal wall; external varix absent or weak, often broad. Umbilical chink absent. Periostracum very thin, very pale yellowish-white. Colour white to pale yellowish-white (Figs. 12a–e; 14c–e).

Operculum: Thin, horny, paucispiral (Fig. 11g).

Radula: As in *O. kergueleni* (see below) but central tooth with formula $\frac{5+1+5}{1 \quad 1}$ (one specimen only examined) (Fig. 11f).

DIMENSIONS.

	Length (mm)	Width (mm)
Syntype	3.05	1.80
Figured syntype	3.00	1.60
Lectotype of <i>R. fraudulenta</i>	2.48	1.26
Paralectotypes	2.38	1.32
	2.37	1.33
Holotype of <i>S. bickertoni</i>	2.70	1.38
Signy Island	2.93	1.54
	2.75	1.44
	2.79	1.50
	2.70	1.47
Figured specimens	2.83	1.43
	2.36	1.22
	1.99	0.99

REMARKS. There is considerable variation in the size and sculpture of the shells of this species, even within a single population (Fig. 12a–c). Compared with the syntypes (Fig. 14d), the Signy Islands specimens are slightly smaller and have a thinner periostracum.

This species has been previously recorded from the South Orkney Islands by Melvill and Standen (1912) and Powell (1951) as *R. fraudulenta*. *Rissoia fraudulenta* Smith (Fig. 14c)

and *Subonoba bickertoni* Hedley (Fig. 14e) cannot be distinguished from *O. turqueti* as shown by direct comparison of type material.

Egorova (1978) has provided some biological data on this species and has shown that it has rather high population densities in the Davis Sea and is, along with *O. gelida* (Smith) and *Powellisetia deserta* (Smith), one of the most abundant molluscs in the area.

The specimens recorded by Hedley (1916b) as *Rissoia fraudulenta* from a raised beach at Cape Royds (AMS, C31464) are an unidentified and probably undescribed species of *Onoba*.

Onoba filostria (Melvill and Standen) has a more inflated, heavier shell than *O. turqueti*. No other similar Antarctic species is known.

DISTRIBUTION. Burdwood Bank (Melvill and Standen, 1912), South Orkney Islands, South Shetland Islands, Antarctic Peninsula and Terre Adélie.

ia. Subgenus *Ovirissoa* Hedley, 1916

Type species: *Rissoia adarensis* Smith, 1902=*Rissoia kergueleni* Smith, 1875.

Remarks. The type species of *Ovirissoa* can be distinguished from other *Onoba* species by its smooth, almost glossy shell and smooth protoconch.

Ovirissoa nivosa Powell, 1957 is a pyramidellid from examination of the types in the BMNH (1951.6.13.47) (holotype) (Fig. 21f) and 3 paratypes (1951.6.13.48–50), although 2 paratypes are *Powellisetia australis* (Watson).

Onoba (Ovirissoa) kergueleni (Smith, 1875). Figures 12f–h; 18e–g.

Rissoia kergueleni Smith, 1875, p. 69; Smith, 1877, p. 176, pl. 9, fig. 12; ? Thiele 1912, p. 238, pl. 14, fig. 30; Gaillard, 1954a, p. 522.

Rissoia adarensis Smith, 1902, p. 205, pl. 24, fig. 17; Melvill and Standen, 1907, p. 132; Lamy, 1910, p. 321; Hedley, 1911, p. 5; Hedley, 1916b, p. 86.

? *Rissoia (Setia) columna* Pelseneer, 1903, p. 21, pl. 5, fig. 55.

Rissoia adarensis Smith; Smith, 1907, p. 8, pl. 2, fig. 2; Smith, 1915, p. 65.

Rissoia observationis Thiele, 1912, p. 239, pl. 15, fig. 4.

Ovirissoa adarensis (Smith); Hedley, 1916a, p. 47; Arnaud, 1972, p. 120.

Ovirissoa columna (Pelseneer); Hedley, 1916a, p. 47.

MATERIAL. Lectotype of *R. kergueleni* (here chosen) and 11 paralectotypes, BMNH, 76.8.28.36; Îles Kerguelen. One specimen (? paralectotype) Baie des Swains, Îles Kerguelen, RSM (a second specimen in this lot is *Odostomia* sp.). Type locality given as 'Swain's Bay, Kerguelen Island(s)', on sponge, 7 fathoms (13 m).

Holotype of *R. adarensis*, BMNH, 1902.5.16.76; Cape Adare, Victoria Land, 24 fathoms (44 m).

Holotype of *R. observationis*, HUM, 63085; Îles Kerguelen.

Îles Kerguelen (several specimens) (AMS, C31841). Golfe du Morbihan, Îles Kerguelen (1 specimen) (NHMP), recorded by Gaillard (1954a) as *Rissoa kergueleni*. 50 m N. of Billie Rocks, Borge Bay, Signy Island, South Orkney Islands, 8 m, rocky bottom on algae, coll. G. Picken, 6 III 1977 (several specimens) (NMW, 1979.002.16; AMS, C131178). Borge Bay, Signy Island, 4–10 m, coll. G. Picken, III 1977 (11 specimens) (NMW, 1979.002.17; AMS, C131179). Ezcurra Inlet, King George island, South Shetland Islands, 75 m, 3 III 1978, Polish Antarctic Expedition (5 specimens) (SME). Cape Royds, Victoria Land, 18–37 m (4 specimens) (AMS C30939, C30923), recorded by Hedley (1911). Mt Erebus, Ross Island, Antarctica, raised beach (4 specimens) (AMS, C31460), recorded by Hedley (1916b). McMurdo Sound, Antarctica, 321 m (1 specimen) (USNM, 666974) 76°S, 164°E, McMurdo Sound, 221 m (2 specimens) (AMS, C31485). Petermann Island, Antarctic Peninsula (1 specimen) (NHMP), recorded by Lamy (1910). Off Wiencke Bay, Port Lockroy, Anvers Island, Antarctic Peninsula, 57 m (1 specimen) (USNM, 664511). Foyn Harbour, Wilhelmina Bay, Danco Coast, Antarctic Peninsula, 46–49 m (2 specimens) (USNM, 664537). Commonwealth Bay, George V Land, Antarctica, 46 m (6 specimens) (AMS, C46661), recorded by Hedley (1916a). Cap Margerie, Terre Adélie, 10–12 m (1 specimen) and 100 m (5 specimens), recorded by Gaillard (1954b) as *Rissoa columna*, and 10–15 m (3 specimens), recorded by Gaillard (1954b) as *Eatoniella kerguelenensis* in part (all NHMP). N.W. of Île des Pétrels, Terre Adélie, 40 m, on algal covered rocks, 12 XII 1964, coll. P. M. Arnaud (SME).

TYPE LOCALITY (of *R. columna*). Bellingshausen Sea, 70°23'S, 82°47'W, 480 m.

DIAGNOSIS.

Shell: Small (maximum length 3.1 mm), shining, pupoid, moderately solid, of 4½–5 whorls. Spire with slightly convex outlines, whorls convex; periphery evenly-rounded. Protoconch of 1½ whorls, smooth; teleoconch smooth in most specimens, shining, with axial growth lines and very indistinct spiral scratches (some of the type series are unusual in having subobsolete spiral grooves). Sutures impressed, simple. Aperture moderately large, oval, angled posteriorly, outer lip projected forwards below, usually with a very weak varix externally in mature specimens; inner lip moderately thickened, attached to parietal area. Umbilical chink absent. Periostracum extremely thin, transparent, very pale yellowish. Colour white (Figs. 12f; 18e–g).

Operculum: Thin, horny, paucispiral (Fig. 12g).

Radula: Typical of Rissoidae. Central teeth with triangular cutting edge, small cusps and single pair of basal denticles; lateral wings with thickened outer edges, $\frac{c.6+1+c.6}{1+1}$. Lateral teeth each with large, triangular cutting edge at inner end, with numerous small, sharp cusps. Marginal teeth large, inner marginals with many small, sharp cusps, outer

marginals apparently smooth but probably with fine cusps on inner sides of distal ends (hidden in mount) (Fig. 12h).

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype	2.82	1.49
Paralectotypes	2.89	1.53
	2.20	1.29
	2.36	1.26
	2.51	1.32
	2.45	1.35
	2.33	1.26
	2.54	1.29
	2.60	1.41
	2.51	1.39
	2.63	1.42
	2.45	1.37
Holotype of <i>R. adarensis</i>	2.66	1.41
Holotype of <i>R. observationis</i>	2.42	1.24
Signy Island	2.93	1.56
	2.80	1.53
	2.97	1.60
	3.11	1.65
Figured specimen	2.71	1.45

REMARKS. Two of the species names placed in synonymy with *O. kergueleni* are based on immature specimens. The immature type of *R. columna* has not been examined and its shell has been destroyed by storage in alcohol (Dr J. van Goethem, personal communication) but that of *R. observationis* (Fig. 18e) is identical to *R. kergueleni*. Comparison of the types of *R. kergueleni* (Fig. 18g) with the holotype of *R. adarensis* (Fig. 18f) shows small differences in outline but the overlap in variation in shape within samples from Îles Kerguelen and the South Orkney islands and Antarctica suggests that only a single species can be recognized.

The specimen referred to *Rissoa adarensis* by Gaillard (1954a: 522) from Îles Kerguelen is not *O. kergueleni* and it is possibly an undescribed species of Rissoidae. It is in poor condition and further material will be required to determine its identity.

The shell of this species is easily recognized by its smooth, glossy surface and rather elongate shape.

DISTRIBUTION. Eastern Antarctica and the Antarctic Peninsula, the South Orkney Islands, Îles Kerguelen and South Shetland Islands.

ii. Macquarie Island species

Onoba melvilli (Hedley, 1916). Figures 15a–e.

Tatea melvilli Hedley, 1916a, p. 46, pl. 7, fig. 75.

Potamopyrgus (?) *melvilli* (Hedley); Powell, 1960, p. 90.

MATERIAL. Holotype, AMS, C46611, and 16 paratypes (C46651); Garden Bay, Aerial Cove, Macquarie Island, under stones above ordinary high water level, coll. H. Hamilton.

Aerial Cove, Macquarie Island, attached to worm tube, coll. H. Hamilton (8 shells) (AMS, C45550, part).

DIAGNOSIS.

Shell: Small (maximum length 2.67 mm), with dull surface, elongate conic, moderately solid, with up to 4¾ whorls. Spire outline straight, whorls lightly-convex; periphery rounded. Protoconch of 1½ whorls, sculptured with exceedingly fine, close, irregular spiral threads with interconnecting, very fine, irregular, axial microlamellae (Fig. 15c, d); teleoconch smooth except for axial growth lines and exceedingly faint spiral lines on periostracum. Sutures impressed, simple. Aperture oval, subangled posteriorly; inner lip narrow, loosely applied to parietal wall when mature; outer lip thin, simple, with an extremely shallow notch in upper ⅓. No umbilical chink. Periostracum rather well-developed, yellowish to pale yellowish-brown, with a few faint, raised spiral lines. Colour of shell white (Fig. 15a, c, d).

Operculum: Thin, horny, simple (Fig. 15b).

Radula: As in *O. kergueleni* but with 4–5 cusps on either side of median cusp on each central tooth (Fig. 15e).

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	2.67	1.32
Paratypes	2.34	1.28
	2.27	1.22
	2.39	1.32
	2.66	1.35
Figured paratype	2.41	1.26

REMARKS. This species was not collected on the 1977–78 survey. Its shell differs from that of *Powellisetia australis* (Watson), of which two specimens were included in the paratype series, in being larger, relatively more elongate, in lacking a varix and in having a well-developed periostracum. It is generally very similar to *O. georgiana* in most shell features, including its protoconch microsculpture. It differs from that species in the shell of most specimens being relatively narrower and in lacking distinct periostracal spiral striae.

DISTRIBUTION. Known only from Macquarie Island.

Onoba steineni (Strebel, 1908). Figures 12i, j; 14a, b.

Rissoia steineni Strebel, 1908, p. 55, pl. 4, figs. 55a, b.

Rissoia studeriana Thiele, 1912, p. 238, pl. 14, fig. 33.

Rissoia valdiviae Thiele, 1925, p. 77, pl. 5, fig. 45.

MATERIAL. Lectotype (here chosen) and 17 paralectotypes (+1 specimen of *O. schraderi*); SHNM, 909; Swedish Antarctic Expedition stn 33, South Georgia, 54°22'S, 36°28'W, 22 m.

Holotype of *R. studeriana*, HUM, 63082; Îles Kerguelen.

S.S.E. of Îles Kerguelen, 49°51'S, 70°19'E, 145–7 m, 15 III 1976, *Marion-Dufresne* cruise MD.04, stn J.113 (8 speci-

mens) (SME). As last, stn J114, 49°54.5'S, 70°24.4'E, 168 m (several specimens) (SME). Aerial Cove, Macquarie Island, from sediment, 3–5 m, 2 II 1978, coll. J. K. Lowry (4 specimens) (AMS, C131181); same locality, on red algae on rocks, 6 m, 2 II 1978, coll. D. S. Horning (1 specimen) (AMS, C131182). All material empty shells.

TYPE LOCALITY (of *R. valdiviae*). Bassin de la Gazelle, Îles Kerguelen.

DIAGNOSIS.

Shell: Small (maximum length 3.5 mm), solid, of about 5 whorls, with strong spiral cords. Spire with slightly convex outlines, whorls lightly-convex; periphery rounded. Protoconch of 1½ whorls, sculptured with fine, close, spiral ridges and weaker, axial microlamellae (based on Macquarie Island specimen), terminated by a distinct varix. Teleoconch with strong, flat-topped spiral cords separated by narrow grooves, 8–11 cords on penultimate whorl, 12–18 on body whorl; whole surface of teleoconch crossed by weak, axial growth lines. Aperture ovate, angled posteriorly; inner lip narrow; outer lip with sharp edge, thickened behind, a weak varix externally, a weak sinus in upper ⅓. Umbilical chink absent. Colour white (Figs. 12i, j; 14a, b).

Operculum and radula: Unknown.

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype of <i>R. steineni</i>	2.98	1.49
Paralectotypes (damaged)	2.85	1.52
	3.30	1.65
	3.50	1.85
	3.12	1.57
	3.37	1.65
	3.06	1.51
	3.15	1.59
	3.05	1.50
Macquarie Island	2.48	1.32
	2.36	1.26
	2.21	1.16
Figured specimen	2.61	1.39
Holotype of <i>R. valdiviae</i> (from original description)	3.2	1.6
Holotype of <i>R. studeriana</i> (damaged)	2.48	1.38
Îles Kerguelen, stn J114	3.15	1.53
	3.03	1.44
	3.18	1.56
	2.14	1.11
	1.81	1.00
	1.87	0.98
Figured specimen	3.22	1.62

REMARKS. The Macquarie Island shells (Fig. 12j) are similar to the type series of *O. steineni* (Fig. 14a) from South Georgia. They differ in their smaller size (see dimensions), relatively broader shape (and therefore larger apertures) and slightly less numerous spirals (7–9 on the penultimate whorl compared with 9–10 and 13–15 on body whorl compared with

17–18). Îles Kerguelen material, however, varies considerably in size and, consequently, the number of spiral cords (8–11 on the penultimate whorl and 12–18 on the body whorl in specimens from the same sample).

Thiele's figure and description of *R. valdiviae* agrees well with *O. steineni*. Unfortunately the holotype in the HUM has been almost completely destroyed by corrosion. Shells that appear to be this species, and also match the immature holotype of *R. studeriana* (Fig. 14b), are available from Îles Kerguelen and agree well with the material from Macquarie Island and South Georgia. A similar species, *Subonoba fallai* Powell, 1955 from the New Zealand sub-Antarctic, is more delicately sculptured than *O. steineni*.

Another species of *Onoba* with a broader, thinner shell and weaker spiral sculpture than *O. steineni* is represented in the Macquarie Island samples by two juveniles and 5 adults in poor condition.

DISTRIBUTION. South Georgia, Îles Kerguelen and Macquarie Island.

iii. Additional Antarctic and sub-Antarctic species of *Onoba*.

Melville and Standen (1916: 350) record *Onoba fuegoensis* (Strebel, 1908) from *Scotia* stn 346 (Burdwood Bank), but because this is typically a southern American species it is not dealt with here. The specimens recorded by Melville and Standen agree well with Strebel's species.

Onoba anderssoni (Strebel, 1908). Figure 18c.

Rissoia anderssoni Strebel, 1908, p. 55, pl. 4, figs. 54a–c.

MATERIAL. Holotype, SNHM, 912; Swedish Antarctic Expedition stn 28, South Georgia, 54°22'S, 36°28'W, 12–15 m, sand and algae.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	1.67	0.95

REMARKS. The unique specimen of this species is very similar to *O. georgiana* but differs in having a smaller shell (Fig. 18c) which is slightly more pupoid in shape, the inner lip is more strongly defined and it lacks a posterior sinus on the outer lip. The periostracum is well-developed, orange-brown, and has weak, raised, spiral lines as in *O. georgiana*. The operculum, as far as can be determined from the retracted animal, is thin and horny. The teleoconch has 2½ whorls and the eroded protoconch probably about 1½.

Onoba delecta n. sp. Figure 15f.

MATERIAL. Holotype and 2 paratypes, USNM (784700 and 784701), off N.W. South Georgia, 53°51'S, 37°38'W, 97–101 m, *Eltanin* stn 1535. Holotype coated with gold.

Port Albemarle, Falkland Islands, 52°11'S, 60°26'W, 40 m, Swedish Antarctic Expedition, stn 55, 8 IX 1902 (1 specimen) (SNHM, 2428), identified as *Rissoia grisea* by Strebel (1908).

DIAGNOSIS.

Shell: Small (maximum length 2.47 mm), ovate-conic, solid, with strong spiral lirae, dull surface and of 4½ whorls. Spire outline straight, whorls strongly convex; periphery rounded. Protoconch of 1½ whorls, apparently smooth but slightly worn in available material. Teleoconch with 4 strong, sharp, narrow, spiral cords and one weaker subsutural cord on penultimate whorl and 9–10 on body whorl. Interspaces with close, distinct, axial growth lamellae and exceedingly fine spiral striae. Sutures impressed, simple. Aperture subcircular, very weakly subangled posteriorly; inner lip narrow, thin, attached to parietal wall, separated slightly from lower base; outer lip opisthoclinal, slightly thickened within, with a prominent external varix immediately behind edge of lip. Umbilical chink represented by very narrow groove. Periostracum apparently absent. Colour white (Fig. 15f).

Radula and operculum: Unknown.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	2.44	1.50
Paratypes	2.35	1.48
	2.42	1.53
Falkland Islands	2.47	1.50

REMARKS. This species is distinguished from all others reviewed here by its shell having an ovate-conical shape and 9–10 strong spiral cords on the body whorl. *Onoba paucilirata* (Melville and Standen) is superficially similar but its shell has a glossy surface, only 6 distinct spiral cords on the body whorl and lacks the lamellate, axial interstitial sculpture of *O. delecta*. *Onoba fuegoensis* (Strebel) from Tierra del Fuego appears to be the most closely related species to *O. delecta* but its shell is relatively much more elongate. The radula of *O. fuegoensis* has been examined and is similar to that of other *Onoba* species.

Onoba gelida (Smith, 1907). Figures 13a, b; 16a–d.

Rissoia gelida Smith, 1907, p. 9, pl. 2, fig. 5; Smith, 1915, p. 65.

Rissoia gelida (Smith); Hedley, 1911, p. 5; Thiele, 1912, p. 195, pl. 11, figs. 37–38.

Subonoba gelida (Smith); Hedley, 1916a, p. 48; Powell, 1958, p. 185; Arnaud, 1972, p. 121.

Subonoba contigua Powell, 1957, p. 184, pl. 1, fig. 8.

MATERIAL. Syntypes (10), BMNH, 1905.9.25.72, and 1905.9.25.73–81; *Discovery* Winter Quarters, Hut Point, McMurdo Sound, 13 II 1904. 4 syntypes, BMNH, 1905.9.25.68–71; *Discovery* Winter Quarters, McMurdo Sound, 23 V 1902.

Holotype of *Subonoba contigua*, SAM, D15441; BANZARE stn 84, Commonwealth Bay, George V Land, 150 m.

Commonwealth Bay, George V Land, 46 m (many specimens) (AMS, C46666) and 82–91 m (9 specimens) (AMS, C46667), recorded by Hedley (1916a). Cape Royds, Antarctica, 29–37 m (7 specimens) (AMS, C30930), recorded by Hedley (1911). Cape Royds, on raised beach near Mt Erebus (6 specimens) (AMS, C31463), recorded by Hedley (1916b). 76°S, 164°E, McMurdo Sound, Antarctica, 221 m (1 specimen) (AMS, C31486). Off Enderby Land, 66°10'S, 49°41'E, 300 m BANZARE stn 39 (3 specimens) (AMS, C131183). Between Ilot du Marégraphe and islet NW of Île Carrel, Terre Adélie, rock, 15 m, holdfasts of *Phyllogigas*, 4 I 1962, coll. P. M. Arnaud (3 specimens) (SME), recorded by Arnaud (1972). Admiralty Bay, King George Island, South Shetland Islands, 60 m, 14 IX 1977, Polish Antarctic Expedition (1 specimen) (SME). *Eltanin* stn 1535, off South Georgia, 53°51'S, 37°38'W, 97–101 m (2 specimens) (USNM).

DIMENSIONS.

	Length (mm)	Width (mm)
Syntypes (1905.9.25.72–81)	2.92	1.77
	2.75	1.81
	2.94	1.79
	2.94	1.90
	2.72	1.71
	2.71	1.74
	2.54	1.56
	2.28	1.60
	2.84	1.78
	2.78	1.84
Figured syntype Syntypes (1905.9.25.68–71)	2.72	1.65
	2.11	1.50
	2.08	1.39
	2.36	1.51
Holotype of <i>S. contigua</i>	2.69	1.84

REMARKS. This species has a broadly ovate shell with strong spiral cords. *Subonoba contigua* Powell falls within the range of variation of *O. gelida* from comparison of the type material (Fig. 13a, b). Powell's (1958) record of *O. gelida* from BANZARE stn 42 is based on an undescribed species of *Onoba*. The shell, protoconch, operculum and radula of *O. gelida* are figured (Figs. 13a, b; 16a–d) for comparison with other species of *Onoba*.

This species has what appears to be a circum-Antarctic distribution although Egorova (1978) found it only in the eastern Antarctic. Egorova (1978) noted that *O. gelida* occurs within a depth range of 6–457 m, that its population density increases with depth and can be rather high (e.g. 480 m² at 32 m) and that, in the Davis Sea, this species is the most abundant mollusc found. Egorova (1978) also gives other biological information about this species.

Onoba inflatella (Thiele, 1912). Figures 16e, f; 18d.

Rissoa inflatella Thiele, 1912, p. 195, pl. 11, fig. 39.

MATERIAL. Holotype and 9 paratypes, HUM, 63027; *Gauss* stn, 66°2'9"S, 89°38'5"E, Davis Sea, 385 m.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype (not given in original description)	2.48	1.90

REMARKS. The shell (Fig. 18d) of this species can be readily separated from that of all other known species of *Onoba* by its globose shape, wide umbilicus and strong, widely-spaced spiral cords and interstitial spiral and axial threads. The protoconch (Fig. 16e, f) is sculptured with closely-spaced spiral rows of pustules.

Onoba lantzi (Vélain, 1877). Figure 14h.

Rissoa lantzi Vélain, 1876, p. 285 (*nom. nud.*); Vélain, 1877, p. 114, pl. 3, fig. 14.

MATERIAL. Syntypes, 3, NHMP: Île St Paul.

Off Passe du Cratère, Île St Paul, 30 m, 27 I 1972, coll. J. Beurois (3 specimens) (SME). La Cale, N.E. coast of Île Amsterdam, in kelp (*Laminaria*) roots, low tide, 11 II 1971, coll. J. Beurois (1 specimen) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Syntypes	2.0	1.04
	2.08	1.01
Figured syntype	1.97	1.01

REMARKS. This species is closely allied to *Onoba alfredensis* (Bartsch, 1915) from South Africa. Its thick shell (Fig. 14h) with shouldered whorls and spirally-ribbed protoconch is readily separable from any Antarctic and sub-Antarctic species. The protoconch is not only unusual in having 6 spiral cords but the apex is distinctly inrolled. The lower half of the outer lip protrudes forwards noticeably.

Onoba paucicarinata n. sp. Figure 16g, h.

MATERIAL. Holotype and 2 (damaged) paratypes, NHMP; S. of Marion Island, 46°59.5'S, 37°46.6'E, 185 m, 29 III 1976 *Marion-Dufresne* cruise MD08, stn 31. Holotype coated with gold. 2 paratypes (one broken), AMS, C.131184; off Enderby Land, 66°10'S, 49°41'E, 300 m, BANZARE stn 39.

DIAGNOSIS

Shell: Minute (maximum length 1.57 mm), broadly ovate-conic, solid, with strong spiral lirae, dull surface and of 3¼–3¾ whorls. Spire outlines slightly-convex, whorls strongly-convex; periphery rounded. Protoconch of 1⅓–1½ whorls, shining, microsculpture of minute, irregularly arranged, raised pustules (Fig. 16h). Teleoconch with 2–3 strong, narrow, spiral cords on penultimate whorl, 5–6 on body whorl. Interspaces with close, distinct, axial growth

lamellae, some strong and crossing spiral cords, and exceedingly fine, close spiral striae. Sutures impressed, simple. Aperture subcircular, weakly-subangled posteriorly; inner lip narrow, attached to parietal wall, slightly separated from lower base; outer lip orthocone, slightly thickened within, with prominent external varix immediately behind edge of lip. Umbilical chink represented by narrow groove, absent in 1 paratype. Colour white (Fig. 16g, h).

Radula and operculum: Unknown.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	1.57	1.07
Paratypes (damaged specimens)	—	1.07
	1.49	—
Enderby Land paratypes	1.29	0.98
(now broken)	1.52	1.07

REMARKS. This species appears to be most closely allied to *O. delecta* nov. but has fewer spiral ribs, is much smaller in size and has an orthocone, not opisthocline, outer lip. Three of the available specimens are damaged but the characters of this species are so distinctive that its description is considered to be warranted. The Antarctic and Marion Island specimens are very similar in all essential details. Although both lots were collected at a similar longitude, the latitudinal separation of the two localities is considerable.

Onoba paucilirata (Melvill and Standen, 1916). Figure 18a.

Rissoa (Onoba) paucilirata Melvill and Standen, 1916, p. 350, pl. unnumbered, fig. 10.

MATERIAL. Holotype, RSM, 1921.143.633; Burdwood Bank, 56 fathoms (102 m), *Scotia* stn 346.

DIMENSIONS.

	Length (mm)	Width (mm)
	2.45	1.74

REMARKS. The shell (Fig. 18a) of this species is readily distinguished from most other Antarctic and sub-Antarctic Rissoidae by its small number of strong spiral cords, ovately-conical shape and shining surface. *Onoba paucilirata* nov. is much smaller, has 3, not 4 spirals on the upper half of the body whorl, lacks the shining surface of *O. paucilirata* and has distinct axial lamellae between the spirals. *Onoba delecta* nov. differs in having 9–10 spirals (not 6+1 weak spiral) on the body whorl and lamellate axial microsculpture. The only related species is *O. inflatella* which is much more broadly-ovate. Both species have a microsculpture of fine spiral threads on the protoconch and teleoconch.

Powell (1951) recorded *Subonoba* cf. *paucilirata* from off Stromness Harbour, South Georgia, in 155–178 m. I have not seen this material but these specimens may be *O. delecta* nov.

Onoba sanctipauli (Vélain, 1877). Figures 13d; 17a–c.

Rissoella sancti-pauli Vélain, 1876, p. 285 (*nom. nud.*).

Jeffreysia sanctipauli Vélain, 1877, p. 116, pl. 3, fig. 20.

MATERIAL. 2 syntypes, NHMP; Île St Paul.

Off Passe du Cratère, Île St Paul, 30 m, 27 I 1972, coll. J. Beurois (1 juvenile) (SME). Île St Paul, in *Macrocystis* holdfast, 2 II 1972, coll. J. Beurois (3 specimens) (SME). S.E. of Île St Paul, 30 m, from stomach of *Jasus*, 28 XII 1971, coll. J. Beurois (1 specimen, eroded but probably this species) (SME). La Cale, N.E. coast of Île Amsterdam, low tide, 27 II 1971, coll. J. Beurois (2 specimens) (SME). Near Biomar, La Roche Godon, N.E. coast of Île Amsterdam, low tide, 22 II 1971, coll. J. Beurois (5 specimens) (SME). Off E. coast of Île Amsterdam, 30 m, 4 XII 1971, coll. J. Beurois (1 specimen) (SME). N. of Pointe de la Novara, E. coast of Île Amsterdam, 30–50 m, 2 I 1972, coll. J. Beurois (1 specimen) (SME). Off E. coast of Île Amsterdam, 30 m, 4 XII 1971 (3 specimens) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Figured syntype	2.39	1.47
Syntype	2.02	1.25
Figured specimen	2.24	1.46

REMARKS. This species is very similar to *O. transenna* (Watson) but differs in being more conical, with less convex whorls, in having a thicker inner lip and a more solid shell. The sculpture of the teleoconch varies from almost smooth (Fig. 17a) to distinctly spirally lirate (8–9 spirals on penultimate whorl) and the protoconch is spirally sculptured (Fig. 17b, c) and differs in detail from that of *O. transenna*. In *O. sanctipauli* the spiral ribs on the protoconch are wide, smooth and flat and the interspaces are coarsely granular (Fig. 17c). In *O. transenna* the protoconch spirals are narrow and there is only an indistinct, variable microsculpture between the ribs (Fig. 17e).

