NEW ZEALAND

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

BULLETIN 188

The Marine Fauna of New Zealand: Porifera, Demospongiae, Part 1

(Tetractinomorpha and Lithistida)

PATRICIA R. BERGQUIST

New Zealand Oceanographic Institute

Memoir No. 37

1968

THE MARINE FAUNA OF NEW ZEALAND: PORIFERA, DEMOSPONGIAE, PART 1

A benthic haul, predominantly of sponges, from the Campbell Plateau (N.Z.O.I. Sta. B 193, Lat. 52° 21′ S, Long. 169° 21.5′ E): conspicuous sponges are *Callyspongia ramosa* (yellow, branching — top) *Polymastia granulosa* (orange, knobbly — centre and top right) and *Ciocalypta penicillus* (yellow, columnar — right centre).

NEW ZEALAND

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

BULLETIN 188

The Marine Fauna of New Zealand: Porifera, Demospongiae, Part 1

(Tetractinomorpha and Lithistida)

by

PATRICIA R. BERGQUIST

Department of Zoology,
University of Auckland, New Zealand

New Zealand Oceanographic Institute

Memoir No. 37

Price: $2.00

1968

This publication should be referred to as *N.Z. Dep. scient. ind. res. Bull. 188*

Edited by M. P. Burton,
Information Service, D.S.I.R.

Received for Publication .. .. January, 1965

R. E. OWEN, GOVERNMENT PRINTER, WELLINGTON, NEW ZEALAND—1968

FOREWORD

SINCE the early nineteenth century there has been continuity of activity in marine biological research in New Zealand. Up to 1900, over 850 papers on the marine zoology of New Zealand had been published. Most of this and later work has appeared as discrete papers, there being relatively few monographic or serial comprehensive treatments of particular taxonomic groups. Despite some substantial contributions in this form, the lack of detailed accounts enabling the ready recognition of species in many other groups has hampered the development of ecological work dependent on such identification.

Since 1955 the N.Z. Oceanographic Institute has been developing a programme of research in benthic ecology in the New Zealand region. The effects of this scarcity of systematic monographs of the marine fauna has been particularly evident. The opportunities that have arisen in the course of sampling programmes have provided additional material for systematic consideration and a number of specialists in systematic groups have interested themselves in working on the New Zealand fauna.

This work is a contribution to the studies on the Marine Fauna of New Zealand published in this memoir series.

The present author has based her survey of this section of the New Zealand sponges principally on material that she has herself collected since 1957. Supplementary material has been available from the collections of the Dominion Museum, Wellington; Canterbury Museum, Christchurch; N.Z. Oceanographic Institute, Wellington; and Zoology Department, Victoria University of Wellington.

The preliminary editing of this manuscript has been carried out by Mrs P. M. Cullen, N.Z. Oceanographic Institute.

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

CONTENTS

	Page
Foreword	5
Abstract	9
Introduction	9
Acknowledgments	10
Collections Examined and Station Details	11
List of Species	14
Systematics	16
Order HADROMERIDA Topsent	16
Order EPIPOLASIDA Sollas	30
Order CHORISTIDA Sollas	37
Order HOMOSCLEROPHORIDA Dendy	60
Order LITHISTIDA Schmidt	63
References	65
Plates	69
Index	100

The Marine Fauna of New Zealand

Porifera, Demospongiae, Part 1

(Tetractinomorpha and Lithistida)

by

PATRICIA R. BERGQUIST

Department of Zoology,
University of Auckland, New Zealand.

ABSTRACT

The morphology and systematic relationships of 60 species of tetractinomorph sponges from the New Zealand region are discussed. Of these species (and those of the Lithistida which have been included for convenience) only 26 were formerly known from the New Zealand region. Twelve new species are described. It should be expected that with future extended collecting a substantial further increase in the number of species may result.

INTRODUCTION

This contribution is the first of four publications which will constitute a revision of the New Zealand Demospongiae. Part 1 (this memoir) is largely confined to the systematics of the Tetractinomorpha. The Lithistida are included for convenience.

Sixty species are considered in this paper, 10 of which are known only from the literature or from restudy of type material and 12 of which are described for the first time. At the commencement of this revision only 26 valid species of Tetractinomorpha and Lithistida were known from the New Zealand region and, although the present total represents a substantial increase in the fauna, it is by no means claimed to be complete. In almost all areas where sponges are being actively studied new species frequently come to hand and New Zealand is no exception.

Literature dealing with New Zealand Demospongiae dates back to Dieffenbach's "Travels in New Zealand" (1843) where Gray described three sponges, *Spongia sinclarii*, *Spongia ramosa*, and *Spongia varia*. The same specimens were the subject of a later paper by Dendy (1897) in which they were redescribed as *Axinella sinclarii*, *Chalina ramosa*, and *Spongelia varia*. Ridley (1881) in his revision of the genus *Dirrophalum* included a description of a new species from New Zealand, *D. neozelanicum*. Marshall (1883) described a single sponge *Agilardiella radiata* from northern New Zealand, the specimen was fragmentary and the description is unrecognisable.

The most prolific contributions to our early sponge literature were made by von Lendenfeld (1886, 1887, 1888, 1889), who described a considerable amount of southern New Zealand material sent to him by Parker. Apart from the records of *Tethya multistella*, *Tethya fissurata*, *Stylotella digitata* and *Sigmatella corticata* (1888), Lendenfeld described only Keratosa and Haplosclerida from this country. Most of his species of the latter are now regarded as synonyms of *Callyspongia ramosa* Gray or *Dactylia palmata* Carter.

Kirk (1909) described a new genus and species *Stylohalina conica* (now *Hymeniacidon conica*) from Campbell Island and later (1911) described seven species from the Kermadec Islands.

The first major contribution to our knowledge of New Zealand Demospongiae appeared in 1923 when Brøndsted described the subantarctic sponges collected by Mortensen's Expedition (1914-1916). Thirty-five species were recorded from the Auckland and Campbell Islands of which 28 were considered new species. Twenty-one of these are still recognised, although further collections from this area will probably serve to reduce this number.

Prior to the publication of the second report by Brøndsted (1924) which dealt with sponges from around the New Zealand coast, Dendy (1924) published the report of the *Terra Nova* dredgings from the North Cape, Three Kings area. Dendy's report is the most important treatise on New Zealand sponges to date, it recorded 80 species of Demospongiae of which 55 were new and among which were eight new genera. Forty-eight species and five of the new genera still stand, the revised collection adds 63 species to the fauna.

The Mortensen collections described by Brøndsted (1924) were made all round the New Zealand coast, but the bulk of the material came from localities very close to those worked by the *Terra Nova*; predictably there is some overlap in the two reports. Brøndsted records three new genera and 34 new species, 28 of which still stand. The final paper on the Mortensen collections (Brøndsted 1926) is devoted mainly to Calcarea and contains a useful list of most sponges then known from the coasts of New Zealand.

Omitting subantarctic and Kermadec species and including those overlooked by Brøndsted, the number of Demospongiae described from New Zealand totalled 160 species belonging to 75 genera. Of this 160, 127 now remain as valid species records, 66 of these being known only from the far north.

Burton (1924) included four species of *Tethya* from unspecified New Zealand localities in his revision of the family Tethyidae.

Between 1926 and the commencement of this revision, only one paper has been published (Fell 1950) on the siliceous sponges of this country. During this period however, overseas workers, Burton (1927, 1929a, 1932b, 1934a), de Laubenfels (1936), Levi 1956c, 1960) and Topsent (1928) have made significant revisions of previous classification and nomenclature within the Demospongiae. Consequently the nomenclature of a great proportion of the New Zealand fauna requires revision.

The system of classification used throughout this work is basically that proposed by de Laubenfels (1936). In electing to follow de Laubenfels's scheme a new, and to some degree faulty, classification is adopted in preference to those propounded by Topsent (1928) and Dendy (1921) and followed by Burton. Burton (1956) has dismissed de Laubenfels's classification by claiming that it is phylogenetically unsound, merely being an inversion of the arrangement used by Topsent and Dendy. This objection has no substance whatsoever; Topsent and Dendy have merely chosen to treat the more primitive forms (Homosclerophorida) first, while de Laubenfels has chosen to consider the most advanced forms first. There is no reason to interpret this as a reversal of earlier phylogeny.

In fact de Laubenfels at no stage committed himself on the larger questions of sponge phylogeny. He was concerned with regrouping of genera and families and made only tentative suggestions as to the interrelationships of orders. The basic criticism of de Laubenfels's work is that it was hasty. In his attempt to cover the whole field he has made many errors in transcription and interpretation of the literature. Furthermore he placed great reliance on spiculation, in many cases to the exclusion of other characteristics, which has resulted in considerable confusion particularly in such groups as the Halichondriidae, Hymeniacidonidae and Desmacidonidae. De Laubenfels's 1936 monograph cannot be used without also checking the original literature, nonetheless it is the only recent work which covers the whole of the Demospongiae and, as such, is the only work which renders the group accessible to new workers. Many of the basic ideas embodied in de Laubenfels's grouping of the Demospongiae into eight orders are those of Topsent, and they serve to de-emphasise the importance of microsclere type in the classification of the Monaxonida. As regards the Tetractinomorpha de Laubenfels adheres relatively closely to the pattern established by Topsent (1928) the only major divergences being in the separation of the Carnosa as a separate order which includes the Pachastrellidae and Chondrosiidae and the maintenance of Sollas's order Epipolasida which receives several families of Topsent's Hadromerida.

De Laubenfels's classification is by his own admission somewhat artificial but, in so far as it embodies the phylogenetic views of Topsent's work, it is not a radical reorientation and it does focus attention again on the unresolved problems of the position of the Axinellidae, the status of the Epipolasida, and the interrelationships of the Haliclonidae, Adociidae and Halichondriidae. It is possible, within the framework of the de Laubenfels system, to work toward a more natural arrangement of Demospongiae and to this end many small alterations are embodied in this work.

Much of the revision of generic and specific nomenclature recorded below derives from the work of Burton (1927, 1932, 1934).

ACKNOWLEDGMENTS

The author wishes to express her gratitude to the many people who have assisted in the completion of this work. Special mention should be made of Dr W. D. Hartman (Yale University), Dr C. Levi (Strasbourg), and Dr M. Burton (British Museum) for information willingly given; of Miss M. MacKenzie and Capt. W. Samson (N.Z. Marine Department) for providing the means of collection; and of the University of New Zealand Research Grants Committee for their generous support since 1958.

COLLECTIONS EXAMINED AND STATION DETAILS

This survey is based on material collected personally since 1957. This has been supplemented by collections from the Dominion Museum, Wellington; Canterbury Museum, Christchurch; New Zealand Oceanographic Institute; and the Victoria University Zoology Department, Wellington.

Holotypes of many of Brøndsted's species and the Australasian collections of the *Galathea* have been made available by Dr Torben Wolff of the Copenhagen Museum. The collections at the National Museum of Victoria (where the Bracebridge Wilson collections are housed) and at the Australian Museum, Sydney, have been examined briefly, but could not be obtained for detailed study. The Australian Museum collections contain portions of the holotypes of many of Dendy's *Terra Nova* specimens and a considerable number of the Lendenfeld types. It is hoped that an early revision of these two Australian collections will be made, otherwise few final decisions can be made on the nomenclature of the Dictyoceratida and Haplosclerida of Australasia.

The scope of my own collections has been considerable both in offshore and intertidal regions. Working from the Fisheries Steamer *Ikatere* with a naturalist dredge, otter trawl and aqualung, stations ranging from 6–65 fm have been worked from just south of Three Kings along the east coast of the North Island as far south as Mahia Peninsula. More extensive dredging and aqualung collecting have been carried out from smaller boats in the inner Hauraki Gulf area and Wellington Harbour. Further stations were worked from the *Ikatere* in Cook Strait at 50 fm and along the east coast of the South Island from Banks Peninsula to Dunedin. Dredging on the west coast of New Zealand has been restricted to the Manukau Harbour and off New Plymouth and Patea. The material from these offshore stations has been supplemented by the Cook Strait collections from Victoria University, Wellington, by the Chatham Islands and Chatham Rise material from Canterbury University, by Three Kings and Campbell Plateau material from N.Z. Oceanographic Institute, by *Galathea* material from Dunedin Harbour. The only oceanographic stations worked along the south and west coasts of the South Island were those from the N.Z. Oceanographic Institute cruise 1959 and the *Galathea* expedition. No sponges were obtained from this area.

Intertidal coverage of New Zealand has been adequate on both coasts of the North Island and on its outlying islands with the exception of Three Kings and Kapiti Islands. The South Island coasts have been covered in Queen Charlotte Sound, at Kaikoura, Banks Peninsula, Portobello, Haast, and between Greymouth and Westport. Stewart Island has been covered only in the Paterson Inlet area. To these collections have been added the rather random collections from the Dominion Museum and some intertidal material from Th. Mortensen's Expedition.

Details for offshore stations from which sponge material was examined are set out below. Gear abbreviations are as follows:

B.T. Beam trawl
D.C. Cone dredge
D.D. Devonport dredge
D.L. Large dredge
D.N. Naturalist's dredge
G.H.O. Hayward orange-peel grab
T.A.S. Small Agassiz trawl

UNIVERSITY OF COPENHAGEN COLLECTION
(Zoology Section)

TH. MORTENSEN EXPEDITION

Stations

16 Nov. 1914, Stewart I., dredging 5–20 fm.
17 Nov. 1914, Stewart I., Paterson Inlet, dredging 5+12–15 fm.
19 Nov. 1914, Stewart I., Halfmoon Bay, 5–7 fm and shore collecting.
20 Nov. 1914, From Halfmoon Bay to Pegasus Bay dredgings in 25–35 fm and shore collecting.
29 Dec. 1914, North Channel Kawau, Hauraki Gulf, 10 fm.
2 Jan. 1915, 2 miles east of North Cape, 70 fm.
5 Jan. 1915, dredging west of Three Kings Is 65 fm, and 10 miles north west of Cape Maria van Diemen 50 fm.
11 Jan. 1915, mouth of Manukau Harbour, shore collecting.
12 Jan. 1915, New Plymouth dredging 8 fm.
21 Jan 1915, Queen Charlotte Sound dredging 3–35 fm.

CANTERBURY UNIVERSITY COLLECTIONS

1954 CHATHAM EXPEDITION

Sta. 6, 24 Jan. 1954, 43° 40'S, 179° 28'E, Chatham Rise, 220 fm. B.T. fine grey sand and mud.

Sta. 14, 27 Jan. 1954, 44° 00'S, 176° 21'E, Hanson Bay, 15 fm. D.L. Coarse shell sand.

Sta. 19, 28 Jan. 1954, 43° 38.2'S, 176° 38'E, off Cape Young, 25 fm. D.L. rock.

Sta. 23, 29 Jan. 1954, 43° 32.5′S, 176° 47.5′E, north of The Sisters, 33 fm. D.L. fine grey sand.

Sta. 26, 29 Jan. 1954, Waitangi wharf. Shore collecting.

Sta. 37, 2 Feb. 1954, 44° 21.5′S, 176° 13′E, between South East I. and Pitt I. 30 fm. D.L. rock and coarse shell sand.

Sta. 59, 11 Feb 1954, 43° 38′S, 177° 19′E, Chatham Rise, 290 fm. B.T. fine green sand and mud.

VICTORIA UNIVERSITY COLLECTIONS

Sta. V.U.Z. 55, 23 Feb. 1956, 41° 39′ 30″S, 175° 13′E, off Cape Palliser. 40–100 fm.

Sta. V.U.Z. 83, 41° 42′ 30″S, 175° 9′E, 17 Feb. 1957, off Palliser Bay. B.T. on bottom of mud shell rock gravel, 550 fm.

NEW ZEALAND OCEANOGRAPHIC INSTITUTE COLLECTIONS

Tui Pacific II Cruise 1958

Sta. B 93, 22 Oct. 1958, 34° 00′S, 172° 30′E. 30–60 fm. South of Three Kings. Irregular rocky bottom, patches of clean bryozoan shell sand, also sponges, hydroids, bryozoa.

Endeavour Ice Edge Cruise 1959 (Campbell Plateau)

Sta. B 172, 8 Oct. 1959, 48° 18.5′S, 168° 30′E to 48° 22.9′S, 168° 30′E. 400 fm. D.C. One-third full. Globigerina ooze, shells, a few pebbles, echinoderm spines, alcyonarians.

Sta. B 173, 8 Oct. 1959, 48° 33′S, 168° 20′E to 48° 35.5′S, 168° 16′E. 381 fm. T.A.S. Some worn pieces of large echinoid, *Pyrosoma*, cidarids.

8 Oct. 1959, 48° 35.5′S, 168° 16′E to 48° 38.5′S, 168° 13.5′E. 371 fm. T.A.S. Gastropod and barnacle shells, shrimps, *Serolis*, *Hyalonoecia* tubes.

Sta. B 175, 9 Oct. 1959, 50° 26.5′S, 166° 37.5′E to 50° 25.5′S, 166° 35.5′E. 52 fm. T.A.S. Much broken staghorn coral, large solitary ascidians, small starfish. D.C. Staghorn coral, brachiopods, bryozoans, Foraminifera, echinoderm spines, broken shell, mud, sand dollar fragments.

Sta. B 176, 9 Oct. 1959, 50° 29′S, 166° 30.5′E to 50° 27′S, 166° 29′E. 46 fm. T.A.S. Broken shell, bryozoa, much sponge - orange, green, brown, black (fungiform), red.

Sta. B 177, 9 Oct. 1959, 50° 38.8′S, 166° 20.5′E. 50 fm. D.C. Brown and red seaweed. Fine rock fragments.

Sta. B 180, 10 Oct. 1959, 50° 50′S, 166° 20′E, 50 fm. D.N. Rock with worm tubes, bryozoans, *Chlamys*, mussel shell, hermit crab, seaweed, sponge (large, soft, whitish yellow).

Sta. B 181, 10 Oct. 1959, 50° 50.5′S, 166° 06′E. 4 fm. Off Musgrave Peninsula, Carnley Harbour. D.N. Rocks, seaweed, crab, *Munida*, *Dosinia*-type shells, live and dead; sponge (colourless).

Sta. B 182, 11 Oct. 1959, 52° 28.5′S, 168° 32′E. 130 fm. D.N. Two spider crabs, two anemones, sponge remains, sand.

Sta. B 183, 11 Oct. 1959, 52° 34.3′S, 168° 49′E. 115 fm. D.N. Stones, slimy sponge, staghorn coral. Rocky bottom.

Sta. B 184, 11 Oct. 1959, 52° 36.9′S, 169° 07′E. 103 fm. D.N. Bag torn. Rocks, sponge remains, dead and subfossil brachiopods.

Sta. B 187, 12 Oct. 1959, 53° 02.6′S, 172° 14′E. 260 fm. D.N. Globigerina ooze, worms, scaphopods.

Sta. B 189, 14 Oct. 1959, 52° 33.2′S, 169° 07.75′E. Perseverance Harbour. 16 fm. G.H.O. Sand, shell fragments, seaweed, worm tubes.

Sta. B 192, 15 Oct. 1959, 52° 27′S, 169° 21′E to 52° 25.2′S, 169° 21′E. 90–105 fm. G.H.O. Yellow shell fragments and gravel, black pebbles up to 1½ in. in diam. Yellow sponge, encrusting bryozoa.

Sta. B 194, 15 Oct. 1959, 51° 59′S, 169° 33.5′E to 51° 53′S, 169° 37′E. 140–145 fm. D.N. Grey-green shell sand, *Hyalonoecia*, some sponge.

Sta. B 195, 16 Oct. 1959, 49° 14.5′S, 171° 45′E. 45–96 fm. G.H.O. Coarse yellow shell sand, small rounded pebbles, much mussel shell, worm tubes, bryozoa. Seems to be calcified reef-top. D.N. Some sponge.

Sta. B 196, 18 Oct. 1959, 46° 20.6′S, 170° 27.6′E to 46° 19.8′S, 170° 28.2′E. 74 fm. D.N. Sand, mostly dead shell especially large *Chlamys*, bryozoans, hydroids, spider and hermit crabs, starfish, ophiuroid, sponge, *Dosinia*-like shells.

Sta. B 197, 18 Oct. 1959, 46° 14.1′S, 170° 32′S to 46° 13.5′S, 170° 32.5′E. 60 fm. D.N. Like B 196 but turbine shells with hermit crabs, more bryozoan substrate, orange starfish, live yellow *Chlamys*, *Maoricolpus*, echinoids, ophiuroids, nudibranch.

Viti Fox Cruise 1960 (Foveaux Strait)

Sta. B 233, 23 May 1960, 46° 39.7′S, 167° 48.0′E. 20 fm. D.D. Apparently rock bottom. Sponges, many dead brachiopods, bryozoa, hydroids, polychaetes, dead mussels, slipper limpets, echinoid test fragments, ophiuroid and a few gastropods. One small piece of granite.

Sta. B 270, 29 May 1960, 46° 42.0′S, 169° 00′E. 18 fm. D.D. Caught on rocky bottom. Turret shells, mussels, brachiopods, Bryozoa, sponge, *Pentagonaster*.

Wilhoite Subantarctic Cruise 1960
(Auckland and Macquarie Is.)

Sta. B 339, 15 Dec. 1960, Wireless Bay, Macquarie I., 4 miles south of Wireless Hill. 50 fm. D.N.

Sta. B 350, 17 Dec. 1960, Sarah's Bosom. Auckland I. 20 fm. D.N.

PERSONAL COLLECTIONS

FROM MV *Ikatere*
(*Naturalist's dredge used throughout*)

South of Three Kings, 2 Feb. 1959, 34°S, 172° 30′E. 30–60 fm. Irregular rocky bottom.

East of Doubtless Bay, 8 Feb. 1959, 34° 40′S, 173° 20′E. 30 fm. Sand and shell.

Off Cape Brett, 10 Feb. 1959, 35° 5′S, 174° 10′E. 30–45 fm. Rock and shell.

East of Hen I., 12 Feb. 1959, 35° 35′S, 174° 20′E. 30 fm. Rock and shell.

East of Little Barrier, 15 Feb. 1959, 36° 00′S, 175° 5′E. Rock, 40 fm.

South-east of Little Barrier, 20 May 1960, 36° 5′S, 175° 5′E. 30–40 fm. Rock and shell.

North-east of Gt. Barrier I., 20 May 1960, 36° 00′S, 175° 10′E. 40–60 fm. Mud and shell.

Colville Channel, 23 Jul. 1960, 36° 10′S, 175° 10′E. 30–40 fm. Shell sand and gravel.

Off Cuvier I., 20 Nov. 1958, 36° 24′S, 175° 20′E. 25–40 fm.

7 miles north-east of Alderman I., 23 Mar. 1961 36° 54′S, 175° 56′E. 56 fm. Conglomerate platform and shell.

East of Mayor I., 6 Nov. 1959, 37°S, 166° 20′E. 80 fm. Rock and shell.

Off Whale I., 8 Nov. 1959, 37° 48′S, 176° 50′E. 25 fm. Mud, sand and shell.

10 miles north of Cape Runaway, 10 Nov. 1959, 37° 30′S, 178° 00′E. 50 fm. Rock.

12 miles east of East Cape, Ranfurly Bank, 13 Nov. 1959, 37° 40′S, 178° 40′E. 30–40 fm. Rock and shell.

2 miles off Table Cape, east of Mahia Peninsula, 12 Mar. 1957, 39° 10′S, 178° 6′E. 60 fm. Rock and mud.

Off Napier, 14 Mar. 1957, 39° 25′S, 176° 58′E. 10 fm. and 39° 26′S, 177° 3′E. 15 fm. Dark sandy mud.

Off Portland I., 13 Mar. 1957, 39° 20′S, 177° 57′E. 20 fm. Rock and mud.

Off Patea, 25 Apr. 1958, 39° 48′S, 174° 12′E. 20 fm. Mud, shell, small rocks.

Off Akaroa, 23 Aug. 1959, 43° 50′S, 173° 00′E. 26 fm.

Off Waitaki River mouth, 26 Aug. 1959, 44° 50′S, 171° 30′E. 50–60 fm. Shell sand.

Dunedin Harbour, 30 Aug. 1959, 45° 42′S, 170° 30′E. 8–10 fm. Sand, mud, small stones.

Many locations were also worked along the east coast of the North Island, the Hauraki Gulf, Manukau Harbour, Wellington Harbour and Cook Strait.

LIST OF SPECIES

(*denotes species not collected during this investigation)

Order **HADROMERIDA** Topsent

Family SPIRASTRELLIDAE Hentschel

Genus **Spirastrella** Schmidt
Spirastrella spinispirulifera (Carter)

Genus **Dotonella** Dendy
**Dotonella mirabilis* Dendy

Genus **Latrunculia** du Bocage
Latrunculia brevis Ridley and Dendy

Genus **Rhabderemia** Topsent
**Rhabderemia corallioides* Dendy
Rhabderemia stellata Bergquist

Genus **Timea** Gray
Timea alba nov. sp.
Timea aurantiaca nov. sp.

Family SUBERITIDAE Schmidt

Genus **Aaptos** Gray
Aaptos aaptos (Schmidt)

Genus **Polymastia** Bowerbank
Polymastia conigera Bowerbank
Polymastia fusca Bergquist
Polymastia granulosa Brøndsted
Polymastia hirsuta nov. sp.

Genus **Stylotella** Lendenfeld
**Stylotella agminata* (Ridley)

Genus **Pseudosuberites** Topsent
Pseudosuberites sulcatus (Thiele)

Genus **Suberites** Nardo
**Suberites affinis* Brøndsted
Suberites axinelloides Brønsted
**Suberites carnosus* (Johnston)
Suberites cupuloides Bergquist
Suberites australiensis nov. sp.
Suberites perfectus Ridley and Dendy

Family CLIONIDAE Gray

Genus **Cliona** Grant
Cliona celata Grant
Cliona euryphylla Topsent

Order **EPIPOLASIDA** Sollas

Family JASPIDAE de Laubenfels

Genus **Lamellomorpha** nov. gen.
Lamellomorpha strongylata nov. sp.

Genus **Asteropus** Sollas
Asteropus simplex (Carter)

Genus **Jaspis** Grey
**Jaspis novae-zealandiae* Dendy

Family SOLLASELLIDAE Lendenfeld

Genus **Epipolasis** de Laubenfels
Epipolasis novae-zealandiae (Dendy)

Family TETHYIDAE Gray

Genus **Tethya** Lamarck
Tethya aurantium (Pallas)
Tethya ingalli Bowerbank
**Tethya robusta* Bowerbank
**Tethya deformis* Thiele

Order **CHORISTIDA** Sollas

Family ANCORINIDAE Gray

Subfamily ANCORININAE de Laubenfels

Genus **Ancorina** Schmidt
Ancorina alata Dendy
Ancorina acervus Bowerbank
**Ancorina progressa* Lendenfeld
**Ancorina stalagmoides* Dendy

Genus **Penares** Gray
Penares tylotaster Dendy

Genus **Thenea** Gray
Thenea novae-zealandiae Bergquist

Subfamily STELLETTINAE Sollas

Genus **Monosyringia** Brøndsted
Monosyringia calcifera nov.sp.
Monosyringia mortenseni Brøndsted

Genus **Stelletta** Schmidt
Stelletta crater Dendy
Stelletta purpurea Ridley
Stelletta arenaria nov. sp.
Stelletta maxima Thiele
Stelletta lithodes nov. sp.
Stelletta communis (Sollas)
Stelletta conulosa nov. sp.
Stelletta maori Dendy
Stelletta novae-zealandiae Brøndsted
Stelletta sandalinum Brøndsted

Genus **Rhabdastrella** Thiele
Rhabdastrella aurora (Hentschel)

Family GEODIIDAE Gray

Genus **Erylus** Gray
Erylus nigra nov. sp.

Genus **Geodia** Lamarck
Geodia regina Dendy
**Geodia rex* Dendy

Genus **Geodinella** Lendenfeld
Geodinella vestigifera Dendy

Family TETILLIDAE Sollas

Genus **Craniellopsis** Topsent
**Craniellopsis zetlandica* (Carter)

Genus **Tetilla** Schmidt
Tetilla australe nov. sp.

Genus **Cinachyra** Sollas
**Cinachyra novae-zealandiae* Brøndsted
Cinachyra uteoides Dendy

Order **HOMOSCLEROPHORIDA** Dendy

Family HALINIDAE de Laubenfels

Subfamily HALININAE de Laubenfels

Genus **Pachastrella** Schmidt
Pachastrella incrustata nov. sp.

Subfamily CORTICINAE Vosmaer

Genus **Corticellopsis** nom. nov.
Corticellopsis novae-zealandiae (Bergquist)

Genus **Plakina** Schulze
Plakina monolopha Schulze
Plakina trilopha Schulze

Order **LITHISTIDA** Schmidt

Family SCLERITODERMIDAE Sollas

Genus **Aciculites** Schmidt
Aciculites pulchra Dendy

Family THEONELLIDAE Lendenfeld

Genus **Lepidothenea** de Laubenfels
**Lepidothenea incrustans* (Dendy)

SYSTEMATICS

(i)*Before species name denotes species not collected during this investigation.
(ii) *Colour notations all refer to Munsell system.*
(iii) *Means of spicule measurements (given in parentheses following range of dimensions) are, unless otherwise stated, based on 20 measurements for each spicule type.*

Order **HADROMERIDA** Topsent

Family SPIRASTRELLIDAE Hentschel

Genus **Spirastrella** Schmidt

Spirastrella spinispirulifera (Carter) (pl. 11g; fig. 1)

Suberites spinispirulifera Carter, 1879, p. 345, pl. XXVIII, fig. 6, 7, a,b.
Suberites spinispirulifera Carter, 1886b, p. 456.
Spirastrella dilatata Kieschnick, 1896, p. 534.
Spirastrella spinispirulifera Dendy, 1897a, p. 251.
Spirastrella dilatata Thiele 1900, p. 70, pl. II, fig. 22.
Anthosigmella spinispirulifera Topsent, 1918, p. 557.
Cerbaris spinispirulifera de Laubenfels, 1936, p. 143.
Spirastrella spinispirulifera Burton, 1959a, p. 209.

OCCURRENCE
Onetangi, Waiheke 6 fm.

DESCRIPTION
Fundamentally a thin encrustation investing a small rock, but in patches becoming thick and irregularly corrugated. Length 7.0 cm; width 5.0 cm; thickness 0.8–1.0 mm, up to 2.4 cm in places.

COLOUR: In life, bright yellow (Y-R-Y 7/10); in spirit yellowish white.

TEXTURE: For the most part the sponge is so very thin that no characteristic texture is developed, where it is thicker the texture is corky. The dermal membrane is elastic.

SURFACE: The surface is granular, undulating and hispid with projecting tylostyles. No pores or oscules are visible.

SKELETON: The skeleton is composed of scattered tylostyles erect upon the substratum and projecting from the surface of the sponge. The great bulk of the skeleton is made up of spinispirae which are present both as a compact dermal crust 0.01 mm thick and abundantly throughout the endosome.

SPICULES:

MEGASCLERES:

TYLOSTYLES, long, slender, slightly curved spicules with prominent tylote heads and often with polytylote swellings along the shaft. The heads of the tylotes are irregular and may be mucronate, oval, double or almost spherical. Occasional tylostrongyles occur.

MICROSCLERES:

SPINISPIRAE, either simply sigmoid or with one and a half complete contortions. Even using maximum resolution available, I am unable to determine the exact spining pattern of these spicules. They appear in some cases to be entirely spined, but in other instances, the spicule resembles a caterpillar with two dorsolateral rows of spines and with a slightly flattened ventral surface. The latter condition approaches that described for *Anthosigmella*, to which genus *S. spinispirulifera* was referred by Topsent (1918).

SPICULE DIMENSIONS OF *Spirastrella spinispirulifera*

Locality and Author	Tylostyles	Spinispirae
	μ	μ
Carter Type Port Elizabeth South Africa	555.0 × 16.0	14.5
Thiele Ternate (Pacific)	500.0 × 15.0–18.0	27.0 × 3.0–4.0
Onetangi, 6 fm	670.0 – 1520.0 × 10.0 – 15.0 (1218.0 × 12.8) Heads 18.0 – 25.0	10.8 – 12.6 (11.5)

REMARKS
Except for the larger size of the megascleres the New Zealand specimen is closely comparable to the type of *Suberites spinispirulifera* Carter which appears to be a wide ranging Indo - Pacific species.

Topsent (1918) has referred *S. spinispirulifera* to *Anthosigmella* a genus characterised by the possession of sigmoid spirasters spined only on the convex surface. In the New Zealand specimen some microscleres approach this condition but in no case is the typical *Anthosigmella* form developed. De Laubenfels (1936) recommended that *S. spinispirulifera* be transferred to *Cerbaris* Topsent, which he states "has peculiar spirasters which are provided with very small spines and are so very much contorted that they resemble springs". This is a misstatement of Topsent's generic diagnosis. *Cerbaris torquata*, the single species, has no microscleres and has finely spined, contort megascleres, which Topsent compares to the contort strongyles of *Burbaris vermiculata*.

The microscleres of *S. spinispirulifera* are not typical of *Spirastrella* but, as Hallmann (1917) points out, are very similar to those of *Trachycladus*. An important point

in urging the comparison of *Trachycladus* and *S. spinispirulifera* is the reported presence of incipient spongin fibres in Thiele's specimen of the latter. Carter's holotype must be examined carefully for such fibres, until this can be done *S. spinispirulifera* is retained as a species of *Spirastrella*. The megascleres are invariably tylostyles and the microscleres, while not typical, are certainly derived from spirasters.

DISTRIBUTION

South Africa (Port Elizabeth); Australia (Western Port, Port Phillip); Ternate (Pacific).

Genus **Dotonella** Dendy

*Dotonella mirabilis** Dendy

Dotonella mirabilis, Dendy, 1924, p. 379, pl. XV, fig. 43–45.

DISTRIBUTION

Three Kings, 100fm (*Terra Nova* Sta. 90)

Genus **Latrunculia** du Bocage

Latrunculia brevis Ridley and Dendy (pl. 1a, b; fig. 2)

Latrunculia brevis Ridley and Dendy, 1886, p. 492.
Latrunculia bocagei Ridley and Dendy, 1886, p. 492.
Latrunculia brevis Ridley and Dendy, 1887, p. 236, pl. XLIV, fig. 5, pl. XLV, fig. 10, 10a.
Latrunculia bocagei Ridley and Dendy, 1887, p. 238, pl. XLIV, fig. 1, pl. XLV, fig. 8, 8a.
Latrunculia lendenfeldi Hentschel, 1914, p. 44, pl. V, fig. 1.
Latrunculia spinispiraefera Brøndsted, 1924, p. 480, fig. 33, a–e.
Latrunculia lendenfeldi, Burton, 1932b, p. 340.
Latrunculia lendenfeldi, Burton, 1940, p. 118, pl. 6, fig. 4.
Latrunculia antarctica Tanita, 1959, p. 7, fig. 7, 8.
Latrunculia spinispiraefera, Bergquist, 1961b, p. 189, fig. 13.

OCCURRENCE

Three Kings, 30–60 fm, Sta. B 93; Cape Brett, 40 fm; Chatham Rise, 220 fm; Campbell Plateau, 46 fm, B 176.

DESCRIPTION

In addition to the four specimens listed above, the type of *L. spinispiraefera* Brøndsted has been examined. The specimens range from encrusting to massive and conical.

DIMENSIONS

Latrunculia brevis

Habit	Length or Height	Width	Thickness	Diameter of Papillae	Height of Papillae
	cm	cm	cm	mm	mm
Encrusting Three Kings 30–60 fm	0.6–1.2	0.4–0.6	0.10–0.18	0.4–0.7	0.06
Massive Campbell Plateau 46 fm	9.0	7.0	3.5	1.0–3.5	0.8–1.2
Massive North Cape 55 fm (Holotype of *L. spinispiraefera* remeasured)	5.0	3.8	2.0	0.8–12.0	1.0–5.0

COLOUR: In life, dark reddish-brown (R3/2 to R-Y-R 3/4); in spirit, identical.

TEXTURE: Soft and easily torn.

SURFACE: Granular and smooth, except where raised into oscular papillae. These are shaped like inverted cones. In most cases the oscules are closed. They are open in the holotype of *L. spinispiraefera*, but the preservation is so poor that it is impossible to discern whether pore areas are present inside some of the seemingly oscular papillae.

SKELETON: the skeleton is an irregular reticulation of thick spicule fibres 90–300μ in diameter. The fibres anastomose freely and interstitial spicules are abundant, consequently the fibres are poorly defined in large areas of the sponge. There is a distinct dermal membrane 1.2–1.4 mm thick, which normally is packed with radially disposed discorhabds. These spicules also occur rarely in the endosome. In the specimen from the Campbell Plateau, discorhabds are absent from large areas of the dermal membrane.

SPICULES:

MEGASCLERES:

STYLES—usually slightly wavy, narrow at the stylote end, sharply pointed distally. In the Campbell Plateau specimen these spicules commonly have subapical polytyolote swellings.

MICROSCLERES:

DISCORHABDS, with a stout central axis bearing a basal whorl of spines. Along the length of the spicule are three further whorls, the largest nearest the base. (Brøndsted, 1924, gives a detailed description of these spicules.)

