

NEW ZEALAND
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

BULLETIN 139

Biological Results of the Chatham Islands 1954 Expedition

PART 7

Bryozoa Cheilostomata

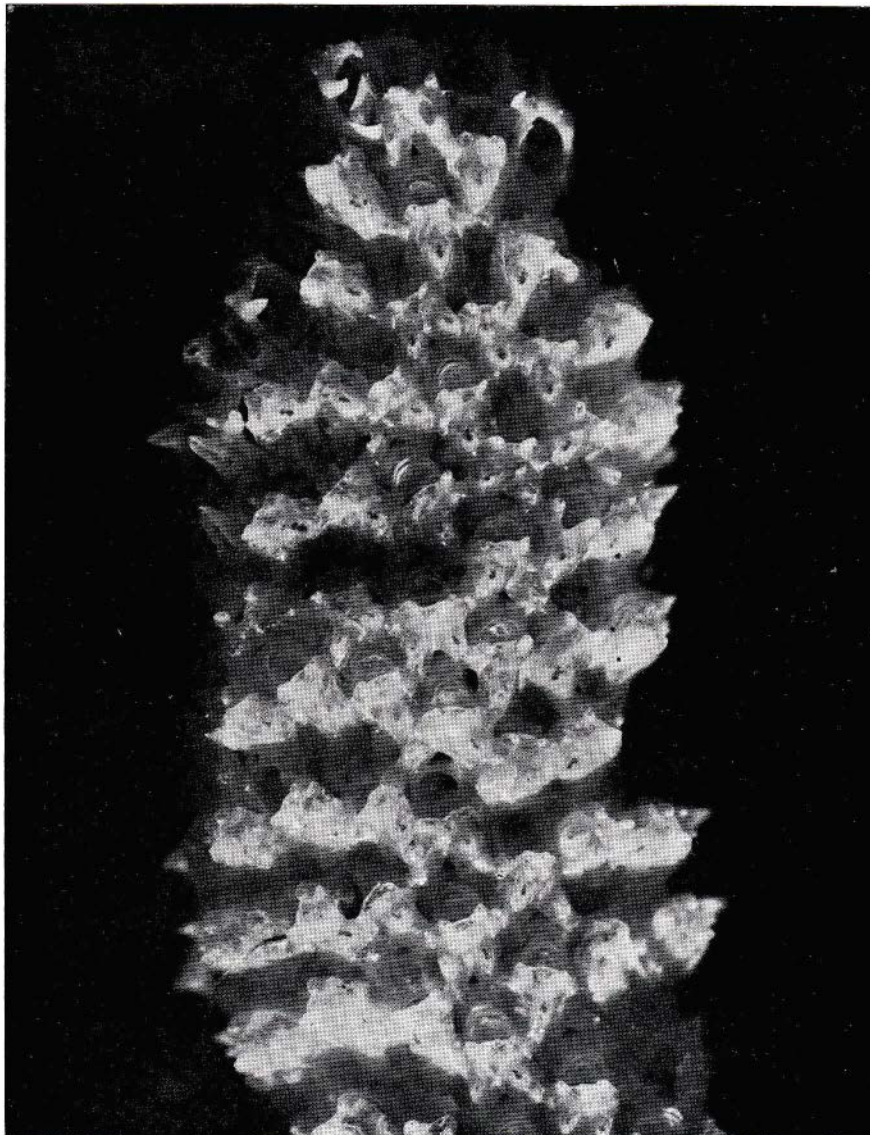
by

the late G. H. UTTLEY, and J. S. BULLIVANT

New Zealand Oceanographic Institute
Memoir No. 57

1971

BIOLOGICAL RESULTS OF
THE CHATHAM ISLANDS 1954 EXPEDITION
PART 7
(concluding Bulletin 139)



FRONTISPIECE: *Parmachaperia chathamensis* n. sp., a unique species from station 5, 300+ fm.
Lobe of a zoarium. $\times 31$

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FOREWORD

The Chatham Islands 1954 Expedition was organised and led by Prof. G. A. Knox of the Zoology Department of Canterbury University. The expedition was planned to explore the distribution of benthic and pelagic animals between the New Zealand coast and the Chatham Islands over the Chatham Rise, and to investigate the faunal affinities of the Chathams group, which lies in the Subtropical Convergence zone.

A substantial grant towards the cost of the expedition was made by the Council for Scientific and Industrial Research on the recommendation of the N.Z. Oceanographic Committee: further financial support was given by Canterbury University, Canterbury Museum, Dominion Museum and Canterbury and Southland Branches of the Royal Society of New Zealand. The expedition was carried out from the M.V. *Alert* under the command of her owner and master, Mr A. J. Black.

The scientific staff was drawn from the following organisations: Canterbury Museum (R. R. Forster); Canterbury University (G. A. Knox, E. W. Dawson, J. R. MacIntyre); Dominion Museum (R. K. Dell, J. M. Moreland); N.Z. Oceanographic Institute (D. M. Garner); Otago University (D. Marshall); Portobello Marine Biological Station (E. J. Batham); Victoria University of Wellington (J. C. Yaldwyn).

Prof. G. A. Knox has been responsible for organising the sorting and allocation of material. Type material from the expedition is deposited at Canterbury Museum. Preliminary technical editing of the resulting manuscripts has been carried out by Prof. Knox and Dr D. E. Hurley.

J. W. BRODIE
Director
N.Z. Oceanographic Institute

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Biological Results of the Chatham Islands 1954 Expedition

PART 7

Bryozoa Cheilostomata

by
the late G. H. UTTLEY,
and
J. S. BULLIVANT

*New Zealand Oceanographic Institute, Department of Scientific
and Industrial Research, Wellington*

ABSTRACT

Ninety-nine species and subspecies of cheilostomate bryozoa in 31 families are described from the Chatham Rise and around the Chatham Islands. Twenty-one new species and subspecies are recorded and described. The ecological relationships are discussed, principally in terms of substrate.

Introduction

A general account of the Chatham Islands 1954 Expedition has been given by Knox (1957). The bryozoan collections made by the expedition are the first large collections to be made in the area. The New Zealand bryozoan fauna itself is not well known, the major work by Brown (1952) being based on existing, fragmentary fossil and Recent collections, and the extensive report by Powell (1967), on a collection from the Three Kings area only.

The bryozoans collected by the Chatham Islands 1954 Expedition were handed to the late Dr G. H. Uttley for examination. Dr Uttley concentrated his attention on the cheilostomate bryozoans which he sorted and mounted on slides and named: he compiled many notes and partly completed written descriptions.

The material and notes were then sorted by Mr D. G. McKnight, N.Z. Oceanographic Institute, who assembled the notes and drew up a list of the species named by Dr Uttley.

The collection has been re-examined by J. S. Bullivant, the names of identified species confirmed or re-determined, and remarks and descriptions which include Dr Uttley's observations have been prepared.

Holotype material is deposited in Canterbury Museum, Christchurch, and paratype material at N.Z. Oceanographic Institute, Wellington.

Mr John J. Whalan, Information Service, DSIR, is thanked for the care with which he took the photographs and Dr D. E. Hurley, N.Z. Oceanographic Institute, for reviewing the manuscript.

Classification

It is realised that such is the state of bryozoan systematics that the classification adopted here is often arbitrary and likely to be rearranged in the future. Recent major works by Bassler (1953), Osburn (1950, 1952, 1953), Harmer (1957), Brown (1952), and Rogick (1956, 1959, 1962) diverge considerably from each other, especially in distinguishing families, e.g., the Hippoporinidae and the Celleporidae, and also genera, e.g., *Trematoecia* and *Osthimosia*; *Schizomavella* and *Lacerna*.

It has been the usual practice in the past to divide the Cheilostomata into two groups, the Anasca and Ascophora. In the former group it is a flexible frontal membrane, and in the latter group a blind sac, the ascus, which allows compensation for the retraction and extension of the lophophore from the zooecium. There is some evidence that this is not a natural division (Harmer, 1957), and that the Ascophora may be at least diphyletic. The family Cribrilinidae are usually regarded as a transition group between the anascan and ascophoran forms as they have a perforated frontal wall over the frontal membrane. However this frontal wall does not incorporate avicularia which are interzooecial in this family. In fact as pointed out by Brown (1952) there is a remarkable similarity between the calloporid *Valdemunitella pyrula* and the cribrilinid *Figularia huttoni*; only the fusion of the frontal spines to form a front wall in *F. huttoni* distinguishes the species. It is logical then to place the family Cribrilinidae after the Calloporidae in the classification. On the other hand the new species of Chaperiidae, the "shielded chaperias" found by the Chatham Islands Expedition and described here, show the way in which the group has developed a protective frontal shield, and link the family with the family Arachnopusiidae. In that these two later families incorporate avicularia into the frontal, they appear to have advanced further towards the ascophoran level of development than other anascans.

The terminology in the present paper follows Bassler (1953) with the addition of the word *cumulus* to describe the piled-up form of zoarial growth of many celleporids, and extension of the use of *opesium* to mean the frontal opening in avicularium chambers as well as the opening containing the frontal membrane in zooecia.

The synonymy for each species is abridged. Reference is made to the type description, to any subsequent observations made use of here, to some recent author (usually Brown (1952), who gives a full synonymy), and to any articles more recent than that author.

New Zealand bryozoa have not been studied extensively. Two major works are those of Brown (1952) and Powell (1967) both of which deal only with Cheilostomata. Brown discusses 147 species and 15 varieties, 66 species being Recent. Powell discusses 100 species and two varieties all taken from the Three Kings area just north of New Zealand. In the present work 99 species and subspecies are recorded 21 of which are new and a further 10 of which had not been recorded from New Zealand waters. The only other collection of bryozoa reported from the Chatham Islands appears to be that made by Professor H. Schauinsland and examined by Waters (1906). Probably four of these species are represented in the present collection.

Among changes made to Dr Uttley's manuscript the following should be mentioned. Some specimens he had labelled "*Melicerita knoxi* n.sp." are separated as a new species *M. chathamensis*. The species described here as *Scutochaperia serrata biporosa* n.subsp., *Clipochaperia funda* n.sp., and *Parmachaperia chathamensis* n.sp. are removed from the family Hiantoporidae and placed in the Chaperiidae. Dr Uttley had labelled fragments which appear to be all *Arthropoma circinata* as three new species.

Note on Ecology

Papers by Garner (1961, 1962), Burling (1961), and Garner and Ridgway (1965), contribute details of the hydrological picture in the vicinity of the Chatham Rise.

The southward-flowing East Cape Current of Subtropical Surface Water and the northward-flowing Southland Current of Subantarctic Surface Water turn away from the New Zealand coast to move eastward on either side of the Chatham Rise. The rapid southward drop in both salinity and temperature between these water masses marks the Subtropical Convergence Zone.

the position of this zone appears to fluctuate and may

lie to the north of the Chatham Islands in the summer and a little to the south in the winter (Garner and Ridgway, 1965). The deeper parts of the Chatham Rise are evidently either in Antarctic Intermediate Water or in water from the zone of mixing between the core of the low salinity Antarctic Intermediate Water at about 1,000 m and the surface layers.

Norris (1964) has discussed the sediments of the Chatham Rise. Rate of sedimentation is apparently low and land-derived sediments are found only near Banks Peninsula and the Chatham Islands. Mernoo and Veyan

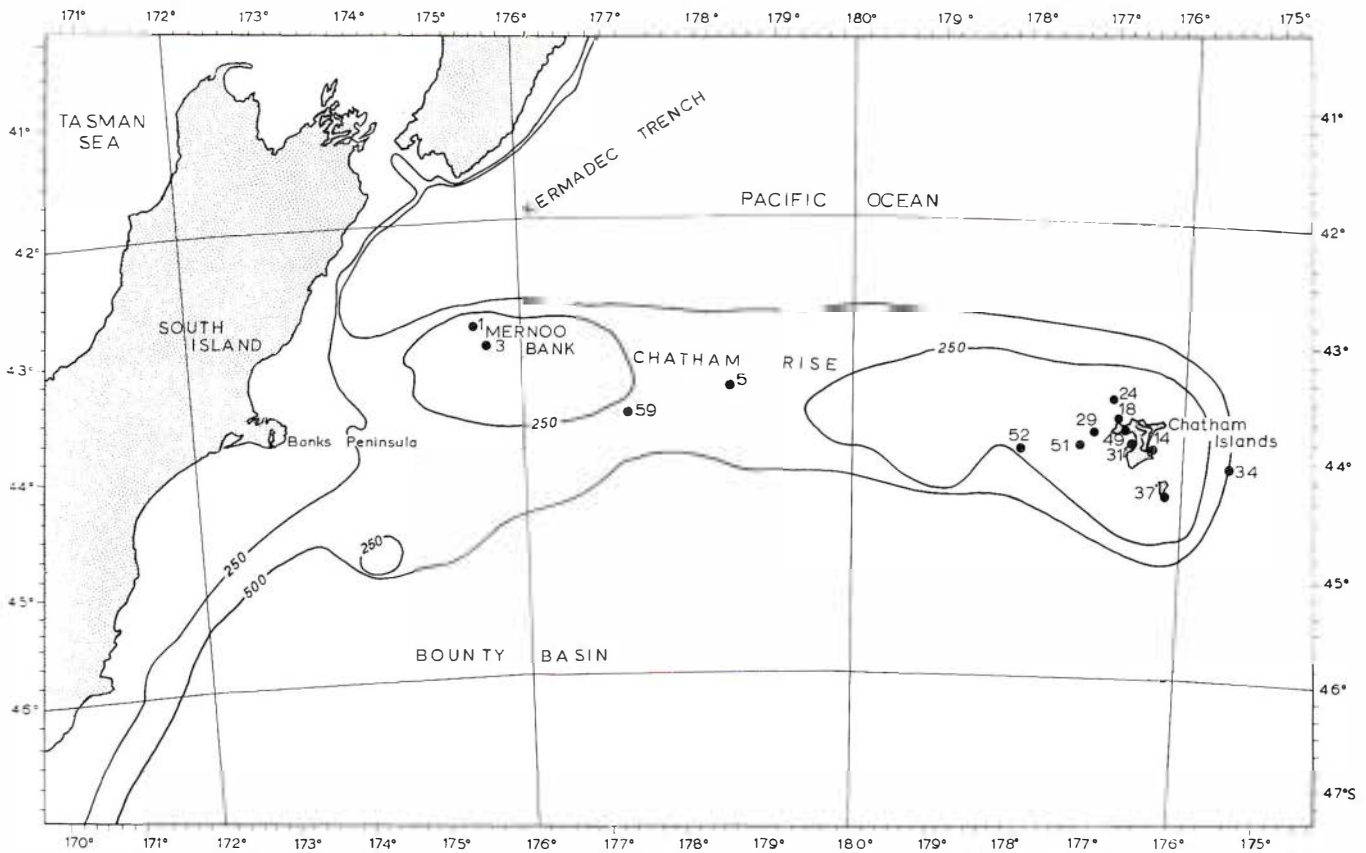


FIG. 1. Chart showing stations where bryozoa were collected.

Banks are capped with shell gravels; foraminiferal oozes extend down to 500 m over most of the rise (save in areas such as Reserve Bank where glauconite is abundant) and silty and clayey sediments blanket the slopes at greater depths. Ice-rafted and tree-rafted erratics are found over most of the Rise and together with phosphatic nodules and skeletal remains of molluscs, bryozoans, and other animals they provide a surface for the attachment of such bryozoans as require a hard substrate. A few species, of course, such as various Selenariidae and Cellariidae, can live resting on, or rooted in, a sandy or muddy substrate.

Only three stations were bryozoans particularly abundant. At sta. 3, 41 fm, on Mernoo Bank, 44 species were collected and the sediment was described as coarse bryozoan shell sand. At sta. 37, 30 fm and sta. 24, 38 fm on coarse shell sand, gravel, and rock, 18 species and 63 species respectively were collected. At the remaining 10 stations the greatest number of bryozoan species collected was five (Fig. 1).

When he discussed the distribution of the large isopod *Serolis bromleyana*, Hurley (1961) defined a bathyal community, the *Serolis bromleyana*—*Spatangus multi-spinus* community, which is found at depths below 200 fm about the Chatham Rise and possibly also in Cook

Strait. The following species of bryozoa are at least sporadic members of this community:

- Melicerita knoxi* n. sp.
- Holoporella tridenticulata*
- Parmachaperia chathamensis* n. sp.
- Osthimosia bicornis*
- O. cyclops* n. sp.

Surprisingly, no molluscs were reported from sta. 3, the shallow station on Mernoo Bank, at which bryozoa were abundant. Some sponges, a hydroid, some errant polychaetes, two species of sipunculids, and two species of ophiuroids were present. One of the ophiuroids, *Amphiura magellanica*, was also found at three stations in less than 50 fm off the Chatham Islands.

About the Chatham Islands in less than 100 fm the sediment is mainly fine sand. At most of the stations on this sand, molluscs dominate the sampled fauna; some species—*Cardita aoteana*, *Pleuromeris marshalli*, *Venericardia purpurata*, *Zemysia zelandica*, and *Barbatia novae-zelandiae*—were found at most of the stations. Among the echinoderms, *Amphiura magellanica*, *Apatopygus recens*, and *Pseudechinus flemingi* were common on the shelf, the last species also being found in deeper water. A few polychaetes were taken at more than one

station near the Chatham Islands: *Sigalion ovigerum* was found at three stations on fine sand, and *Trypanosyllis taeniaeformis* at three stations at which the substrate was rock or coarse shell sand. The swimming crab *Nectocarcinus antarcticus* was found at nearly all these stations and *Ebalia cheesehami* was also quite common. The two stations already mentioned in this locality at which bryozoa were abundant were sta. 24 and sta. 37 where the sediment was coarse shell sand and rock.

Bryozoa are clearly most abundant in the area where fine sediment which would smother these small encrusting organisms, is absent. Where bryozoa are reported from areas where fine sediment is being deposited they are either forms adapted to such a substrate like the Selenariidae or they are species which established themselves for a short time on scattered solid objects lying on the surface of the sediment where they grew until smothered by sediment.

Species Collected by the Expedition

Phylum **BRYOZOA**

Class **GYMNOLAEMATA**

Order **CHEILOSTOMATA**

Suborder **A N A S C A**

Family **ELECTRIDAE**

Electra pilosa (Linnaeus, 1767)

Family **HINCKSINIDAE**

Aplousina nodulosa Uttley, 1949

**Ellisina antarctica* Hastings, 1945

Family **CALLOPORIDAE**

Crassimarginatella cucullata (Waters, 1898)

**Retevirgula sejuncta* (MacGillivray, 1891)

Valdemunitella valdemunita (Hincks, 1885)

Odontionella cyclops (Busk, 1854)

Family **CRIBRILINIDAE**

Figularia huttoni Brown, 1952

F. mernae n. sp.

Family **CHAPERIIDAE**

Chaperia acanthina (Lamouroux, 1825)

Chaperiopsis cristata (Busk, 1884)

C. spiculata (Uttley, 1949)

Scutochaperia serrata n. gen., n. sp.

S. serrata biporosa n. gen., n. subsp.

Clipeochaperia funda n. gen., n. sp.

Parmachaperia chathamensis n. gen., n. sp.

Family **ARACHNOPUSIIDAE**

Arachnopusia unicornis (Hutton, 1873)

A. quadralabia n. sp.

**A. perforata* (Maplestone, 1909)

Family **MICROPORIDAE**

Micropora coriacea (Johnston, 1847)

Family **THALAMOPORELLIDAE**

Opaeophora gracilis Uttley, 1949

O. lepida (Hincks, 1881)

O. monopia Brown, 1952

Family **SELENARIIDAE**

Selenaria squamosa Tenison-Woods, 1880

Family **STEGANOPORELLIDAE**

Steganoporella neozealanica (Busk) *magnifica*

Harmer, 1900

Family **MACROPORIDAE**

Macropora grandis (Hutton, 1873)

Family **CELLARIIDAE**

Cellaria immersa (Tenison-Woods, 1880)

C. tenuirostris (Busk, 1852)

Melicerita knoxi n. sp.

M. chathamensis n. sp.

Family **BICELLARIELLIDAE**

Dimetopia cornuta Busk, 1852

Family **BEANIIDAE**

Beania plurispinosa n. sp.

**B. wilsoni* MacGillivray, 1884

Family **SCRUPOCELLARIIDAE**

**Bugulopsis cuspidata* (Busk, 1852)

Caberea zelandica (Gray, 1843)

Canda arachnoides Lamouroux, 1816

Family **MARGARETTIDAE**

Menipea crystallina (Gray, 1843)

Suborder **A S C O P H O R A**

Family **HIPPOTHOIDAE**

Hippothoa distans MacGillivray, 1869

Family **EUTHYROIDIDAE**

Euthyroides jellyae Levinsen, 1909

E. episcopalis (Busk, 1852)

Family **UMBONULIDAE**

**Umbonula bicuspis* (Hincks, 1880)

*Known species not previously reported from New Zealand waters.

- Family PETRALIIDAE
Petraliella firmata (Waters, 1887)
- Family SMITTINIDAE
Mucronella spinosissima Hincks, 1881
Parasmittina trispinosa aotea Brown, 1952
P. hexaspinosa n. sp.
Porella marsupium (MacGillivray, 1869)
Smittina purpurea (Hincks, 1881)
**S. smittiella* Osburn, 1947
S. landsborovi (Johnston, 1847)
S. akaroensis (Levinsen, 1909)
- Family SCHIZOPORELLIDAE
Haswellina pentagona (d'Orbigny, 1842)
H. polypora (Brown, 1952)
H. tubulata n. sp.
Brodieella longispinata (Busk, 1884)
Arthropoma circinata (MacGillivray, 1869)
Dakaria subovoidea (D'Orbigny, 1852)
D. feegeensis (Busk) *vallata* n. subsp.
Rogicka biserialis (Hincks, 1885)
Lacerna auriculata (Hassal, 1842)
L. improvisa n. sp.
L. incurvata n. sp.
L. minuta n. sp.
Schizomavella cinctipora (Hincks, 1883)
S. conjuncta n. sp.
Buffonellodes ridleyi (MacGillivray, 1883)
**B. rimosa* (Jullien, 1888)
Chiastosella deadala (MacGillivray, 1887)=
Schizoporella insignis MacGillivray, 1883
**C. gabrieli* Stach, 1937
C. enigma Brown, 1952
Escharina waiparaensis Brown, 1952
- Family HIPPOPORINIDAE
Hippoporina lancifera (Hincks, 1891)
Hippomenella vellicata (Hutton, 1873)
H. curvata n. sp.
- Family ESCHARELLIDAE
Exochella conjuncta (Brown, 1952)
E. tricuspis (Hincks, 1881)
- Family MICROPORELLIDAE
Microporella discors n. sp.
M. diademata (Lamouroux, 1825)
Calloporina angustipora (Hincks, 1885)
Fenestulina malusii (Audouin, 1826)
- Family EURYSTOMELLIDAE
Eurystomella foraminigera (Hincks, 1883)
- Family RETEPORIDAE
Hippellozoon novaezelandiae (Waters, 1895)
Rhynchozoon larreyi (Audouin, 1826)
R. paa n. sp.
- Family CREPIDACANTHIDAE
Crepidacantha crinispina (Levinsen, 1909)
C. crinispina (Levinsen) *parvipora* (Canu & Bassler, 1930)
C. zelanica Canu & Bassler, 1929
- Family CELLEPORIDAE
Osthimosia eatonensis (Busk, 1883)
O. proximalis n. sp.
**O. bicornis* (Busk, 1881)
O. cyclops n. sp.
“*Cellepora*” *dubia* n. sp.
Harmerella hastigera (Busk, 1884)
Holoporella tridenticulata (Busk, 1881)
- Family VITTATICELLIDAE
Costaticella hastata (Busk, 1852)
Vittaticella elegans (Busk, 1852)
Scuticella ventricosa (Busk, 1852)
S. margaritacea (Busk, 1852)
- Family CALWELLIIDAE
Calwellia sinclairii (Busk, 1857)
C. bicornis Wyville Thomson, 1858

Station Data† and Species Occurrences

Sta. 1. 42° 51.9' S, 175° 26.5' E, Mernoo Bank, 100 fm,
coarse bryozoan shell sand.

Micropora coriacea
Parasmittina trispinosa aotea
Dakaria subovoidea
Microporella discors
Holoporella tridenticulata

Sta. 3. 43° 10.1' S, 175° 36.5' E, Mernoo Bank, 41 fm,
coarse bryozoan shell sand.

Ellisina antarctica
Crassimarginatella cucullata

Figularia mernae
Chaperia acanthina
Chaperiopsis cristata
C. spiculata
Scutochaperia serrata
Arachnopusia unicornis
A. perforata
Micropora coriacea
Opaeophora lepida
O. monopia
Macropora grandis
Cellaria immersa

†For further details see Knox (1957).

Dimetopia cornuta
Beania wilsoni
Bugulopsis cuspidata
Euthyroides episcopalis
Parasmittina trispinosa aotea
Smittina landsborovi
S. akaroensis
Haswellina pentagona
H. polypora
Brodiella longispinata
Arthropoma circinata
Dakaria feegeensis vallata
Rogicka biserialis
Lacerna improvisa
L. minuta
Schizomavella cinctipora
Chiastossella gabrieli
C. enigma
Escharina waiparaensis
Hippoporina lancifera
Hippomenella vellicata
Exochella conjuncta
E. tricuspis
Microporella discors
M. diademata
Rhynchozoon larreyi
R. paa
Crepidacantha crinispina parvipora
Harmerella hastigera
Scuticella ventricosa

Sta. 5, 43° 32' S, 178° 38' E, Chatham Rise, 300+ fm, fine green sand.

Parmachaperia chathamensis
Melicerita knoxi
Holoporella tridenticulata

Sta. 14, 44° 00' S, 176° 21' W, Hanson Bay, 15 fm, coarse shell sand, limestone.

Canda arachnoides

Sta. 18, 43° 41' S, 176° 48' W, off Cape Pattison, 15 fm, rock.

Beania plurispinosa
Caberea zelandica
Osthimosia eatonensis

Sta. 24, 43° 36.2' S, 176° 48.5' W, south of The Sisters, 38 fm, coarse shell sand gravel.

Electra pilosa
Aplousina nodulosa
Ellisina antarctica
Retevirgula sejuncta
Valdemunitella valdemunita
Odontionella cyclops
Figularia mernae
Chaperia acanthina
Chaperiopsis cristata
Scutochaperia serrata biporosa
Clipeochaperia funda
Arachnopusia unicornis
A. quadrilabia
Micropora coriacea
Opaeophora gracilis
O. lepida
Steganoporella neozealanica magnifica
Cellaria immersa
Hippothoa distans
Umbonula bicuspis
Petraliella firmata
Mucronella spinosissima
Parasmittina trispinosa aotea
P. hexaspinosa
Porella marsupium
Smittina purpurea
S. smittiella

S. landsborovi
Haswellina pentagona
H. polypora
H. tubulata
Arthropoma circinata
Dakaria subovoidea
Rogicka biserialis
Lacerna auriculata
L. improvisa
L. incurvata
L. minuta
Schizomavella cinctipora
S. conjuncta
Buffonellodes ridleyi
B. rimosa
Chiastossella daedala
C. gabrieli
C. enigma
Escharina waiparaensis
Hippoporina lancifera
Hippomenella vellicata
H. curvata
Exochella conjuncta
E. tricuspis
Microporella discors
M. diademata
Calloporina angustipora
Fenestulina malusii
Eurystomella foraminigera
Hippellozoon novaezelandiae
Rhynchozoon larreyi
R. paa
Crepidacantha crinispina parvipora
C. zelanica
"Cellepora" dubia
Harmerella hastigera

Sta. 29, 43° 55.5' S, 177° 08' W, Petre Bay, 50 fm, fine grey sand.

Valdemunitella valdemunita
Arachnopusia perforata
Selenaria squamosa

Sta. 31, 43° 56.5' S, 176° 37' W, Petre Bay, 40 fm, fine green sand.

Odontionella cyclops

Sta. 34, 44° 04' S, 175° 23.5' W, east of the Forty Fours, 130 fm, fine sand gravel.

Electra pilosa
Melicerita chathamensis
Mucronella spinosissima
Brodiella longispinata
Holoporella tridenticulata

Sta. 37, 44° 21.5' S, 176° 13' W, between South East I. and Pitt I., 30 fm, rock, coarse shell sand.

Figularia huttoni
Arachnopusia unicornis
Opaeophora lepida
Cellaria immersa
C. tenuirostris
Bugulopsis cuspidata
Canda arachnoides
Menipea crystallina
Euthyroides jellyae
Fenestulina malusii
Crepidacantha crinispina
Osthimosia proximalis
O. bicornis
Costaticella hastata
Vittaticella elegans
Scuticella margaritacea
Calwellia sinclairii
C. bicornis

Sta. 49, 43° 49' S, 177° 41' W, Port Hutt, shore collection.
Chaperia acanthina

Sta. 52, 44° 04' S, 178° 04' W, Chatham Rise, 260 fm,
fine green sand mud.