Onoba suavis (Thiele, 1925). Figures 13e, f.

Rissoa suavis Thiele, 1925, p. 76, pl. 17 (5), fig. 43.

MATERIAL. Holotype, HUM, 64952; Îles Kerguelen.

DIMENSIONS.

	Length (mm)	Width (mm)
	2.53	1.48

REMARKS. The unique shell (Fig. 13e, f) of this species is distinguished by its elongately ovate-conical shape, distinct spiral sculpture of narrow, raised cords, weakly-convex whorls and its very heavy labial varix. It is probably related to *O. filostria* but can be distinguished by its narrower shape, slightly weaker sculpture and heavier labial varix. Two

specimens from Îles Kerguelen are tentatively referred to *O. filostria* although one of these is closer in shape to *O. suavis*. They have a somewhat eroded shell surface but appear to have weaker sculpture than *O. suavis* and an indistinct labial varix. Further material is required to determine the status of this species.

Onoba schraderi (Strebel, 1908). Figure 17f, g.

Rissoia schraderi Strebel, 1908, p. 54, pl. 4, figs 52a-c.

MATERIAL. Lectotype (here chosen) and 21 paralectotypes, SNHM, 913; South Georgia, 54°22'S, 36°28'W, sand and algae in 12-15 m (3 additional paralectotypes are *O. georgiana*). Lectotype coated with gold.

S. part of Golfe du Morbihan, Îles Kerguelen, 15 m, 28 II 1966, coll. J. C. Hureau (2 specimens) (SME). Baie de la Table, Îles Kerguelen, 49°31'S, 69°11.7'E, 23 m, 26 II 1975 (1 specimen) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype	2.33	1.41
Paralectotypes	2.51	1.44
	2.20	1.32
	2.57	1.41
	2.27	1.34
Îles Kerguelen, 15 m	2.24	1.44
	2.11	1.38

REMARKS. The shell (Fig. 17f) of this species closely resembles that of *Onoba georgiana* in size and shape but can be distinguished by the very fine, close, spiral threads on the teleoconch and slightly more convex whorls. The spiral threads number 13-18 on the penultimate whorl. The protoconch microsculpture (Fig. 17g) is similar to that of *O. georgiana* but the spiral ridges are more widely spaced. The general features of the shell are similar to *O. filostria* but the finer spiral sculpture and the heavier periostracum readily separate the two species.

About two-thirds of the specimens in the type series of *Rissoia insignificans* Strebel, 1908 were *O. schraderi*. Three specimens in the type series of *R. schraderi* are *O. georgiana*.

Three specimens from Îles Kerguelen are referred to this species but are smaller, broader and have a less strongly opisthocline outer lip.

Onoba subantarctica subantarctica (Thiele, 1912). Figures 13i; 15g, h.

Rissoia subantarctica Thiele, 1912, p. 238, pl. 14, fig. 32.

MATERIAL. Holotype, HUM, 63084; Îles Kerguelen.

S.S.E. of Îles Kerguelen, 49°54.5'S, 70°24.4'E, 168 m, Marion-Dufresne cruise MD.04, stn J114, 15 III 1975 (many specimens) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	2.48	1.76
Îles Kerguelen, 168 m	2.54	1.68
	2.60	1.77
	2.65	1.84
Figured specimen	2.46	1.72

REMARKS. This species, in which two geographic subspecies are here recognized, is very similar to *O. filostria* but can be distinguished by its more distinct teleoconch microsculpture of fine, close spiral lines, its larger size and relatively thinner shell. In other respects the two species are virtually identical although *O. subantarctica* has relatively weaker spiral threads (about 14 on the penultimate whorl) and is consistently broadly-ovate. The protoconch microsculpture consists of subobsolete spirals with weak axial threads between (Fig. 15h) and in this respect may also differ from *O. filostria*, although the observed differences may be due to wear in the available material of *O. subantarctica*.

Tomlin (1948) recorded *Subonoba wilkesiana* from Îles Kerguelen but Powell (1955) regarded this material as an unidentified species. This record is possibly based on *O. subantarctica*, although I have not seen the material.

Onoba subantarctica wilkesiana (Hedley, 1916). Figure 13h.

Subonoba wilkesiana Hedley, 1916a, p. 48, pl. 7, fig. 77; Arnaud, 1972, p. 121.

MATERIAL. Holotype, AMS, C46671; Commonwealth Bay, Antarctica, 52-91 m.

Cap Géodésie, Terre Adélie, 210-230 m, 21 XII 1964, coll. P. Arnaud (1 specimen) (SME), recorded by Arnaud (1972).

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	2.49	1.81
Cap Géodésie	2.45	1.85

REMARKS. *Onoba subantarctica wilkesiana* differs from *O. subantarctica subantarctica* in having a shell which is relatively more inflated and has fewer whorls (3½ whorls cf. 4½ whorls in specimens of the same size). In other respects the shells of the two taxa are very similar. Their real relationships are difficult to assess as only two specimens of *O. s. wilkesiana* are available for comparison. They are tentatively regarded as being subspecifically distinct.

Onoba transenna (Watson, 1886). Figures 13c; 17d, e.

Rissoia (Ceratia) transenna Watson, 1886, p. 603, pl. 45, fig. 9.

Cingula transenna (Watson); Gaillard, 1971, p. 297.

MATERIAL. 4 syntypes, BMNH, 1887.2.9.1963–66. Between Marion and Prince Edward Islands, 140 fathoms (256 m).

S. of Marion Island, 46°59.5'S, 37°46.6'E, 185 m, 29 III 1976, *Marion-Dufresne* cruise MD.08, stn 31 (1 specimen) (SME). Îles Crozet, between Île de la Possession and Île de l'Est, 46°25.0'S, 51°59.7'E, 270–247 m, 21 IV 1976, *Marion-Dufresne* cruise MD.08, stn 77 (several specimens) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Syntypes of <i>R. transenna</i>	1.96	1.25
	1.71	1.16
(damaged)	2.30	1.38
Figured syntype	2.08	1.26
Stn 77 (figured)	2.15	1.44

REMARKS. This species resembles *O. gelida* but its shell (Figs. 13c; 17d) differs in being smaller and in having a finely but distinctly spirally-striate protoconch (Fig. 17e). *Onoba transenna* can be distinguished from *O. sanctipauli* on small but consistent differences in the shape of the shell, the relative strength of the spiral sculpture and the microsculpture of the protoconch (see under *O. sanctipauli* for details).

2.1.2. Genus *Powellisetia* Ponder, 1965

Type species: *Rissoa porcellana* Suter, 1908.

Remarks. Species of *Powellisetia* can be distinguished from those in the closely allied genus *Onoba* by their ovate-conic shell, the aperture of which has an orthocline outer lip in most species, and usually bears a varix. The teleoconch sculpture is usually lacking or consists of fine spiral striae. No distinct periostracum is developed. The protoconch microsculpture is weakly developed and usually consists of spiral elements. The radular and opercular characters are closely similar to those of *Onoba* species but there are differences in the features of the head-foot, the most significant being the absence of a metapodial tentacle in *Powellisetia*.

Key to Antarctic and sub-Antarctic species of *Powellisetia*

1. Shell smooth 2
Shell with fine but distinct spiral striae 5
2. Shell ovate (length/width ratio usually less than 1.6) 3
Shell narrowly-ovate (length/width ratio usually greater than 1.6) 4
3. Shell greater than 2.2 mm in length *deserta*
Shell less than 2.1 mm in length *principis*
4. Shell without umbilical chink *australis*
Shell with umbilical chink *inornata*
5. Shell with heavy apertural varix *varicosa*
Shell lacking an apertural varix 6
6. Shell of about 4½ whorls *arnaudi*
Shell of about 3½ whorls *pelseneeri*

i. Signy Island species

Powellisetia deserta (Smith, 1907). Figures 19a–c; 21c.

Rissoia deserta Smith, 1907, p. 9, pl. 2, fig. 1; Melvill and Standen, 1912, pp. 336, 349; Smith, 1915, p. 66; Hedley, 1916b, p. 86.

Subonoba deserta (Smith); Hedley, 1916a, p. 48 (in part); Arnaud, 1972, p. 120.

MATERIAL. Lectotype (here chosen) and 3 paralectotypes, BMNH, 1905.9.25.84–87; *Discovery* Winter Quarters, Cape Armitage, McMurdo Sound, 10 fathoms (18 m) 19 III 1902. 2 paralectotypes, BMNH, 1905.9.25.88–90) *Discovery* Winter Quarters, 20 II 1902.

50 m N. of Billie Rocks, Borge Bay, Signy Island, South Orkney Islands, 8 m, 6 III 1977, rocky bottom on algae, coll. G. Picken (several specimens) (NMW, 1979.002.19, AMS, C131185). Borge Bay, Signy Island, 4–10 m, coll. G. Picken (many specimens) (NMW, 1979.002.20, AMS, C131186). Scotia Bay, South Orkney Islands (5 specimens in two lots) (RSM), recorded by Melvill and Standen (1912). Commonwealth Bay, George V Land, Antarctica, 46 m and 82–91 m (4 specimens, 2 lots) (AMS, C46665 (part), C46664 (part) recorded (in part) by Hedley (1916a). Cape Royds, Victoria Land, Antarctica, raised beach (AMS, C31462 (part)), recorded (in part) by Hedley (1916b). 77°50.0'S, 166°34.0'E, near Hut Point, Ross Sea, 124–165 m (many specimens) (NMNZ). Cap Margerie, Terre Adélie, 10–12 m (2 specimens) (NHMP), recorded (in part) by Gaillard (1954b) as *Eatoniella kerguelenensis*; same locality, 100 m (4 specimens) (NHMP), recorded (in part) by Gaillard (1954b) as *Eatoniella subrufescens*. N.W. coast Îles des Pétrels, Terre Adélie, holdfasts of *Phyllogigas*, 31 m, 23 IX 1962, coll. P. M. Arnaud (several specimens) (SME), recorded by Arnaud (1972).

DIAGNOSIS.

Shell: Small (maximum length 2.6 mm), ovate-conic, rather thin, translucent, of 4¼–4½ whorls. Spire with almost straight outlines, whorls convex; periphery rounded. Protoconch of 1¾ whorls, transparent, with very weak, narrow spiral ridges; teleoconch with weak, axial growth lines and sometimes, traces of spiral scratches. Aperture ovate, angled posteriorly, peristome thin, inner lip rather narrow, separated from umbilical area, attached to parietal area; outer lip very weakly sinuate, a very shallow sinus posteriorly; very weak external thickening in fully mature specimens. Umbilical chink small to absent. Periostracum very thin, transparent. Colour white (Figs. 19a; 21c).

Operculum: Thin, horny, paucispiral (Fig. 19c).

Radula: Similar to that of *O. kergueleni* but with 4–5 (usually 4) cusps on either side of the median cusp on each central tooth and the outer marginal teeth have several minute, sharp cusps (Fig. 19b).

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype	2.44	1.65
Paralectotypes	2.60	1.56
	2.19	1.41
	2.54	1.76

	Length (mm)	Width (mm)
Signy Island	2.47	1.80
	2.47	1.75
	2.44	1.72
	2.53	1.85
Figured specimen	2.46	1.68

REMARKS. This species was placed in *Subonoba* (= *Onoba*) by Hedley (1916a) and, despite the lack of obvious spiral sculpture on the shell, it has remained in that genus. It is, however, a typical *Powellisetia*, its shell differing from that of most species of *Onoba* in lacking definite spiral sculpture and in being broader and thinner. *Powellisetia principis* (Watson) is very similar to *P. deserta* but is smaller, with a more solid shell which has a stronger apertural varix and does not develop a distinct umbilical chink.

A single, damaged, but live-collected, specimen from Macquarie Island is apparently one of those recorded by Tomlin (1948) as *Eatoniella kerguelensis*. This specimen is slightly smaller than typical *P. deserta* but is otherwise similar. Tomlin (1948) records '3 or 4 examples, dead, from Macquarie Island, without further data'. The specimen (BMNH, 1951.6.13.54) has the data 'ashore at Buckle Bay'. As this species was not collected by the 1977-78 expedition and was alive when collected, it possibly represents a mislocalized specimen.

There are several species of *Powellisetia* known from the New Zealand area (Ponder, 1965b) but the only other described Antarctic and sub-Antarctic species are *P. pelseneeri* (Thiele), the shell of which has a taller spire than *P. deserta* and faint spiral striations, *P. australis* (Watson), which has a smaller shell with a relatively taller spire, and *P. inornata* (Strebel) which has a much smaller, more elongately-conic shell.

Powellisetia deserta has previously been recorded from the South Orkney Islands by Melvill and Standen (1912). Hedley's (1916a) record of this species from Commonwealth Bay consists of a few specimens of *P. deserta* and several *Eatoniella demissa*.

Egorova (1978) has shown that this species is one of the most abundant molluscs in the Davis Sea and gives some biological data.

DISTRIBUTION. Circum-Antarctic; the South Orkney Islands and possibly Macquarie Island.

ii. Macquarie Island Species

Powellisetia australis (Watson, 1886). Figures 18b; 19d-f.

Rissoa (Setia) australis Watson, 1886, p. 608, pl. 45, fig. 1.

Ovirissoa nivosa; Powell, 1957, p. 141 (in part).

Eatoniella (Eatoniella) australis (Watson); Ponder and Yoo, 1978, p. 641.

MATERIAL. Lectotype (here chosen) and 3 paralectotypes, BMNH, 87.2.9.2008-11; Passe Royale, Îles Kerguelen.

Off Cascade Bidy, Fjord Henri Bossière, Golfe du Morbihan, Îles Kerguelen, 5 m, algae and rocks, 11 II 1970, P. M. Arnaud (several specimens) (SME). Garden Bay, Aerial Cove, Macquarie Island, 17 III 1912, from paratypes of *Tatea melvilli* Hedley (2 specimens) (AMS, C46651 (part)). 8 localities, Macquarie Island, 0-20 m, coll. J. K. Lowry *et al.*, 1977-78 (AMS). Off Lusitania Bay, Macquarie Island, 69 m, BANZARE stn 83 (2 paratypes of *Ovirissoa nivosa* Powell, 1957) (BMNH).

DIAGNOSIS.

Shell: Minute (maximum length 2.12mm), shining, smooth, narrowly ovate, moderately solid, semitranslucent, of 4 whorls. Spire with very slightly convex outlines, whorls convex; periphery rounded. Protoconch of 1½ whorls, sculptured with subobsolete spiral threads (Fig. 19f); teleoconch smooth except for fine, axial growth lines and extremely fine spiral scratches. Sutures impressed, simple. Aperture subcircular, subangled posteriorly; peristome thin, sharp; inner lip narrow; outer lip with very shallow sinus in upper third, lower two-thirds very slightly opisthocline, with a very weak varix behind. Umbilical chink absent. Periostracum thin, transparent. Colour translucent white, chalky white in dead material, periostracum pale yellowish in type series but colourless and thinner in Macquarie Island specimens (Figs. 18b; 19d, f).

Operculum: Thin, horny, paucispiral.

Radula: Similar to that of *O. kergueleni* but with the central teeth having relatively narrower, more elongately-triangular cutting edges and about 4 small cusps on either side of the median cusp (Fig. 19e).

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype of <i>R. australis</i>	1.91	1.13
Paralectotypes	1.68	0.98
	1.71	0.98
	1.75	1.12
Macquarie Island	2.12	1.18
	2.08	1.16
	1.74	1.06
	1.81	1.13
Figured specimen	1.57	0.98

REMARKS. This species resembles *P. deserta* in general shell features but is smaller, with a relatively narrower spire and less inflated body whorl. Comparison of Watson's 4 syntypes (Fig. 18b) with the Macquarie Island material (Fig. 19d), suggests that they are probably the same species. Ponder and Yoo (1978) incorrectly listed this species as an *Eatoniella*.

This species was common in some of the sublittoral samples from Macquarie Island collected by the 1977-78 expedition but was almost entirely represented by subadults and juveniles. Nearly all of the adult material comprised empty shells. This suggests that the species matures and probably reproduces in the late summer at Macquarie Island. Specimens collected from Îles Kerguelen in February include adults.

The 3 paratypes of *Ovirissoa nivosa* Powell include 2 specimens of this species. The largest paratype and the

holotype are a pyramidellid which is extremely similar but differs in the heterotrophe protoconch and in having a very weak plait on the columella.

DISTRIBUTION. Îles Kerguelen and Macquarie Island.

iii. Additional Antarctic and sub-Antarctic species of *Powellisetia*

Powellisetia arnaudi n. sp. Figure 19g, h.

MATERIAL. All Îles Kerguelen, *Marion-Dufresne* cruise MD.04.

Holotype and many paratypes, NHMP; 20 paratypes, AMS, C131187; S.S.E. of Îles Kerguelen, 49°54.5'S, 70°24.4'E, 168 m, basaltic pebbles with sand and bryozoans, 15 III 1975, stn J114. Holotype coated with gold. Several paratypes, NHMP, 3 paratypes, AMS, C131188, S.S.E. of Îles Kerguelen, 49°51'S, 70°19'E, 145 m, basaltic gravel, stones and fine sand, 15 III 1975, stn J113. 1 Paratype, SME; S.S.W. of Îles Kerguelen, 50°04.0'S, 68°29.0'E, 195 m, 25 II 1975, stn C24 (1 specimen, collected alive).

DIAGNOSIS.

Shell: Small (maximum length 2.83 mm), ovate-conic, thin, surface rather dull, with 4½ convex whorls. Spire outlines almost straight, periphery evenly-convex. Protoconch of 1½ convex whorls, apparently smooth. Teleoconch with very weak, widely-spaced, raised spiral lines (Fig. 19h). Sutures impressed, simple. Aperture rather large, oval to sub-quadrangle, some specimens with weak angulation at base of columella, others with convex anterior edge; weak posterior angulation present. Inner lip narrow, thin, usually partly or completely enclosing a very narrow umbilical chink. Outer lip thin, slightly opisthocline, with no external varix. Periostracum apparently absent. Colour white (Fig. 19g, h).

Operculum and radula: Not examined.

Animal: Not pigmented.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	2.83	1.81
Paratypes	2.57	1.53
	2.67	1.66
	2.54	1.53
	2.34	1.52

REMARKS. This species can be distinguished from the other Antarctic and sub-Antarctic species of *Powellisetia* by its thin shell which lacks a varix on the outer lip and by the very weak spiral threads. *Powellisetia deserta* and *P. principis* are smooth, have a varix and are relatively broader, *P. australis* is smooth and more elongate and *P. inornata* has a varix, is smooth and is smaller. *Powellisetia pelseneeri* has a relatively broader shell of about 3½ whorls without an umbilical chink. Detailed comparison of *P. pelseneeri* and *P. arnaudi* is impossible given the lack of comparative material but the differences appear to be sufficient for specific distinction. The animal of the single specimen obtained alive was not

examined as the shell would have had to be destroyed and it was the only record of this species from stn C24.

This species is named for Dr P. M. Arnaud who assisted greatly with this project by making his extensive collections of eatoniellids and rissoaceans available.

Powellisetia inornata (Strebel, 1908). Figures 2g; 20a-d.

Rissoia inornata Strebel, 1908, p. 53, pl. 1, fig. 11a-c.

MATERIAL. Lectotype and 13 paralectotypes (+14 specimens of *Eatoniella occulta* nov. which were part of the original syntype series and become the type series of that species), SNHM, 1960; Carenage Creek, Port Louis, East Falkland Island, Falkland Islands, 51°32'S, 58°7'W, 1 m, sand bottom with *Codium*.

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype	1.50	1.07
Paralectotypes	1.57	0.98
	1.74	1.13
	1.44	1.07
	1.50	0.98
	1.65	1.03
	1.50	0.99
	1.54	1.11
Figured paralectotype	1.50	0.96

REMARKS. This species differs from others in the genus by its small size and the elongate-ovate shape and convex whorls of its shell. The shell (Figs. 2g; 20a, b) has a smooth surface, a very small posterior sinus in the rather thin outer lip and a weak external varix. The head-foot is unpigmented and the mantle darkly pigmented as in *Eatoniella occulta*. The operculum (Fig. 20c) and radula (Fig. 20d) are figured for comparison with other species.

Powellisetia pelseneeri (Thiele, 1912).

Rissoa (*Ceratia*?) *subtruncata* Pelseneer, 1903, p. 21, pl. 5, fig. 59 (*non Rissoa subtruncata* Vélain, 1877).

Rissoa pelseneeri Thiele, 1912, p. 194, pl. 11, fig. 34 (*nom. nov. pro R. subtruncata* Pelseneer, 1903 *non* Vélain, 1877).

MATERIAL. *Gauss* stn, 66°2'2"S, 89°38'5"E, Davis Sea, 385 m (HUM), Thiele's specimens of *R. pelseneeri*.

TYPE LOCALITY. W. Antarctica, 70°S, 80° 48'W, 550 m.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype (from original description)	2.0	1.3
Davis Sea (from Thiele, 1912)	1.9	1.3

REMARKS. The holotype of *R. subtruncata* Pelseneer is decalcified (Dr J. van Goethem personal communication). Examination of Thiele's material, which was briefly examined during a visit to HUM, suggests placement of this species in *Powellisetia*. It differs from the other Antarctic species, except *P. arnaudi* nov., in the shell having fine spiral striae. Topotypic material needs to be examined to confirm the identity of Thiele's specimens as they were obtained from opposite sides of Antarctica.

Powellisetia principis (Watson, 1886). Figure 21a, b.

Rissoa (Setia) principis Watson, 1886, p. 608, pl. 44, fig. 13.

Cingula principis (Watson); Gaillard, 1971, p. 297.

MATERIAL. Lectotype (here chosen) and 4 paralectotypes, BMNH, 1887.2.9.2003-6; between Marion and Prince Edward islands, 140 fathoms (256 m). Paralectotypes, 2, BMNH, 1887.2.9.2007, Passe Royale, Îles Kerguelen.

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype	2.05	1.36
Paralectotypes	1.96	1.28
	1.62	1.10
	1.55	0.96
	1.35	0.95
Îles Kerguelen paralectotype (figured)	1.32	0.92

REMARKS. This species is close to *P. deserta* and is contrasted under that species above. The Îles Kerguelen specimens were collected alive and are immature. They agree closely with the primary type series (compare Fig. 21a with 21b).

Powellisetia varicosa n. sp. Figure 20e.

MATERIAL. Holotype and 2 paratypes, NHMP, S.S.E. of Îles Kerguelen, 49°54.5'S, 70°24.4'E, 168 m, basaltic pebbles with sand rich in bryozoans, 15 III 1975, *Marion-Dufresne* cruise MD.04, stn J114. Holotype coated with gold.

DIAGNOSIS.

Shell: Minute (maximum length 1.7 mm), with shining surface, ovate-conic, thin, of 3½ whorls. Spire outline very slightly convex, whorls convex, periphery rounded. Protoconch of 1½ convex whorls, smooth, shining. Teleoconch smooth except for extremely fine spiral threads and closely-spaced, delicate axial growth lines. Sutures impressed, simple. Aperture ovate, sub-angled posteriorly; inner lip narrow, thickened, raised above, and separated from, umbilical chink. Outer lip orthocone, with shallow excavation posteriorly and anteriorly, thickened within and with prominent varix externally. Umbilical chink very small, a shallow depression behind inner lip. Periostracum absent (dead shells only available). Colour white (Fig. 20e).

Operculum and radula: Unknown.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	1.70	1.09
Paratypes	1.47	1.02
	1.59	1.08

REMARKS. This species can be distinguished from the others reviewed herein by its small size, varicose outer lip which is also thickened internally and the presence of spiral sculpture. The only other species with spiral sculpture (*P. pelseneeri* and *P. arnaudi* nov.) lack a varix on the outer lip and do not show any internal thickening of the aperture.

2.2. Family BARLEEIDAE

2.2a. Subfamily BARLEEINAE

2.2a.1. Genus *Fictonoba* Ponder, 1967

Type species: *Rissoa carnosa* Webster, 1905.

Fictonoba (?) *cymatodes* (Melvill and Standen, 1916). Figure 14g.

Onoba cymatodes Melvill & Standen, 1916, p. 120, text fig.

MATERIAL. Holotype RSM, 1974.3, Burdwood Bank, S. of Falkland Islands, *Scotia* Expedition, 1905 (Paratype NMW, 1955.158, Melvill-Tomlin colln; not seen).

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	2.57	1.05

REMARKS. The generic placement of this species needs to be confirmed by the examination of the operculum and radula. Its shell is very similar to that of the New Zealand type species of *Fictonoba*. No other records of this species are known and there are no similar species in the Antarctic or sub-Antarctic.

2.2b. Subfamily ANABATHRINAE

2.2b.1. Genus *Pisinna* Monterosato, 1878

Type species: *Rissoa punctulum* Philippi, 1836.

Pisinna cazini (Vélain, 1877).

Rissoa cazini Vélain, 1876, p. 285 (*nom. nud.*); Vélain, 1877, p. 114, pl. 3, fig. 15.

Ovirissoa cazini (Vélain); Hedley, 1916a, p. 47.

Estea cazini (Vélain); Dell, 1972, p. 35.

Pisinna cazini (Vélain); Ponder and Yoo, 1976, p. 210, fig. 9j.

MATERIAL. Syntypes, 2, NHMP; Île St Paul.

DIMENSIONS.

	Length (mm)	Width (mm)
Syntype (from original description)	2.0	1.0

REMARKS. This is the only known sub-Antarctic *Pisinna* outside the New Zealand region where it is represented by 5 species (Powell, 1979).

2.2b.2. Genus *Scrobs* Watson, 1886

Type species: *Rissoa (Scrobs) scrobiculator* Watson, 1886.

Remarks. The two species tentatively included below in the genus *Scrobs* appear to be congeneric with a small group of southern African species which are to be provided with a new genus taxon elsewhere.

'*Scrobs*' *subtruncata* (Vélain, 1877). Figure 18i.

Rissoa subtruncata Vélain, 1877, p. 115, pl. 3, figs 16–17.

MATERIAL. Syntypes, 2, NHMP; Île St Paul.

Off Passe du Cratère, Île St Paul, 30 m, fine sand, 27 I 1972, coll. J. Beurois (1 specimen) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Figured syntype	0.80	0.47
Syntype	0.68	0.39

REMARKS. This species is distinguished from the next in having a smooth shell.

'*Scrobs*' *parvula* (Vélain, 1877). Figure 18h.

Lacuna parvula Vélain, 1877, p. 113, pl. 3, figs. 11, 12.

MATERIAL. Syntypes, 2, NHMP; Île St Paul.

DIMENSIONS.

	Length (mm)	Width (mm)
Figured syntype	0.73	0.56

REMARKS. This minute species has two spiral keels on the shell.

2.3 Family CINGULOPSIDAE

Remarks. The genera of this family have recently been diagnosed by Ponder and Yoo (1980).

There are only 5 species-group taxa recognized as cingulopsids described from the Antarctic, *Rissoa (Setia) sinapi* Watson, 1886 (= *Rissoa miliaris* Thiele, 1912), *Rissoa (Setia) edwardiensis* (Watson, 1886) and *Eatoniella paludi-*

noides Smith, 1902, type species of *Eatoniopsis* Thiele. Examination of material of *Skenella georgiana* Pfeffer shows it to be congeneric with *Eatoniopsis* and, because *Skenella* is the earlier generic name, it must replace *Eatoniopsis*. *Eatoniopsis ainsworthi* Hedley, 1916 is an *Eatoniella* as shown above.

Cingulopsids are very similar to eatoniellids in shell characters but all of the Antarctic and sub-Antarctic species of Cingulopsidae have a weak bulge on the columella whereas the eatoniellids have a simple, concave columella.

Key to the species of Antarctic Cingulopsidae

Remarks: This key will have a limited reliability as it uses shell characters only. The taxonomic basis of the classification of this family is on radular characters, the shells tending to show only very minor differences. As in the case of the other keys only adult material in good condition should be used to obtain a satisfactory result.

1. Shell depressed-trochiform.....*Skenella georgiana*
Shell ovate to conic..... 2
2. Shell conic (shell length/width ratio greater than 1.6)
Pickenia signyensis
Shell ovate-conic to ovate (shell length/width ratio less than 1.5)..... 3
3. Shell with small but distinct umbilicus *Skenella umbilicata*
Shell with umbilical chink only 4
4. Shell with two brown bands on base
Skenella sp. (= *sinapi* of Thiele)
Shell uniform brown or yellow-brown 5
5. Shell usually longer than 1.8 mm, with thickened, broad inner lip.....*Skenella paludinoides*
Shell less than 1.6 mm in length, with thin, narrow inner lip 6
6. Shell longer than 1.3 mm*Skenella edwardiensis*
Shell less than 1.2 mm in length *Skenella sinapi*

2.3.1. Genus *Skenella* Pfeffer, 1886

Type species: *Skenella georgiana* Pfeffer, 1886.