SPICULE DIMENSIONS OF *Latrunculia brevis*

Locality and Author	Styles	Discorhabds
	μ	μ
Brøndsted North Cape, 55 fm Holotype of *L. spinispiraefera*	420 × 10.0	45 × 25
Holotype remeasured (*L. spinispiraefera*	362–458 × 9.0–10.6 (418 × 10.2)	40–52 (47)
Three Kings, 30–60 fm	299–435 × 6.9–12.7 (386 × 8.9)	52–59 (54)
Chatham Rise, 220 fm	328–379 × 5.8–7.8 (362 × 7)	38–46 (43) (56 × 35)
Campbell Plateau, 46 fm	321–462 × 6.0–11.0 (432 × 9.0)	48–64 × 28–40 (56 × 35)

REMARKS

The holotype of *L. spinispiraefera* was described (Brøndsted, 1924) as possessing spinispirae, an unusual feature in so uniform a genus as *Latrunculia*. These

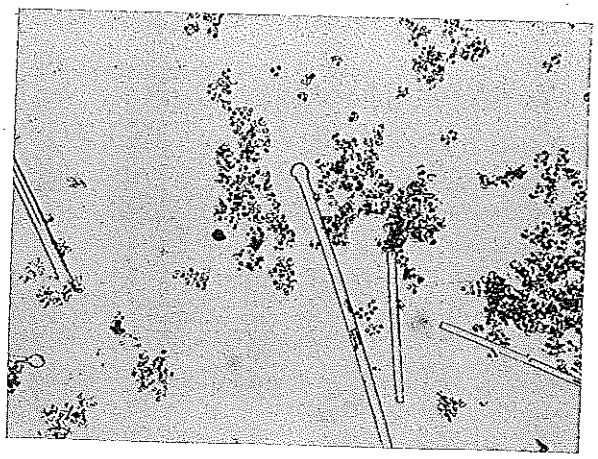


FIG. 1: *Spirastrella spinispirulifera* (Carter)
Tylostyles and Spirasters.

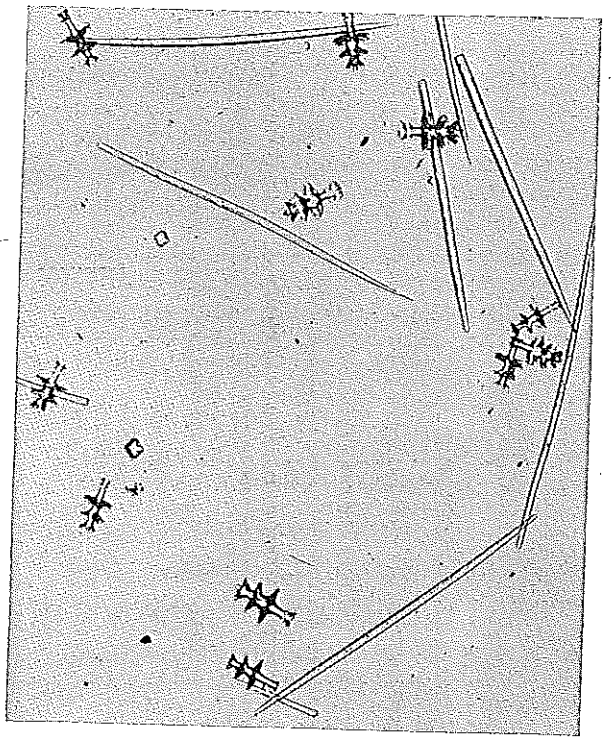


FIG. 2: *Latrunculia brevis* Ridley and Dendy
Subtylostyles and discorhabds.

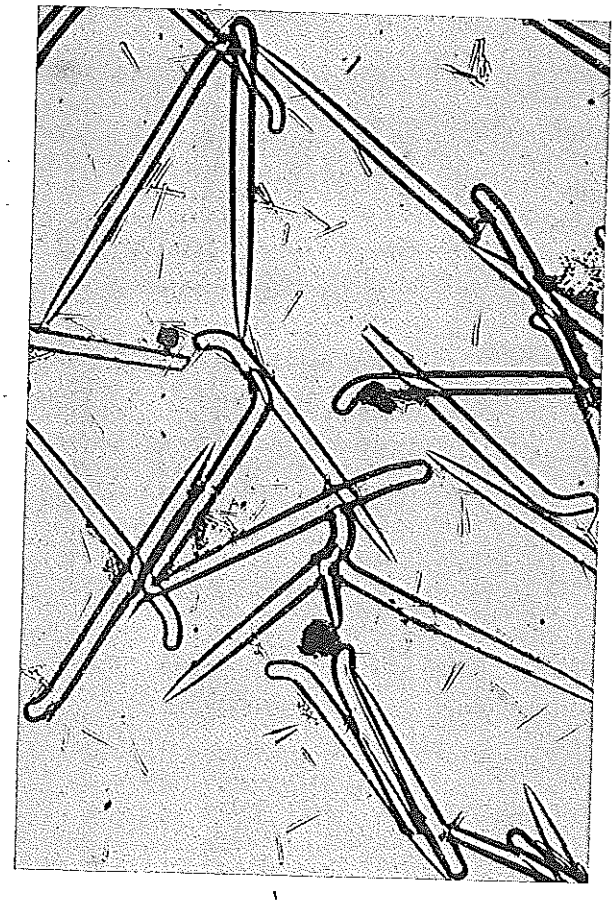


FIG. 3: *Rhabderemia stellata* Bergquist
Rhabdostyles and acanthostyles.

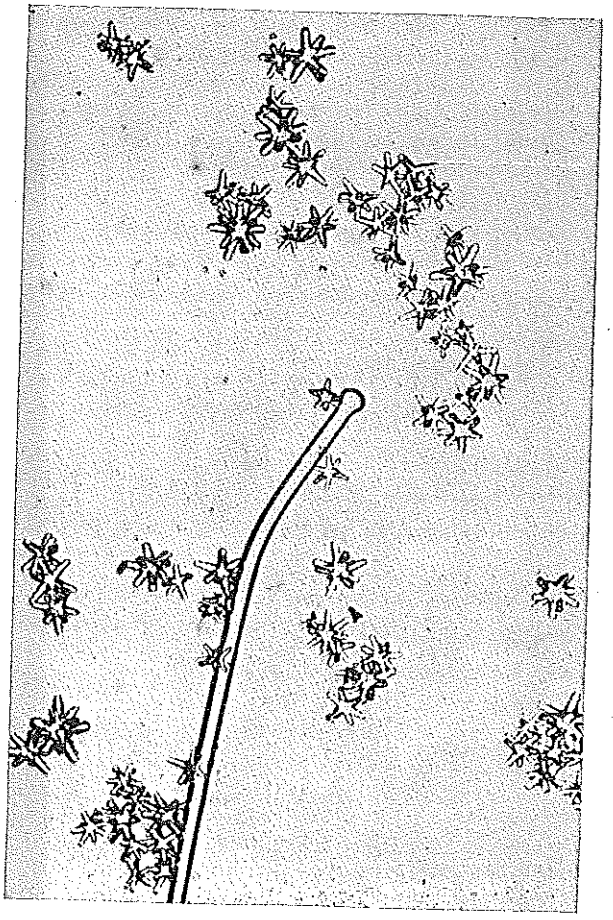


FIG. 4: *Timea alba* nov. sp.
Tylostyle and strongylospherasters.

spicules are foreign, actually belonging to a specimen of *Trachycladus stylifer* which had been collected and packaged with *Latrunculia spinispiraefera*. None of the specimens since collected have spinispirae and neither do the internal tissues of the holotype. The type description must consequently be amended to allow for the deletion of the spinispirae.

Having made this alteration it becomes apparent that there is no reason to separate *L. spinispiraefera* from *L. lendenfeldi* Hentschel (from the Antarctic and Argentina). Consideration of the distribution, morphology and spiculation of *L. lendenfeldi* in conjunction with *L. bocagei* and *L. brevis*, Ridley and Dendy, clearly indicates that the three species are synonymous. The form of all four of the above species is closely comparable and their spicule dimensions, particularly those of the discorhabds, overlap.

COMPARISON OF SPICULE DIMENSIONS OF *Latrunculia* SPP.

Spicules	*L. spinispiraefera*	*L. lendenfeldi*	*L. bocagei*	*L. brevis*
	μ	μ	μ	μ
Styles	229–460 × 5.8–12.7	484–608 × 12.0–13.0	600 × 18.0	600 × 12.6
Discorhabds	38–64 × 28–40	67–73 × 40–45	70 × 30	up to 50 × 44

L. spinispiraefera Brøndsted, *L. lendenfeldi* Hentschel and *L. bocagei* Ridley and Dendy cannot be differentiated on any substantial grounds from *L. brevis* Ridley and Dendy. The recently described *L. antarctica* Tanita is also part of this complex.

Latrunculia apicalis Ridley and Dendy is considered distinct from *L. brevis* because of the large size and distinctive shape of the discorhabds in the former.

L. brevis is a wide ranging Antarctic, subantarctic, and temperate Southern Hemisphere species.

DISTRIBUTION

South Atlantic; South Indian Ocean; Antarctic; Argentine; North Cape (New Zealand).

Genus **Rhabderemia** Topsent

*Rhabderemia corallioides** Dendy

Rhabderemia corallioides Dendy, 1924, p. 357, pl. XII, fig. 3, pl. XV, fig. 1–4.
Rhabderemia corallioides, Burton, 1940, p. 116.

DISTRIBUTION

East of North Cape, 70 fm; south-east of Maldonado, Uruguay.

Rhabderemia stellata Bergquist (pl. 1c, 11h; fig. 3)

Rhabderemia stellata Bergquist, 1961a, p. 41, fig. 13, a–c.

OCCURRENCE

Rangitoto Island; Mayor Island, 2 fm.

HOLOTYPE

Dominion Museum, Por. 12.

DESCRIPTION

A thickly encrusting sponge with conspicuously porose surface marked by ramifying subdermal grooves.

DIMENSIONS:

Rhabderemia stellata

Locality	Length	Width	Thickness	Oscules	Length of Channels	Diameter of Channels
	cm	cm	cm	mm	cm	cm
Rangitoto Type	3.5	5.0	0.5	0.6–1.0	0.6–1.9	0.4–1.0
Mayor I.	6.0	4.0	0.3–1.4	0.8–2.5	0.2–2.8	0.4–1.2

COLOUR: In life, yellow (Y8/6); in spirit, brown (Y-R-Y5/4), or pale yellowish (Y8/4).

TEXTURE: Firm and incompressible, extremely brittle.

SURFACE: The surface is undulating, conspicuously porose (pores up to 0.8 mm) and patterned by meandering subdermal, excurrent channels which converge in stellate fashion on the oscules. In life these channels are roofed by a thin, transparent dermal membrane, 0.1 mm thick, which breaks down in preserved specimens.

SKELETON: The skeleton is an irregular reticulation of slightly plumose ascending fibres 80–120μ in diameter, with unispicular connectives. Both connectives and primary fibres are cored by rhabdostyles. Traces of spongin are evident in the basal portion of some of the primary fibres.

SPICULES:

MEGASCLERES:

RHABDOSTYLES, smooth, stout, evenly tapered spicules with broadly rounded, sharply flexed apex.

MICROSCLERES:

(a) ACANTHOSTYLES. These are small, straight spicules, almost flat apically, sharply pointed distally. The degree of spining of these spicules varies from stout overall spination to faintly roughened overall. The latter condition is predominant.

(b) CONTORT SIGMAS. These spicules have a variety of curious shapes, but are never straight or simply flexed.

SPICULE DIMENSIONS OF *Rhabderemia stellata*

Locality	Rhabdostyles	Acanthostyles	Sigmas
	μ	μ	μ
Rangitoto I. (low tide)	200–325 × 15–21 (268–18)	39–45 × 3.0–4.0 (43–3.6)	11.0–17.0 (13.6)
Mayor I. (2 fm)	218–356 × 12–23 (281 × 19)	36–48 × 3.0–4.3 (43 × 3.7)	10.6–16.0 (13.2)

REMARKS

R. stellata is sharply distinct from *R. corallioides*, the only other New Zealand species of *Rhabderemia*, in habit and spiculation.

Genus **Timea** Gray

Timea alba nov. sp. (pl. 11b; fig. 4)

OCCURRENCE

Three Kings, 30–60 fm, Sta. B 93.

HOLOTYPE

Deposited in the N.Z. Oceanographic Institute, Wellington. Type Reg. No. 32.

DESCRIPTION

An extremely thin encrustation on a limestone rock. A single large specimen was collected and this is designated holotype.

DIMENSIONS: Length, 4.0–5.2 cm; width, 2.8–3.4 cm; thickness, 0.6–1.3 mm.

COLOUR: In spirit, white.

TEXTURE: Elastic.

SURFACE: The surface is granular and undulating with oblique projecting tylostyles. These projecting spicules occur in patches and may be absent from large areas of the surface. No pores or oscules are apparent.

SKELETON: The skeleton is primarily composed of large strongylospherasters which are abundant throughout the sponge. The tylostyles are not organised into fibres, but are arranged vertically or obliquely to the substrate and project up to 1000–1500μ above the surface of the sponge.

SPICULES:

MEGASCLERES:

TYLOSTYLES, long, stout, slightly to sharply curved spicules with pin-like heads which may be somewhat irregular and bi- or 4-lobed.

MICROSCLERES:

Large strongylospherasters, with a well developed centrum, and 7–14 thick, roughened rays, often of unequal length. Occasional rays are oxeote.

SPICULE DIMENSIONS OF *Timea alba*

Locality	Tylostyles	Strongylospherasters
	μ	μ
Three Kings	2970–4018 × 15.8–20.6	34.8–49.2
30–60 fm	(3659 × 18.2)	(44.6)
Type	heads 22.0–30.8	rays up to 5.7 basal diameter

REMARKS

In the form of its asters, *Timea alba* can be compared with *Timea crassa* Topsent, *Timea hallezi* var. *crassa* Levi and *Timea* (*Hymedesmia*) *stellata* var. *centrifera* (Hentschel). It is distinguished from these species by the much greater size of both microscleres and megascleres.

Timea (*Hymedesmia*) *spinatostellifera* (Carter) has strongylospherasters of comparable size to those of *T. alba* but they have a curious spining pattern, successive rings of small spines along the distal two-thirds of each ray.

The only other species of *Timea* beside *T. alba* which is white in colour is *Timea* (*Hymedesmia*) *capitatostellifera* (Carter) a sponge which has extremely distinctive microscleres.

Timea aurantiaca nov. sp. (pl. 11c).

OCCURRENCE

Great Barrier, Whangapoua (in shaded mid-tidal cave) this specimen is designated holotype; Goat Island Bay (under mid-tidal rocks); Narrow Neck (under low tidal rocks).

HOLOTYPE

Dominion Museum, Por. 15.

DESCRIPTION

A thinly encrusting sponge, often forming extensive mats in shaded positions usually under boulders in association with the small hydroid, *Sertularella*, and with polyzoans.

DIMENSIONS: Length up to 18.0 cm; width up to 8.0 cm; thickness, 0.8–0.9 mm.

COLOUR: In life, bright orange (rY-R5/10) to red (yR5/10); in spirit, grey.

TEXTURE: Elastic.

SURFACE: The surface is uneven and granular owing to the dense dermal layer of spherasters. Conspicuous, clear, subdermal channels are visible in the live sponge and these appear to occupy almost the entire thickness of the sponge. They are meandering, up to 4.6 cm long, 1.0 mm in diameter and drain into small, insignificant oscules 0.8–1.0 mm in diameter. No pores are visible.

SKELETON: The skeleton is a confused mat of tylostyles with a suggestion of vertical disposition in places. A dermal membrane 0.1 mm thick is present, this is densely packed with spherasters.

SPICULES:

MEGASCLERES:

TYLOSTYLES, straight, slender spicules with elongate oval heads which may be slightly asymmetric and roughened. The tylote expansions are frequently subterminal.

MICROSCLERES:

SPHERASTERS, which vary from tylospherasters to strongylospherasters to normal spherasters with sharp, oxeote rays. The number of rays varies from 8–20 and the centrum is always clearly defined.

SPICULE DIMENSIONS OF *Timea aurantiaca*

Locality	Tylostyles	Spherasters
	μ	μ
Gt Barrier	193–677 × 2.3–6.0	4.6–20.0
Whangapoua	(480 × 4.8)	(13.9)
Holotype		
Goat Island Bay	217–400 × 2.3–4.0	5.7–22.2
	(340 × 3.7)	(11.5)

REMARKS

This species can be compared to *Timea hallezi* Topsent, from which it differs in colour, diameter of megascleres and in the greater size and occasional tylote condition of the microscleres.

Timea spherastraea Burton, from Zanzibar, is similar in spiculation to *T. aurantiaca*, but in the former all spicules are of much greater size and the tylote condition of the microscleres is only incipient.

Family SUBERITIDAE Schmidt

Genus **Aaptos** Gray

Aaptos aaptos (Schmidt) (pl. 1d)

RESTRICTED SYNONYMY

Ancorina aaptos Schmidt, 1864, p. 33.
For full synonomy see Dendy and Fredrick, 1924, p. 508.
Aaptos aaptos, Bergquist, 1961a, p. 44.

OCCURRENCE

Stanley Bay (lower mid littoral); Rangitoto (under low tidal rocks); Rangitoto Channel, 6–8 fm; Whangarei Harbour, 2–4 fm.

DESCRIPTION

The intertidal specimens of this species are irregularly hemisperical, low-lying sponges; the sublittoral specimens are large, erect and spherical, often with a stout cylindrical stalk.

DIMENSIONS:

Aaptos aaptos

Locality	Habit	Height	Width	Thickness	Diameter of Stalk	Oscules
		cm	cm	cm	cm	mm
Rangitoto intertidal	Low-lying hemi-spherical	1.0	4.2	–	–	Not apparent
Rangitoto Channel	Erect stipitate	Up to 9.0	Up to 4.8	Up to 3.5	Up to 1.2	0.6–1.8

COLOUR: In life, reddish purple externally (rY-R5/4) to brownish yellow internally (Y-R-Y6/6); in spirit, greyish.

TEXTURE: Firm, but compressible.

SURFACE: The surface is granular, warty, or essentially smooth in intertidal specimens. In sublittoral specimens it is raised into irregularly rounded lumps caused by the growth of the sponge around commensal amphipods, *Polycheria antarctica*. These amphipods occur in great numbers on specimens of *Aaptos aaptos* and have all their legs curiously modified into claws to enable them to hold on to the sponge until such time as they burrow into it or until the sponge overgrows them. Oscules are small and abundant, occuring over the apical half of the sponge, occasionally occurring in groups in an apical oscular depression, 3.0–4.0 mm in diameter.

SKELETON: The skeleton is radially arranged and made up of stout spicule tracts 100–400μ in diameter which are composed of styles. These tracts terminate in brushes of intermediate size styles which interdigitate with a dense radially disposed layer of small dermal tylostyles. The dermal tylostyles project up to a third of their length beyond the surface.

SPICULES:

MEGASCLERES:

(a) SUBTYLOSTYLES, of two sizes, straight spicules which make up the endosomal skeleton.

(b) TYLOSTYLES, small, straight spicules with definite tylote heads.

SPICULE DIMENSIONS OF *Aaptos aaptos*

Locality and Author	Large Subtylostyles	Medium Subtylostyles	Dermal Tylostyles
	μ	μ	μ
Topsent, 1900 France	1000–1500 × 17–25	200–700 × 3–10	
Rangitoto intertidal	1600–2100 × 17.6–23 (1906 × 19.7)	328–600 × 5.4–6.9 (453 × 6.4)	146–189 × 4.0–5.4 (170 × 4.8)
Rangitoto Channel 6–8 fm	1800–2470 × 20.0–24.3 (2182 × 21.0)	339–532 × 5.7–6.9 (468 × 6.3)	154–184 × 4.6–5.7 (178 × 5.2)

REMARKS

The New Zealand specimens of this species are similar to those described from Australia and the Northern Hemisphere, the dermal spicules are, however, more plainly tylote in the former.

DISTRIBUTION

Mediterranean; West Indies; Indian Ocean; Malaya; Australia.

Genus **Polymastia** Bowerbank

Polymastia conigera Bowerbank (pl. 2d, fig. 5)

Polymastia conigera Bowerbank, 1874, p. 192, pl. LXXII.
Polymastia conigera, Dendy, 1921, p. 150.
Polymastia conigera, Dendy, 1924, p. 381.

OCCURRENCE

Three Kings 30–60 fm, Sta. B 93.

DESCRIPTION

A small, spherical sponge bearing a single conical apical papilla with terminal osculum 0.2 mm wide. No point of attachment is visible, the sponge is complete and appears to have been free living.

DIMENSIONS: 8.5 mm diameter; papilla 9.5 mm high, 5.0 mm wide basally, 1.5 mm apically.

COLOUR: In spirit, fawn (Y-R-Y6/4).

SURFACE: A fine surface pile, formed by the projecting dermal tylostyles, is present over the whole sponge. At several points a more robust hispidation formed by projecting brushes of larger styles is present.

TEXTURE: Firm but brittle.

SKELETON: The cortex is 0.3 mm thick and invests a lax fibrous choanosome. The structure and arrangement of the skeleton conform closely to the type.

SPICULES: MEGASCLERES: TYLOSTYLES, of three sizes:

(i) Large stout tylostyles, often polytylote. These are the structural spicules of the choanosome.

(ii) Medium sized tylostyles, relatively stout, choanosomal.

(iii) Small dermal tylostyles, found as subdermal brushes and projecting through the surface.

SPICULE DIMENSIONS OF *Polymastia conigera*

Locality and Author	Large tylostyles	Medium tylostyles	Dermal tylostyles
	μ	μ	μ
Three Kings 30–60 fm	970–1082 × 20–24 (1021 × 21)	677–726 × 17.2–19.7 (692 × 18.0)	169–193 × 5.0–8.1 (180 × 6.2)
Saya de Malha, 125–123 fm Dendy 1921	1900	–	130 × 4.1
Britain Shetland, 40–50 fm. Bowerbank Type	Often in excess of 1560.0	–	–

REMARKS

The large spicules of the New Zealand specimen are smaller than those of either the type or the Indian Ocean specimen and unfortunately Dendy (1924) gave no details of his specimen. Form and spicule size, however, appear to be variable in this section of *Polymastia.* From published descriptions it is likely that *P. tubulifera* Dendy, a species with larger spicules, but almost identical form, will prove to be synonymous with *P. conigera.*

DISTRIBUTION

Britain; Saya de Malha; Three Kings, New Zealand, 100 fm (*Terra Nova* Sta. 90).

Polymastia fusca Bergquist (pl. 2a)

Polymastia fusca Bergquist, 1961a, p. 43, fig. 16a,b.

OCCURRENCE

Three Kings, 30–60 fm, Sta. B 93; Burgess Bay; Ahipara Bay; North Cape, Spirits Bay, Stanmore Bay; Goat Island Bay, Great Barrier; Cape Colville; Piha; Anawhata; Mercury Bay; Mayor I.; Campbell Plateau Sta B 176, 46 fm; (all inter-tidal unless otherwise stated).

HOLOTYPE

Dominion Museum, Por. 13.

DESCRIPTION

A massive sponge covered with numerous papillae, spreading and thin when intertidal, often up to several inches high and subspherical when from deeper water. Specimens from the Subantarctic in 46 fm closely resemble intertidal West Coast specimens.

DIMENSIONS:

Polymastia fusca

Locality and Author	Papillae Height	Papillae Width	Cortex Thickness	Oscule Dimensions	Habit
	mm	mm	mm	mm	
Burgess Bay Kawau. Type.	3.2–6 (4.5)	3.0–5.0 (4.25)	1.0	0.25–0.5 (0.3)	Encrusting
Campbell Plateau B176	5.0–9.5 (7.5)	3.0–7.0 (4.4)	0.8	0.25–1.0 (0.35)	Encrusting
Three Kings, 30–60 fm	6.0–17.0 (11.4)	5.0–12.0 (9.0)	0.5–0.7	1.3–5.0 (3.1)	Ovate to subspherical
Piha-Anawhata	1.0–3.0 (1.75)	0.7–5.0 (2.0)	1.3	0.2–0.4	Spreading

TEXTURE: Firm and fleshy.

COLOUR: In life, greenish to chocolate brown externally (Y-R8/4) dull yellow internally (Y-6/6). In spirit the colour is chocolate brown externally, yellow internally, very little change taking place on fixation.

SKELETON: The skeleton is composed of stout radiating fibres of large subtylostyles with medium sized and small subtylostyles scattered thickly in the choanosome and forming a dense dermal layer. The dermal skeleton is essentially a palisade of small subtylostyles the tips of which just pierce the surface. Some of the radially disposed spicules of intermediate size project about three-quarters of their length.

In the choanosomal region there are often stellate groups of small subtylostyles.

SPICULES:

MEGASCLERES:

SUBTYLOSTYLES of three sizes:

SPICULE DIMENSIONS OF *Polymastia fusca*

Locality and Author	Large Styles	Medium Styles	Small Styles
	μ	μ	μ
Burgess Bay, Kawau (littoral) Type	690–720 × 11.5 (697 × 11.5)	380–480 × 8.0 (435 × 8.0)	101–159 × 1.6–4.6 (140–3.2)
Three Kings, 30–60 fm	801–800 × 10.4 –11.9 (758 × 11.3)	276–532 × 5.7 –8.0 (422 × 6.9)	164–189 × 3.8–5.7 (176 × 4.8)
Campbell Plateau B176, 46 fm	695–810 × 10.4 –13.0 (770 × 11.8)	320–501 × 5.6 –8.1 (440 × 6.4)	120–175 × 2.1–4.6 (148 × 3.7)

The shape of the spicules is variable.

(i) LARGE SUBTYLOSTYLES always straight, never polytylote, with no terminal head, but usually narrowing towards the stylote end. A subterminal tylote expansion may occur.

(ii) MEDIUM SUBTYLOSTYLES identical with above except for size.

(iii) SMALL SUBTYLOSTYLES may be either terminally tylote or exotylote in the same specimen. Often slightly and evenly curved.

REMARKS

Polymastia fusca is one of the commonest intertidal sponges in northern New Zealand. It is a light-tolerant species which is often found on firm substrate on the

unshaded sides of crevices or between rocks. Its distinctive features are the external colouration and growth form in conjunction with a very compact skeleton and exotylote dermal spicules.

Polymastia granulosa Brøndsted (pl. 2b, d, e)

Polymastia granulosa Brøndsted, 1923, p. 162, fig. 36, a–c.
Polymastia granulosa, Bergquist, 1961a, p. 44.

OCCURRENCE

Carnley Harbour (Auckland Is.); North Cape; Spirits Bay; Ahipara; Whangaroa; Hokianga Heads; Piha; Anawhata; Goat Island Bay; Poor Knights; Stanmore Bay; Waiwera; Takatu Point (8 fm); Burgess Bay, Kawau, 2 fm; Great Barrier; Point Chevalier; Narrow Neck; Ladies Bay; Mayor Island; Cape Colville; Mahia Peninsula; Lyall Bay; Kaikoura; Stewart Island; Campbell Plateau, 46 fm; (all intertidal except where indicated).

DESCRIPTION

A spreading to massive spherical sponge often attaining a width of 80 cm on the west coast of New Zealand in situations of maximal exposure to wave action. In muddy, still waters in the presence of *Corallina* it often underlies the coralline mat and mud. It appears in these situations as isolated yellow fistules.

DIMENSIONS:

Polymastia granulosa

Locality and Author	Papillae Height	Papillae Width	Cortical Thickness	Oscule Dimensions	Habit
	mm	mm	mm	mm	cm
Carnley Harbour (littoral, type) Brøndsted	15.0	4.0–5.0			Encrusting
Piha (lower littoral)	2.0–6.0 (4.5)	2.0–4.0 (3.3)	1.0–1.5	0.75–1.5 (0.8)	Spreading up to 2.5 thick
Campbell Plateau B 176,46 fm	4.0–16.0 (13.0)	3.0–9.0 (6.0)	1.25	1.0–2.0 (1.6)	Spreading almost circular 1.5–2.0 thick
Hokianga	9.0–17.0 (14.0)	1.5–3.0 (2.1)	1.0	Not apparent	Encrusting
Narrow Neck	4.0–6.0 (5.2)	2.0–4.0 (2.8)	0.5	0.25–0.75 (0.4)	Spreading

COLOUR: In life deep orange (rY-R6/6 to yY-R7/10); in spirit pale yellow to whitish (rY8/4)

SURFACE: The surface appears smooth, but is seen to be granular under low magnification and is raised into numerous oscule-bearing papillae or fistules.

TEXTURE: Cartilaginous.

SKELETON: The type description is an accurate account of the skeletal structure which, by comparison with *P. fusca*, is lax in the deeper layers and not as strongly compacted in the cortex.

SPICULES:

MEGASCLERES:

SUBTYLOSTYLES OR TYLOSTYLES of three sizes:

(i) LARGE SUBTYLOSTYLES making up the bulk of the skeleton. These spicules are straight, usually polytylote, but rarely terminally tylote.

(ii) MEDIUM SUBTYLOSTYLES as above, but not polytylote.

(iii) SMALL TYLOSTYLES usually markedly tylote but sometimes tapering toward the head.

SPICULE DIMENSIONS OF *Polymastia granulosa*

Locality and Author	Large Styles	Medium Styles	Small Styles
	μ	μ	μ
Carnley Harbour (littoral type) Brøndsted 1923	650.0	Not recognised	165 × 4.0
Piha (lower littoral)	556–620 × 8.1–12.7 (578 × 11.2)	329–445 × 8.1–10.4 (402 × 8.6)	127–189 × 3.4–5.0 (155 × 4.5)
North Channel 8 fm	550–630 × 8.0–12.0 (580 × 10.9)	310–430 × 8.1–10 (387 × 8.7)	130–165 × 3.4–4.8 (145 × 4.0)
Campbell Plateau B 176, 46 fm	880–970 × 14.3–15.0 (950 × 14.8)	390–500 × 9.6–11.5 (480 × 10.9)	96–145 × 3.1–4.0 (137 × 3.2)
Burgess Bay, Kawau, 2 fm	484–580 × 7.5–11.3 (524 × 9.2)	271–329 × 6.9 (304 × 6.9)	140–174 × 3.8–4.6 (150 × 4.0)
Takatu Point, 6–7 fm	556–580 × 11.59 (558 × 11.9)	280–435 × 5.7–6.2 (376 × 5.8)	159–184 × 1.15–3.4 (172 × 2.2)
Narrow Neck (littoral)	484–605 × 10.4–11.5 (556 × 10.9)	280–411 × 4.6–5.7 (360 × 4.9)	116–198 × 2.8–4.6 (132 × 3.5)

REMARKS

A consistent difference between *P. fusca* and *P. granulosa* is colour. Brøndsted (1923, p. 163) states that *P. granulosa* is greyish-brown with a red tint, which closely approaches the colour of *P. fusca*. I have examined the type specimen of *P. granulosa* and find that most of the pigment has been removed by fixation. Had there been brown pigment in the surface some trace should have remained, as brown pigments are stable in both alcohol and formalin. I conclude that this specimen was probably a deep orange (equivalent to specimens I have from subantarctic waters) and certainly was almost the same colour throughout.

P. granulosa is a common intertidal species throughout New Zealand. It usually occurs with *P. fusca*, but is always more abundant than the latter.

DISTRIBUTION

Carnley Harbour, low water.

Polymastia hirsuta nov. sp. (pl. 3a)

OCCURRENCE

Little Barrier Island, 16–20 fm.

HOLOTYPE

Dominion Museum, Por. 16.

DESCRIPTION

Only a single specimen has been collected, this is designated holotype. It is a massive, spreading sponge growing over a dead shell of *Notovola*.

DIMENSIONS: 16.0 cm long; 14.0 cm wide; 4.5 cm high.

COLOUR: In life, bright yellow to orange (Y-R-Y6/10); the pile is light grey; in spirit (Y-R5/2).

TEXTURE: Firm, just compressible.

SURFACE: The upper surface bears typical oscular papillae. These are somewhat involute and only their rounded apices project above the level of the dermis. A fine pile, 0.2–0.4 mm high, formed by projecting dermal tylostyles, covers the surface of the sponge.

PAPILLAE AND CORTICAL DIMENSIONS OF *Polymastia hirsuta*

Papillae, Length mm	Papillae, Width mm	Cortical Thickness mm	Oscule Diameter mm
2.0–10.0 (5.0)	8.0–20.0 (11.6)	1.0	0.5–0.75 (0.6)

SKELETON: The main endosomal skeleton is composed of dense masses of irregularly arranged tylostyles and no organisation into tracts is apparent. The ectosome or cortex is 1.0 mm thick and composed of radially disposed tylostyles, the largest of which project as the dermal pile.

SPICULES:

MEGASCLERES:

TYLOSTYLES of three sizes:

(i) LARGE, STOUT TYLOSTYLES, exclusively endosomal, very faintly tylote terminally, but often with polytylote expansions along the length of the spicule. These expansions are, however, not as frequent or as marked as in *Polymastia granulosa*.

(ii) INTERMEDIATE TYLOSTYLES, only very faintly tylote. These spicules are responsible for the formation of the dermal pile, in addition they are distributed throughout the cortical and endosomal tissues.

(iii) SMALL DERMAL TYLOSTYLES arranged in radial brushes. These spicules have obconical tylote heads.

SPICULE DIMENSIONS OF *Polymastia hirsuta*

Large Tylostyles	Medium Tylostyles	Dermal Tylostyles
μ	μ	μ
629–774 × 12.7–18.5 (708 × 16.2)	407–453 × 5.8–11.7 (437 × 9.2)	169–193 × 4.6–5.7 (180 × 4.8)

REMARKS

In the tendency to involution of the papillae this sponge resembles *P. invaginata* (Kirkpatrick) from the Antarctic where the single papilla is completely involute and the surface pile developed to a greater degree. Nevertheless, spicule sizes are in no way comparable in the two species. *Polymastia hirsuta* does to some extent bridge the gap between the normal growth form for the genus and the great specialization of *P. invaginata*.

Key to the New Zealand Species of *Polymastia*

1. Specimen encrusting to massive with many papillae 2
   Specimen spherical with one apical cone .. .. **P. conigera**
2. Specimen with surface pile and involute papillae.. **P. hirsuta**
   Specimen with erected papillae and smooth surface .. 3
3. Specimen dark chocolate brown externally .. **P. fusca**
   Specimen orange-yellow-pink .. .. **P. granulosa**

DISCUSSION

The genus *Polymastia* is well represented in New Zealand both in number of species and frequency of individuals, *P. granulosa* and *P. fusca* being extremely common intertidally and in shallow offshore waters.

P. granulosa is extremely close in form, size, and spiculation to *Polymastia robusta* Bowerbank a common European, Mediterranian, Eastern North American species. It is not clear whether the polytylote nature of the spicules of *P. granulosa* is significant and can be used to distinguish between this species and *P. robusta*. Several species of *Polymastia* (*P. conigera, P. hirsuta*) have polytylote spicules, and these are rare in some specimens of *P. granulosa*.

Genus **Stylotella** Lendenfeld

*Stylotella agminata (Ridley)

RESTRICTED SYNONOMY

Hymeniacidon agminata Ridley, 1884, p. 466.
Stylotella digitata Ledenfeld, 1888, p. 185.
Stylotella agminata, Hallman, 1914, p. 349.
Stylotella agminata, Brøndsted, 1923, p. 145, fig. 23.
Stylotella agminata, de Laubenfels, 1954, p. 213, fig. 145, a–d.

DISTRIBUTION

Central Pacific; Australia; Perseverance Harbour; Campbell Island; New Zealand (Nelson, Lyttelton).

Genus **Pseudosuberites** Topsent

Pseudosuberites sulcatus (Thiele) (fig. 6)

RESTRICTED SYNONYMY

Suberites sulcatus Thiele, 1905, p. 417, fig. 27, 39.
Suberites incrustans Brøndsted, 1923, p. 162, fig. 35.
Suberites ramosus Brøndsted, 1923, p. 160, fig. 33.
Suberites anastomosus Brøndsted, 1923, p. 161, fig. 34.
Suberites brøndstedi, Burton, 1930b, p. 536.
Pseudosuberites sulcatus, Burton, 1930a, p. 334.
Pseudosuberites sulcatus, Burton, 1932b, p. 336.
Pseudosuberites sulcatus, Burton, 1938, p. 18.

OCCURRENCE

Stanley Bay (mid-littoral encrusting); Narrow Neck (intertidal); North Channel, 6 fm.

DESCRIPTION

A small, thinly encrusting sponge, often bearing irregular, erect processes. This sponge has been found encrusting *Elminius modestus* under mid-tidal rocks; growing in conjunction with *Corallina officinalis*, in which habitat the erect processes are formed; and encrusting *Glycimeris laticostata*.

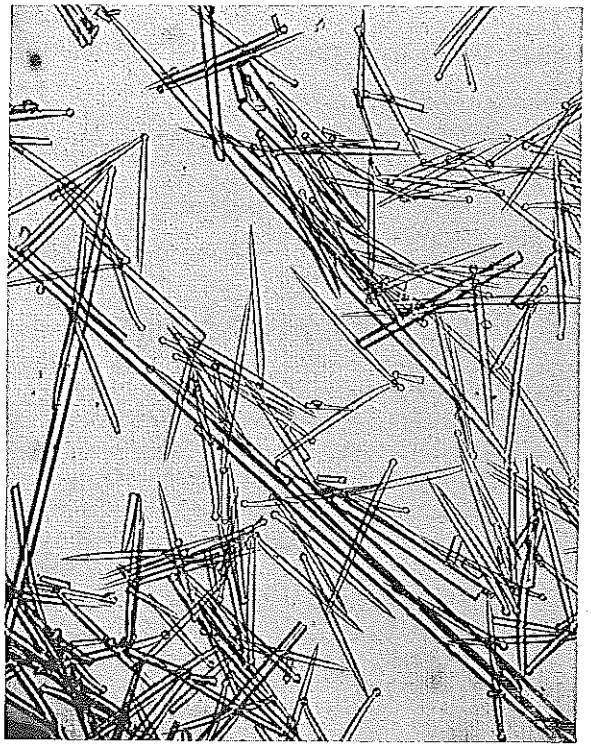


FIG. 5: *Polymastia conigera* Bowerbank Tylostyles.