Osthimosia bicornis
O. cyclops

Sta. 59, 43° 38' S, 177° 19' E, Chatham Rise, 290 fm, fine
green sand mud.
Melicerita knoxi

Systematics

Suborder A N A S C A

Family ELECTRIDAE Lagaaij, 1952

Genus *Electra* Lamouroux, 1816

Electra pilosa (Linnaeus, 1767)

E. pilosa: Macken, 1958, p. 104.
E. pilosa: Gordon, 1967, p. 51, fig. 11.

MATERIAL EXAMINED: A small colony lacking soft parts and spines, encrusting a pelecypod shell, from sta. 24, 38 fm. Encrusting *Melicerita chathamensis* n. sp., from sta. 34, 130 fm.

REMARKS: The specimen was at first thought to be a distinct species, but a larger colony obtained from Tahuna Beach, Nelson, clearly shows the transition from young zoecia like the present material to the more heavily calcified form with crater-like formations surrounding the zoecia figured by Uttley, 1951.

Family HINCKSINIDAE Canu & Bassler, 1927

Genus *Aplousina* Canu & Bassler, 1927

Aplousina nodulosa Uttley, 1949

A. nodulosa Uttley, 1949, pp. 183–4, pl. 34, figs 1, 2.
A. nodulosa: Macken, 1958, p. 104.

MATERIAL EXAMINED: One colony encrusting a pelecypod shell now in two fragments, from sta. 24, 38 fm.

Genus *Ellisina* Norman, 1903

Ellisina antarctica Hastings, 1945

E. antarctica Hastings, 1945, pp. 94–8, fig. 6.

MATERIAL EXAMINED: A small colony lacking soft parts and encrusting a piece of bone, from sta. 3, 41 fm. A small colony with frontal membranes intact encrusting a piece of brachiopod? shell, from sta. 24, 38 fm.

REMARKS: Both colonies lack ovicells but the cryptocyst is narrow proximally as well as laterally suggesting this species rather than *E. sericea* (MacGillivray, 1890). The basal wall of the zoecia is uncalcified or shows only the faintest trace of calcification.

Family CALLOPORIDAE Norman, 1903

Genus *Crassimarginatella* Canu, 1900

Crassimarginatella cucullata (Waters, 1898)

Membranipora nobilis: Waters, (not Reuss), 1887, p. 46, pl. 6, fig. 7.
M. sculpta var. *cucullata* Waters 1898, p. 685, pl. 47, fig. 14.
Gramella sculpta var. *cucullata*: Canu & Bassler, 1920, p. 130.
Crassimarginatella cucullata: Uttley, 1951, pp. 29, 30, figs 13, 14.
C. cucullata: Macken, 1958, p. 104.

MATERIAL EXAMINED: Two colonies encrusting pelecypod shells and five colonies encrusting bone fragments from sta. 3, 41 fm.

REMARKS: Neotype (here selected) is based on a Recent specimen from Tahuna, Nelson, described by Uttley (1951, p. 29), now in the collection of the Canterbury Museum. The whereabouts of the Recent specimen from Charleston, New Zealand, figured by Waters (1898, pl. 47, fig. 14), is unknown and topotype material is unavailable.

NEOTYPE: Canterbury Museum zb26.

Genus *Retevirgula* Brown, 1948

Retevirgula sejuncta (MacGillivray, 1891)

Membranipora sejuncta MacGillivray, 1891, p. 78, pl. xx, figs 5–5a.
M. sejuncta: Hastings, 1930, pp. 710–11.

MATERIAL EXAMINED: A small colony encrusting a pebble, from sta. 24, 38 fm.

REMARKS: Spines are not present but the 6 or 7 pairs of spine bases are in some cases very prominent. Some kenozoecia have a simple round perforation; others, what appear to be the opesia of avicularia though they lack a pivot bar or condyles. The sides of these opesia are straight, the ends rounded, and the distal end cucullate. The species is close to *Retevirgula tubulata* (Hastings, 1930) but that species has a frontal foramen in the ovicell. Hastings examined material of the present species and discusses it.

Genus *Valdemunitella* Canu, 1900

Valdemunitella valdemunita (Hincks, 1885)

Membranipora valdemunita Hincks, 1885, p. 248, pl. 7, figs 2–2a.
Valdemunitella valdemunita: Brown, 1952, pp. 63–4, figs 19, 20.
Valdemunitella valdemunita: Macken, 1958, p. 104.

MATERIAL EXAMINED: Five or six fragments, some encrusting pelecypod shells from sta. 24, 38 fm. A colony on a bryozoan from sta. 29, 94 fm.

REMARKS: One colony has slightly larger zooecia and seven pairs of spines.

Genus *Odontionella* Canu & Bassler, 1917

Odontionella cyclops (Busk, 1854)

Membranipora cyclops Busk, 1854, p. 61, pl. 65, fig. 3.
Odontionella cyclops: Brown, 1952, pp. 80–3, figs 32–34.
O. cyclops: Macken, 1958, p. 104.
O. cyclops: Gordon, 1967, p. 53, fig. 18.

MATERIAL EXAMINED: Fragments of encrusting colonies from sta. 24, 38 fm and sta. 31, 22 fm.

Family CRIBRILINIDAE Hincks, 1880

Genus *Figularia* Jullien, 1886

Brown (1952, p. 67) has pointed out the close relationship between *Figularia huttoni* Brown, 1952 and *Valdemunitella pyrula* (Hincks, 1881) (ref.: Hincks, 1881a).

Figularia huttoni Brown, 1952. FIG. 2

F. huttoni Brown, 1952, pp. 183–5, figs 126–128.

MATERIAL EXAMINED: A colony encrusting a brachiopod shell, from sta. 37, 30 fm.

REMARKS: The specimen is assigned to this species although it does not fit the original description exactly.

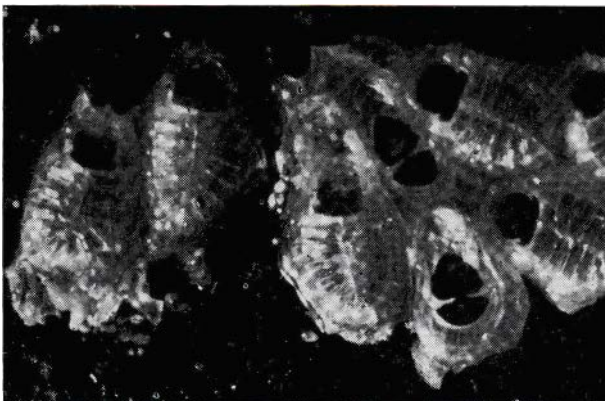


FIG. 2. *Figularia huttoni* Brown, 1952, with avicularia. $\times 47$.

There are two pairs of small spine bases on the distal margin of the orifice of non-ovicelled zooecia instead of one pair. The frontal does not possess a median ridge. The slits between the costae are very narrow and there are usually only six pairs of costae with a proximal single median costa although up to eight pairs do occur. The angle between the distal and proximal parts of the orifice is not as acute as a right angle.

Figularia mernae n. sp. FIG. 3

DESCRIPTION

Zoarium encrusting. Zooecia separated by shallow grooves. Gymnocyst slightly convex, smooth, hyaline, extensive, forming a third to a half of the frontal proximally and about a quarter of its width on either side of the costate area. Six to nine pairs of smooth flat costae, contiguous or leaving very narrow lacunae, butted together in the midline either without forming a ridge, or with only a very slight one. Each costa usually possessing a small, single, round pelmata close to the midline of the zooecium. The proximal lip of the orifice formed by the distal pair of costae, broadly and deeply sinuate. The poster half the length of the anter. The anter widening distally and about as wide as the orifice is long. The margin of the anter inturred proximally to form a pair of small condyles. The poster slightly shallower in ovicelled zooecia; the anter that is formed by the lip of the ovicell a little smaller and arched somewhat frontally. No oral spines. The operculum delicate with a slightly thickened margin, that part covering the poster is elevated at an angle to the distal part. The interzooecial avicularia

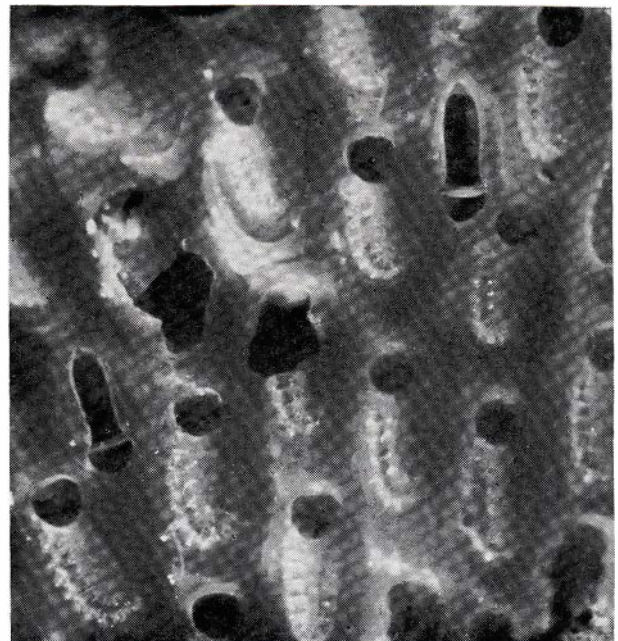


FIG. 3. *Figularia mernae* n. sp., with avicularia. $\times 47$.

are about three-quarters as long as the zooecia. The distally directed mandible is four times as long as wide and sword-shaped, widening very slightly to about two-thirds of the way along its length and then curving rapidly to a point. The distal opesium the same shape as the mandible, with no basal shelf; the pivot complete; and the proximal opesium semicircular and slightly wider than the mandible. The hyperstomial ovicell longer than wide and extending distally over two-thirds of the front of the distal zooecium. A low median ridge running the length of the ovicell, proximally expanding into a transverse ridge thickening the lip of the ovicell.

MATERIAL EXAMINED: A colony encrusting a fragment of shell from sta. 3, 41 fm. A small colony encrusting a colony of *Arachmopusia unicornis* from sta. 24, 38 fm. A colony with ovicells encrusting a fragment of eroded bryozoan (*Harmerella hastigera*) from sta. 24, 38 fm.

REMARKS: The present species is near *Figularia triangula* Powell, 1967 in the shape of the orifice and width of the gymnocyst. However, there are small pelmata present which *F. triangula* lacks, and the ovicells show no sign of transverse fenestra.

HOLOTYPE: Canterbury Museum, zb181.

LOCALITY: Sta. 3, Mernoo Bank, 43° 10.1' S, 175° 36.5' E, 41 fm; coarse bryozoan shell sand.

PARATYPES: NZOI, P151; NZOI, P152 (colony with ovicells).

Family CHAPERIIDAE Jullien, 1888

Although Harmer (1957) adopted the name *Chaperiella* Strand, 1928 in place of *Chaperia* Jullien, 1881, and renamed the family the Chaperiellidae on the grounds that *Chaperia* was preoccupied, Brown (1952) pointed out that Munier-Chalmas, 1873, who originally published the name *Chaperia*, gave no indication. Brown retained the name *Chaperia* (fam. Chaperiidae), and he has been followed here.

This family is represented in the collection by several interesting species.

There are four species, believed not to have been described before, which bear some form of shield over the opesium. The genus *Chaperiopsis* Uttley, 1949 contains many species and these "shielded chaperia's" are so distinctive it was decided to assign them to three new genera, each distinguished by the type of shield. These three genera are of particular interest in that they show how avicularia may have been incorporated in the frontal of certain ascophoran families, something which is not shown by the groups such as the Cribrilinidae that are nevertheless supposedly transitional between the Anasca and Ascophora. The genus *Scutochaperia* may

well have evolved from a species close to *Chaperiopsis spiculata* Uttley, 1949, the single elevated proximal avicularia of which bears short spines projecting over the opesium.

Characters which typify the family but may not all be present in a genus include the occlusor-lamina, the small distal avicularium, the ectooecial arch or rib, and the oral lip and spines.

Genus *Chaperia* Jullien, 1881

Chaperia acanthina (Lamouroux, 1825)

Flustra acanthina Lamouroux, 1825, p. 605, pl. 89, figs 1, 2.
Chaperia acanthina: Brown, 1952, pp. 95-7, fig. 45 (cum. syn.).
C. acanthina: Gordon, 1967, p. 67, fig. 14.

MATERIAL EXAMINED: Four small colonies encrusting pelecypod shells, from sta. 3, 41 fm. Three small colonies encrusting pelecypod shells and one colony encrusting a soft bodied animal now dried, from sta. 24, 38 fm. One colony encrusting a pelecypod shell, from sta. 49, shore collection.

Genus *Chaperiopsis* Uttley, 1949

Chaperiopsis cristata (Busk, 1884)

Membranipora galeata: Busk, 1879, p. 195.
Amphiblestrum cristatum Busk, 1884, p. 65, pl. 15, figs I, Ib-d (not Ia).
Chaperia sp. cf. *cristata*: Brown, 1952, pp. 101-2, fig. 49.

MATERIAL EXAMINED: One small colony encrusting a fragment of the retopore *Hippellozoon novaezelandiae*, and also one small colony with some opercula, spines, and pedunculate avicularia intact, from sta. 24, 38 fm. Several eroded colonies encrusting fragments of erect cyclostomes are possibly this species, from sta. 3, 41 fm.

REMARKS: The proximal margin of the wide opesi is almost straight. The occlusor-lamina extend under this proximal margin and may turn in at right angles to meet the lateral walls; they join distally via a narrow arched shelf. Non-ovicelled zooecia usually have six and sometimes have four bases for the articulation of spines or pedunculate avicularia in their distal margin. Usually either or both of the proximal pair bear narrow trumpet-like avicularia. Two pairs of bases could usually be distinguished proximal to the ovicell. On the proximal gymnocyst there is usually a spreading chamber with a frontal perforation, the base of a pedunculate avicularium. On a few zooecia this chamber is replaced by a stalwart, turreted, transversely-directed avicularium. The ovicell is globular and elevated. The ectooecium forms a pyramidal chamber on the summit of the ovicell, the proximal side of which is open and may have been the site of an avicularium. The entoecium is little exposed above the vertical opening of the ovicell.

Chaperiopsis spiculata Uttley, 1949

C. spiculata Uttley, 1949, p. 188, pl. XXXV, figs 1, 2.

MATERIAL EXAMINED: Three colonies encrusting *Harmerella hastigera* nodules, from sta. 3, 41 fm.

REMARKS: The dried colonies still retaining their soft parts are purple.

Genus **Scutochaperia*** n. gen.

Chaperiidae having an avicularium-bearing shield broadly based on the proximal gymnocyst and extending over the opesium, with a toothed distal margin. The shield attached to the zooecium only at its base. Type Species: *Scutochaperia serrata* n. sp.

The two forms represented here (*Scutochaperia serrata* and *S. serrata biporosa*) are very similar and both lack the small distal avicularium characteristic of many other members of the family.

Scutochaperia serrata n. sp. FIG. 4

DESCRIPTION

Zoarium encrusting. Zooecia sub-hexagonal to pyriform separated by distinct grooves. Gymnocyst proximally smooth and convex, covering about half the zooecium; extending laterally on either side of the opesium as a narrow vertical wall. Opesium oval and a little constricted distally by a pair of spine bases on either side of the oral lip. Cryptocyst vertical and lightly and finely granulated, it rises distally to the spine bases. Distal lip thickened, convex, reflected distally, and granular in non-ovicelled zooecia, but smooth and concave in ovicelled zooecia. Frontal membrane thin and pale and the operculum slightly thickened along its margin. A shield arising from a wide base on the gymnocyst over the proximal margin of the opesium and extending distally about half the length of the opesium. The ocluser-lamina, both laterally and distally, clearly visible from above. The lateral extensions may be somewhat sinuate and the distal portion somewhat straightened. They extend by a third the length of the opesium. In the centre of the shield an avicularium which has a proximally directed mandible elevated often more than 45°. The mandible of the avicularium about one and a half times as long as wide; condyles wanting or inconspicuous; the proximal opesium semicircular with a granular cryptocyst. The chamber of the avicularium communicating with the zooecium via a single pore chamber equipped with a pore plate in the gymnocyst, when there is no ovicell, extending forward from the proximal zooecium, and by a pair of pore chambers



FIG. 4. *Scutochaperia serrata* n. sp., with ovicells. $\times 47$.

when there is such an ovicell. Distal to the avicularium, the shield spreading out as a fan of several to 15 irregularly disposed spines. Usually only a single pair of distal spines and these about the height of the ovicell, narrow, somewhat flattened, and curved inwards a little from the vertical. Ovicell globular and anchored to the spine bases proximally. Opening of the ovicell closed by its own operculum. Rim of the orifice arching frontally and when viewed from the side, curving somewhat distally. A prominent ridge formed by the ectooecium arising just behind the large oral spines and traversing the summit of the ovicell.

MATERIAL EXAMINED: A large colony encrusting fragments of a pelecypod shell from sta. 3, 41 fm.

REMARKS: *S. serrata* is very similar to *S. serrata* subsp. *biporosa* but in the latter the cryptocyst is more coarsely granular, there are four distal spine bases instead of two, the shield is more fully developed, curving back on either side to form the pair of pores, when viewed from above, which gives this variety its name, and the mandible of the avicularia is not quite as elevated.

HOLOTYPE: Canterbury Museum, zb182.

LOCALITY: Sta. 3, Mernoo Bank, 43° 10.1' S, 175° 36.5' E, 41 fm; coarse bryozoan shell sand.

PARATYPE: NZOI, P153.

* From *scutum* (Latin) shield.

Scutochaperia serrata biporosa n. subsp. FIG. 5

DESCRIPTION

Zoarium probably encrusting. Zooecia subhexagonal to pyriform, separated by distinct grooves. A smooth convex gymnocyst covering the proximal third to one half of the zooecium leaving a pyriform opesium widest proximally. The gymnocyst embracing the opesium as a narrow vertical wall. The cryptocyst narrow and almost vertical, rising considerably distally to the thickened arched oral lip which is reflected outwards. A spine base on each side of this arched lip and two more spine bases over which the lip protrudes. A broadly based avicularium-bearing shield extending over the opesium for three-quarters of its length and bearing about 10 short, blunt, usually bifid, spines. Proximo-lateral spines curving proximally to form a circular opening on either side of the origin of the process. A shelf, the occlusor-lamina, arising in the lateral walls below the middle of the opesium and curving smoothly round beneath the distal lip: it is widest distally and lies at about the level of the bottom of the interzooecial grooves. Mandible of the avicularium triangular, about twice as long as wide, and elevated about 30°; the condyles inconspicuous. The chamber of the avicularium communicating with the inside of the zooecium through a single pore (equipped with pore plate) in the gymnocyst when there is no ovicell on the proximal zooecium. When there is an ovicell there are a pair of communication pores.

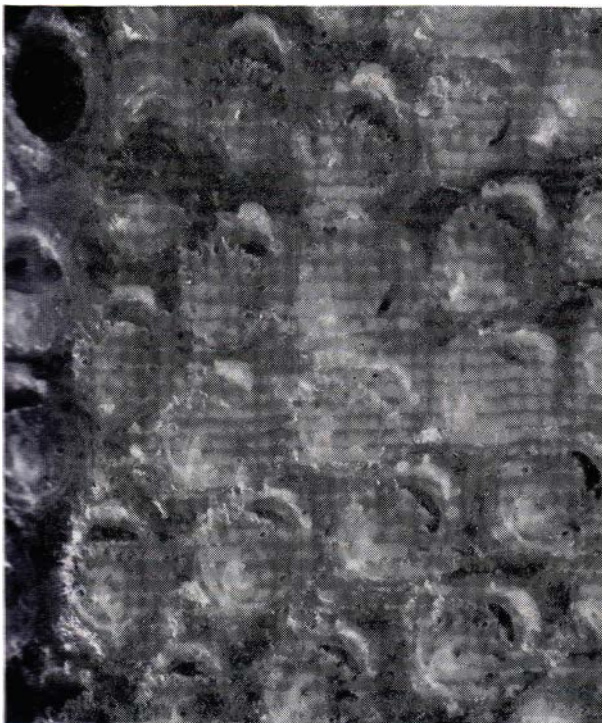


FIG. 5. *Scutochaperia serrata biporosa* n. subsp., ovicell top left.

MATERIAL EXAMINED: A small fragment of a colony with one ovicell, the basal surface of which looks as though it had been attached to a flat surface, and a small, poorly preserved colony from sta. 24, 38 fm.

REMARKS: The distinction between this variety and the preceding one has already been made. The two varieties are very much alike and further material is required to examine their relationship.

HOLOTYPE: Canterbury Museum, zb183.

LOCALITY: Sta. 24, south of The Sisters, 43° 36.2' S, 176° 48.5' W, 38 fm; coarse shell sand gravel.

PARATYPE: NZOI, P154.

Genus Clipeochaperia* n. gen.

Chaperiidae having a frontal shield formed by two to four avicularium-bearing processes based on the proximal gymnocyst and extending over the opesium to fuse with the most proximal pair of oral spines. The processes forming the shield separated by perforations. Oral spines forming a rounded arch over the operculum.

Type species: *Clipeochaperia funda* n. sp.

One species, *Clipeochaperia funda* n. sp., is represented in the collection. *Hiantopora halli* MacGillivray, 1895 is also assigned to this genus.

Clipeochaperia funda† n. sp. FIG. 6

DESCRIPTION

Zoarium encrusting; zooecia quincunx, hexagonal to elliptical, only a little longer than broad. Lateral walls of zooecia of moderate height, distal wall elevated, and distal lip transverse, little curved, overhanging the opesia, rounded, and with longitudinal grooves. Two thin spines in the distal wall directed distally and upwards (these may be elongate spine bases since their ends are open). A small distally directed avicularium lying between and below these spines. This avicularium may be replaced by an ovicell which extends forward over the distal zooecium. Gymnocyst limited to narrow vertical, lateral walls, and a narrow proximal shelf. Cryptocyst smooth, narrow, and sloping steeply. A weakly developed occlusor-lamina arising two-thirds of the way along the lateral walls from the proximal end and forming a smooth curve. It is obscured from above by the oral lip. It appears to be formed by an inpocketing of the lateral and distal walls. Rims of the lateral walls thin, rising distally to the oral lip. Where they meet the oral lip two flattened hollow spines rise; the spines, at first vertical, bend over and widen out, their ends meeting or overlapping to

*From *clipeus* (Latin) shield.

†From *funda* (Latin) a net (referring to the appearance of the surface of a zoarium).

form an arch over the orifice, just obscuring the oral lip. Frontal shield apparently formed basically from three flattened avicularium-bearing processes arising from wide bases on the gymnocyst. These processes extending over the opesium to the oral arch with which they fuse. Central process cross-connected with the lateral processes by stout bars which leave two rows of three or four pores. Occasionally the central process replaced by two processes each bearing an avicularium in which case there are three rows of pores. Between the lateral processes and the lateral wall of the zooecium a single, descending, solid plate leaving two openings.

All the avicularia similar in shape, having a triangular rostrum about twice as long as it is wide, barely perceptible condyles, and a semicircular proximal opesium. Distal avicularium slightly smaller than the frontal avicularium, and occasionally within the colony but more often at the edges, are large interzoecial avicularia mounted turret-like on a hexagonal chamber and directed distally. Median frontal avicularia directed proximally and the lateral frontal avicularia, nearer the orifice than the median one, directed proximo-laterally. The lateral-frontal avicularia may be connected solidly with the oral arches of the proximo-lateral zooecia, giving rise to a characteristic pattern on the surface of the colony. This cross-connection may in some cases be completely absent. Ovicell thin-walled imperforate and opening widely over the distal lip; and anchored to the

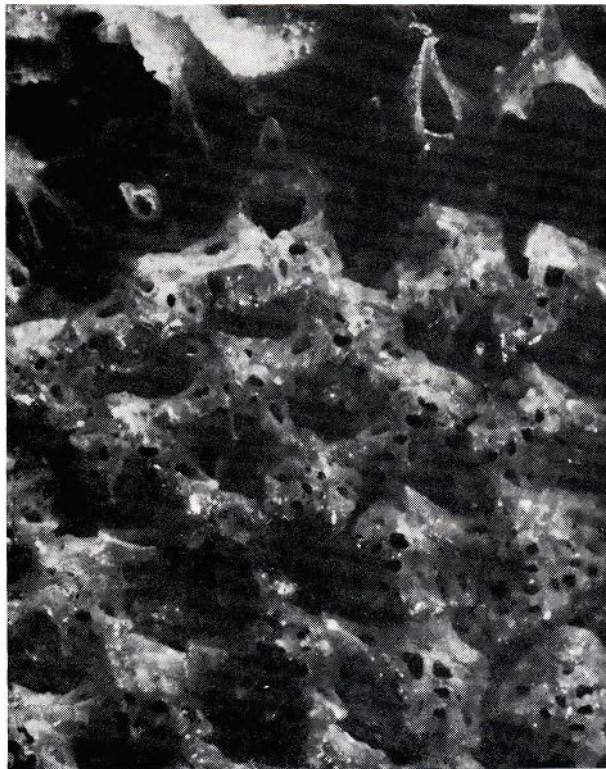


FIG. 6. *Clipeochaperia funda* n. sp., ovicells and marginal avicularia present. $\times 47$.

spine bases on either side of the oral lip, the other two distal spines standing lightly against it on either side. A rib originating on either side between the spines, arching over the summit of the ovicell. This rib may be hollow and is formed by the ectooecium.

MATERIAL EXAMINED: Eighteen fragments, four of which are encrusting pelecypod shells and none of which possess soft parts, from sta. 24, 38 fm.

REMARKS: This species clearly belongs to the family Chaperiidae—the oral lip, two pairs of oral spines, distal avicularium, and ribbed ovicell characteristic of this family. An occlusor-lamina is also present although weakly developed.

Hiantopora halli MacGillivray, 1895, pp. 61–62, pl. VIII, figs 25a, b, c, may be referred to this genus. MacGillivray's specimen came from Muddy Creek, Victoria, Australia, a Tertiary locality. *C. halli* has only two avicularium-bearing processes making up the frontal shield, and the ends of the pair of distal spines which make up the oral arch appear to be exposed. It resembles the present species in having a small distal avicularium, a ribbed ovicell with a thin projecting spine base on either side, and a cross-connection between the latero-frontal avicularia and the oral arch of the proximo-lateral zooecium. MacGillivray's figure shows complete pivot bars in the avicularia, a feature which is not characteristic of the Chaperiidae.

HOLOTYPE: Canterbury Museum, zb184.

LOCALITY: Sta. 24, south of The Sisters, 43° 36.2' S, 176° 48.5' W, 38 fm; coarse shell sand gravel.

PARATYPES: NZOI, P155; NZOI, P156.

Genus *Parmachaperia** n. gen.

Chaperiidae with a frontal shield formed by one or two avicularium-bearing processes arising from the proximal gymnocyst and fusing with and terminating between the most proximal pair of oral spines.

Type Species: *Parmachaperia chathamensis* n. sp.

The one species in the collection, *Parmachaperia chathamensis*, may have a flustrine habit.

***Parmachaperia chathamensis* n. sp.** *Frontispiece* and FIG. 7

DESCRIPTION

Zoarium free, erect, frondose; fronds somewhat elongated, bilamellar, flat and rather narrow; zooecia in quincunx with the central row vertically on a frond and those on either side directed more and more laterally the further they are from the mid-line. Zooecia elongate-oval to somewhat irregular in shape. Walls high. A

*From *parma* (Latin) a shield.

narrow, smooth, convex, proximal gymnocyst extending laterally along the sides. Distal wall considerably elevated, its edge thickened, rounded, and bearing longitudinal grooves. Below this oral lip two distally directed spines and below them a small, median, distally directed avicularium which may be replaced by an ovicell that extends forwards over the distal zoecium. From the proximal end of the opesium on either side, the gymnocyst rising as thin vertical walls increasing in height to join the transverse oral lip. A narrow cryptocyst, with faintly granular surface and faintly serrated edge, widest proximally and disappearing laterally towards the distal end of the opesium. Occlusor-lamina below the level of the cryptocyst, horizontal, narrow, rounded, most pronounced distally, and tapering out along the sides. From either end of the oral lip, two thick flattened spines arising. These paddle-like spines curving fronto-distally and perforated at their tips. Opesium covered by one or two avicularium-bearing plates which arch over it from the proximal gymnocyst. There are two plates when there is an ovicell on the proximal zoecium and a single plate when there is no ovicell. Plates with bevelled solid entire edges and a hollow chamber extending from the avicularium to the gymnocyst. Chamber communicating with the cavity of the zoecium via a pore plate in the gymnocyst, and when there is a single plate, extending distally to terminate between and fuse with the large oral spines, its distal edge straight. When there are two plates, a triangular space between them and distal to the ovicell; one of these plates fuses to the other which then extends forwards to fuse with the oral spines. In either case the shield obscuring the oral lip when viewed vertically. Two elongate lateral openings on either side of the frontal shield between the large oral spines and the origin of the shield.