Synonym *Eatoniopsis* Thiele, 1912.

Type species: *Eatoniella paludinoides* Smith, 1902.

2.3.1a. Subgenus *Skenella* s.s.

Remarks. For generic and subgeneric diagnosis see Ponder and Yoo (1980) (as *Eatoniopsis*). One feature of the species described below is that they have weak spiral microsculpture on the protoconch, a character not mentioned in earlier descriptions.

i. Signy Island species

Skenella (Skenella) umbilicata n. sp. Figures 22a–d; 26e.

Eatoniopsis (Eatoniopsis) cf. *edwardiensis* (Watson); Ponder and Yoo, 1980, p. 34, figs. 13f–i.

MATERIAL. Holotype NMW, 1979.002.21, and many paratypes, NMW, 1979.002.22, 8 paratypes, AMS, C131189; Borge Bay, Signy Island, South Orkney Islands, 4–10 m, coll. G. Picken, VI 1975. Several paratypes, AMS, C131190; 50 m N. of Billie Rocks, Borge Bay, G. Picken, 6 III 1977. Many paratypes, NMW, 1979.002.23; Borge Bay, Signy Island, III 1976, G. Picken.

Duke of York Island, near Cape Adare, Antarctica, 11 m (BMNH, 1902.5.16.66–75 (in part)). Pointe Géologie Archipelago, Terre Adélie, Antarctica, between Île des Pétreils and Île Rostand, 20 m, in holdfast of *Phyllogigas grandifolius*, coll. P. M. Arnaud, 14 II 1965 (several specimens) (AMS, C131191; 5 specimens, NHMP). Commonwealth Bay, George V Land, 3–4 IX 1912, Australian Antarctic Expedition (4 specimens) (AMS, C131192). Bonaparte Inlet, Arthur Harbour, Anvers Island, Antarctic Peninsula, 24 I 1963 (many specimens) (USNM, 664506).

DIAGNOSIS.

Shell: Small (maximum length 1.66 mm), ovate-conic, umbilicate, moderately solid, of 3½ whorls. Spire outlines straight to slightly convex; whorls convex, periphery rounded. Protoconch of 1½ whorls, minutely sculptured with irregular spiral ridges (Fig. 22b); the interspaces with weak, irregular axial rugae; teleoconch sculptured with axial growth lines only. Aperture subcircular, columella with distinct bulge, inner lip attached to parietal wall but separated from umbilical area; outer lip simple, almost straight. Umbilicus very narrow, small externally. Periostracum very thin. Colour orange-brown, aperture pale yellow-brown (Figs. 22a, b; 26e).

Operculum: Typical of genus; yellow, transparent; a small peg emerges from nucleus and projects beyond margin of operculum (Fig. 22c).

Radula: Central teeth triangular, each with a large, blunt, easily shed cusp and prominent lateral thickenings. Lateral teeth large, deep, with median cusp large, blunt, formula 1–5+1+3, cusps on inside of median cusp usually small. Inner marginal teeth each with a very large, shovel-like to long, pointed median cusp and 1 moderately prominent cusp on either side as well as 1–2 very small cusps on outer side. Outer marginal teeth with about 7 small cusps. Both marginal teeth long, outer marginal teeth slightly smaller than inner marginals (Fig. 22d).

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	1.45	1.14
Paratypes	1.53	1.13
	1.43	1.18
	1.43	1.06
	1.20	1.03
	1.21	1.01
Figured paratype	1.31	1.05
Pointe Géologie Archipelago,		
Terre Adélie	1.62	1.22
	1.66	1.26
	1.55	1.19
Commonwealth Bay, George V Land	1.65	1.41
	1.48	1.25
	1.26	1.14

REMARKS. This species resembles *Rissoa (Setia) edwardiensis* Watson, 1886, from off Prince Edward Island. The shell of Watson's species has a much smaller umbilical chink, a weaker columellar fold and the inner lip is more closely applied to the basal area (Fig. 26d). *Skenella umbilicata* was tentatively referred to *Eatoniopsis edwardiensis* (Watson) by Ponder and Yoo (1980). The mainland Antarctic specimens tend to be larger than the South Orkney material but otherwise appear to be identical in shell and radular features.

The new species was collected together with *S. paludinooides* (Smith, 1902) at Pointe Géologie and Duke of York Island. Its shell differs from that of Smith's species in being smaller, having a narrower inner lip, a larger umbilicus and in usually being slightly darker in colour. There are also radular differences between the two species (cf. Figs. 22d and 22e).

DISTRIBUTION. South Orkney Islands, the Antarctic Peninsula and Terre Adélie, Antarctica.

ii. Other Antarctic and sub-Antarctic species of *Skenella*

Skenella (Skenella?) edwardiensis (Watson, 1886). Figure 26d.

Rissoa (Setia) edwardiensis Watson, 1886, p. 610, pl. 45, fig. 11; Powell, 1960, p. 138.

Cingula edwardiensis (Watson); Gaillard, 1971, p. 297.

MATERIAL. Lectotype (here chosen) and 4 paralectotypes, BMNH, 1887.2.9.2015–19, off Prince Edward Island, 50–150 fathoms (91–274 m).

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype	1.41	1.12
Paralectotypes	1.48	1.17
	1.35	1.10
	1.53	1.19
(juvenile)	0.98	0.86

REMARKS. This species is similar to *S. umbilicata* described above and is contrasted under that species. Its subgeneric classification will remain doubtful until its radula is described.

Skenella (Skenella) georgiana Pfeffer (in Martens and Pfeffer), 1886. Figures 23a–e; 26a–c.

Skenea cf. subcanaliculata; Martens, 1885, p. 92 (non E. A. Smith).

Skenella georgiana Pfeffer (in Martens and Pfeffer), 1886, p. 97, pl. 2, fig. 6a, b; Strebel, 1908, p. 53; Ponder and Yoo, 1978: 641.

MATERIAL. Swedish Antarctic Expedition stn 19F, Cumberland Bay, South Georgia (5 specimens) (SNHM, 2795

(part). Stn 46, Carenage Creek, Port Louis, Falkland Islands, 1 m (2 specimens) (SNHM, no number). No stn given, Cumberland Bay, South Georgia, 5 V 1902 (several specimens) (SNHM, 2464).

TYPE LOCALITY. South Georgia.

DIMENSIONS.	Height (mm)	Width (mm)
Stn 46, Port Louis	0.73	1.03
Cumberland Bay	1.10	1.31
	1.22	1.38
	1.02	1.25
	0.99	1.19
Figured specimen	0.92	1.16

REMARKS. Type material could not be located for this species and no material originating from Pfeffer could be found in any of the museums visited by the writer. The original description agrees with Strebel's material and this is taken as being typical of the species. The dimensions cited by Pfeffer are length 1.49 mm, length of aperture 0.59 mm. The length cited is obviously incorrect as judged from the dimensions of the aperture and the proportions of the drawing.

The shell features (Figs. 23b; 26a-c) agree closely with those of species in the subgenus *Pilatonia* Ponder and Yoo, 1980, but the radular characters (Fig. 23c, d) differ considerably and are consistent with those of species included in *Eatoniopsis* s.s. by Ponder and Yoo (1980). As in other species of *Skenella* s.s., the protoconch of *S. georgiana* is spirally sculptured (Fig. 23a) and the operculum (Fig. 23e) is also like that of other species in the group. The shell differs from the other Antarctic and sub-Antarctic cingulopsids in its depressed helicoid shape.

Skenella (Skenella) paludinoidea (Smith, 1902). Figures 22e-g.

Eatoniella paludinoidea Smith, 1902, p. 205, pl. 24, fig. 18.

Eatoniopsis paludinoidea (Smith); Thiele, 1912, p. 237, pl. 14, figs. 29, 29a, pl. 16, fig. 2 (radula); Arnaud, 1972, p. 119, figs. 10 and 13.

Eatoniopsis (Eatoniopsis) paludinoidea (Smith); Ponder and Yoo, 1980, p. 34, fig. 13j-n.

MATERIAL. Syntypes, 14, BMNH, 1902.5.16.52-65; Cape Adare, Antarctica, 8 fathoms (15 m).

Pointe Géologie Archipelago, Terre Adélie, Antarctica, 20 m, P. M. Arnaud (12 specimens) AMS, C131192). Robertson Bay, Duke of York Island (several specimens) (BMNH).

DIMENSIONS.	Length (mm)	Width (mm)
Syntype (from original description)	1.5	1.0
Robertson Bay, Duke of York Island (figured)	1.90	1.35
(from Ponder and Yoo, 1980)	2.12	1.63
Pointe Géologie Archipelago	2.15	1.53
	2.29	1.64

REMARKS. Arnaud (1972) records this species from several localities in Terre Adélie but his material, at least in part, consists of a mixture of *S. paludinoidea* and *S. umbilicata* nov. The shell, radula and operculum (Fig. 22e-g) are figured for comparison with *S. umbilicata*.

Skenella (Skenella) sinapi (Watson, 1886). Figures 23f, g; 27c, d.

Rissoa (Setia) sinapi Watson, 1886, p. 610, pl. 45, fig. 13.

Rissoa miliaris Thiele, 1912, p. 239, pl. 15, fig. 3.

Eatoniopsis (Boogina) sinapi (Watson); Ponder and Yoo, 1980, p. 34.

MATERIAL. Lectotype (designated by Ponder and Yoo, 1980, p. 34), and one paralectotype, BMNH, 1887.2.9.2020-1; Passe Royale, Îles Kerguelen.

Port Jeanne d'Arc, S.W. of Golfe du Morbihan, Îles Kerguelen, 14-17 m, in kelp bed (*Macrocystis pyrifera*), 12 II 1970, P. M. Arnaud (3 specimens) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Lectotype	1.05	0.77
Paralectotype	0.77	0.65
Holotype of <i>R. miliaris</i> (from original description)	1.00	0.75
Figured specimen	1.01	0.73

REMARKS. Ponder and Yoo (1980) have discussed the uncertainty surrounding Thiele's (1912) identification of *R. sinapi*. One specimen (Fig. 27a), which closely resembles Thiele's illustration of the shell, proves to have a radula similar to that described by Thiele. The radula (Fig. 23f) and operculum (Fig. 23g) of a specimen (Fig. 27d) conspecific with *R. sinapi*, although a poor mount, show it to be a species of *Skenella* s.s. A third species is represented at Îles Kerguelen and is known from only one adult (Fig. 27b) and a juvenile in poor condition (Golfe du Morbihan, Îles Kerguelen, 5 m, rocks and algae, 11 II 1970, P. M. Arnaud (SME).

Thiele's *Rissoa miliaris* is based on a single specimen now in a poor state of preservation. Comparison of photographs taken of this specimen and the lectotype of *S. sinapi* do not reveal any significant differences and the two species are here considered to be synonyms.

2.3.1b. Subgenus *Boogina* Thiele, 1913

Nom. nov. pro Watsonella Thiele, 1912, non Grabau, 1893.

Type species: *Watsonella sinapi* Thiele, 1912 (non *Rissoa (Setia) sinapi* Watson, 1886).

REMARKS. The species on which *Boogina* was based was misidentified and, because all of the existing material of that species is either destroyed or in very poor condition, is not named here. The unsatisfactory course of temporarily

maintaining a genus-group taxon lacking a named type species is considered preferable to naming a species taxon based on inadequate material. Even with the provision of a new name for Thiele's species the fixing of the type species of *Boogina* would still require a decision by the ICZN.

Skenella (Boogina) sp. Figures 24a-c; 27a.

Watsonella sinapi; Thiele, 1912, p. 237, pl. 15, figs. 2, 2a, 25 (non Watson).

Boogina sinapi; Thiele, 1913, p. 86 (non Watson).

MATERIAL. Baie de la Table, Îles Kerguelen, 49°31.0'S, 69°11.7'E, 23 m, 26 II 1975 (1 damaged specimen) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Baie de la Table (figured)	1.69	1.29
Thiele's specimen (from Thiele, 1912)	1.25	1.00

REMARKS. This species, as noted above, is subgenerically distinct from *S. sinapi* and is apparently the species misidentified as *sinapi* by Thiele (1912). Its shell (Fig. 27a) differs from *S. sinapi* in being larger, thinner, having two colour bands on the base, a more prominent columellar bulge and in being relatively broader. The radular mount of this species is poor (Fig. 24b, c) but the radula and the operculum (Fig. 24a) are very similar to those described and figured by Thiele (1912).

Thiele's two specimens from Baie de l'Observatoire, Îles Kerguelen have been destroyed by corrosion (HUM, 63066). The only extant specimen is in poor condition, the shell being badly broken. This specimen clearly requires a new name but, because of the lack of adequate material, is not named herein.

2.3.2. Genus *Pickenia* n. gen.

Type species: *P. signyensis* n. sp.

DIAGNOSIS.

Shell: Minute, conical, spire taller than aperture, with weak columellar fold, protoconch with numerous spiral rows of minute, hollow blisters.

Operculum: Similar to that of species of *Skenella*; rather thin, transparent, with a small peg emerging from the nucleus and extending just beyond the margin. There is no internal thickening.

Radula: Central teeth absent, lateral teeth large, with few cusps, inner marginal teeth long, hook-shaped, with large median cusps and small lateral cusps; outer marginal teeth very small (rudimentary).

REMARKS. This genus is distinguished from the other genera of the Cingulopsidae mainly by its radular features. The absence of central teeth is unique in the Rissoacea, although most cingulopsids have reduced central teeth. The outer marginal teeth are very small, as in *Eatonina* Thiele, 1912

and *Pseudopisinna* Ponder and Yoo, 1980 but in this respect *Pickenia* differs from *Skenella*, which it closely resembles in opercular features. Species of *Skenella* and *Tubbreva* Ponder, 1965 also have shells with a bulge on the columella but *Tubbreva* lacks a radula and has a shorter peg on the operculum. The shell is, however, in general features, more like *Eatonina* than *Skenella* but differs in having a microsculpture of spiral rows of pustules on the protoconch.

The new genus is named for Dr Gordon Picken who collected the molluscan material that forms the basis of this report.

Pickenia signyensis n. sp. Figures 24d-f, 25a-c.

MATERIAL. Holotype (NMW, 1979.002.24) and many paratypes (NMW, 1979.002,25), several paratypes (AMS, C131195); Borge Bay, Signy Island, South Orkney Islands, 4-10 m, coll. G. Picken, 4 X 1976. Holotype coated with gold. Many additional paratypes (NMW, 1979.002.26); same data, March 1976. 8 paratypes, AMS (C131194); 50 m N. of Billie Rocks, Borge Bay, Signy Islands, South Orkney Islands, in 5m, rocky bottom on algae, coll. G. Picken, 10 III 1977.

DIAGNOSIS.

Shell: Minute (maximum length 1.5 mm) solid, rather narrowly-conic, of about 4½ whorls. Spire outlines straight, periphery rounded. Protoconch of 1½ whorls, with about 25 spiral rows of minute, closely-spaced pustules (Fig. 25b, c); teleoconch with convex whorls, smooth except for fine axial growth lines. Aperture nearly circular, slightly angled posteriorly, columella with weak bulge not visible in front view; inner lip rather broad, thin, separated from base and umbilical area; outer lip moderately retracted, thin, simple, advanced forward at suture. Umbilicus very narrow, usually closed by inner lip leaving only a small umbilical chink. Periostracum thin, transparent. Colour pale orange-brown, aperture yellowish-brown to yellowish-white, protoconch usually dark purplish-brown in preserved material (Fig. 25a-c).

Operculum: As for generic diagnosis (Fig. 24d).

Radula: Central teeth absent; lateral teeth large, deep, each with a small, blunt, median cusp, 2-3 very small cusps on inner side, none (?) on outer side of median cusp. Inner marginal teeth large, each with long, large, rather blunt, hooked terminal cusp and several very small cusps on lateral faces. Outer marginal teeth very small, narrow, with 1-2 small terminal cusps (Fig. 24e, f).

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	1.43	0.88
Paratypes	1.36	0.85
	1.40	0.83
	1.34	0.85
	1.46	0.89
	1.43	0.84
	1.48	0.89

REMARKS. The shell of this species closely resembles some species of the Eatoniellidae in general features but can be separated from members of that family by the bulge on the columella. It has no close resemblance to any other Antarctic or sub-Antarctic cingulopsid known to the writer.

DISTRIBUTION. Known only from Signy Island, South Orkney Islands.

2.4. Family ORBITESTELLIDAE

This family has been diagnosed by Ponder (1967).

2.4.1 Genus *Microdiscula* Thiele, 1912

Type species: *Microdiscula vanhoeffeni* Thiele, 1912.

Microdiscula subcanaliculata (Smith, 1875). Figure 25d–g.

Skenea subcanaliculata Smith, 1875, p. 175, pl. 9, fig. 15.

Microdiscula subcanaliculata (Smith); Thiele, 1912, p. 240, pl. 15, fig. 6, pl. 16, figs. 5 and 6 (radula and jaw).

MATERIAL. 50 m N. of Billie Rocks, Borge Bay, Signy Island, South Orkney Islands, 8 m, rocky bottom on algae, coll. G. Picken, 6 III 1977 (20 specimens) (NMW, 1979.002.30; AMS, C131198). Macquarie Island, 0–20 m, in 6 localities, coll. J. K. Lowry *et al.*, 1977–78 (AMS).

TYPE LOCALITY. Passe Royale, Îles Kerguelen, on *Tethya* in 7 fathoms (13 m).

DIAGNOSIS.

Shell: Minute (maximum diameter 1.4 mm), depressed, spire only slightly raised, widely umbilicate, of 3¼ whorls. Protoconch 1½ whorls, smooth; teleoconch sculptured with weak, slightly sinuous growth lines. Aperture subcircular, peristome thin; outer lip forms a distinct sinus at suture, projected forward in outer dorsal part, retracted below; inner lip thin, closely attached to parietal wall. Umbilicus deep, wide. Periostracum very thin, transparent. Colour white (Fig. 25d, e).

Operculum: Almost circular, thin, horny, of about 4 whorls, nucleus central (Fig. 25f).

Radula: Central teeth large, each with long, free, basal projections, cutting edge triangular, with sharp cusps; formula 4+1+4. Lateral teeth each with rounded, finely-cusped cutting edge. A single, large, finely-cusped marginal tooth present on each side in each row (Fig. 25g).

DIMENSIONS.

	Diameter (mm)	Height (mm)
Type (from original description)	1.3	0.5
Macquarie Island	1.23	0.76
	1.22	0.68
Signy Island	1.38	0.77
	1.32	0.75
Figured specimen	1.27	0.67

REMARKS. This species has previously been known only from Îles Kerguelen. The specimens from the South Orkney Islands and Macquarie Island have not been compared with the type but they closely match Thiele's figure. Another Antarctic species, the type of the genus, *M. vanhoeffeni* Thiele, 1912, has a smaller, flatter shell with a shallower apertural sinus and distinct growth lines.

DISTRIBUTION. Îles Kerguelen, Macquarie Island and South Orkney Islands.

Microdiscula vanhoeffeni Thiele, 1912.

Microdiscula vanhoeffeni Thiele, 1912, p. 199, pl. 12, figs. 10–12.

MATERIAL. Two syntypes (BMNH, 1911.11.4.2–3); *Gauss* stn, 66°2'9"S, 89°38'5"E, Davis Sea, 385 m.

DIMENSIONS. Not given in original description.

REMARKS. This species is contrasted with *M. subcanaliculata* above.

3. Superfamily RISSOELLACEA

3.1. Family RISSOELLIDAE

3.1.1. Genus *Rissoella* J. E. Gray, 1847

Type species: *Rissoa* ? *glaber* Alder (= *Rissoa albella* Alder, 1844).

Remarks. Diagnoses of *Rissoella* and its subgenera are given by Ponder and Yoo (1977).

Only three Antarctic–sub-Antarctic species have been assigned to this family. One of them, *Jeffreysia edwardiensis* Watson, 1886, is probably a member of the Eulimidae (holotype, Fig. 21e), as far as can be judged from its shell (BMNH, 1887.2.9.1854.9).

i. Signy Island species

2.5.1a. Subgenus *Jeffreysiella* Thiele, 1912

Type species: *J. notabilis* Thiele, 1912.

Rissoella (Jeffreysiella) powelli n. sp. Figures 26i, 28a–d.

MATERIAL. Holotype (NMW, 1979.002.27) and several paratypes (NMW, 1979.002.28; AMS, C131196); 50 m N. of Billie Rocks, Borge Bay, Signy Island, South Orkney Islands, 8 m, rocky bottom on algae, coll. G. Picken, 6 III 1977. Many paratypes, NMW, 1979.002.29; AMS, C131197; Borge Bay, Signy Island, South Orkney Islands, 4–10 m, coll. G. Picken.

DIAGNOSIS.

Shell: Small (maximum length 2.7 mm), fragile, semitransparent, ovate, of up to 4½ whorls. Spire with slightly convex outlines, whorls convex, periphery rounded. Protoconch of

1½ whorls, smooth; teleoconch smooth except for weak axial growth lines and traces of exceedingly fine spiral scratches. Sutures simple. Aperture broadly pyriform, strongly angled posteriorly, rounded anteriorly; peristome thin; inner lip narrow, outer lip simple, slightly retracted towards suture in upper ⅓. Umbilical chink very small to absent. Periostracum extremely thin, transparent. Colour white, protoconch white to colourless-transparent (Figs. 26i; 28a).

Operculum: Typical of family (Fig. 28b).

Radula: Central teeth strongly asymmetrical, each with 2–3 cusps on right side, several minute denticles on left side, lateral basal extension simple on left side, thickened and bent on right side. Lateral teeth asymmetrical, those on right side larger and with stronger cusps than those on left side, 3–4+1+3–4 (right), left with several very small cusps on each side of a rather long, hooked median cusp. Marginal teeth with several small cusps on both sides of a moderately large median cusp. No outer marginal tooth or plate present (Fig. 28c, d).

Animal: Mantle cavity roof grey to black, mantle pigment spot rather large, black. Head and foot unpigmented. Cephalic and oral tentacles both rather long.

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype	2.42	1.65
Paratypes	2.50	1.75
	2.51	1.74
	2.44	1.57
	2.54	1.67
Figured paratype	2.66	1.41

REMARKS. The strongly asymmetrical central tooth and the asymmetrical lateral teeth are typical of the subgenus *Jeffreysiella* but all other species in this subgenus, for which the radula is known, have a simple plate as the outer marginal tooth. In *R. powelli* this plate is absent (confirmed in 4 radular mounts). The shell of *R. powelli* (Figs. 26i, 28a), is virtually identical to that of *R. notabilis* (Fig. 26g, h) from Îles Kerguelen but, because of their simple shells, differences (in the shells) between species of the Rissoellidae are usually very slight. The general similarity of the radula and shell of *R. powelli* to other species of *Jeffreysiella*, suggests placement in that subgenus. It has apparently lost the outer marginal plates found in the radula of other species of *Jeffreysiella*, and in this respect resembles members of the subgenus *Rissoella* s.s. A sub-Antarctic species, identified by Thiele as *Jeffreysiopsis duperrei* (Vélain, 1877), has a somewhat similar radula (Thiele, 1912, pl. 19, fig. 25 and herein (Fig. 29b, c)) but, like other species of *Rissoella* s.s., has symmetrical central teeth (Ponder and Yoo, 1977). The type specimens of *Paludestrina duperrei* Vélain are a species of *Eatoniella* (see above) and Thiele's species is almost certainly *Lacuna heberti* Vélain, 1877. Only one species of *Jeffreysiella*, *R. (J) rissoaformis* (Powell, 1939) from New Zealand, is known to have symmetrical central teeth (Ponder and Yoo, 1977). *Rissoella notabilis* has a similar radula (Fig. 28e, f) to the new species but it differs in having the other marginal teeth present.

This species is named for Dr A. W. B. Powell as a small appreciation of his significant contributions to the study of Antarctic Mollusca.

DISTRIBUTION. Known only from Signy Island, South Orkney Islands.

ii. Additional sub-Antarctic species of *Rissoella*

Rissoella (Jeffreysiella) notabilis (Thiele, 1912). Figures 26g, h; 28e–g.

Jeffreysiella notabilis Thiele, 1912, p. 239, pl. 15, fig. 5, pl. 16, figs 3 and 4 (radula and jaw).

Rissoella (Jeffreysiella) notabilis (Thiele); Thiele, 1925, p. 92, pl. 7, fig. 13.

MATERIAL. Holotype, HUM, 63064; Baie de l'Observatoire, Îles Kerguelen.

Îlot Channer, N.E. of Golfe du Morbihan, Îles Kerguelen, 25 m, 29 I 1974, A. Guille (1 decalcified specimen – radula and operculum figured) (SME). Anse du Vulcan, Golfe des Baleiniers, Îles Kerguelen, 12 m, 13 II 1974, A. Guille (1 specimen, shell figured) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Holotype (from original description)	1.8	1.25
Bassin de la Gazelle (from Thiele, 1925)	2.5	1.6
Figured specimen	2.80	1.78

REMARKS. This species appears to be virtually identical in shell characters to *R. powelli* described above but their radulae differ significantly (cf. Figs. 28c, d, 28e, f), *R. notabilis* having an additional pair of teeth in each row. The cusp pattern and shape of the central, lateral and inner marginal teeth are similar in the two species. Thiele's figure of the central tooth of *R. notabilis* incorrectly shows it as being symmetrical. Thiele (1925) figured the shell of a larger specimen than the holotype (Fig. 26g) from Bassin de la Gazelle, Îles Kerguelen. The operculum is illustrated in Fig. 28g.

Rissoella (Rissoella) heberti (Vélain, 1877). Figures 26f, 29a–c.

Lacuna heberti Vélain, 1877, p. 113, pl. 3, fig. 13.

Jeffreysiopsis duperrei; Thiele, 1912, p. 278, pl. 29, fig. 21, pl. 19, fig. 21 (radula) (*non* Vélain, 1877).

MATERIAL. Syntypes, 2, NHMP: Île St Paul.

East of Île St Paul, 40 m, 30 I 1972, J. Beurois (1 specimen) (SME). Between Roche Quille and Île St Paul, 3–4 m, in roots of *Laminaria*, 30 I 1972, J. Beurois (5 specimens) (SME). Off Passe du Cratère, Île St Paul, 30 m, algae, 27 I 1972, J. Beurois (5 specimens) (SME). La Cale, N.E. coast of Île Amsterdam, on algae, upper sublittoral, 11 II 1971, J. Beurois (5 specimens) (SME). Fom stomach of *Jasus*, Île Amsterdam, 5–10 m, 12 II 1972, J. Beurois (4 specimens) (SME).

DIMENSIONS.

	Length (mm)	Width (mm)
Syntype	1.75	1.04
Figured syntype	1.62	0.94

REMARKS. As noted above this appears to be the species that Thiele (1912) incorrectly identified as *Jeffreysiopsis duperrei*, the type species (by subsequent designation, Robertson, 1961) of *Jeffreysiopsis* Thiele, 1912. Radulae of specimens from Île St Paul and Île Amsterdam (Fig. 29a, b) have been examined and appear to be identical.

III. DISCUSSION

The material available for this review is inadequate to carry out a detailed biogeographic analysis. Some general trends, however, are obtainable from the available data and these are presented below.

Clearly a great deal more work is needed to provide further information on the distribution of these and other small and minute molluscs. Much of the collecting already done in the Antarctic-sub-Antarctic has obtained small gastropods only incidentally, usually in very small numbers and as dead shells. However, the excellent material in the collections of G. Picken, J. Lowry and P. M. Arnaud have made it possible to provide a basis for the taxonomy and biogeography of the few families of micro-gastropods dealt with in this report.

A list of the recognized species and a summary of their distribution is presented in Table II.

1. Biogeographic Analysis

The majority of species and subspecies covered in this review (40 or 66%) are endemic to either the Antarctic mainland, including the Antarctic Peninsula (7 or 12%), South Orkney Islands (4 or 7%) or sub-Antarctic islands or groups of islands. In this last category Îles Kerguelen has the largest number of endemic taxa (9 or 23% of all endemics), South Georgia has 4, St Paul-Amsterdam 8 (the entire fauna), the Falkland Islands-Burdwood Bank 4, Macquarie Island 2 and Marion and Prince Edward islands 2.

The species group taxa can be divided into three categories, an Antarctic fauna, a sub-Antarctic fauna and a mixed Antarctic-sub-Antarctic fauna. Of the species and subspecies with an Antarctic distribution which comprise 26% (16 taxa) of the total, 7 (12%) range into the South Orkneys and/or South Shetlands.