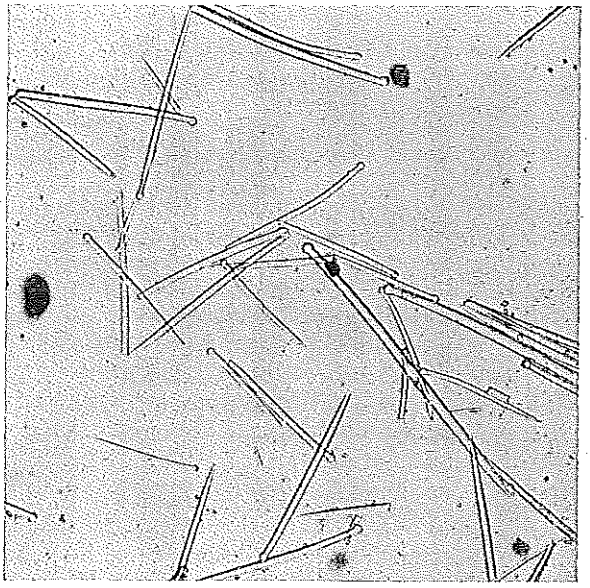


FIG. 6: *Pseudosuberites sulcatus* (Thiele) Tylostyles.

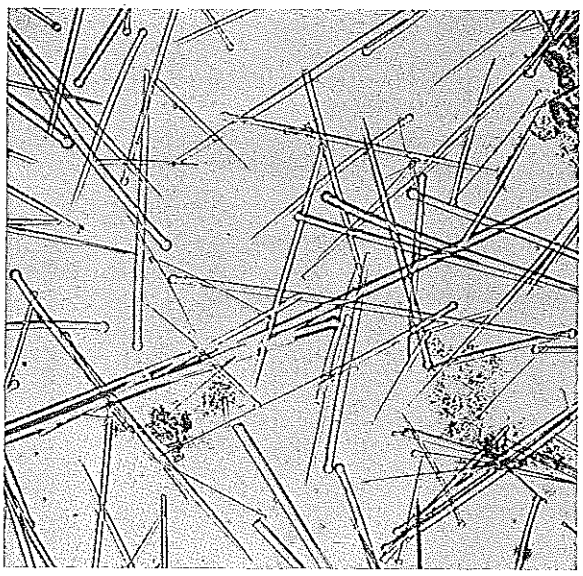


FIG. 7: *Suberites axinelloides* Brøndsted Tylostyles.

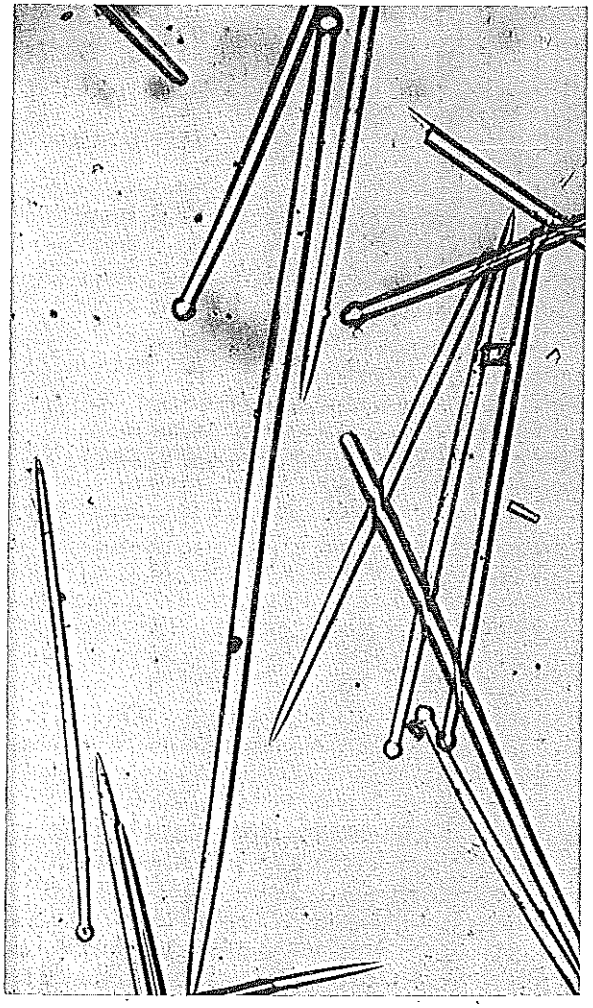


FIG. 8: *Suberites cupuloides* Bergquist Tylostyles.

DIMENSIONS: 0.8–1.4 mm thick; processes 2.8–4.0 mm high; 1.2–1.6 mm wide.

COLOUR: In life, pale yellow (rY8/6) to dull orange (yY-R6/8); in spirit, whitish.

TEXTURE: Soft and easily torn.

SURFACE: Smooth, slightly uneven, with conspicuous subdermal spaces. No pores or oscules are visible.

SKELETON: The endosomal skeleton is a confused mat of large tylostyles with a tendency for vertically disposed spicules to predominate. A dermal skeleton is present and composed of vertically arranged tylostyles of large and small size. There is a tendency for small spicules to predominate in the dermal region. These spicules do, however, occur in the endosome.

SPICULES:

MEGASCLERES:

TYLOSTYLES are not clearly differentiated into two categories but show considerable variation in length and width, they are evenly curved with rounded terminal heads and reach their greatest diameter two-thirds of their length from the head.

SPICULE DIMENSION OF *Pseudosuberites sulcatus*

Locality and Author	Tylostyles (Large)	Tylostyles (Small)
Argentine Thiele 1905 Type	370 × 12.0 μ	175 × 5.0 μ
Brøndsted Campbell Is as *S. incrustans*	170–530 × up to 12.0–13.0	Not distinguished
Brøndsted as *S. ramosus*	200–500 × up to 11.0	Not distinguished
Narrow Neck	170–386 × 6.0–12.7 (284 × 9.6)	
North Channel, 6 fm	140–387 × 4.6–8.4 (272 × 7.3)	

REMARKS

De Laubenfels (1936, p. 148), notes that Burton (1930) transferred *S. ramosus* and *S. anastomosus* Brøndsted to *Prosuberites* on the grounds that Brøndsted clearly described two size groups of tylostyles, the smaller being dermal.

This comment is quite erroneous. Burton referred the above species and *S. incrustans* (renamed *brøndstedi* since *incrustans* is preoccupied) to *Pseudosuberites* Topsent, not to *Prosuberites*. In *Pseudosuberites* a dermal skeleton is present, hence de Laubenfels's objection to the transfer is invalid. Burton points out that this dermal skeleton is variable in composition and disposition of spicules. This fact is also implied in Brøndsted's description of *S. anastomosus* and *S. raniosus*.

Burton has examined the type specimens of Brøndsted's three species and consequently his suggestion of placing them in *Psuedosuberites* is followed here. It should be noted, however, that Burton recognised the probability that *Pseudosuberites* may eventually be treated as a subgenus of *Suberites*, a move initially recommended by Thiele (1905). The distinction between *Suberites* and *Pseudosuberites* is extremely fine and difficult to apply in practice.

DISTRIBUTION

Campbell Island, South Georgia, Panama, Argentine, Falkland Is.

Genus **Suberites** Nardo

*Suberites affinis** Brøndsted

Suberites affinis Brøndsted, 1923, p. 159, fig. 32.

DISTRIBUTION

Carnley Harbour, 45 fm.

Suberites axinelloides Brøndsted (fig. 7)

Suberites axinelloides Brøndsted, 1924, p. 481, fig. 34, a, b.

OCCURRENCE

Rangitoto Channel, 3–5 fm; wharf piles, Waitemata Harbour.

DESCRIPTION

A thinly encrusting sponge found growing over a shell of *Maoricolpus* and encrusting dead shells of *Saxostrea* on wharf piles. On the former, the sponge is 0.9–1.2 mm thick and completely invests the shell except at the operculum.

COLOUR: In life, bright orange (rY-R6/8); in spirit, greyish.

TEXTURE: Soft and easily torn.

SURFACE: Smooth and granular, very faintly hispid with no pores or oscules visible.

SKELETON: The endosomal skeleton is better developed than in the holotype since the sponge is substantially thicker. Short ascending tracts composed of large tylostyles are present, the tracts are 60–100μ in diameter near the substratum and expand to 180–200μ below the surface where the terminal spicules interdigitate with a vertical layer, 120.0μ deep, of small dermal tylostyles. Between the endosomal tracts, numerous tangentially disposed spicules occur.

SPICULES:

MEGASCLERES:

TYLOSTYLES of two sizes:

(i) LARGE STOUT TYLOSTYLES which make up the main skeleton. These are straight or very slightly curved with rounded terminal heads.

(ii) SMALL DERMAL TYLOSTYLES are usually straight, but sometimes curved just behind the head which rarely may be subterminal.

SPICULE DIMENSIONS OF *Suberites axinelloides*

Location and Author	Large Tylostyles	Dermal Tylostyles
	μ	μ
East of North Cape, 55 fm Brøndsted Type	200–700 × up to 21.0 Categories not differentiated	
Rangitoto Channel, 3.5 fm	382–650 × 9.6–12.7 (508 × 11.4)	121–226 × 3.0–4.0 (174 × 3.6)

DISTRIBUTION

East of North Cape, 55 fm.

***Suberites carnosus** (Johnston)

RESTRICTED SYNONYMY

Halichondria carnosa Johnston, 1842, p. 146, pl. xiii, fig. 7–8.
Suberites carnosus, Topsent, 1900, p. 233, pl. vii, figs. 1–5.
Suberites carnosus, var *novae zealandiae*, Dendy, 1924, p. 380.

REMARKS

After examination of the type of *S. carnosus* var. *novae zealandiae*, Burton (1934) decided that the variety is indistinguishable from *S. carnosus*.

DISTRIBUTION

Coasts of Europe; Red Sea; Indian Ocean; Tasmania; New Zealand.

Suberites cupuloides Bergquist (pl. 3b; fig. 8)

Suberites cupuloides Bergquist, 1961a, p. 42, fig. 14, a, b.

HOLOTYPE

Dominion Museum, Por. 2.

OCCURRENCE

Rangitoto; Milford; Ladies Bay; Onetangi.

DESCRIPTION

A massive to erect sponge with large rounded lobes, usually found growing in full light situations between, or in crevices in, basalt boulders in the Auckland area.

DIMENSIONS:

Suberites cupuloides

Locality	Height	Width	Thickness	Oscules
	cm	cm	cm	mm
Rangitoto Type	1.2–5.0	0.2–2.5	0.2–1.9	Not apparent
Milford	4.2–7.0	2.0–2.9	1.2–2.0	1.0–1.4
Ladies Bay	8.5	6.0	3.2	1.0–1.4

COLOUR: In life, varies from yellowish to scarlet externally (R-Y-R5/10 to rY-R4/8), deep orange internally (Y-R6/10); in spirit yellowish brown (Y-R-Y6/4) to grey.

TEXTURE: Firm and fleshy, easily compressible.

SURFACE: The surface is smooth and minutely hispid. Oscules are infrequently observed and always apical on the lobes. Pores are never apparent.

SKELETON: The endosomal skeleton is composed of loose, subplumose, ascending fibres of extremely variable diameter, terminating below the surface in paniculate brushes of small tylostyles which constitute a distinct dermal layer. Small patches of spongin up to 60.0μ in diameter occur around clusters of spicules in the deeper region of the endosome.

SPICULES:

MEGASCLERES:

TYLOSTYLES:

(i) LARGE STOUT TYLOSTYLES of the endosomal region. These spicules are variable in length and width and have prominent rounded heads. They are straight or occasionally asymmetrically curved, reaching their maximum diameter about the middle.

(ii) SMALL DERMAL TYLOSTYLES with prominent, rounded heads. These spicules are straight and reach their maximum diameter two thirds of their length behind the head.

SPICULE DIMENSIONS OF *Suberites cupuloides*

Locality	Large Tylostyles	Dermal Tylostyles
	μ	μ
Rangitoto Holotype	387–847 × 11.0–20.0 (625 × 17.0)	170–240 × 6.9–8.0 (218 × 7.4)
Ladies Bay	495–902 × 12.0–21.2 (677 × 18.0)	193–266 × 6.8–9.0 (229 × 7.8)
Milford Reef	442–865 × 12.0–20.4 (648 × 17.6)	158–227 × 6.9–8.0 (206 × 7.5)

REMARKS

S. cupuloides differs from other New Zealand species of *Suberites* in habit and in spiculation and is distinct from all other massive lobate species of *Suberites* known to me in colour and spicule dimensions.

Suberites australiensis nov. sp. (pl. 3c, d.)

Suberites domuncula, Lendenfeld, 1888, p. 65.

OCCURRENCE

South-east of East Cape 45 fm (on *Alcithoe*) (Holotype); Cook St. 70 fm; south-east of Cuvier I., 40 fm.

HOLOTYPE

Dominion Museum, Por. 17.

DESCRIPTION

This sponge is comparable in form to sponges described as *Suberites ficus* from various Northern Hemisphere localities. Two specimens are massive and subspherical with an apical osculum and apparently were rooted in mud compacted around fine shell fragments, the third, growing on *Alcithoe arabica* is broad and massive with no visible osculum. None of these sponges are associated with hermit crabs, but one specimen from Port Phillip Bay, Melbourne, is growing upon a *Pilumnus*.

DIMENSIONS:

Suberites australiensis

Locality	Height	Width	Thickness	Oscules	Pores
	cm	cm	cm	mm	mm
South of East Cape, 45 fm	6.0	7.5	2.0	Closed	Not apparent
Cook Strait, 70 fm	6.0	2.0	1.5	4.8	Not apparent
Cuvier I., 40 fm Holotype	10.0	7.0	3.2	9.0	0.08

COLOUR: In life, dull yellow (Y-R-Y7/6); in spirit, pale reddish-yellow (Y-R6/4).

TEXTURE: Firm and fleshy, just compressible.

SURFACE: The surface is smooth and uneven. Under 12× magnification it appears to be faintly hispid.

SKELETON: The skeleton is a confused mass of tylostyles with very faint traces of fibre formation. There is a distinct, radially-disposed layer of dermal tylostyles. These are disposed in a series of paniculate brushes up to 90μ across and 200μ deep. The dermal spicules do not differ clearly in size or shape from the endosmal tylostyles.

SPICULES:

MEGASCLERES:

TYLOSTYLES, slender, straight or very slightly curved spicules with variable irregularly shaped heads. The commonest type is doubly tylote and asymmetric. Very occasional centrotylote oxeas occur and one tylostrongyle has been found.

SPICULE DIMENSIONS OF *Suberites australiensis*

Locality	Tylostyles	Oxea
	μ	μ
South of East Cape, 45 fm	201–532 × 3.6–6.2 (372 × 4.6)	Absent
Cook St., 70 fm	193–526 × 4.6–9.0 (425 × 6.3)	Absent
Cuvier I., 40 fm	209–562 × 4.6–6.9 (409 × 5.8)	484–521 × 4.6–6.9 (506 × 5.2)

REMARKS

The small points in which this sponge differs from the Northern Hemisphere complex, *Suberites ficus* and *Suberites domuncula*, when the disjunct distribution is taken into account, are sufficient to justify separating the Australasian specimens as a distinct species.

The Australasian specimens have no microscleres, these have been searched for exhaustively; they have few oxeas, these spicules having been found in small numbers in one specimen; they have tylostyles with irregular heads; the sponges are of relatively porous consistency and, as far as can be ascertained, spongin is lacking. With this combination of characters, plus a variable habitat, *S. australiensis* can be excluded from *S. ficus* and *S. domuncula*. The latter two species have been the subject of exhaustive reviews by Vosmaer (1933), Burton (1953), de Laubenfels (1936, 1949a), and Hartman (1958). In comparing *Suberites australiensis* with the *ficus, domuncula* complex, the definitions arrived at by Hartman have been adopted.

It is somewhat questionable whether the specimens from Australia described as *Suberites domuncula* by Lendenfeld belong to *Suberites australiensis*. Lendenfeld's sponges have larger tylostyles than the New Zealand specimens but these spicules appear to have the irregular heads which characterise the megascleres of *S. australiensis*.

Suberites perfectus Ridley and Dendy (pl. 4d)

Suberites perfectus Ridley and Dendy, 1886, p. 485.
Suberites perfectus, Ridley and Dendy, 1887, p. 200, pl. XLI fig. 9, pl. XLV, figs. 3, 3a, 3b.
Suberites perfectus, Brøndsted, 1924, p. 482.

OCCURRENCE

Great Barrier; Whangapoua; Mayor Island (intertidal crevices); Rangitoto Channel, 3–6 fm.

DESCRIPTION

A small globular sponge with oscules elevated on small, thin-walled apical projections and with a slight tendency toward a stipitate habit. In the sublittoral specimens the dermal region of the sponge is infested with commensal amphipods, *Polycheria antarctica*, and the surface becomes lumpy. In this condition it is impossible to differentiate externally between the openings of amphipod burrows and true oscules.

COLOUR: In life, reddish-yellow (rY-R4/8) to dull orange (yY-R6/8) in intertidal specimens; in spirit, dull greenish-yellow (Y7/4).

TEXTURE: Firm and compact, just compressible.

SURFACE: The surface is smooth except where raised into oscular papillae. Under low magnification the surface appears finely hispid and extremely porous. The abundant small pores, 40–70μ in diameter, which occur in groups between the spicule brushes of the dermis give the live sponge a markedly reticulate appearance.

This reticulation is not apparent in fixed specimens where considerable contraction occurs and closes all pores. Oscules are small and circular 0.6–0.9 mm in diameter.

SKELETON: The arrangement of the skeleton is typical for *Suberites*. Pronounced radially disposed fibres are present which contain large tylostyles to subtylostyles in the centre of the sponge and smaller tylostyles subdermally. The fibres terminate in a layer of small dermal tylostyles arranged as a series of dermal brushes. These spicules project obliquely from the sponge surface.

SPICULES:

MEGASCLERES:

TYLOSTYLES of two size groups.

(i) LARGE TYLOSTYLES to subtylostyles. These spicules vary considerably in length and width. They are usually straight,

but rare spicules may be sharply flexed anteriorly.

(ii) SMALL TYLOSTYLES with prominent, rounded heads. These are straight spicules which reach their greatest diameter just behind the middle.

SPICULE DIMENSIONS OF *Suberites perfectus*

Locality and Author	Large Tylostyles	Small Tylostyles
	μ	μ
Ridley and Dendy Type Pt. Jackson, 30–35 fm	1000 × 25 (up to 1200 × 30.0)	280 × 12.6 down to 200 × 7.8
Brøndsted Three Kings, 65 fm	532–1258 × 10.4–22.8 (962 × 18.4)	145–268 × 4.6–8.0 (209 × 5.8)
Rangitoto Channel, 3.5–6 fm	726–1280 × 12.7–20.0 (892 × 16.8)	160–287 × 5.7–8.4 (220 × 6.2)

REMARKS

My specimens compare closely with the holotype in form, spicule dimensions and skeletal structure. The only major difference is the tendency in the New Zealand specimens for the larger megascleres to be subtylostyles not tylostyles.

DISTRIBUTION

Pt. Jackson, 30–35 fm; Three Kings, 65 fm.

Family CLIONIDAE Gray

Genus **Cliona** Grant

Cliona celata Grant (pl. 4c)

RESTRICTED SYNONYMY:

Cliona celata Grant, 1826, p. 78.
Cliona celata, Topsent, 1900, p. 32, pl. I, fig. 5, 6, 9, pl. II, fig. 1.
Cliona celata, Hartman, 1958, p. 16, pl. I, fig. 1–4.
Cliona celata, Bergquist, 1961a, p. 44 (for full synonomy refer Topsent 1900; Hartman 1958).
Cliona celata, Bergquist, 1961b, p. 190, fig. 14a–c.

OCCURRENCE

Narrow Neck Reef; Bon Accord Harbour, Kawau; North Channel, 6 fm; Goat Island Bay; Gt. Barrier, Kaiarara, Whangapoua; Pt. Chevalier Reef; Ladies Bay Reef; Milford Reef; Waiwera; Onetangi; Cape Brett, 40 fm; Waitawa Bay; Islington Bay, 2 fm; Ponui Channel, 3 fm; Cook St., 30 fm; Manukau Harbour, 3–10 fm; Wellington Harbour, 4 fm; Akaroa; Chatham Is; Piha; Anawhata; Karekare; Foveaux St., 20–30 fm. (All intertidal unless otherwise stated).

DESCRIPTION

Cliona celata in New Zealand waters is quite typical of the species as seen in the Northern Hemisphere. It commonly infests shells of *Notovola*, *Glycimeris* and *Ostrea sinuata* in the sublittoral and shells of barnacles, *Pomatoceras* and *Crassostrea* in the intertidal. The sponge occurs very frequently in the intertidal region in the α stage as groups of bright yellow papillae protruding slightly from the excavations made by the sponge. These cylindrical papillae are differentiated into incurrent and excurrent, the latter slightly larger.

DIMENSIONS:

α stage:
Excurrent papillae 2.0–3.2 mm
Incurrent papillae 1.0–2.4 mm
γ stage:
Length up to 90.0 cm
Width up to 50.0 cm
Thickness up to 16.0 cm

COLOUR: The colour varies considerably and is associated with the stage of development and the habitat. In the intertidal region the α stage is always bright clear yellow (Y8/10), in the sublittoral it is usually similar but orange-red (rY-R5/10) colonies occur frequently. The possibility that these colour variants represent two species cannot be excluded until statistical and habitat analyses are applied to the offshore clionid populations. γ colonies from both intertidal and sublittoral are bright orange (Y–R6/10), in spirit, dark brown (Y-R3/4). The tendency for γ New Zealand colonies to be orange rather than yellowish is the only character by which the Northern Hemisphere populations of *Cliona celata* can be differentiated.

TEXTURE: Firm and rather leathery, formed by the growing together of adjacent incurrent and excurrent systems.

SURFACE: The surface is marked in a polygonal pattern formed by the growing together of adjacent incurrent and excurrent systems. A line of darker pigment is formed where adjacent polygonal areas intersect. This appears as a prominent tracery over the whole sponge.

SKELETON: The skeleton is a confused mass of tylostyles which tend to form a compact ectosomal region and a lax, crumbly choanosome which often incorporates much coarse calcareous debris. The ectosomal layer is up to 5.0 mm deep.

SPICULES:

MEGASCLERES:

TYLOSTYLES straight or slightly curved spicules with oval, slightly subterminal heads.

SPICULE DIMENSIONS OF *Cliona celata*

Locality and Author	Tylostyles
	μ
Topsent 1900, France	180.0–360.0 × 3.0–9.0
Hartman 1958 East Haven Conn. YPM 767	213.0–377.0 × 7.0–11.9 (323.0 × 9.1)
Goat Island Bay α stage	260.0–339.0 × 7.2–9.4 (298.0 × 8.1)
Narrow Neck α stage	217.0–350.0 × 5.7–11.5 (294.0 × 8.6)
Gt. Barrier γ stage	200.0–290.0 × 5.7–8.9 (268.0 × 7.6)

REMARKS

Cliona celata is an important and abundant sponge throughout New Zealand particularly in northern waters where it infests 70% of the dead shells of *Glycimeris laticostata*, a common offshore species in the Hauraki Gulf, and 60% of live *Ostrea sinuata* dredged on the Manukau Harbour. The percentage infestation of the Foveaux St. oyster beds is also high.

A notable feature of the New Zealand specimens of *C. celata* is the absence of both oxeas and spirasters from both young and mature colonies. In this respect they resemble the North American populations described by Hartman (1958).

DISTRIBUTION

Arctic; Atlantic coasts of Europe and North America; West Indies; Indian Ocean; Red Sea; Malaya; Australia; New Guinea.

Cliona euryphylla Topsent (pl. 11a, fig. 9)

RESTRICTED SYNONYMY:

Cliona euryphylla Topsent, 1888, p. 82.
Cliona chilensis Thiele 1905, p. 409.
Cliona chilensis, Burton 1940, p. 118, pl. 6, fig. 5.
Cliona euryphylla, de Laubenfels, 1954, p. 218, fig. 149, a–c.

OCCURRENCE

North of Takatu Point, 14 fm.

DESCRIPTION

The sponge is in the α stage of development and was boring in a mass of dead tubes of *Stephopoma rosaeum* and *Balanus* sp. There is a slight degree of lateral spreading of the sponge tissue from the excavated cavities.

DIMENSIONS: Diameter of excavations 2.0–8.0 mm (4.5 mm).

COLOUR: In life, yellow (Y8/6); in spirit, dark red brown (yR4/2).

TEXTURE: Leathery and tough, compressible.

SURFACE: The surface is granular but smooth, no pores or oscules are apparent.

SKELETON: The skeleton is a confused mass of stout tylostyles with little, if any, tendency to radial disposition in the burrows. Microscleres are extremely abundant and form a definite dermal crust, 0.02 mm deep.

SPICULES:

MEGASCLERES:

TYLOSTYLES, stout spicules with prominent oval to rounded heads. Each spicule has a slightly curved shaft which is thickest two thirds to three quarters of the distance from the head.

MICROSCLERES:

SPIRASTERS, of short squat form with relatively few stout conical rays. More attenuated spirasters do occur but are very rare.

SPICULE DIMENSIONS OF *Cliona euryphylla*

Locality and Author	Tylostyles	Spirasters
	μ	μ
Topsent, East Pacific	300.0 × 4.0	35.0 × 5.0
Thiele *C. chilensis* Chile	300.0–330.0 × 17.0	18.0
De Laubenfels Ponapé	300.0 × 7.0	? × 4.0–8.0 Shaft
North of Takatu Pt., 14 fm	290–392.0 × 9.5–17.5 (344.0 × 12.5)	17.0–28.0 × 5.0–9.2 shaft (24.0 × 6.3) diameter including spines, up to 14.0

REMARKS

De Laubenfels (1954) synonymised three species of *Cliona* with *C. euryphylla* Topsent. The result of this synonymy is to leave only a single species of *Cliona* with short thick spirasters bearing a few large spines.

The specimen from New Zealand compares well with published descriptions of *C. euryphylla*, it must be stated however that these descriptions are singularly lacking in detail.

It is not possible at present to agree or disagree with de Laubenfels's synonymy; it is probable that *Cliona chiliensis* Thiele is a distinct species, but both type specimens and additional material are necessary to confirm this opinion. This is the first record of *C. euryphylla* from the New Zealand region.

DISTRIBUTION

East and west Pacific; Chile; Argentine; tropical Atlantic; Gulf of Guinea.

Order **EPIPOLASIDA** Sollas

Family JASPIDAE de Laubenfels

Genus **Lamellomorpha** nov. gen.

This genus is established for a species of Jaspidae with an irregular, stalked or lamellate form. The megascleres are huge contort strongyles, oxeas and strongyloxeas. The microscleres are faintly spined microstrongyles and small plesiasters. The microstrongyles are abundant as a dermal layer and throughout the endosomal tissues. The architecture of the sponge is confused and there is no special cortical region.

Another sponge which should be included in this genus is *Coppatias baculifer*, Kirkpatrick from South Africa. De Laubenfels (unpublished index) was undecided as to a genus for this sponge and considered it possibly unrecognisable. Wilson (1925) considered that *C. baculifer* should not be placed in *Jaspis*, but should be the type of a new genus. Burton and Rao (1932) were also uncertain as to the affinities of *C. baculifer*, but chose to leave it in *Jaspis*. It is similar to *Lamellomorpha strongylata* from New Zealand in possession of microstrongyles as microscleres, but apparently lacks streptasters.

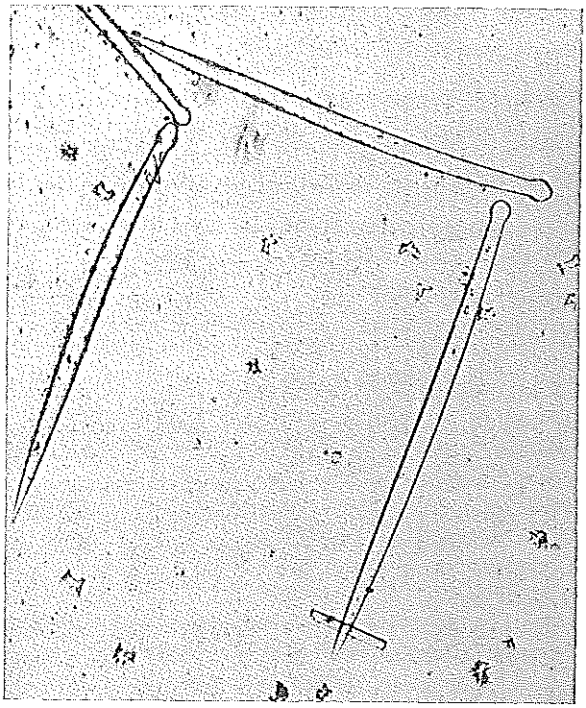


FIG. 9: *Cliona euryphylla* Topsent
Tylostyles and spirasters.

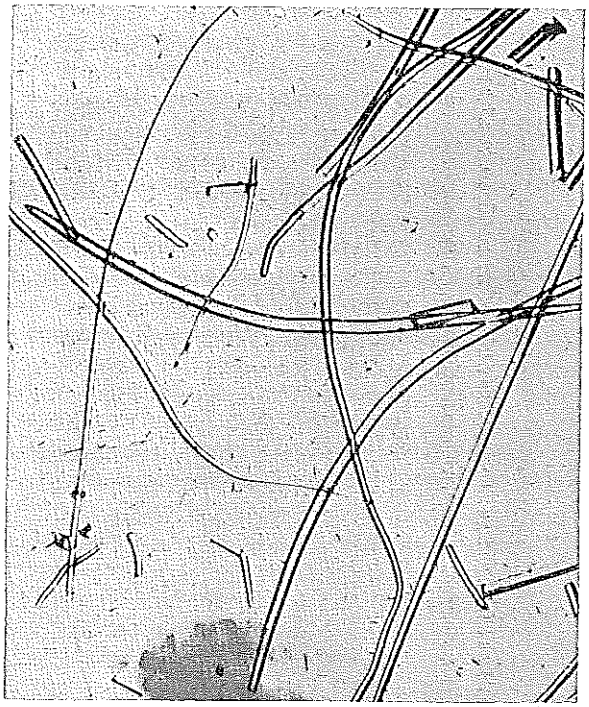


FIG. 10: *Lamellomorpha strongylata* nov. sp.
Contort strongyles and oxeas.

Lamellomorpha is comparable in microsclere content to *Triptolemus** Sollas (Pachastrellidae), particularly to *Triptolemus simplex* Sarà (1959).

Lamellomorpha strongylata nov. sp. (pl. 4a, 11e, f; fig. 10)

OCCURRENCE

Three Kings, 30–60 fm (Holotype), Sta. B 93; Campbell Plateau, 46 fm, B 176; 103 fm, B 184.

HOLOTYPE

Deposited in the New Zealand Oceanographic Institute, Wellington: Type Reg. No. 33.

DESCRIPTION

A massive, thick, sometimes folded and incurved lamellate sponge supported by a stout stalk.

DIMENSIONS:

Lamellomorpha strongylata

Locality	Height	Width of Lamella	Diameter of Stalk	Diameter of Lamella	Dermal Membrane	Oscules
	cm	cm	cm	cm	mm	mm
Three Kings, 30–60 fm Holotype	13.0	10.2	3.0	1.8–2.2	0.5	1.0–2.6
Campbell Plateau 46 fm	16.0	8.9	Broken	3.2–5.8	0.4	Not apparent

COLOUR: In life, bright green (G-Y6/6); in spirit, blue green (G-Y-G7/2), or yellowish-green (YG-Y6/4).

TEXTURE: Firm, but compressible, crisp and easily broken.

SURFACE: Smooth where the dermal membrane is intact, otherwise ragged due to the projecting clumps of oxeas and strongyles. Oscules are on the convex surface of the lamella and lie flush with the surface.

SKELETON: The endosomal skeleton is lax and confused. Only slight traces of a radiate construction are discernable. In the subdermal region, on each surface of the sponge, tracts of megascleres curve outward and intersect the surface at an acute angle. These tracts are variable in thickness and are absent from a large portion of the sponge. A distinct skin-like dermal membrane is present and is densely packed with microstrongyles. These microscleres and the plesiasters occur abundantly throughout the sponge.

SPICULES:

MEGASCLERES:

STRONGYLES, OXEAS and STRONGYLOXEAS. All of similar range in length and width varying only in relative frequency in the two specimens. The Three Kings specimen has predominantly, markedly contort strongyles or strongyloxeas, and true oxeas are rare. The subantarctic specimen has predominantly oxeas. Some of these are curved, but most are contort.

MICROSCLERES:

(a) MICROSTRONGYLES, squat, evenly rounded spicules, slightly roughened and occasionally centrotylote.

(b) PLESIASTERS. These are small spicules with three to 12 smooth, sharply pointed rays.

* This name was preoccupied 1885 by Peckham for an Arachnid.

SPICULE DIMENSIONS OF *Lamellomorpha strongylata*

Locality	Megascleres	Microstrongyles	Plesiasters
	μ	μ	μ
Three Kings, 30–60 fm Holotype.	1000–2808 × 14.0–33.0 (1980 × 26.0)	23–28 × 2.3–3.6 (24.8 × 2.9)	8.0–11.0 (9.8)
Campbell Plateau, 46 fm	1161–1937 × 17.0–28.0 (1482 × 23.0)	24–30 × 2.3–4.3 (27 × 3.2)	8.0–11.0 (9.6)

REMARKS

L. strongylata would be a typical *Jaspis* were it not for the completely different microsclere content of microstrongyles and streptasters. The confused rather than radiate architecture, in conjunction with contort megascleres, is reminiscent of *J. serpentina* Wilson, but again the microscleres are quite distinct.

I have stated earlier that *Jaspis* (*Coppatias*) *baculifer* Kirkpatrick should be transferred to this genus. It has microstrongyles for microscleres and these are usually centrotylote. The microstrongyles in *J. baculifer* probably reflect derivation from an asterose microsclere by loss of rays. *L. strongylata* has diverged further from the jaspid condition since only occasional microstrongyles are centrotylote and streptasters are present in abundance.

Genus **Asteropus** Sollas

Asteropus simplex (Carter) (pl. 4b, 11d)

Stellettinopsis simplex Carter, 1879, p. 349, pl. XXVIII, fig. 16–18.
Asteropus simplex, Sollas, 1888.
Asteropus haeckeli Dendy, 1905, p. 109, pl. V, fig. 3.
Asteropus simplex, Hentschel, 1909, p. 369.
Asteropus simplex, Dendy, 1916, p. 251, pl. 46, fig. 6.
Asteropus simplex, Dendy, 1924, p. 306.
Asteropus simplex, Dendy and Fredrick, 1924, p. 494.
Asteropus simplex, Wilson, 1925, p. 327, pl. 38, fig. 4.
Stellettinopsis simplex, de Laubenfels, 1936, p. 160.

OCCURRENCE

Three Kings, 30–60 fm, Sta. B 93.

DESCRIPTION

A single, massive specimen of this sponge was obtained. It is conical in shape, flat dorsally and completely invested to a thickness of 1.2–1.6 mm by *Desmacella dendyi*.

DIMENSIONS: Height 11.5 cm; width, apically 7.5 cm; basally 5.0 cm; thickness 6.0 cm.

COLOUR: In life, light yellow (rY8/6); in spirit, straw colour (rY7/4).

TEXTURE: Firm, just compressible.

SURFACE: The surface of the sponge is completely obscured by the investing *Desmacella*. Large oxeas project from the *Asteropus* and penetrate the *Desmacella*, rendering the surface extremely rough to the touch. No pores or oscules are apparent.

SKELETON: The skeleton is a confused reticulation of stout oxeas with no regional differentiation. The lack of dermal or ectosomal differentiation is the only notable feature in which this specimen differs from those described by Dendy (1916, 1924), this is undoubtedly correlated with the presence of a complete external coat of *Desmacella*. Microscleres are abundant throughout the sponge.

SPICULES:

MEGASCLERES;

OXEAS, large, stout, evenly tapered and slightly curved spicules.

MICROSCLERES:

(a) OXYASTERS, with eight to 20 long pointed, smooth or slightly roughened rays. In some cases a distinct centrum is developed, in the majority the centrum is small.

(b) SANIDASTERS, with short strongylote rays and almost straight axis. These spicules are bifurcate to trifurcate at each end and have the rays either arranged in two distinct whorls or irregularly placed along the shaft.

SPICULE DIMENSIONS OF *Asteropus simplex*

Locality	Oxeas	Oxyasters	Sanidasters
	μ	μ	μ
Dendy, 1916 Indian Ocean	2100 × 65.0	50.0	20.0
Dendy, 1924 North Cape	2500 × 68.0	40.0	20.0
Three Kings, 30–60 fm	2016–2915 × 57.0–81.0 (2490 × 72.0)	25.0–58.0 (39.6)	13.9–22.0 (16.8)

REMARKS

Stellettinopsis simplex Carter was made the type of a new genus, *Asteropus*, by Sollas (1888) in order to distinguish it from *Stellettinopsis corticata* Carter in which triaenes had been found. *S. corticata* has been designated type of the genus *Stellettinopsis* by de Laubenfels 1936, and this genus probably falls into synonymy with *Ecionemia* Bowerbank.

De Laubenfels (1954 p. 223) expresses the opinion that *S. simplex* and *S. corticata* are conspecific. In view of Sollas's redescription of *S. corticata* and the redescriptions many authors have given of *S. simplex* this is unlikely.