The median distal avicularium with a triangular mandible twice as long as wide, with small condyles and a semicircular beaded margin to the proximal opesia; with a rostrum sloping slightly downward. Avicularia on the frontal shield similar in size and shape to the distal avicularium but directed proximally and having their rostra considerably elevated. The margin of the cryptocyst of these avicularia may bear a few serrations. Along the margins of the colony may occur heterozooecia similar in size to the autozoecia or smaller and bearing a similar small distal avicularium usually turned, somewhat laterally. Heterozooecia possessing no oral spines or oral lip; a reduced opesium having a coarsely granular margin and bearing a large distally directed avicularium arises proximally on the wide gymnocyst but extends distally beside the opesium that leans against and is partially fused to the shield of the adjacent zoecium.

Avicularium raised. The cryptocyst bordering the semicircular proximal opesium wide and granular, the rostrum rather narrow, almost parallel-sided, and with a tip that may curve downward, be straight, or be slightly hooked up. Avicularium not quite as long as the opesium of an autozoecium. Ovicell large, rounded, slightly

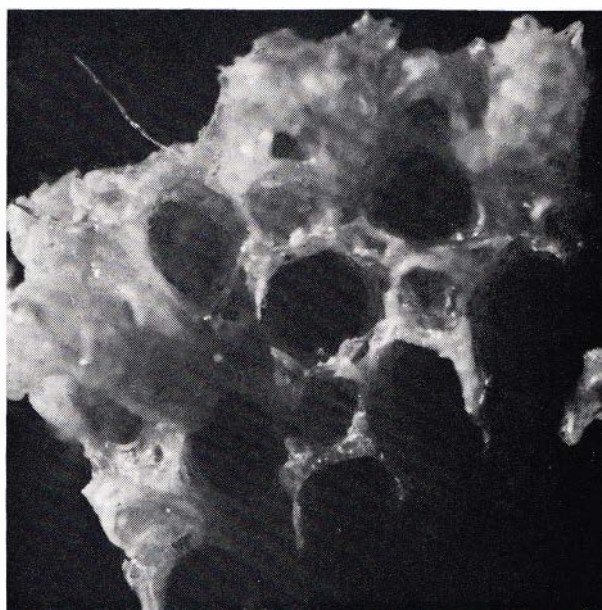


FIG. 7. *Parmachaperia chathamensis* n. sp., frontal shield removed to show occlusor-lamina. $\times 47$.

elongated, opening broadly over the distal lip; imperforate, and bearing two narrow conspicuous ridges which arise just distal to the large oral spines and together arch over the summit of the ovicell. In some cases the ridges are only separated at the summit of the ovicell. Ectoecium covering both the frontal and distal surfaces of the ovicell but with the entoecium exposed between the ridges. Ancestrula with an oval opesium—a narrow gymnocyst without proximal avicularium-bearing processes. A narrow vertical cryptocyst slightly elevated at one end and four small perforations evenly spaced outside the other end of the opesium. Ancestrula in the same plane as the colony.

MATERIAL EXAMINED: Two fragments from sta. 5, 300+ fm.

REMARKS: The material at hand comprises two small fragments each cemented by one surface onto separate slides. As far as can be seen they are unilaminar. Notes with a diagram apparently of this species by the senior author read: "Zoarium free erect, frondose, fronds somewhat elongated bilamellar, flat rather narrow." Without further material this part of the description must be treated as tentative especially as what is assumed to be an ancestrula is in the same plane as the colony and there are no rhizoids in its vicinity.

HOLOTYPE: Canterbury Museum, zb185.

LOCALITY: Sta. 5, Chatham Rise, 43° 32' S, 178° 38' E, 300+ fm; fine green sand.

PARATYPE: NZOI, P157.

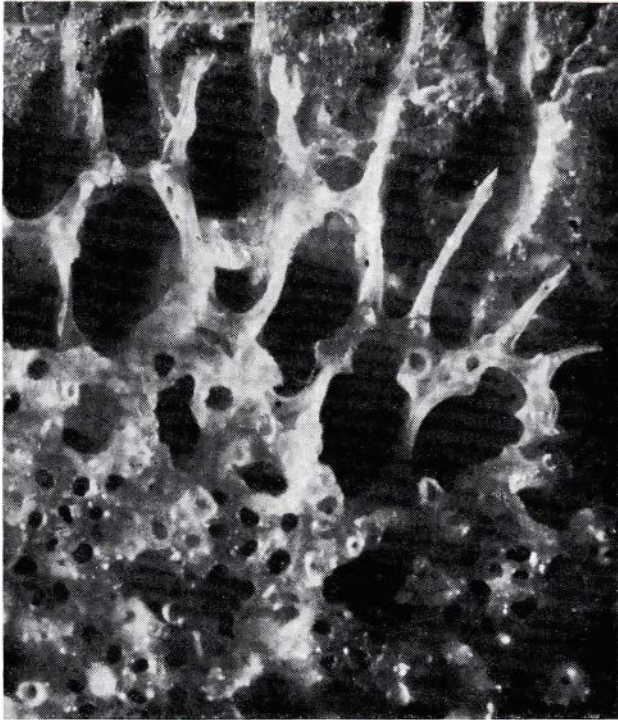


FIG. 8. *Arachnopusia unicornis* (Hutton, 1873), formation of oral arch. $\times 47$.

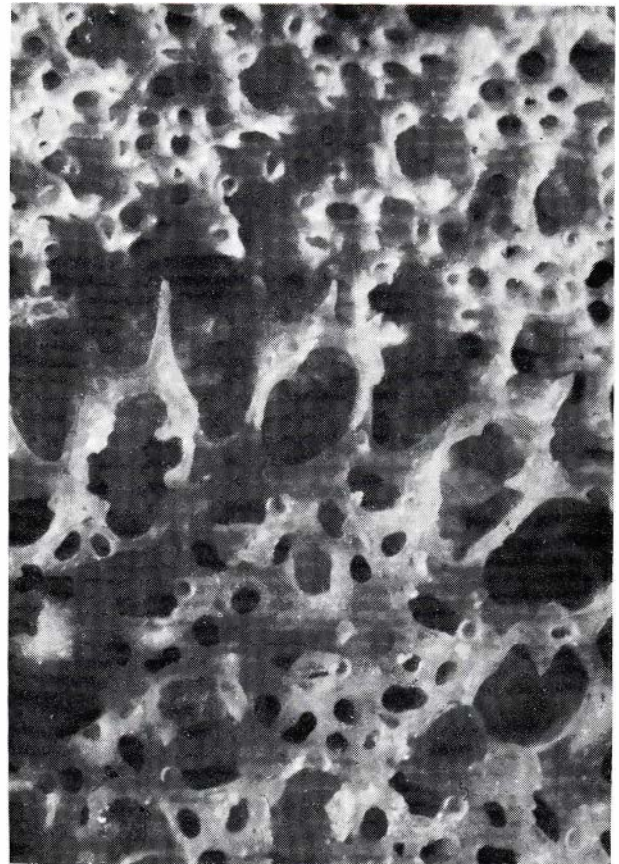


FIG. 9. *Arachnopusia unicornis* (Hutton, 1873), zoecial variation. $\times 47$.

Family ARACHNOPUSIIDAE Jullien, 1888

In FIG. 8 an early stage in the development of a zooecium of *Arachnopusia unicornis* is shown. The rounded transverse oral lip between the hollow bases of the ascending processes of the orifice, and the two distally directed spine bases outside the oral lip, are considered to be characteristic features of this family. In the formation of the frontal shield the ascending processes of the oral arch unite at an early stage.

These structures appear to be homologous with the corresponding structures in species belonging to the family Chaperiidae. Furthermore, the arrangement of the frontal avicularia in the new species *A. quadrilabia* is like the arrangement of the frontal avicularia of *Clipeochaperia funda*.

Other similarities between the shielded chaperias and the Arachnopusiidae are the nature of the ovicell with its proximally exposed entoecium and separate operculum (Brown, 1952) and the way the frontal shield arches up over the frontal membrane from a proximal gymnocyst.

Genus *Arachnopusia* Jullien, 1888

Arachnopusia unicornis (Hutton, 1873) FIG. 9

Eschara unicornis Hutton, 1873, p. 99.

Arachnopusia unicornis: Brown, 1952, pp. 175–9, figs 120–121.

A. unicornis: Brown, 1954a, p. 424.

A. unicornis: Macken, 1958, p. 104.

MATERIAL EXAMINED: Several fragments from sta. 3, 41 fm and sta. 24, 38 fm; 1 fragment from sta. 37, 30 fm.

REMARKS: This species is subject to a rather bewildering variation in general appearance. The material in the collection shows the following features.

Size: The zooecia and orifice vary in size.

Frontal Shield: The number of perforations varies considerably, the number not necessarily depending on the age of the zooecia. Cross bridging appears to take place after formation of the shield, multiplying the number of pores and decreasing their size, and secondary calcification also decreases pore size as well as changing the appearance of the orifice. The distal margin of the frontal shield is usually turned up as a solid triangular process bearing one of the small avicularia on its front directed distally. Sometimes the distal margin is straight.

Orifice: This is square and almost vertical. A denticle directed inwards on one ascending process and a spine base in the opposite process are constant features. The oral lip is longitudinally grooved,

mildly convex proximally, and not concealed by the frontal shield. In immature zoecia at the growing edge, two additional oral spine bases are present one on either side below the oral lip, and are directed distally.

Ovicell: The margin of the ectooecium is removed slightly from the edge of the entooecium by a broadly triangular incursion.

Avicularia: *Small*. These are numerous, with one on the frontal shield and several in the vicinity of the orifice or ovicell. They have a triangular mandible, inconspicuous condyles, and a proximal semi-circular opesium. *Large*. These have either a broadly triangular or an elongated mandible about twice as long as wide, with a complete pivot. The proximal opesia are narrowly transverse. They are usually found at the proximal end of a zoecium often over an ovicell, and directed proximally or proximo-laterally. *Marginal*. Rarely, a large interzoecial avicularium is found at the margin of a colony; it is then directed distally, has a broadly triangular elevated mandible, and lacks a complete pivot bar.

An example of a difference in general appearance of the zoecia in two different parts of a small colony is illustrated in Fig. 9. It is not known why this difference occurs but it may be due to a seasonal change in growth.

Archnopusia quadralabia n. sp. FIG. 10

DESCRIPTION

Zoarium encrusting; zoecia rectangular to elliptical, not separated by grooves and ridges. Frontal, convex in young zoecia; irregularly perforated by about three to eight small to large pores; thick. A thickened and imperforate area below the orifice bearing a low rounded umbo, the frontal usually extended over the orifice as a trapezoidal process which is about a quarter to a third the length of the orifice. Orifice rectangular, directed obliquely downward, wider than long; oral shelf beaded and when viewed from above, arching into the orifice below the trapezoidal process. Distal to the orifice a shallow groove representing the gymnocyst of the succeeding zoecium, the frontal shield of that zoecium rising steeply beyond the groove. Just below the dorsal lip of the orifice three spine bases, not elevated above the surface, may have spines incorporated in the proximal rising portion of the distal zoecium. The spines themselves tubular and a little longer than the length of the zoecium. Fourth spine base placed on one side or other of the orifice on the distal surface of the ascending process that is somewhat elevated in older zoecia. Margin of the opesium formed by a thin, barely perceptible cryptocyst which reaches the orifice just in front of the oral lip. Inner surface of the frontal shield arching over the frontal membrane. Suboral avicularium small, dagger-shaped, and directed distally; its pivot incomplete. Similar avicularia, one on either side of the mucro but

so far laterally as to overlap the adjacent zoecia, directed proximally and laterally. Usually a similar avicularium directed vertically on the ascending process of the orifice opposite the spine base. Mandible of these avicularia only a little longer than the proximal opesium. Avicularia half as long as the width of the orifice. Occasionally a large avicularium having a broadly triangular, steeply elevated mandible with a narrow transverse proximal opesium situated proximally on the frontal shield, often above an ovicell and directed proximally or proximo-laterally. This avicularium may sometimes resemble the small avicularia in shape. Some variation in the distribution of the avicularia. Ovicell opening widely above the oral shelf, and covered by the frontal shield of the distal zoecium but sometimes exposing the thin proximal edge; double-walled, the entooecium being a little exposed proximally. Ovicell extending under this shield for a little more than a third of its length causing a slight hump.

MATERIAL EXAMINED: Several fragments, some encrusting pelecypod shells, from sta. 24, 38 fm.

REMARKS: Some variation occurs in the size of the zoecia and extent of calcification.

Perhaps the most important distinguishing character of this species is the small, vertically directed avicularium

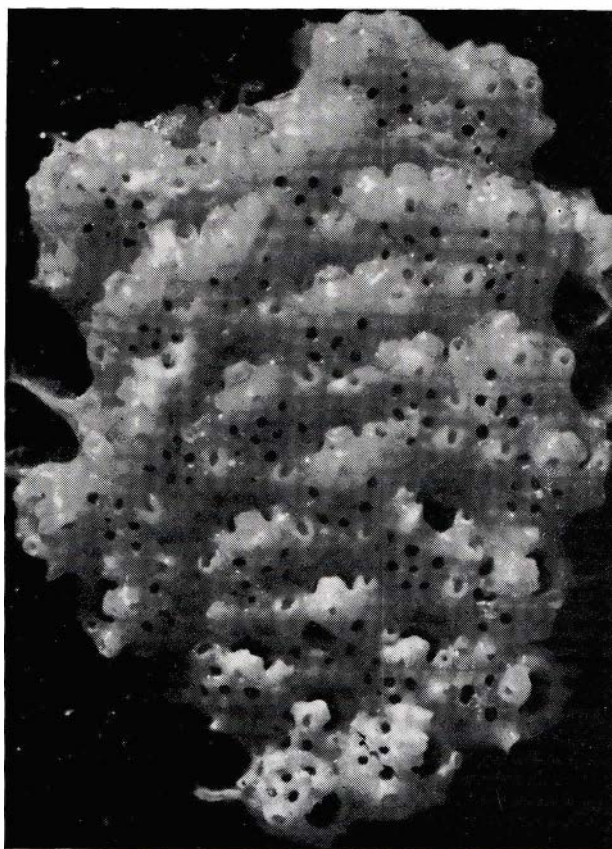


FIG. 10. *Archnopusia quadralabia* n. sp. $\times 47$.

on one of the ascending processes of the orifice. This avicularium is replaced by a denticle in *A. unicornis* and *A. monoceros*.

HOLOTYPE: Canterbury Museum, zbl86.

LOCALITY: Sta. 24 south of The Sisters, 43° 36.2' S, 176° 48.5' W, 38 fm; coarse shell sand gravel.

PARATYPES; NZOI, P158; NZOI, P159.

Arachnopusia perforata (Maplestone, 1909) FIG. 11

Hiantopora perforata Maplestone, 1909, pp. 271–2, pl. 78, fig. 9.

MATERIAL EXAMINED: Three multilaminate fragments from sta. 29, 94 fm. One colony encrusting a shell, from sta. 3, 41 fm.

REMARKS: The present specimens are consistently different from *A. unicornis*. They have many more perforations in the frontal shield in both marginal and old zooecia, and a long strap-like avicularium that is up to four times as long as wide. The avicularium also has a delicate complete pivot and is directed proximally or laterally on the proximal part of the frontal shield of some zooecia often over an ovicell.

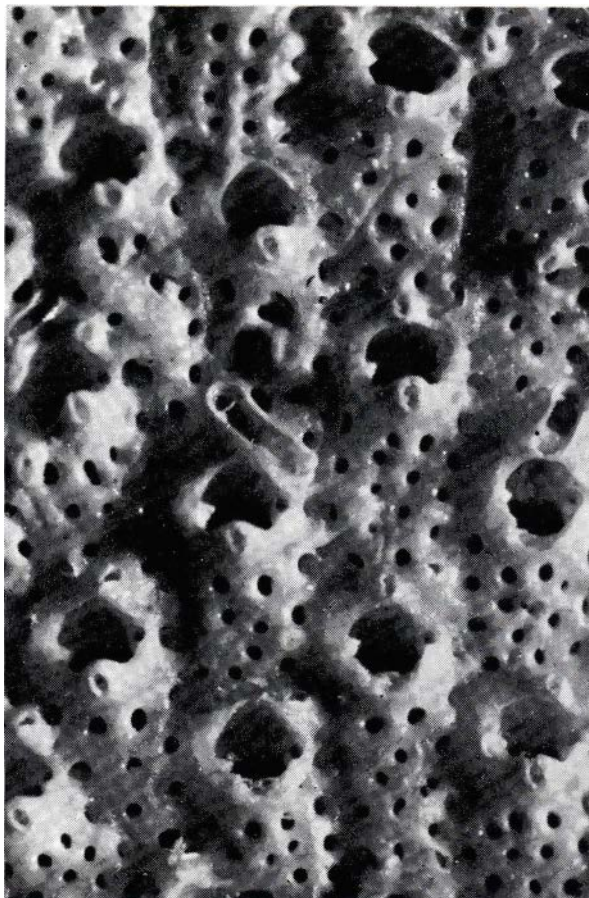


FIG. 11. *Arachnopusia perforata* (Maplestone, 1909). Note regular perforations and strap-like avicularia. $\times 47$.

Family MICROPORIDAE Hincks, 1880

Genus *Micropora* Gray, 1848

Micropora coriacea (Johnston, 1847)

Flustra coriacea Johnston, 1847, p. 348, pl. 56, fig. 8.
Micropora coriacea: Brown, 1952, pp. 126–9, fig. 74.

MATERIAL EXAMINED: Colonies encrusting shells from the following stations: sta. 1, 100 fm; sta. 3, 41 fm; sta. 24, 38 fm.

REMARKS: Livingstone (1929: p. 61) separates *M. mortenseni* from other species of *Micropora* on the basis of lunate opesiules. The material in the collection also has lunate opesiules but corresponds to *M. coriacea*. Livingstone's material is probably this species.

Only two avicularia were discovered in the material. They are situated on the proximal surface of the frontal, have a semicircular proximal opesium and a mandible in the shape of an equilateral triangle directed distolaterally and about the same length as the orifice of a zooecium without an ovicell.

Family THALAMOPORELLIDAE Levinsen, 1902

Genus *Opaeophora* Brown, 1948

Opaeophora gracilis Uttley, 1949

O. gracilis Uttley, 1949, pp. 174–5, pl. 36, fig. 2.

MATERIAL EXAMINED: Three colonies, one encrusting a stone and one encrusting a pelecypod shell, from sta. 24, 38 fm.

REMARKS: Apart from its delicate construction, perhaps the most obvious feature which distinguishes this species from *O. lepida* is the small size of the avicularium and its position distal to the zooecium.

Opaeophora lepida (Hincks, 1881)

Haploporella lepida Hincks, 1881a, p. 11, pl. 2, fig. 2.
O. lepida: Brown, 1952, pp. 129–31, fig. 75.
O. lepida: Macken, 1958, p. 104.

MATERIAL EXAMINED: A small fragment of a colony from sta. 37, 30 fm; two fragments from sta. 24, 38 fm; one colony from sta. 3, 41 fm.

REMARKS: The avicularia of the material in the collection do not agree with Brown's (1952) description. The proximal opesia is triangular or U-shaped, widening towards the condyles, and not "... wide semicircular ...". The mandible is generally but not always curved to one side.

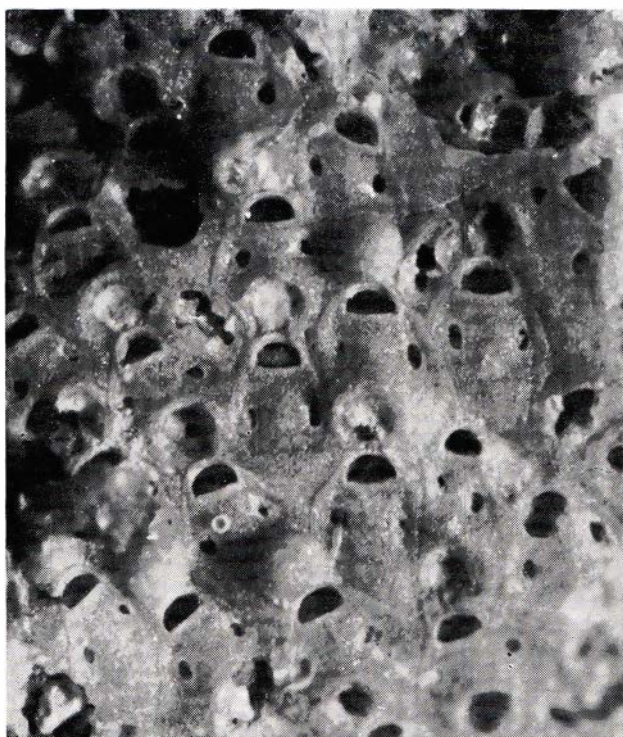


FIG. 12. *Opaeophora monopia* Brown, 1952, with avicularia and ovicells. $\times 47$.

***Opaeophora monopia* Brown, 1952** FIG. 12

O. lepida (Hincks) var. *monopia* Brown, 1952, pp. 131–2, fig. 76.

DESCRIPTION

Zoarium encrusting. Zoecia diamond-shaped, separated by fine grooves with lateral walls raised a little on either side of the groove. Frontal granular, faintly convex proximally, somewhat concave distally, the boundary between the two areas curving proximally from just beyond the lateral angles. Two conspicuous oval or D-shaped opesiules perforating the dished area near the lateral margins and about two-thirds of the way from the proximal end of the zoecium to the orifice. They are oriented in a proximo-distal direction. Orifice crescentic, about twice as wide as it is long. Proximal margin almost straight, being very slightly concave with the curve reversed at the corners to form slight incisions. The border of the primary orifice, at least distally, smooth and surrounded by a low granular peristome with the proximal margin raised above the frontal. A pair of small distal spine bases. Avicularium large and interzoecial; dagger-shaped; the mandible usually curved to one side. Proximal opesium U-shaped, the condyles transverse, raised, conspicuous. Mandible widening out rapidly towards the condyles. Rostrum continuing past the semicircular distal opesium. Ovicell conspicuous and globular, resting on the proximal surface of the distal zoecium and but little depressing it. Its surface granular and low, its arched orifice narrower than the orifice of the zoecium.

MATERIAL EXAMINED: One dead colony from sta. 3, 41 fm (Canterbury Museum no. zb203).

REMARKS: Although Brown (1952) regarded this form as a variety of *Opaeophora lepida* there appear to be sufficient grounds for raising it to specific rank.

In both Brown's material and in the present material there is only one pair of opesiules to each zoecium in the colony. The lower lip of the orifice in *O. monopia* is slightly sinuate; in *O. lepida* it is slightly convex. The lateral margins of the orifice of *O. lepida* in the material at hand curve inward a little to the proximal corners but they do not do this in *O. monopia*.

Family SELENARIIDAE Harmer, 1926

Genus *Selenaria* Busk, 1854

***Selenaria squamosa* Tenison-Woods, 1880**

S. squamosa Tenison-Woods, 1880, p. 29, figs 29A, B.

S. squamosa: Brown, 1952, pp. 145–8, figs 90–2.

S. squamosa: Macken, 1958, p. 104.

MATERIAL EXAMINED: One colony from sta. 29, 94 fm.

Family STEGANOPORELLIDAE Bassler, 1953

Genus *Steganoporella* Smitt, 1873

***Steganoporella neozelanica* (Busk) *magnifica* Harmer, 1900**

Membranipora magnilabris: Hutton, 1873, p. 96.

S. neozelanica (Busk) var. *magnifica* (Busk MS) Harmer, 1900, 260–4, pl. 12, fig. 5; pl. 13, fig. 26.

S. neozelanica (Busk) var. *magnifica*: Brown, 1952, pp. 123–5, figs 70–71.

MATERIAL EXAMINED: Several encrusting colonies all from sta. 24, 38 fm.

Family MACROPORIDAE Uttley, 1949

Genus *Macropora* MacGillivray, 1895

***Macropora grandis* (Hutton, 1873)**

Lepralia grandis Hutton, 1873, p. 98.

M. grandis: Brown, 1952, pp. 135–7, figs 78, 79.

M. grandis: Macken, 1958, p. 104.

MATERIAL EXAMINED: A multilaminar fragment and a colony encrusting a bryozoan nodule, neither with avicularia or ovicells, from sta. 3, 41 fm.

Family CELLARIIDAE Hincks, 1880

Genus *Cellaria* Ellis & Solander, 1786

Cellaria immersa (Tenison-Woods, 1880)

Salicornaria immersa Tenison-Woods, 1880, p. 27, fig. 27.
C. immersa: Brown, 1952, pp. 156–9, figs 104–107.
C. immersa: Macken, 1958, p. 104.

MATERIAL EXAMINED: Colonies from sta. 3, 41 fm.; sta. 24, 38 fm.; sta. 37, 30 fm.

Cellaria tenuirostris (Busk, 1852)

Salicornaria tenuirostris Busk, 1852, p. 17 (part). (Not pl. 63, fig. 4 = *S. bicornis* Busk, 1852a, p. 366.)
C. tenuirostris: Brown, 1952, pp. 159–61, figs 108–110.
C. tenuirostris: Macken, 1958, p. 104.

MATERIAL EXAMINED: Two small internodes each about 6 mm long from sta. 37, 30 fm.

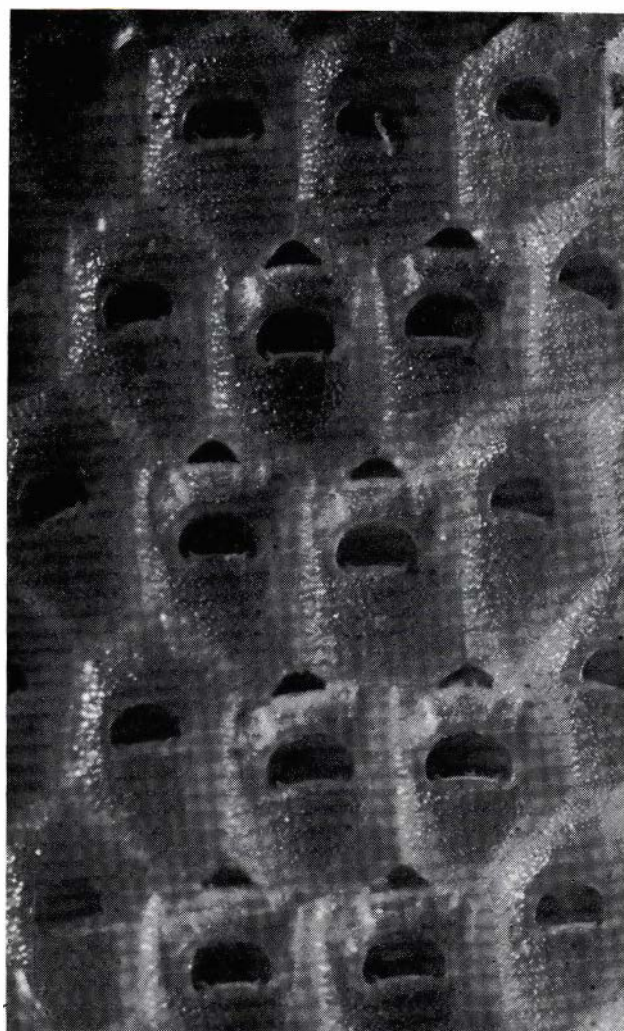


FIG. 13. *Melicerita knoxi* n. sp., fertile and infertile zooecia. $\times 47$.

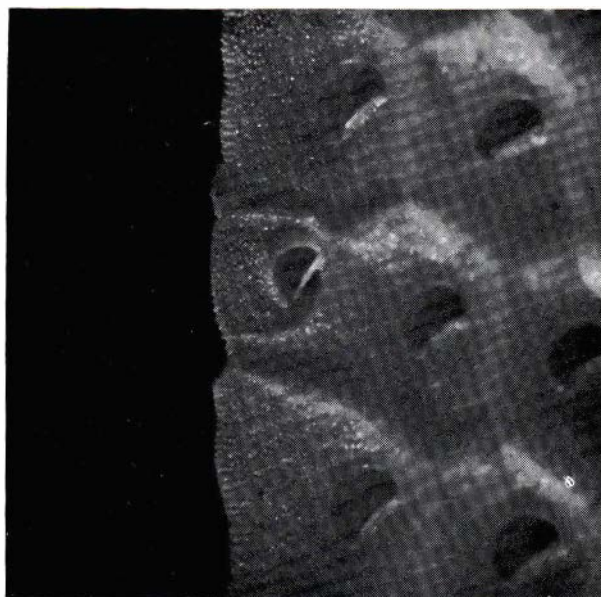


FIG. 14. *Melicerita knoxi* n. sp., avicularium. $\times 47$.