The South Orkney Islands fauna is found in part on the sub-Antarctic islands, 7 taxa (12% of the total) sharing a distribution with at least one of the sub-Antarctic islands. The strongest relationship is with South Georgia (4 taxa, 7%), although only one species is shared with the Falkland Islands. Only one species occurs at the South Orkney Islands and Îles Kerguelen. Two species occur at Îles Kerguelen and Macquarie Island as well as the South Orkneys. The Antarctic mainland fauna has very little relationship with that of the sub-Antarctic islands, involving only 4 taxa. Thus, as far as the mixed Antarctic-sub-Antarctic element is concerned, this, as one would expect, appears to be principally centred in the South Orkney Islands which lie close to the edge of the Antarctic Provinces and are closely associated with the Antarctic Peninsula.

The sub-Antarctic element, as shown above, mainly comprises taxa endemic to individual islands or closely spaced groups of islands. Twenty-nine species and subspecies (48%

of the total) are in this category, this being 81% of those recorded from the sub-Antarctic islands.

Similar patterns are seen if the two large families are analysed separately with only 12% (2) of eatoniellid and 11% (3) of rissoid species and subspecies being confined to the Antarctic mainland. Similar low numbers of taxa are found in the Antarctic mainland and the South Orkneys-South Shetlands (1 eatoniellid, 3 rissoids) or are confined to the South Orkneys (1 eatoniellid, 1 rissoid). The number of species having an Antarctic mainland-sub-Antarctic distribution is also similar: 2 eatoniellids and 3 rissoids. A lower number are distributed between the South Orkneys and the sub-Antarctic islands - only 1 species of eatoniellid and 2 species of rissoid. Of the sub-Antarctic species only 2 eatoniellids and 3 rissoids are non-endemic, while the remaining 7 species and subspecies (41%) of eatoniellids and 12 (44%) of rissoids are endemic to a sub-Antarctic island or groups of islands. All three species of the subfamily Anabathrinae (Barleeidae) are endemic to Île St Paul and Île Amsterdam.

A low level of endemism is seen in the eatoniellids in the New Zealand sub-Antarctic islands: of 11 species in two genera only one is endemic (Ponder, 1965a; Powell, 1979). The rissoids show a higher degree of endemism with 14 endemic species (or 48% of the 29 species) contained in 8 genera. Five of these genera do not occur in other parts of the sub-Antarctic and all are represented elsewhere in the New Zealand region (data from Ponder, 1965b; Powell, 1979). Over half the endemics are 9 species of *Subonoba* (= *Onoba*). Six species of *Powellisetia* are represented and, in the Barleeidae, 5 species of *Pisinna*, but none of these species is endemic. The New Zealand cingulopsids have only two sub-Antarctic species, one of which is represented by an endemic subspecies and the other is probably not endemic (Ponder, 1965b). Both of these species are contained in genera not present in the rest of the sub-Antarctic. There is a non-endemic species of *Orbitestella* (Orbitestellidae) and, although species of Rissoellidae are recorded from southern New Zealand, none are known from the sub-Antarctic islands.

The predominance of endemic species in the sub-Antarctic islands (excluding those of New Zealand) is possibly accounted for, at least in part, by the assumed direct development of all of the species covered in this review. All of the species almost certainly lay egg capsules which are attached to the substrate or to algae and which contain 1 or 2 large, yolky eggs. One would assume that at least the algal-living species would be dispersed more readily than the distribution analysis suggests. Clearly more detailed information about microhabitat requirements and life-history are required before a satisfactory hypothesis can be formulated.

TABLE II - (continued)

Species and subspecies	Antarctic Mainland	South Orkney Islands	South Shetland Islands	Macquarie Island	Îles Kerguelen	Îles Crozet	Marion and Prince Edward Islands	South Georgia	Falkland Islands-Burdwood Bank	Île St Paul and Île Amsterdam	Faunal grouping
<i>Cingulopsidae</i>											
<i>Skenella</i>											
<i>edwardiensis</i>							(+)				S*
<i>georgiana</i>								+			S*
<i>paludinoïdes</i>	+										A*
<i>sinapi</i>					+						S*
<i>umbilicata</i>	+	+									A
sp.					+						S*
sp.					+						S*
<i>Pickenia</i>											
<i>signyensis</i>		+									A*
<i>Microdiscula</i>											
<i>subcanaliculata</i>		+		+	+						M
<i>vanhoffeni</i>	(+)										A*
<i>Rissoellidae</i>											
<i>Rissoella</i>											
<i>heberti</i>										+	S*
<i>notabilis</i>					+						S*
<i>powelli</i>		+									A*
Total species	17	15	4	7	17	1	5	12	6	8	

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Ms B. Duckworth is responsible for most of the drawings and Mr E. K. Yoo and Miss J. Hall took the SEM photographs and prepared the material for examination. Miss Hall also assisted with the preparation of the plates and in measuring specimens. Mrs V. Jenkins and Mrs Caroline Sinclair typed the manuscript. SEM work was carried out at the Electron Microscope Unit, University of Sydney. I am grateful to Mrs J. Kerslake, Dr R. K. Dell, Dr P. M. Arnaud and Dr P. G. Oliver for critically reading the manuscript.

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VI. FIGURES

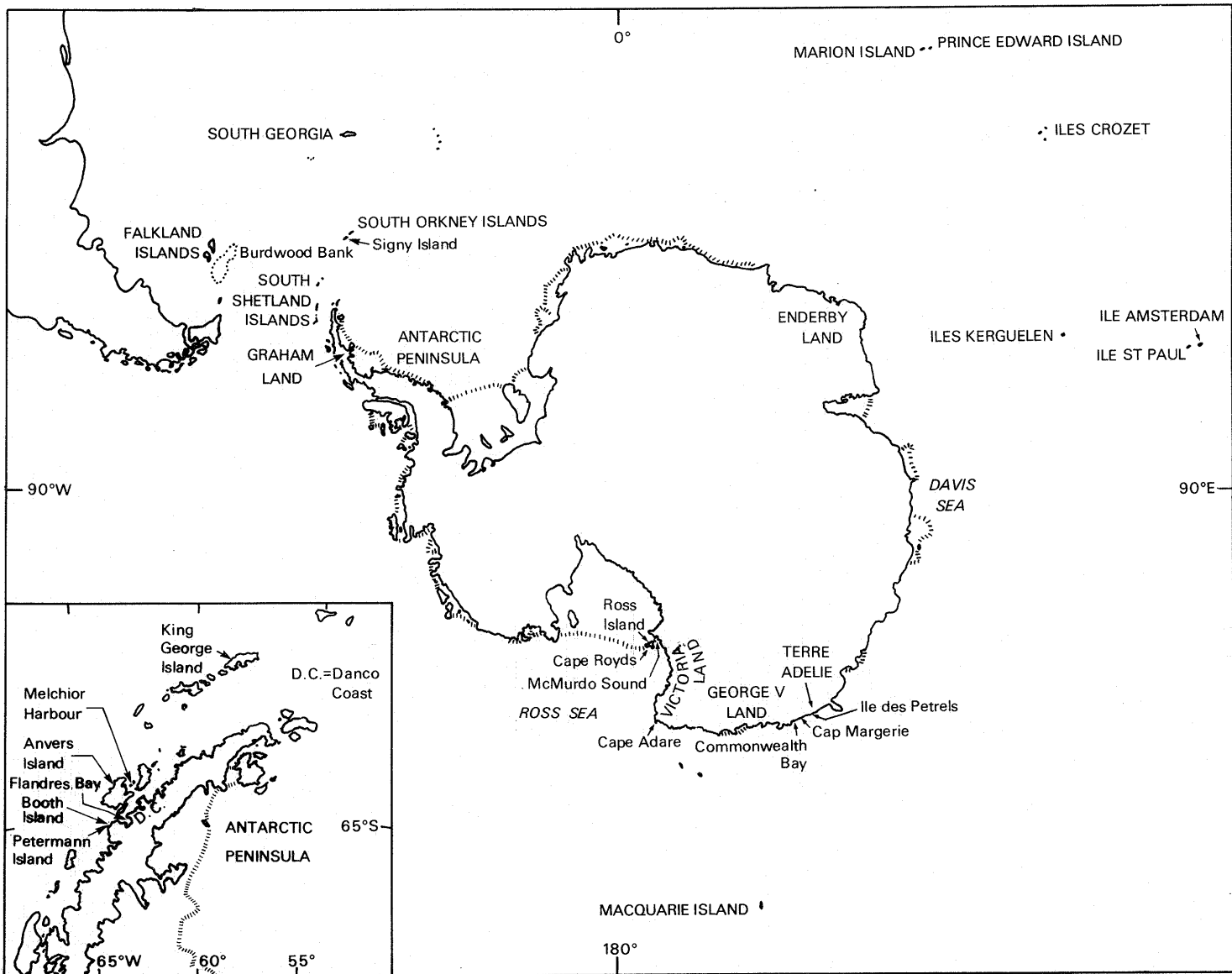
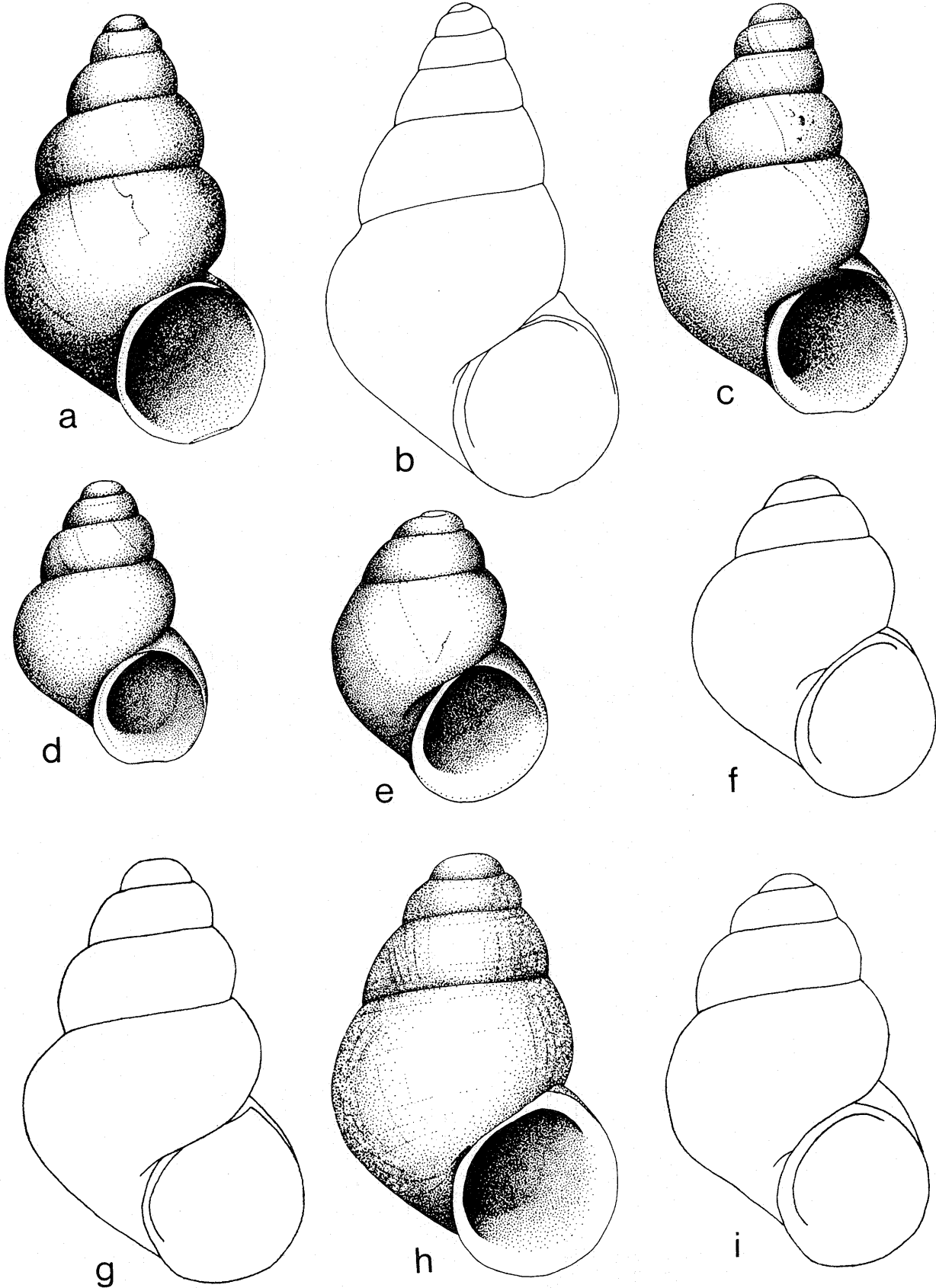


FIGURE 1

Map of Antarctica and the sub-Antarctic showing the principal localities mentioned in this report.

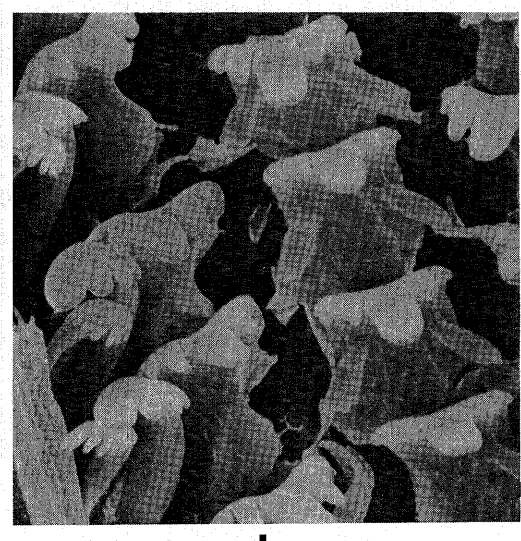
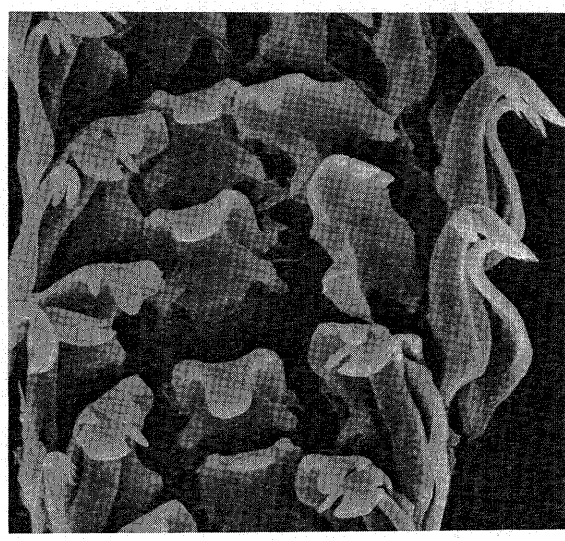
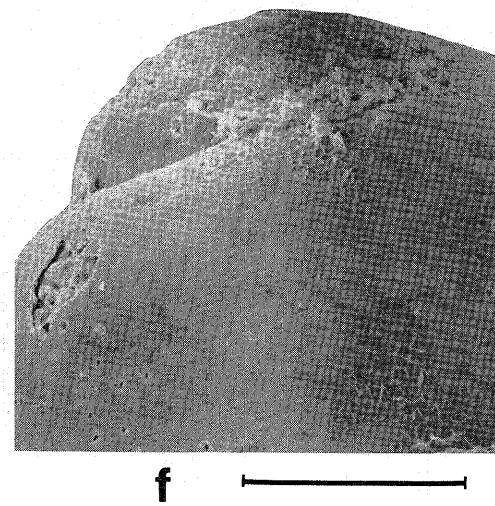
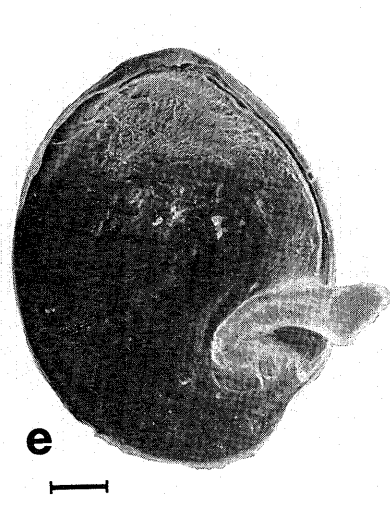
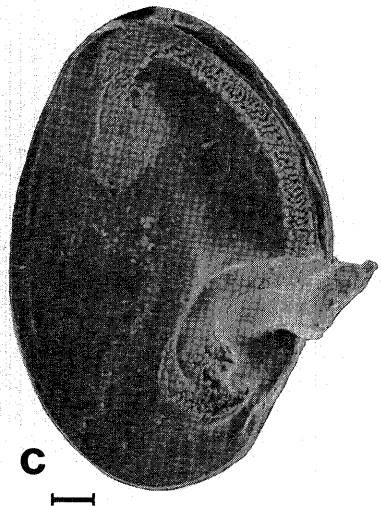
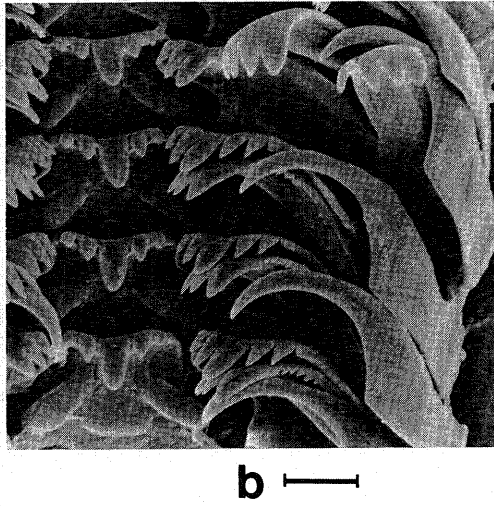
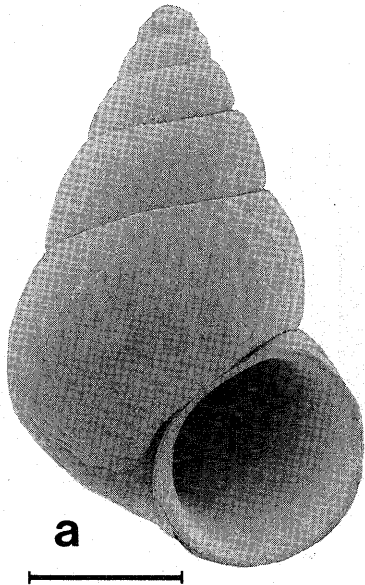
- FIGURE 2
Shells of Eatoniellidae and Rissoidae.
- a. *Eatoniella kerguelenensis kerguelenensis* (Smith), syntype.
b. *Eatoniella kerguelenensis regularis* (Smith), syntype.
c. *Eatoniella glacialis* (Smith), lectotype.
d. *Eatoniella demissa* (Smith), lectotype.
e. *Eatoniella duperrei* (Vélain), syntype.
f. *Eatoniella occulta* n. sp., holotype.
g. *Powellisetia inornata* (Strebel), paralectotype.
h, i. *Eatoniella subrufescens* (Smith). h. Holotype of *Rissoa marionensis* Watson. i. Syntype of *Eatonia subrufescens*.
- a-d scale A; e-i scale B.



1 mm A 1 mm B

FIGURE 3

- a-c. *Eatoniella kerguelensis regularis* (Smith), Borge Bay, Signy Island. a. Shell, b. Radula.
c. Operculum (inner side).
- d-g. *Eatoniella cana* n. sp., paratypes. d. Shell. e. Operculum (inner side). f. Protoconch.
g. Radula.
- h. *Eatoniella caliginosa* (Smith), radula, Borge Bay, Signy Island.
- a, d - 1 mm scale; c, e, f - 0.1 mm scale; b, g, h - 0.01 mm scale.



- FIGURE 4
- a, b. *Eatoniella caliginosa* (Smith). Borge Bay, Signy Island. a. Shell. b. Operculum (inner side).
c-e. *Eatoniella* aff. *caliginosa* (Smith). South Georgia, 24-52 m. c. Shell. d. Operculum (inner side). e. Radula.
f-h. *Eatoniella varicifera* n. sp., paratypes. f. Shell. g. Radula. h. Operculum (inner side).
a, c - 1 mm scale; b, d, f, h - 0.1 mm scale, e, g - 0.01 mm scale.

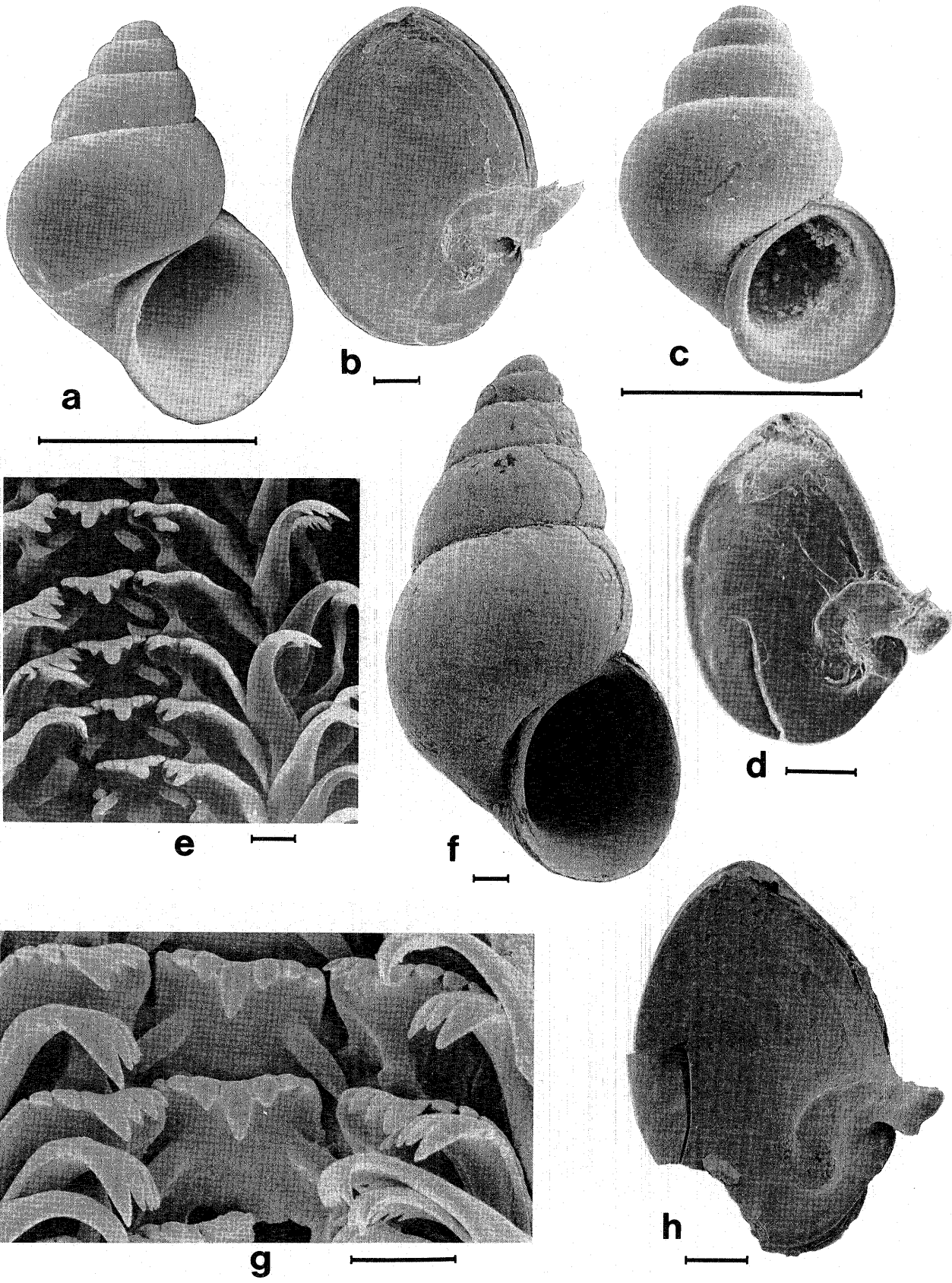


FIGURE 5
Shells of Eatoniellidae.

- a, b. *Eatoniella caliginosa* (Smith). a. Syntype. b. Macquarie Island.
c. *Eatoniella cana* n. sp., holotype.
d. *Eatoniella varicifera* n. sp., holotype.
e. *Eatoniella glacialis* (Smith), lectotype of *Eatoniella kerguelenensis* forma major.
f. *Eatoniella contusa* Strebel, lectotype.
g. *Eatoniella subgoniostoma* Strebel, syntype.
h, i. *Eatoniella* aff. *caliginosa* (Smith). h. South Georgia, 24–52 m. i. Borge Bay, Signy Island.

All to same scale.

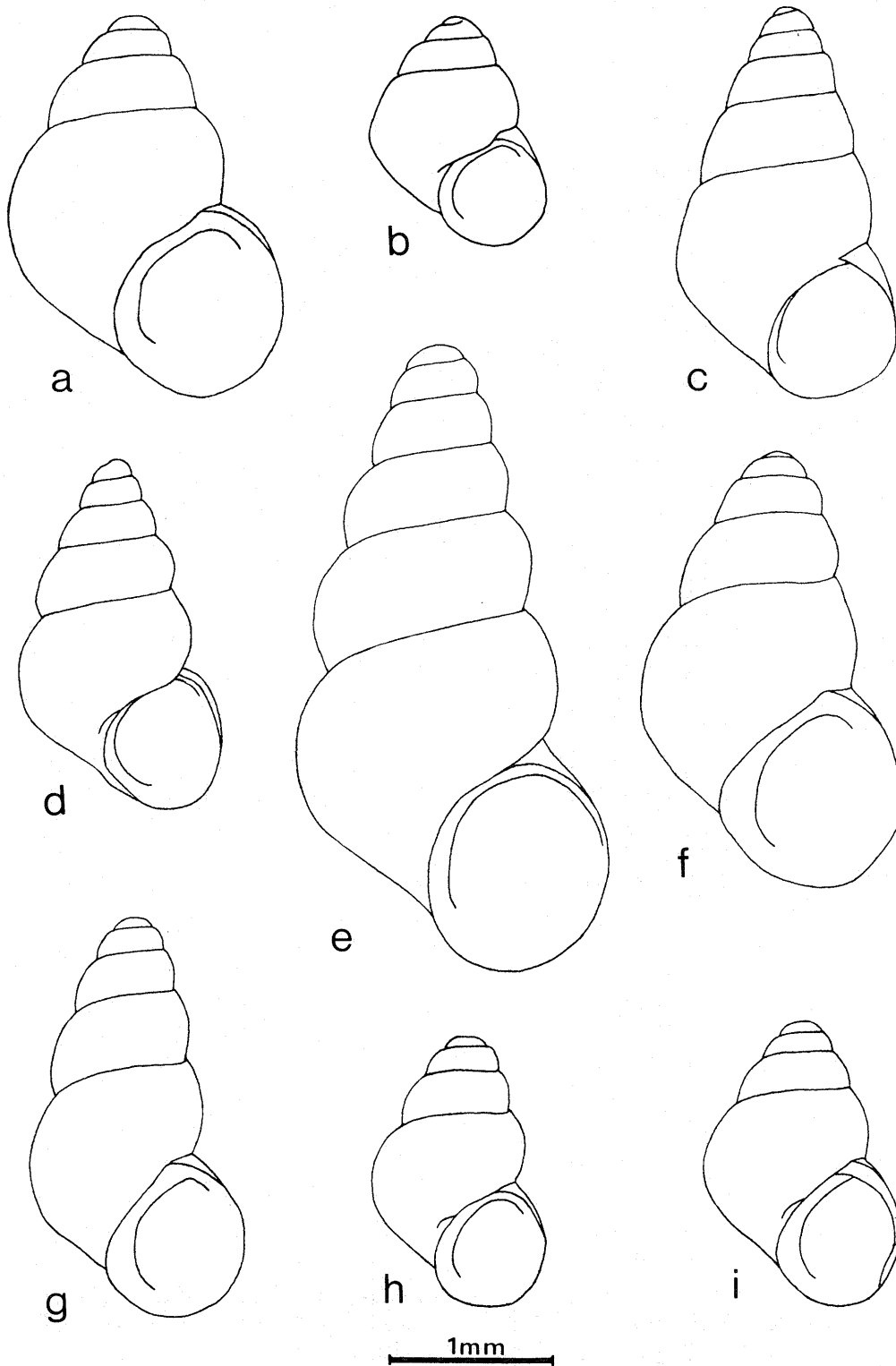


FIGURE 6

- a-c. *Eatoniella ainsworthi* (Hedley), paratypes. a. Shell. b. Radula. c. Operculum (inner side).
d-f. *Eatoniella hyalina* Thiele. Handspike Point, Macquarie Island, intertidal. d. Shell. e. Radula.
f. Operculum (inner side).
g. *Eatoniella alboelata* n. sp. Holotype.
h, i. *Eatoniella contusa* Strebel. Paralectotype, stn 19D, South Georgia.
- a, d, g, h - 1 mm scale; c, f, i - 0.1 mm scale; b, e - 0.01 mm scale.