A problem of generic definition arises in the case of *Asteropus*. The species at present in the genus fall into two distinct groups according to the types of microscleres they contain. The first, in which genuine sanidasters are present, includes the type of *Asteropus*, *A. simplex*, also *A. ketostea* (de Laubenfels) and *A. kaena* (de Laubenfels). The second group has diactinal microscleres varying from *Ecionemia*-like rhabds to substantial microxeas and includes *Asteropus sarasinorum* (Thiele) and *A. cherbonnieri* (Levi). It can be argued that two genera are represented here, in which case *Melophus* Thiele would be the correct name for the latter group. This situation is exactly parallel to that of *Ancorina* Schmidt and *Ecionemia* Bowerbank. Throughout his writings Dendy expressed uncertainty as to the synonomy

of the latter genera but, by 1924, influenced by the work of Topsent, he decided that the transition from a sanidaster to a microrhabd could be made within a single sponge and that a distinction between these microsclere types was not grounds for generic separation. This view is upheld and the treatment of *Asteropus* advocated here is merely consistent with it.

DISTRIBUTION

West Australia; Victoria; Gulf of Manaar; Indian Ocean; Philippines; Haiti (?); North Cape, 70 fm.

Genus **Jaspis** Gray

*Jaspis novae-zealandiae Dendy

Jaspis novae-zealandiae Dendy, 1924, p. 305, pl. VII, fig. 20–23.
Jaspis novae-zealandiae, Burton, 1929a, p. 415.
Dorypleres novae-zealandiae, de Laubenfels, 1954, p. 228.

REMARKS

Burton and Rao (1932), eonsidered that many species of *Jaspis* were in fact lipotriaenose specimens of *Stelletta*. A further extension of this argument was their proposal that *Penares*, *Pachamphilla*, *Jaspis*, and *Spongosorites* merely represent stages in the reduction of spiculation and all four genera were thus relegated to *Jaspis*. De Laubenfels (1936) has categorically rejected Burton's hypothesis and recognises all the above genera.

There are two facets to Burton's argument. One deals with the identity of *Jaspis dendyi*, the type of *Dorypleres* Sollas, with a complex of *Stelletta* species, termed by Burton *Stelletta maxima* Thiele. The second, and more controversial, concerns the treatment of most described species of *Jaspis* and *Coppatias* as reduced Stellettids and the extension of this reasoning to include *Penares*, *Pachamphilla* and *Spongosorites* within *Jaspis*, which is then redefined.

Burton's proposal that *Stelletta columna* Dendy is a synonym of *Stelletta maxima* Thiele is accepted, and certainly the similarity of the large microscleres of these sponges and those of *Jaspis* (*Dorypleres*) *dendyi* is impressive. Points in which *S. maxima* and *Jaspis dendyi* differ are the absence of triaenes and lack of small asters in *Jaspis dendyi* in addition to entirely different form and surface characteristics. The difference in size of the oxeas of *S. columna* Dendy and *Jaspis dendyi* is considerable, invoking *S. brevis* Hentschel to bridge this gap is unconvincing. It is conceivable but by no means certain that *Jaspis dendyi* is a reduced *Stelletta*; it is much less certain that it can be identified with *Stelletta maxima* Thiele.

A point of interest raised by Topsent (1904) and by Burton and Rao (1932), and relevant to de Laubenfels's (1954) use of *Dorypleres*, is that two categories of asters are not recognisable in sponges assigned to *Jaspis dendyi*. It is thus clear that *Dorypleres* cannot be re-used as de Laubenfels suggests for Jaspids which have two categories of asters.

* *Dorypleres splendens*, de Laubenfels (1954), does not possess two categories of asters as indicated in the type description.

When de Laubenfels published his classification of Porifera (1936), and recognised the Epipolasida as a separate order, he stressed that sponges classified there, particularly in the Jaspidae and Sollasellidae, may eventually prove to be of polyphyletic derivation. At the same time he pointed out that there is no way of being certain whether the species in question are reduced Hadromerida, reduced Choristida, or merely primitive types which never had either triaenes or tylostyles. If genera and species are to be removed from the Epipolasida and transferred to other groups each case must be evaluated independently. Dendy (1916a) discussed the relationship of the Epipolasid sponges *Rhabdastrella distincta* Thiele, *Aurora cribriporosa* Dendy, and *Diastra sterrastrea* Row to various species of *Aurora* and in this case the evidence is irrefutable. By no means the same case has been made by Burton for synonymising *Penares*, *Pachamphilla* and *Spongosorites* with *Jaspis*.

Jaspis novae-zealandiae is considered by Burton to be a reduced *Stelletta* and in spiculation, particularly in form and size of the main megascleres, this sponge does resemble *Stelletta*. The type description of the sponge makes no reference to the presence of cortical microxea, Burton and Rao (1932) stated that "scattered cortical oxeas set at right angles to the surface are present". A series of spicule mounts of the holotype (B.M. 1923.10.1.32) have been examined and large numbers of small oxeas 50.0–150.0μ long are present, in addition oxeas of about 500.0–700.0μ are common, the latter are clearly small megascleres, the former may be cortical or even foreign, and only examination of the entire type specimen can resolve this issue. If the small oxeas are proper then much of the resemblance *J. novae-zealandiae* has to *Stelletta* disappears. In characters other than spiculation, for example, lack of a defined cortex, plate-like lamellate form, separable dermal membrane, *J. novae-zealandiae* is not typical of the Stellettidae.

DISTRIBUTION

Cape Maria van Diemen, 35–40 fm; Spirits Bay, 11–20 fm; McMurdo Sound, 140 fm.

Family SOLLASELLIDAE Lendenfeld

Genus **Epipolasis** de Laubenfels

Epipolasis novae-zealandiae (Dendy) (pl. 5c; fig 11)

Spongosorites novae-zealandiae Dendy, 1924, p. 307.
Epipolasis novae-zealandiae, de Laubenfels, 1936, p. 162.

OCCURRENCE

Three Kings, 30–60 fm, Sta. B 93.

DESCRIPTION

A massive, shallow, cup-shaped sponge supported by a stout pillar-like stalk. One almost whole specimen of this sponge has been collected and several fragments

obviously belong to another specimen. The latter appears to have been columnar with a very slightly concave, expanded upper surface.

This sponge is radically distinct in habit from that described as *Spongosorites novae-zealandiae* by Dendy (1924). The correct allocation of these specimens has proved difficult owing to this discrepancy since, in collections from the same locality (very close to the type locality for *S. novae-zealandiae*), there is a sponge which corresponds precisely in form with Dendy's description, being rolled or cylindrical with a smooth surface, internally transversed by two large parallel canals and several smaller canals which open terminally on the (presumably) upper surface of the sponge. In this sponge the spicules are oxeas but they have a uniform size range which does not correspond to any of the three categories of spicules in *S. novae-zealandiae*. To consider these specimens as two developmental levels of the same species would require postulating enormous variability in spicule complement and habit. Consequently this remarkable correspondence in form is interpreted as a parallel development and the tubular sponge is treated as a member of that section of *Spongosorites* which is part of the Axinellidae.

DIMENSIONS:

Epipolasis novae-zealandiae

Locality	Height	Width of Cup	Thickness of Cup	Diameter of Stalk	Height of Cup
	cm	cm	cm	cm	cm
Three Kings, 30–60 fm	10.0, 15.0	8.0, 10.0	2.5, 2.0	?, 7.0	3.5, 7.0

COLOUR: In life and in spirit, white externally, pale pinkish white (Y-R7/4), in the centre of the stalk and the lamella where a little spongin occurs.

TEXTURE: Hard and incompressible, extremely brittle.

SURFACE: The surface is extremely hispid and appears felt-like. No pores or oscles are visible nor is any dermal membrane apparent. On the inner surface of the cup and vertically along the column occasional subdermal channels are visible, these are 1.5–3.0 mm in diameter and not easily observed owing to the dense felt-work of projecting dermal oxeas.

SKELETON: The structure of the skeleton is weakly radiate with the large oxeas densely packed in the centre of the stalk and of the cup, and bound by traces of spongin. On either side spicules pass out obliquely toward and beyond the surface. The number of spicules is so great and they are so tightly packed that no regular arrangement or division into zones is discernable. Small oxeas, as well as occuring abundantly throughout the sponge, are aligned radially below the surface and show some semblance of forming a cortical layer. From a macroscopic view this layer is completely disrupted by the huge structural oxeas, but is in some places accentuated by the presence of long subcortical channels into which the inhalant pores drain.

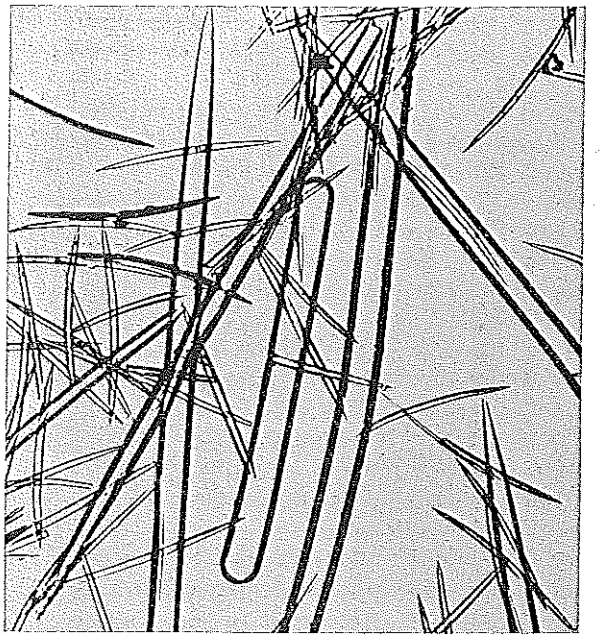


FIG. 11: *Epipolasis novae-zealandiae* (Dendy) Strongyle and oxeas.

SPICULES:

MEGASCLERES:

(a) OXEAS

(i) Extremely stout, often curved, biangulate or contort oxeas with a tendency to become strongylote or occasionally stylote.

(ii) Long fine, straight or somewhat sinuous oxeas. These spicules are not abundant

(iii) Small, slender, straight or evenly curved oxeas of variable length.

(b) STRONGYLES. Rare, short, stout spicules. These are obviously variants of the structural oxeas with which they correspond in width.

SPICULE DIMENSIONS OF *Epipolasis novae-zealandiae*

Locality and Author	Oxeas Large	Oxeas Long fine	Oxeas Accessory	Strongyles
	μ	μ	μ	
Dendy Type North Cape, 70 fm	Up to 1600 × 48	1900 × 10.0	240 × 10.0	—
Three Kings, 30–60 fm Spec. 1	1087–1560 34.0 (1322 × 42.0)	1400–2100 × 8.0–10.0 (1764 × 9.6)	174–391 × 5.8–12.2 (268 × 7.4)	314–914 × 34–40 (2 spicules)
Three Kings, 30–60 fm Spec. 2	972–1680 × 36.0–50.0 (1482 × 47.0)	1310–1925 × 8.0–10.0 (1689 × 9.4)	152–428 × 5.8–12.0 (297 × 7.8)	278–810 × 34.0–46.0 (8 spicules)

REMARKS

Dendy's slides of *S. novae-zealandiae* and a small portion of the holotype have been available for examination and in construction of the skeleton and spiculation the present specimens are identical to the holotype.

De Laubenfels (1936) erected the genus *Epipolasis* for those species of *Spongosorites* Topsent which were clearly epipolasid in construction and spiculation. *Spongosorites novae-zealandiae* definitely falls into this group and is very close indeed to *Epipolasis* (*Spongosorites*) *suluensis* Wilson which was nominated type of the genus *Epipolasis*. The type species of *Spongosorites*, *S. placenta*, has been considered a *Jaspis* by Burton and Rao (1932). De Laubenfels placed *Spongosorites* (sensu stricto) in the Axinellidae, where certainly most species that do not belong in *Epipolasis* should be placed. The exception is *S. placenta*, the affinities of which are difficult to determine. In the event of this species being redescribed and demonstrated to be epipolasid then a new generic name will be required for those axinellid species now in *Spongosorites* (*S. lamellata* Dendy, *S. lapidiformis* Dendy, *Spongosorites porites* de Laubenfels and *Spongosorites hentscheli* Levi).

Burton and Rao's (1932) brief revision of *Spongosorites* can be almost disregarded, it is incomplete and the claims are undocumented. According to this revision *Spongosorites placenta* is a *Jaspis*, this goes beyond Topsent's suggestion that it belongs to the Jaspidae and no evidence is produced to support this synonymy. In the same paper *Spongosorites suluensis* is also referred to *Jaspis*, there is no support to be gained for this contention either from Wilson's type description or from a restudy of the type specimen (USNM 21297). It is possible to allow that genera are related without considering them to be identical. *Spongosorites novae-zealandiae* is not considered by Burton and Rao.

De Laubenfels (1949b) described *Spongosorites porites* and stated that it was close to *S. placenta*; examination of the former (USNM 22732) has not confirmed this, it seems closest to the Axinellids and it does not have the dense skeleton and lamellate form of *S. placenta*.

Levi (1956d) described *Spongosorites hentscheli*, which seems close to *S. porites* and *Topsentia indica* Hentschel but, again on the basis of published descriptions, is not clearly generically identifiable with *S. placenta* Topsent. In the same publication Levi proposes conserving *Epipolasis* for *E. suluensis* Wilson, and emphasises the presence of trichodragmata in this sponge. These spicules are extremely rare in *E. suluensis* and their presence or absence in many sponges is known to vary. It is impractical to thus restrict *Epipolasis* which clearly also receives *E. novae-zealandiae* Dendy and *E. salomonensis* Dendy.

The confusion surrounding this group of sponges is so great that only a re-examination and redescription of the specimens involved can clarify the situation. This work has been begun and will be published separately, indications are that the axinellid species of *Spongosorites* (sensu lato) are most closely related to the Heteroxyae.

DISTRIBUTION

East of North Cape, 70 fm.

Family TETHYIDAE Gray

Genus **Tethya** Lamarck

Tethya aurantium (Pallas) (pl. 5a, 13a, b, d)

RESTRICTED SYNONYMY

Alcyonium aurantium Pallas, 1766, p. 210.
Tethya aurantium, Topsent, 1900, p. 294. (For synonymy see Lendenfeld, 1896, Topsent, 1900, 1918, Burton, 1924).
Donatia lyncurium, Burton, 1924, p. 1036.
Donatia japonica, Brøndsted, 1924, p. 444.
Tethya fissurata, Powell, 1947, p. 4.
Tethya compacta Bergquist, 1961b, p. 193, fig. 15.

OCCURRENCE

Spirits Bay; North Cape; Russell; Whangaroa; Ahipara; Poor Knights; Hen Island; Bream Head; Whangarei Harbour; Bethell's Beach; Piha; Anawhata; Karekare; Stanmore Bay; Tyndalls Beach; Great Barrier; North Channel; Burgess Bay; Onetangi; Rangitoto; Motutapu; Ponui Island; Noises Island; Takatu Point; Cape Colville; Amodeo Bay; Mt. Maunganui; Mayor Island; Mahia; Cape Palliser; Cook Strait; Kaikoura; Queen Charlotte Sound; Punakaiki; Stewart Island; Diamond Harbour; Portobello; Chatham Rise, 220 fm.

DESCRIPTION

A globular to slightly depressed sponge with basal rooting processes. This sponge is extremely common in New Zealand at low tide levels on coasts of all degrees of exposure.

DIMENSIONS: The dimensions of the sponge are extremely variable, the smallest specimens found were 1.2 mm in diameter, the largest 6.8 cm in diameter.

COLOUR: In life, bright golden orange externally (Y-R6/8) to (yY-R6/8), dull orange yellow internally, (Y-R-Y7/8) to (Y-R-Y6/8). In spirit, pale yellowish white.

TEXTURE: Firm, just compressible.

SURFACE: The surface is mamillate, often with a polygonal pattern. Oscules when visible tend to be apical, small 0.1–0.8 mm in grooves between the surface elevations. In some habitats, usually more exposed situations on the east coast (e.g., Great Barrier, Goat Island Bay, Poor Knights), *T. aurantium* often has a surface encrustation of Polyzoans and small red algae which completely invest the sponge.

SKELETON: The skeleton is strongly radiate, composed of stout fascicles of strongyloxeas which run from the centre to the surface. A distinct cortex is differentiated. It is 1060.0–1850.0 μ deep and contains abundant spherasters and tylasters as well as the expanding dermal brushes of strongyloxeas. The microasters are organised into a dense dermal layer 20–50 μ deep. Apart from the dermal layer the distribution of microscleres in the cortex tends to be in the form of triangular tracts with base outermost. Both microsclere types are abundant in the endosomal regions.

There appear to be no strongyloxeas outside the fibres.

SPICULES:

MEGASCLERES:

STRONGYLOXEAS, of considerable range in length and width, always attaining their greatest diameter around the middle. The mode of termination is variable, ranging from pointed at one end and broadly rounded at the other, to a condition where both ends are abruptly narrowed and rounded.

MICROSCLERES:

(a) SPHERASTERS, of considerable size range, but of typical form with 16–24 broadly conical, sharp pointed rays.

(b) TYLASTERS, with 12–16 short, rather truncate rays, often terminally tylote, always terminally roughened.

SPICULE DIMENSIONS OF *Tethya aurantium*

Locality	Strongyloxeas	Spherasters	Tylasters
	μ	μ	μ
Rangitoto I.	700–1970 ×	40.0–75.0	8.0–14.0
Auckland	8.0–27.0 (1152 × 16.0)	(58.0)	(11.2)
Poor Knights Is	556–1690 × 11.0–34.0 (1174 × 23.2)	42.0–82.0 (69.0)	9.8–12.9 (11.5)
Dunedin Harbour	493–1406 × 9.2–23.0 (1150 × 14.8)	17.0–50.0 (40.0)	10.6–18.0 (14.1)
Cook Strait	701–1699 × (1186 × 15.0)	38.0–67.0 54.0	5.8–13.9 10.2

REMARKS

My initial identification of this species as *T. aurantium* has been confirmed by an identification made in manuscript notes by Dr. Burton of the British Museum. *Tethya* has been a difficult genus in which to recognise specific differences and Burton's revision (1924) makes a notable contribution toward restoring order to this genus. Subsequent work has, however, pointed the need for a more thorough revision broadly based and paying critical attention to the characters of the cortex.

For many years the common intertidal *Tethya* in New Zealand has been known as *T. fissurata* Lendenfeld. This species is most distinct, with a stipitate habit, tesselated microscleres and size differentiated spherasters. Lendenfeld (1888) has recorded *T. fissurata* from New Zealand, but Hallmann (1914) shows that Lendenfeld carelessly identified most specimens of this sponge; this record is consequently very dubious.

I have examined Brøndsted's specimens from the Copenhagen Museum and all except a North Cape specimen, which is close to *T. ingalli*, belong to *T. aurantium*.

Tethya compacta Bergquist is a synonym of *T. aurantium*, the single specimen upon which the former was based was probably a dried and contracted sponge which had been included by accident with the spirit specimens from the same locality.

DISTRIBUTION

Atlantic Coast of Europe; Africa; North and South America; Mediterranean; New Zealand.

Tethya ingalli Bowerbank (pl. 5b, 13c, e)

RESTRICTED SYNONYMY:

Tethea ingalli Bowerbank, 1858, p. 307.
Tethea ingalli, Bowerbank 1872, p. 119, pl. V, fig. 11–17.
Tethya ingalli, Sollas, 1888, p. 431, pl. XLIV, fig. 15, 16.
Donatia ingalli, Hentschel, 1909, p. 371.
Donatia ingalli, Hentschel 1912, p. 316.
Donatia diploderma, (pars) Burton, 1924, p. 1039.
Tethya diploderma, Levi, 1956d, p. 8, fig. 4, 1–3.
Tethya ingalli, (pars) Burton, 1956, p. 120.
Tethya multistella, Bergquist, 1961b, p. 193, fig. 16, a,b.

OCCURRENCE

East of North Cape, 55 fm; Spirits Bay; Cape Brett, 35 fm; Ahipara; Tyndalls Beach; Stanmore Bay; Little Barrier, 20 fm; Goat Island Bay; North Channel, 6 fm; Burgess Bay, Kawau, 2 fm; Narrow Neck; Piha; Mayor Island; Menzies Bay, 60 fm; Dunedin Harbour, 10 fm; Stewart Island; Chatham Rise, 220 fm. (Intertidal unless otherwise stated.)

DESCRIPTION

A globular sponge with markedly mamillate to tuberculate surface and occasionally with rooting processes.

DIMENSIONS: As in the case of *T. aurantium*, the dimensions are exceedingly variable. The specimens collected range from 1.2 mm–10.0 cm in diameter.

COLOUR: The colour in life is most distinctive. Externally, a deep rose pink (R5/6), internally, white to dull yellow (rY7/4). In spirit pinkish purple (R4/4 to pR5/6) externally, white internally.

TEXTURE: Firm, but compressible.

SURFACE: The surface is coarsely mamillate to tuberculate, with small pores distributed between all tubercles and oscules usually situated between the apical tubercles. Oscules are small, 0.6–1.2 mm in diameter.

SKELETON: The skeleton is radiate, made up of stout fascicles of strongyloxeas running from the centre to the periphery and expanding into brushes in the subdermal region. The cortical region is extremely well defined, 1.5–2.0 mm deep and divisible into two layers. A superficial layer 0.4–0.6 mm deep is present in which numerous strongyloxeas are aligned at right angles to the surface and bounded by a dense dermal layer of tylasters. Internal to this is a uniform layer of dense homogeneous, fleshy tissue containing tracts of spherasters and abundant tylasters. The cortical structure is closely comparable to that figured by Sollas (1888). All microscleres are abundant in the endosome.

SPICULES:

MEGASCLERES:

STRONGYLOXEAS of considerable range in length and width, often the finer, short strongyloxeas are those from the superficial region of the cortex, but this distribution is not always found, small spicules invariably occur in the endosomal fibres. The megascleres are often narrowed at the stylote end and tapered in stepwise fashion toward the oxeote end. As is typically the case in species of this genus, all types of terminations occur in the strongyloxeas.

MICROSCLERES:

(a) SPHERASTERS, of typical form with 16–20 evenly tapered, sharp rays. These spicules are abundant in all parts of the sponge.

(b) TYLASTERS, with four to 12 stout, long or short, tylote, terminally spined rays. These spicules are very abundant in the dermal region and throughout the endosome, but are sparse in the inner layers of the cortex.

(c) CHOANOSOMAL OXYASTERS, with four to 10 thin, pointed, often irregular and branched rays, which may be smooth, slightly roughened or even faintly tylote and roughened. These spicules are rare in some specimens but are relatively abundant in others.

SPICULE DIMENSIONS OF *Tethya ingalli*

Locality	Strongyloxeas	Spherasters	Tylasters	Oxyasters
	μ	μ	μ	μ
North Cape, 50 fm	1060–3248 × 11.5–46.0 (2210 × 32.0)	40.0–75.0 (53.0)	9.0–13.0 (11.8)	30.0–46.0 (40.0)
Goat I. Bay	1089–1700 × 10.2–26.0 (1462 × 20.0)	34.0–56.0 (44.0)	10.0–17.0 (13.9)	20.0–28.0 (25.0)
North Channel, 6 fm	260–1760 × 5.7–27.0 (1102 × 16.0)	17.0–52.0 (40.0)	10.0–17.0 (12.9)	17.0–30.0 (22.8)
Menzies Bay, 60 fm	800–1400 × 11.5–22.0 (1120 × 17.0)	30.0–52.0 (43.0)	11.0–16.8 (13.0)	12.0–30.0 (20.2)

REMARKS

This sponge in New Zealand waters is well characterised by its pink colouration. There is no gradation in colour between *T. ingalli* and *T. aurantium*. The two species are clearly distinguishable when they occur in the same locality.

Dendy (1916a) in his discussion of *Tethya ingalli* noted that the Australian specimens referred by Sollas and Hentschel to this species were probably a distinct species close to *Tethya seychellensis* but differing in the lack of cortical lacunae. The type of *Tethya ingalli* is from West Australia and seems to differ from other Australasian specimens referred to this species in having a cortex densely packed with spherasters. Burton (1924, 1948, 1956) has cast doubt upon the stability of cortical structure in *Tethya*, claiming that the extrusion of microscleres occurs under certain conditions. No critical work has yet been done which would enable a decision to be made upon the usefulness of cortical structure in distinguishing between the species of *Tethya*.

Until such time as critical observations are completed these Australasian specimens are best referred to *T. ingalli*. Burton (1956) adopts a very broad synonomy, including *T. seychellensis* Wright and *T. diploderma* Schmidt under *T. ingalli*, that is, all oxyaster-containing species of *Tethya* except *T. actinia* de Laubenfels. The Pacific specimens of *T. actinia* are certainly distinct from those from the type locality, Bermuda, and may belong to the Australasian and Pacific complex here included in *T. ingalli*. Until the types of *T. diploderma*, *T. seychellensis* and *T. ingalli* are redescribed (if extant) then synonymy such as Burton suggests is merely confusing.

Tethya ingalli has been recorded from New Zealand by Burton (1924) but no locality details were given.

DISTRIBUTION

West Australia; South Australia; Indian Ocean; Madagascar; West Central Pacific; Malaya; New Zealand.

*Tethya robusta Bowerbank

RESTRICTED SYNONYMY:

Tethea robusta, Bowerbank, 1858, p. 287.
Tethea robusta, Bowerbank, 1873, p. 10.
Donatia robusta, Burton 1924, p. 1037; ibid. for synonomy.

REMARKS

This species was recorded from an unspecified New Zealand locality by Burton (1924).

DISTRIBUTION

Australia, New Zealand; Indian Ocean; Red Sea.

*Tethya deformis Thiele

RESTRICTED SYNONYMY:

Tethya deformis, Thiele, 1898, p. 29.
Donatia lyncurium var. *australis*, Kirk, 1911, p. 574, fig. 1, 1–5.
Donatia deformis, Burton, 1924, p. 1036, for synonymy see Burton, 1924.

REMARKS

This species was recorded from an unspecified New Zealand locality by Burton (1924), and from the Kermadecs by Kirk (1911).

DISTRIBUTION

Japan; Christmas Island; New Zealand; Tasmania; South-east Australia; west coast of North America; Raoul Island.

Order **CHORISTIDA** Sollas

Family ANCORINIDAE Gray

Subfamily ANCORININAE De Laubenfels

Genus **Ancorina** Schmidt

Ancorina alata Dendy (pls. 5d, 6a, 13f, g; fig. 12)

Ancorina alata Dendy, 1924, p. 298, pl. V, fig. 1 and 2; pl. VIII, fig. 1–7.
Ancorina osculifera Dendy, 1924, p. 300.

OCCURRENCE

Three Kings, 30–60 fm; Takatu Pt., 6 fm; off Little Barrier, 40 fm; Burgess Bay, Kawau, 2 fm; Narrow Neck, low water; Milford Reef, low water; Rangitoto, low water; Cape Colville, low water; Mayor I., 4 fm; Mahia Peninsula, 60 fm; Cook Strait, 50 fm; New Plymouth, 8 fm.

DESCRIPTION

An extremely variable sponge which may be globular, lamellate, irregular or have thick fingerlike projections arising from a massive round base.

DIMENSIONS:

(a) GLOBULAR specimens: 4.5–5.0 cm. high; 5.0–6.8 cm wide.
(b) LAMELLATE TO TRIANGULAR SPECIMENS: 8.0–20.0 cm high; 3.0–5.0 cm wide; up to 90 cm (probably more) long.
(c) MASSIVE IRREGULAR SPECIMENS: up to 10 cm high; 8 cm wide.

COLOUR: In life steel grey to grey, or black grading to white basally. In spirit varies from black, greyish, to white or fawn (yY-R6/4).

TEXTURE: Firm but compressible.

SURFACE: The surface may be perfectly smooth, irregular with mamillate elevations or tuberous projections, roughened or clearly hispid.

Oscules are usually visible and tend to be congregated in reniform areas either apically situated in fingerlike massive specimens, or laterally in globular specimens, they have never been observed in lamellar specimens. The oscules range from 0.5–3 mm (1.8 mm) and have well defined membranes.

SKELETON: The skeleton is perfectly typical of *Ancorina* and is described in detail by Dendy (1924) for both species.

SPICULES:

MEGASCLERES:

(a) PLAGIOTRIAENES with simple, slightly recurved straight clads set at about 100° to the shaft. The clads of these spicules form a distinct dermal layer, their length and width are extremely variable.
(b) ANATRIAENES with variable clads and long fine, often curved, shaft. The clads may be long and pointed and recurved to lie almost parallel with the shaft or they may be short and only slightly recurved. In some cases one clad may be vestigial. All gradations of form can be found in the one specimen. Anatriaenes may be absent altogether from individual specimens.
(c) OXEAS, stout, straight or with central flexure. These spicules make up the bulk of the fibres in all but the dermal regions.
(d) OXEAS, long, fine, straight or wavy. These spicules are the functional equivalent of the anatriaenes, but may also be present in sponges possessing anatriaenes. In these cases both oxeas and anatriaenes lie radially at the surface parallel to the plagiotriaenes.
(e) OXEAS, short, fine. These spicules are straight and occur in a radial dermal layer between and below the clads of the plagiotriaenes.

MICROSCLERES:

(a) MICRORHABDS, these spicules are abundant and variable. They may be fusiform or strongylote, almost smooth, or entirely roughed.
(b) Fine TYLASTERS with four to 10 rays.

SPICULE DIMENSIONS, see p. 40.

REMARKS

The only difference between *Ancorina alata* and *Ancorina osculifera* as described by Dendy is the presence in the latter of fine oxeas replacing the anatriaenes. My observations indicate that this is not a valid distinction, forms with both thin oxeas and anatriaenes are as frequent as those with spicules of one category or the other.

This species is common along the North Island coast and is often found intertidally on the east coast under shaded ledges. When growing intertidally the sponge always assumes rounded massive to lobate form, as compared to the variable form shown by specimens from deeper water.

DISTRIBUTION:

East of North Cape, 70 fm; south-west off Three Kings, 100 fm (*Terra Nova* Sta. 90).

Ancorina acervus (Bowerbank)

RESTRICTED SYNONYMY:

Ecionemia acervus Bowerbank, 1862, p. 1101, pl. XXIII, fig. 1.
Ecionemia acervus, Bowerbank, 1873, p. 322, pl. XXX.
Stelletta bacillifera, Carter, 1887, p. 78, pl. VI, figs. 9–14.
Ancorina novae-zealandiae Dendy, 1924, p. 301, pl. VIII, fig 8–15b.
Ecionemia bacillifera, Burton, 1937, p. 5, pl. 1, fig. 2.
Ecionemia acervus Burton, 1959a, p. 194.
Ancorina acervus, Bergquist, 1965, p. 191, fig. 31, a,b.

REMARKS

Re-examination of the type of *Ancorina novae-zealandiae* Dendy and comparison with specimens of *A. acervus* Bowerbank from the Western Pacific leave no doubt that the two belong to the same species. Dendy listed three features in which *A. novae-zealandiae* was distinct from *A. acervus*; the possession of ortho- rather than plagiotriaenes,

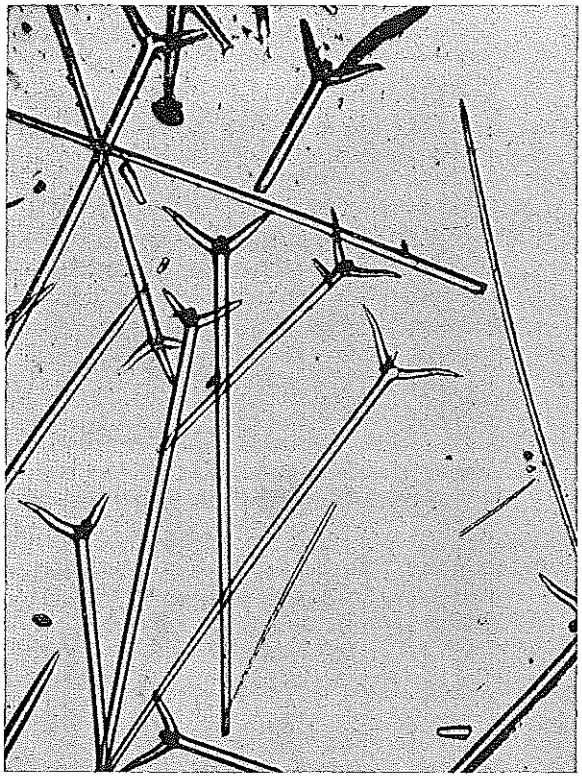


FIG. 12: *Ancorina alata* Dendy
Plagiotriaenes and oxeas.

FIG. 14: *Monosyringia calcifera* nov. sp.
Dichodiaenes.

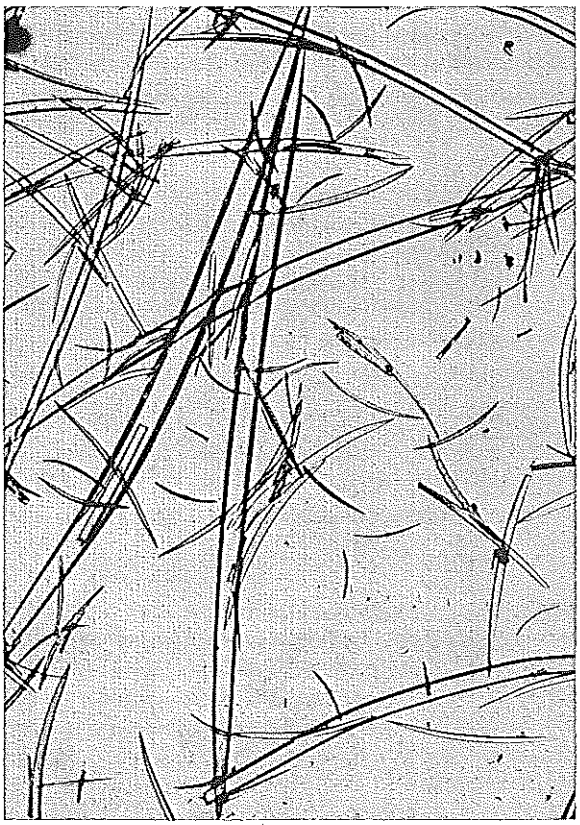


FIG. 13: *Penares tylotaster* Dendy
Oxeas.

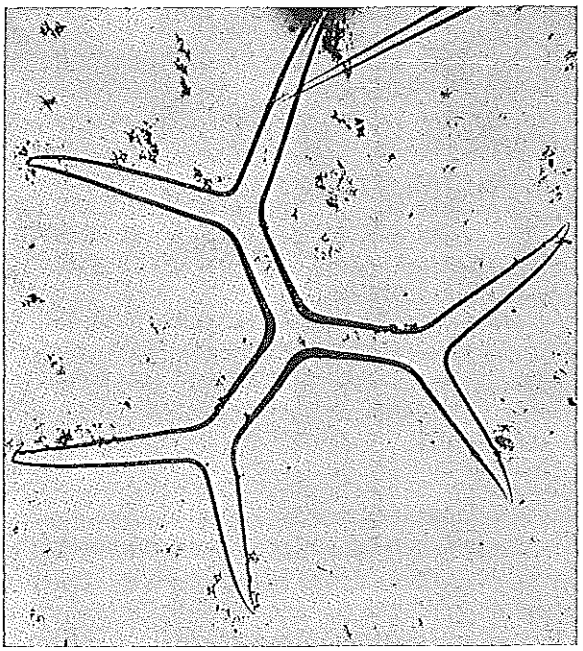


FIG. 15: *Monosyringia calcifera* nov.sp.
Dichotriaene.

SPICULE DIMENSIONS OF *Ancorina alata*

	Plagiotriaenes	Anatriaenes	Stout Oxeas	Long Thin Oxeas	Short Dermal Oxeas	Tylasters	Microrhabds
	μ	μ	μ	μ	μ	μ	μ
Takatu Point	1500–3800 × 25.0–58.0 (2900 × 48.0)	2010–3900 × 8.0–16.0 (2800 × 10.6)	2000–2800 × 40.0–65.0 (2520 × 58.0)	–	200–350 × 3.0–8.0 (310 × 4.0)	7.0–10.0 (8.2)	6.0–9.6 (8.2)
Little Barrier	1500–3700 × 38.0–70.0 (2750 × 60.0)	–	1870–3600 × 36.0–70.0 (3220 × 58.0)	2520–4200 × 7.0–10.0 (3700 × 8.6)	210–380 × 5.0–12.0 (335 × 7.8)	8.0–12.0 (9.8)	7.0–10.2 (8.7)
Mayor Island	2100–3600 × 42.0–76.0 (2980 × 62.0)	2208–3700 × 12.0–17.0 (3100 × 15.6)	2160–3400 × 38.0–60.0 (2886 × 45.0)	2181–3500 × 8.0–14.0 (3012 × 12.2)	218–375 × 3.8–8.0 (320 × 5.0)	8.0–12.0 (9.4)	7.0–10.0 (8.4)

DIMENSIONS OF *Penares tylotaster*

Locality and Author	Habit	Length	Width	Height	Cortex	Oscules	Pores
		cm	cm	cm	mm	mm	mm
North Cape, 70 fm Dendy Type	Massive	7.5	7.5	4.0	0.14	3.0–4.0	0.15
Shag Rock, Hauraki Gulf, 27 fm	Massive Irregular	7.5	6.0	6.0	0.2	2.0–3.0	Not apparent
Great Barrier, low tide	Thickly encrusting	15.0	8.0	1.8	0.8	1.0–4.0	0.04–0.1
Three Kings, 30–60 fm	Thinly encrusting	1.0	0.8	0.2	Not distinct	Not apparent	Not apparent

SPICULE DIMENSIONS OF *Penares tylotaster*

Locality and Author	Dichotriaenes	Large Oxeas	Small Oxeas	Tylasters	Oxyasters
	μ	μ	μ	μ	μ
East of North Cape, 70 fm, Dendy Type	600 × 60.0 Cladome 600	1400 × 40.0	340 × 4.0–340 × 17.0	8.0–12.0	–
Shag Rock, 27 fm	500–750 × 42.0–56.0 (680 × 51.0) cladome 480–620	960–1500 × 32.0–45.0 (1320 × 40.0)	210–380 × 6.0–18.0 (310 × 8.0)	7.0–16.0 (12.8)	12.0–16.0 (13.1)
Great Barrier (low tide)	420–610 × 46.0–56.0 (572 × 50.0) Cladome 410–560	840–1280 × 36.0–46.0 (1100 × 41.0)	200–410 × 6.0–16.0 (342 × 8.6)	8.0–15.0 (12.4)	10.0–14.0 (12.8)
Three Kings, 30–60 fm	430–520 × 42.0–58.0 (492 × 52.0) cladome 400–480	975–1600 × 30.0–46.0 (1420 × 40.0)	230–400 × 7.0–16.0 (340 × 9.0)	8.0–15.0 (12.2)	10.0–15.0 (12.9)

the possession of tylasters not oxyasters and the presence of smooth, rather than tuberculated microrhabds. Dendy's type has minutely roughened irregular microrhabds very similar to those described by Bowerbank and some large triaenes in *A. novae-zealandiae* are orthotriaenes; further, it is not clear from Bowerbank's figures that his sponge had oxyasters, Burton's synonymy (1959) indicates that it contained tylasters. Consequently the only difference between the two species is the presence in *A. novae-zealandiae*, of promesotriaenes. These spicules are rare and they appear to be variants of the anatriaenes rather than a definite category of spicule. It is not possible to maintain a specific distinction on the basis of presence and absence of these spicules and consequently *A. novae-zealandiae* is referred to *Ancorina acervus*, a wide-ranging Indo-Pacific species.