Genus *Melicerita* Milne-Edwards, 1836

*Melicerita knoxi** n. sp. FIGS 13, 14, 15

DESCRIPTION

Zoarium free, flattened, scimitar-shaped, widening distally, attached by rootlets. Zooecia hexagonal, slightly elongate, distinct. Faint narrow grooves separating the raised edges of the gymnocyst. In mature zooecia distal walls forming transverse shoulders on either side of the orifice of the ovicell. Cryptocyst finely tuberculate, sloping rather steeply distally and laterally to the orifice. Orifice large, semicircular, the proximal border straight between the condyles. A shallow sinus outside each condyle. Avicularia interzooecial, placed along the margins of the colony; mandible about three-quarters as wide and half as long as an operculum, pivot bar complete; proximal opesium small, transverse, its proximal border denticulate. Avicularium chamber smaller than a zooecium. Orifice of ovicell large, triangular, three-quarters the width of the orifice and half as long. The cryptocyst thickened slightly on either side between the orifice and the oeciopore; flat between these thickenings, but dipping into acute depressions on either side of the orifice. The orifice of the ovicell closed by an operculum with a slightly thickened distal margin.

MATERIAL EXAMINED: Six colonies from sta. 5, 300+ fm; one colony from sta. 59, 290 fm. (This is evidently a deep-water species.)

REMARKS: The course of calcification of ovicelled and non-ovicelled zooecia differs. In zooecia which will develop an ovicell the cryptocyst first forms a complete

*After Professor G. A. Knox, leader of the expedition.

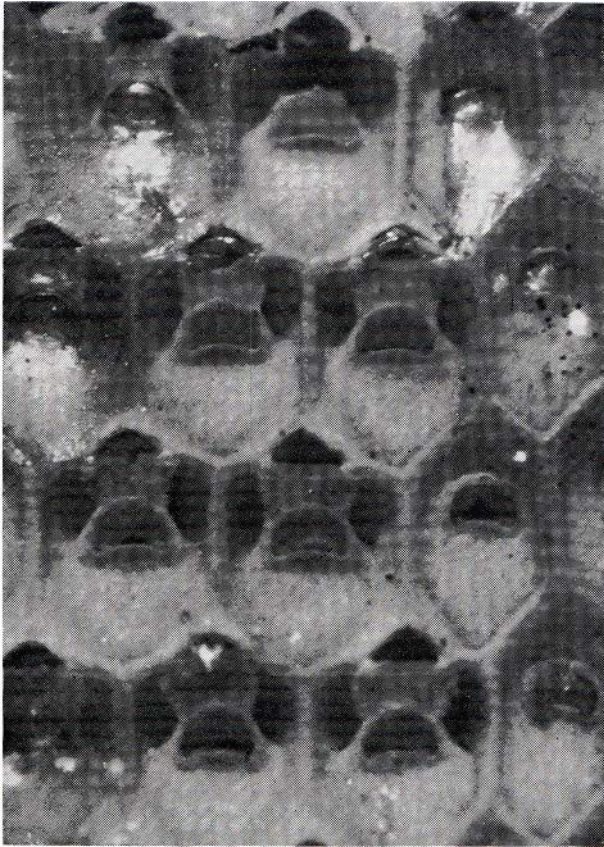


FIG. 15. *Melicerita knoxi* n. sp., formation of ovicell. $\times 47$.

front wall proximal to the orifice and on either side of the orifice. This wall curves over and forms the lateral extensions of a vertical wall which descends from the distal margin of the orifice (fig. 15). There appear to be some very small perforations scattered over this wall; at its base is an oval multiporous pore plate which communicates by a tunnel with the next distal zoecium in line, passing beneath the opposed walls of the two distal zoecia en echelon. The distal ooeial compartment is covered by a cryptocyst, extending at first from the distal margin of the orifice to the proximal margin of the orifice of the ovicell. In zoecia which do not develop an ooeial compartment a small depression which does not reach the basal wall is formed distal to the orifice.

HOLOTYPE: Canterbury Museum, zb187.

LOCALITY: Sta. 59, Chatham Rise, $43^{\circ} 38' S$, $177^{\circ} 19' E$. 290 fm, fine green sand, mud.

PARATYPE: NZOI, P160.

***Melicerita chathamensis* n. sp.** FIGS 16, 17

DESCRIPTION

Zoarium flattened, scimitar-shaped, expanding distally, with a few barely perceptible constrictions along its

length. Zoecia regularly hexagonal, except near the edges of the zoarium, a little longer than wide, demarcated by a thin line. Zoecia with ovicells and adjacent zoecia a little wider than the others. The frontal granulated, sloping down on all sides to the orifice. The orifice small, wider than long, and semi-oval; the proximal lip depressed and extending into the orifice. The orifices of zoecia with ovicells about a third as wide again as the orifices of zoecia without ovicells. A groove on either side of the proximal lip for the retractor muscles and a thin salient ridge crossing the surface of this lip and projecting from either side of it into the lateral grooves. Occasional avicularia along the margins of the zoarium are interzoecial, and smaller than the zoecia. A very narrow spindle-shaped opesium and a complete pivot bar. Mandible about as wide as the proximal lip of the orifice. Ovicell with a triangular orifice about three times as wide as long and about as wide as the orifice of zoecia without ovicells. Distal margin of the frontal wall on either side of the ooeiopore slanting proximally at a flatter angle than the distal margins of infertile zoecia.

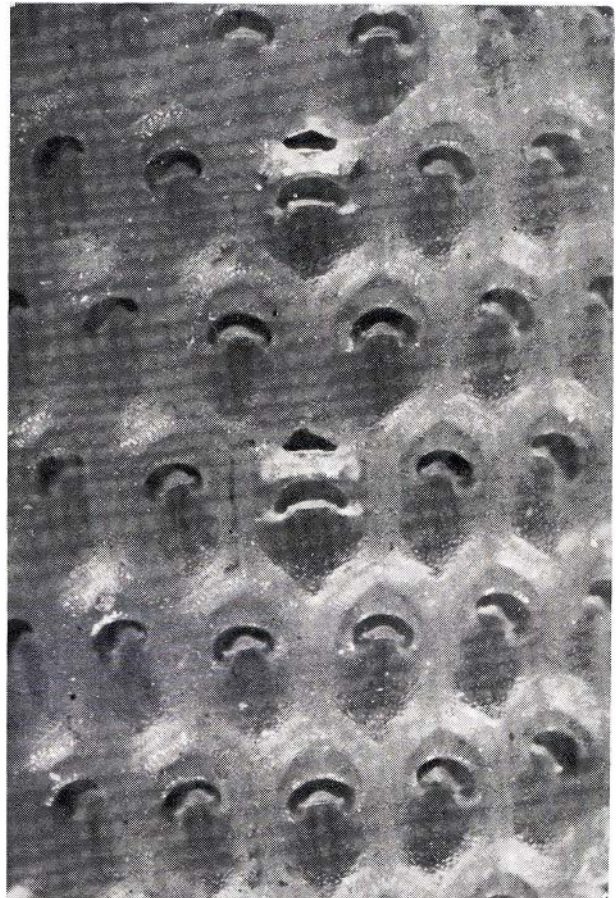


FIG. 16. *Melicerita chathamensis* n. sp., fertile and infertile zoecia. $\times 47$.

Genus *Beania* Johnston, 1840

Beania plurispinosa n. sp. FIGS 18, 19

DESCRIPTION

Zoarium adnate; zooecia in quincunx. Only the proximal part of the basal surface in contact with the substrate, the distal part elevated at about 40°. Distal margin forming a round collar which slants downward slightly, distally. Lateral margins of the zooecia curving inwards to meet the proximal ends of the collar. The six interzooecial tubes short, the zooecia almost touching and joining the zooecia around the proximal basal area. In some zooecia a shallow rounded depression in the upturned distal wall extending from just above the proximo-distal connecting-tube (where a thin curved lip is formed) to the distal margin slightly overhanging the operculum. The depression surrounded by a thickened ridge but the floor of the depression thin. Frontal widely open and the operculum situated within the collar. In zooecia without an "ovicell", a double row of spines outside the margin of the collar; 11 spines in both inner and outer rows. In zooecia with an "ovicell", three spines in the inner row on either side and four in the outer row. Spines varying in length; robust; and may be half to three-quarters as long as a zooecium. Along the lateral margins, wedges of smaller spines directed forwards and inwards. These wedges contain 10 to 16 spines arranged about four deep distally and tapering to odd spines

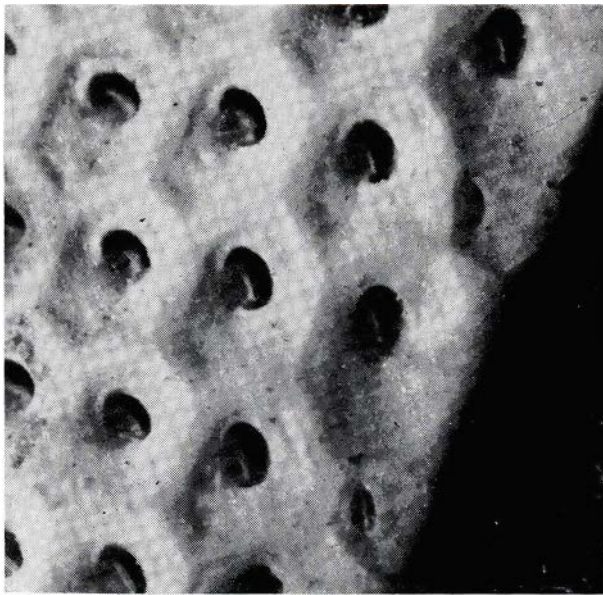


FIG. 17. *Melicerita chathamensis* n. sp., avicularia. $\times 47$.

MATERIAL EXAMINED: Five colonies from sta. 34, 130 fm.

REMARKS: In some zooecia the proximal lip is depressed so far below the frontal that it seems unlikely that the operculum would be hinged on the ridge of the lip.

In zooecia in which the polypides have probably degenerated, a flat granulated bridge crosses the frontal above the proximal lip of the orifice and a plate extends forwards to the distal margin of the orifice. The structure thus forms a pocket on the frontal which opens proximally.

The oocial compartment appears to be formed the same way as in *M. knoxi* n. sp.

HOLOTYPE: Canterbury Museum, zbl88.

LOCALITY: Sta. 34, east of Forty-fours, 44° 04' S 176° 23.5' W, 130 fm; fine sand gravel.

PARATYPE: NZOI, P161.

Family BICELLARIELLIDAE Levinsen, 1909

Genus *Dimetopia* Busk, 1852

Dimetopia cornuta Busk, 1852

D. cornuta Busk, 1852a, p. 384.

D. cornuta: Livingstone, 1929, pp. 55-6.

D. cornuta: Macken, 1958, p. 104.

MATERIAL EXAMINED: Fragments with organic matter removed, from sta. 3, 41 fm.

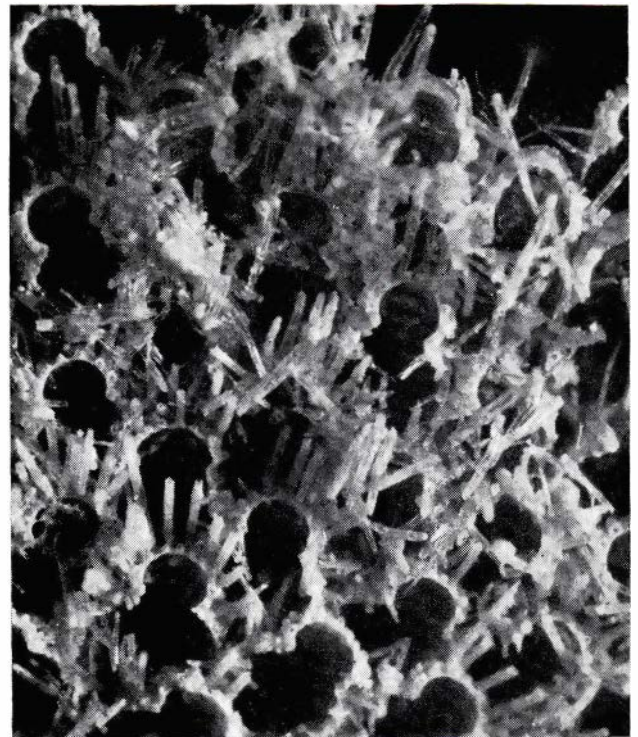


FIG. 18. *Beania plurispinosa* n. sp., with ovicells. $\times 47$.



FIG. 19. *Beania plurispinosa* n. sp., basal spines and attachment discs. $\times 47$.

proximally. Spines also on the basal surface—two or three on either side of the proximo-distal connecting tube directed distally, and a distally directed median spine a little proximal to the other spines. There may also be a spine between the lateral connecting tubes. Delicate chitinous tubes criss-crossing the basal surface, and arising, at least in part, from a median-proximal pore on the basal surface. Calcareous attachment discs scattered over this network. They have a thickened arcuate centrepiece which gives off a flat array of short dendrites around their margins.

MATERIAL EXAMINED: Fragments from sta. 18, 15 fm.

REMARKS: This species is distinguished from *B. hirtissima* (Heller, 1867) by the arrangement and number of spines and the “ovicell”. *B. pulchella* Livingstone, 1929 has two enlarged spines distally, and larger lateral spines than *B. plurispinosa* n. sp. but it has similar “ovicells”.

HOLOTYPE: Canterbury Museum, zbl 89.

LOCALITY: Sta. 18, off Cape Pattison, 43° 41' S, 176° 48' W, 15 fm; rock.

PARATYPE: NZOI, P162.

Beania wilsoni MacGillivray, 1884

B. wilsoni MacGillivray, 1884, pp. 108–9, pl. II, fig 1–1a.

DESCRIPTION

Zooecia connected by six tubes not quite as long as the zooecia are wide. Median connecting tube arising from the rounded basal surface a quarter the length of the zooecium from the distal end and opening out directly into the distal end of the next zooecium. Zooecia in quincunx. Lateral tubes arising symmetrically from either side of the base of the zooecium. Zooecium boat-shaped. Opesium occupying the whole of the front of the zooecium. Seven pairs of hollow curved spines arising just outside the margin of the opesium, the longest of these spines as long as the opesium is wide. Six of these pairs of spines cross over the frontal membrane; the seventh most distal pair are shorter and more erect. A pedunculate avicularium attached to the base of each member of this seventh pair of spines. Beyond the seventh pair of spines, located on either side of the operculum, a slight step down in the margin of the zooecium. Two short spines, arising one on either side at the base of this step, converging along the outside of the distal margin of the zooecium to give the appearance of a prow. Stalk of the avicularium short, just separating the avicularium from the zooecial wall. Avicularium with a bulbous chamber and a deeply hooked rostrum shorter than the chamber. No ovicells were seen.

MATERIAL EXAMINED: A single fragment of four zooecia from sta. 3, 41 fm.

REMARKS: The description of the material at hand is given to supplement MacGillivray's description.

Family SCRUPOCELLARIIDAE Levinsen, 1909

Bugulopsis Verrill, 1879

Bugulopsis cuspidata (Busk, 1852)

Cellularia cuspidata Busk, 1852b, p. 19, pl. 27, figs 1, 2.
C. cuspidata: MacGillivray, 1881, p. 31, pl. 58, figs 1, 1a, b.

MATERIAL EXAMINED: A minute colony, attached by rootlets to a colony of *Scuticellaria margaritacea*, from sta. 37, 30 fm. Some fragments, with the organic matter removed, from sta. 3, 41 fm.

REMARKS: The material agrees well with MacGillivray's description and appears to be distinguished from the European *B. peachii* by having a single perforation instead of three to five on the dorsal surface, and a smooth margin to the opesium.

Genus *Caberea* Lamouroux, 1816

Caberea zelandica (Gray, 1843)

- Selbia zelandica* Gray, 1843, p. 292.
C. zelandica: Hastings, 1943, pp. 371-4, pl. VI, fig. 5; text-fig. 20B-D.
C. zelandica: Brown, 1952, pp. 172-3, figs 117-119.
C. zelandica: Macken, 1958, p. 104.
C. zelandica: Gordon, 1967, p. 56, fig. 23.

MATERIAL EXAMINED: Several branches from sta. 18, 15 fm. Notes on the slide, presumably referring to the colour in life, state: "bright orange vermillion".

Genus *Canda* Lamouroux, 1816

Canda arachnoides Lamouroux, 1816

- C. arachnoides* Lamouroux, 1816, p. 132.
C. arachnoides: Hastings, 1943, pp. 364-5.

MATERIAL EXAMINED: Branches from sta. 14, 15 fm; sta. 37, 30 fm.

Family MARGARETTIDAE Harmer, 1957

Genus *Menipea* Lamouroux, 1812

Menipea crystallina (Gray, 1843)

- Emma crystallina* Gray, 1843, p. 293.
M. crystallina: Levinsen, 1909, pl. 2, fig. 1.
M. crystallina: Livingstone, 1929, p. 55.
M. crystallina: Macken, 1958, p. 104.

MATERIAL EXAMINED: A single twig from sta. 37, 30 fm.

Suborder ASCOPHORA

Family HIPPOTHOIDAE Levinsen, 1909

Genus *Hippothoa* Lamouroux, 1909

Hippothoa distans MacGillivray, 1869

- H. distans* MacGillivray, 1869, p. 130.
H. distans: Brown, 1952, pp. 203-4, fig. 142.
H. distans: Rogick, 1956, pp. 189-90.
H. distans: Powell, 1967, pp. 250-1, text-fig. 24.

MATERIAL EXAMINED: Three colonies encrusting shell fragments, from sta. 24, 38 fm.

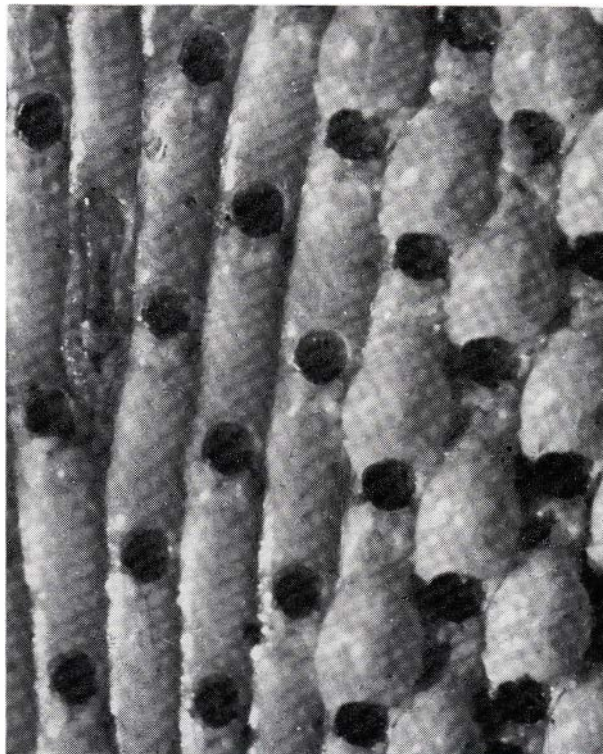


FIG. 20. *Euthyroides jellyae* Levinsen, 1909, avicularium and ovicells. \times 47.

Family EUTHYROIDIDAE Levinsen, 1909

Genus *Euthyroides* Harmer, 1902

Euthyroides jellyae Levinsen, 1909 FIG. 20

- E. jellyae* Levinsen, 1909, p. 264, pl. 16, figs 8a-c. (Erroneously designated *E. episcopalis* (Busk) at the foot of pl. 16.)
E. jellyae: Canu & Bassler, 1929, p. 246, figs 102a-e.
E. jellyae: Powell, 1967, pp. 247-9, text-fig. 22, pl. 4, fig. C.

DESCRIPTION

Zoarium free, unilaminar. Zooecia elongate, quadrate, slightly narrower proximally, distinct, separated by shallow grooves. Frontal wall imperforate, smooth, slightly convex. Orifice with an almost semicircular anter; the condyles small, rounded, separated from the widely sinuated poster by two small lateral indentations. Peristome without spines, thin, rounded, scarcely raised, bordering the anter; sub-triangular, paired, hollow processes extend from the condyles bordering the poster, meeting in a median longitudinal line, the inner extremities of each of the processes with a small, rounded pore. Ovicells elongated, mitriform or sub-elliptical, hyperstomial, the ectooecium smooth, with two large sub-triangular lateral fenestrae; orifice and lateral processes of the fertile zooecia larger. Avicularia vicarious, elongate, as large as the zooecia, sub-elliptical, tapering proximally, spatulate; the rostrum wide and rounded distally condyles small, pointed.

MATERIAL EXAMINED: One piece from the end of a broad frond, from sta. 37, 30 fm.

REMARKS: *Euthyroides episcopalis* (Busk) is more abundant in the New Zealand region than *E. jellyae* Levinsen, an Australian Recent species. The ovicells of the two species are very similar but the paired lateral processes or bars, proximal to the orifice, are quite distinctive in each species. *Euthyroides episcopalis* is without an avicularium.

Euthyroides episcopalis (Busk, 1852)

Carbasea episcopalis Busk, 1852b, p. 52, pl. 48, figs 1–2; pl. 55, fig. 3.

E. episcopalis: Livingstone, 1929, pp. 73, 74.

MATERIAL EXAMINED: One or two flat branched fronds from sta. 3, 41 fm.

Family UMBONULIDAE Canu, 1904

Genus **Umbonula** Hincks, 1880

Umbonula bicuspis (Hincks, 1880)

Mucronella bicuspis Hincks, 1880, p. 201, pl. 7, figs 2–2a.

U. bicuspis: Brown, 1952, p. 305, figs 230, 231.

U. bicuspis: Powell, 1967, pp. 230–1, text-fig. 10, pl. 4, fig. b.

U. bicuspis: Gordon, 1967, fig. 28a, b.

MATERIAL EXAMINED: Several colonies on scallop shells, from sta. 24, 38 fm.

Family PETRALIIDAE Levinsen, 1909

Genus **Petraliella** Canu & Bassler, 1927

Petraliella firmata (Waters, 1887)

Mucronella firmata Waters, 1887, p. 58, pl. 7, fig. 20.

P. firmata: Brown, 1952, pp. 308–11, figs. 232, 233.

MATERIAL EXAMINED: One colony encrusting a pelecypod shell from sta. 24, 38 fm.

REMARKS: The colony lacks ovicells. The squared lyrule has a median notch not mentioned by Brown (1952).

Family SMITTINIDAE Brown, 1952

Genus **Mucronella** Hincks, 1877

(See Rogick, 1956, for reasons for accepting *Mucronella* rather than *Escharella* Gray, 1848.)

Mucronella spinosissima Hincks, 1881

M. spinosissima Hincks, 1881a, pp. 124–5, pl. III, fig. 2.

Escharella spinosissima: Brown, 1952, pp. 337–9, fig. 258.

MATERIAL EXAMINED: Several colonies encrusting pelecypod shell fragments, from sta. 24, 38 fm. One colony encrusting a pelecypod shell, from sta. 34, 130 fm.

REMARKS: The size of the zoecia in the colonies varies slightly. The colony with the largest zoecia (0.5 mm compared with 0.4 mm) comes from the deeper station. The distal margin of the primary orifice has seven or eight fine but distinct serrations. The secondary orifice is widest distally and bears a median tooth proximally above the wide lyrule. Most of the zoecia are covered with a fairly heavy layer of secondary calcification.

Genus **Parasmittina** Osburn, 1952

Parasmittina trispinosa (Johnston, 1838) *aotea* Brown 1952

Mucronella nitida (Verrill) forma *inaequalis* Waters, 1887, p. 55.

Smittina trispinosa (Johnston, 1838) var. *aotea* Brown, 1952, pp. 331–2, fig. 254.

S. trispinosa (Johnston, 1838) var. *aotea*: Macken, 1958, p. 105.

P. trispinosa (Johnston, 1838) var. *aotea*: Powell, 1967, p. 331, text-fig. 83.

DESCRIPTION

Zoarium encrusting. Zoecia subquadrate, elongate, narrow, distinct, separated by raised lines. Frontal wall slightly convex proximally, more convex distally, formed of a granular pleurocyst with a single row of large, rounded areolae.

Orifice semi-elliptical, slightly transverse; the proximal margin with a rather wide trapezoidal median lyrule; the lateral condyles sharp, prominent, and inwardly and proximally directed.

Peristome subtubular, salient, with four or five distal spines. Ovicell hyperstomial, slightly impressed in the distal zoecium, opening into the deep peristome, rather salient, globular with a semicircular frontal perforate area bordered by a smooth basal band; peristome well developed, sometimes sinuated proximally, extending across the proximal margin of the ovicell. Avicularia large, elongate, salient, placed laterally, and extending from near the proximal angle of the peristome almost to the proximal margin of the zoecium; the semi-elliptical transverse proximal opesium separated from the narrower but longer semicircular distal opesium by a complete pivot; the rostrum elongate, triangular, tapering, slightly rounded distally, and directed more or less proximally and upwards.

REMARKS: In the older zoecia the walls are thickened, the areolae are enlarged, and the frontal wall flattened.

The lyrule is about a quarter of width of the primary orifice. Its sides curve proximally and laterally to the recurved condyles. A minute oral avicularium may sometimes be found symmetrically opposite the large avicularium and in one colony, on some zoecia, another small oval avicularium occurred on the proximal end of the frontal and was distally directed.

MATERIAL EXAMINED: Several colonies encrusting shell fragments, from sta. 1, 100 fm; sta. 3, 41 fm; sta. 24, 38 fm.

Parasmittina hexaspinosa n. sp. FIG. 21

DESCRIPTION

Zoarium encrusting. Zooecia small, broad, hexagonal, separated by shallow grooves. Frontal a pleurocyst with small areolae, moderately convex, smooth at first, becoming rugose with secondary calcification. Primary orifice wide, anter semicircular, a very wide quadrangle wider than half the width of the primary orifice, and small condyles transverse or faintly recurved placed beyond the distal end of the lyrule. Peristome salient, its distal margin formed by six spine bases. The lateral margins at first thin, low, becoming more elevated proximally and converging to leave a parallel-sided gap below the orifice. A proximo-laterally directed avicularium is often situated on the frontal arising at the gap in the peristome; a semicircular proximal opesium and an elongate triangular mandible widening out towards the pivot bar over a semicircular distal opesium. Mandible elevated but curved slightly downward and about as long as the lyrule is wide. The ovicell large, a little flattened, with peripheral secondary calcification and small pores scattered over the front; the opening low within the peristome; some thickening may occur above the opening.

MATERIAL EXAMINED: Two small colonies encrusting a pelecypod shell, from sta. 24, 38 fm.

REMARKS: This species is separated from *P. trispinosa* with some hesitation owing to the great variation reported in that species. Osburn (1952) mentions that *P. trispinosa* has two to four spines. *Parasmittina trispinosa aotea* Brown, 1952, may have five spines. *Parasmittina hexaspinosa* can be distinguished from *P. trispinosa* by the six distal spines and the very wide lyrule.

The species also resembles *Smittoidea reticulata* (MacGillivray, 1842), but has six spines and the avicularium is not entirely separated from the peristome.

HOLOTYPE: Canterbury Museum, zb190.

LOCALITY: Sta. 24, south of The Sisters, 43° 36.2' S, 176° 48.5' W, 38 fm; coarse shell sand gravel.

FARATYPE: NZOI, P163.

Genus **Porella** Gray, 1848

Porella marsupium (MacGillivray, 1869)

Lepralia marsupium MacGillivray, 1869, p. 136.

P. marsupium: Brown, 1952, pp. 312-4, figs 234-235.

P. marsupium: Macken, 1958, p. 105.

P. marsupium: Powell, 1967, pp. 333-5, text-fig. 85, pl. 11, fig. 9.

MATERIAL EXAMINED: Many small colonies encrusting pelecypod shells, from sta. 24, 38 fm.