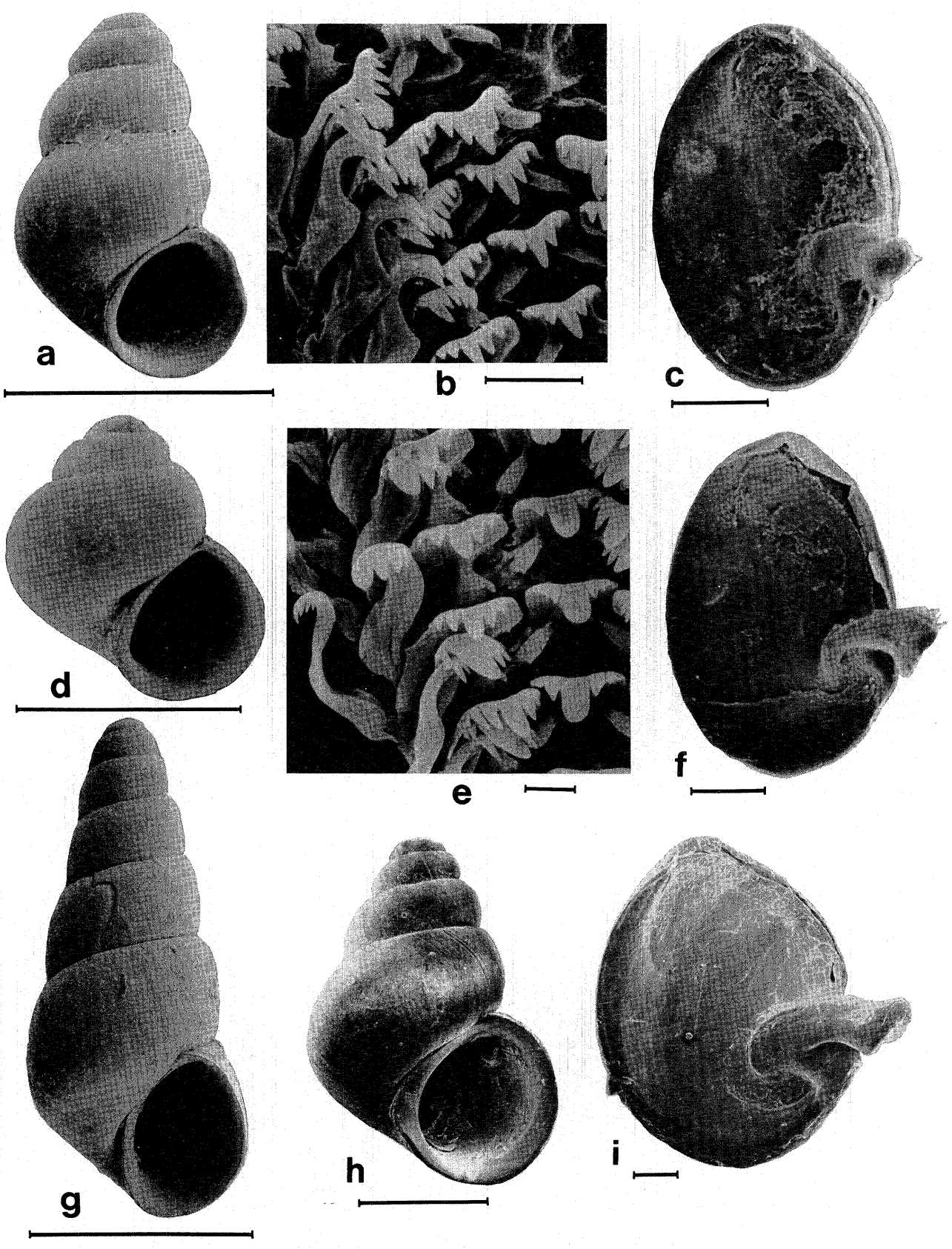
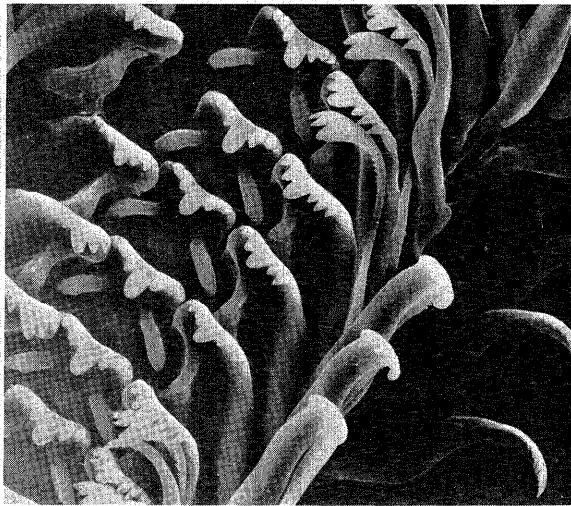
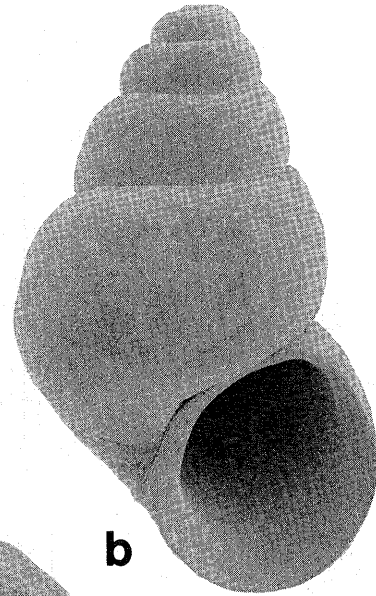


FIGURE 7

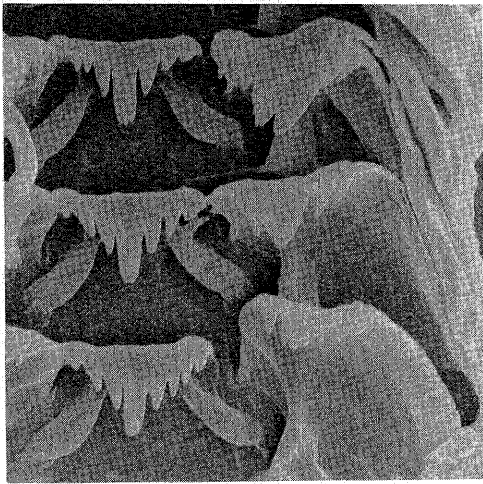
- a. *Eatoniella contusa* Strebel, Cumberland Bay, South Georgia. Radula.
b-d. *Eatoniella demissa* (Smith), Commonwealth Bay, 46 m. b. Shell. c. Operculum (inner side).
d. Radula.
e, f. *Eatoniella kerguelenensis kerguelenensis* (Smith), syntype. e. Radula. f. Operculum (inner side).
- b - 1 mm scale; c, f - 0.1 mm scale; a, d, e - 0.01 mm scale.



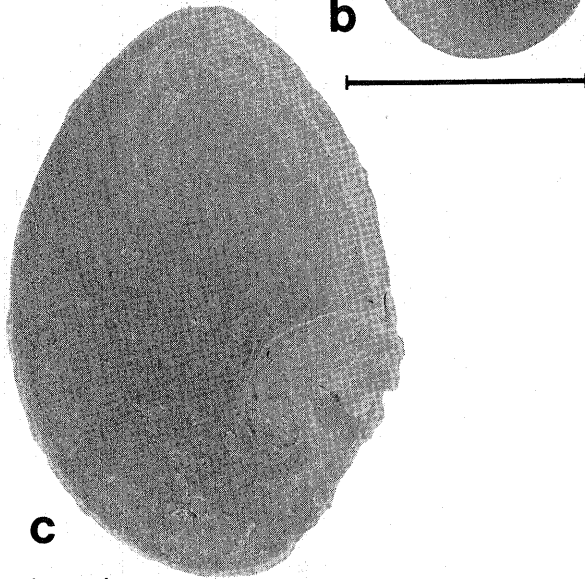
a I



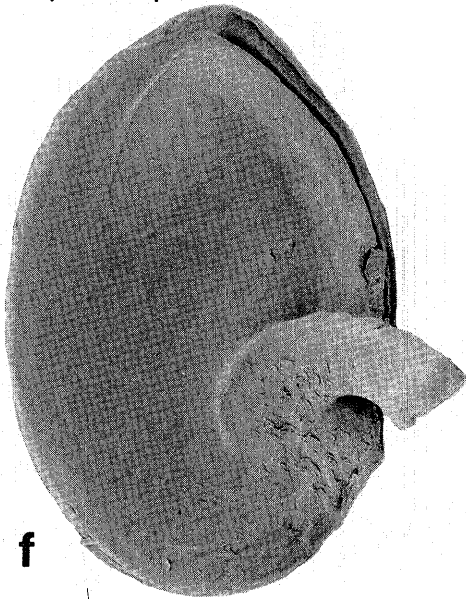
b



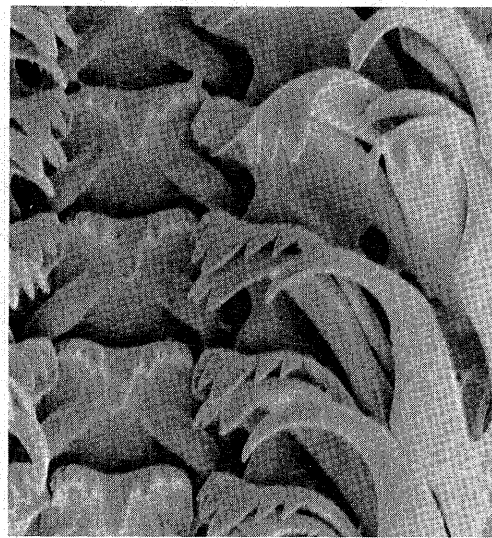
d I



c I

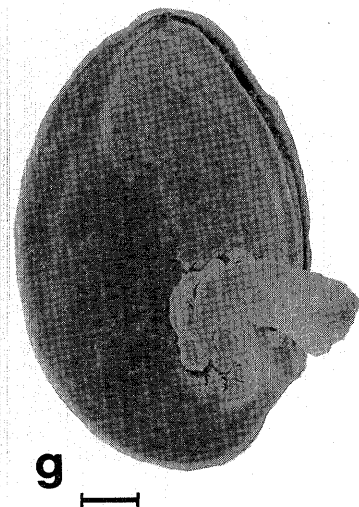
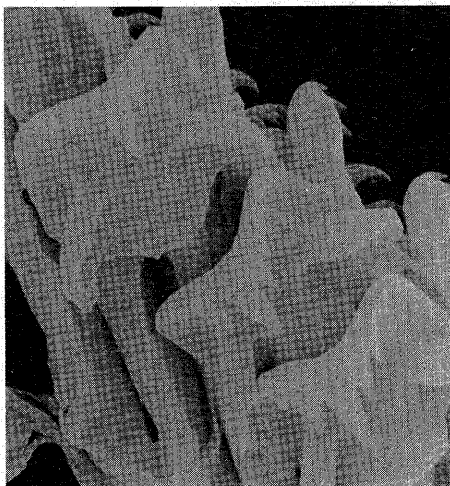
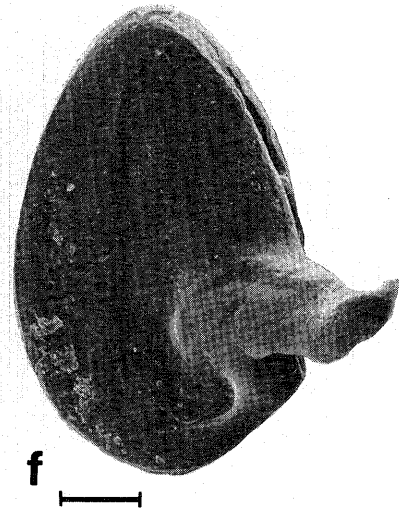
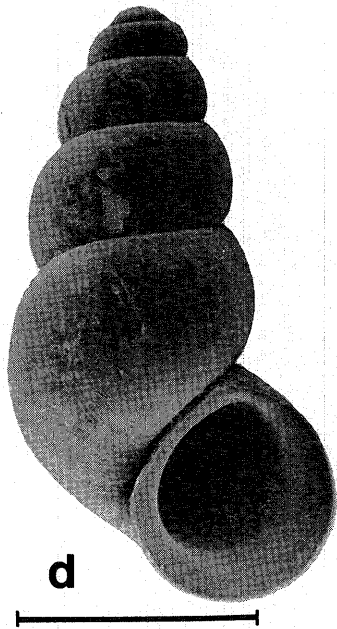
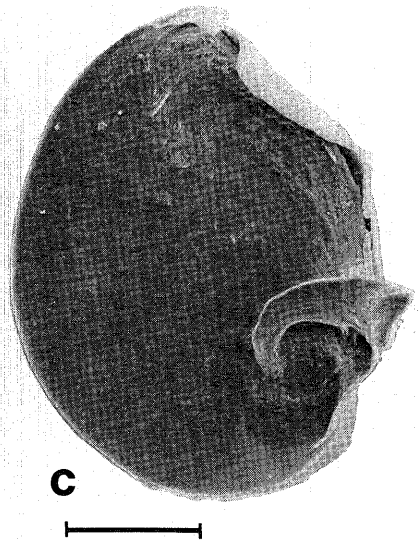
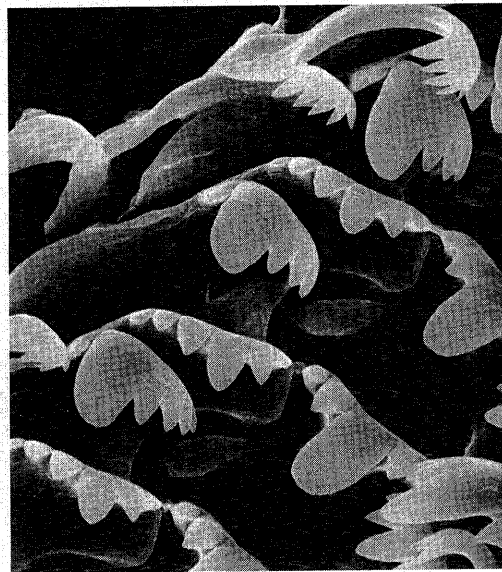
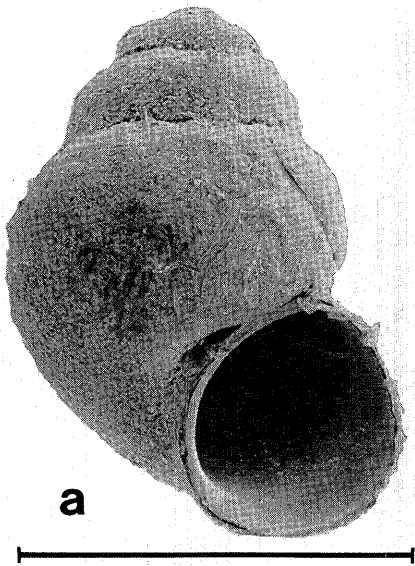


f I



e I

FIGURE 8
a-c. *Eatoniella occulta* n. sp., paratypes. a. Shell. b. Radula. c. Operculum (inner side).
d-f. *Eatoniella subgoniostoma* Strebel, syntype. d. Shell. e. Radula. f. Operculum (inner side).
g-i. *Eatoniella subrufescens* (Smith), syntypes. g. Operculum (inner side). h, i. Radula,
h. Central teeth, i. Lateral and marginal teeth.
a, d - 1 mm scale; c, f, g - 0.1 mm scale; b, e, h, i - 0.01 mm scale.



- FIGURE 9
- a-e. *Onoba filostria* (Melvill and Standen), Borge Bay, Signy Island. a. Shell. b. Microsculpture of teleoconch. c. Operculum (inner side). d. Radula. e. Microsculpture of protoconch, dorsal view.
- f-h. *Onoba georgiana* (Pfeffer), Borge Bay, Signy Island. f. Shell. g. Protoconch, dorsal view, h. Protoconch microsculpture.
- a, f-1 mm scale; c, -0.1 mm scale; b, d, e, h-0.01 mm scale.

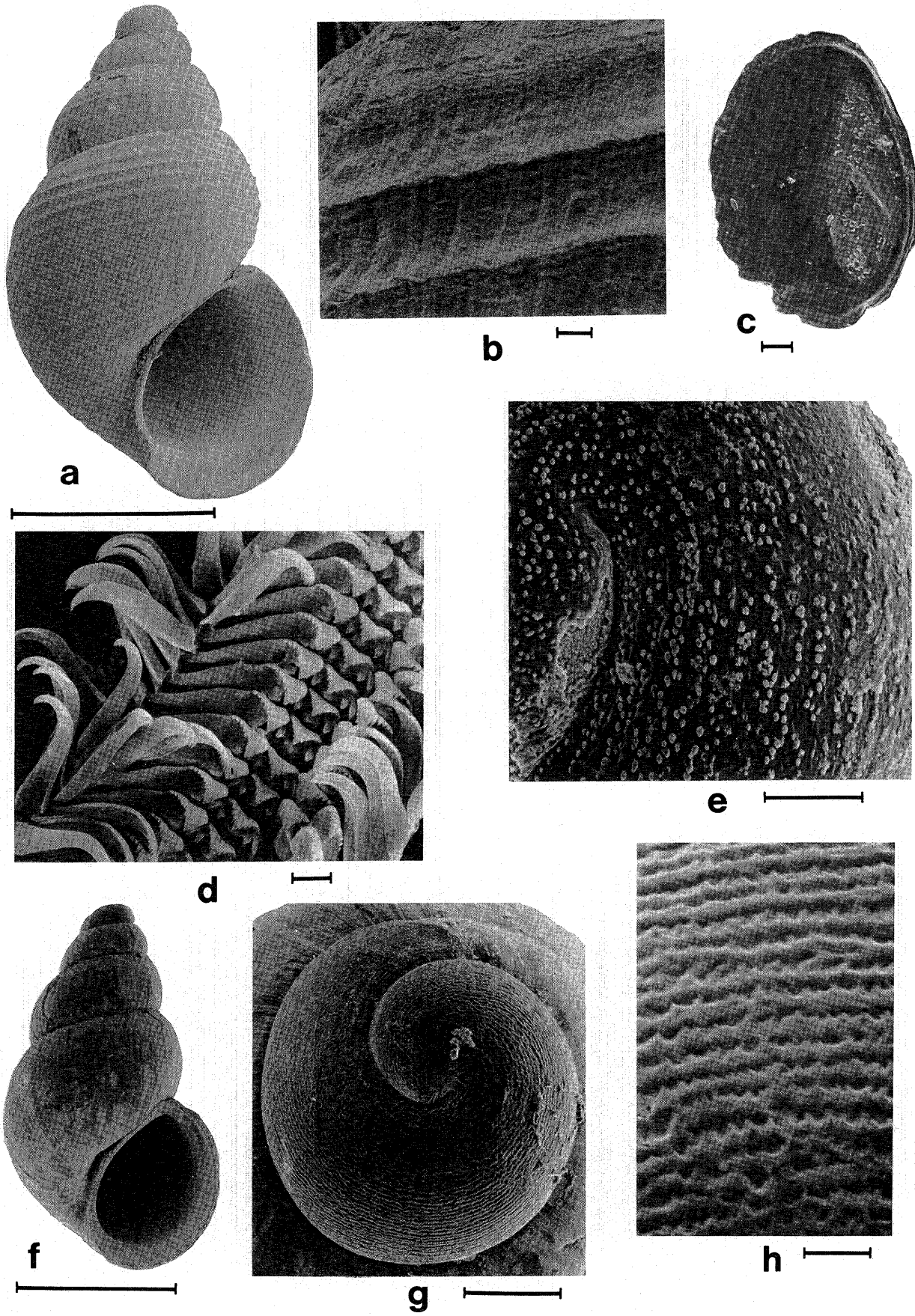
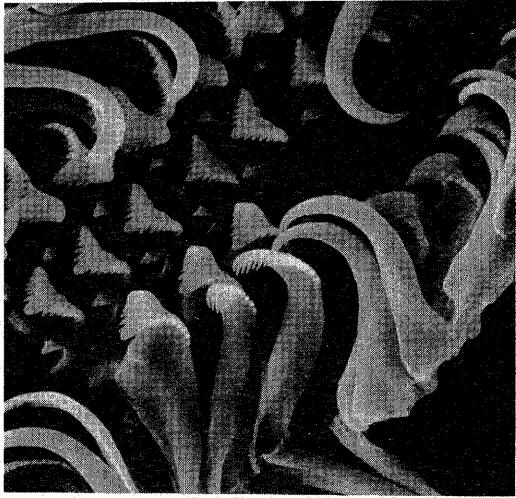


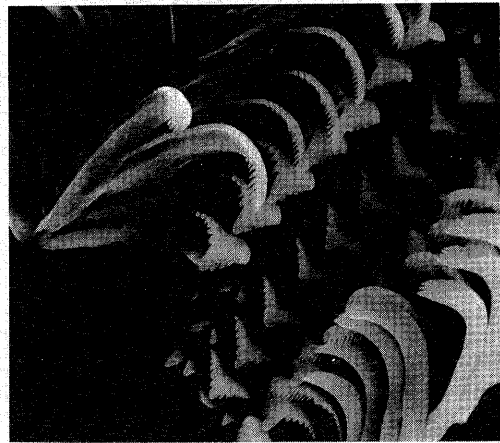
FIGURE 10

a-h. *Onoba georgiana* (Pfeffer). a, b. Radula (a) and operculum (inner side) (b), Borge Bay, Signy Island. c-e. Radula (c), protoconch (d) and shell (e), South Georgia, Swedish Antarctic Exped. stn 25. f-h. Shell of lectotype (f) and radula (g) and operculum (inner side) (h) of paralectotype of *Rissoia insignificans* Strebel.

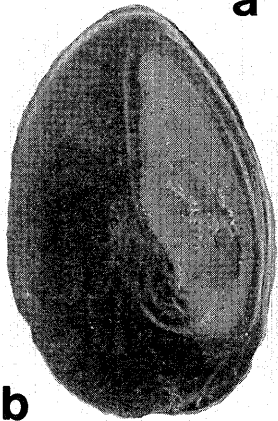
e, f-1 mm scale; b, d, h-0.1 mm scale; a, c, g-0.01 mm scale.



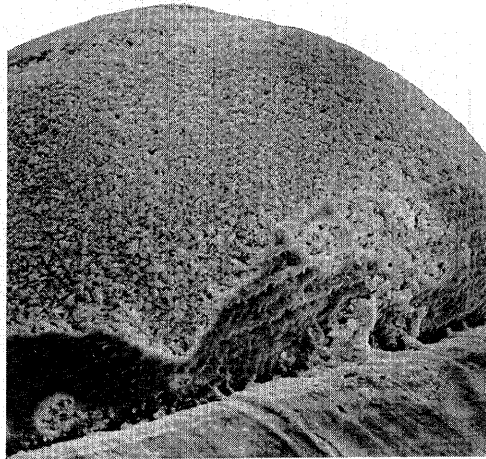
a I



c I



b I



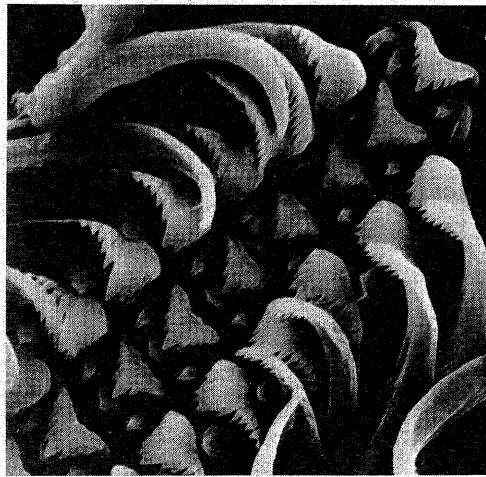
d I



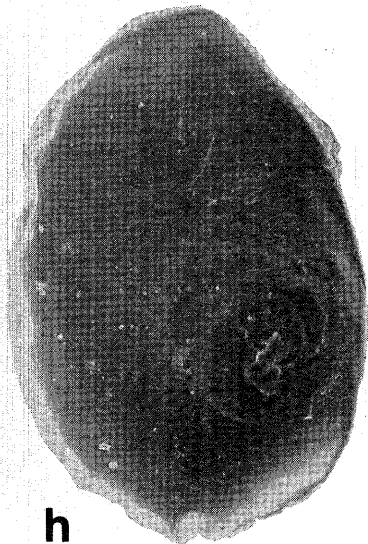
e I



f I

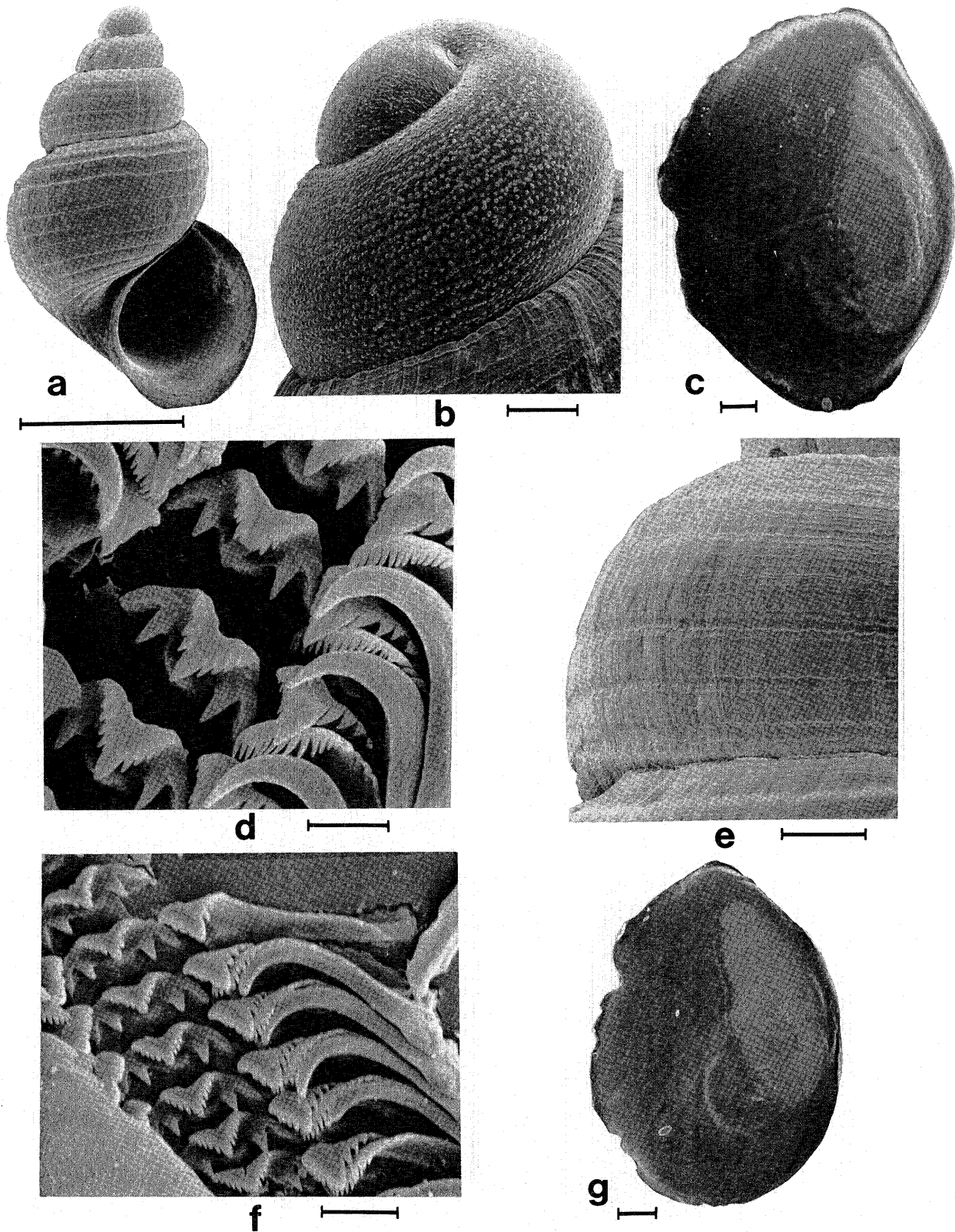


g I

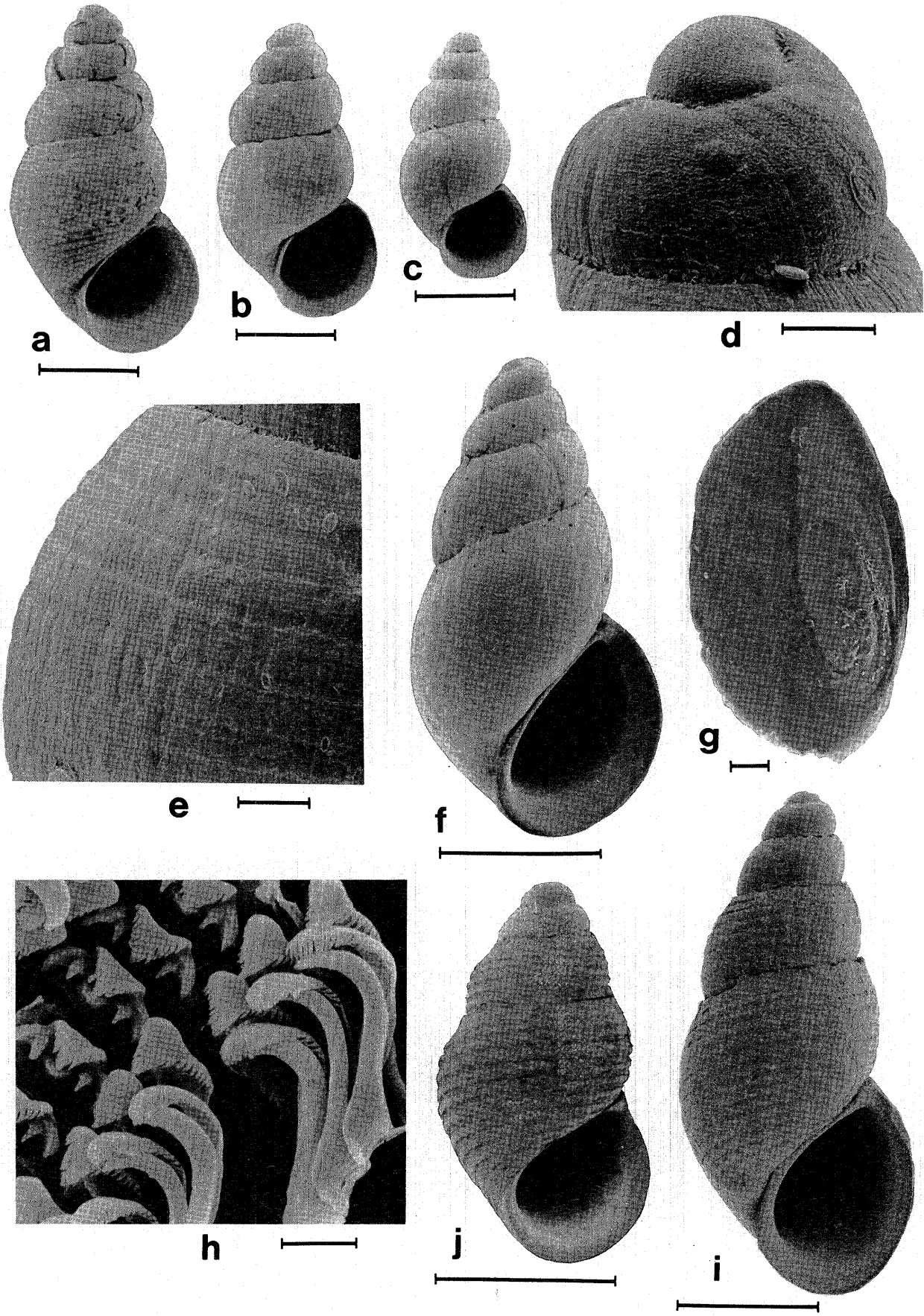


h I

FIGURE 11
a-e. *Onoba grisea* (Martens), Borge Bay, Signy Island. a. Shell. b. Protoconch. c. Operculum (inner side). d. Radula. e. Teleoconch microsculpture.
f, g. *Onoba turqueti* (Lamy), Borge Bay, Signy Island. f. Radula. g. Operculum (inner side).
a-1 mm scale; b, c, e, g-0.1 mm scale; d, f-0.01 mm scale.