DISTRIBUTION

Indian Ocean; Indo-Pacific; Australia; Three Kings, 100 fm.

***Ancorina progressa** Lendenfeld

Ancorina progessa Lendenfeld, 1907, p. 259.
Ancorina progressa var. *diplococcus*, Dendy, 1924, p. 297.

REMARKS

Spicule size and microsclere morphology vary so greatly within Choristid species that varietal distinctions on these grounds alone are insignificant.

DISTRIBUTION

South of Cape of Good Hope; Three Kings, 100 fm.

***Ancorina stalagmoides** Dendy

Ancorina stalagmoides Dendy, 1924, p. 297, pl. 111, fig. 4, pl. VII, figs. 12–15.

REMARKS

A. stalagmoides and *A. progressa* are clearly separated from the variable *A. alata* by their possession of dichotriaenes, and in having oxyasters as microscleres.

DISTRIBUTION
Three Kings, 100 fm.

Genus **Penares** Gray

Penares tylotaster Dendy (pl. 6b, fig. 13)

Penares tylotaster Dendy, 1924, p. 303, pl. VII, figs. 16–17.
Penares tylotaster, Brøndsted, 1924, p. 440.
Penares tylotaster, Burton, 1929a, p. 415.
Penares tylotaster, Bergquist, 1961b, p. 198.

OCCURRENCE
Three Kings, 30–60 fm, Sta. B 93; Cape Brett, 20 fm; Great Barrier; Whangapoua; Burgess Bay, Kawau, 2 fm; off Shag Rock, 27 fm; Rangitoto; Mayor I. (low tidal unless otherwise stated).

DESCRIPTION
This sponge may be thinly or thickly encrusting, spreading or massive and irregular.

DIMENSIONS, see p. 40.

COLOUR: In life the colour varies considerably from lemon yellow (Y7/6) to yellowish white (Y8/4) in specimens from deeper water (Three Kings, Shag Rock). Specimens are black and dull yellow externally (Y-R-Y7/6 and Y4/2) and dull yellow internally (Y-R-R6/6) in shallow water and at low tide mark. In spirit grey to black externally, dull yellow internally (Y-R-Y7/4).

TEXTURE: Solid and incompressible.

SURFACE: Minutely corrugated or lumpy, completely smooth to the touch. Only one specimen, from the Chatham Rise (Bergquist 1961) has calcareous debris in the tissues and adhering to the surface. This condition, described for the holotype, does not appear to be general in this species. Oscules may be single or in groups of 3–4, flush with the surface, on short turrets, or sunken below the surface.

SKELETON: The cortex is clearly differentiated in all but thinly encrusting specimens and is made up of closely packed cortical oxeas. This layer is split into wedges by the numerous openings to the sub-cortical cavities associated with the inhalant pores. Just below the cortex the cladomes of the dichotriaenes are aligned parallel to the surface. These spicules vary greatly as to the number present in an individual specimen. Consequently this layer may be well or poorly defined. The choanosomal skeleton is an irregular reticulation of oxeas.

SPICULES:
MEGASCLERES:
(a) DICHOTRIAENES with short stout shaft and spreading cladi, these are often very rare, never abundant.
(b) OXEAS: large, stout, fusiform, slightly curved.
(c) OXEAS: small, often centrotylote or angulate, tending toward a stylote condition. These spicules are abundant in the cortex, but also occur in considerable numbers throughout the endosome.

MICROSCLERES:
(a) TYLASTERS with up to 10 slender tylote rays.
(b) OXYASTERS with up to 16 pointed rays. These spicules are never abundant.

SPICULE DIMENSIONS, see p. 40.

REMARKS
Penares tylotaster as described by Dendy (1924) is distinct from other species assigned to this genus in its possession of tylasters, in combination with short dichotriaenes. All specimens that I have examined possess oxyasters in addition to tylasters. Thus *P. tylotaster* is the only species of *Penares* with two distinct categories of asterose microscleres.

DISTRIBUTION
North Cape, 70 fm; Slipper I. (coast); McMurdo Sound, 140 fm; Chatham Rise, 220 fm.

Genus **Thenea** Gray

Thenea novaezealandiae Bergquist (pls. 6c, 12a)

Thenea novaezealandiae Bergquist, 1961b, p. 197, fig. 17, a–d.

OCCURRENCE
East of the Forty Fours (Chathams), 130 fm.

DESCRIPTION
Three specimens of this sponge were obtained, one of which is juvenile. It is a subspherical sponge with a cupola-like summit protruding over a hemispherical base. Small, relatively inconspicuous, rootlets project from the ventral and ventrolateral surfaces of the sponge.

DIMENSIONS:
(a) MATURE SPECIMENS 24–27 mm high; 26–28 mm wide.
(b) JUVENILE SPECIMEN 8.0 mm high; 6.0 mm wide.

COLOUR: In spirit, greyish white.

TEXTURE: Soft and spongy.

SURFACE: The surface is uniformly hispid. There are no obvious projecting spicules, however, even around the fringe of the cupola. Oscules up to 3.0 mm in diameter are present, congregated in a shallow depression in the centre of the dorsal surface. An equatorial recess is formed by the projection of the summit over the base and here a delicate porous membrane covers a series of subdermal cavities.

SKELETON: There is no differentiation of the body into cortical and endosomal regions. The skeleton is compact, composed of radiate spicule fibres in which oxeas are the chief elements in the deeper layers, triaenes appearing in greater numbers in the superficial layers of the sponge.

In between the fibres, metasters or plesiasters (large, smooth and spiny) occur abundantly.

SPICULES:

MEGASCLERES:

(a) DICHOTRIAENES with long spreading cladi and long slender shaft. The secondary cladi lie at right angles to the shaft.

(b) ANATRIAENES, long and slender with short strongly recurved cladi. These spicules are rare.

(c) PLAGIOTRIAENES with long spreading cladi basally almost as thick as the shaft, but tapering to a fine point.

(d) OXEAS, long, varying in width, often curved like a longbow.

MICROSCLERES:

(a) STREPTASTERS of a wide variety of form and size. Some plesiasters are extremely large, usually spined, but may be smooth. The number of rays in these spicules varies from 2–9, the most frequent form is a calthrops. All types of smaller streptasters, metasters, plesiasters and amphiasters, may be found. The number of rays in these spicules varies from 3–16. The rays are often tylote and usually microspined. All microsclere types are abundant.

(b) MICROXEAS of quite ordinary form occur occasionally.

SPICULE DIMENSIONS OF *Thenea novaezealandiae*

	μ
Dichotriaenes	3240–5100 × 39.0–50.0 (3820 × 46.0) cladome 1080–1160
Oxeas	4500–8219 × 3.4–38.0 (6706 × 17.0)
Plagiotriaenes	3600–4800 × 34.0–48.0 (4308 × 42.0) cladi 500–532 × 30.0–40.0
Anatriaenes	3200–4000 × 18.0–28.0 (3720 × 21.0) cladi 120.0 long
Large plesiasters	72–435 (283.0) total diameter rays 20.0–242.0 long, 2.3–13.9 wide
Small streptasters	12.0–41.0 (24.0)
Microxeas	80.0–150.0 × 4.0–8.0 (110.0 × 6.2)

REMARKS

This species was described with considerable hesitation since it approaches moderately closely to *Thenea megaspina* Lendenfeld from the Ceylon area. The chief differences are in the absence of short shaft dichotriaenes, tylostyles and protriaenes from *T. novaezealandiae*. The strongest point of similarity is the occurrence in both species of large, spined plesiasters and microxeas. Burton (1959a) has revised the genus *Thenea* and considers that only five species can be upheld. His criteria for the definition of these species are external characters in conjunction with geographical distribution. In the course of this revision *T. megaspina* Lendenfeld falls to *T. grayi* Sollas. In the revised description of *T. grayi* there is no mention of large spined plesiasters (streptasters).

Burton has devised a key to his five species which depends for its initial dichotomy upon whether oscules are equatorial, at the opposite end of the body to the pore-bearing crypt, or whether they are apical. *Thenea grayi* keys to the first of these alternatives, but is finally differentiated from *T. centrotylota* upon the absence of microxeas. Lendenfeld (1906) clearly describes and figures microxea in his specimens of *T. megaspina*.

According to this key *T. novaezealandiae* with apical oscules in an irregular "cribriform crypt" and a subspherical body should fall into *T. muricata* Bowerbank. *T. novaezealandiae* differs from the revised description of *T. muricata* in the absence of protriaenes and in the uniform spining of the streptasters and plesiasters. The geographical position of *T. novaezealandiae* is also widely separate from *T. muricata* which is recorded from North Atlantic, Arctic, and Japan.

Burton's revision has contributed materially to our knowledge of *Thenea*, but as it stands at present is too artificial to serve as a basis for strictly defining species. One could just as easily argue that we are dealing with one variable, widely dispersed, deep water species.

Until such time as further material is available I propose to consider *T. novaezealandiae* as a distinct species (a solution supported by Dr Burton, pers. comm.), closely related to *T. megaspina*, which is also considered distinct from *T. grayi*. *T. noveazealandiae* is the only species of *Thenea* lacking both protriaenes and tylostyles.

Subfamily STELLETTINAE Sollas

Genus **Monosyringia** Brøndsted

Monosyringia calcifera nov. sp. (pl. 14a; figs. 14, 15)

OCCURRENCE

Campbell Plateau, Sta. B 172.

HOLOTYPE

Slide only.

DESCRIPTION

An extremely small sponge of typical *Monosyringia* form, having a globular body covered with calcareous debris and supporting a single, slightly curved oscular tube.

DIMENSIONS:

Height, 5.0 mm; width of body 2.0 mm; width of tube, 0.8–1.0 mm; height of tube 3.0 mm.

COLOUR: In life, white; in spirit, identical.

TEXTURE: Brittle.

SURFACE: Granular on the oscular tube, over the body hispid with projecting dichodiaenes and dichotriaenes. A characteristic feature is the possession of turbinate processes, up to 0.4 mm, which function to hold the shell and bryozoan fragments in position. The single osculum is 0.3 mm in diameter and apical upon the exhalant tube.

SKELETON: The skeleton of the body is radially arranged consisting of stout fibres, 200–250 μ in diameter. These fibres are made of oxeas and dichotriaenes running from the centre to the periphery. There is a definite cortical region in which the clads of the dichotriaenes, dichodiaenes and occasional anatriaenes are located. This layer is 0.18 mm deep. In the oscular tube four ranks of regularly

arranged dichodiaenes make up the entire megasclere skeleton.

Microscleres in the form of tylasters and chiasters are abundant throughout the tissues whilst oxyasters are rare.

SPICULES:

MEGASCLERES:

(a) DICHOTRIAENES with wide spreading cladi and relatively short shaft. These spicules are the chief constituents of the fibres in and immediately below the cortex.

(b) ANATRIAENES with relatively short, recurved cladi and long slender shaft. These occur sporadically among the dichotriaenes in the fibres and also interstitially.

(c) PROTRIAENES: Of similar dimensions to the anatriaenes. Only one was found.

(d) DICHODIAENES: These spicules make up the entire skeleton of the oscular tube and also occur in the body region as hispidating spicules associated with the dichotriaenes. They are long slender spicules with primary cladi gently recurved and secondary cladi strongly recurved so as to lie almost parallel with the shaft.

(e) OXEAS: Straight stout spicules making up the bulk of the skeleton in the deeper regions of the sponge.

MICROSCLERES:

(a) OXYASTERS: With six to 12 slender pointed rays.

(b) TYLASTERS: With up to 12 relatively stout tylote rays. These spicules may have terminally spined, completely spined or smooth rays. Occasionally spicules occur which are more typically chiasters than tylasters.

SPICULE DIMENSIONS, see below.

REMARKS

This species is distinct from the three previously described members of this genus in several respects:

(i) In the shape of the dichodiaenes. These spicules in no way resemble those of *M. brøndstedi* Burton and could be more specifically termed modified orthodiaenes.

(ii) In the presence of protriaenes.

(iii) In the absence of trichodragmata.

(iv) The microscleres (tylasters and oxyasters, with occasional chiasters) of this sponge approach those of *M. longispinum* Lendenfeld and *M. brøndstedi* Burton, but neither of these species has three categories of asterose microscleres.

Monosyringia mortenseni Brøndsted (pl. 6d, 14b)

Monosyringia mortensèni Brøndsted, 1924, p. 442, fig. 4, a–g.

OCCURRENCE

Three Kings, 30–60 fm, Sta. B 93.

DESCRIPTION

A globular sponge surmounted by a long parchment-like oscular tube.

DIMENSIONS: Body, 1.5 cm in diameter.

Oscular tube, 3.5 cm long; 6.0 mm diameter basally, 1.5 mm diameter apically.

COLOUR: In life and in spirit, white.

TEXTURE: Hard, just compressible; the oscular tube stiff and papery.

SURFACE: Coarsely hispid, covered to a considerable degree in the body region with fragments of shell and Polyzoa. The adhering debris is held firmly to the sponge body by short turbinate processes.

SKELETON: The arrangement of the skeleton is as described for the holotype (Brøndsted 1924).

SPICULES: The spicule complement is as described by Brøndsted except that trichodragmata appear to be absent and the orthotriaenes are largely replaced by dichotriaenes.

SPICULE DIMENSIONS, see p. 44.

REMARKS

The above specimen differs from the holotype in three minor features.

(i) The replacement of orthotriaenes by dichotriaenes of equivalent size.

(ii) The absence of trichodragmata.

(iii) The much greater size of the spherasters and chiasters.

SPICULE DIMENSIONS OF *Monosyringia calcifera*

Dichotriaenes	Dichodiaenes	Oxeas	Anatriaenes	Oxyasters	Tylasters
μ	μ	μ	μ	μ	μ
774–1406 × 42.0–58.0 (1260 × 54.0)	2160–2820 × 23.0–26.0 (2370 × 24.8)	1089–1860 × 28.0–40.0 (1625 × 36.0)	1220–2400 × 18.0–22.0 (1850 × 21.6)	20.0–25.0 (22.6)	13.0–24.0 (18.7)
Cladome	Cladome		Cladome		
480–520 (496)	860–986 (942)		130–145		
Secondary cladi					
184–290 long					

SPICULE DIMENSIONS OF *Monosyringia mortenseni*

Locality and Author	Orthotriaenes	Orthodiaenes	Oxeas	Oxyasters	Chiasters
	μ	μ	μ	μ	μ
Colville Channel, 35 fm, Brøndsted	4000 × 60.0 Cladome 430	4500 × 45.0 1° cladi 1700	4000 × 52.0	16.0	7.0–8.0
Three Kings, 30–60 fm	3200–4400 × 51.0–68.0 (3920 × 58.0) Dichotriaenes of similar size	3700–4820 × 38.0–50.0 (4610 × 46.0) 1° cladi 1800	3200–4500 48.0–56.0 (3900 × 52.0)	12.0–17.0 (15.0)	10.0–23.0 (19.0)

Marshall (1883) described a sponge *Agilardiella radiata* from 45 fm north of New Zealand. This may possibly be the same species as *M. mortenseni*. Unfortunately Marshall only obtained the oscular tube of his sponge and his description is inadequate. Sollas (1888) referred *Agilardiella radiata* to *Tethyopsis*, but the original description does not characterise the sponge sufficiently to enable comparison to be made with other species of this genus. The possible comparison with *M. mortenseni* rests upon the presence of a long oscular tube, of orthotriaenes and modified diaenes, and of spheraster among the microscleres. We know nothing of the whole sponge in which other spicule categories probably occurred; there may also have been more than a single oscular tube. De Laubenfels (1936) was correct in considering *A. radiata* unrecognizable.

DISTRIBUTION

Cape Maria van Diemen, 50 fm; Three Kings, 65 fm; Colville Channel, 35 fm (Th. Mortensen's 1915 Expedition).

Genus **Stelletta** Schmidt

Stelletta crater Dendy (pl. 7a,d; 12 c,d)

Stelletta crater Dendy, 1924a, p. 292, pl. IX, fig. 5, pl. VII, figs. 5–7.
Stelletta crater, Burton, 1929a, p. 415.

OCCURRENCE

One of the specimens from Cook Strait and that from Little Barrier conform closely to the type description in being cup shaped with a roughly channelled outer surface. The specimen from Three Kings is turbinate and flat apically, the second specimen from Cook Strait is small, and similar in appearance to the Three Kings sponge.

DESCRIPTION

DIMENSIONS:

Stelletta crater

Locality and Author	Height	Width	Habit	Cortical Thickness
	cm	cm		mm
East of North Cape, 70 fm Dendy, Type	12.4	12.2	Cup shaped	0.85
Little Barrier, 40 fm	7.5	9.5	Cup shaped	2.0
Three Kings, 30–60 fm	7.0	4.0 2.5 base	Turbinate	1.2

COLOUR: In life, light orange (rY-R7/8) externally, white internally; in spirit greyish.

TEXTURE: Firm, incompressible.

SURFACE: In the cup-shaped specimen the surface is extremely rough owing to the projecting brushes of oxeas and triaenes. Over part of the surface investing *Desmacella* masks the *Stelletta* and a granular texture results.

SKELETON: The skeleton is identical to that of the type.

SPICULES:

MEGASCLERES:

(a) PLAGIOTRIAENES

(b) OXEAS

These spicules are identical to those figured by Dendy (1924).

MICROSCLERES:

OXYSPHERASTERS: Two distinct types of these spicules occur, but never in the same specimen:

(a) With many pointed, relatively long rays and feebly developed centrum.

(b) With eight to 16 short, conical rays and a conspicuous centrum.

SPICULE DIMENSIONS OF *Stelletta crater*

Locality and Author	Plagiotriaenes	Oxeas	Oxyspherasters (a)	Oxyspherasters (b)
	μ	μ	μ	
East of North Cape Dendy Type	2100 × 93.0	2560 × 140	(a) 22.0	(b)
Little Barrier, 40 fm	2420–2800 × 90.0–108.0 (2706 × 102.0)	2200–3060 × 120.0–148.0 (2780 × 136.0)	11.0–17.0 (14.0)	Absent
Three Kings, 30–60 fm	2108–2760 × 63.0–90.0 (2367 × 75.0)	2180–2786 × 108.0–150.0 (2400 × 130.0)	Absent	7.0–9.0 (7.5)

REMARKS

Dendy (1924) described only one type of aster for this species which would therefore fall into *Myriastra* if Sollas's and de Laubenfels's concept of this genus is upheld. The specimen described above from Three Kings complicates this simple transfer. It has an identical megasclere composition to *S. crater*, but has distinctly different oxyspherasters. It is possible that this sponge could be a *Stelletta* with a basic complement of two types of oxyspheraster which have never been found together in the same specimen. These specimens could also represent two species of *Myriastra* (in which case the specimen from Three Kings would be a new species) or examples of a single species, *M. crater*, which has variable oxyspherasters.

If, however, one is to admit variability of microsclere content within the genus *Myriastra* then much of the reason for maintaining the genus disappears. Bergquist (1961b) expressed support for de Laubenfels's distinctions between *Stelletta* and *Myriastra* on microsclere content. Burton (1926a) has maintained that this is not a valid distinction and the case of *Stelletta crater* provides support for his argument. *Stelletta crater* Dendy is thus retained in *Stelletta* as a species with variable microsclere complement.

DISTRIBUTION

East of North Cape, 70 fm; Spirits Bay, 11–20 fm, McMurdo Sound, 140 fm.

Stelletta purpurea Ridley (pl. 7c; fig. 16)

RESTRICTED SYNONYMY:

Stelletta purpurea Ridley, 1884, p. 473, pl. XL, fig. e; pl. XLIII, fig. j, j^1.
Pilochrota purpurea, Sollas, 1886b, p. 190.
Myriastra biformis Brondsted, 1924, p. 437, fig. 1, a–e.
Stelletta purpurea, Burton, 1926a, p. 45.
Myriastra purpurea, de Laubenfels, 1954, p. 239, fig. 164, a–d.
Myriastra purpurea, Levi, 1958, p. 9, fig. 5, a–d.
Myriastra purpurea, Bergquist, 1961b, p. 201, fig. 19, a, b.
(For further synonymy see Burton, 1926a, p. 45–46.)

OCCURRENCE

Chatham Rise, 220 fm; Three Kings, 30–60 fm, Sta. B 93; New Plymouth, 8 fm; Takatu Channel, 6–10 fm.

REMARKS

Since my earlier account of *S. purpurea* from New Zealand (Bergquist 1961b) I have examined the type of *Myriastra biformis* (Brøndsted) and am able to endorse its relegation (Burton 1929a) to *S. purpurea*. *S. purpurea* is widely distributed in the New Zealand region and throughout its range shows no significant variation in spiculation or habit, but varies considerably in colour from cream white (rY8/4) to red (RY-R6/4).

DISTRIBUTION

Red Sea; Indian Ocean; Indo-Pacific; Japan; Australia; New Zealand; Antarctic.

Stelletta arenaria nov. sp. (pl. 7b; 12e)

OCCURRENCE

Whangapoua, Gt. Barrier I. (low tide) (Holotype); Goat I. Bay (low tide).

HOLOTYPE

Dominion Museum, Por. 20.

DESCRIPTION

A thickly encrusting, spreading or massive spherical sponge often found growing on low tidal rocks under cover of *Carpophyllum maschalocarpum* and *Xiphophora chondrophylla*.

DIMENSIONS, see p. 48.

COLOUR: In life, sandy to greyish black externally, internally pale yellow (Y-R-Y7/6), in spirit greyish white.

TEXTURE: Firm, easily compressible.

SURFACE: The surface, where visible, is mamillate. It is usually covered with small red algae, hydroids and encrusting bryozoans and coated with sand grains. Oscules are confined to the upper surface and pores are lateral.

SKELETON: The skeleton is made up of radiating wavy spicule tracts 150.0–200.0 μ in diameter, composed entirely of oxeas. A few triaenes with reduced cladi are present, but are not in sufficient numbers to form a cortical layer. The frequency of the triaenes is about 1 per 200 spicules. Oxeas are abundant interstitially and are irregularly disposed. The cortex is made up of a layer 1.0–1.2 mm deep of sand grains. In and below this cortical layer are abundant tylasters.

SPICULES:

MEGASCLERES:

(a) OXEAS long, straight, relatively stout spicules with a variety of terminations. They are occasionally stylote, more often strongyloxeote or with a trace of subterminal swelling. The normal oxeote condition is found in 40–50% of the diacts.

(b) PLAGIOTRIAENES of similar size and shape to the oxeas, narrowing evenly to a sharp point but with insignificant clads, often reduced to small protruberences, never exceeding 80–90 μ in length and often terminally rounded.

MICROSCLERES:

(a) TYLASTERS with five to 12 long fine smooth rays and no centrum, very abundant in and below the sand cortex.

(b) CHIASTERS with six to 15 short terminally roughened, sometimes expanded rays.

SPICULE DIMENSIONS OF *Stelletta arenaria*

Locality and Habit	Plagiotriaenes	Oxeas	Tylasters	Chiasters
	μ	μ	μ	μ
Great Barrier Spherical Low tide	960–1070 × 12.0–13.6 (980 × 12.7)	677–1270 × 11.5–13.9 (965 × 12.0)	8.0–11.5 (9.8)	6.2–9.0 (8.0)

REMARKS

This species approaches closely to *Stelletta vestigum* Dendy from Ceylon in the great reduction of the triaenes and their replacement by a cortex filled with foreign matter. The size of the megascleres is also comparable. In *S. vestigum* triaenes appear to be common, but nearly always reduced. In *S. arenaria* they are uncommon and only occasionally reduced.

There is no similarity in the microscleres of the two sponges and they are therefore treated as distinct species.

Stelletta maxima Thiele (pl. 8d, 12b; fig. 17)

Stelletta maxima Thiele, 1898, p. 15, pl. I, fig. 8; pl. 7, fig. 3a–f.
Stelletta columna Dendy, 1924, p. 294, pl. V, fig. 4; pl. VII, fig. 1–4.

OCCURRENCE
Mahia Peninsula, 60 fm.

DESCRIPTION
The specimen is similar to the type of *S. columna* except that the columns are terminally rounded rather than slightly concave. The specimen is invested by *Desmacella dendyi*.

DIMENSIONS:

Stelletta maxima

Locality and Author	Habit	Width	Height	Cortical Thickness
		cm	cm	mm
East of North Cape, 70 fm	Columnar	14.5 base 6.5 halfway	14.5	1.0–4.0
Mahia Peninsula, 60 fm	Columnar	6.5	7.6	2.0
S. maxima Thiele Japan Type	Massive	13.0 × 25.0	10.0	2.0

COLOUR: In life, light orange (rY-R7/8) externally, white internally; in spirit, pinkish, (rY-R6/4).

TEXTURE: Firm, incompressible.

SURFACE: Rough, externally hispid except where the dermal membrane of the *Desmacella* is still intact. In most places oxeas of the *Stelletta* protrude through the 1.0 mm layer of *Desmacella* and render the surface hispid. No pores or oscules are visible.

SKELETON: The skeleton is typical, being composed of radiate tracts made up of plagiotriaenes and oxeas. The clads of the plagiotriaenes, together with a distinct layer of small oxyspherasters, make up the dermal layer. Tracts of large and small oxyspherasters occur between the fibres in the deep layers of the sponge.

SPICULES: These are comparable in shape and size with those of the type of *Stelletta maxima* and are slightly smaller than those of *S. columna* (see table, p.48).

MEGASCLERES:
(a) Stout PLAGIOTRIAENES with incurved cladi and often strongly curved shape.
(b) OXEAS, extremely stout spicules making up the endosomal skeleton.

MICROSCLERES:
(a) OXYSPHERASTERS of two types:
(i) Very large with prominent centrum, restricted to the choanosome.
(ii) Small, very abundant in the dermis and the choansome.
(b) PYCNASTERS occur as variants of the small oxyspherasters and occur both in the Mahia specimen and in the holotype of *S. columna*.

SPICULE DIMENSIONS, see p. 48.

REMARKS
Burton (1932) has synonymised *Stelletta columna* Dendy and *S. brevis* Hentschel with *S. maxima* Thiele and no objection can be made to his views regarding *S. columna*. The second New Zealand specimen described here is intermediate between *S. maxima* from Japan and Dendy's *S. columna* in spicule size and microsclere content.

DISTRIBUTION
Japan; south-west Australia; east of North Cape, 70 fm.

Stelletta lithodes nov. sp. (pl. 8c, 14c; fig. 18, 19)

OCCURRENCE
East of Mahia Peninsula, 60 fm.

HOLOTYPE
Dominion Museum, Por. 21.

DESCRIPTION
A massive stony sponge invested by *Desmacella dendyi* and growing attached to a basalt boulder. The single specimen is designated holotype.

DIMENSIONS: 8.0 cm long; 8.0 cm high; 6.0 cm thick.

COLOUR: In life, light orange (Y-R6/6) externally, internally whitish; in spirit, flesh coloured throughout (Y-R7/4).

TEXTURE: Stony, resembling a lithistid.

SURFACE: The surface is rough, raised into rounded conules which are pierced by groups of 2–3 huge oxeas. No pores or oscules are apparent in the single specimen.

SKELETON: This specimen has proved impossible to section and therefore little can be said about the disposition of the microscleres. The whole sponge is a compact mass of huge oxeas and dichotriaenes which are radially disposed, but so dense as to obscure any grouping into fibres. The dichotriaenes are abundant in the cortical region and their meshed clads form a continuous dermal armour. The *Desmacella* external to the surface of the *Stelletta* is pierced by the projecting oxeas which are so large that they obscure the region where the shafts of the dermal triaenes terminate, consequently there is no defined cortex.

SPICULES:
MEGASCLERES:
(a) DICHOTRIAENES. These are relatively short, stout spicules with shaft usually slightly curved and narrowing abruptly in the posterior third. The long primary cladi are as thick as the shaft and project at an angle of 110–130°. The secondary cladi are short and stumpy usually less than a third the length of the primaries. Many irregular and deformed conditions occur among the dichotriaenes.

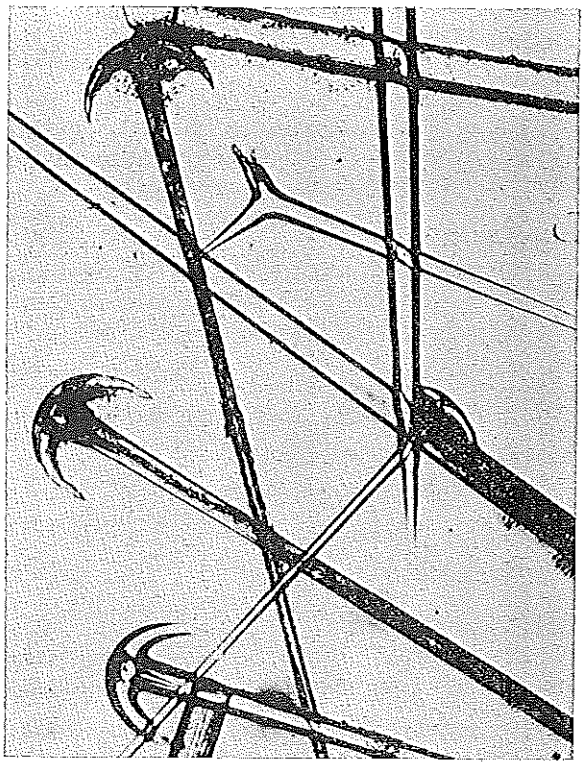


FIG. 16: *Stelletta purpurea* Ridley
Anatriaenes and plagiotriaene.

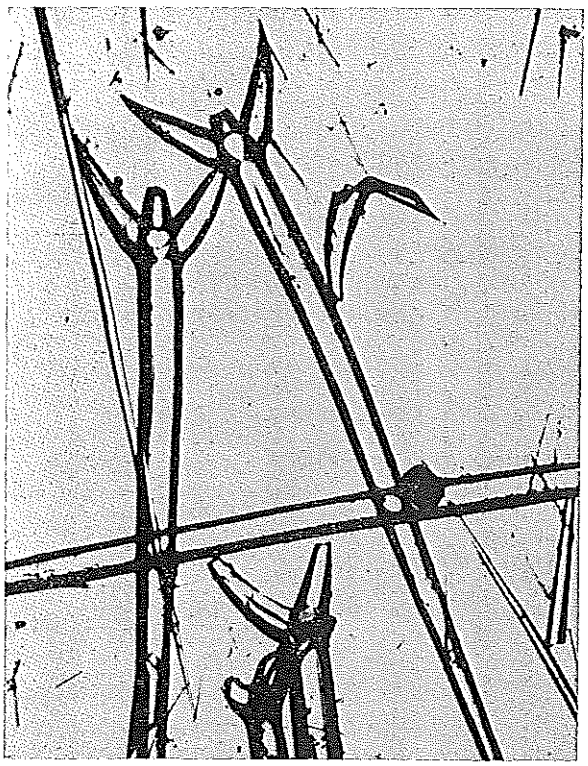


FIG. 17: *Stelletta maxima* Thiele
Plagiotriaenes.

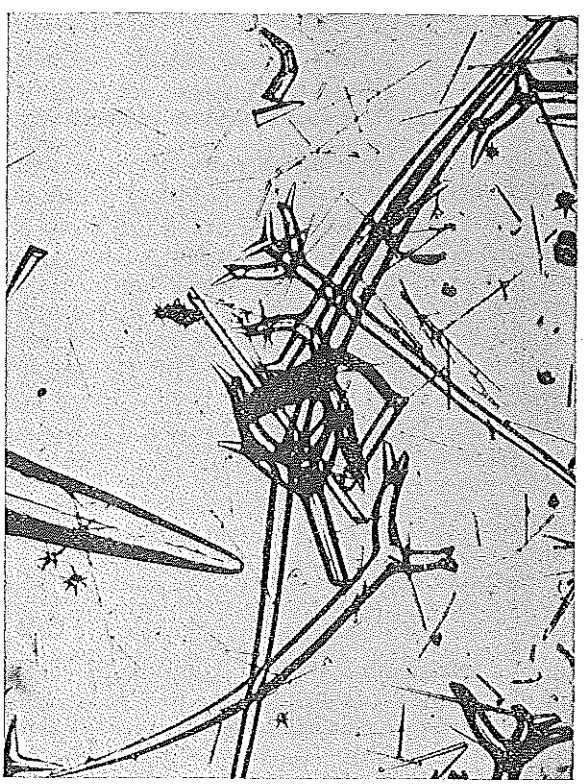


FIG. 18: *Stelletta lithodes* nov. sp.
dichotriaenes, oxeas, end of one of the largest oxeas, spheraster. Tylostyles belong to investing *Desmacella*.

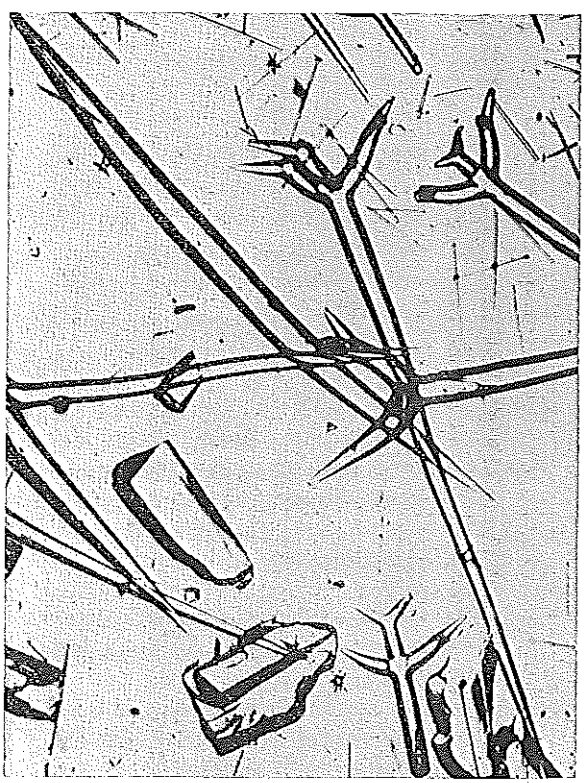


FIG. 19: *Stelletta lithodes* nov. sp.
Dichotriaenes, oxeas and spherasters.

DIMENSIONS OF *Stelletta arenaria*

Locality	Habit	Height	Width	Length	Thickness	Oscules	Pores
		cm	cm	cm	cm	mm	mm
Great Barrier	Spreading	–	1.0	1.5	0.8	Not apparent	–
Great Barrier Type	Spherical	4.5	4.0	6.0		1.5–3	0.2–0.3
Goat Island Bay	Spherical	5.2	4.8	5.0		1.8–3	–

SPICULE DIMENSIONS OF *Stelletta maxima*

Locality and Author	Plagiotriaenes	Oxeas	Oxyspherasters Large	Oxyspherasters Small	Pycnesters
	μ	μ	μ	μ	μ
East of North Cape, 70 fm, *S. columna* Dendy	3200 × 100.0 Cladome 340	4250 × 90.0	40.0–96.0 rays up to 48.0	12.0	10.0–12.0
Mahia Peninsula, 60 fm	1800–3600 × 80.0–140.0 (2540 × 128.0)	3430–4700 × 80.0–96.0 (3590 × 85.0)	30.0–80.0 (63.0) up to rays 34.0	9.2–13.9 (11.8)	9.0–13.0
Stelletta maxima Thiele Japan Type	1400.0 × 65.0 *Cladi* 150.0–200.0	2000.0–2250.0 × 60.0	Two categories not specified, but up to at least 70.0, two sizes figured		9.0

SPICULE DIMENSIONS OF *Stelletta lithodes*

Locality	Dichotriaenes	Large Oxeas	Small Oxeas	Oxyspherasters Large	Oxyspherasters Small
	μ	μ	μ	μ	μ
Mahia Peninsula, 60 fm (Holotype)	1200–1480 × 48.0–69.0 (1420 × 56.0) Cladome 480–530 Primary cladi 26.0–67.0 diameter	3000–6800 × 290–500 (4860 × 420)	2800–4600 × 12.0–28.0 (3400 × 16.0)	58.0–106.0 (86.0)	3.4–6.9 (4.3)

SPICULE DIMENSIONS OF *Stelletta communis*

Locality and Authors	Dichotriaenes	Plagiotriaenes or Orthotriaenes	Anatriaenes	Oxeas	Anthasters	Tylasters or Chiasters
	μ	μ	μ	μ	μ	μ
S. communis Sollas Point Jackson, 6–15 fm Type	4418–5700 × 90.0–110.0	–	3000–4300 × 32.0–39.0	4200–5600 × 60.0–90.0	Total diameter not given; actives 21.0–28.0	6.0–8.0
S. parvispicula Sollas off Melbourne, 33 fm	–	1750 × 20.0	1300 × 16.0	1300 × 20.0	Total diameter not given actines 14.0 × 3.5	*11.8
S. communis Three Kings, 30–60 fm	2072–3000 × 38.0–60.0 (2790 × 50.0) cladome 400–460	2000–2200 × 30.0–42.0	1258–1450 × 17.0–24.0 (1308 × 19.0)	1860–2300 × 20.0–33.0 (2050 × 30.0)	20.0–34.0 (26.0 actines 6.0–15.0)	8.0–11.0 (9.6)

(b) OXEAS of two sizes:

(i) OXEAS, huge, stout, evenly curved, constituting the bulk of the skeleton. These spicules occasionally have strongylote ends.