REMARKS: Brown (1952) recognises a subspecies variety *porifera* which has a pair of pores in its avicularium chamber. A colony in the present collections has some

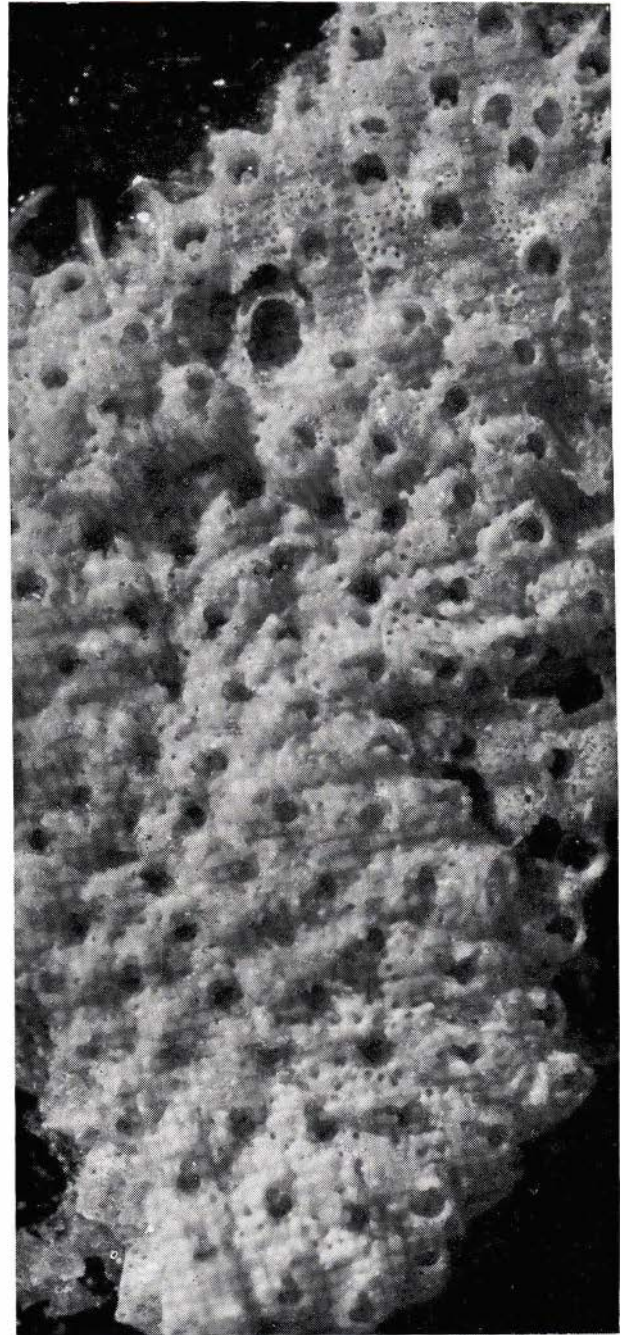


FIG. 21. *Parasmittina hexaspinosa* n. sp., spine bases, lyrule, and avicularia are all visible (encrusting *Smittina smittiella* Osburn), $\times 47$.

zooecia with and others without the pores. In most of the other fresh material the pores are visible.

Genus **Smittina** Norman, 1903

Smittina purpurea (Hincks, 1881)

S. landsborovii (Johnston) var. *purpurea* Hincks, 1881a, p. 123.

Smittina monacha Jullien, 1888, pp. 52-3, pl. 2, figs 1-3.

S. purpurea: Brown, 1952, pp. 322-3, fig. 245.

S. purpurea: Powell, 1967, p. 318, text-fig. 72, pl. 12, fig. C.

Not *S. purpurea* Jullien 1888, pp. 54-5, pl. 2, fig. 4.

MATERIAL EXAMINED: One colony from sta. 24, 38 fm.

REMARKS: The bridge formed by the peristome is a little distal to the avicularium and does not cover it as Brown (1952) describes.

Smittina smittiella Osburn, 1947

S. smittiella Osburn, 1947, p. 37.

S. smittiella: Osburn, 1952, pp. 404-5, pl. 47, figs 11, 12.

MATERIAL EXAMINED: Two small colonies from sta. 24, 38 fm. One colony encrusting *Lacerna* sp., no station data.

REMARKS: Marginal zooecia have six distal oral spine bases. This species closely resembles *S. landsborovi* but is about half the size.

Smittina landsborovi (Johnston, 1847) FIG. 22

Lepralia landsborovi Johnston, 1847, p. 310, pl. 54, fig. 9.

S. landsborovi: Osburn, 1952, pp. 400-1, pl. 47, figs 1-2.

S. landsborovi: Brown, 1952, pp. 319-20.

S. canui Rogick, 1956, pp. 89-292, pl. 25.

MATERIAL EXAMINED: Two colonies, each encrusting a pelecypod shell, one from sta. 3, 41 fm, and one from sta. 24, 38 fm.

REMARKS: Osburn (1952) and Brown (1952) have discussed this cosmopolitan species. Brown selected a neotype and gave a diagnosis of the species which mentions a small median lyrule and large pores in the tremocyst. Osburn's description mentions numerous pores and a broad lyrule.

Rogick (1956) considered *S. canui* from the Antarctic was distinct from this species because of the nature of the secondary orifice. The present material indicates that the differences she mentions are due to differences in calcification.

Smittina sigillata Jullien, 1888 could well be this species, since it agrees in the nature of the lyrule, oral avicularium, and peristome. But the original material should be examined to see whether the frontal is perforated by numerous pores.

Neither Osburn, Brown, nor Rogick mention spines. Very young marginal zooecia in the present material have about six small distal oral spine bases.

Smittina akaroensis Levinsen, 1909

S. akaroensis Levinsen, 1909, p. 342, pl. 18, figs 12a, b.

S. akaroensis: Brown, 1952, pp. 329-31, fig. 253.

S. akaroensis: Brown, 1954a, p. 431.

S. akaroensis: Macken, 1958, p. 105.

S. akaroensis: Gordon, 1967, p. 59, fig. 35.

MATERIAL EXAMINED: One small, rather worn colony, from sta. 3, 41 fm.

REMARKS: The outlines of the zooecia are irregular and indistinct. The colony is fused into a single unit by a thick tremocyst perforated by numerous pores. Ovicells

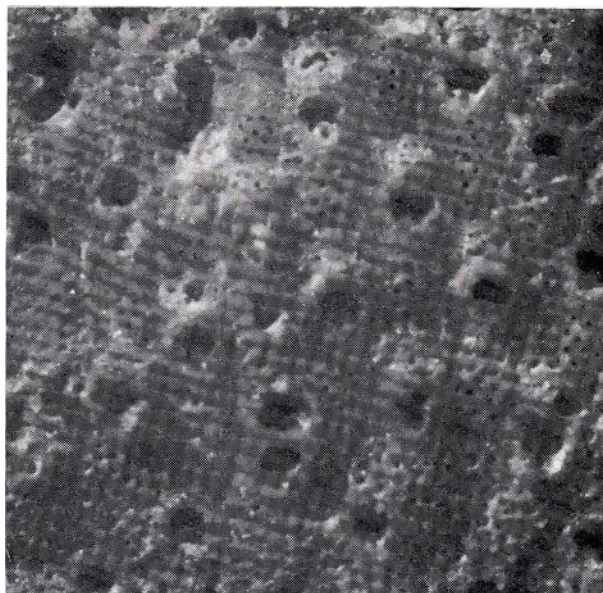


FIG. 22. *Smittina landsborovi* (Johnston, 1847). $\times 47$.

appear to be absent. The secondary orifice which incorporates the avicularium is markedly clithriate. The lyrule is wide and low and the pivot bar bears the strong ligula. Levinsen (1909) uses the spelling *akaroensis* in the legend and caption of pl. 18, fig. 12 and in the index for this species whose type locality is Akaroa Harbour. The spelling in the heading "*Smittina akaroensis* n. sp." on p. 342 was presumably a mistake.

Family SCHIZOPORELLIDAE Jullien, 1883

Genus **Haswellina** Livingstone, 1928

Haswellina pentagona (d'Orbigny, 1842) FIG. 23

Vincularia pentagona d'Orbigny, 1842, pl. 10, figs 4-6; 1847, p. 21.

Spiroporina pentagona: Brown, 1952, p. 213, figs 148, 149.

H. pentagona: Macken, 1958, p. 105.

DESCRIPTION

Zoarium free, erect, branching dichotomously, sometimes irregularly, the branches cylindrical. Zooecia elliptical, elongate, distinct at first, separated by rather deep grooves. Frontal wall convex, minutely granulated, bordered by a row of small, rounded distant areolae. Orifice greater than a semicircle, the proximal margin with a rather small, median sinus, flanked by two rather stout condyles. Peristome in the younger zooecia thin and salient, without spines. Avicularia paired, stalked strongly, salient. One on each lateral margin of the peristome, the semi-elliptical transverse proximal opesium of the avicularium separated from the much larger semi-elliptical elongate distal opesium by a complete pivot

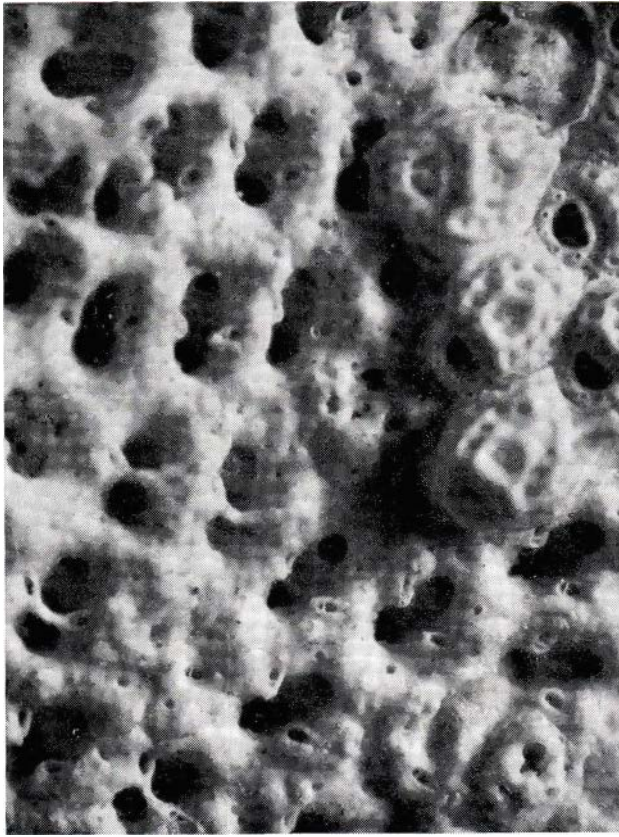


FIG. 23. *Haswellina pentagona* (d'Orbigny, 1842), with ovicells encrusted by *Fenestulina malusii* (Audouin, 1826) and *Crepidacantha zelanica* Canu & Bassler, 1929. $\times 47$.

with a median ligula; the rostrum sub-triangular, elongate, tapering, narrow, rounded, and slightly curved distally.

MATERIAL EXAMINED: Several colonies encrusting pelecypod shells and other bryozoans, from sta. 3, 41 fm and sta. 24, 38 fm. A few small cylindrical twigs with about 6 zoecia around the circumference, from sta. 3, 41 fm.

REMARKS: The above description applies to the very young zoecia; the strong calcification of the older zoecia obliterates the zoecia boundaries; the peristome is greatly thickened, and the orifice is deeply buried; the avicularia became much less salient and sometimes depressed within the calcareous thickening. The rounded indentation between the avicularia becomes closed and a large circular median foramen is produced. The ovicell which is hyperstomial is almost wholly obscured, being recognisable only by the more or less circular area of the ectoecium. The front of the ovicell hangs as a short trapeziform extension over the oeciopore.

Although this species is described as "free, erect, cylindrical" (Brown, 1952), most of the present specimens are encrusting.

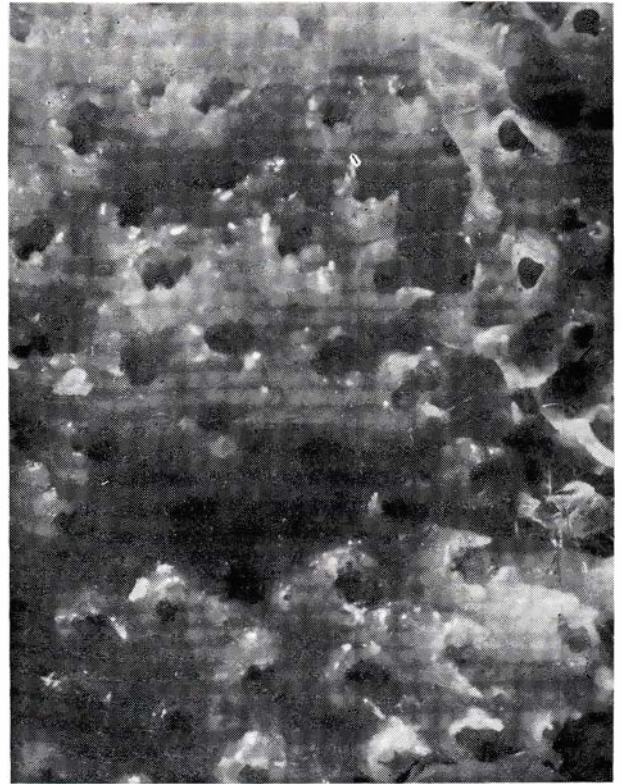


FIG. 24. *Haswellina polypora* (Brown, 1952), with ovicells. $\times 47$.

The avicularia are somewhat turned into the peristome and diverge distally. On marginal zoecia the avicularia appear first as cupped ear-like projections. There appear to be no oral spines. In some colonies an alate process arises on the avicularium chamber just proximal to the avicularium and extends over the orifice. It usually meets and fuses with the one from the opposite side, thus forming with the peristome a circular space distally and leaving a large subquadrate opening proximally. In the cylindrical zoaria the avicularium chambers are produced as solid points rather than cupped processes and there are no alate extensions.

***Haswellina polypora* (Brown, 1952) FIG. 24**

Spiroporina polypora Brown, 1952, pp. 216-9, figs 152-155.

DESCRIPTION

(*Encrusting stage*): Colony encrusting, zoecia sub-erect, in quincunx, a proximal zoecia extending over a distal interzoecial groove. Frontal convex, polished, imperforate. Orifice perpendicular to the plane of the colony, greater than a semicircle, proximal margin with a U-shaped sinus flanked by two small conical condyles. Peristome continuous with frontal markedly salient. Secondary orifice oblique, circular to somewhat elongate, a pair of small elliptical avicularia at about the proximal third, just within the peristome; these avicularia with a laterally directed distal opesium

which is slightly greater than a semi-circle. The peristomes of zooecia at the edge of the colony continued in a pair of moderately robust spines which are extensions of the avicularium chambers. In older zooecia the peristome proximal to the avicularia may be elevated, bending out from the frontal. A single avicularium of the same size and shape as the peristomial avicularia often on the frontal surface, its chamber extending from the proximal wall to the middle of the frontal wall where the avicularium is sited, its mandible perpendicular to the frontal wall. Ovicell spheroidal, immersed in the groove between the two distal zooecia, with a wide lunate opening in the frontal wall crossed internally by radiating bars. The front of the ovicell hanging as a trapeziform extension over the ooeciopore.

MATERIAL EXAMINED: Two small encrusting colonies on a pelecypod shell, from sta. 24, 38 fm. A large number of cylindrical branches from sta. 3, 41 fm, three from sta. 24, 38 fm.

REMARKS: The encrusting stage of *H. polypora* is superficially so different from the erect zoaria that it was at first considered to be a new species, distinguishable from *H. pentagona* by the lunate exposure of the entoecium and the additional avicularia. Neither of the two encrusting colonies of *H. polypora* have the larger, spatulate, vicarious avicularia which are found on the erect specimens. These avicularia are almost as large as a zooecium and the mandible widens distally.

However, the only significant structural difference between the encrusting and erect stages seems to be size. The primary orifice in the encrusting form is three-quarters as long as in the erect form.

In the erect form there is a piling up of zooecia in a celoporid position, and a very heavy calcification of older zooecia.

Attention is drawn to the following similarities between *Haswellina*, *Rhynchozoon*, and *Brodiella*:

1. primary orifice schizoporellid,
2. peristomial avicularia,
3. trapeziform process over ooeciopore,
4. similar frontals,
5. cumulus zoaria;

and *Haswellina* and *Osthimosia*:

1. peristomial avicularia,
2. similar frontals,
3. frontal opening in ectoecium.

The genera are evidently closely related, but whether they should remain in their separate families cannot be adequately discussed here.

***Haswellina tubulata* n. sp. FIG. 25**

DESCRIPTION

Zoarium encrusting. Zooecia tubular suberect, separated by very deep grooves, with distal part completely disjunct. Frontal wall smooth, strongly convex with a single row of rather large elliptical areolae

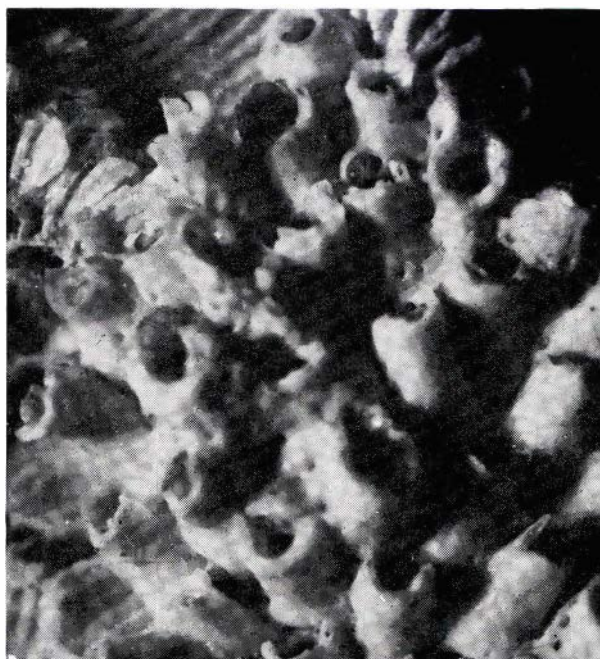


FIG. 25. *Haswellina tubulata* n. sp., with ovicells. $\times 47$.

occluded in older zooecia. Orifice with slightly transverse semi-elliptical anter, and a deeply sinuated poster almost equal in length to the anter, condyles not evident. Peristome a tubular continuation of the frontal, thin and lower distally, thicker laterally and proximally, without spines, bearing a pair of small avicularia whose triangular rostrums are directed proximally along the lateral edges of the peristomes and whose length is less than half the width of the orifice. Ovicell hyperstomial, becoming deeply buried between the zooecia, with a frontal opening in the ectoecium somewhat the shape of the orifice, the exposed entoecium calcified but with radiating pores. A suture extending down from the exposed area of entoecium to the transverse upper margin of the ooeciopore.

MATERIAL EXAMINED: Two colonies encrusting a pelecypod shell, from sta. 24, 38 fm.

HOLOTYPE: Canterbury Museum, zbl91.

LOCALITY: Sta. 24, south of The Sisters, 43° 36.2' S, 176° 48.5' W, 38 fm; coarse shell sand gravel.

PARATYPE: NZOI, P164.

Genus *Brodiella n. gen.**

Schizoporellid aperture with a clithridiate sinus and beaded vestibular arch. Frontal an olocyst; ovicell imperforate, with a trapeziform process hanging down over the ooeciopore. Large vicarious avicularia and small

*After J. W. Brodie, Director of the N.Z. Oceanographic Institute.

avicularia on either side of the orifice. Zoarial growth encrusting or cumulus.

TYPE SPECIES: *Brodiella longispinata* (Busk, 1884)

REMARKS: *Brodiella longispinata*, usually placed in the genus *Rhynchozoon*, may be separated from *Rhynchozoon* by the absence of an asymmetrical peristomial complex of mucro, avicularium and uncinat process. It is, however, clearly allied to *Rhynchozoon* by the nature of the frontal of the ovicell, the beaded vestibular arch, and the proximal sinus.

***Brodiella longispinata* (Busk, 1884) FIG. 26**

Schizoporella longispinata Busk, 1884, pp. 163-4, pl. 17, figs 2a, c.
S. scintillans Hincks, 1885, 251-2, pl. IX, fig. 7.
“*Schizoporella*” *scissa* Brown, 1952, pp. 245-6; figs 178, 179.
“*S.*” *butleri* Brown, 1952, pp. 246-7, fig. 180.
“*S.*” *scissa*: Brown, 1954a, pp. 427-9; fig. 5.
Rhynchozoon scintillans: Powell, 1967, pp. 360-3, text-fig. 102.

DESCRIPTION

Zoarium encrusting. Zooecia deep, sub-hexagonal, separated at first by wide grooves, boundaries later obscured by extensive thickening of the frontal wall. Frontal smooth or minutely rippled, transversely curving down to the lateral margins but curving up towards the somewhat elevated distal part of the zooecium. No areolae or tremopores. Anter of orifice an arch with slightly diverging sides, margin serrated. Poster with a deep sinus set in the middle of a wide V, the proximal part of the sinus V-shaped, the margins of the sinus encroaching a little distally. Long condyles underlie the wide lateral margins of the poster and may also encroach on the sinus. Operculum bearing a median groove which extends from the poster almost to the distal margin of the anter. Operculum may be somewhat inflated on either side of the groove. Peristome oval bearing six spines, completely enclosing the orifice and a proximal shelf which includes the sinus. Spines tubular, open ended, sometimes a little flattened, of variable thickness, and may be as long as a zooecium. Ovicell may begin to develop before the two most distal spines disappear, the two proximal pairs of spines remaining after the ovicell has developed. An avicularium may be found on either side of the peristome just distal to the most proximal pair of spines, the small semicircular mandibles directed laterally and a little distally and slightly elevated. Chambers of these avicularia tubular and run proximally and downwards on either side of the peristome. These avicularia having the appearance of shoulders on either side of the peristome. A large avicularium sometimes present on the frontal or replacing either or both of the small distal avicularia. Its rostrum strongly elevated, deep, narrow, hooked. The mandible one and a half times as long as the orifice, narrow, pointed, expanding a little at the pivot, proximal opesia small; when on the frontal usually directed proximally or laterally. In more heavily calcified colonies similar avicularia not elevated above the frontal may be directed disto-laterally on either side of the peristome. The ovicell globular, leaning back

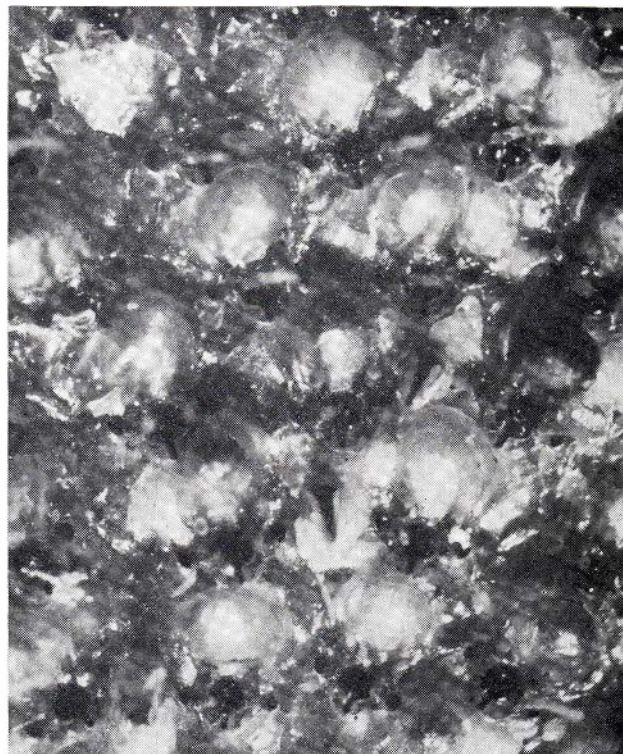


FIG. 26. *Brodiella longispinata* (Busk, 1884), young zoarium. $\times 47$.

against the distal zooecium and extending to the peristome of that zooecium, becoming a little immersed; its wall rather transparent, traversed by a few fine lines, imperforate. The front of the ovicell sloping proximally to extend as a free quadrate labium between the second pair of spines over the low opening of the ovicell. Opening of ovicell not closed by operculum.

MATERIAL EXAMINED: Four colonies encrusting massive bryozoan material, from sta. 3, 41 fm. One colony encrusting a pelecypod shell, from sta. 34, 130 fm.

REMARKS: The colony from sta. 34 differed from those from sta. 3 in the following respects: the zooecia were up to one and a half times larger; the colony was more open in appearance and less heavily calcified; the large avicularia were strongly salient and the small distal avicularia were never replaced by a pair of large disto-laterally directed avicularia. However, colonies from both stations had six oral spines, similar orifices, both types of avicularia, and similar ovicells.

Although Busk's description of *Schizoporella longispinata* from the Straits of Magellan does not mention small distal avicularia*, the spines, large avicularia,

*Miss P. L. Cook, British Museum (Natural History), has kindly examined the type of *Schizoporella longispinata* Busk, 1884 and she comments: “*S. longispinata* Busk differs from *Rhynchozoon scintillans* and the specimen from sta. 34 only in that the majority of the avicularia are of the elongated type with raised rostra directed proximally, rather than the small type with rounded rostra directed laterally. The number and type of spines, dimensions, form of orifice, and ovicell labellum are otherwise the same.”

orifice, and ovicell all correspond to the species examined here.

Brown (1952) described the two species "*S.* *scissa* and "*S.* *butleri*. Both have a similar orifice and six peristomial spines. "*S.* *butleri* has a pair of distally directed, acuminate, para-oral avicularia which may be reduced to small bulbous chambers on either side of the orifice. Brown states that the large avicularia are rare on "*S.* *scissa* and his figure does not indicate their shape. However, in 1954 Brown reported "*S.* *scissa* from another locality, this time figuring the ovicell with a labium as in the present species and stating that the avicularia are small, rather tubular, and placed alongside the orifice. It is concluded that all these specific names are synonyms of *Brodiella longispinata* (Busk, 1884).

Genus *Arthropoma* Levinsen, 1909

Arthropoma circinata (MacGillivray, 1869)

- A. circinata* MacGillivray, 1869, p. 134.
- A. circinata*: Brown, 1952, pp. 233–5, fig. 167.
- A. circinatum*: Powell, 1967, pp. 256–9, text-figs 29, 30.

MATERIAL EXAMINED: Several colonies encrusting pelecypod shells, from sta. 24, 38 fm. One colony encrusting a dead bryozoan colony, from sta. 3, 41 fm.

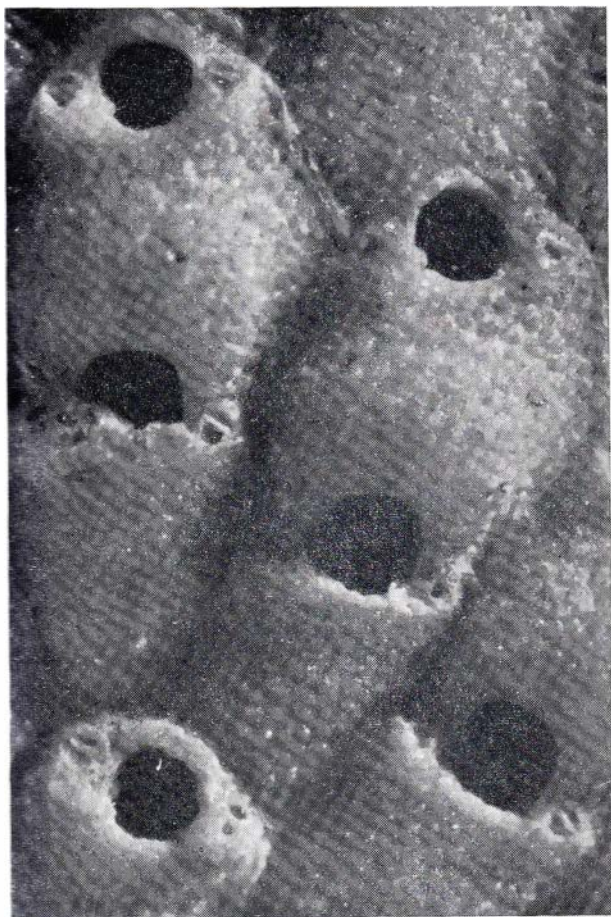


FIG. 27. *Dakaria feegeensis vallata* n. subsp. $\times 47$.

REMARKS: Quite commonly, a long avicularium is found on the frontal reaching from the suboral umbo to the proximal end of the zooecium. The mandible of this avicularium tapers slightly and the rostrum is a little raised but curves downwards. It has two small condyles and the opesium extends a little more than half the length of the rostrum.

Genus *Dakaria* Jullien, 1903

Dakaria subovoidea (d'Orbigny, 1852)

- Cellepora ovoidea* Audouin, 1826, p. 238.
- C. subovoidea* d'Orbigny, 1852, p. 402 (for *Cellepora ovoidea* Audouin, 1826 (in Audouin & Savigny, 1826), preoccupied).
- D. subovoidea*: Harmer, 1957, p. 1022.
- Watersipora cucullata*: Skerman, 1960, pp. 615–9.
- W. cucullata*: Gordon, 1967, p. 61, fig. 40.

MATERIAL EXAMINED: Encrusting colonies on pelecypod shells from sta. 1, 100 fm, and sta. 24, 38 fm.

Dakaria feegeensis (Busk, 1884) *vallata* n. subsp. FIG. 27

DESCRIPTION

Zoarium encrusting. Zooecia large, somewhat irregular in outline, usually subhexagonal and elongated, distinct, separated by slightly raised ridges. Frontal wall convex, coarsely granular, perforated by minute pores. Orifice subcircular; anter a little more than semicircular, slightly transverse; poster sinuate, concave portion in depth about one fifth as deep as the length of the orifice. A thin vestibular arch in the anter terminates at the short robust condyles. The robust operculum provided with two muscle dots distally and a thickened border. Peristome slightly thickened proximally and laterally, distal margin more salient, spines wanting in mature zooecia. Avicularia paired, placed on either side of the peristome co-linear with the condyles, sometimes one or both missing. Rostrum of avicularium triangular, a little elevated, about half the width of the orifice in length, and about half as wide as long. Ovicell large, flattened, extending almost to the orifice of the distal zooecium, separated from the cavity of that zooecium by a very thin calcareous lamina and covered by the frontal of that zooecium which it elevates slightly. Its front is perforated.