- FIGURE 12
- a-e. *Onoba turqueti* (Lamy). Borge Bay, Signy Island. a-c. Shells (to same scale). d. Protoconch.
e. Teleoconch microsculpture.
- f-h. *Onoba (Ovirissoa) kergueleni* (Smith). Borge Bay, Signy Island. f. Shell. g. Operculum (inner
side). h. Radula.
- i, j. *Onoba steineni* (Strebel). i. Shell, S.S.E. of Îles Kerguelen, 145-7 m. j. Shell, Aerial Cove,
Macquarie Island, 3-5 m.
- a, b, c, f, i, j - 1 mm scale; d, e, g - 0.1 mm scale; h - 0.01 mm scale.



- FIGURE 13
Shells of Rissoidae.
- a b. *Onoba gelida* (Smith). a. Lectotype. b. Holotype of *Subonoba contigua* Powell.
 - c. *Onoba transenna* (Watson), syntype.
 - d. *Onoba sanctipauli* (Vélain), syntype.
 - e, f. *Onoba suavis* (Thiele), holotype.
 - g. *Onoba flostria* (Melvill and Standen), holotype.
 - h. *Onoba subantarctica wilkesiana* (Hedley), holotype.
 - i. *Onoba subantarctica subantarctica* (Thiele), holotype.

All figures to same scale.

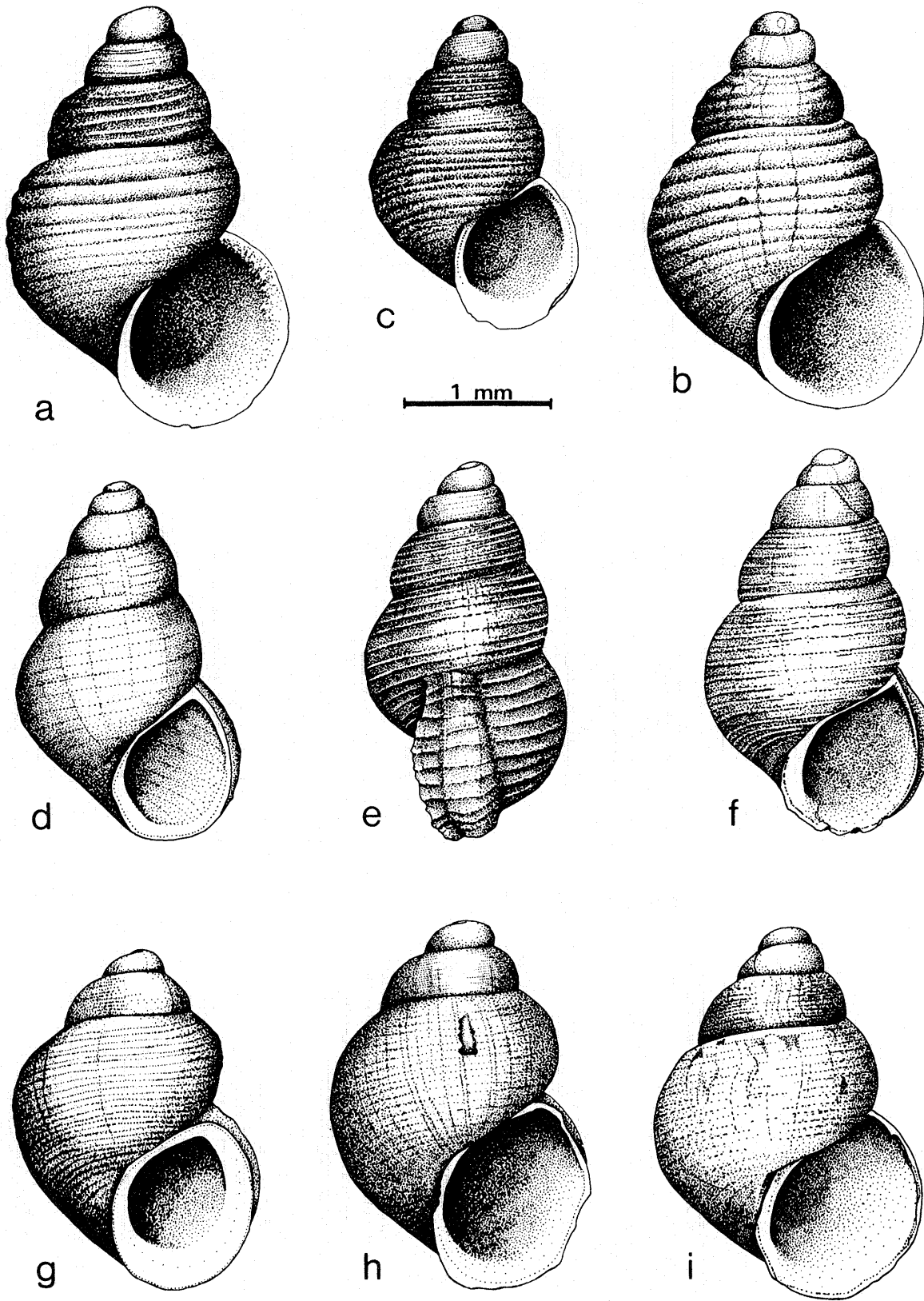
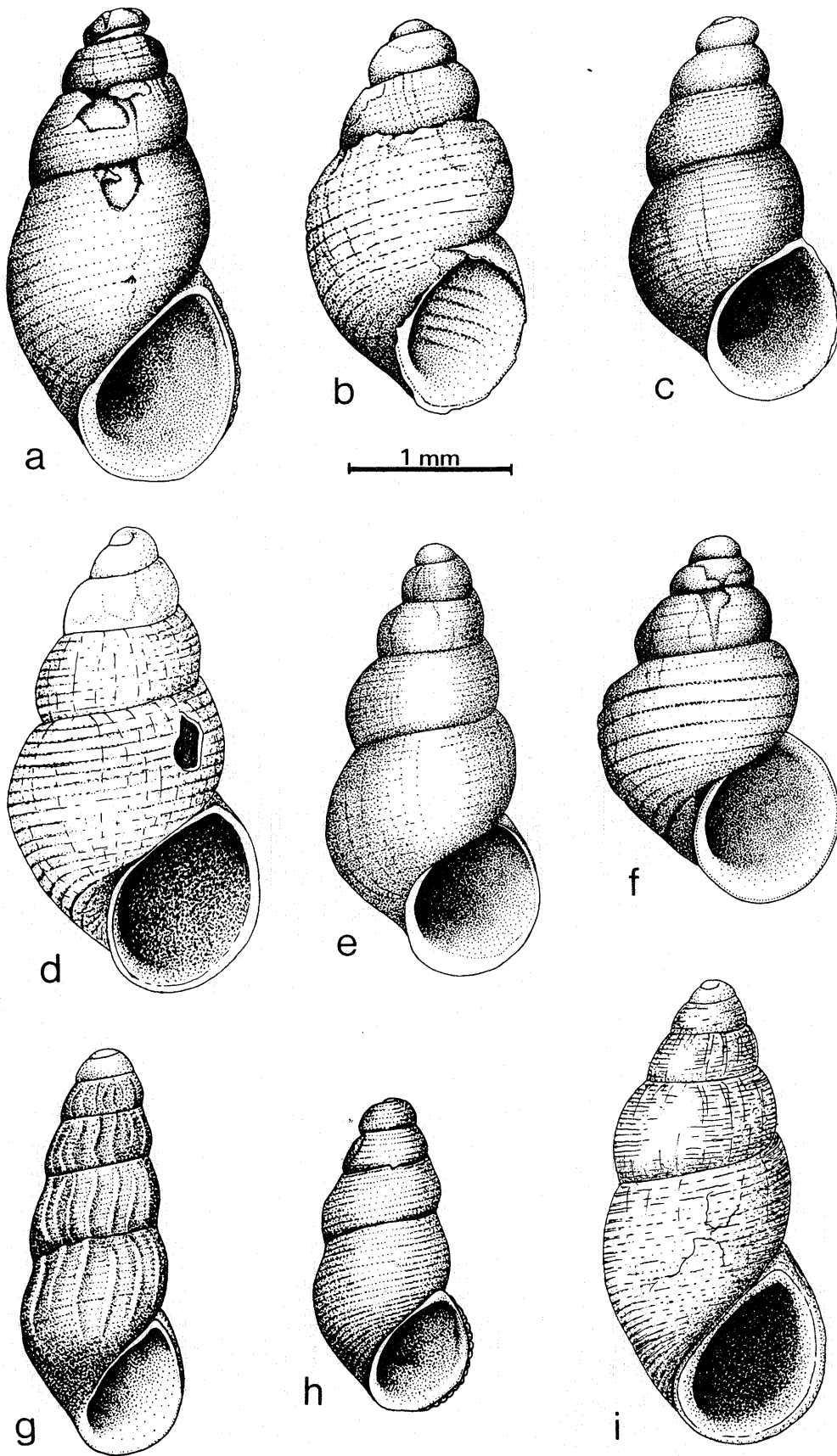


FIGURE 14

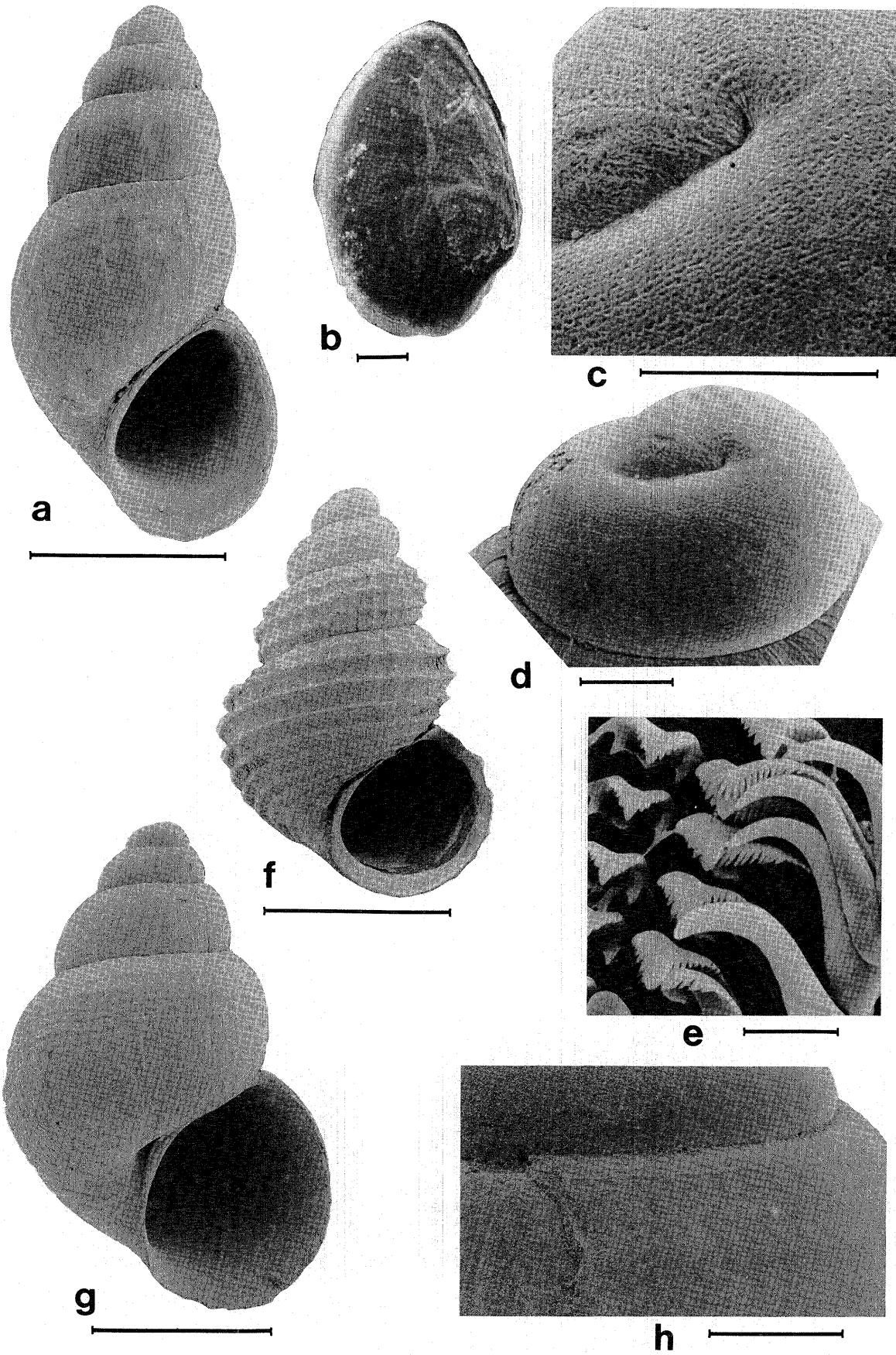
Shells of Rissoidae and Barleeidae.

- a, b. *Onoba steineni* (Strebel). a. Lectotype. b. Holotype of *Rissoa studeriana* Thiele.
c-e. *Onoba turqueti* (Lamy). c. Lectotype of *Rissoa fraudulenta* Smith. d. Syntype of *Rissoa turqueti*. e. Holotype of *Rissoa bickertoni* Hedley.
f. *Onoba grisea* (Martens), holotype of *Rissoia sulcata* Strebel.
g. *Fictonoba cymatodes* (Melvill and Standen), holotype.
h. *Onoba lantzi* (Vélain), syntype.
i. *Onoba semicostata* (Montagu). Holotype of *Rissoa (Onoba) scotiana* Melvill and Standen.

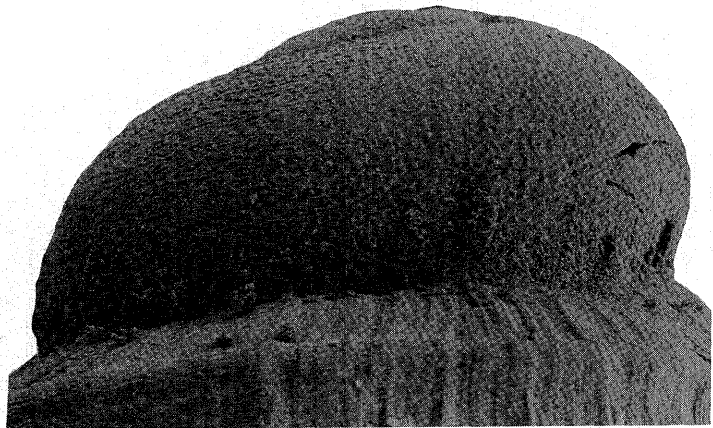
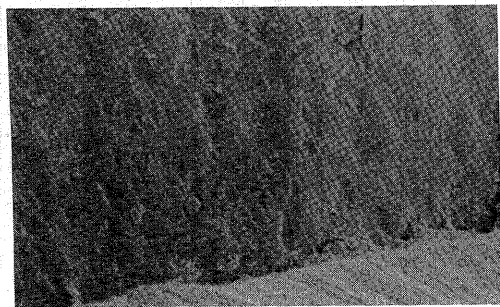
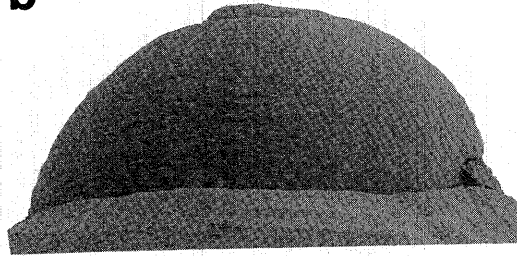
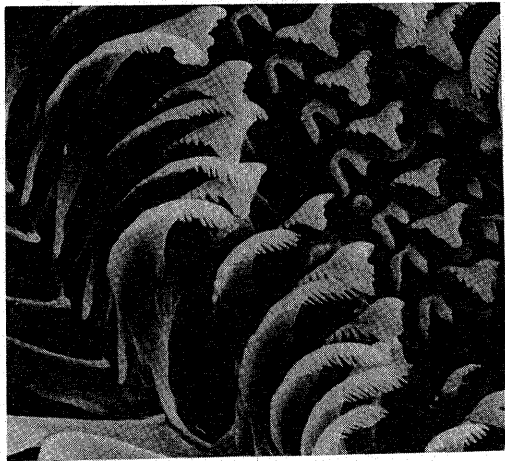
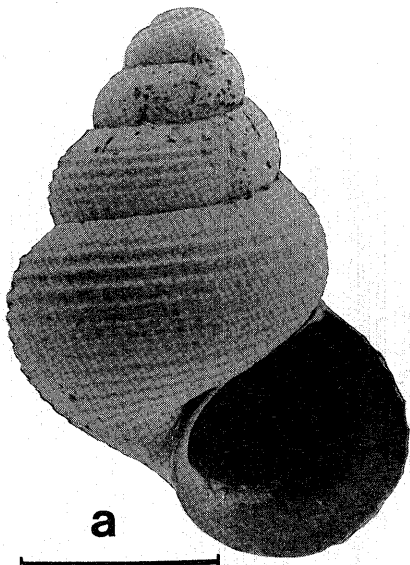
All figures to same scale.



- FIGURE 15
- a-e. *Onoba melvilli* (Hedley), paratypes. a. Shell. b. Operculum (inner side). c. Protoconch microsculpture. d. Protoconch. e. Radula.
- f. *Onoba delecta* n.sp., holotype.
- g, h. *Onoba subantarctica subantarctica* (Thiele). S.S.E. of Îles Kerguelen, 168 m. g. Shell. h. Protoconch microsculpture.
- a, f, g - 1 mm scale; b, c, d, h - 0.1 mm scale; e - 0.01 mm scale.



- FIGURE 16
- a-d. *Onoba gelida* (Smith), Commonwealth Bay, 46 m. a. Shell. b. Protoconch. c. Operculum (inner side). d. Radula.
- e, f. *Onoba inflatella* (Thiele), paratype. e. Protoconch and part of the first whorl of the teleoconch. f. Protoconch microsculpture.
- g, h. *Onoba paucicarinata* n. sp. Holotype. g. Shell. h. Protoconch and a portion of the first whorl of the teleoconch.
- a - 1 mm scale; b, c, e, g, h - 0.1 mm scale; d, f - 0.01 mm scale.



- FIGURE 17
- a-c. *Onoba sanctipauli* (Vélain). N.E. coast, Île Amsterdam. a. Shell. b. Protoconch. c. Protoconch microsculpture.
- d, e. *Onoba transenna* (Watson), Îles Crozet, 37 m. d. Shell. e. Protoconch and first whorl of teleoconch.
- f, g. *Onoba schraderi* (Strebel), lectotype. f. Shell. g. Protoconch and portion of teleoconch microsculpture.
- a, d, f—1 mm scale; b, e, g—0.1 mm scale; c—0.01 mm scale.

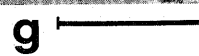
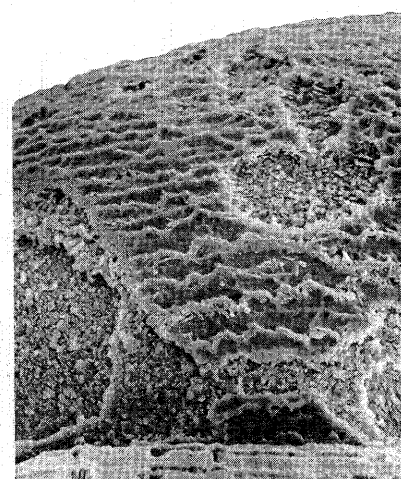
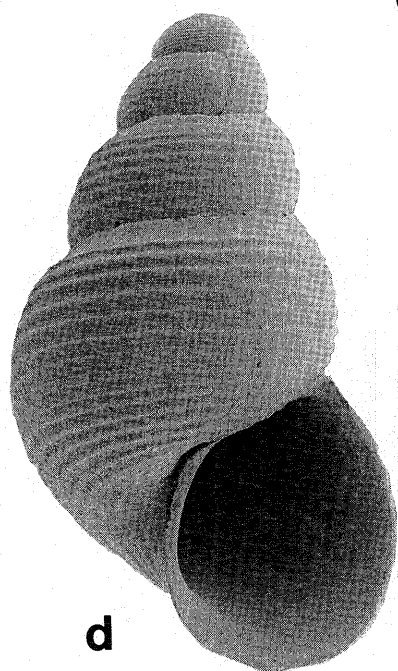
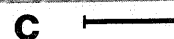
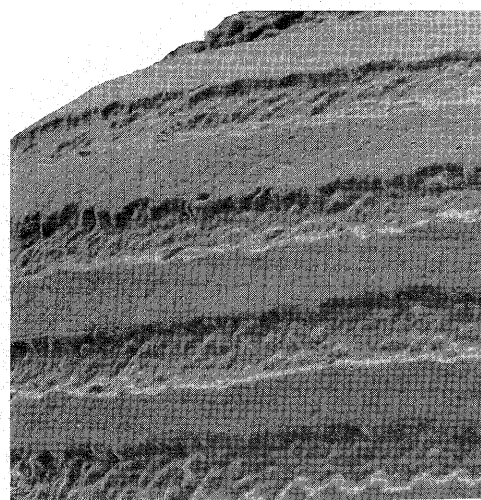
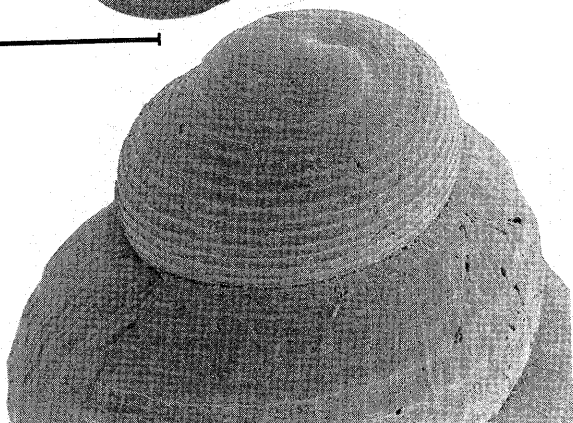
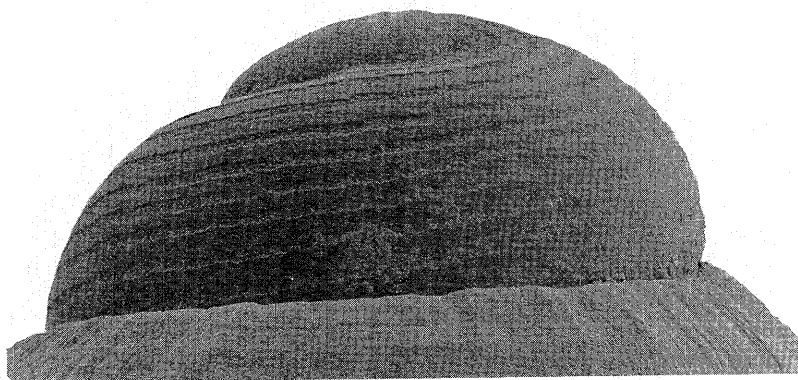
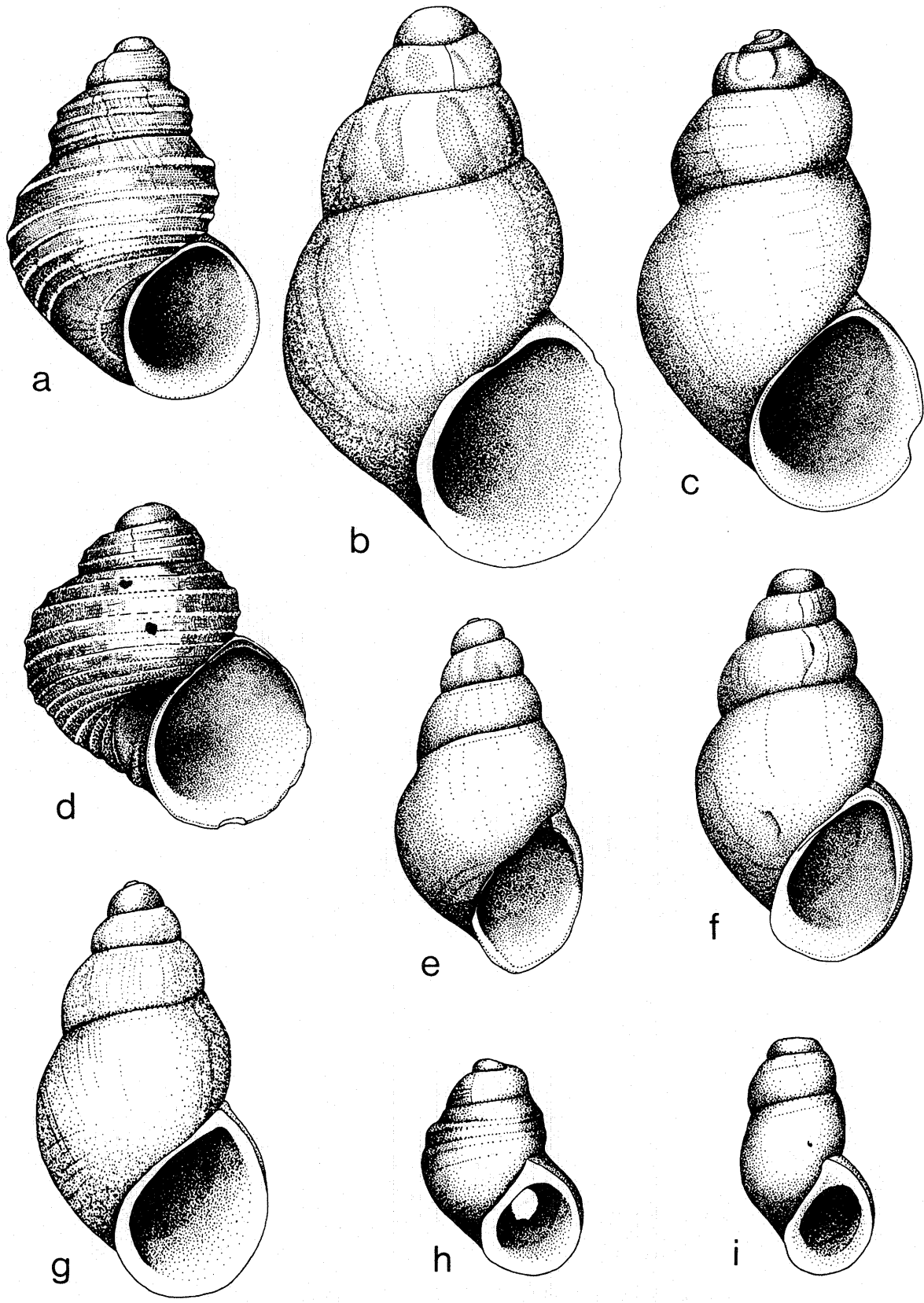


FIGURE 18
Shells of Rissoidae and Barleceidae.