(ii) OXEAS, long, fine, straight or slightly angled in the middle, these are not common.

MICROSCLERES:

(a) OXYSPHERASTERS of large size, with well developed centrum and 12–20 stout, conical, pointed rays. In many cases up to half of the rays are truncated, half their normal length and rounded. These spicules are abundant.

(b) OXYSPHERASTERS, very small, with 6–16 slender slightly roughened pointed rays.

SPICULE DIMENSIONS, see above.

REMARKS

Stelletta lithodes is unique in the genus for the huge size of its structural oxeas and the complete replacement of the usual arrangement of spicules in endosomal tracts by a compact radial arrangement of spicules. This condition is almost achieved in the specimen of *Stelletta tethyopsis* Carter described by Dendy (1905) from Ceylon but in this sponge the triaenes and oxeas are 8000.0/μ × 74.0 μ, longer but substantially finer than the oxeas of *Stelletta lithodes*.

Stelletta lithodes is closest in appearance and spiculation to *S. columna* Dendy but this species possesses only plagiotriaenes and has much smaller oxeas. Similarities do exist between *S. lithodes* and *S. crater* Dendy particularly in habit and the dimensions of the oxeas. In form

of the triaenes and microsclere content, however, the two species are easily distinguishable.

Stelletta communis (Sollas) (fig. 20)

Anthastra communis Sollas, 1886b, p. 191.
Anthastra communis Sollas, 1888, p. 140, pl. XII, fig. 1–29; pl. XV, fig. 20–27.
Anthastra parvispicula Sollas, 1888, p. 145, pl. XIII, fig. 30–40; pl. XL, fig. 1–2.
Stelletta communis, Lendenfeld, 1903, p. 42.

OCCURRENCE
Three Kings, 30–60 fm, Sta. B 93.

DESCRIPTION
Four specimens have been collected. All are small, spherical to ovate sponges growing attached to the basal branches of *Plumularia* sp.

DIMENSIONS: 8.0–9.0 mm wide; 12.0 mm high.

COLOUR: In life, red brown to light brown (Y-R-Y6/4–Y-R-Y6/2); in spirit, identical.

TEXTURE: Crisp, easily compressed.

SURFACE: Rough, with fragments of shell and bryozoan adhering in several places. Occasional anatriaenes project up to 800 μ from the surface. No oscules are visible, but numerous skeletal pores are discernable between the cladi of the dichotriaenes and they give the surface a punctate appearance under low magnification.

SKELETON: The skeleton is lax in the deeper layers, compacted externally by the interlacing cladi of the dichotriaenes and plagiotriaenes. All megascleres are radially disposed and to some extent concentrated into tracts which are up to 400 μ in diameter in the centre of the sponge. The cortical region is 70.0–90.0 μ deep, composed of the cladi of the triaenes, a layer of anthasters and a zone of collenchymatous tissue.

SPICULES:

MEGASCLERES:

(a) DICHOTRIAENES of normal form, with primary cladi at 100° to the shaft and secondary cladi at 90°. These are the chief structural spicules.

(b) PLAGIOTRIAENES of similar size and shape to the above except for the simple cladi. These spicules are not common.

(c) OXEAS long, thin, straight and evenly tapered. These spicules, together with the dichotriaenes, make up the fibres.

(d) ANATRIAENES of normal form occur as interstitial spicules, occasionally protruding some distance above the surface.

MICROSCLERES:

(a) ANTHASTERS with three to 12 stout, rounded, spined rays. In those spicules with more than five rays, a centrum is well developed. The anthasters occur abundantly as a dermal crust and also interstitially.

(b) TYLASTERS with five to nine long fine, minutely roughened rays and no centrum. These spicules are found lining the canal system and interstitially.

SPICULE DIMENSIONS, p. 48.

REMARKS
This is the first record of *Stelletta communis* from New Zealand. Its occurrence, however, is not surprising in view of the high percentage correlation between the sponge faunas of New Zealand and south-eastern Australia.

The New Zealand specimens have proved a little difficult to allot to Sollas's species. Although they resemble *S. communis* in spiculation, the dimensions of the spicules correspond much more closely to those given by Sollas for *S. parvispicula*. The reasons for considering *S. communis* and *S. parvispicula* as separate species are:

(i) The replacement of dichotriaenes by orthotriaenes in *S. parvispicula*; and

(ii) The much greater size of all spicules *S. communis*.

Spicule size is now recognised to vary within very wide ranges in Choristids (Burton, 1926a), and the New Zealand specimens have both dicho- and plagiotriaenes. The latter may often have almost horizontal cladi, that is, they approach orthotriaenes. These two species are thus united as *S. communis*.

DISTRIBUTION
Port Jackson, 6–15 fm; Melbourne, 33 fm.

Stelletta conulosa nov. sp. (pl. 8b, 14h; fig. 21, 22)

OCCURRENCE
Takatu Point, 6 fm, rocky bottom, one specimen, the holotype; Leigh, 10 fm.

HOLOTYPE
Dominion Museum, Por. 22.

DESCRIPTION
A massive sponge, triangular in vertical section, which ramifies over the surface and along the sides of large rocks. Single colonies are up to 6 ft. long.

DIMENSIONS, see p. 53.

COLOUR: In life, slate grey externally (N.5.5), white internally; in spirit, purplish grey externally (R-P-R5/2), pinkish brown internally (rY-R6/4).

TEXTURE: Firm, just compressible.

SURFACE: The surface is the most characteristic feature of the sponge. It is raised into conules 1.0–3.0 mm apart. Along the dorsal ridge and at the base the conules are low (0.5 mm), but laterally they attain a height of 7.0 mm. The conules are supported by extensions of the subdermal fibres and receive both triaenes and oxeas. These spicules project slightly above the level of the dermis over the entire surface. The resultant hispidation cannot be seen but the surface is extremely rough to the touch.

No apertures are visible in the spirit specimens but oscules were observed at the time of collection. They were large (5.0 mm) and irregularly dispersed along the dorsal ridge.

SKELETON: The skeleton is made up of radiating fibres, composed, in the deeper regions, almost entirely of oxeas, and in the cortical and dermal regions, of plagiotriaenes. Terminally, the fibres expand into several smaller tracts which enter the conules.

Immediately below the surface the fibre tracts are 3.5–4.2 mm in diameter. These subdivide into several spicule brushes 0.8–1.2 mm in diameter. Fleshy parts of the sponge are well developed; the distance between the fibres in the choanosome is at least equal to the diameter of the fibres. A dermal layer of small oxyspherasters is developed and these are found interstitially and in all membranes that line canals. Larger microscleres, oxyasters of varying shape, are the chief interstitial spicules. These occur in great numbers just below each conule.

SPICULES:

MEGASCLERES:

(a) PLAGIOTRIAENES of stumpy form, usually with three cladi, but sometimes with two or four. In the majority of spicules the disposition of the cladi is orthodox. They make an angle of 115–125° with the shaft. In some cases one clad may be set at right angles or even at an acute angle to the shaft.

(b) DICHOTRIAENES, of identical form to the plagiotriaenes except for the dichotomous cladi. These are rare.

(c) OXEAS. These are the main structural spicules. They are stout, evenly tapered and straight.

MICROSCLERES:

(a) OXYASTERS of considerable size range, with 4–20 slender rays and a well marked centrum. Extremely abundant.

(b) OXYSPHERASTERS with 8–15 short conical rays rising from a well marked centrum. Extremely abundant.

SPICULE DIMENSIONS OF *Stelletta conulosa*

Locality	Plagiotriaenes	Oxeas	Oxyasters	Oxyspherasters
	μ	μ	μ	μ
Takatu 6 fm	774–1089 × 48.0–57.0	1260–1690 × 38.0–60.0	6.9–57.0 (37.0)	5.0–9.0 (7.2)
Holotype	(970 × 54.0) cladome 46.0–63.0	(1482 × 50.0)		

REMARKS

The external form and surface morphology of this sponge differentiate it from other New Zealand Stellettids and resemble those of *S. boglicii* Schmidt, the type of the genus *Stelletta*. The colour and the general shape of the triaenes resemble those of *S. herdmani* Dendy from Ceylon, but the surface microscleres are quite different and *S. herdmani* has reduced, but not deformed, triaenes.

Stelletta maori Dendy (pl. 8a, 14f, 15f; fig. 23)

Stelletta maori Dendy, 1924, p. 290, pl. VII, fig. 8–11.
Stelletta maori var. *bistellata*, Dendy, 1924, p. 291.
Stelletta maori, Burton, 1929, p. 414, text fig. 3.

OCCURRENCE

Mahia Peninsula, 60 fm; Menzies Bay, Christchurch, 60 fm; Takatu Point, 6 fm; Campbell Plateau, 46 fm.

DESCRIPTION

This sponge ranges in habit from large and vasiform to massive and cushion-like, sometimes low lying and spreading.

DIMENSIONS, see p. 53.

COLOUR: All living specimens collected have been different in colour, ranging from pinkish (RY-R6/4) to maroon (yR3/4) and dull red brown (rY-R5/6). In spirit the colour is uniformly pinkish (rY-R6/4).

TEXTURE: Firm, but compressible.

SURFACE: Coarsely granular, covered with very shallow grooves. No pores or oscules are visible.

SKELETON: The arrangement of the skeleton is essentially as described by Dendy (1924). The dermal layer of euasters which Dendy described as "ill-defined" is well developed in my specimens.

SPICULES:

MEGASCLERES:

(a) DICHOTRIAENES with great variation in the mode and angle of branching of the secondary cladi. These spicules make up the bulk of the spicule tracts in the dermal and cortical region where their cladi form a compact dermal armour. The dichotriaenes vary greatly in size and shape. Usually the shaft is slightly curved and tapered to a sharp point. The specimen from Mahia is unusual in this respect having relatively short straight shafts to the dichotriaenes.

(b) PLAGIOTRIAENES of normal form occur in specimens from Christchurch and Mahia only. They are of equivalent size to the dichotriaenes, but are always rare.

(c) OXEAS of two size groups:

(i) Large oxeas which make up the bulk of the skeleton in the deeper layers of the sponge. The oxeas vary greatly in size from specimen to specimen and within single specimens.

(ii) Small stout oxeas, relatively rare, occurring randomly in the fleshy tissues.

MICROSCLERES: Asters of several types, chiefly oxyasters and oxyspherasters. Both categories are subject to variation in the presence or absence of spines and in the deformation and suppression of rays.

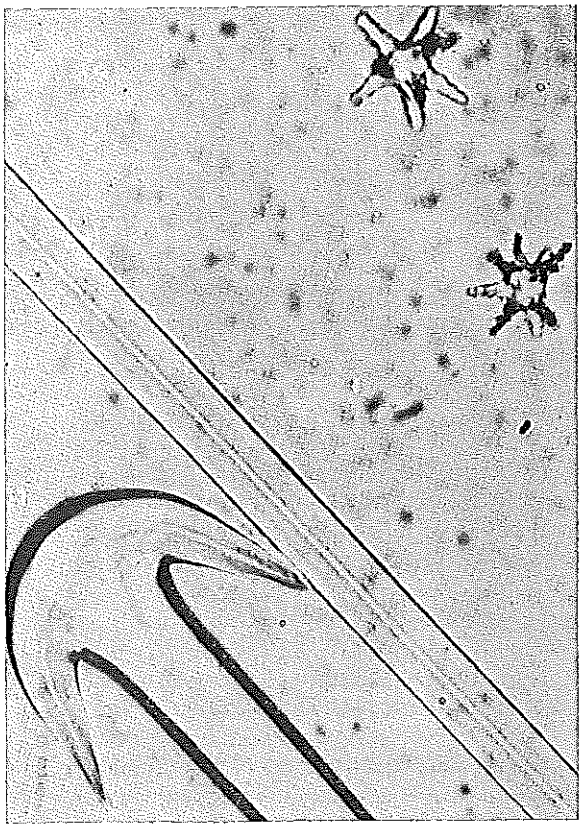


FIG. 20: *Stelletta communis* (Sollas)
Anatiaene and anthasters.

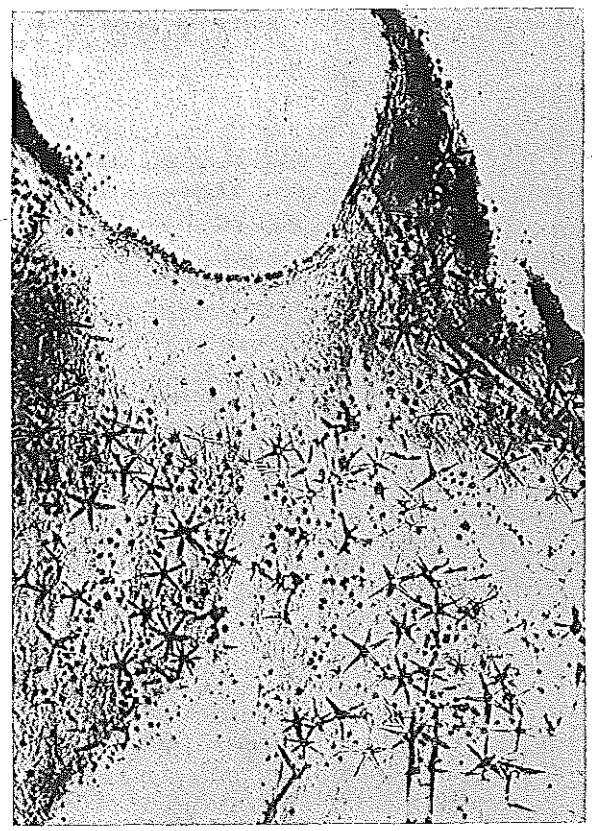


FIG. 22: *Stelletta conulosa* nov. sp.
Section to show disposition of the microscleres.

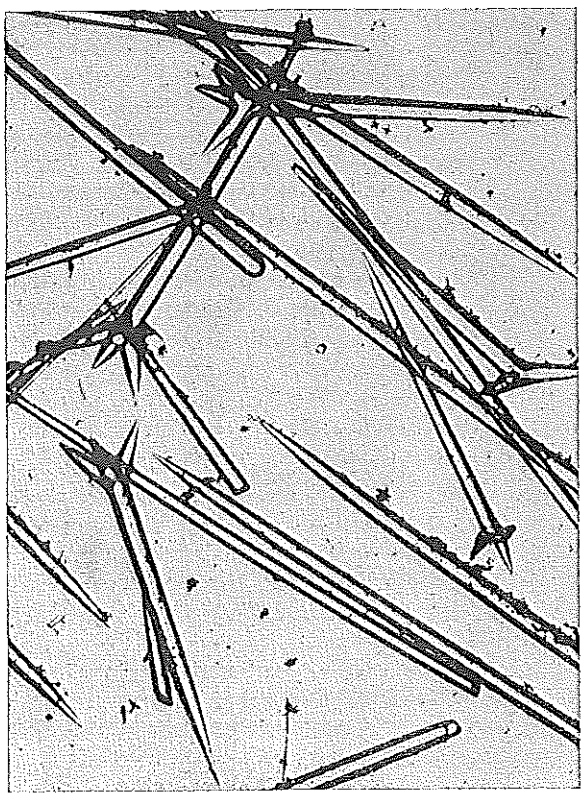


FIG. 21: *Stelletta conulosa* nov. sp.
Plagiotriaenes and oxyspherasters.

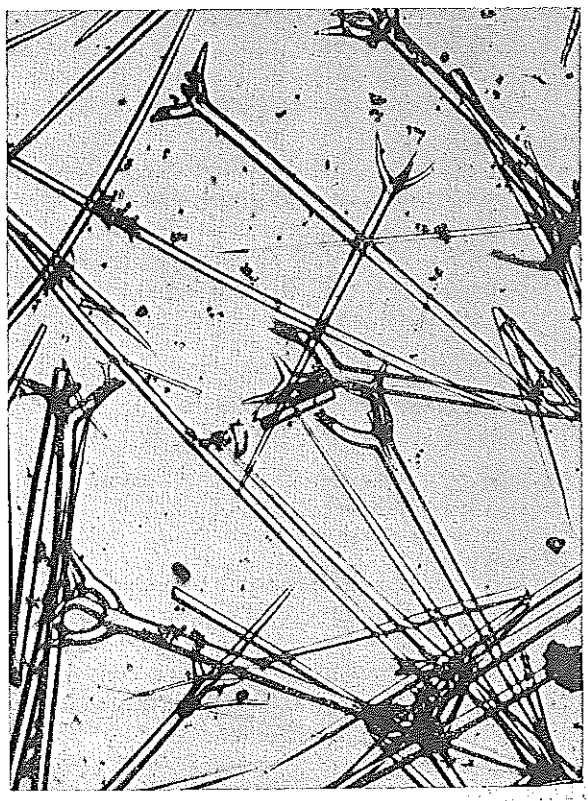


FIG. 23: *Stelletta maori* Dendy
Dichotriaenes and oxeas.

(a) OXYASTERS with smooth or slightly roughened rays and small centrum. The number of rays varies from 4–12. In some of the larger oxyasters the tips of the rays bear two or three very prominent spines. This condition is found in specimens from Mahia and Christchurch only. These spicules vary greatly in size and are restricted to the endosome.

(b) OXYSPHERASTERS, small, abundant in the dermal region, occasionally with slightly tylote rays.

SPICULE DIMENSIONS, see p. 53.

REMARKS

Only one specimen was available to Dendy at the time of the type description. Eight further specimens from four different localities have been collected during this survey. The type description needs little modification except to stress, as Burton (1929) did, the variability of asters and dichotriaenes in this species.

DISTRIBUTION

Spirits Bay, 11–20 fm; McMurdo Sound, 140 fm.

Stelletta novae-zealandiae Brøndsted (pl. 14d)

Stelletta novae-zealandiae Brøndsted, 1924, p. 436, fig. a–e.
Stelletta novae-zealandiae Bergquist, 1916b, p. 199, fig. 18, a, b.

REMARKS

The only specimen collected has been described and illustrated earlier (Bergquist, 1961b). It conforms closely in spiculation and skeletal features with Brøndsted's type specimen. Full details of spicule dimensions were omitted earlier but are given on p. 53.

I have re-examined a slide made from the holotype and find that three categories of microscleres are present, not one as figured and described by Brøndsted (1924). The chiasters are rare in the type specimen and would easily be overlooked.

DISTRIBUTION

East of North Cape, 55 fm; Waitangi Wharf, Chatham Is.

Stelletta sandalinum Brøndsted (pl. 9e, 14e; fig. 24)

Stelletta sandalinum Brøndsted, 1924, p. 438, fig. a–e.

OCCURRENCE

Cuvier I., 15 fm; Mayor I., 2 fm.

DESCRIPTION

Of the two specimens collected one resembles the type very closely being a flattened, hispid, cushion-shaped sponge. The other, from deeper water, is a large vasiform sponge, not markedly hispid, but having a conspicuous punctuate appearance as mentioned by Brøndsted for the type specimen.

DIMENSIONS:

FLATTENED specimen 3.5 cm long; 3,0 cm wide; 1.8 cm high.

VASIFORM specimen 18.5 cm high; 13.0 cm wide; 7.5 cm thick; walls of vase 1.5–3.0 cm thick; 7.0 cm basal width.

COLOUR: This is not mentioned in the type description. In both specimens collected the sponge has been white to light grey.

TEXTURE: The cortical spicules are densely packed and give the sponge a hard texture even though the skeleton of the interior is lax and compressible.

SURFACE: Rough to the touch, in places extremely hispid. A punctate appearance is conferred by numerous skeletal pores. No oscules are visible.

SKELETON: The arrangement of the skeleton is very typical for the genus. A conspicuous feature is the crustose cortex formed by the dense layer of radially disposed plagiotriaenes.

SPICULES:

MEGASCLERES:

(a) PLAGIOTRIAENES of typical form, as described by Brøndsted (1924).

(b) DICHOTRIAENES, identical with the plagiotriaenes except for the branching cladi. These spicules are rare in the specimen from Mayor Island, but abundant in the Cuvier Island specimen.

(c) OXEAS. These spicules agree in shape and disposition with those described by Brøndsted.

MICROSCLERES:

(a) OXYASTERS with two to six long pointed rays which can be bifurcate. Very abundant interstitially.

(b) OXYASTERS with eight to 20 short pointed rays with a marked centrum.

(c) STRONGYLOSPHERASTERS. These spicules are very small, of variable shape, with eight to 12 short truncated rays and a well developed centrum. They are abundant in the dermal region and in the lining membrane of the canal systems where they form a distinct layer.

SPICULE DIMENSIONS, see p. 53.

REMARKS

Burton (1929a) relegated *Stelletta sandalinum* Brøndsted to *S. maori* Dendy, but gave no reasons for this action. *S. maori* is a variable species as regards microsclere shape and content as well as megasclere morphology, the variation itself characterises the species. The two specimens described as *S. sandalinum* are remarkable for the uniformity of their megascleres and for the shape of their oxyasters. Brøndsted's type description of *S. sandalinum* adequately describes my specimens except that he did not differentiate two categories of oxyasters. This species is consequently reinstated.

DISTRIBUTION

Slipper I., low water.

DIMENSIONS OF *Stelletta conulosa*

Locality	Height	Width Apex	Width Base	Length	Cortical Thickness	Conule Height	Conule Width
	cm	cm	cm	m	mm	mm	mm
Takatu Point, 6 fm	10.0–18.0	1.0	3.0–4.5	2 m	1.0–2.0	0.5–7.0 (4.5)	2.0–4.0 base 0.5–1.0 apex

DIMENSIONS OF *Stelletta maori*

Locality and Author	Habit	Length	Height	Width	Cortical Thickness
		cm	cm	μ	mm
Spirits Bay, 11–20 fm, Dendy Type	Cushion shape	–	2.0	2.2	1.0
Mahia Peninsula, 60 fm	Spreading	5.0	1.0	2.0–3.0	1.0
Menzies Bay, 60 fm	Shallow cup shaped	–	5.5–7.5	5.5 (3.0 base)	2.3
Takatu Point, 6 fm	Large deep vasiform	–	20.0	16.0	1.5
Campbell Plateau, 46 fm	Massive cushion shaped	15.5	8.0	7.0	1.8

SPICULE DIMENSIONS OF *Stelletta maori*

Locality and Author	Dichotriaenes	Large oxeas	Small Oxeas	Oxyasters	Oxyspherasters
	μ	μ		μ	μ
Spirits Bay, 11–20 fm Dendy Type	1800 × 68.0 cladome 500.0	5000 × 10.0 or 2550 × 34.0	–	20.0–36.0	Tylasters, equal in size to oxyasters
Mahia Peninsula, 60 fm	1400–1750 × 32.0–46.0 (1480 × 42.0) Cladome 217.0–380.0	1680–1940 × 28.0–40.0 (1852 × 32.0)	217–232 × 8.0–10.0 (224 × 9.2)	23.0–30.0 (27.0)	12.0–17.0 (13.8)
Menzies Bay, 60 fm	2690–3630 × 28.0–36.0 (3106 × 33.0) Cladome 530.0–550.0	2900–5324 × 10.4–20.0 (3800 × 12.0)	200–246 × 8.0–10.0 (230 × 8.6)	28.0–46.0 (34.0)	5.8–17.0 (12.0)
Takatu Point, 6 fm	780–1880 × 26.0–50.0 (1270 × 38.0) Cladome 360.0–500.0	1800–3060 × 30.0–46.0 (2180 × 40.0)	190–230 × 7.0–9.0 (210 × 8.4)	9.2–20.0 (16.0)	8.0–12.0 (9.3)
Campbell Plateau, 46 fm	2300–3208 × 26.0–46.0 (2780 × 38.0) Cladome 320–376	2800–4700 × 12.8–20.0 (3260 × 16.2)	217–314 × 9.0–10.0 (260 × 9.6)	28.0–40.0 (32.0)	11.0–18.0 (13.4)

SPICULE DIMENSIONS OF *Stelletta novae-zealandiae*

Locality and Author	Plagiotriaenes	Oxeas Large	Dichotriaenes	Oxeas Small	Chiasters	Oxyasters Large	Oxyasters Small
	μ	μ	μ	μ	μ	μ	μ
East of North Cape, 55 fm, Brøndsted Type	1500–3000 × 30.0–40.0	1200–3000 up to 45.0	1500–3000 × 50.0 cladome 350.0	200–400 × 10.0	–	26.0–32.0	–
Waitangi wharf, Chatham Is., Low water	1480–2300 × 30.0–45.0 (1670 × 38.0) Cladome 162.0	1570–2000 × 28.0–40.0 (1860 × 35.0)	2000–2100 × 40.0–50.0 (2020 × 43.0)	75–320 × 6.0–10.0 (230 × 8.6)	6.0–10.0 (8.3)	12.0–30.0 (21.0)	4.0–8.0 (7.1)
Type remeasured	1350–3000 × 30.0–48.0 (2100 × 40.0)	1220–2800 × 26.0–48.0 (1900 × 34.0)	1600–2800 × 38.0–50.0 (2300 × 47.0)	120–360 × 6.0–10.0 (270 × 8.0)	5.0–7.0 (6.3)	18.0–34.0 (26.0)	4.6–8.0

SPICULE DIMENSIONS OF *Stelletta sandalinum*

Locality and Author	Plagiotriaenes	Oxeas	Large	Small	Strongyle spherasters
	μ	μ	μ	μ	μ
Slipper I., low water Brøndsted Type	2000–2500 × 80.0 cladi 160 long	2000–3000 × 52.0	50.0 up to	–	8.0
Cuvier I., 15 fm	1699–3108 × 46.0–75.0 (2320 × 60.0)	1406–2660 × 40.0–56.0 (1980 × 50.0)	50.0–76.0 (69.0)	10.0–17.0 (12.3)	3.4–6.9 (5.8)
Mayor I., 2 fm	1590–2200 × 60.0–72.0 (1920 × 68.0)	2100–2520 × 54.0–58.0 (2360 × 53.0)	60.0–104.0 (76.0)	13.0–23.0 (18.0)	5.7–8.0 (6.2)

Genus **Rhabdastrella** Thiele

Aurora Sollas 1888, p. 187, preoccupied 1887 by Ragonot for a Lepidopteran.
Rhabdastrella Thiele 1903.
Diastra Row 1911.

Rhabdastrella aurora (Hentschel) (pl. 9d)

Stelletta aurora Hentschel, 1909, p. 361, fig. 5 and 6.
Stelletta aurora var. *arenosa* Hentschel, 1909, p. 362, fig. 7.

OCCURRENCE

Foveaux St. Sta. B 270, 15 fm; B 233, 37 fm.

DESCRIPTION

Two irregularly globose specimens of this sponge are available, both externally resembling *Stelletta aurora* var. *arenosa* Hentschel from south-west Australia.

DIMENSIONS:

Rhabdastrella aurora

	Height	Width	Cortical Thickness	Oscule Diameter
	mm	mm	mm	mm
Spec. 1 Sta. B 70	3.0	2.0–2.5	1.0–1.5	–
Spec. 2 Sta. B 233	4.5–5.5	2.0–4.5	1.3–2.7	2.0–7.0

The characteristic feature of these specimens is the coarsely sandy cortex.

COLOUR: In spirit, greyish yellow throughout (Y8/2-Y7/2) slightly paler in the endosome.

TEXTURE: Very firm but compressible. The cortex is hard and brittle, the endosome relatively fleshy.

SURFACE: The surface is uneven overall owing to the irregularity of the sand and shell incorporated into the cortex. No pores are visible but, in the larger specimen, three large oscules are present and open into a single apical oscular depression.

SKELETON: The cortex is composed predominantly of sand grains and shell fragments cemented together by large quantities of spongin A. A crust of small stronglylospheraster forms an uneven dermal spicule layer below which the large spherasters characteristic of the genus occur intermingled with detritus. The latter spicules are not abundant in the cortex in these specimens and in this regard *R. aurora* differs from all other species of this genus.

Disposition of the endosomal spicules is variable. They are predominantly oxeas and are arranged in

(i) A dense tangential layer at the junction between cortex and endosome;
(ii) In an orderly radial fashion just below this and in the deeper parts of the endosome;
(iii) In vague intersecting tracts which have no fixed orientation.

The sand cortex in this species replaces the triaenes functionally and the latter are few in number, variable and often irregular in shape and displaced from their usual superficial position into the endosome where they occur with the radially disposed oxeas.

Microscleres are abundant throughout the endosome and many developmental forms of the large spherasters occur.

SPICULES:

MEGASCLERES:

(a) PLAGIO—to ORTHOTRIAENES which are frequently reduced to diaenes and monaenes and in which the angle between cladi is extremely variable. 750.0–860.0 × 10.0–18.0 μ (825.0 × 13.0 μ) Clads 30.0–170.0 μ.
(b) Straight or slightly curved oxeas which are frequently stylote or strongylote. 562.0–1225.0 × 4.0–24.0 μ (737.0 × 15.0 μ).

MICROSCLERES:

(a) STRONGYLOSPHERASTERS, small with approximately eight to 20 rays roughened or bearing blunt spines for most of their length. Some of these spicules have a micronate termination to each ray and simulate oxyasters. 5.0–20.0 μ (12.0 μ).
(b) STRONGYLOSPHERASTERS large or STERROSPHERASTERS with numerous rays. In addition to these two types of spheraster there are numerous variants present, mainly spicules ranging from comparatively simple oxyasters with tiny centrum through many rayed oxyasters to many rayed oxyspherasters and then to strongylospherasters with smooth blunt rays terminating in the strongylospheraster with small lateral and terminal processes on each ray. Dendy (1916a) has described a similar spicule range in *Rhabdastella* (*Aurora*) *rowi* and considers all to be developmental stages of the rugose strongylospheraster. Row (1911) describes a series of developmental stages for the spherasters of *Rhabdastrella* (*Diastra*) *sterrastrea*. Hentschel (1909) refers to the presence of variable oxyasters in *S. aurora*, but does not figure these spicules.
Dimensions, 15.0–34.0 (26.0 μ).

REMARKS

The name *Aurora* was first used in 1887 by Ragonot for a Lepidopteran and hence was not available when Sollas (1888) used it for a sponge genus. Dendy (1916a) demonstrated clearly that both *Rhabdastrella* (Thiele) and *Diastra* (Row) are synonyms of *Aurora* Sollas. *Rhabdastrella* is used here to receive all species hitherto termed *Aurora*. Dendy drew attention to three pairs of species within *Rhabdastrella* (s.s.), *Diastra* and *Aurora* in which the members were only distinguishable by the presence or absence of triaenes.

Rhabdastrella (*Diastra*) *sterrastrea* (Row)
Rhabdastrella distincta Thiele
Rhabdastrella (*Aurora*) *cribriporosa* (Dendy)
R. (*Aurora*) *rowi* (Dendy)
R. (*Stelletta*) *globostellata* (Carter)
R. (*Aurora*) *providentiae* (Dendy)

It is easy to extend this argument for synonymy of Epipolasid genera with seemingly related Stellettid genera. Burton and Rao (1932) have done so in their far reaching list of synonyms of *Jaspis* which they advocated placing among the Stellettids. This claim can only be supported if undue emphasis is placed upon spicule characteristics of the sponge; form, construction and disposition of the skeleton and histological differentiation are not considered. It is probable that some lipotriaenose Stellettids have been included in *Jaspis* and related Epipolasid genera. However, these are few and the great majority of species reflect the relationship of the Jaspids to the Pachastrellidae. Such genera as *Pachamphilla* and *Jasplakina* are somewhat intermediate between the two groups.

This argument will be expanded elsewhere: suffice to say that the absence of triaenes in sponges with asterose microscleres does not indicate that they have been lost. They may never have been present. For this reason the retention of the Epipolasida as a separate order, although artificial and synthetic, serves a useful purpose. Genera may be withdrawn from this order as evidence relating them to other groups becomes available.

Rhabdastrella aurora is closest to *R. rowi* and *R. sterrastrea* and shows an intermediate condition in the reduction and loss of triaenes. The New Zealand specimens are closer to the lipotriaenose condition than the West Australian specimens. The microscleres of all three of the above species are remarkably similar.

DISTRIBUTION
South-west Australia.

Family GEODIIDAE Gray

Genus **Erylus** Gray

Erylus nigra nov. sp. (pl. 9c, 12f; fig. 25)

OCCURRENCE
7 miles north-east of Alderman I., 56 fm.

HOLOTYPE
Dominion Museum, Por. 23.

DESCRIPTION
A small sponge growing in the irregularities in the surface of a large conglomerate boulder. Two specimens are roughly hemispherical, the third rounded and elongate.

DIMENSIONS: Height 2.0–3.2 cm; width 2.0–3.0 cm; length 6.0 cm.

COLOUR: In life, pale grey to white basally, black above; interior black. In spirit, black.

TEXTURE: Stony and brittle.

SURFACE: The surface is almost completely encrusted with bryozoans and small vermetids, but in places where it can be observed it appears smooth.

SKELETON: A cortical region 1.0–1.6 mm thick is differentiated and this is constituted almost entirely of microscleres, aspidasters, euasters and microrhabds, with rare orthotriaenes. Beneath the cortex is a lax, fibrous, cavernous endosome. The fibres radiate from the base to the cortex and are made up of stout curved strongyles. Between the fibres are spaces up to 4.0 mm across and 2.0–3.0 mm high. Fibres range from 150.0–200.0 μ in diameter.

SPICULES:

MEGASCLERES:

(a) ORTHOTRIAENES which are almost calthrops, with the rhabdome only very slightly longer than the cladi. These spicules are extremely rare, and occur just below the cortical crust of aspidasters.

(b) STRONGYLES. These are the structural spicules of the endosomal tracts. They are relatively stout, untapered and slightly curved.

MICROSCLERES:

(a) ASPIDASTERS of normal ellipsoidal form with hilum in the centre of one surface.

(b) OXYASTERS to STRONGYLASTERS with two to 10 long roughened rays and a well marked centrum.

(c) Small OXYSPHERASTERS each with numerous smooth conical rays and large centrum.

(d) MICROSTRONGYLES, slightly roughened, often centrotylote and curved.

All microscleres except the oxyspherasters are extremely abundant.

SPICULE DIMENSIONS, see p. 56.

REMARKS
This species is in several respects intermediate between *E. alleni* de Laubenfels from Puerto Rico and *E. proximus* Dendy from the Indian Ocean.

In all three species the triaenes are almost calthrops. The diacts are variable from oxeas to strongyles to styles in *E. proximus*. In *E. alleni* they are oxeas, in *E. nigra* strongyles. The microscleres of *E. nigra* and *E. alleni* are very closely comparable in type, but not in size. The aspidasters and strongylasters of *E. nigra* are much larger than in either of the other species while megasclere sizes are roughly comparable in all three species. A notable difference between *E. alleni* and *E. nigra* lies in the texture, the former being spongy, an unusual condition in this genus.

This is the first record of *Erylus* from Australasian waters although several species have been described from between Western Australia and Madagascar and from the New Guinea – Indo – Malayan area.

SPICULE DIMENSIONS OF *Erylus nigra*

Orthotriaenes	Strongyles	Aspidasters	Oxyasters	Oxyspherasters	Microstrongyles
μ	μ	μ	μ	μ	μ
Cladome 930.0–950.0 wide *Rhabdome* 600.0–620.0 *Cladi* 530.0–580.0 × 48.0 (19.0 terminal diameter)	384.0–708.0 15.0–19.0 (534.0 × 17.8)	217.0–242.0 140.0–145.0	33.0–70.0 (49.0)	8.2–12.8 (11.6)	33.0–72.0 × 5.7–8.1 (58.0 × 6.6)

DIMENSIONS OF *Geodia regina*

Locality and Author	Length	Height	Width	Cortical Thickness	Habit	Oscule Dimensions
	cm	cm	cm	mm		mm
East of North Cape, 70 fm, Dendy Type	–	11.2	11.2	Outer 0.5 Inner 1.7	Shallow Cup shape	0.14
Mayor I., 2 fm	5.5	3.0	2.6	Outer 0.7 Inner 1.6	Reniform	Not visible
Mahia Peninsula, 60 fm	6.0	3.5	4.0	Outer 0.6 Inner 1.6	Squat, Shallow cup	Not visible

SPICULE DIMENSIONS OF *Geodia regina*

Locality and Authors	Plagiotriaenes or Dichotriaenes	Anatriaenes*	Oxeas Large	Oxeas Small	Sterrasters	Oxyspherasters	Spherasters	Protriaenes
	μ	μ	μ	μ	μ	μ	μ	μ
North Cape, N.Z., 70 fm, Dendy Type	4600–100.0 cladome 850.0	8000 × 20.0 cladi 81.0 long	4250 × 60.0	240 × 12.0	187.0–153.0	Up to 48.0	4.0	4100 × 17.0
Mayor I., 2 fm	1820–2900 × 36.0–58.0 (2520 × 47.0) cladome 400.0–600.0	3750–4700 × 17.0–22.0 (4100 × 19.0)	1800–3020 × 28.0–46.0 (2380 × 35.0)	210–248 × 9.0–12.0 (230 × 10.0)	110–158.0 (142.0)	18.0–32.0 (29.0)	4.0–6.0 (4.6)	–
Mahia Peninsula, 60 fm	1742–2900 × 38.0–56.0 (2600 × 42.0) cladome 400.0–650.0	3800–5000 × 18.0–25.0 (4260 × 21.0)	1850–3200 × 26.0–42.0 (2400 × 35.0)	220–242 × 9.0–12.0 (235 × 10.0)	120.0–168.0 (145.0)	18.0–28.0 (24.0)	4.0–6.0 (4.8)	1900–2600 × 38.0–54.0 (2420 × 40.0)
Slipper I., Brøndsted	2000–3000	4000–5000	2000–3000	250.0	110.0–160.0	12.0–30.0	Not recognised	4000–5000

* Cortical anatriaenes have been recorded for the type but have not been seen subsequently.