MATERIAL EXAMINED: Two colonies, one of which encrusts a pelecypod shell, from sta. 3, 41 fm.

REMARKS: The absence of spines, the shape of the orifice, the nature of the frontal, and the large deeply immersed ovicell all suggest the genus *Dakaria*.

Several authors (Busk, 1884; Osburn, 1940; Brown, 1952) have pointed out that in *D. feegeensis* specimens vary in form from place to place especially in the size of the ovicell and position of avicularia.

HOLOTYPE: Canterbury Museum, zb192.

LOCALITY: Sta. 3, Mernoo Bank, 43° 10.1' S, 175° 36.5' E, 41 fm; coarse bryozoan shell sand.

Genus *Rogicka** n. gen.

Schizoporellid orifice, the poster with a median sinus, sloping shoulders, and wedge-shaped recumbent condyles. Two rows of distal oral spines. Frontal a tremocyst with small pores, ovicell imperforate. Contact between zooecia reduced.

TYPE SPECIES: *Rogicka biserialis* (Hincks, 1885)

REMARKS: The double row of spines, the imperforate ovicell, and the reduction of contact between zooecia distinguish this genus from related genera such as *Lacerna*.

Rogicka biserialis (Hincks, 1885) FIG. 28

Schizoporella biserialis Hincks, 1885, p. 250, pl. 7.

"*Schizoporella*" *biserialis*: Brown, 1952, p. 387.

?*Dakaria biserialis*: Osburn, 1952, pp. 329–30, pl. 39, figs 5–6.

Arthropoma biserialis: Powell, 1967, pp. 259–60, text-fig. 31, pl. 5, fig. b.

DESCRIPTION

Zoarium encrusting. Zooecia large, variable in size, may be disordered in arrangement, with chains of zooecia growing in different directions. Zooecia separated by deep grooves. Frontal a tremocyst markedly inflated, pores small, numerous. Anter semicircular, shoulders of poster sloping to a median U-shaped sinus about a fifth the width of the orifice and as long as wide. Condyles long, wedge-shaped, extending from the junction of the anter and the poster to about half-way down the shoulders of the poster, a little recessed. Orifice surrounded by two distal rows of spines. Inner row composed of about 16 straight, tapering spines about half the width of the zooecium in length. The outer row of spines just outside the inner row, away from the margin of the zooecium. Spines in this row numerous, but may be fewer than in the inner row. Most of the spines in this outer row like those in the inner row, but on either side about six spines away from the proximal ends of the row are three slightly longer spines which project distally and curve inwards, displaced into a vertical line, and, when an ovicell is present, embrace its sides. No avicularia. Ovicell spherical, imperforate, surface a little roughened. Not immersed in frontal of distal zooecium, surrounded by a narrow perforated basal band.

MATERIAL EXAMINED: Two colonies encrusting an old massive bryozoan, from sta. 3, 41 fm, and sta. 24, 38 fm.

REMARKS: Osburn (1952) describes a form similar to this but having perforations in the ovicell, 8–12 spines in the inner row, and a proximal rounded sinus half as broad as the distal part of the orifice. Osburn's form may well be a distinct species. He placed it in the genus *Dakaria* partly because it lacked avicularia and the ends of the anter enclosed the ends of the poster. Rogick (1962)

* After the late Dr Mary Dora Rogick who made detailed systematic studies of North American phylactolaemate and Antarctic cheilostomate bryozoa.

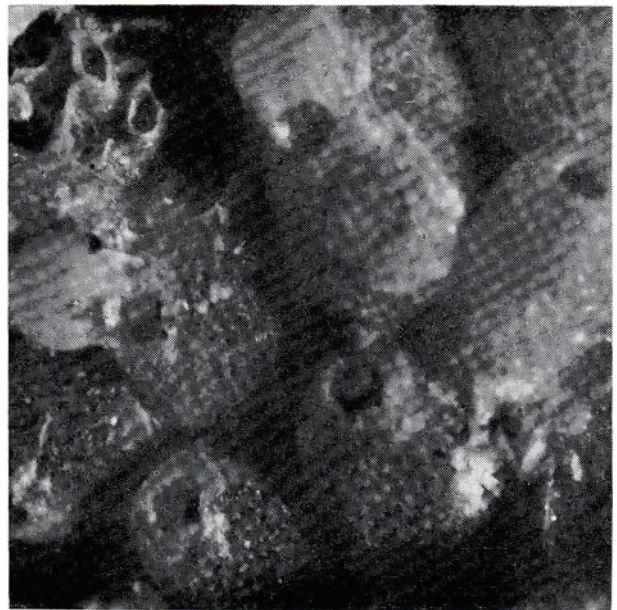


FIG. 28. *Rogicka biserialis* (Hincks, 1885), interzoecial tubes, orifice, ovicells, and frontal walls. $\times 47$.

points out that species of *Dakaria* may possess avicularia, so the presence or absence is not significant. The poster of the present species is not that of *Dakaria*, and species of *Dakaria* do not usually have oral spines.

A remarkable feature of this species is the reduction in contact between the zooecia and the development of kenozoecia lacking an orifice. Lateral walls are reduced or non-existent, and a zooecium may be in contact at only one point with another zooecium, a condition paralleling features of *Hippothoa distans*.

Genus *Lacerna* Jullien, 1888

Lacerna auriculata (Hassall, 1842) FIG. 29

Lepralia auriculata Hassall, 1842, p. 411.

Schizoporella auriculata Hincks, 1880, pp. 260–3, pl. xxix, figs 3–9.

S. punctigera MacGillivray, 1883, p. 133, pl. 2, fig. 13.

Not *Arthropoma punctigerum*: Harmer, 1957, p. 1005, pl. LXXII, fig. 28.

Schizomavella punctigera: Powell, 1967, text-fig. 41, pl. 5, fig. C.

DESCRIPTION

Zoarium encrusting. Zooecia quadrate, elongate, first zooecia of a new row pointed proximally. Zooecia separated by shallow grooves, mural rim thin when evident. Frontal wall thick, strongly granulated, somewhat convex, surrounded by a single row of prominent areolae, highest just proximal to the orifice. Anter of orifice slightly more than a semicircle, margin continuing proximally and medially to form the pointed condyles leaving a gap a third of the width of the orifice; V-shaped poster overlying and extending proximally to the condyles between them. Peristome thin, not salient, applied to the edge of the thickened frontal laterally

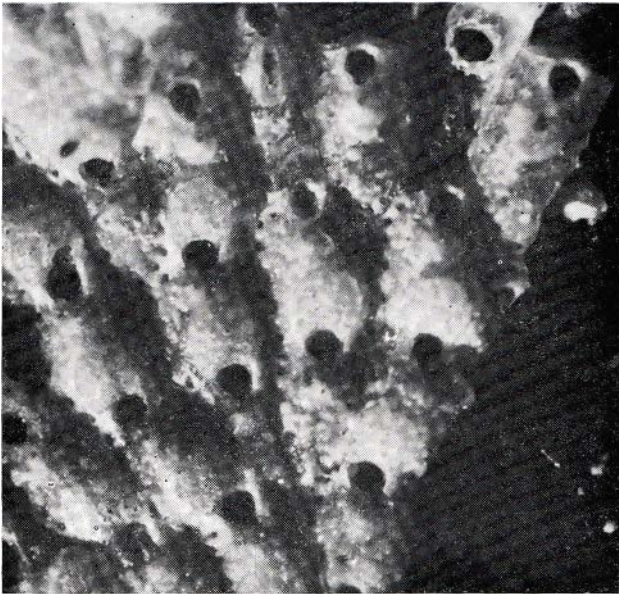


FIG. 29. *Lacerna auriculata* (Hassall, 1842), elongate and normal avicularia. $\times 47$.

and extended proximally to enclose a small suboral avicularium. Five distal peristomial spines. Mandible of the suboral avicularium directed proximally and forward, subtriangular, point rounded like the poster proximal to the condyles; pivot extending as a broad V into rostrum; proximal opesium minute, transverse. Rarely, suboral avicularium with an elongate spatulate mandible half the length of the frontal. Ovicell immersed in the frontal of the distal zoecium, its front widely exposed, flush with or a little elevated above the frontal, perforated by small scattered pores and extending almost halfway to the orifice of the distal zoecium. Orifice of the ovicell narrow, transverse; a crescentic ridge just within this orifice on the floor of the ovicell.

MATERIAL EXAMINED: Three small colonies, two encrusting pelecypod shells, from sta. 24, 38 fm. One specimen now Canterbury Museum no. zb204.

REMARKS: In a weakly calcified colony the flat ovicell rests on the frontal, the spine bases are visible and the avicularium chamber is tumid and peaked. From the avicularium chamber on either side short tubes run laterally and distally to open internally before they reach the lateral walls.

Powell (1967) pointed out that MacGillivray's species closely resembled *Lepralia auriculata* Hassall, 1842. Livingstone (1929) was of the same opinion. The discovery in the present material of a zoecium with an elongate spatulate avicularium confirms these opinions.

***Lacerna improvisa* n. sp. FIG. 30**

DESCRIPTION

Zoarium encrusting; zoecia subhexagonal, distinct, separated by shallow grooves. Frontal smooth, convex;

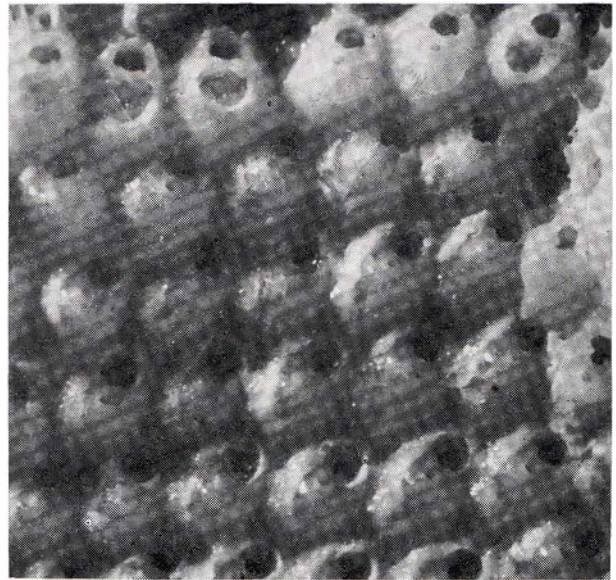


FIG. 30. *Lacerna improvisa* n. sp. $\times 47$.

a few marginal areolae of irregular shape in a single row. A suboral avicularium chamber forming a rounded elevation extending from the orifice for half the length of the frontal. Anter of the orifice forming slightly more than a semicircle, the poster a wide V about half the length of the anter. Robust conical condyles extending into the orifice from either side beneath the poster. The peristome not salient, its depth depending on the thickness of the frontal. Four spine bases along the distal margin of the orifice. Suboral avicularium directed proximally and outwards; with subequal opesia, thin pivot bar, and faintly pointed rostrum. Ovicell not seen.

MATERIAL EXAMINED: Two colonies encrusting pelecypod shells, from sta. 24, 38 fm, and two small colonies on a pelecypod shell from sta. 3, 41 fm.

REMARKS: This species differs from *Lacerna auriculata* in the shape of the avicularium and in having a larger avicularium chamber, condyles further apart in the orifice, and four instead of five oral spines.

HOLOTYPE: Canterbury Museum, zb193.

LOCALITY: Sta. 24, south of The Sisters, 43° 36.2' S, 176° 48.5' W, 38 fm; coarse shell sand gravel.

PARATYPE: NZOI, P165.

***Lacerna incurvata* n. sp. FIG. 31**

DESCRIPTION

Zoarium encrusting, zoecia hexagonal in shape, rounded distally, separated by shallow grooves in which is often a thin slightly salient ridge. Frontal, a smooth, faintly convex pleurocyst surrounded by a single row of widely spaced areolae. Orifice pyriform; anter greater

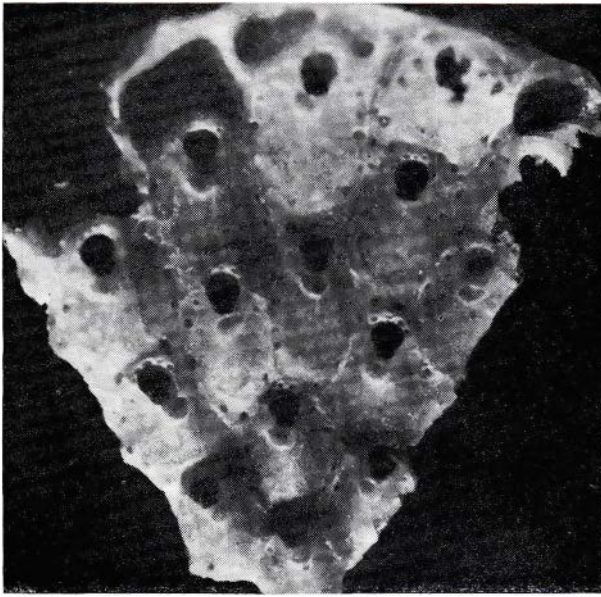


FIG. 31. *Lacerna incurvata* n. sp. $\times 47$.

than a semi-circle, poster continuous with anter and about half as wide as it and a quarter its length. Condyles prominent, conical, curved proximally. Peristome slightly salient, with 5–6 distal spines, and proximal to the orifice it is continuous with a median avicularium chamber which rises to a point. The avicularium lies within the peristome directed to the tip of the chamber. Mandible short, broad, spatulate, about as wide as long. Distal opesium broader than the very short proximal opesium and there is a thin complete pivot bar. Ovicell more or less immersed in the thickened frontal of the distal zoecium, covering about half its length. Front of the ovicell flattened and finely perforate.

MATERIAL EXAMINED: Three small encrusting colonies from sta. 24, 38 fm.

HOLOTYPE: Canterbury Museum, zb194.

LOCALITY: Sta. 24, south of The Sisters, $43^{\circ} 36.2' S$, $176^{\circ} 48.5' W$, 38 fm; coarse shell sand gravel.

PARATYPES: NZOI, P166; NZOI, P167.

***Lacerna minuta* n. sp.** FIGS 32, 33

DESCRIPTION

Zoarium encrusting. Zoecia subhexagonal, slightly elongated, distinct, separated by wide grooves in which thin mural rims are sometimes evident. Frontal smooth, becoming granulated, later convex, a prominent, pointed, suboral avicularium chamber, frontal bordered by a few oval areolae. Orifice small, anter greater than a semi-circle, poster a wide V one-third of the length of the orifice. Condyles, obtuse slanting into poster, the distance between them one-quarter the width of the orifice. Peristome low, elevated a little distally where it bears

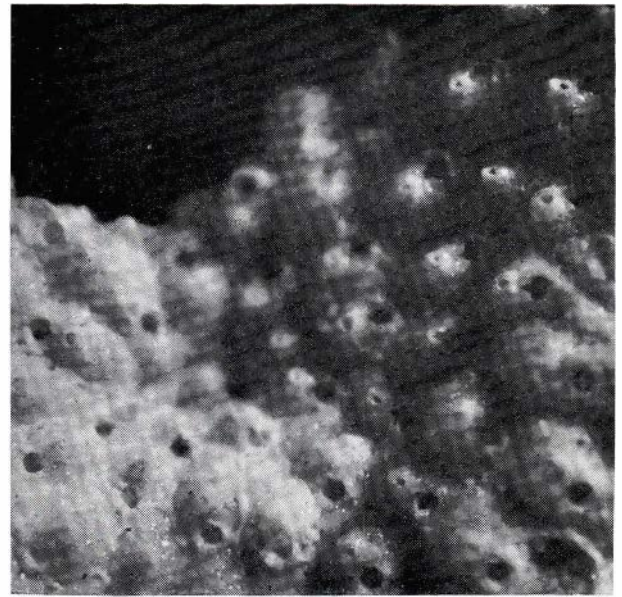


FIG. 32. *Lacerna minuta* n. sp., avicularia and orifice. $\times 47$.

5 or 6 spines. Suboral avicularium small, directed proximally, and steeply forward, distal opesium Y-shaped, pivot complete, proximal opesium small. Ovicell flattened, resting on two-thirds of frontal of distal zoecium, overgrown by frontal but a subcircular perforated area exposed above the orifice. The orifice of the ovicell low and transverse; a low crescentic ridge may be found on the floor of the ovicell within the orifice.

MATERIAL EXAMINED: Two colonies from sta. 24, 38 fm; and one colony, encrusting a pelecypod shell, from sta. 3, 41 fm.

REMARKS: This species is similar to *L. auriculata* but differs in the frontal not being so coarsely granular, the mandible of the avicularium being longer, and the proximal margins of the condyles being parallel rather than diverging proximally.

HOLOTYPE: Canterbury Museum, zb195.

LOCALITY: Sta. 24, south of The Sisters, $43^{\circ} 36.2' S$, $176^{\circ} 48.5' W$, 38 fm; coarse shell sand gravel.

PARATYPES: NZOI, P168.

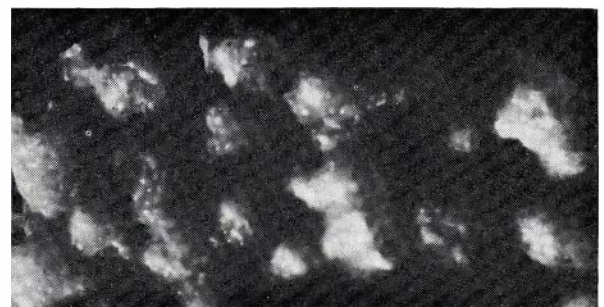


FIG. 33. *Lacerna minuta* n. sp., ovicells. $\times 47$.

Genus *Schizomavella* Canu & Bassler, 1917

Schizomavella cinctipora (Hincks, 1883)

- Schizoporella cinctipora* Hincks, 1883, p. 200, pl. 7, fig. 3.
S. cinctipora Hincks, var. *personata* Waters, 1887, p. 67, pl. VIII, fig. 28.
Smittina cinctipora: Marcus, 1922, pp. 110–2, pl. V, figs 9a, b, text-figs 7–7a.
Schizomavella cinctipora: Brown, 1952, pp. 236–9, fig. 170.
S. cinctipora: Macken, 1958, p. 105.

DESCRIPTION

Zoarium encrusting. Zoecia in quincunx, approximately diamond-shaped, widest at mid-length, separated by low mural ridges. Frontal jointly convex, thick, evenly perforated by numerous small tremopores. Primary orifice slanting distally and invaginating at the proximal end of distal zooecium so that the lateral walls meet the orifice at the end of its lateral margins. Anter. of the primary orifice a little more than a semicircle, the poster almost straight, transverse with lateral margins and a small sub-circular median sinus about a fifth of the width of the anter. Prominent transverse condyles beneath the lateral margins of the poster reaching almost to the distal corners of the sinus. The peristome not rising above the general surface of the colony but in most zooecia forming a vertical wall down to the primary orifice, deepest distally, usually terminating at the proximal corners of the orifice, rarely continuing as a shallowly curving rim which crosses the frontal below the poster. Peristome may bear four to six spines with minute spine bases distally but these rarely visible. In zooecia with ovicells the primary orifice may be very deeply immersed and a suboral avicularium may be present within the peristome. In this case, the secondary orifice with a sub-circular distal portion and a U-shaped proximal portion of a similar length and a width half that of the distal portion. Suboral avicularium directed proximally and upwards just proximal to the sinus in the mid-line, or displaced a little to either side. Pivot bar separating a very short, transverse proximal opesium from a broad, ligulate mandible which may widen distally, a little longer than wide. Avicularium half the width of the orifice in length.

Occasionally an additional avicularium on the frontal; this is often present on ovicelled zooecia, rarely present on non-ovicelled zooecia. This avicularium may be oriented in any direction. The avicularium may also be found on an interzooecial kenozoecium. Mandible about as long as the orifice and may be almost as wide, the same shape as the peristomial avicularium. Rostrum may be a little salient. Ovicell resting on the frontal of the distal zooecium opening into the peristome above the primary orifice by a transverse opening which is not closed by the operculum. Frontal of the ovicell perforated and flat, and soon after its formation only demarcated from the surrounding frontals by the mural ridges.

MATERIAL EXAMINED: Eight colonies encrusting pelecypod shells or massive bryozoan fragments, from sta. 3, 41 fm. One colony on a pelecypod shell, from sta. 24, 38 fm.

REMARKS: Among the specimens is a fine colony with intact opercula from sta. 3 encrusting an oyster shell. It is the only specimen with avicularia and intact ovicells. The ovicells are seen to be formed by a double-walled basal plate and circular margin continuous with the peristome, and resting on the frontal of the distal zooecium which becomes roofed over by a coarsely perforate entoecium. Although very inconspicuous, spine bases were detected on marginal zooecia of this and other colonies. Spines were found only on a colony from sta. 24. This colony varied from the others in having smaller tremopores, a more pronounced slope of the orifice, and a transverse proximal rim of the peristome. The corners of the peristome which divide its distal and proximal parts may nearly meet, approaching a personate type of peristome.

The present material has been described because there is evidently some confusion regarding the nature of this species. Hincks (1883) figures a rounded avicularium placed a little to one side below the orifice and Brown (1952) concurs with this. However, there is good agreement between the orifice, frontal, and ovicell of the present material and that described by Brown, and it is believed that the present material also indicates that *Schizoporella cinctipora* Hincks var. *personata* Waters, 1887 and *Smittina cinctipora* (Hincks): Marcus, 1922 should be included in this species.

One of the most interesting features of this species is the great thickening of the frontal around the ovicell. Also of interest is the peristomial avicularium. Both features would protect the ovicell.

Until a more careful study can be made of the whole family this species is retained in the genus *Schizomavella* despite the narrow sinus in the poster and the ovicell opening above the operculum.

Schizomavella conjuncta n. sp. FIG. 34

DESCRIPTION

Zoarium encrusting. Zoecia subhexagonal or elliptical, elongated, separated by shallow grooves. Frontal wall moderately convex, perforated, the pores small, rounded, numerous. Orifice declining distally, with the anter an arch, a little longer than wide; sides of the poster slanting a little proximally to a median U-shaped sinus about half the width of the anter. Condyles prominent, projecting transversely to form extended margins of the sinus. Peristome thin, bearing four spines and enclosing in a large sinus the suboral avicularium when it is present. The peristome may become elevated laterally, the lateral walls sending flanges across the front of the ovicell above its orifice, to meet proximally to form a circular secondary orifice. Avicularium usually present median, suboral, pointing proximally, a minute proximal opesium embraced by a larger reniform transverse rostrum, a little over half the width of the orifice, a flat smooth shelf separating the avicularium from the sinus. Ovicell occupying about half of the frontal of the distal zooecium,

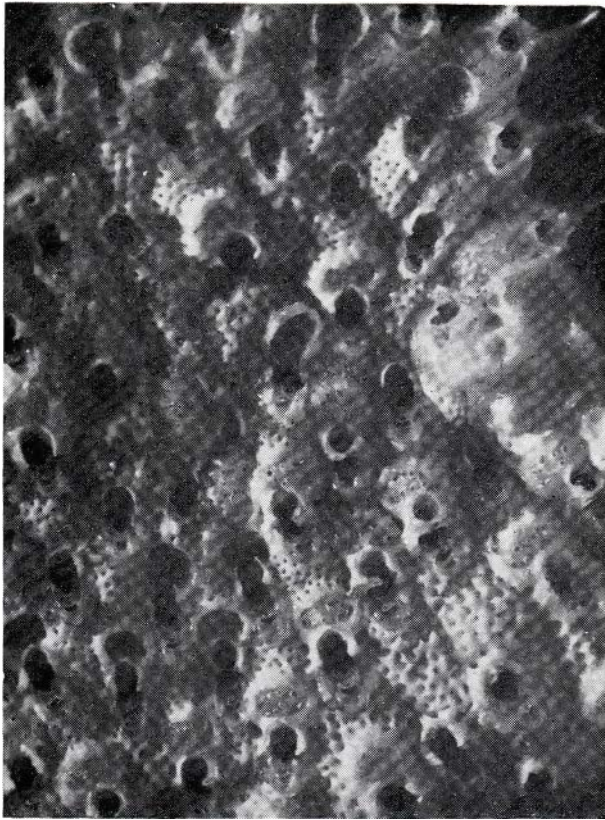


FIG. 34. *Schizomavella conjuncta* n. sp., with persona. $\times 47$.

a little flattened, perforated by scattered pores. Secondary calcification forms an imperforate band basally.

MATERIAL EXAMINED: One colony encrusting a pelecypod shell, from sta. 24, 38 fm.

REMARKS: This species appears to be like *Schizoporella ortmami* Kluge, 1955, but in that species the avicularium has a ligulate mandible which may be directed to one side within the peristome.

The peristomial avicularium and frontal of this species is strikingly similar to *Smittina purpurea* (Hincks 1881a).

HOLOTYPE: Canterbury Museum, zb196.

LOCALITY: Sta. 24, south of The Sisters, 43° 36.2' S, 176° 48.5' W, 38 fm; coarse shell sand gravel.

Genus *Buffonellodes* Strand, 1928

Buffonellodes ridleyi (MacGillivray, 1883)

Schizoporella marsupium: Ridley, 1881, p. 8, pl. 6, fig. 6.

S. ridleyi MacGillivray, 1883, p. 191, pl. 1, fig. 1.

S. ridleyi: Brown, 1952, pp. 383–4.

MATERIAL EXAMINED: Two small colonies from sta. 24, 38 fm.

Buffonellodes rimosa (Jullien, 1888) FIG. 35

Buffonella rimosa Jullien, 1888, p. 47, pl. 1, fig. 1.

DESCRIPTION

Zoarium encrusting, zooecia in quincunx, hexagonal, wide at mid-length, distal wall convex. Zooecia separated by grooves, mural rims not salient. Frontal smooth, convex, lacking secondary calcification, without areolae or tremopores, a large hollow conical avicularium-bearing umbo reaching either side of the frontal and extending proximally for over a third of the length of the frontal. The anter a little wider than a semicircle, the poster a wide V the sides of which are a little convex. Prominent condyles underlying the margins of the poster, distal margins of these condyles having a shallower slope than the sides of the poster. Median margins leaving a sinus between them about one third of the width of the aperture. Poster less than half the length of the anter. Four peristomial spines on the distal margin of the orifice. In zooecia with ovicells the two median spine bases covered by the distal wall of the ovicell. Median suboral avicularium directed vertically upwards and sited just below the apex of the suboral umbo. It is oval and the rostrum is about as long as it is wide. Occasionally there may be one or two additional avicularium chambers encroaching on the frontal from the margins, proximal to the suboral avicularium, bearing avicularia similar to the suboral avicularium on their inner faces. Tumescient ovicell not immersed, and extending over the frontal of the distal zooecium as far as the avicularium chamber and, like that chamber, its summit coming to a solid point. Ovicell with a low transverse opening over the orifice.

MATERIAL EXAMINED: Three colonies from sta. 24, 38 fm, two of which encrust pelecypod shells.

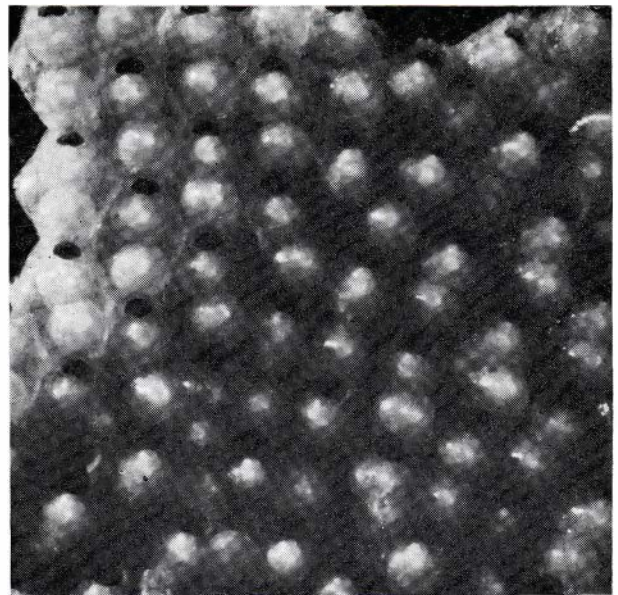


FIG. 35. *Buffonellodes rimosa* (Jullien, 1888). $\times 47$.