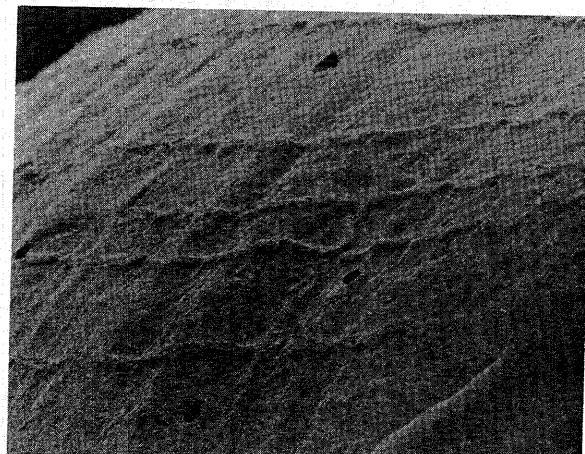
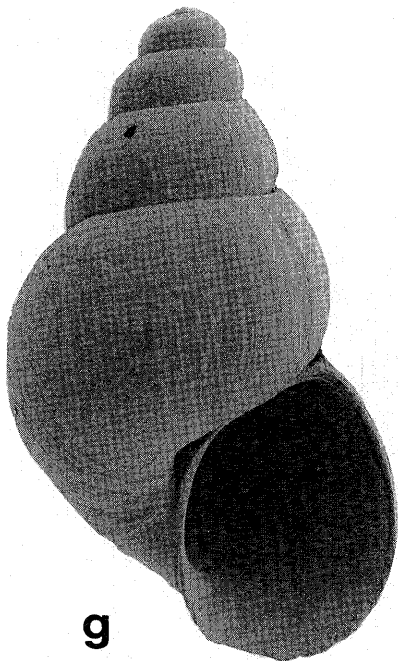
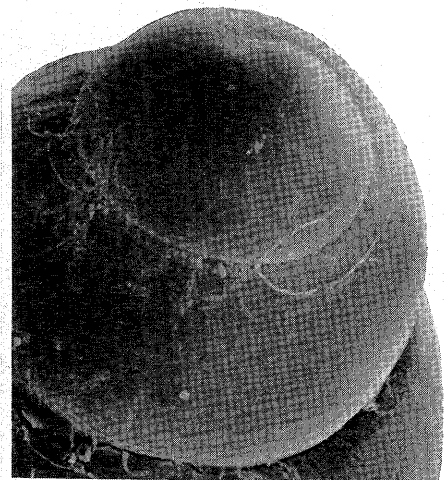
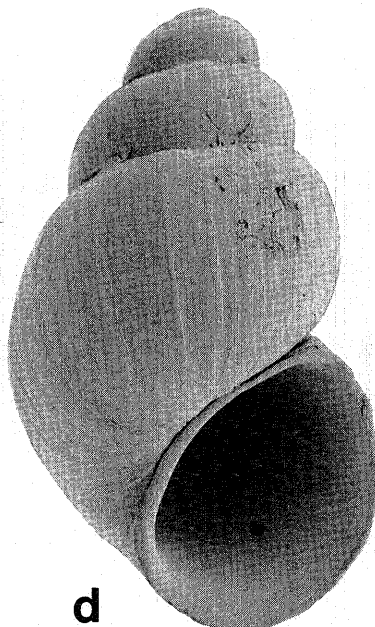
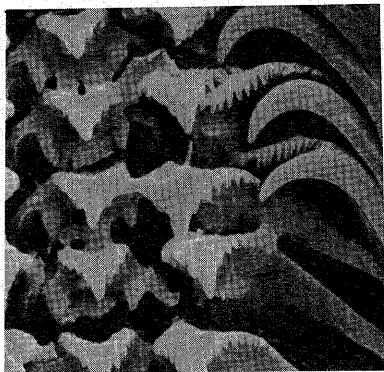
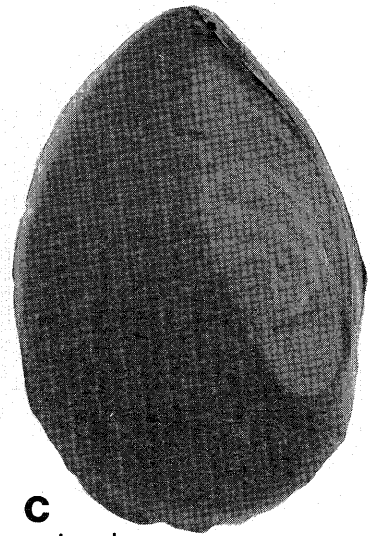
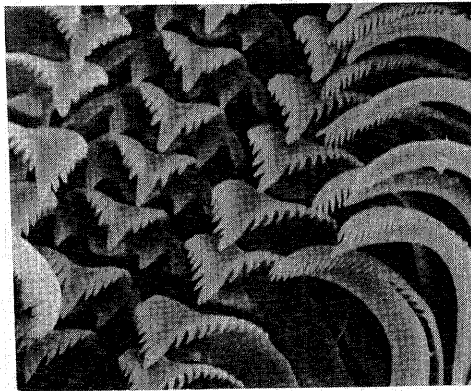
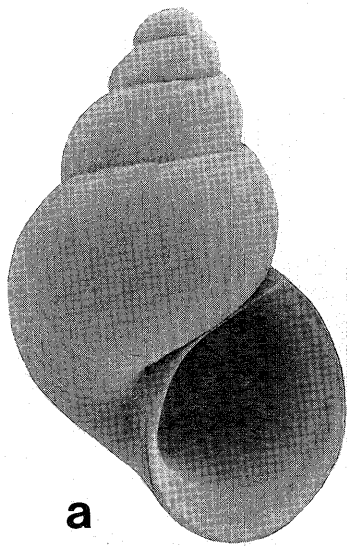
- a. *Onoba paucilirata* (Melvill and Standen), holotype.
 - b. *Powellisetia australis* (Watson), lectotype.
 - c. *Onoba anderssoni* (Strebel), holotype.
 - d. *Onoba inflatella* (Thiele), holotype.
 - e-g. *Onoba (Ovirissoa) kergueleni* (Smith). e. Holotype of *Rissoa observationis* Thiele. f. Holotype of *Rissoa adarensis* Smith. g. Lectotype of *Rissoa kergueleni*.
 - h. *Scrobs (?) parvula* (Vélain), syntype.
 - i. *Scrobs (?) subtruncata* (Vélain), syntype.
- a, d-g scale A; b, c, h, i scale B.



1mm
A

1mm
B

- FIGURE 19
- a-c. *Powellisetia deserta* (Smith), Borge Bay, Signy Island. a. Shell. b. Radula. c. Operculum (inner side).
d-f. *Powellisetia australis* (Watson), Anchor Rock, Macquarie Island, 20m. d. Shell. e. Radula. f. Protoconch.
g-h. *Powellisetia arnaudi* n. sp., holotype. g. Shell. h. Microsculpture of teleoconch.
a, d, g - 1 mm scale; c, f - 0.1 mm scale; b, e, h - 0.1 mm scale.



- FIGURE 20
- a-d. *Powellisetia inornata* (Strebel). a. Shell of lectotype. b-d. Shell (b) operculum (inner side) (c) and radula (d) of paralectotype.
- e. *Powellisetia varicosa* n. sp., holotype.
- a-c, e - 0.1 mm scale; d - 0.01 mm scale.

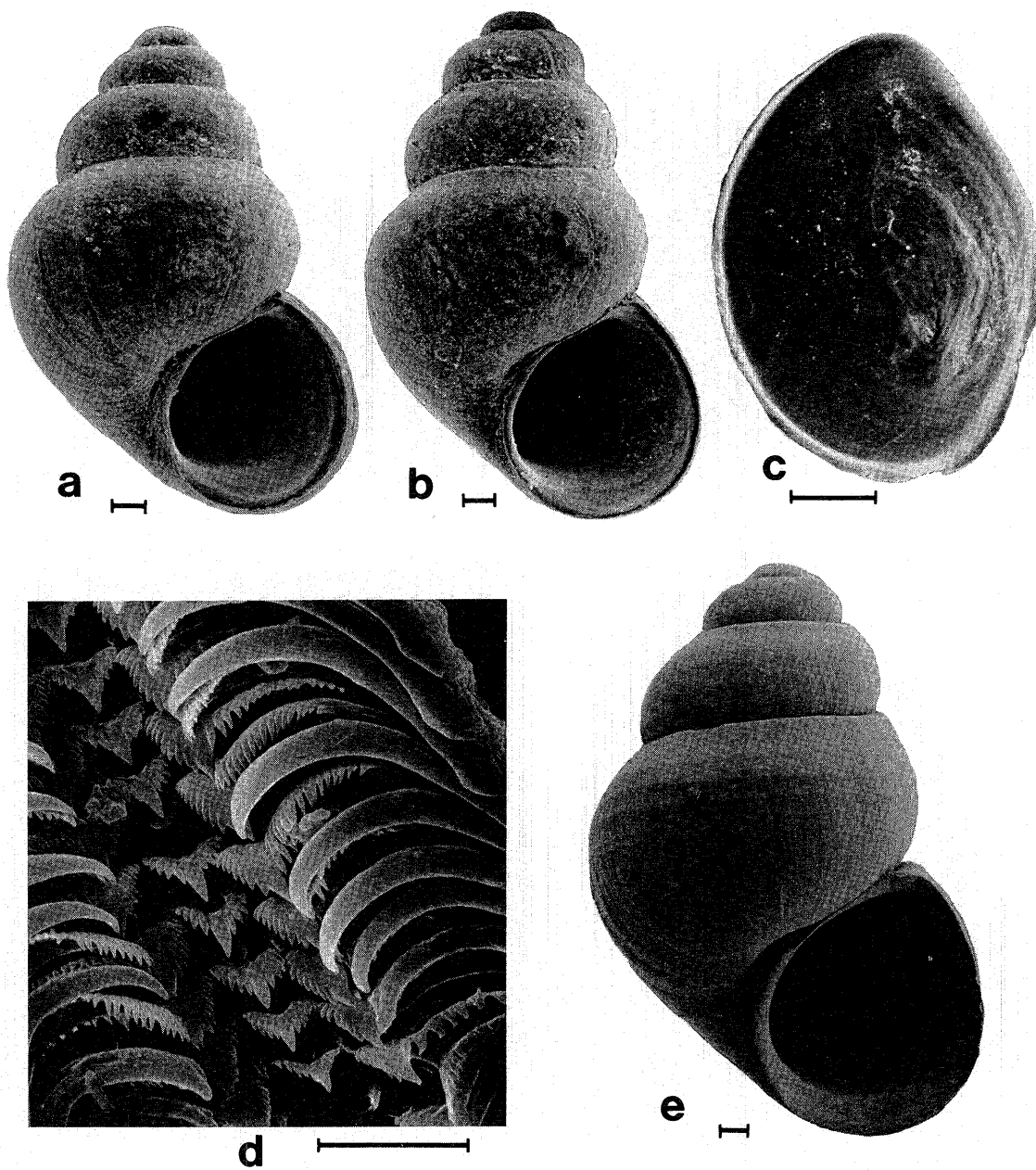
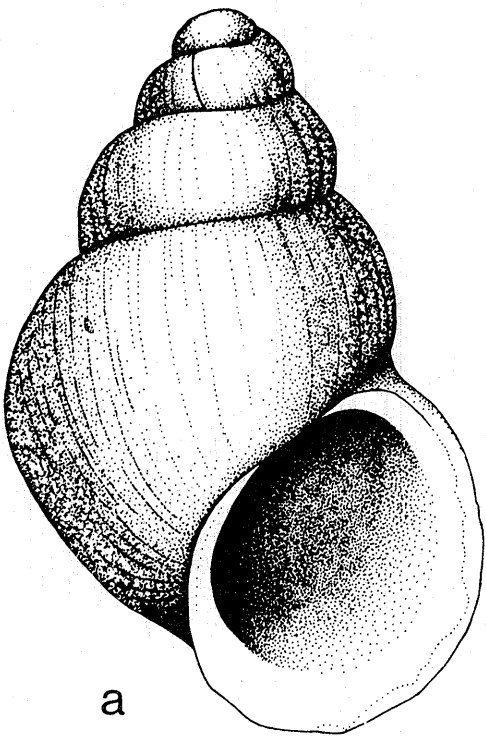


FIGURE 21

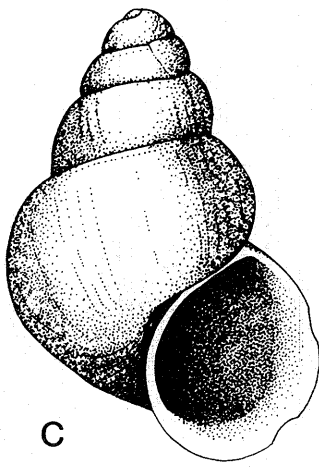
Shells of Rissoidae, Eulimidae (?) and Pyramidellidae.

- a b. *Powellisetia principis* (Watson). a. Lectotype. b. Paralectotype from Îles Kerguelen.
c. *Powellisetia deserta* (Smith), lectotype.
d. *Rissoa parva* (Da Costa), paratype of *Rissoa edgariana* Melvill and Standen (UMM).
e. '*Jeffreysia*' *edwardiensis* Watson, holotype.
f. '*Ovirissoa*' *nivosa* Powell, holotype (BMNH, 1951.6.13.47).
g. '*Rissoa*' *bythinella* Thiele, holotype (HUM, 63083).
h. '*Rissoa*' *ovata* Thiele, holotype (HUM, 63030).

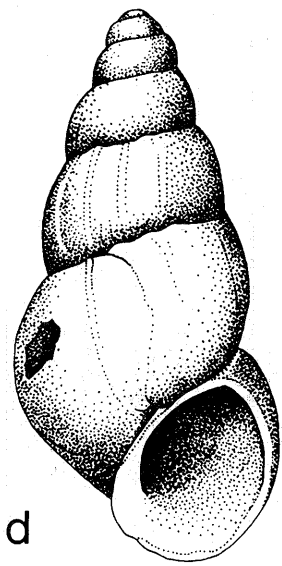
a, b and e scale A; c, d, f-h scale B.



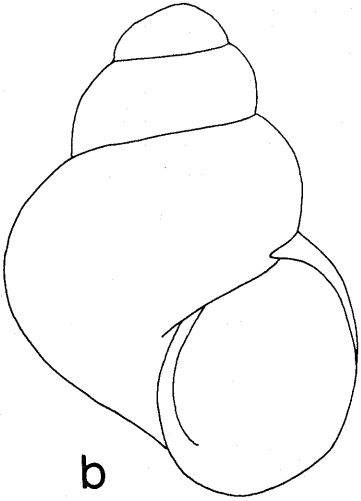
a



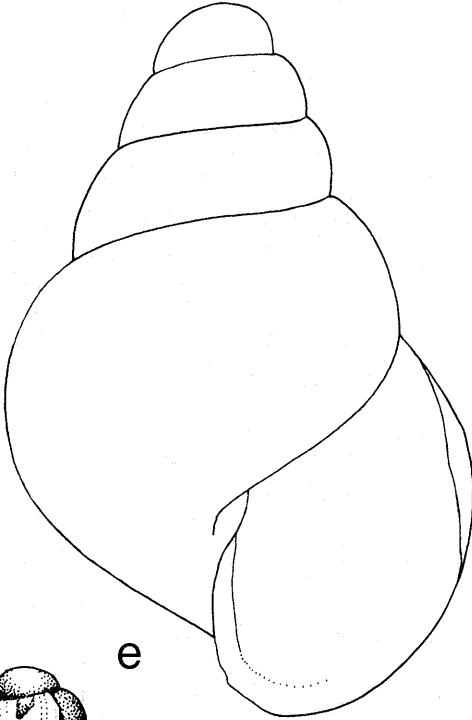
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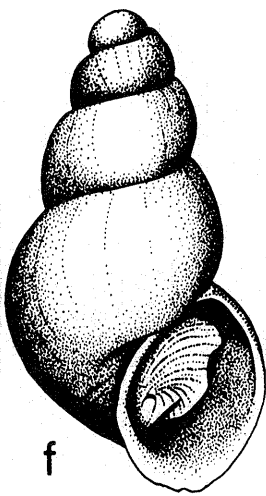
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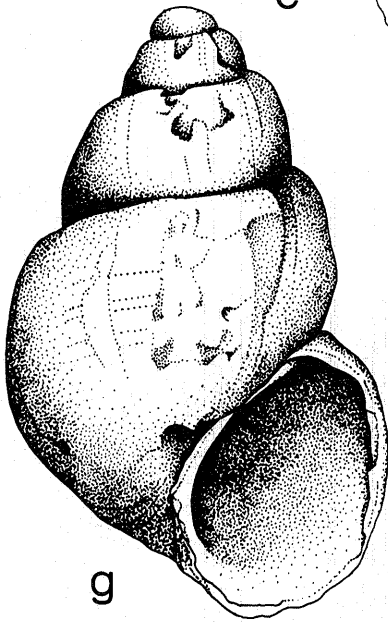
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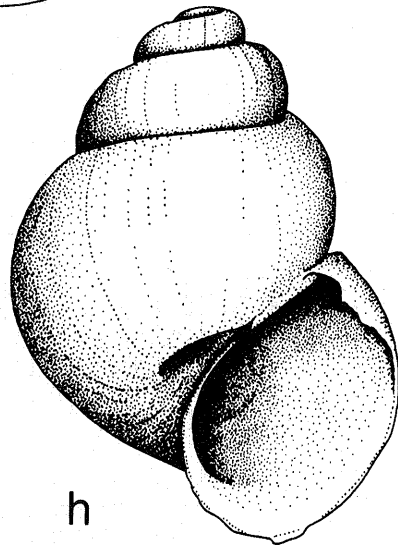
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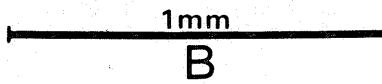
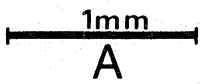
f



g



h



- FIGURE 22
- a-d. *Skenella (Skenella) umbilicata* n. sp., paratypes. a. Shell. b. Protoconch microsculpture.
c. Operculum (inner side). d. Radula.
- e-g. *Skenella (Skenella) paludinoides* (Smith), Robertson Bay, Duke of York Island. e. Radula.
f. Shell. g. Operculum (inner side).
- a, f - 1 mm scale; b, c, g - 0.1 mm scale; d, e - 0.01 mm scale.

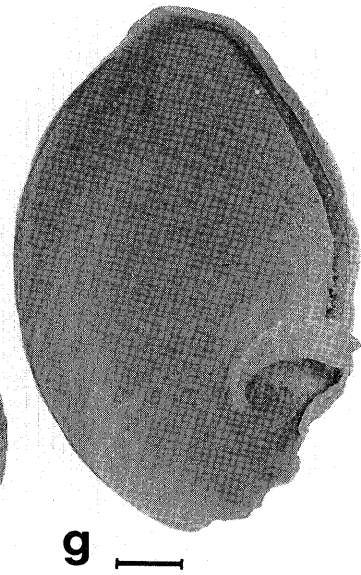
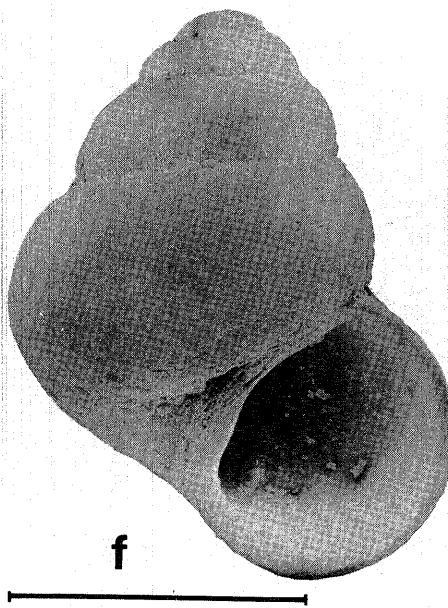
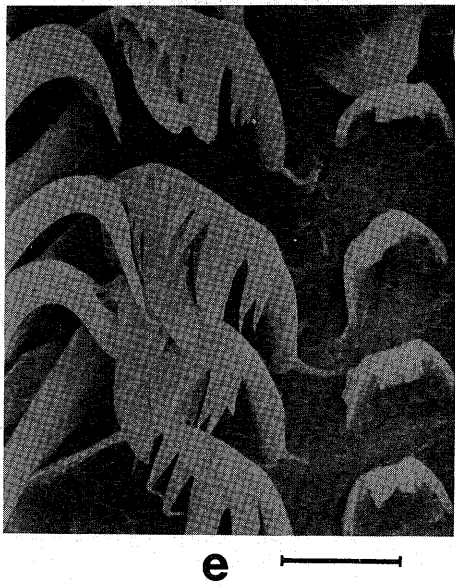
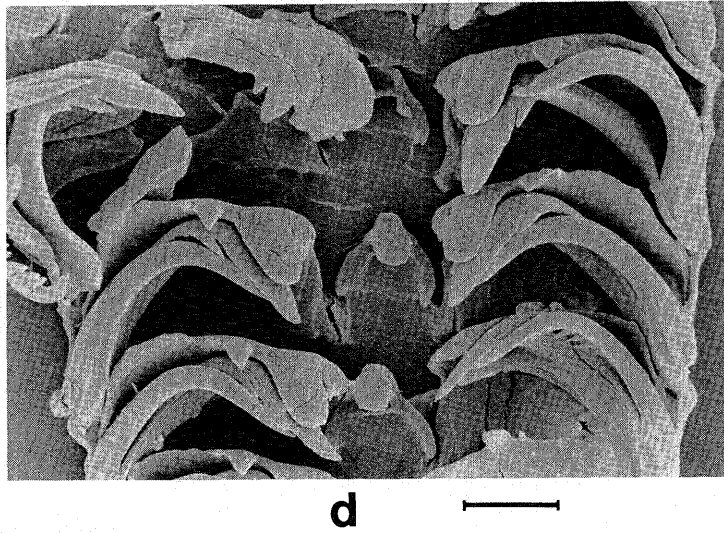
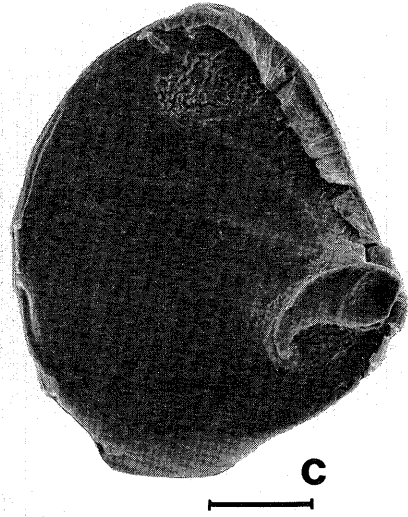
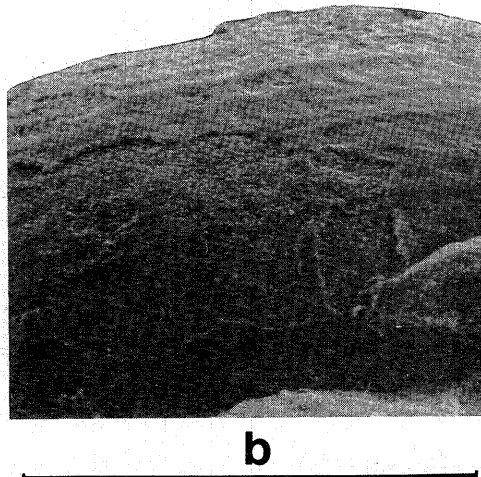
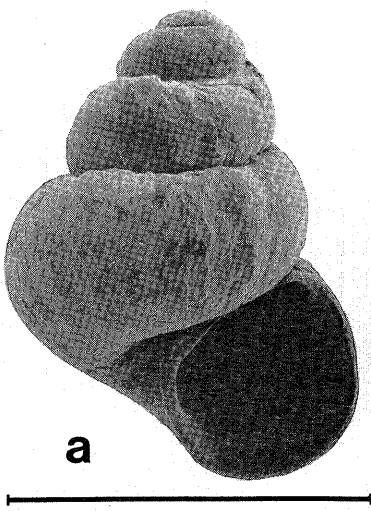
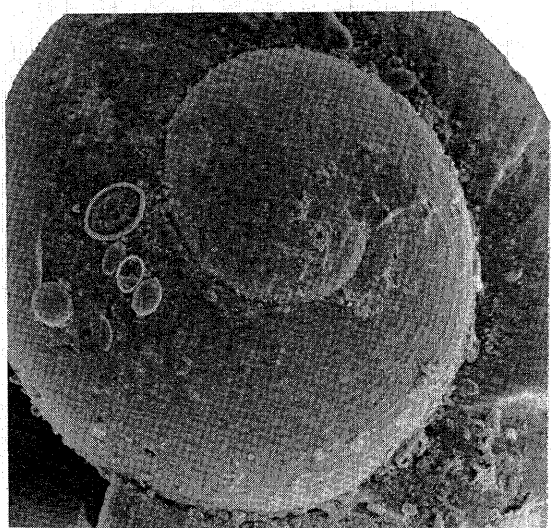
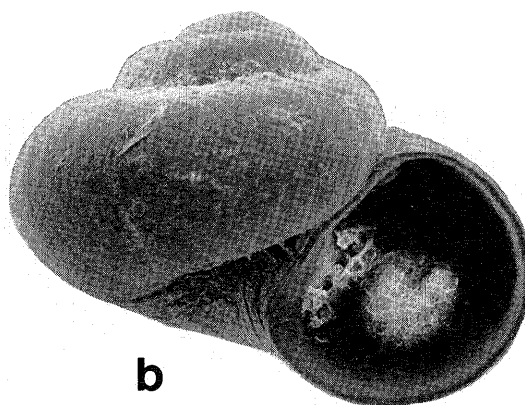


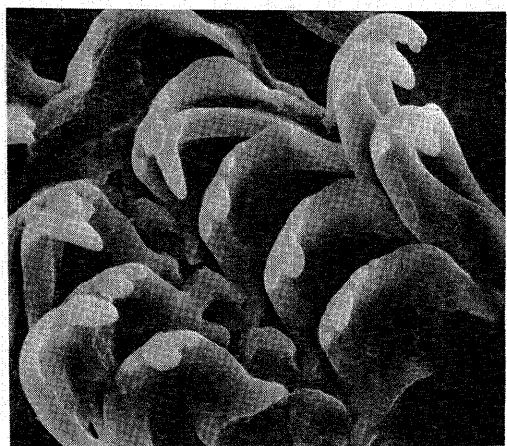
FIGURE 23
a-e. *Skenella (Skenella) georgiana* (Pfeffer), Cumberland Bay, South Georgia. a. Protoconch, dorsal view. b. Shell. c. Operculum (inner side). d, e. Radula, e. central tooth.
f, g. *Skenella (Skenella) sinapi* (Watson), Îles Kerguelen, 14-17 m. f. Radula. g. Operculum (inner side).
b - 1 mm scale; a, c, g - 0.1 mm scale; d, e, f - 0.01 mm scale.



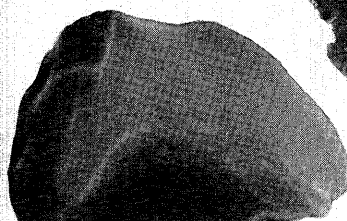
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b



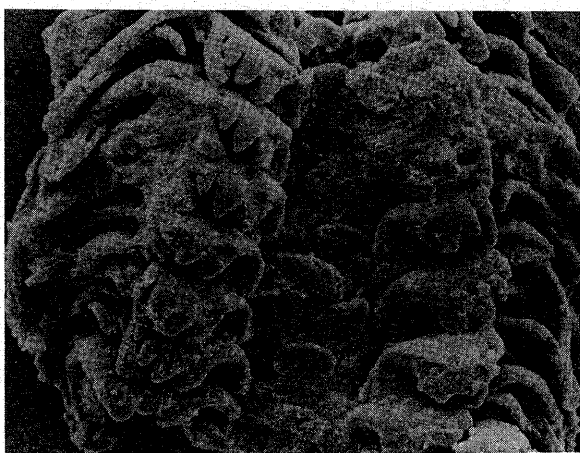
d



e



c



f



g

FIGURE 24
a-c. *Skenella (Boogina)* sp. Îles Kerguelen, 23 m. a. Operculum (inner side). b, c. radula.
c. central tooth and inner ends of lateral teeth.
d-f. *Pickenia signyensis* n. sp., paratype. d. Operculum (inner side). e, f. Radula.
a, d - 0.1 mm scale; b, c, e, f - 0.01 mm scale.