SPICULE DIMENSIONS OF *Geodinella vestigifera*

Locality and Author	Reduced Triaenes or Styles	Oxeas Long Thin	Oxeas Long Stout	Oxeas Short Stout	Sterrasters	Oxyasters	Strongylasters	Strongylo-spherasters
	μ	μ	μ	μ	μ	μ	μ	μ
Dendy, Spirits Bay, 11–20 fm Type	1400 × 25.0	1900 × 20.0	2000 × 120.0	480 × 17.0	140.0 × 120.0	Up to 64.0	24.0	12.0
Brøndsted, East of North Cape,	1200–1650 × 18.0–30.0	1620–2100 × 17.0–23.0	1900–2320 × 60.0–85.0	200–360 × 12.0–16.0	122.0–150.0 (138.0)	12.0–45.0 (28.0)	10.0–20.0 (17.0)	6.0–10.0 (8.2)
55 fm (remeasurement)	(1420 × 27.0)	(1825 × 19.0)	(2100 × 73.0)	(275 × 14.0)				
Cook Strait, 40–100 fm	1150–1700 × 18.0–32.0 (1400 × 28.0)	1525–2100 × 16.0–20.0 (1762 × 18.0)	1950–2210 × 50.0–78.0 (2108 × 62.0)	180–420 × 11.0–17.0 (320 × 14.5)	120.0–162.0 (147.0)	12.0–36.0 (29.0)	10.0–18.0 (16.0)	5.0–10.0 (7.8)

FIG. 24: *Stelletta sandalinum* Brøndsted
Plagiotriaenes.

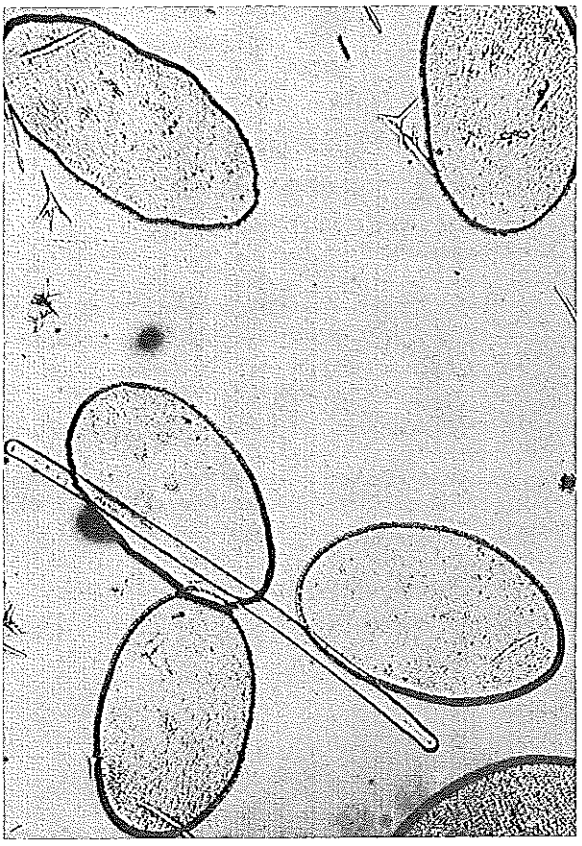


FIG. 25: *Erylus nigra* nov. sp.
Aspidasters, strongyle, microrhabds and oxyasters.

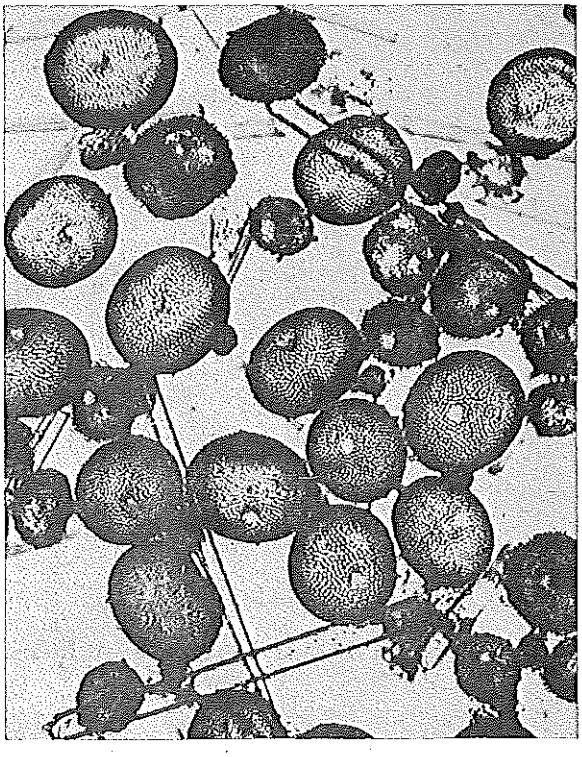


FIG. 26: *Geodinella vestigifera* Dendy
Sterrasters.

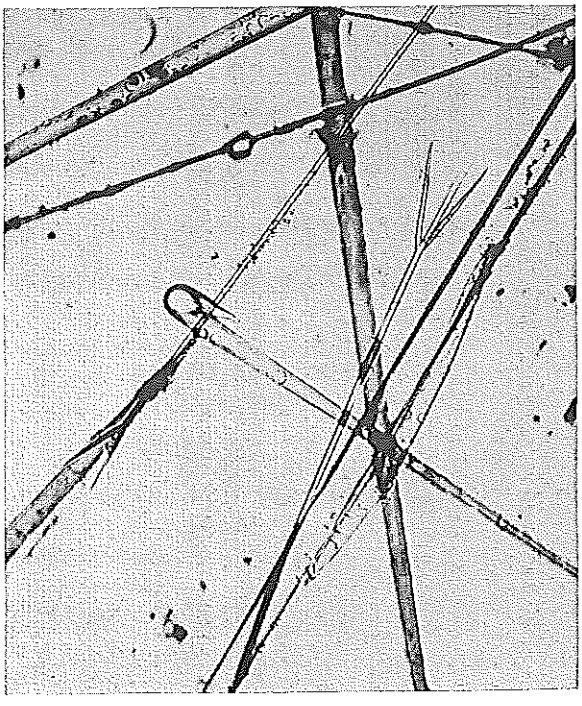


FIG. 27: *Tetilla australe* nov. sp.
Anamonaene, protriaenes and oxeas.

Genus **Geodia** Lamarck

Geodia regina Dendy (pl. 9a, 14j)

Geodia regina Dendy, 1924, p. 308, pl. V, fig. 5; pl. VIII, fig. 16–22.
Geodia regina, Brøndsted, 1924, p. 440.

OCCURRENCE
Mayor I., 2 fm; off Mahia Peninsula, 60 fm.

DESCRIPTION
Both specimens are massive, subspherical to reniform in shape, each growing attached by its long axis to the upper surfaces of stones.

DIMENSIONS, see p. 56.

COLOUR: In life, black above to pale yellowish at the base (rY8/4); in spirit, black above, pale fawn basally (yY-R8/4).

TEXTURE: Hard and incompressible.

SURFACE: Rough to the touch owing to the projecting pile of cortical oxeas.

SKELETON: The arrangement of the skeleton differs very little within *Geodia* and both specimens of *G. regina* collected coincide perfectly with the type in this respect. The constitution of the skeleton varies slightly in my two specimens. In the specimen from Mayor Island the cortical triaenes are plagiotriaenes, not dichotriaenes as in the holotype and protriaenes are absent. The Mahia specimen retains the dichotriaenes.

SPICULES:

MEGASCLERES:

(a) DICHOTRIAENES OR PLAGIOTRIAENES with relatively wide spreading cladi and stout evenly tapered shafts.
(b) OXEAS. These are straight, stout spicules making up the choanosomal skeleton.
(c) ANATRIAENES with long, slender, straight shaft and short, pointed cladi.
(d) Cortical OXEAS, short, stout and slightly curved spicules.

MICROSCLERES:

(a) STERRASTERS with a slight dorsoventral flattening and a distinct hilum on one flattened surface. Developmental forms with long rays occur frequently in the choanosome.
(b) OXYSPHERASTERS
(c) Very small SPHERASTERS with short truncate rays which are very frequently absent, the spicules being reduced to mere knobs.

SPICULE DIMENSIONS, see p. 56.

REMARKS
This species, as may be expected in *Geodia*, has proved to be variable in form and in details of spiculation. The spicule dimensions in both new specimens described here are substantially smaller than in the holotype. As the whole genus shows variation of equivalent order this is not considered significant. Brøndsted's (1924) specimen appears, from the few measurements given, to provide continuity in spicule dimensions between my specimens and the holotype.

DISTRIBUTION
East of North Cape, 70 fm; Slipper I., low tide.

***Geodia rex** Dendy

Geodia rex Dendy, 1924, p. 311, pl. VI, fig. 4, pl. VIII, fig. 23–28.

REMARKS
This species is notable among the species of *Geodia* for the great size of both its megascleres and its sterrasters.

DISTRIBUTION
Off Three Kings Is. (no depth given).

Genus **Geodinella** Lendenfeld

Geodinella vestigifera Dendy (pl. 10b,d; 15a; fig. 26)

Geodinella vestigifera Dendy, 1924, p. 313, pl. VIII, figs. 29–37.
Geodinella vestigifera, Brøndsted, 1924, p. 441.
Geodinella vestigifera, Burton, 1929a, p. 415.

OCCURRENCE
Cook Strait, 40–100 fm; east of North Cape, 55 fm.

DESCRIPTION
An erect tuberous or subspherical, irregularly mamillate sponge, externally indistinguishable from members of the genus *Geodia*. Two specimens of this sponge were available, one collected by the Victoria University Zoology Department (VUZ 55), the other is the specimen recorded by Brøndsted (1924).

DIMENSIONS:

Geodinella vestigifera

Locality and Author	Height	Width	Length	Cortical Thickness	Oscule
	cm	cm	cm	mm	mm
Spirits Bay, 11–20 fm	–	2.0	4.0	–	0.5
Dendy Type East of North Cape, 55 fm	8.5	4.5	–	1.4	0.5–2.0 (1.3)
Brøndsted Cook Strait 40–100 fm	10.0	8.0	16.0	1.4	0.4–2.1

COLOUR: In life, pale pinkish red (yR7/2); in spirit, white.

TEXTURE: Hard and incompressible.

SURFACE: The surface is completely smooth. The tips of the tuberous projections or mamillae are slightly concave and in the concavity are the oscular chones which are up to 3.0 cm in diameter.

SKELETON: The cortex has a thick layer of sterrasters, 0.9–1.2 mm in extent. This is bounded by a dermal layer of small stronglylospherasters. The skeleton of the

choanosome is lax in the region immediately below the cortex, but is compacted into spicule tracts in the centre of the sponge. All tracts are relatively short and the overall arrangement of the skeleton is confused.

SPICULES: The spicules conform closely in shape and type to those of the holotype.

SPICULE DIMENSIONS, see p. 56.

REMARKS

My observations on these specimens suggest that there is only one category of oxyasters, not two as suggested by Dendy (1924) and that the large oxeas are a normal component of the skeleton, occurring in great numbers in the deeper regions of the choanosome.

Except for the reduction of triaenes, the six members of the genus *Geodinella* are perfectly typical of *Geodia*. The New Zealand species, *G. vestigifera*, is very close to *Geodia regina*. In the genus *Stelletta* several species show this great reduction of the triaenes whilst being typical in all other respects, yet these species are not assigned to a separate genus. The separation of *Geodinella* from *Geodia* is unnecessary and somewhat arbitrary and it is likely that it will be synonymised with *Geodia*.

DISTRIBUTION

Spirits Bay, 11–20 fm; east of North Cape, 55 fm, McMurdo Sound.

Family TETILLIDAE Sollas

Genus **Craniellopsis** Topsent

*Craniellopsis zetlandica (Carter)

RESTRICTED SYNONYMY

Tethya zetlandica Carter, 1872, p. 417.
Craniella zetlandica, Sollas, 1888, p. 55.
Tethyopsilla zetlandica, Lendenfeld, 1903, p. 36.
Craniellopsis zetlandica, Topsent, 1913a, p. 14, pl. II, fig. 10.
Craniella zetlandica, Dendy, 1924, p. 318.
Craniellopsis zetlandica, de Laubenfels, 1936, p. 171. (For further synonymy see Lendenfeld, 1903; Dendy, 1924.

DISTRIBUTION

North and South Atlantic; Indian Ocean; South Pacific Ocean; east of North Cape, New Zealand, 70 fm.

Genus **Tetilla** Schmidt

Tetilla australe nov. sp. (pl. 9b, 15d; fig. 27)

OCCURRENCE

Three Kings, 30–60 fm, Sta. B 93.

HOLOTYPE

Deposited in the N.Z. Oceanographic Institute, Type Reg. No. 34.

DESCRIPTION

The single specimen, here designated holotype, is a hispid, ovate sponge with no apparent point of attachment.

DIMENSIONS: 1.4 mm long; 1.1 mm wide.

COLOUR: In life, yellow (rY7/4), in spirit, brown (rY5/4).

TEXTURE: Firm but compressible.

SURFACE: Hispid with projecting spicule brushes made up of protriaenes, anatriaenes and oxeas, with protriaenes predominating. All spicule brushes have a strong slant to the right viewed from below. Neither porocalyces nor oscules are visible beneath the surface spicules.

SKELETON: The skeleton is made up of tracts radiating from the centre and terminating beyond the surface. In the centre of the sponge, oxeas are the main components of the spicule tracts, nearer the surface they are composed chiefly of anamonaenes and oxeas. Superficially anamonaenes, protriaenes and anatriaenes almost completely replace the large oxeas, the smaller oxeas are, however, concentrated in the subdermal region. Spicule tracts range from 0.6–1.2 mm in diameter. No clear ectosomal region is differentiated.

SPICULES:

MEGASCLERES:

(a) OXEAS, long, relatively stout, slightly curved spicules; these are the structural spicules concentrated in the subdermal region.

(b) OXEAS, small, irregularly scattered throughout the sponge, abruptly tapered, slightly curved.

(c) ANATRIAENES with relatively long, sharply recurved clads and slender shaft tapering to a wavy lash-like point.

(d) ANAMONAENES. These are stout spicules with recurved clad, they are stouter than the anatriaenes and possibly replace larger protriaenes. Occasional anadiaenes are present.

(e) PROTRIAENES. Fine spicules with thin cladi and a relatively straight shaft which tapers to a filiform point.

MICROSCLERES:

SIGMASPIRAE of quite normal form, extremely abundant and very finely roughened.

SPICULE DIMENSIONS OF *Tetilla australe*

Spicules	Locality Three Kings 30–60 fm.
	μ
Oxeas (large)	1457–2072 × 17.3–34.7 (1826 × 27.0)
Oxeas (small)	350–680 × 8.0–12.0 (460 × 10.6)
Anatriaenes	4780–6280 × 11.5–13.9 (5808 × 12.6) cladi 80.0–106.0 long
Anamonaenes	2900–3800 × 22.0–30.0 (3492 × 25.0) (clad 70.0 long)
Protriaenes	1380–1600 × 4.0–5.6 (clads 72.0 long)
Sigmaspirae	11.5–13.9 (12.7)

REMARKS

Tetilla australe is distinct from other Indo-Pacific and Antarctic tetillids in having a preponderance of anamonaenes which functionally replace larger protriaenes. The only species to which *T. australe* can be compared closely is *T. bonaventura* Kirkpatrick, from South Africa, which has a distinctly different form although coming relatively close in spiculation to the New Zealand species. *Tetilla* (*Tethya*) *stylifera* Lendenfeld from the Antarctic has a few anamonaenes but these are of peculiar form.

Genus **Cinachyra** Sollas

*Cinachyra novae-zealandiae** Brøndsted

Cinachyra novaezealandiae Brøndsted, 1924, p. 445, fig. 5, a–f.

REMARKS

In external features this species is similar to *Tetilla australe*, but there are major differences in spiculation even if the "siliceous threads" of this species are equated with the whip-like anatriaenes of *T. australe*. Brøndsted did not clearly characterise the oscular and poral openings of *C. novae-zealandiae* as porocalyces and without reference to the type specimen it is not possible to confirm that this sponge is a *Cinachyra* rather than a *Tetilla*.

DISTRIBUTION

Hen and Chicken I., 50 fm.

Cinachyra uteoides Dendy (pl. 10c, 15e)

Cinachyra uteoides Dendy, 1924, p. 318, pl. X, fig. 4.

OCCURRENCE

Three Kings, 30–60 fm, Sta. B 93.

DESCRIPTION

Two specimens were collected, both very similar to the holotype in appearance. They are ovoid sponges, slightly narrower apically, slightly flattened basally, where they had been broadly attached to a sandy substratum.

DIMENSIONS: Height 2.4 cm and 5.6 cm; width 2.0 cm and 5.0 cm; thickness 1.0 cm and 3.0 cm.

COLOUR: In life, light yellow (rY8/6); in spirit, biscuit, (rY8/4).

TEXTURE: Firm, compressible, rather brittle.

SURFACE: The surface of the sponge is dotted with openings of porocalyces which are concentrated on the apical third of the sponge. Dendy (1924) mentions that the apical porocalyces are elevated and conical and surmised that these were exhalant. Since these apical porocalyces are open in my specimens I can confirm that they are complex exhalant structures. The surface between openings is rough and sandpapery to the touch owing to the slightly projecting dermal oxeas.

SKELETON: This was well described by Dendy (1924) and the present specimens do not differ in any notable feature.

SPICULES. The spiculation likewise resembles that of the type, although the protriaenes are relatively rare.

SPICULE DIMENSIONS, see p. 61.

DISTRIBUTION

Three Kings, 100 fm (*Terra Nova* Sta. 90).

Order **HOMOSCLEROPHORIDA** Dendy

Family HALINIDAE de Laubenfels

Subfamily HALININAE de Laubenfels

Genus **Pachastrella** Schmidt

Pachastrella incrustata nov. sp. (pl. 15; fig. 28)

OCCURRENCE

North Cape, 100 fm, this specimen is designated holotype; Three Kings, 30–60 fm.

HOLOTYPE

Dominion Museum, Por. 25. (Paratype: N.Z.O.I. No. P32.)

DESCRIPTION

Two specimens were obtained, one was thinly encrusting in patches on the surface of *Ancorina alata* and the other, the holotype, a fragment of a low-lying spreading sponge, very similar in appearance to Dickinson's specimen, (1945, pl. 87, fig. 174) of *Pachastrella dilifera* from California.

DIMENSIONS:

ENCRUSTING specimen: Length 0.6–1.2 cm, width 0.4–1.0 cm, thickness 1.2 mm.

SPREADING specimen: Length 2.8 cm, width 1.8 cm, thickness 0.9 cm.

COLOUR: In life, red-brown (rY-R4/4); in spirit, identical.

TEXTURE: Soft, compressible, easily torn.

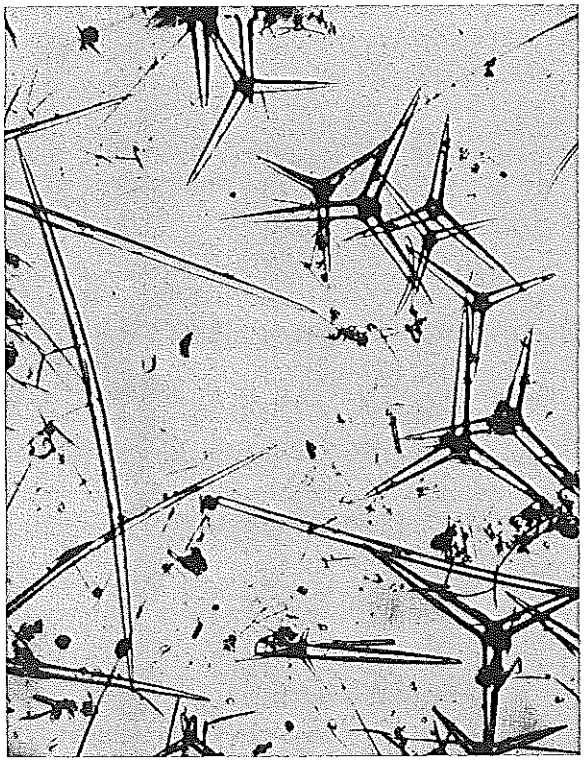
SURFACE: The surface is granular, minutely and faintly hispid. No pores or oscules are visible.

SKELETON: The skeleton shows no organisation into spicule tracts, the endosome is a confused mass of large oxeas and calthrops. In the ectosomal region, the oxeas tend towards a radial arrangement, but this is very irregular. Any projecting spicules are tangentially disposed.

SPICULES:

MEGASCLERES:

(a) CALTHROPS, stout spicules of normal form. Two spicules were observed with a single dichotomous clad.



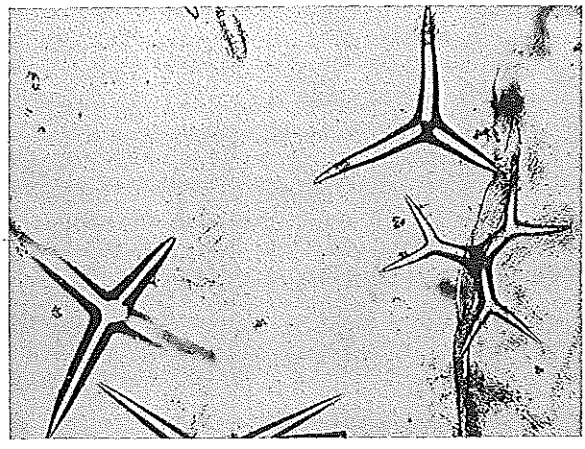


FIG. 29: *Corticellopsis novaezealandiae* Bergquist
Calthrops and dichotriaene.

FIG. 28: *Pachastrella incrustata* nov. sp.
Calthrops and oxeas.

(b) OXEAS long, stout, slightly curved spicules which taper evenly to sharp points. Some very fine, long oxeas occur and are probably developmental stages of the structural spicules.

MICROSCLERES:

(a) MICROXEAS; smooth, sharply-pointed spicules which may be once or twice centrotylote.

(b) SPIRASTERS; small, smooth spicules with nine to 20 spines.

(c) METASTERS; smooth spicules with three to seven long, sharply pointed rays.

SPICULE DIMENSIONS, see below.

REMARKS

Pachastrella incrustata is closely comparable to *P. cribum* Lebwohl from Japan, the New Zealand species being differentiated by its lack of a specialised cortex (cf. *P. dilifera* Dickinson 1945) and the aporous nature of the surface. The spiculation, habit and colour of the two species are very close and it is possible that, if more complete material from both localities were available, they would be considered identical.

SPICULE DIMENSIONS OF *Cinachyra uteoides*

Locality	Protriaenes μ	Trichotriaenes μ	Anatriaenes μ	Oxeas Thin μ	Oxeas Stout μ	Sigmaspirae μ
Three Kings, 100 fm, Dendy Type	6300 × 25.0 cladi up to 140 × 11.0	Not measured	2500 × 17.0 cladome 120.0 diameter	4300 × 50.0	Up tp 2600 × 80.0	12.0
Three Kings, 30–60 fm	3800–4600 × 17.0–26.0 (4320 × 22.0) cladi 120.0–152.0	2600–2900 × 3.8–5.6 (2806 × 5.0)	2400–2915 × 12.0–15.6 (2780 × 14.8)	2900–3400 × 38.0–42.0 (3120 × 39.8)	1200–1740 × 40.0–72.0 (1582 × 57.0)	8.0–14.0 (12.2)

SPICULE DIMENSIONS OF *Pachastrella incrustata*

Locality	Oxeas μ	Calthrops μ	Microxeas μ	Metasters μ	Spirasters μ
North Cape, 100 fm	1450–2620 × 30.0–46.0 (1860 × 38.0) also 1200–1800 × 2.6–3.0	Rays 189–500 × 20.0–50.0 (397 × 40.0) whole cladome 339–700 (562)	90–170 × 4.0–5.0 (139 × 4.6)	17.0–38.0 (29.0)	11.5–17.0 (14.8)

Subfamily CORTICINAE Vosmaer

Genus **Corticellopsis** nom. nov.

Corticellopsis novaezealandiae (Bergquist) (pl. 15c; fig. 29)

Corticella novaezealandiae Bergquist, 1961, p. 45, fig. 17a, b, c.

OCCURRENCE
Rangitoto I.

HOLOTYPE
Dominion Museum, Por. 7.

DESCRIPTION
An encrusting to massive and depressed sponge growing on the undersurfaces of stones at just above low-tide level.

DIMENSIONS: Length 3.0–5.0 mm, width 2.6–4.0 cm, thickness 0.5–0.8 cm.

COLOUR: In life, white; in spirit, pale brown.

SURFACE: The surface is smooth, but undulate and coarsely granular to the touch. Oscules are 0.6–0.8 mm in diameter.

SKELETON: The skeleton is a compact interlocked mass of calthrops with no differentiation into regions and with no definite alignment.

SPICULES:

MEGASCLERES:

Calthrops usually of normal form, sometimes with five to six rays and occasional dicho-modification.

MICROSCLERES:

(a) STRONGYLASTERS with up to 10 short, truncate rays, which may be reduced to mere knobs.

(b) OXYASTERS of normal form, with five to seven smooth rays. These spicules are never abundant.

SPICULE DIMENSIONS OF *Corticellopsis novaezealandiae*

Locality	Calthrops	Strongylasters	Oxyasters
	μ	μ	μ
Rangitoto Island Type	Rays 120–210 × 26.0–38.0 (190 × 32.8) Total diameter 170.0–262.0 (221.0)	8.0–13.0 (11.0)	50.0–70.0 (58.0)

REMARKS

This sponge was originally referred to *Corticella* Sollas (Bergquist 1961a). That name was preoccupied by Ehrenberg (1872) for a Protozoan and a new generic name is required. Lendenfeld (1903) referred the type species of *Corticella, C. stelligera* to *Calthropella*. This transfer has not been recognised by de Laubenfels on the grounds that *Calthropella* Sollas has, in addition to calthrops, triads and bent diacts, neither of which occur in *C. stelligera*, or in *C. novaezealandiae*.

Corticellopsis novaezealandiae differs from *Corticellopsis* (*Corticella*) *stelligera* in the dimensions of all spicules.

Genus **Plakina** Schulze

Plakina monolopha Schulze (pl. 12h)

RESTRICTED SYNONYMY

Plakina monolopha Schulze, 1880, p. 407, pl. XX, figs. 1–7.
Plakina monolopha, Burton, 1929, p. 414.
Plakina monolopha, Bergquist, 1961a, p. 47.

OCCURRENCE
Rangitoto I.; Narrow Neck; Ladies Bay; Akaroa (Wainui).

DESCRIPTION
An encrusting sponge, common under rocks in the mid to low tidal region in the above localities.

DIMENSIONS: Length up to 12.0 cm; width up to 8.0 cm; thickness 2.5 cm.

COLOUR: In life, orange (yY-R7/6) to yellowish-orange (yY-R6/8); in spirit, white to grey.

TEXTURE: Extremely soft and crumbly.

SURFACE: The surface of this sponge is very characteristic. Numerous oscules 0.3–0.4 mm in diameter are scattered at intervals of 1–2 mm. The oscules are sunk below the surface of the sponge and the latter is slightly raised and lumpy between the oscular pits. The overall appearance of the surface of the sponge resembles the inflorescence of the Umbelliferae. Toward the growing margin of the sponge the oscules decrease in size and frequency and finally disappear. At the point where they disappear the margin rolls under, lifts from the substratum and the continuation of the dermal membrane is plainly visible on the undersurface of the sponge. This results in the sponge being very loosely attached to the substratum.

SKELETON: The skeleton is a confused mass of small calthrops and microxea with no differentiation into layers. A dermal membrane 0.1 mm thick is present and contains all spicule types.

SPICULES:

MEGASCLERES:

(a) CALTHROPS. These spicules are mainly triads but four, five, and six rayed forms are common. The rays are usually simple and straight, but can be irregularly curved and show dicho- modifications.

(b) MICROXEAS. Sharply tapered, smooth spicules with a central expansion and usually a central flexure.

MICROSCLERES: Monolophotriaenes of typical form.

SPICULE DIMENSIONS OF *Plakina monolopha*

Locality	Calthrops	Microxeas	Lophotriaenes
	μ	μ	μ
Narrow Neck Reef	42–54 (48) rays 20–28 × 3.6 (26 × 3.6)	72–96 × 4.0 (78 × 4.0)	12.0 high 11.0–13.0 × 2.0 (basal rays) 6.9–8.0 (cladome)

REMARKS

The skeleton and habit of this sponge accord well with earlier descriptions. The chief difference in the New Zealand specimens is the absence of specialised oscules.

DISTRIBUTION

Mediterranean; Atlantic coast of France; West Indies; Antarctic; Japan.

Plakina trilopha Schulze (pl. 12g)

RESTRICTED SYNONYMY:

Plakina trilopha Schulze, 1880, p. 442, pl. XX, figs. 8–11.
Plakina trilopha, Burton, 1929, p. 414.
Plakina trilopha, Bergquist, 1961, p. 47.

OCCURRENCE

Rangitoto Island, under mid-littoral rocks.

DESCRIPTION

An encrusting sponge, always of small size.

DIMENSIONS: 2.0 × 1.2 cm; thickness, 1.3–1.8 mm.

COLOUR: In life, deep cream (Y-R-Y8/6) to purple (P3/4).

SURFACE: Smooth and granular with no pores or oscules visible. As in *P. monolopha*, this sponge lifts from the substrate at the growing margin and rolls under.

SKELETON: A compact mass of calthrops and microxeas with no regional differentiation.

SPICULES:

MEGASCLERES:

(a) CALTHROPS, usually triads with smooth, straight rays and no tendancy toward being dichotomous.

(b) MICROXEAS, sharply tapered and irregularly centrotylote.

MICROSCLERES:

TRILOPHOTRIAENES of normal form, often with considerably twisted basal rays.

SPICULE DIMENSIONS OF *Plakina trilopha*

Locality	Calthrops	Microxeas	Lophotriaenes
Rangitoto Island	48–58 (50) μ rays 24–29 × 4.6 (27 × 4.6)	67–72 × 5.0–5.5 μ (69 × 5.2)	height: 27–30 μ shaft: 16–20 × 3.6–4.0 cladome: 20–28 (23)

REMARKS

This species conforms closely in habit and spiculation with other described specimens, but, as with *P. monolopha*, differs in the lack of oscular tubes.

DISTRIBUTION

Mediterranean; Antarctic.

Family CHONDROSIIDAE Schulze

(a) Brøndsted (1924) records *Chondrosia collectrix* (now *C. chucalla* de Laubenfels) from New Zealand (New Plymouth). He states, however, that he was very dubious about his identifications. I have examined Brøndsted's specimen from the Copenhagen Museum and cannot agree that it is *Chondrosia*. It is probably a species of *Psammopemma* but, in view of the dearth of information on these "sand sponges", it cannot be identified further.

(b) Burton (1934b) records *Chondrilla nucula* from New Zealand and quotes Dendy (1924, p. 314) as his authority, the specimen described by Dendy is, however, from Southern Trinidad. This sponge has not yet been collected in New Zealand, but occasional chondrillid spicules occur in keratose sponges in northern waters. This indicates that the sponge may, in fact, be present.

Order **LITHISTIDA** Schmidt

Family SCLERITODERMIDAE Sollas

Genus **Aciculites** Schmidt

Aciculites pulchra Dendy (pl. 10a; fig. 30)

Aciculites pulchra Dendy, 1924, p. 315, pl. VI, fig. 1, 1a.

OCCURRENCE

Off Mahia Peninsula, 60 fm.

DESCRIPTION

The specimen coincides perfectly with Dendy's specimens from North Cape and is a fragment from a large, curved, undulate, lamellate sponge. The outer, convex surface is the oscular surface, the inner concave surface is presumably the poral surface.

DIMENSIONS: Height 9.0 cm; width 8.0 cm; thickness 2.0 cm.

COLOUR: In life, and in spirit, reddish brown (rY-R4/4).

TEXTURE: Stony.

SURFACE: The surface is granular and smooth on the inner surface of the lamella, granular and raised into small hemispherical oscular projections on the outer surface. The oscules are abundant, 0.6–1.0 mm in diameter and 2.0–2.4 mm apart.

SKELETON: The skeleton is as described by Dendy (1924), except that large, stout oxeas are found in addition to the strongyles and desmas. The oxeas are radially disposed and occur singly or in groups of up to four just below the oscular surface. The oscular channels originate in the centre of the lamella and run without branching to the surface. They are walled by interlocked desmas.

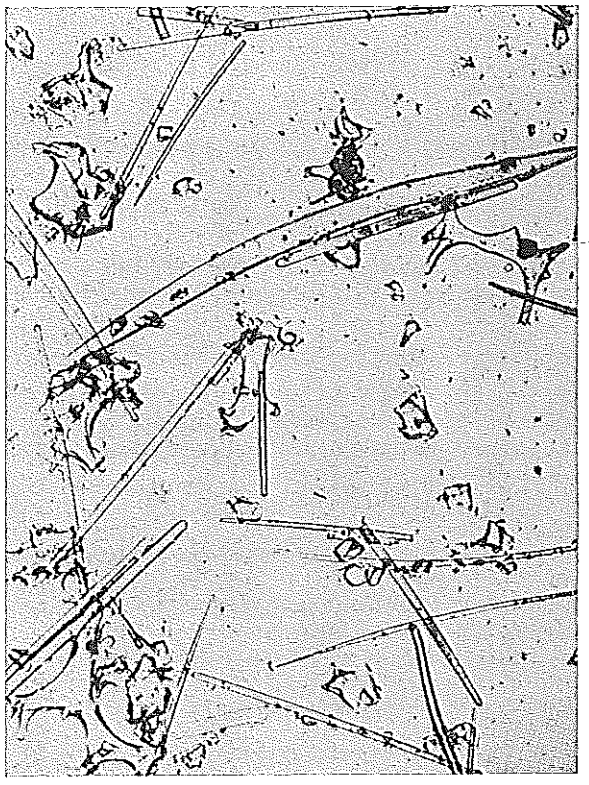


FIG. 30: *Aciculites pulchra* Dendy
Oxeas, strongyles and shattered desmas.

SPICULES:

MEGASCLERES:

(a) MONOCREPID DESMAS, richly tuberculated.

(b) OXEAS, stout, fusiform spicules.

SPICULE DIMENSIONS OF *Aciculites pulchra*

Locality and Author	Desmas	Strongyles	Oxeas
	μ	μ	μ
Dendy, North Cape Type, 70 fm	340	340 × 12.0	Not recorded
Mahia Peninsula, 60 fm	300–387 (361)	314–411 × 5.7–12.6 (368 × 10.2)	510–663 × 23.0–30.0 (566 × 28.0)

REMARKS

De Laubenfels (1936) grouped *Aciculites* Schmidt in the family Gastrophenellidae of the Hadromerida, presumably by equating the inequiended strongyles of *Aciculites* with tylostrongyles. This is an unjustified extrapolation from the literature. Wilson (1925) placed *Aciculites* in the Scleritodermidae following Sollas (1888) and this, pending a much needed revision of the Lithistida is the best solution. De Laubenfels (1936), Burton (1929a) and Dendy (1905) have all expressed the opinion that the Lithistida are polyphyletic but no reclassification has yet been proposed which is a great improvement upon Sollas's arrangement of the group.

It is likely that *Aciculites pulchra* is identical with *Aciculites ciliata* Wilson from the Philippines. The two sponges are strikingly similar in form and spiculation, the only major difference is the presence of stout oxeas in *A. pulchra*, compared with slender oxeas in *A. ciliata*. Dendy (1924) did not record oxeas in the type of *A. pulchra*, they are however abundant in my specimen, which in all other features is identical to the type.

DISTRIBUTION

East of North Cape, 70 fm.

Family THEONELLIDAE Lendenfeld

Genus **Lepidothenea** de Laubenfels

***Lepidothenea incrustans** (Dendy)

Lepidospongia incrustans Dendy, 1924, p. 317, pl. XIII, fig. 1–3.
Lepidothenea incrustans, de Laubenfels, 1936, p. 176.

REMARKS

De Laubenfels (1936) pointed out that *Lepidospongia* was preoccupied and proposed *Lepidothenea* for this encrusting lithistid.

DISTRIBUTION

Three Kings, 100 fm.

REFERENCES

BERGQUIST, P. R., 1961a: A collection of Porifera from northern New Zealand with descriptions of 17 new species. *Pacif. Sci. 15 (1):* 33–48.

——— 1961b: Demospongiae (Porifera) of the Chatham Islands and Chatham Rise, collected by the Chatham Islands 1954 Expedition. *N.Z. Dep. sci. industr. Res. Bull. 139(5):* 169–206.

——— 1961c: The Keratosa (Porifera) collected by the Chatham Islands 1954 Expedition. *N.Z. Dep. sci. industr. Res. Bull. 139 (5):* 207–19.