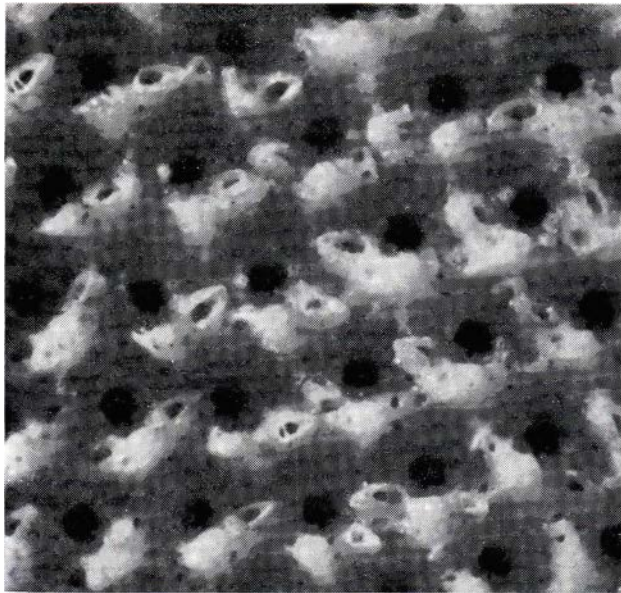


FIG. 36. *Chistosella daedala* (MacGillivray, 1887). $\times 47$.

Genus *Chistosella* Canu & Bassler, 1934

Chistosella daedala (MacGillivray, 1887) FIG. 36

Schizoporella insignis MacGillivray, 1883, p. 132, pl. II, fig. 11.
 Not *S. insignis* Hincks, 1881b, pp. 134–5, pl. V, fig. 10.
S. daedala MacGillivray, 1887, p. 180 (*nom. nov.*).
C. daedala Stach, 1937, pp. 335–6, pl. XVIII, figs. 1, 2.
C. daedala Brown, 1952, pp. 220–1, fig. 156.

MATERIAL EXAMINED: Several unilaminate fragments, mostly encrusting pelecypod shells, from sta. 24, 38 fm.

REMARKS: The material does not agree entirely with Stach's redescription (Stach 1937). The very large umbo on the frontal (mentioned by Brown, 1952) is present on all except the most immature marginal zoecia; there are no additional avicularia, only the large single or paired laterally directed frontal avicularia; there are five, and often six, peristomial spines, not four, and the zoecium is small, about 0.4 mm and not 0.9 mm in length. The minute denticles at the distal end of the sinus mentioned by previous authors are present and appear to be formed by the proximal margin of the orifice. The resemblance of the present material to the figures of earlier authors, particularly MacGillivray (1883), is strong.

Chistosella gabrieli Stach, 1937

C. gabrieli Stach, 1937, p. 336, pl. 18, figs 3, 4.

MATERIAL EXAMINED: A colony from sta. 24, 38 fm, encrusting a pelecypod shell. A colony from sta. 3, 41 fm.

REMARKS: The specimens do not have ovicells and differ a little from the original description. The zoecia are large (0.8 mm) but not as large as described by Stach (1.3 mm). Areolae are prominent and a few may form a

second row on either side near the orifice, but tremopores are not evident. The frontal avicularium is about as long as the orifice is wide. It is directed laterally and is placed well to the side. The sides of the opesia of the avicularium slope inwards and the rostrum is strongly elevated and somewhat curved downwards; teeth were not detected in the rostrum. Not all zoecia possess a frontal avicularium. There are four or five peristomial spines, not three.

However, the general shape and location of the avicularium, the size of the zoecium, and the shape of the orifice all suggest this species.

Chistosella enigma Brown, 1952

C. enigma Brown, 1952, pp. 558–60, fig. 1a.
C. enigma: Macken, 1958, p. 105.

MATERIAL EXAMINED: Three colonies from sta. 3, 41 fm, two of which encrust pelecypod shells, and one of which encrusts a massive bryozoan.

Two colonies from sta. 24, 38 fm, one of which encrusts a colony of *Fenestulina malusii*.

REMARKS: One of the colonies from sta. 24 is more heavily calcified than the others, being almost rugose in appearance. Ovicells are not present. Two or three opercula were examined: the anter was a fairly robust plate and the poster formed a very weak extension.

Genus *Escharina* Milne-Edwards, 1836

Escharina waiparaensis Brown, 1952

E. waiparaensis Brown, 1952, pp. 229–31, figs 153–165.
E. waiparaensis: Brown, 1954a, p. 427.

MATERIAL EXAMINED: Two colonies encrusting pelecypod shells from sta. 24, 38 fm. Two bilamellar fragments from sta. 3, 41 fm.

REMARKS: The bilamellar fragments are robust, five or six zoecia wide, with rounded edges. The sinuses of some of the zoecia are longer and with the sides pinched in more than in the encrusting form.

Family HIPPOPORINIDAE Osburn, 1952

Genus *Hippoporina* Neviani, 1895

Hippodiplosia: Osburn, 1952, p. 338.
 not *Hippoporina*: Osburn, 1952, p. 344.
Hippoporina: Harmer, 1957, p. 976.

Hippoporina lancifera (Hincks, 1891)

Lepralia lancifera Hincks, 1891, p. 296, pl. 7, fig. 6.
H. lancifera: Brown, 1952, p. 382.
H. lancifera: Macken, 1958, p. 105.

MATERIAL EXAMINED: A thick multilaminate fragment from sta. 3, 41 fm. A colony encrusting a pelecypod shell from sta. 24, 38 fm.

REMARKS: The appearance of the two colonies is very different. The one from sta. 3 is more densely calcified and often has several avicularia as well as the suboral one. These are often placed on either side of the suboral avicularia and occasionally on either side of the ovicell, directed distally, or on the frontal, directed distally. The infundibulate nature of the frontal pores is evident in this colony. In the other colony calcification is much weaker; usually only the suboral avicularium is present and the pores are small.

Genus *Hippomenella* Canu and Bassler, 1917

Hippomenella vellicata (Hutton, 1873) FIG. 37

Lepralia vellicata Hutton, 1873, p. 98.

H. vellicata: Brown, 1952, pp. 278-81, figs 209, 210.

H. vellicata: Powell, 1967, pp. 305-6, figs 62a-d.

MATERIAL EXAMINED: Three encrusting colonies, two of which are on pelecypod shells, from sta. 3, 41 fm. One encrusting colony from sta. 24, 38 fm.

REMARKS: One colony bears ovicells. A single distally directed, large, acuminate avicularium often lies on the frontal, distal to the ovicell.

The colony from sta. 24 has an ancestrula of a rather unusual appearance (Fig. 37). The frontal of the ancestrula is an imperforate gymnocyst which is continuous with the slanting lateral walls. The orifice has a sinuate proximal margin with a wide concave portion and the distal margin is an arch, the lateral walls of which diverge considerably. There is an oval array of 14 spine bases that are closest together along the distal margin of the orifice, and forming the only demarcation of the frontal. Powell (1967) also figures this ancestrula.

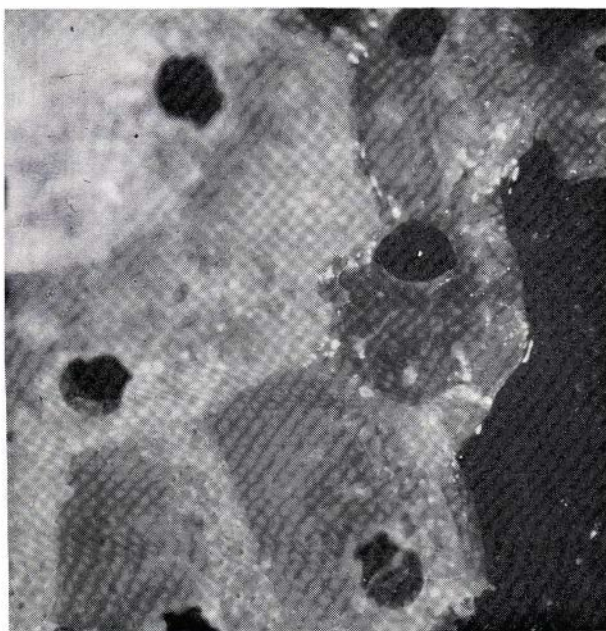


FIG. 37. *Hippomenella vellicata* (Hutton, 1873), ancestrula. $\times 47$.

Hippomenella curvata n. sp. FIG. 38

DESCRIPTION

Zoarium encrusting. Zoecia in quincunx becoming multilaminar. Zoecia variable in shape: rectangular, up to twice as long as wide; or hexagonal, the distal wall convex, separated by a shallow groove, mural rim not salient. Frontal slightly convex, surrounded by areolae, becomes thickened and granular, a faint suboral umbo may occur, and there are three spine bases on the distal rim of the low peristome. Primary orifice pyriform, as long as broad, base of poster broadly rounded. The prominent finger-like condyles directed medially and curved slightly proximally from beneath the straight converging sides of the primary orifice at about a fifth of its length from its proximal end. An occasional avicularium near the margin of the frontal wall just proximal to the orifice and directed proximo-laterally, more rarely an avicularium on each side. Avicularium flattened and inconspicuous and sited over an areolae; oval to parallel-sided or widening a little distally with rounded ends. Mandible a little longer than wide, about two-thirds the width of the aperture in length and directed away from the aperture. A curved shelf filling the distal half of the distal opesium. No ovicells were observed.

MATERIAL EXAMINED: Several colonies encrusting pelecypod shells, from sta. 24, 38 fm.

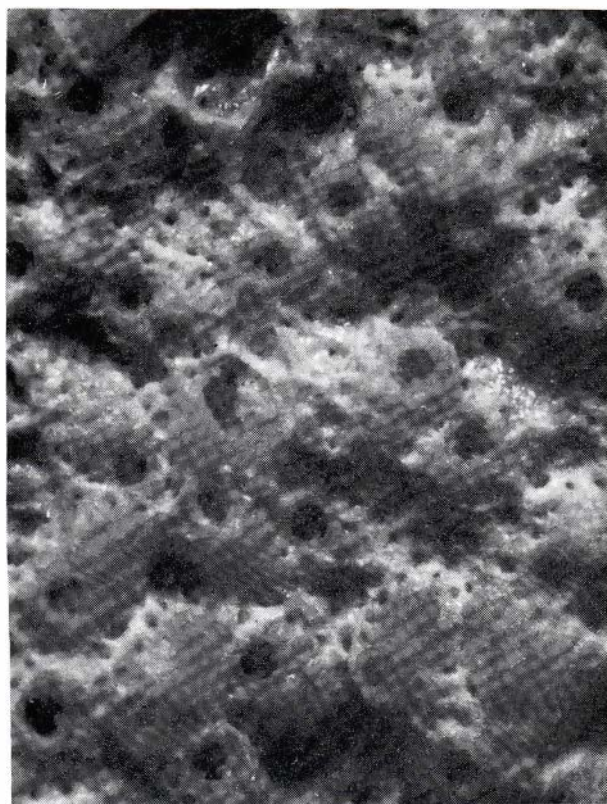


FIG. 38. *Hippomenella curvata* n. sp., avicularia present. $\times 47$.

REMARKS: The species resembles *H. hippopus* (Smitt, 1867) and *H. ligulata* Powell, 1967, but differs from the former in that the anter is narrower and the avicularia are directed away from the orifice, and differs from the latter in that the avicularia are consistently small and lack a ligula, the vestibular arch is not beaded, and spines are present.

HOLOTYPE: Canterbury Museum, zb197.

LOCALITY: Sta. 24, south of The Sisters, 43° 36.2' S, 176° 48.5' W, 38 fm; coarse shell sand gravel.

PARATYPE: NZOI, P169.

***Exochella conjuncta* Brown, 1952**

Smittia napierii Waters, 1883, p. 438 (pars), pl. 12, fig. 14.
E. conjuncta Brown, 1952, pp. 294–6, figs 220–223.
E. conjuncta: Macken, 1958, p. 105.

MATERIAL EXAMINED: Several colonies, mostly encrusting pelecypod shells, from sta. 24, 38 fm. One colony on a pelecypod shell, from sta. 3, 41 fm.

REMARKS: Brown (1952) did not recognise the primary orifice. In specimens in which the operculum is intact, it lies below the level of the peristomial teeth and when the orifice is viewed from inside the zooecium it is clear that the primary orifice is a transverse subelliptical opening with a wide low delicate lyrule in the proximal margin.

***Exochella tricuspis* (Hincks, 1881)**

Mucronella tricuspis Hincks, 1881b, p. 125, pl. III, fig. 1.
E. longirostris Jullien, 1888, pp. 55, 56.
E. tricuspis: Brown, 1952, pp. 289–91, fig. 217.
E. tricuspis: Macken, 1958, p. 105.
E. tricuspis: Powell, 1967, pp. 312–3, text-fig. 67.

MATERIAL EXAMINED: Several colonies, some encrusting pelecypod shells, from sta. 24, 38 fm. One colony from sta. 3, 41 fm.

REMARKS: Brown (1952) pointed out the similarity of *E. longirostris* and *E. tricuspis* but separated them on the basis of Levinsen's figure (pl. 17, fig. 96) in which the proximal lip is shown as entire, shallowly concave, and devoid of a lyrule. It seems likely from the present material that this is a mistake and that a delicate lyrule has been overlooked or broken off.

In both this and the preceding species a faint line originating at the corners of the primary orifice traces an oval area half the length of the frontal on the under surface of the frontal, presumably the site of the ascus.

Family ESCHARELLIDAE Brown, 1952

Genus *Exochella* Jullien, 1888

Brown (1952) placed this genus in the family Exochellidae, with the following remarks: "Under this heading I have grouped the three genera *Exochella* Jullien, *Escharoides* Milne-Edwards, and *Umbonula* Hincks, because of the similar nature of their frontal walls. However, in view of the fact that the ovicells appear to be structurally different, this arrangement must be regarded as purely tentative and only for convenience in the present work."

Bassler (1953) lists a family Exochellidae as follows: "Exochellidae Bassler, 1935 [as Exochellinae] [=Peristomellae Canu-B., 1917; Didymosellidae Brown, 1952]". [Note: "Canu-B." = Canu & Bassler.] The Peristomellae are defined in part as having an oblique orifice which lacks lyrule, cardelles, or rimule. Levinsen (1909) figures an internal view of the orifices of *Exochella longirostris* Jullien, 1888 and *E. lobata* Lev. 1909. In both species there is an obvious lyrule on the proximal margin of the primary orifice. A lyrule was found on the proximal margin of the primary orifice of both *E. conjuncta* Brown, 1952 and *E. tricuspis* Hincks, 1881. (Grounds are given below for considering *E. longirostris* Jullien a synonym of *E. tricuspis* Hincks.) The presence of a lyrule is thus probably a generic character and indicates an affinity with the lyrulate families, in particular the Escharellidae Brown, 1952 which contains the genus *Escharella*, the primary orifice of which possesses a lyrule and no condyles.

What is the function of the large proximal teeth in the peristome of *E. tricuspis* and *E. conjuncta*? A possible answer is that they hold the operculum away from the margin of the peristome when the lophophore is extended and permit water to flow into and out of the ascus through the single pore in *E. conjuncta* and the pair of pores in *E. tricuspis*.

Family MICROPORELLIDAE Hincks, 1880

Genus *Microporella* Hincks, 1877

***Microporella discors** n. sp. FIG. 39**

DESCRIPTION

Zoarium encrusting. Zooecia hexagonal, distinct, separated by rather deep grooves. Frontal wall convex, granulated, perforate, the pores small, rounded, and numerous. Orifice more than twice as wide as long, semi-elliptical, the proximal margin straight and denticulated. Peristome thin, slightly salient, rounded, complete, slightly wider proximally, with four distal spines. A persona may or may not be present. When present persona formed by the ectooecium continuing proximally

* From *discors* (L)—disagreeing.

on either side of the orifice and then transversely as a vertical wall between the ascopore and the orifice; lightly fused with the frontal. The ectooecium forming a ridge above the ooeciopore which is continuous with the persona. Entooecium exposed below this ridge. Ascopore crescentic, perforate, with a salient, smooth border, situated at a distance from the orifice greater than the length of the orifice. Avicularia adventitious, of medium size, salient, the proximal extremity close to the ascopore, the distal extremity reaching almost to the zoecial margin, the rostrum directed laterally; a large, semi-elliptical, proximal opesium separated from a small, subtriangular, distal opesium by a complete pivot, the rostral edge thin, salient, compressed laterally, convergent and rounded distally, the extremity sometimes deeply incised. Mandible setiform and about as long as the zoecia are wide. The triangular proximal part narrowing beyond the rostrum and then widening slightly. Ovicell hyperstomial, slightly impressed, salient, large, hemispherical, granulated, opening widely above the orifice, the proximal extremities of the ovicell co-linear with the straight proximal margin of the orifice in the impersonate form.

MATERIAL EXAMINED: Clean fragments of one colony (impersonate form), from sta. 1, 100 fm. Two colonies (personate form), from sta. 24, 38 fm, one of which is on a shell; a colony with one personate ovicell on a pelecypod shell, from sta. 3, 41 fm. Size: Length of zoecia, impersonate form, sta. 1: 0.55 mm (av. of 5); personate form, sta. 24: 0.46 mm (av. of 5).

REMARKS: This species is close to *M. hyadesi* Jullien, 1888 but is distinguishable by the oral spines, the perforate ascopore, and the form of the persona which forms a rim and has a lower margin being fused with the frontal in this species. In *M. hyadesi* the persona forms a bridge, there being a gap between the proximal margin and the frontal. The ascus has a lunate opening instead of pores and there are no spines.

HOLOTYPE: Canterbury Museum, zbl98.

LOCALITY: Sta. 1, Mernoo Bank, 42° 51.9' S, 176° 26.5' E, 100 fm; coarse bryozoan shell sand.

PARATYPE: NZOI, P170.

Microporella diademata (Lamouroux, 1825)

Flustra diademata Lamouroux, 1825, p. 609, pl. 89, figs 3–6.
M. ciliata (Pallas) var. *diademata*: Brown, 1952, pp. 252–4, fig. 185.
M. orientalis Harmer, 1957, pp. 962–3, pl. LXII, figs 25–28, 38.
M. ciliata var. *diademata*: Macken, 1958, p. 105.

MATERIAL EXAMINED: Several colonies from sta. 24, 38 fm, some on pelecypod shells, and two colonies from sta. 3, 41 fm both on pelecypod shells.

REMARKS: This species is closely related to *M. ciliata*. Harmer (1957) distinguished specimens in which the

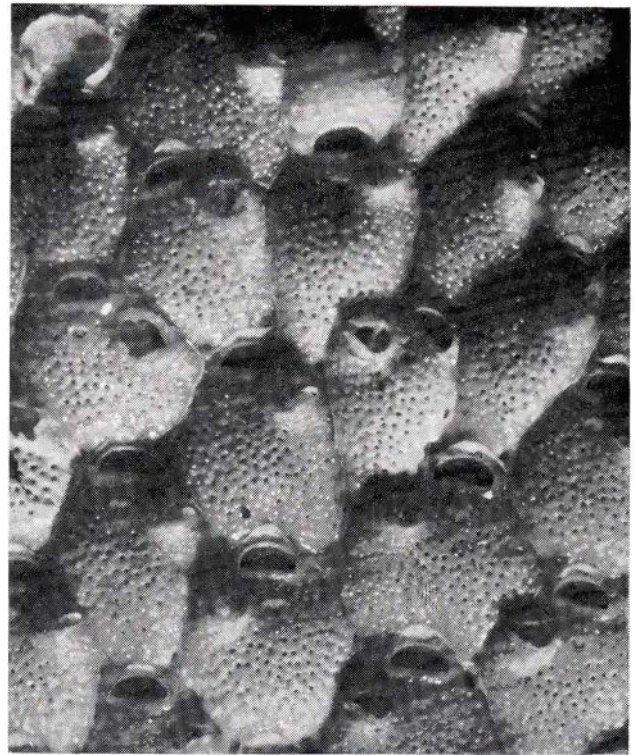


FIG. 39. *Microporella discors* n. sp. × 47.

setiform mandible of the avicularium bears a pair of hooks which hang over the end of the rostrum, and assigned them the name *M. orientalis*. In the material examined a group of specimens at first assigned to *M. ciliata* var. *diademata* was found to have similar small hooks on the setiform mandibles. The mandibles are almost as long as the zoecia are wide. The zoecia bear four to six peristomial spines; a narrow band of entooecium is exposed above the ooeciopore; and the ectooecium in older zoecia is continued proximally on either side of the orifice in the beginnings of a labium. The labium is not complete, although the projections may almost meet between the ascopore and the orifice over the frontal.

Genus *Calloporina* Neviani, 1895

Calloporina angustipora (Hincks, 1885)

Microporella diadema (MacGillivray) forma *angustipora* Hincks, 1885, p. 249, pl. 8, figs 3–3a.
C. diadema (MacGillivray) var. *angustipora*: Brown, 1952, pp. 263–5, figs 195–196.
C. angustipora: Brown, 1954c, p. 558, fig. 1c.
C. angustipora: Macken, 1958, p. 105.
C. angustipora: Powell, 1967, pp. 300–1, text-fig. 59, pl. 8, figs c, d.

MATERIAL EXAMINED: A few colonies from sta. 24, 38 fm.

Genus **Fenestulina** Jullien, 1888

Fenestulina malusii (Audouin, 1826)

- Cellepora malusii* Audouin, 1826; Savigny (*in* Audouin & Savigny, 1826), pl. 8, figs 81–82.
F. malusii: Brown, 1952, pp. 260–2, fig. 194.
F. malusii: Macken, 1958, p. 105.
F. malusii: Powell, 1967, pp. 296–8, text-fig. 57.
F. malusii: Gordon, 1967, p. 58, fig. 32.

MATERIAL EXAMINED: Several colonies from sta. 24, 38 fm, and a fragment from sta. 37, 30 fm.

Family EURYSTOMELLIDAE Levinsen, 1909

Genus **Eurystomella** Levinsen, 1909

Eurystomella foraminigera (Hincks, 1883)

- Lepralia foraminigera* Hincks, 1883, p. 200, pl. 7, fig. 1.
E. foraminigera: Brown, 1952, pp. 286–8, figs 215, 216.
E. foraminigera: Powell, 1967, p. 310, text-fig. 66.
E. foraminigera: Gordon, 1967, p. 59, fig. 33.

MATERIAL EXAMINED: Four colonies from sta. 24, 38 fm, three of which encrust pelecypod shells.

Family RETEPORIDAE Smitt, 1867

Genus **Hippellozoon** Canu & Bassler, 1917

Hippellozoon novaezealandiae (Waters, 1895)

- Retepora novae zealandiae* Waters, 1895, p. 270, pl. 7, figs 1–6, 19.
H. novae-zealandiae: Brown, 1952, pp. 344–6, figs 265a, b.
H. novaezealandiae: Powell, 1967, pp. 356–7, text-fig. 99.

MATERIAL EXAMINED: Several fragments of colonies from sta. 24, 38 fm.

Genus **Rhynchozoon** Hincks, 1895

Rhynchozoon larreyi (Audouin, 1826) FIG. 40

- Cellepora* (?) *larreyi* Audouin, 1826 (*in* Audouin & Savigny, 1826), p. 239.
R. angulatum Levinsen, 1909, pp. 295–6, pl. 23, figs 4a–h.
R. larreyi: Harmer, 1957, pp. 1074–6, pl. 70, figs 12, 16–20.
R. larreyi: Powell, 1967, pp. 362–3, pl. 14, fig. f.

DESCRIPTION

Zoarium encrusting. Zooecia at first in quincunx, becoming cumulus. Frontal a thickened convex pleurocyst with about eight areolae. In older zooecia frontal developing a suboral complex which forms the proximal part of the peristome and is composed of an avicularium chamber bearing on its oral side a transverse uncinat process and an avicularium, and rising to form a tall mucro frontally. On one side of this avicularium chamber is a notch in the peristome with a smaller mucro on the other side of the notch. Frequently a proximally directed avicularium on the frontal. Uncinate process a

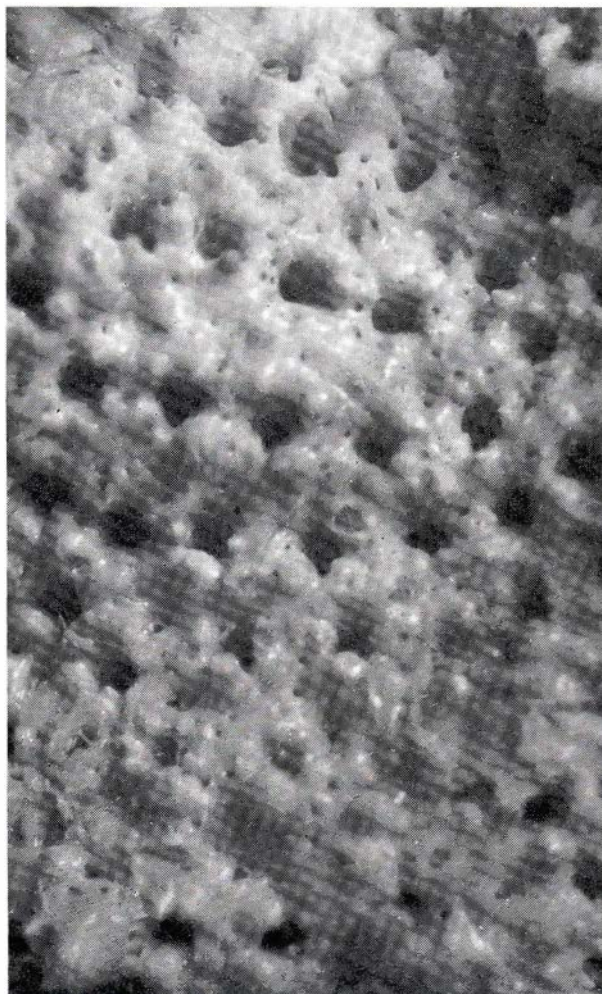


FIG. 40. *Rhynchozoon larreyi* (Audouin, 1826). $\times 47$.

horizontal shelf running out from the peristomial avicularium chamber above the primary orifice; its distal edge straight, a corner projecting into the peristomial notch. Mucro on the avicularium chamber usually broken, but when intact, in younger zooecia, nearly as long as the peristomial spines. Two, sometimes three or four, distal peristomial spines only found on young zooecia: they may be almost as long as a zooecium. In heavily calcified specimens two or three small mucroid papilla may appear around the peristome in addition to the suboral mucros. Primary orifice sloping steeply distally. Anter a little wider than long and the inner margin of the vestibular arch beaded. Poster a wide V, its depth a third to a half its width. A pair of small condyles partway down and beneath the sides of this V and there may be slight notches in the sides of the poster over the condyles. Avicularia about half the width of a zooecium in length. Mandible acutely triangular with the tip a little elevated. Peristomial avicularium lying transversely in a vertical plane above the uncinat process, its mandible directed away from the asymmetrical

peristomial notch. Frontal avicularium may be a little larger than the peristomial avicularium, and usually directed proximally or transversely. Ovicell formed in two stages: at first widely open, thin walled, and hood shaped; later immersed, and with a thin frontal wall which extends downwards as a trapeziform plate over the ooeciopore.

MATERIAL EXAMINED: Several colonies encrusting pelecypod shells, from sta. 24, 38 fm. A colony from sta. 3, 41 fm.

REMARKS: The above description is given as species of this genus do not appear to be well defined. For example, this species is close to *Rhynchozoon bispinosum* (Johnston, 1847) but *R. bispinosum* apparently has a smaller uncinatate process and smaller avicularia (Osburn, 1952).