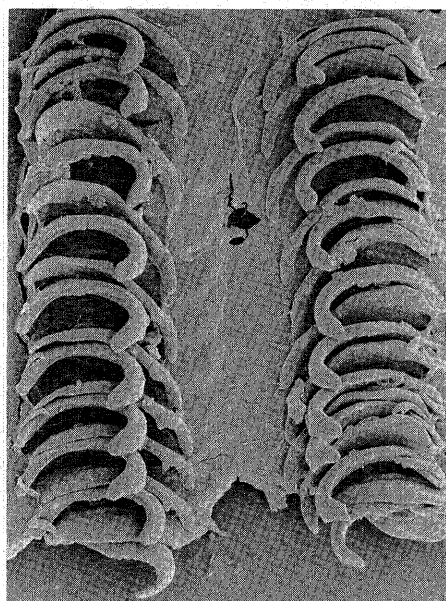
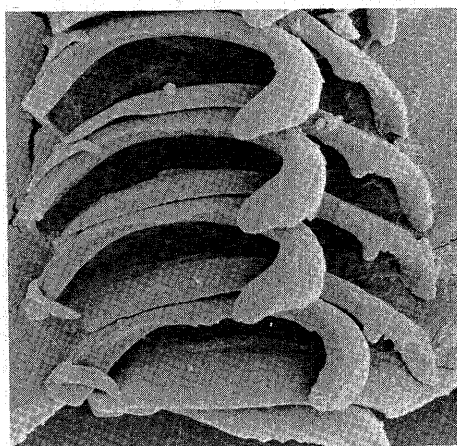
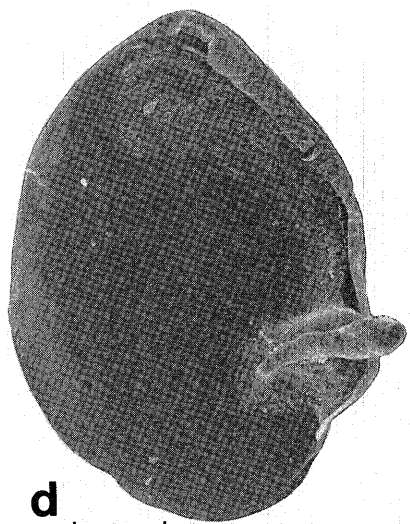
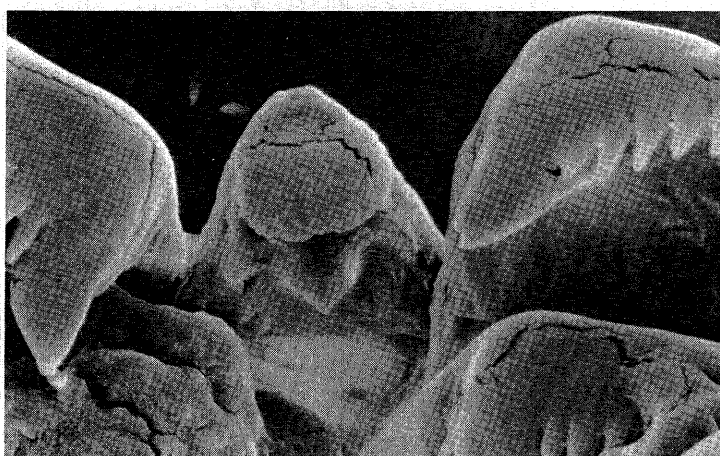
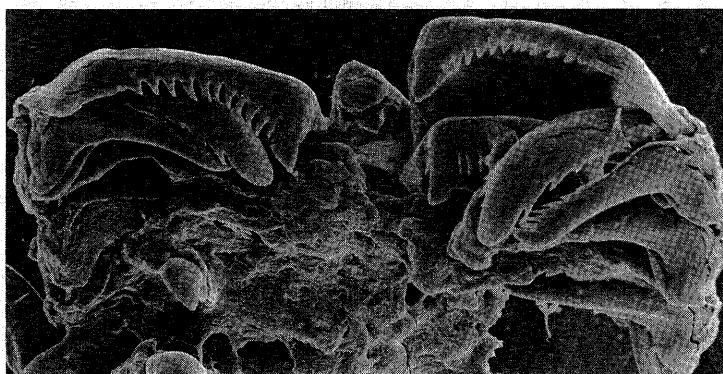
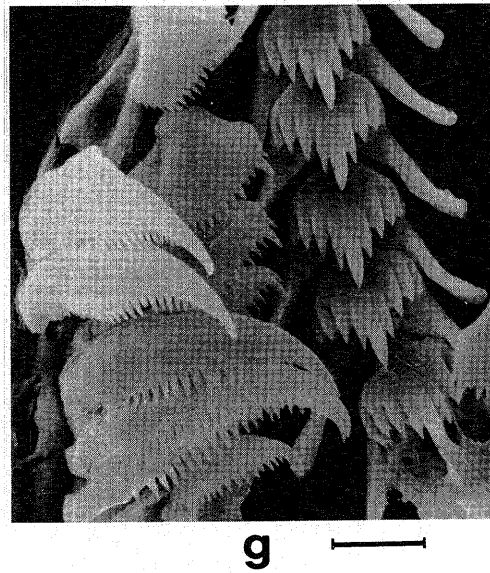
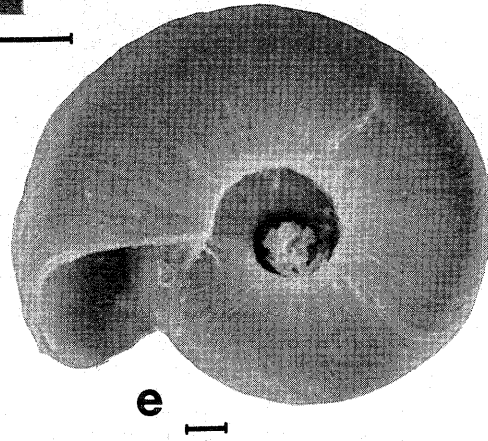
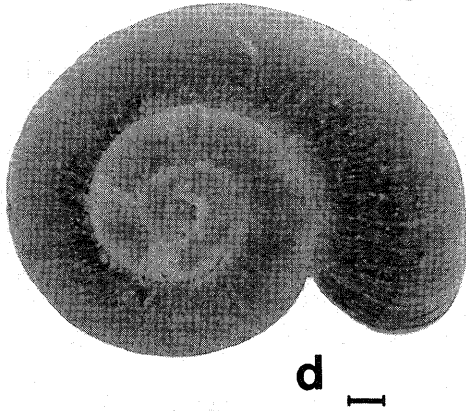
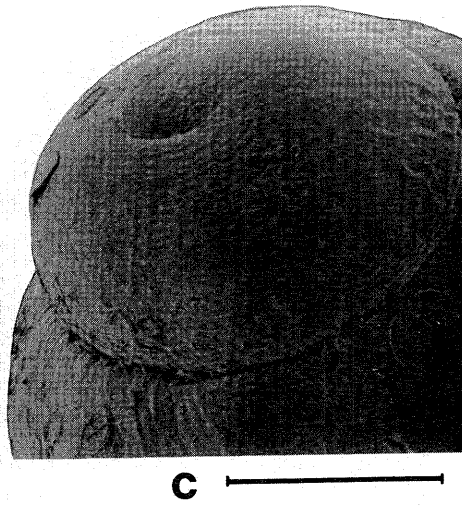
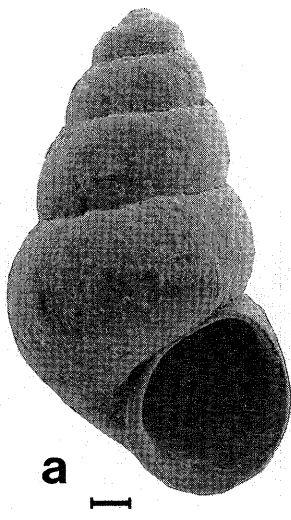
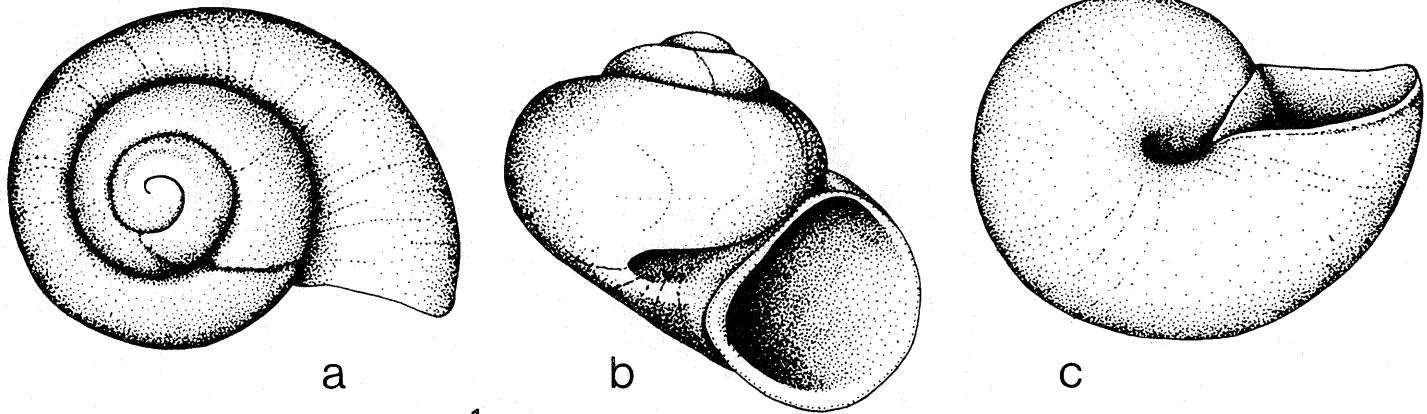


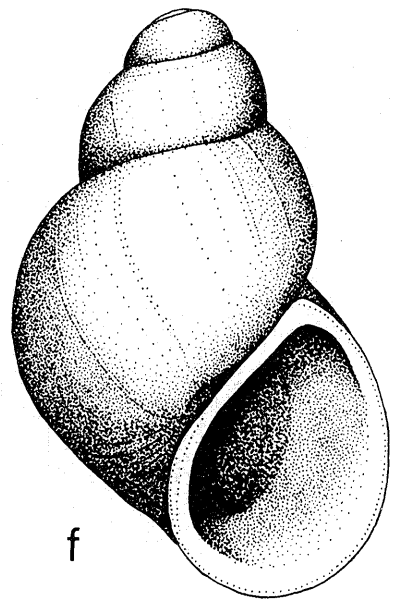
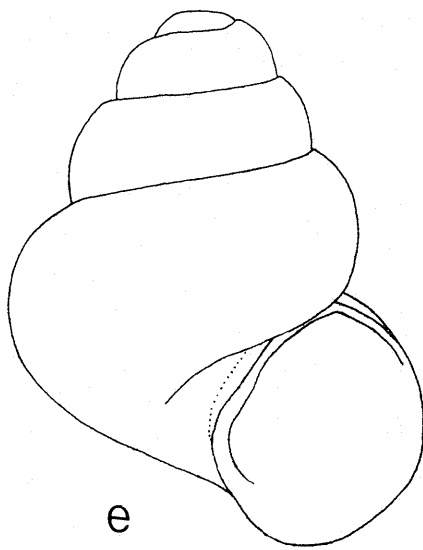
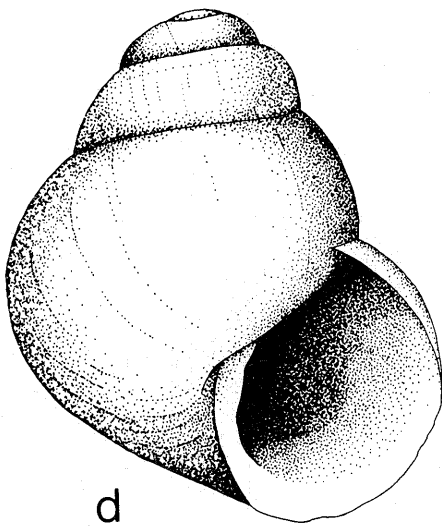
FIGURE 25
a-c. *Pickenia signyensis* n. sp., holotype (a, b) and paratype (c). a. Shell. b, c. Protoconch.
d-g. *Microdiscula subcanaliculata* (Smith). Borge Bay, Signy Island. d, e. Shell. f. Operculum
(inner side). g. Radula.
a-f-0.1 mm scale; g-0.01 mm scale.



- FIGURE 26
Shells of Cingulopsidae and Rissoellidae.
- a-c. *Skenella (Skenella) georgiana* (Pfeffer), Cumberland Bay, South Georgia.
d. *Skenella (Skenella?) edwardiensis* (Watson), lectotype.
e. *Skenella (Skenella) umbilicata* n. sp., holotype.
f. *Rissoella (Rissoella) heberti* (Vélain), syntype.
g, h *Rissoella (Jeffreysiella) notabilis* (Thiele). g. Holotype drawn from Polaroid photograph. h. Îles Kerguelen, 12 m.
i. *Rissoella (Jeffreysiella) powelli* n. sp., holotype.
a-f scale A; h, i scale B. Scale for g approximate.



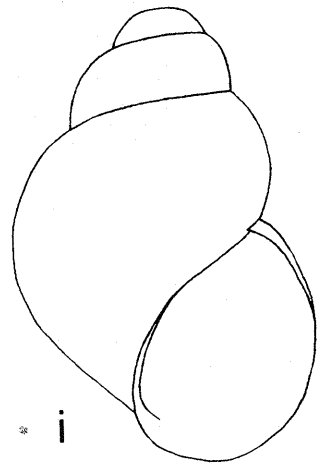
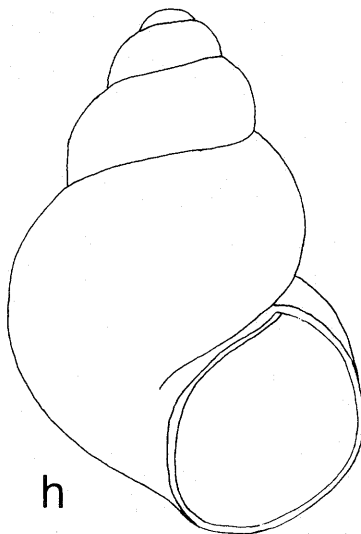
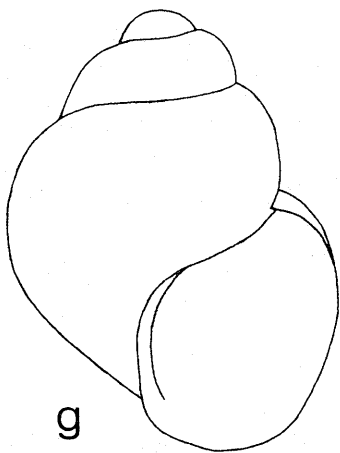
1mm
A



d

e

f



g

h

i

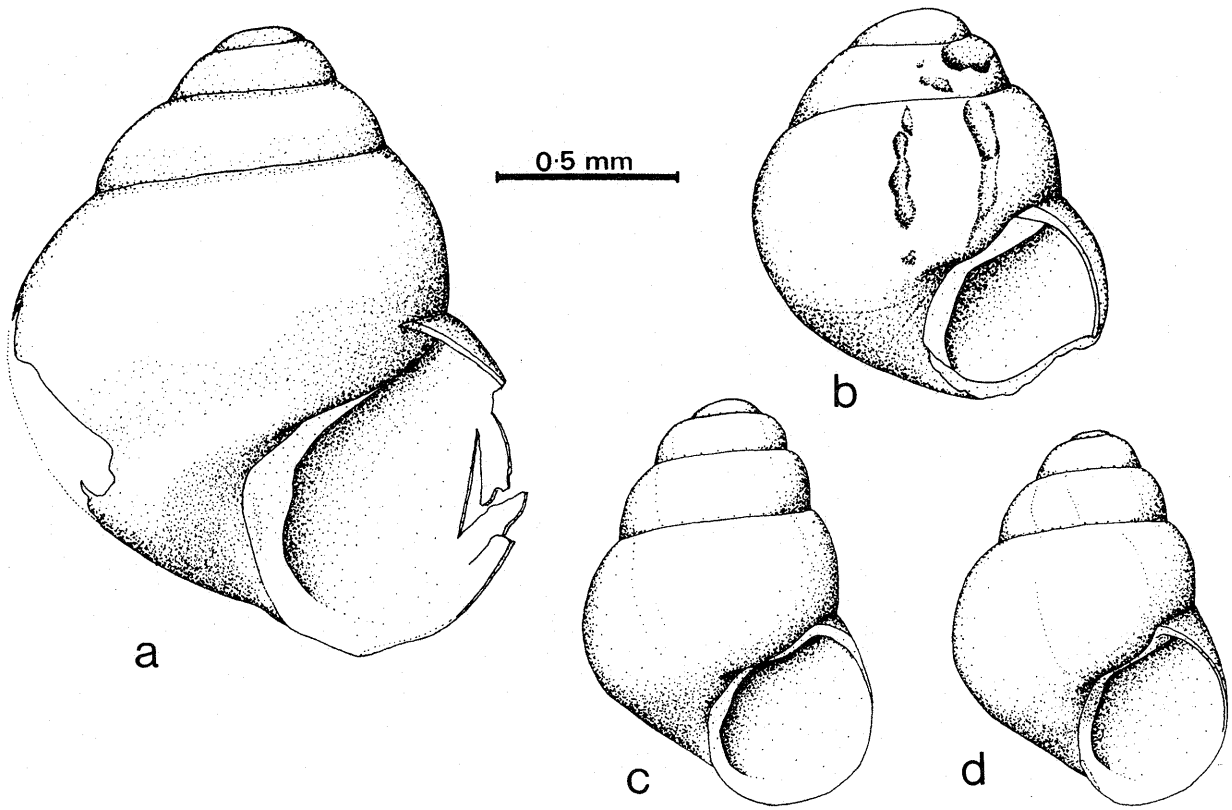
1mm

1mm
B

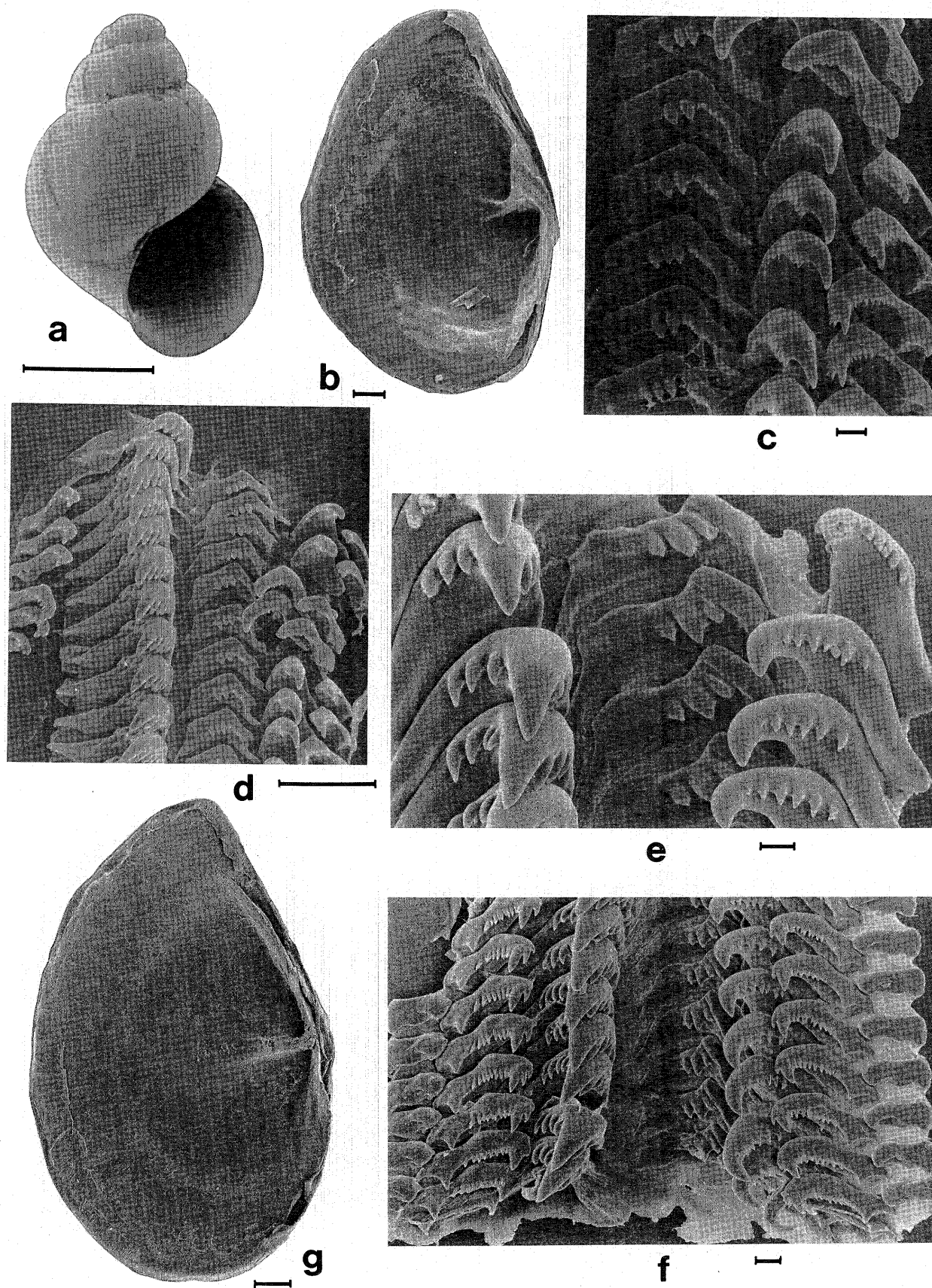
FIGURE 27
Shells of Cingulopsidae.

- a. *Skenella* sp. Îles Kerguelen, 23 m.
- b. *Skenella* sp. Îles Kerguelen, 5 m.
- c, d. *Skenella (Skenella) sinapi* (Watson). c. Lectotype. d. Îles Kerguelen, 14–17 m.

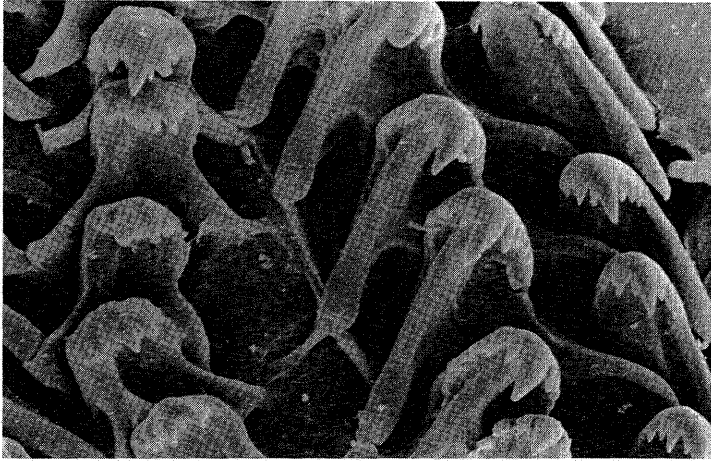
All figures to same scale.



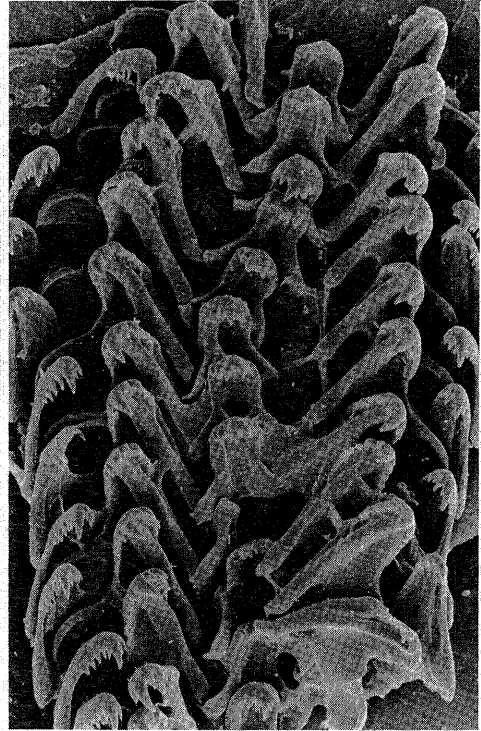
- FIGURE 28
- a-d *Rissoella (Jeffreysiella) powelli* n. sp., paratypes. a. Shell. b. Operculum (inner side). c, d. Radula.
- e-g *Rissoella (Jeffreysiella) notabilis* (Thiele). Îles Kerguelen, 25 m. e, f. Radula. g. Operculum (inner side)
- a - 1 mm scale; b, d, g - 0.1 mm scale; c, e, f - 0.01 mm scale.



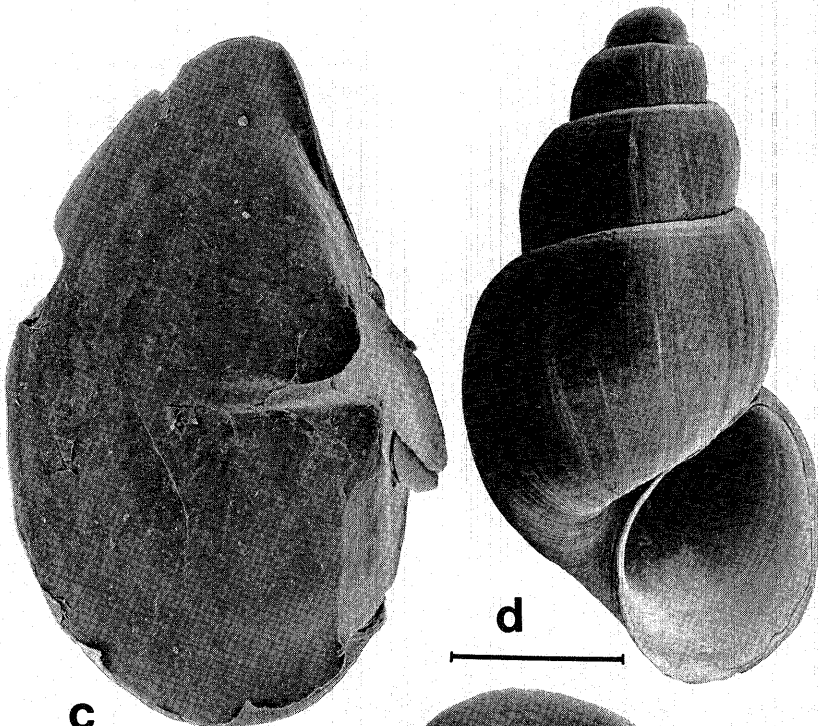
- FIGURE 29
- a-c. *Rissoella (Rissoella) heberti* (Vélain), La Cale, Île Amsterdam. a, b. Radula. c. Operculum (inner side).
- d-f. *'Rissoa' bythinella* Thiele, Îles Kerguelen, 145 m (SME). d. Shell. e. Protoconch and upper teleoconch. f. Operculum (inner side).
- d - 1 mm scale; c, e, f - 0.1 mm scale; a, b - 0.01 mm scale.



a —

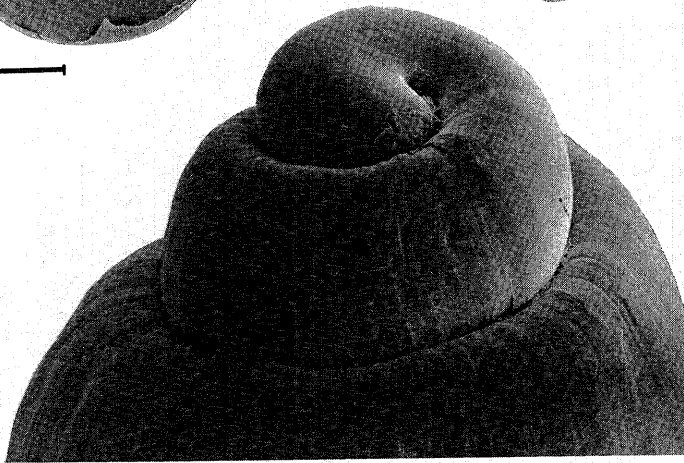


b —

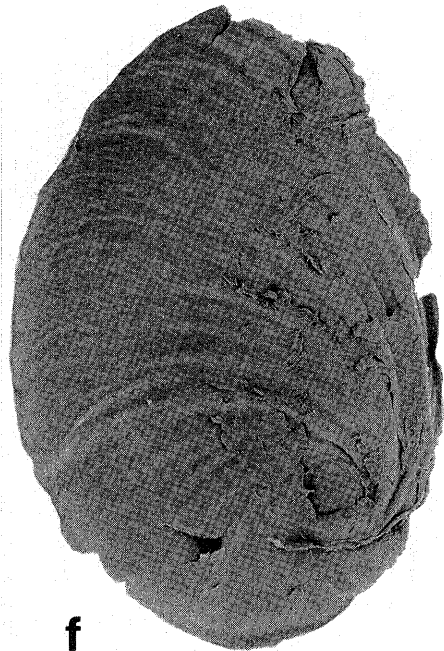


c —

d —



e —



f —

VII. INDEX TO TAXA

Family, genus and species group names are listed for the species dealt with in this report. Species names listed as substrate etc. (e.g. algae) are not listed. Page numbers in **bold type** refer to the major introduction of a valid name.

Page numbers in *italics* refer to the listing of a name as a synonym. Other page citations are primarily given for species names when these are mentioned in comparative comments, or as misidentifications etc.

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