***Rhynchozoon paa** n. sp. FIG. 41**

DESCRIPTION

Zoarium encrusting. Zooecia of moderate size, at first in quincunx, becoming cumulus. Frontal a thickened, convex pleurocyst, with about six small areolae. In all but the youngest zooecia a suboral complex develops to form the proximal part of the peristome: this is an avicularium chamber, bearing on its oral side a transverse uncinatate process above which is an avicularium, surmounted by a robust mucro. Chamber to one side or other of the peristome; a peristomial groove on the other side which becomes occluded in older zooecia. Mucro usually broken especially in older zooecia. Uncinatate process with a straight inner edge, about twice as long transversely as it is wide, its greatest width being at the edge exposed in the peristomial groove; this edge often slanting back to leave a somewhat acute angle. A small mucro may be found on the other side of the peristomial groove and in more mature zooecia two or three other small mucros may be found around the peristome. In young zooecia there may be four to six peristomial spines. Two types of avicularia. Primary orifice sloping steeply distally. Anter two-thirds as long as wide and the lower margin of the vestibular arch beaded. Poster forming a wide shallow V with small condyles beneath the outer ends of the V. The small peristomial avicularium with a thin pivot bar and a mandible about as wide as it is long, wider at mid-length than at its base, its rounded sides coming to a slight point which may be a little elevated. Avicularium situated above the widest part of the uncinatate process, directed vertically, and turned a little towards the groove. One or two similar avicularia outside the peristome or on the frontal. Second type of avicularium uncommon. Mandible narrowly spatulate, about four times as long as wide, almost half the length of a zooecium, directed proximally, on the frontal or beside the peristome. Ovicell spherical with a steep frontal extending downwards as a trapeziform plate over the

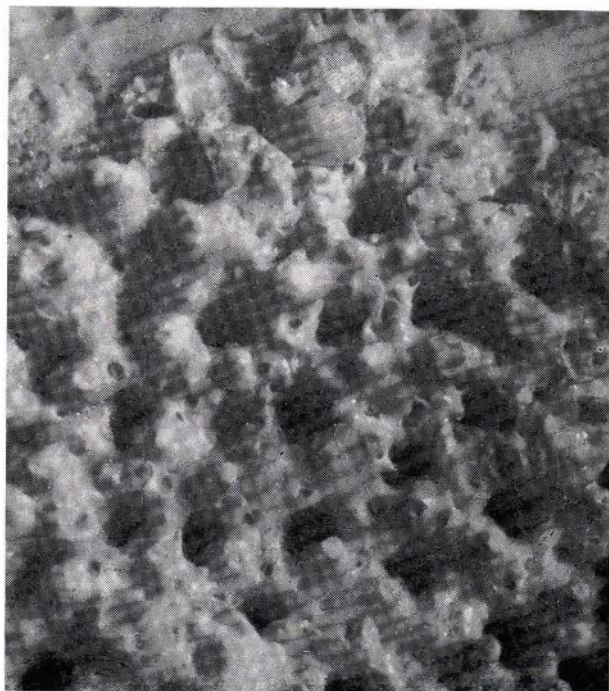


FIG. 41. *Rhynchozoon paa* n. sp. × 47.

ooeciopore. Ovicell becomes buried as secondary calcification proceeds. A cap forms over the ovicell but a thinly calcified frontal area is left.

MATERIAL EXAMINED: A small colony from sta. 3, 41 fm and several colonies from sta. 24, 38 fm.

REMARKS: This species is distinguished from *R. larreyi* by having small, as well as large, avicularia and by the shape of the primary orifice.

HOLOTYPE: Canterbury Museum, zb199.

LOCALITY: Sta. 24, south of The Sisters, 43° 36.2' S, 176° 48.5' W, 38 fm; coarse shell sand gravel.

PARATYPES: NZOI, P171; NZOI, P172.

Family CREPIDACANTHIDAE Levinsen, 1909

Genus *Crepidacantha* Levinsen, 1909

***Crepidacantha crispina* (Levinsen, 1909)**

C. poissonii, Audouin, var. *crispina* Levinsen, 1909, p. 266, figs 1–3, 5, 6.

C. crispina: Brown, 1954b, pp. 248–50, fig. 1c.

C. crispina: Macken, 1958, p. 106.

C. crispina: Powell, 1967, pp. 342–3, figs 90a, b.

C. crispina: Gordon, 1967, p. 61, fig. 39.

MATERIAL EXAMINED: One colony encrusting a pelecypod shell, from sta. 37, 30 fm.

* From *Paa* (Maori)—a fortified village, usually on a hill top.

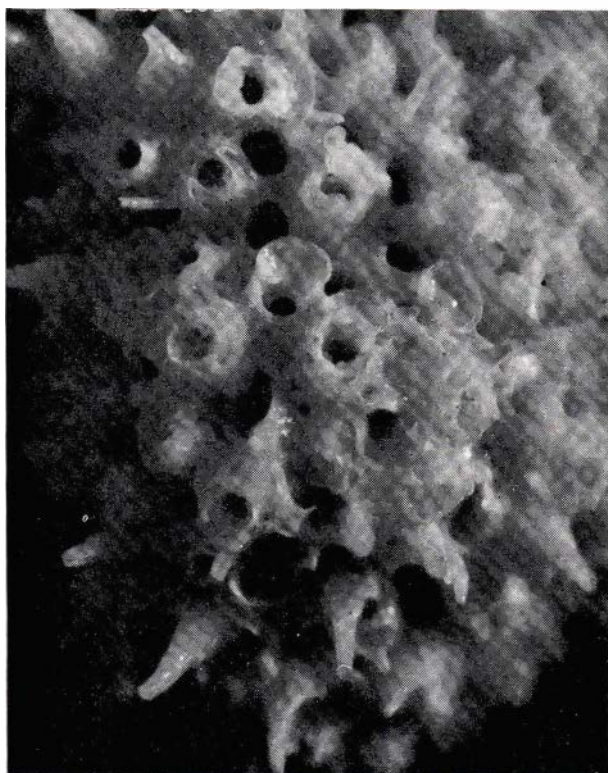


FIG. 42. *Osthimosia proximalis* n. sp., ovicells, orifice. $\times 47$.

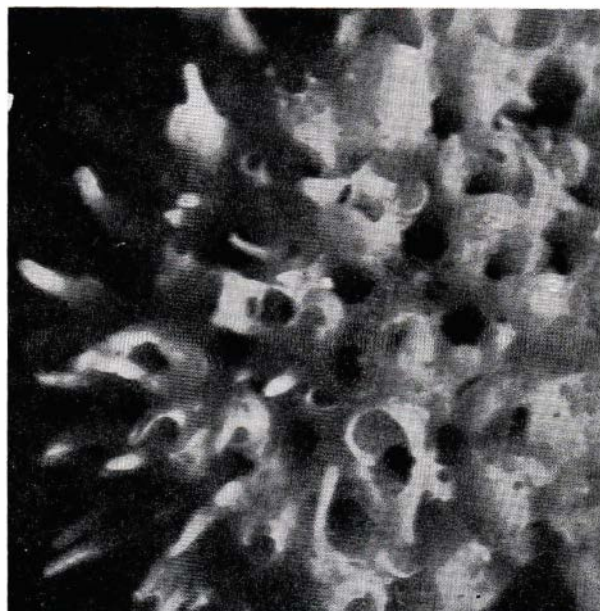


FIG. 43. *Osthimosia proximalis* n. sp., suboral avicularia and spines. $\times 47$.

***Osthimosia proximalis* n. sp. FIGS. 42, 43**

DESCRIPTION

Zoarium pisiform. Zooecia small, erect, frontal convex, smooth, several areolae. Anter. of orifice slightly greater than a semicircle, a U-shaped median sinus in the proximal lip about a third the length of the anter. and with straight shoulders about as wide as the sinus. Operculum fitting around these shoulders, with a tongue which closes the sinus. Peristome at first a broad U which may incorporate an areolae on either side. Proximal part of the peristome becoming extended vertically as a robust, broad-based, tall, acuminate spine or an almost parallel-sided process with tubular margins extended as a pair of spines, with a round to pyriform avicularium on the inner concave surface of this process, raised well above the orifice. Rostrum of the avicularium directed vertically away from the orifice, round, the pivot concave on that side; the distal margin of the rostrum may be a thin low serrate rim, the proximal opening is narrow, transverse, and lunate. Ovicell is hyperstomial, large, spherical; entoecium exposed as a subtriangular area in front. Below it a broad thickened band above the oeciopore and above it the smooth thickened ectoecium may rise as a thin acuminate spine. The exposed entoecium may have radiating pits at its margin.

MATERIAL EXAMINED: One small colony from station 37, 30 fm.

REMARKS: The nature of the ovicell indicates that this species belongs to the genus *Osthimosia* but the absence of vicarious avicularia is unusual (Rogick, 1959) and they may be found later when more material is examined

***Crepidacantha crinispina parvipora* (Canu & Bassler, 1930)**

C. parvipora Canu & Bassler, 1930, pp. 32-3.
C. crinispina var. *parvipora*: Brown, 1954b, p. 250, fig. 10.

MATERIAL EXAMINED: Two colonies from sta. 3, 41 fm, one on another bryozoan and the other on a pelecypod shell. Two colonies encrusting bryozoan colonies, from sta. 24, 38 fm.

***Crepidacantha zelanica* Canu & Bassler, 1929**

C. zelanica Canu & Bassler, 1929, p. 410.
C. zelanica: Brown, 1954b, p. 254.
C. zelanica: Macken, 1958, p. 106.

MATERIAL EXAMINED: Six colonies from sta. 24, 38 fm encrusting pelecypod shells.

Family CELLEPORIDAE Levinsen, 1909

Genus *Osthimosia* Rogick, 1959

***Osthimosia eatonensis* (Busk, 1881)**

Cellepora eatonensis Busk, 1881a, pp. 351-2.
C. eatonensis: Busk, 1881b, pl. 27, figs 2, 3, 6.
O. eatonensis: Rogick, 1959, pp. 18-22, pl. 2, figs 16-26.
O. eatonensis: Gordon, 1967, p. 62, fig. 44.

MATERIAL EXAMINED: Four colonies from sta. 18, 15 fm.

Again, the operculum of *O. eatonensis* is pyriform in shape whereas this species has a narrow poster portion.

HOLOTYPE: Canterbury Museum, zb200.

LOCALITY: Sta. 37, between South East Island and Pitt Island, 44° 21.5' S, 176° 13' W, 30 fm; rock coarse shell sand.

Osthimosia bicornis (Busk, 1881) FIG. 44

Cellepora bicornis (Busk, 1881a) pp. 354-5.
O. bicornis: Rogick, 1959, pp. 14-8.

MATERIAL EXAMINED: A colony from sta. 37, 30 fm (Fig. 44) and a colony from sta. 52, 260 fm.

Osthimosia cyclops n. sp. FIG. 45

DESCRIPTION

Zoarium, encrusting cumulus, may form spindle-shaped masses. Zooecia large, erect, barrel-shaped, separated by deep grooves, piled up. When the zooecia are not touching they may be cross-connected by high thin partitions which may insert all around the zooecia. Walls smooth strongly convex, a few small scattered

areolae. Primary orifice pyriform, only a little longer than wide, with the small conical condyles set at about the proximal fifth. Peristome highest frontally, bearing a pair of avicularia set obliquely, mandible directed proximally and upwards, rounded, slightly longer than wide, its proximal opesium transverse. In young zooecia in which the peristome has not developed the avicularia appear to replace areolae on either side of the orifice. Interzooecial avicularia resembling the peristomial avicularia in size and shape scattered about the zoarium, and often sited on the vertical partitions. Ovicell small, thin-walled, broad, opening widely into the peristome, its smooth frontal with a small pore a little distance above the edge of the oeciopore; a suture running from the pore to this edge.

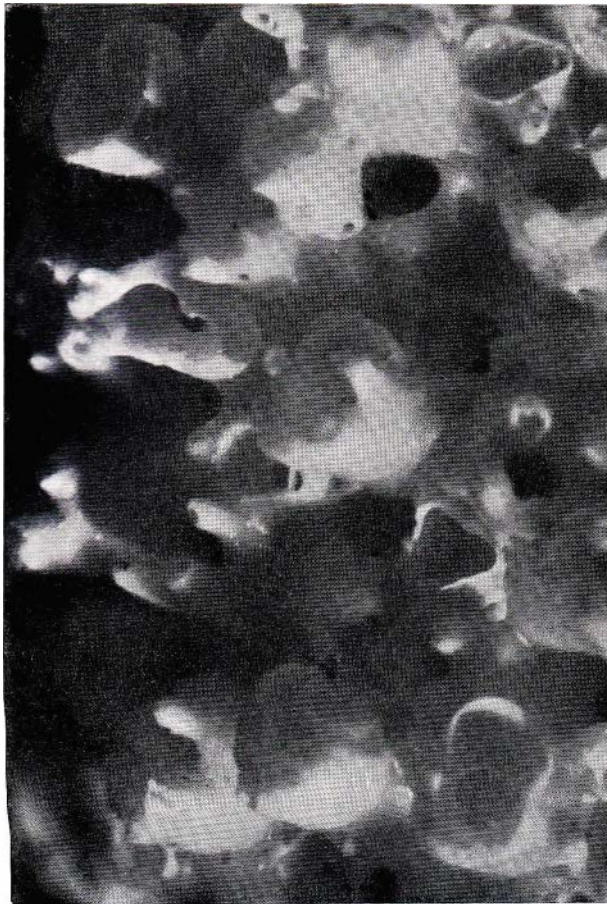


FIG. 44. *Osthimosia bicornis* (Busk, 1881). $\times 47$.

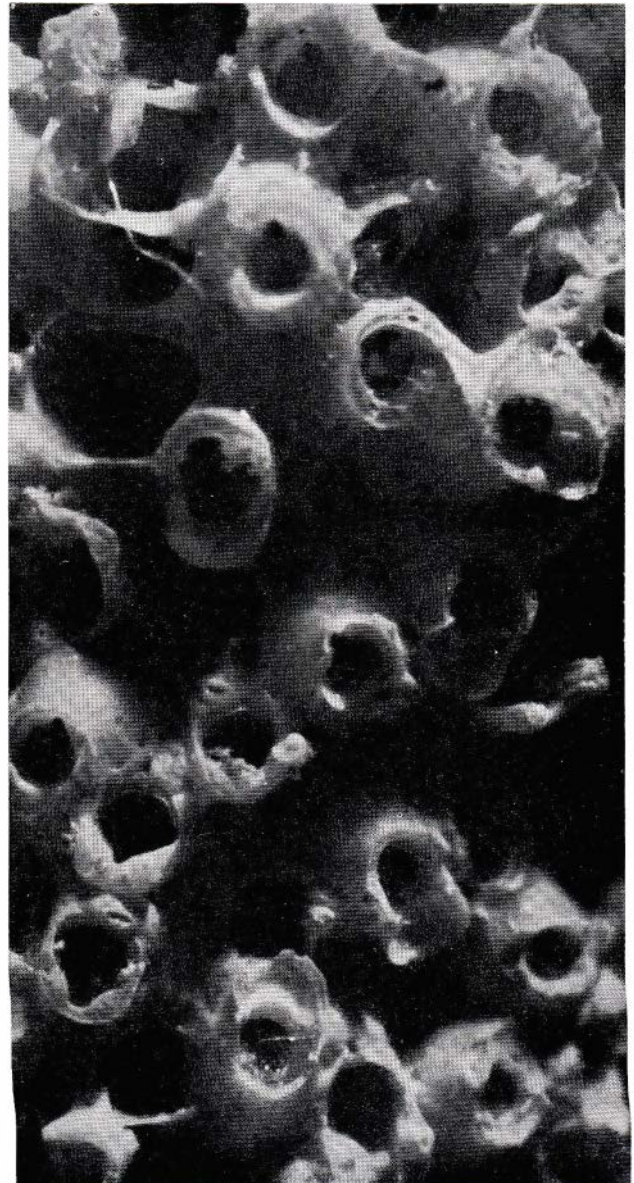


FIG. 45. *Osthimosia cyclops* n. sp., with orifice and ovicell. $\times 47$.

MATERIAL EXAMINED: One colony from sta. 52, 260 fm.

REMARKS: The difference between *Osthimosia* Rogick, 1959 and *Trematoecia* Osburn, 1940 is not clear. Whether the absence of a calcified entoecial plate in the frontal foramen of the ovicell warrants separation at the generic level is questioned.

HOLOTYPE: Canterbury Museum, zb201.

LOCALITY: Sta. 52, Chatham Rise, 44° 04' S, 178° 04' W, 260 fm; fine green sand mud.

Genus "Cellepora"

"Cellepora" is here used in the sense suggested by Harmer (1933), the true relationship of the species being uncertain.

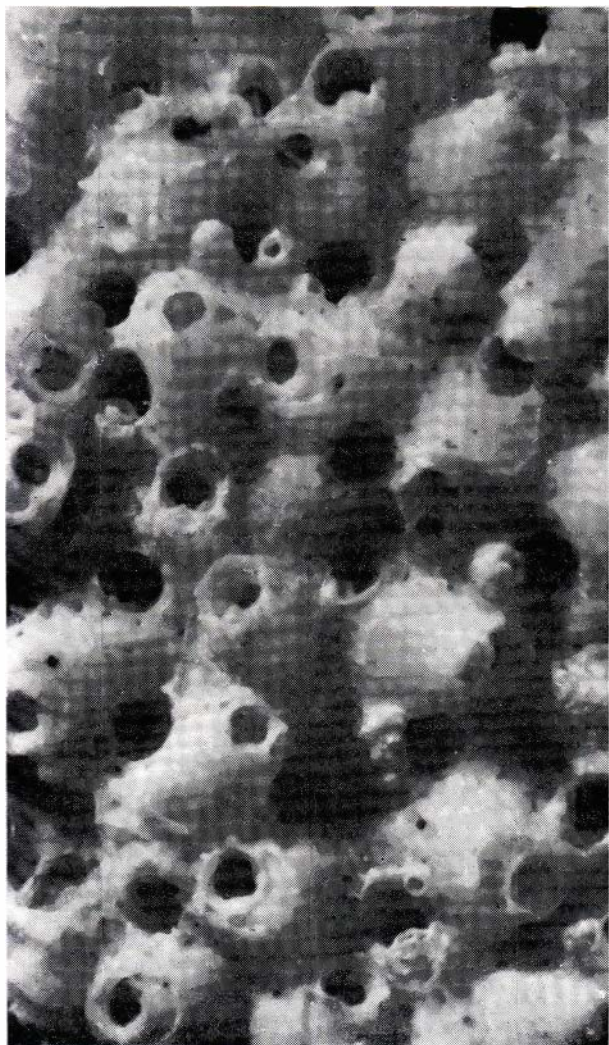


FIG. 46. "*Cellepora*" *dubia* n. sp. \times 47.

"*Cellepora*" *dubia* n. sp. FIG. 46

DESCRIPTION

Zoarium encrusting, becoming cumulus. Zoecia sub-erect, elliptical, slightly elongated, distinct, separated by deep grooves. Frontal wall smooth, strongly convex, with a single row of a few rounded marginal areolae. Anter semicircular, poster deeply sinuate, with a wide almost V-shaped sinus about as long as anter. Peristome strongly developed, tubular, forming a hollow umbo proximally, which when fully developed bears a rounded avicularium inside its summit. In young zoecia, before the suboral avicularium chamber develops peristome appearing as thin, grooved, pointed extensions on either side of the orifice. Peristomes not extending above the general surface of the colony and prolonged only in those zoecia which are buried below the surface. Median suboral avicularium with a rounded heart-shaped mandible directed proximally and outwards. Occasionally two or three similar avicularia may develop around the peristome associated with adjacent areolae. Ovicells not seen.

MATERIAL EXAMINED: One colony from sta. 24, 38 fm encrusting a pelecypod shell.

REMARKS: It is widely recognised that the "cellepores" are in need of revision and as the present species does not fit readily into any of the more clearly defined genera it is assigned to "*Cellepora*."

There is a similarity between this species and *Celleporina spatula* (MacGillivray) and perhaps more material of the present species will indicate they are synonymous.

HOLOTYPE: Canterbury Museum, zb202.

LOCALITY: Sta. 24, south of The Sisters, 43° 36.2' S, 176° 48.5' W, 38 fm; coarse shell sand gravel.

Genus *Harmerella* Lagaij, 1952

Harmerella hastigera (Busk, 1884) FIGS. 47, 48

Cellepora hastigera Busk, 1884, p. 192, pl. XXIX, fig. 1, pl. XXXV, fig. 8.

C. tuberculata Busk, 1884, p. 193, pl. 28, fig. 9, pl. 35, fig. 7.

C. foliata MacGillivray, 1888, p. 246, pl. 166, figs 2-2a, pl. 168 fig. 10.

Holoporella hastigera: Brown, 1952, pp. 367-9, fig. 288.

DESCRIPTION

Zoarium encrusting, in widely spread multi-laminar, mamillate growths. Zoecia large, elliptical, elongated, sub-erect to erect, irregularly arranged, separated by grooves. Frontal wall smooth, convex, with a single row of small rounded areolae. Orifice large, ovoid, slightly narrower distally, anter almost semicircular, poster slightly wider, proximal lip faintly concave, condyles minute, widely based. Apex of peristome displaced proximally, becoming a thickened rounded ridge, slanting up gradually from one side, and steeply from the other, with a small transverse avicularium set in the steep side in some zoecia. In older zoecia the peristome may extend vertically as a prominent spine. There may

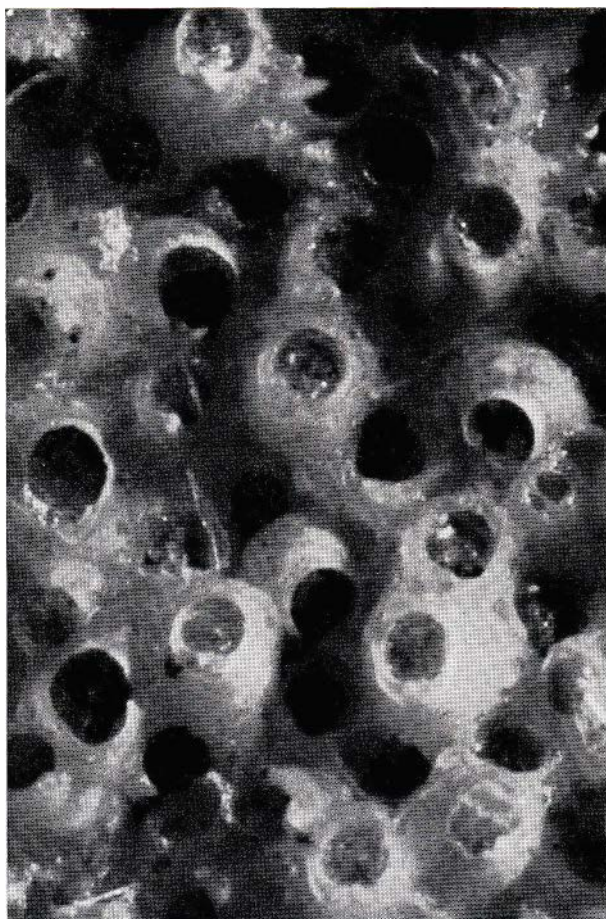


FIG. 47. *Harmerella hastigera* (Busk, 1884), orifice, ovicells, and peristomial and spatulate avicularia. $\times 47$.

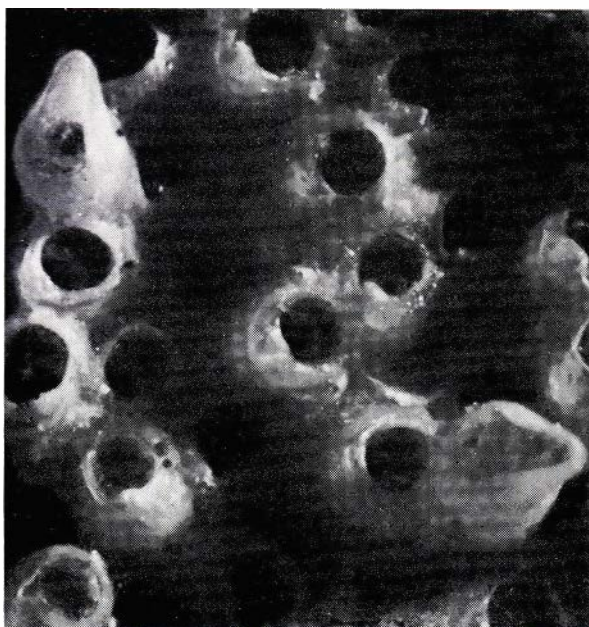


FIG. 48. *Harmerella hastigera* (Busk, 1884), turreted avicularia. $\times 47$.

be a slight groove in the peristome below the avicularium. Four types of avicularia: upward-directed peristomial avicularium with a small semicircular to subtriangular mandible and incomplete pivot; a pair of minute avicularia which may occur one on each side of the orifice in the line of the areolae and which have a proximally directed spatulate avicularium; two types of larger vicarious avicularia. Most abundant are those having a spoon-shaped mandible elevated at the tip, a complete pivot, and a narrow transverse proximal opesium; the rostrum is about twice as long as the opesium. The other large vicarious avicularium is sited on a high, slightly tapering tube, the triangular mandible directed obliquely upwards, and a little wider than half its length, the pivot complete, and the proximal opesium narrow and transverse; the edges of the rostrum of this avicularium may bear teeth. Ovicell forming a chamber directly above the orifice, its lateral walls coming together in front but not fusing, to leave a small gap below and a circular secondary orifice above. Presumably embryos are held in the shallow depression on the distal side of this chamber.

MATERIAL EXAMINED: Fragments, some massive, with chitinous parts intact, from sta. 3, 41 fm, and sta. 24, 38 fm.

REMARKS: Although Busk's figures and descriptions are not complete it seems likely that both his species (*Cellepora hastigera*, *C. tuberculata*) belong here. It is also noted that MacGillivray's short description of three species of *Cellepora*, viz., *C. foliata*, *C. prolifera*, and *C. spicata*, do not clearly distinguish them.

Genus *Holoporella* Waters, 1909

Holoporella tridenticulata (Busk, 1881)

Cellepora tridenticulata Busk, 1881a, p. 347.

C. tridenticulata Busk, 1881b, pl. 26, fig. 9.

H. tridenticulata: Brown, 1952, pp. 365-7, fig. 287.

MATERIAL EXAMINED: Several lunulitiform zoaria. Three from sta. 1, 100 fm, two from sta. 5, 300+ fm, four from sta. 34, 130 fm.

Family VITTATICELLIDAE* Harmer, 1957

Genus *Costaticella* Maplestone, 1899

Costaticella hastata (Busk, 1852)

Catenicella hastata Busk, 1852a, p. 355.

Costicella hastata: Levinsen, 1909, pp. 236-7, pl. XII, figs 1c, d, f, g, j, pl. XX, figs 8a, b.

Costaticella hastata: Powell, 1967, p. 243, text-fig. 18, pl. 3, fig. g.

MATERIAL EXAMINED: Four branches from sta. 37, 30 fm.

* Although Levinsen (1909) argues strongly in favour of the family name Catenariidae, the generic name *Catenaria* was not originally published in a latinised form. Hence Harmer's (1957) classification is followed.

Genus *Vittaticella* Maplestone, 1901

Vittaticella elegans (Busk, 1852)

Catenicella elegans Busk, 1852a, p. 361.
Catenaria elegans: Levinsen, 1909, pp. 255–6, pl. 21, fig. 2a,
pl. 13, figs 3a, b.
V. elegans: Powell, 1967, p. 237, text-fig. 13, pl. 3, fig. 9.

MATERIAL EXAMINED: Several twigs from sta. 37, 30 fm.

Genus *Scuticella* Levinsen, 1909

Scuticella ventricosa (Busk, 1852)

Catenicella ventricosa Busk, 1852a, p. 357, pl. 1, fig. 1.
S. ventricosa: Levinsen, 1909, pp. 227–8, pl. 20, figs 5a–c(a),
pl. 11, figs 6a–b.
S. ventricosa: Powell, 1967, pp. 239–40, text-fig. 15.

MATERIAL EXAMINED: A branch and fragments from sta. 3,
41 fm.

Scuticella margaritacea (Busk, 1852)

Catenicella margaritacea Busk, 1852a, p. 356.
S. margaritacea: Levinsen, 1909, pp. 229–30, pl. 20, fig. 3a, pl.
11, figs 5a–c.
S. margaritacea: Macken, 1958, p. 106.

MATERIAL EXAMINED: One twig from sta. 37, 30 fm.

REMARKS: Levinsen's description (1909) refers to five fenestrae in the sternal area. Some of the zooecia in the present fragment have only three.

Family CALWELLIIDAE MacGillivray, 1887

Harmer (1957) has pointed out that *Onchopora*, as originally used by Busk, is a synonym of *Margaretta* and that *O. sinclairii* Busk, 1857 may be referred to *Calwellia* Wyville Thomson, 1858.

It may be that *Calwellia* has affinities with *Margaretta*. Both genera lack avicularia, and have an ascopore and zoaria of similar growth form. However, *Margaretta* zooecia have a peristome and peristomial ovicells, a perforate frontal, and lack the “scapular” kenozoecia present in *Calwellia*.

Genus *Calwellia* Wyville Thomson, 1858

Calwellia sinclairii (Busk, 1857)

Onchopora sinclairii Busk, 1857, p. 172, pl. XV, figs 1–3.
O. sinclairii: Levinsen, 1909, pp. 260–1, pl. 13, figs 7a–h.
C. sinclairii: Waters, 1888, pp. 17–8, pl. 1, fig. 5.
C. sinclairii: Harmer, 1957, p. 826.

MATERIAL EXAMINED: Several twigs from sta. 37, 30 fm.

Calwellia bicornis Wyville Thomson, 1858

C. bicornis Wyville Thomson, 1858, p. 92, pl. IX, figs 2–2a.
C. bicornis: Levinsen, 1909, pp. 262–3, pl. XIII, figs 8a–c.

MATERIAL EXAMINED: A few fragments from sta. 37,
30 fm.

REMARKS: The figure of *C. bicornis* of MacGillivray (1880, pl. 46, fig. 7) shows zooecia which are wider distally than in the figures of Levinsen (1909) with which the present material agrees. Harmer's (1902) figures of *C. gracilis* agree closely with Levinsen's figures.

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