——— 1965: The Sponges of Micronesia, Part I. The Palau Archipelago. *Pacif. Sci. XIX (2):* 123–204.

BOWERBANK, J. S., 1864: A monograph of the British Spongiidae I. Ray Soc. Publ. 1–290.

——— 1866: A monograph of the British Spongiidae II. Ibid.: 1–388.

——— 1873: Contributions to a general history of the Spongiidae. Pt. IV. *Proc. zool. Soc. Lond.:* 3–25.

——— 1874: A monograph of the British Spongiidae III. Ray Soc. Publ.: 1–360.

——— 1877: Description of five new species of sponges discovered by A. B. Meyer on the Philippine Is and New Guinea. *Proc. zool. Soc. Lond.:* 456–64.

——— 1882. A monograph of the British Spongiidae IV. Edited with additions by the Rev. A. M. Norman. (Supplementary.) *R. Soc. Publs.:* i–xxii, 1–250.

BRØNDSTED, H. V., 1923: Sponges from the Auckland and Campbell Islands. Papers from Dr Th. Mortensen's Pacific Expedition 1914–16. *Vidensk Meddr Dansk naturh. Foren. 75:* 117–67.

——— 1924: Sponges from New Zealand, Pt. I. Papers from Dr Th. Mortensen's Pacific Expedition 1914–16. *Vidensk Meddr. Dansk naturh. Foren. 77:* 435–83.

——— 1926: Sponges from New Zealand. Pt II. *Vidensk. Meddr. Dansk. naturh. Foren. 81:* 295–331.

——— 1934: Resultats Sci. du Voyage aux Indes Orientales Néerlandaises. Sponges. II (15): 3–26.

BURTON, M., 1924: A revision of the sponge family Donatiidae. *Proc. Zool. Soc. Lond.:* 1033–45.

——— 1926a. *Stelletta purpurea*, Ridley and its variations. *Ann. Mag. nat. Hist. 9 (18):* 44–9.

——— 1926b: Description of South African Sponges collected in the South African Marine Survey II. Myxospongida and Astrotetraxonida *Rep. Fish. Mar. biol. Surv. S. Afr. 9:* 1–29.

——— 1927: A revision of the genera and species contained in Lendenfeld's "Die Chalineen des australischen Gebietes". *Ann. Mag. nat. Hist. 9 (20):* 289–96; 802–12.

——— 1928: Report on some deep sea sponges from the Indian Museum collected by the RIMS *Investigator*. *Rec. Indian Mus. 30 (1):* 109–38.

——— 1929a: Porifera II. Antarctic sponges. *Nat. Hist. Rep. "Terra Nova" Exped. 4 (4):* 393–458.

——— 1929b: Descriptions of South African sponges collected in the South African Marine Survey II. The "Dithistidae" *Rep. Fish. mar. biol. Surv. Un. S. Afr. 7:* 1–12.

——— 1930a. Report on a collection of sponges from South Georgia and from Campbell Island, South Pacific, obtained by Dr Kohl-Larsen. *Senckenberg. biol. 12 (6):* 331–35.

——— 1930b: Norwegian sponges from the Norman collection. *Proc. zool. Soc. Lond. (2):* 487–546.

——— 1932a: Report on a collection of sponges made in South Sakhalin by Mr Tomoe Urita. *Sci. Rep. Tôhoku Univ. 4:* (7), (2): 195–206.

——— 1932b: Sponges. *Discovery Rep. 6:* 237–392.

——— 1934a: Sponges. *Sci. Rep. Gr. Barrier Reef Exped. 4 (14):* 513–614.

——— 1934b: Sponges. *Zool. Res. Swed. Antarct. Exped. (2):* 1–58.

——— 1937: The Littoral Fauna of Krusadi Island. Porifera. *Bull. Madras Govt. Mus. nat. Hist. n.s. 1 (2) pt. 4:* 1–58.

——— 1938: Non-calcareous sponges. *Sci. Rep. Aust. Antarct. Exped. Ser. C. 9 (5):* 5–22.

——— 1940: Las Esponjas Marinas del Museo Argentino de Ciencias Naturales. *An. Mus. Argent. Cienc. nat. 40:* 95–121.

——— 1946: Notes on certain species of *Geodia* described by Oscar Schmidt. *Ann. Mag. nat. Hist. 11 (13):* 856–60.

——— 1948: The ecology and natural history of *Tethya aurantium* Pallas. *Ann. Mag. nat. Hist., 12 (1):* 122–30.

——— 1953. *Suberites domuncula* (Olivi); its synonymy, distribution and ecology. *Bull. Br. Mus. nat. Hist. Zool. 1 (12):* 353–78.

——— 1956: The sponges of West Africa. *Atlantide Rep. 4:* 111–47.

——— 1959a: Sponges. *Murray Exped. sci. Rep. 10 (5):* 151–281.

——— 1959b: The Zoology of Iceland II. (3 and 4): 1–71.

——— and RAO, S., 1932: Report on the shallow water marine sponges in the collection of the Indian Museum. *Rec. Indian Mus. 34 (3):* 299–356.

CARTER, H. J., 1872: On two new sponges from the Antarctic sea and on a new species of *Tethya* from Shetland; together with observations on the reproduction of sponges commencing from zygosis of the sponge animal. *Ann. Mag. nat. Hist. 4 (9):* 409–35.

——— 1874: Descriptions, figures of deep sea sponges from Atlantic Ocean dredged up on board HMS *Porcupine* chiefly in 1869. *Ann. Mag. nat. Hist. 4 (14):* 207–21; 245–57.

——— 1876: Descriptions and figures of deep sea sponges from the Atlantic Ocean, dredged up on board HMS *Porcupine*, chiefly in 1869. *Ann. Mag. nat. Hist. 4 (18)* 226–40; 307–24; 388–410; 458–79.

——— 1879: Contributions to our knowledge of the Spongida. *Ann. Mag. nat. Hist. 5 (3):* 284–304; 343–60.

——— 1880: Report on specimens dredged from the Gulf of Manaar and presented to the Liverpool Free Museum by Capt. W. H. Cawne Warren. *Ann. Mag. nat. Hist. 5 (6):* 35–61; 129–56; 457–510.

——— 1885a: Descriptions of sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. Mag. nat. Hist. 5 (15):* 107–17; 196–222; 301–21.

——— 1885b: Ibid. *5 (16):* 277–94; 347–68.

——— 1886a: Ibid. *5 (17):* 40–53; 112–27; 431–41; 502–16.

——— 1886b: Supplement to the descriptions of Mr J. Bracebridge Wilson's Australian sponges. *Ann. Mag. nat. Hist. 5 (18):* 271–90; 369–79; 445–66.

DENDY, A., 1889: Report on a second collection of sponges from the Gulf of Manaar. *Ann. Mag. nat. Hist. 6 (3):* 73–99.

——— 1894–1895: Catalogue of non calcareous sponges collected by J. Bracebridge Wilson in the neighbourhood of Port Phillip Heads. Part I. *Proc. R. Soc. Vict. 2 (7):* 232–60.

——— 1895–1896: Ibid. Part II. *Proc. R. Soc. Vict. 2 (8):* 14–51.

——— 1897a: Ibid. Part III. *Proc. R. Soc. Vict. 2 (9):* 230–59.

——— 1897b: On the sponges described in Dieffenbach's "New Zealand". *Trans. N.Z. Inst. 30:* 316–20.

——— 1905: Report on the sponges collected by Professor Herdman at Ceylon in 1902. *Herdman Rep. Pearl Oyster Fisheries, Gulf of Manaar, Suppl. 18:* 57–246.

——— 1916a: Report on the Homosclerophora and Astrotetraxonida collected by HMS *Sealark* in the Indian Ocean. *Trans. Linn. Soc. Lond. 17 (2):* 225–71.

——— 1916b: Report on the non-calcareous sponges collected by James Hornell at Okhamandal in Kattiawar in 1905–6. Report to the Government of Baroda on the Marine Zoology of Okhamandal in Kattiawar. II: 93–146.

——— 1921: Report on the Sigmatotetraxonida collected by HMS *Sealark* in the Indian Ocean. *Trans. Linn. Soc. Lond. 18 (1):* 1–164.

——— 1924: Porifera. Part I. Non-Antarctic sponges. *Nat. Hist. Rep. "Terra Nova" Exped. 6 (3):* 269–392.

DENDY, A. and FREDERICK, L. M., 1924: On a collection of sponges from the Albrohos Is., West Australia. *J. Linn. Soc. (Zool.) 35* 477–519.

DICKINSON, M. G., 1945: Sponges of the Gulf of California. *Allan Hancock Pacif. Exped. 11 (1):* 1–55.

DUCHASSAING, DE FONBRESSIN, P. and MICHELOTTI, G., 1864: Spongiaires de la Mer Caraïbe. Mem. Pupl. Soc. Holl. des Sci. a Harlem. *Natuurk. Verh. holland. Maatsch. Wet. Mij. Haarlem. 21:* 1–124.

FELL, H. B., 1950: The Kirk collection of Sponges (Porifera) in the Zoology Museum, V.U.C. *Zool. Publs. Vict. Univ. Wellington. 4:* 1–12, pl. 1.

GEORGE, W. C., and WILSON, H. V., 1919: Sponges of Beaufort (N.C.) Harbor and Vicinity. *Bull. U.S. Bur. Fish. 36:* 129–179.

GRAY, J. E., 1867: Notes on the arrangement of sponges with the description of some new genera. *Proc. zool. Soc. Lond.:* 492–558.

HALLMANN, E. F., 1912: Report on the sponges obtained by the FIS *Endeavour* on the coasts of New South Wales, Victoria, South Australia, Queensland and Tasmania, Pt. I. *Zool. Res. Fish. Exp. Endeavour 2:* 117–300.

——— 1914: A revision of the monaxonid species described as new in Lendenfeld's "Catalogue of the sponges in the Australian Museum". *Proc. Linn. Soc. N.S.W. 39 (1):* 263–315; *39 (2):* 327–76; *39 (3):* 398–446.

——— 1917: A revision of the genera with microscleres included, or provisionally included in the family Axinellidae; with descriptions of some Australian species. *Proc. Linn. Soc. N.S.W. 41 (1):* 453–91; *41 (2):* 495–552; *41 (3):* 634–75.

HARTMAN, W. D., 1958: Natural History of the Marine Sponges of Southern England. *Bull. Peabody Mus. 12:* 1–155.

HENTSCHEL, E., 1909: Tetraxonida, Part I. Fauna Sudwest Australiens. II: 347–402.

——— 1911: Tetraxonida, Part II. Fauna Sudwest Australiens. III: 279–393.

——— 1912: Kiesel-und Hornschwamme der Aru-und Kei-Inseln. *Abh. Senckenb. naturforsch. Ges. XXXIV:* 291–448.

——— 1914: Monaxone Kieselund Hornschwamme der Deutschen Südpolar Expedition 1901–1903, XV. Zoology VII: 37–141.

KELLER, C., 1889: Die spongienfauna des Rothen Meeres. *Z. Wiss. Zool. 48:* 311–405.

KIRK, H. B., 1911: Sponges collected at the Kermadec Is. by Mr W. R. B. Oliver. *Trans. N.Z. Inst. 43:* 574–81.

KIRKPATRICK, R., 1900a: Description of sponges from Funafuti. *Ann. Mag. nat. Hist. 7 (6):* 345–62.

——— 1900b: On the sponges of Christmas I. *Proc. zool. Soc. Lond.:* 127–141.

——— 1903: Description of South African sponges. Pt. III. *C. G. H. Dep. Agric. Bull. 14. Mar. Invest. S. Afr. 11:* 233–64.

——— 1907: Preliminary report on the Monaxinellida of the National Antarctic Expedition. *Ann. Mag. nat. Hist. 7 (20):* 271–91.

——— 1908: Tetraxonida. *National Antarctic Exped. Nat. Hist. 4 (2):* 1–56.

KNOX, G. A., 1957: General account of the Chatham Is. 1954 Expedition. *N.Z. Dep. sci. industr. Res. Bull. 122:* 1–37.

LAUBENFELS, M. W. DE, 1930: The sponges of California. *Stanford Univ. Bull., Ser. 5, V (98):* 24–29.

——— 1932: The marine and fresh water sponges of California. *Proc. U.S. natn. Mus. No. 2927, 81 (4):* 1–140.

——— 1934: New sponges from the Puerto Rican Deep. *Smithson. misc. Collns 91 (17):* 1–28.

LAUBENFELS, M. W. DE, 1936: A discussion of the sponge fauna of the Dry Tortugas in particular and the West Indies in general, with material for a revision of the families and orders of the Porifera. *Publs Carnegie Instn. No. 467, Pap. Tortugas Lab. 30:* 1–225.

——— 1949a: The sponges of Woods Hole and adjacent waters. *Bull. Mus. comp. Zool. Harv. 103 (1):* 1–55.

——— 1949b: New sponges from the Yap Archipelago. *Pacif. Sci. 3 (2):* 124–26.

——— 1949c: The sponges of the Western Bahamas. *Am. Mus. Novit. 1431:* 1–25.

——— 1950a: The sponges of Kaneohe Bay, Oahu. *Pacif. Sci. 4 (1):* 3–36.

——— 1950b: The Porifera of the Bermuda Archipelago. *Trans. zool. Soc. Lond. 17 (1):* 1–154.

——— 1954: The sponges of the West Central Pacific. *Ore. St. Monogr. Stud. Zool. No. 7:* 1–306.

——— 1955: Sponges of Onotoa. *Pacif. Sci. 9 (2):* 137–43.

——— 1957: New species and records of Hawaiian sponges. *Pacif. Sci. 11 (2):* 236–51.

LEBWOHL, F., 1914: Japanische Tetraxonida I. Sigmatophora und II Astrophora metastrosa. *J. Coll. Sci. Tokyo 35 (2):* 1–116.

——— 1914: Japanische Tetraxonida. III Euastrosa und IV Sterrastrosa. *J. Coll. Sci. imp. Univ. Tokyo 35 (5):* 1–70.

LENDENFELD, R. VON., 1884: A monograph of the Australian sponges. I and II. *Proc. Linn. Soc. N.S.W. 9:* 121–54.

——— 1885: A monograph of the Australian sponges. III. *Proc. Linn. Soc. N.S.W. 9:* 1083–150.

——— 1886: A monograph of the Australian sponges: V and VI. *Proc. Linn. Soc. N.S.W. 10:* 282–325; 481–553.

——— 1888: Descriptive catalogue of the sponges in the Australian Museum, Sydney. London, 8vo. pp. i–xvi and 1–260.

——— 1903: Tetraxonia. *Das Tierreich, 19:* 1–168.

——— 1907: Die Tetraxonia. *Wiss. Ergebn. Valdivia II:* i–iv, 59–374.

LEVI, C., 1952: Spongiaires de la Côte du Senegal. *Bull. Inst. fr. Afr. noire 14:* 34–59.

——— 1953: Sur une nouvelle classification des Demosponges. *C. R. Acad. Sci. Paris, 236:* 853–55.

——— 1956a: Spongiaires de la region de Dakar. *Bull. Inst. fr. Afr. noire 18:* 391–405.

——— 1956b: Sponges Littorales des Kerguelen Recoltées par M. Angot. *Mém. Inst. sci. Madagascar Ser. A. (10):* 25–34.

——— 1956c: Etude des *Halisarca* de Rosoff. Embryologie et systematique des Demosponges. *Archs Zool. exp. gén. 93:* 1–181.

——— 1956d: Spongiaires des Côtes de Madagascar. *Mém. Inst. sci. Madagascar, Sér. A (10):* 1–23.

——— 1957: Spongiaires des Côtes D'Israel. *Bull. Res. Coun. Israel 6B (3–4):* 201–12.

——— 1958: Spongiaires de Mer Rouge. Resultats scientifique des Campagnes de la *Calypso* Fasc. III. *Ann. Inst. Oceanogr. Paris.* 3–46.

——— 1959: Spongiaires: Résultats scientifiques des Campagnes de la *Calypso* Fasc. IV, pt. 5 *Ann. Inst. Oceanogr. Paris.* 115–141.

——— 1960: Spongiaires des Côtes occidentales africaines. *Bull. Inst. fr. Afr. noire, Sér. A, 22 (3):* 743–769.

——— 1961: (2) Les Spongiaires de l'ile Aldabra: Résultats Scientifiques des Campagnes de la Calypso. Fasc. V (2). *Ann. Inst. Oceanogr. Paris:* 1–31.

——— 1961: Spongiaires des Iles Philippines, principalment recoltées au voisinage de Zamboanga. *Philipp. J. Sci. 88 (4):* 509–33.

LINDGREN, N. G., 1898: Beitrag zue Kenntniss der Spongienfauna des Malayischen Archipels und der Chinesischen Meere. *Zool. Jb:* 1–96.

MARSHALL, W., 1883. *Agilardiella radiata*, einer neuer Tetractinellidenform mit radiarem Bau. Abh. Ak. Berl. 1884, 15 pp., 1 pl.

MUNSELL, A., 1942: Book of color. Pocket edn., 2 vols. Munsell Color Co. Inc. Baltimore, Maryland.

NEAVE, S. A., 1940: Nomenclator Zoologicus, 4 vols. and suppl. Publs zool. Soc. London.

POWELL, A. W. B., 1947: Native animals of New Zealand. Auckland Museum Handbook of Zoology, Auckland, 2nd ed., Unity press. 2nd impr.: 96 pp.

RIDLEY, S. O., 1881: Spongida. Ch. XI of Account of the Zoological Collections made during the survey of HMS *Alert* in the Straits of Magellan and on the Coast of Patagonia. *Proc. zool. Soc. Lond.:* 107–37; 140–41.

——— 1884: Spongida. Rep. on the Zoological Collections made in the Indopacific Ocean during the voyage of HMS *Alert*, 1881–82. London: 366–482; 582–630.

RIDLEY, S. O., and DENDY, A., 1886: Report on the Monaxonida collected by the HMS *Challenger*. Pt. I and II. *Ann. Mag. nat. Hist. 5 (17):* 470–93.

RIDLEY, S. D., and DENDY, A., 1887: Report on the Monaxonida collected by HMS *Challenger* during the years 1873–76. *Rep. scient. Results Explor. Voyage Challenger. Zool. XX(LIX):* 1–275, pl. I–LI.

ROW, R. W. H., 1911: Report on the sponges collected by Mr Cyril Crossland in 1904–05. Pt. II. Non-Calcarea. XIXth Rep. Rep. Marine Biol. Sudanese Red Sea. *J. Linn. Soc. Lond. 31:* 287–400.

SARÀ, M., 1959: Specie nuove di Demospongie prosenienti acque Superficiali del golfo di Napoli. *Annuar. R. Mus. zool. Univ. Napoli 11:* 1–22.

SCHMIDT, O., 1862: Die Spongien des adriatischen Meeres. Leipzig. 4to: 1–88.

——— 1864: Supplement der spongien des adriatischen Meeres. Leipzig. 4to: 1–48.

——— 1868: Die spongien der Kuste von Algier. (Drittes Suppl.) Leipzig. 4to: 1–44.

——— 1879: Die spongien des Meerbusen von Mexico. Jena. Gustav Fischer. I: 1–32.

——— 1880: Die spongien des Meerbusen von Mexico (und des Caraibischen Meeres) Jena. Gustav Fischer. 2: 34–90.

SHAW, M. E., 1927: On a collection of sponges from Maria Island, Tasmania. *Proc. zool. Soc. Lond. 18:* 419–39.

SOLLAS, I. B. J., 1902: Sponges collected during the *Skeat* Expedition to the Malay Peninsula 1899–1900. *Proc. zool. Soc. Lond. 11:* 210–21.

SOLLAS, W. J., 1882: The Sponge Fauna of Norway; a report of Rev. A. M. Norman's Collection of Sponges from the Norwegian Coast. *Ann. Mag. nat. Hist. 5 (9):* 141–65; 426–53.

——— 1886a: A classification of the Sponges. *Sci. Proc. R. Dublin Soc. 5:* 112.

——— 1886b: Preliminary account of the tetractinellid sponges dredged by the HMS *Challenger* 1872–1876. Part I. The Choristida. *Sci. Proc. R. Dublin Soc. 5:* 177–99.

——— 1888: Report on the Tetractinellida collected by HMS *Challenger* during the years 1873–1876. *Rep. Challenger Zool. 25.* i–clxvi, 1–458.

TANITA, S., 1959: Sponges. Biol. Res. Japanese antarct. Res. Exped. 1. *Publ. Seto Mar. biol. lab.:* 3–8.

THIELE, J., 1898: Studien uber Pazifische Spongien: I. *Zoologica Stuttg. 24:* 1–72.

——— 1899: Studien uber Pazifische Spongien: II. *Zoologica Stuttg. 24:* 1–33.

——— 1900: Kieselschwamme von Ternate: *I. Abh. Senckenb. naturforsch. Ges. 25:* 19–80.

——— 1903: Kieselwchwamme von Ternate: II. *Abh. Senckenb. naturforsch. Ges. 25:* 933–68.

——— 1905: Die Kiesel-und Hornschwamme der Sammlung Plate. *Zool. Jb. Suppl. 6:* 407–96.

TOPSENT, E., 1888: Contributions a l'etude des Clionides. *Archs Zool. exp. gen. 5 (suppl.):* 1–165.

——— 1890: Notice preliminaire sur les spongiaires receuilles durant les campagnes de l'Hirondelle. *Bull. Soc. zool. Fr. 15:* 26–32; 65–71.

——— 1891: Deuxieme contribution a l'étude des Clionides. *Archs Zool. exp. gen. 9:* 555–92.

——— 1892: Contribution a l'étude des spongiaires de l'Atlantique Nord. *Res. de Camp. Sci. Alb. Ier. Prince de Monaco Fasc. II:* 1–165.

——— 1894a: Une reforme dans la classification des Halichondrina. *Mém. Soc. Zool. France.* VII: 5–26.

——— 1894b: Etude monographique des spongiaires de France. I. Tetractinellida. *Archs Zool. exp. gén. 3 (2):* 259–400.

——— 1898a: Introduction a l'étude monographique des Monaxonides de France. Classification des Hadromerina. *Archs Zool. exp. gen. 6:* 91–113.

——— 1898b: Eponges nouvelle des Acores (Première Série). *Mem. Soc. zool. France XI:* 225–55.

——— 1900: Etude Monographique des spongiaires de France. III. Monaxonida (Hadromerina) *Archs Zool. exp. gén. 8:* 1–331.

——— 1902: Spongiaires. Exped. Ant. Belge. *Résultats Voyage S. Y. Belgica 1897–1899:* 1–54.

——— 1904: Spongiaires des Acores. *Résult. Camp. scient. Prince Albert I. Fasc. 25:* 1–280.

——— 1908: Spongiaires. *Expéd. Antarct. fr. (1903–05):* 1–37.

——— 1913a: Spongiaires provenant des Campagnes scientifiques de la Princesse Alice dans les mers du Nord. (1898–1899, 1906–1907). *Résult. Camp. Scient Prince Albert I 45:* 1–67.

——— 1913b: Spongiaires de l'Expédition Antarctique Nationale Ecossaise. *Trans. R. Soc. Edinb. 49:* 579–643.

——— 1917: Spongiaires. 2me *Expéd. Antarct. fr. (1908–1910):* 1–88.

——— 1918: Eponges de San Thone. *Archs Zool. exp. gen. 57:* 535–618.

——— 1920a: Spongiaires receuilles par la *Scotia* dans l'Antarctique. (1903–1904) Suppl. *Trans. R. Soc. Edinb. 51:* 35–43.

——— 1920: *Tethya aurantium* (Pallas) et les *Tethya* de Lamarck. *Bull. Mus. Hist. nat. Paris:* 640–46.

——— 1920c: Spongiaires de Musee zool. Strasbourg. Monaxonides. *Bull. Inst. oceanogr. Monaco, 381:* 1–36.

——— 1928: Spongiaires de l'Atlantique et de la Mediterranean provenant des croisieres du Alb. I de Monaco. *Result. Camp. scient. 74:* 1–376.

——— 1938: Commentaires sur quelques genres d'Eponges marines. *Bull Inst. Oceanogr. Prince Albert I. 744:* 1–23.

VOSMAER, G. C. J., 1911: The Porifera of the Siboga Expedition. II: The Genus *Spirastrella. Siboga—Expéditie VI (A'):* 1–69.

——— 1933: The sponges of the Bay of Naples. Porifera Incalcaria. ed. C. S. Vosmaer-Roell and M. Burton. The Hague: Martinus Nijhoff. 1933–1935. 3 vols.: 1–828.

WHITELEGGE, T., 1902: Report on sponges from the coastal beaches of New South Wales. *Rec. Aust. Mus. 4:* 55–1180.

——— 1906: Sponges. Pt. I. *In* Scientific results of the Trawling Exped. of HMCS *Thetis* off the coast of N.S.W. *Rec. Aust. Mus. 4 (1):* 453–484.

——— 1907: Sponges. Pt. I (Addenda). *In* Scientific results of the Trawling Exped. of HMCS *Thetis* off the coast of N.S.W. *Rec. Aust. Mus. 4 (1):* 487–515.

WILSON, H. V., 1904: Report of an exploration off the West Coast of Mexico, Central and South America and the Galapagos. *Mem. Mus. comp. Zool. Harv. 30:* 1–164.

——— 1925: Siliceous and horny sponges collected by the U.S. Fisheries steamer *Albatross* during the Philippine Exped. 1906–1910. *Bull. U.S. natn. Mus. No. 100, 2 (4):* 173–532.

PLATE 1

A. *Latrunculia brevis* Ridley and Dendy

B. *Latrunculia brevis* Ridley and Dendy

C. *Rhabderemia stellata* Bergquist

D. *Aaptos aaptos* Schmidt

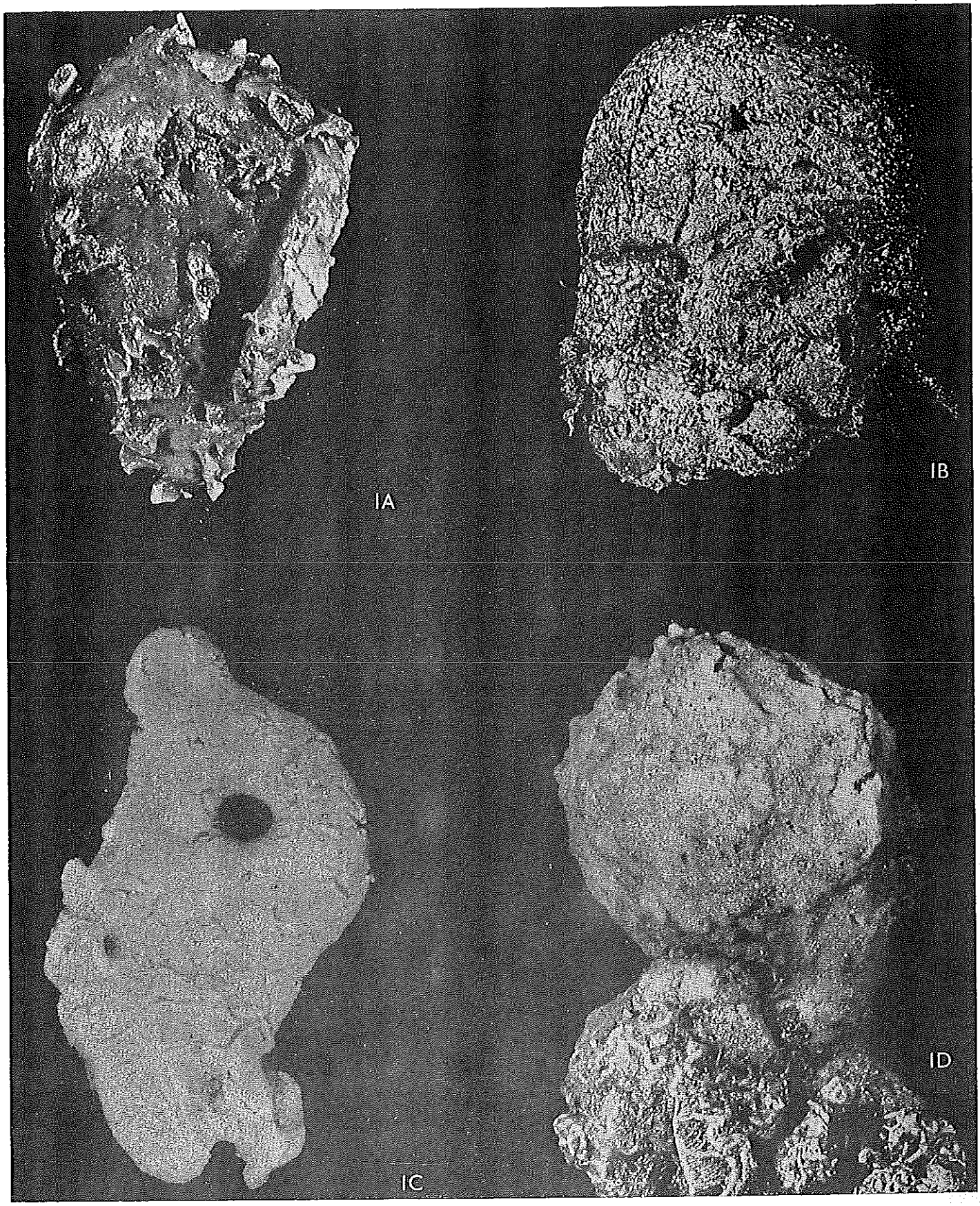

IA
IB
IC
ID

PLATE 2

A. *Polymastia fusca* Bergquist

B. *Polymastia granulosa* Brøndsted
Coralline-inhabiting form; mid-tidal region

C. *Polymastia conigera* Bowerbank

D. *Polymastia granulosa* Brøndsted
North Channel; shallow offshore form

E. *Polymastia granulosa* Brøndsted
Campbell Plateau 46 fm

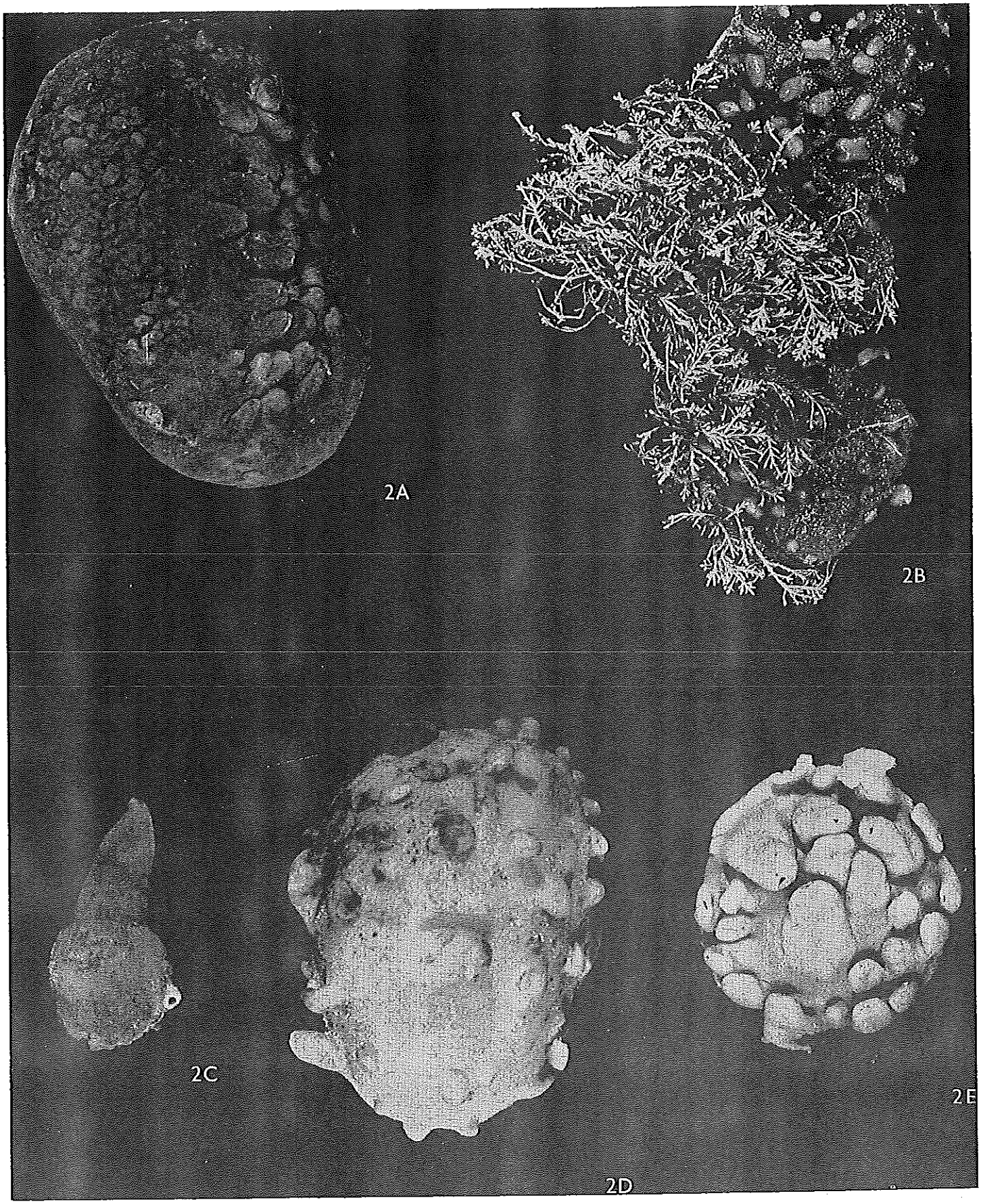

2A
2B
2C
2D
2E

PLATE 3

A. *Polymastia hirsuta* nov. sp.
Suberites cupuloides Bergquist

C. *Suberites australiensis* nov. sp.

D. *Suberites australiensis* nov. sp.

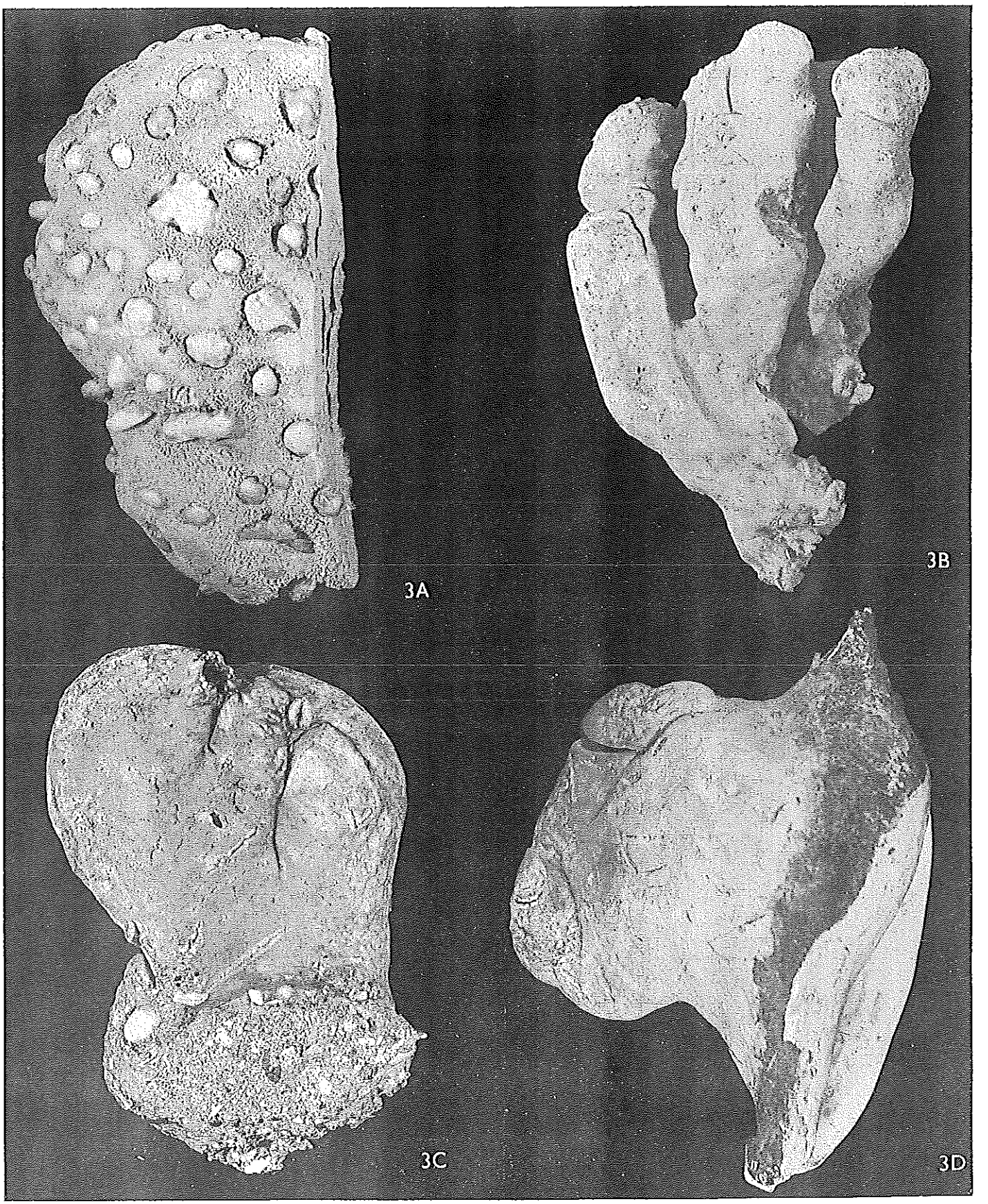

3A
3B
3C
3D

PLATE 4

A. *Lamellomorpha strongylata* nov. sp.

B. *Asteropus simplex* (Carter)

C. *Cliona celata* Grant
   a Stage on *Glycimeris laticostata*

D. *Suberites perfectus* Ridley and Dendy

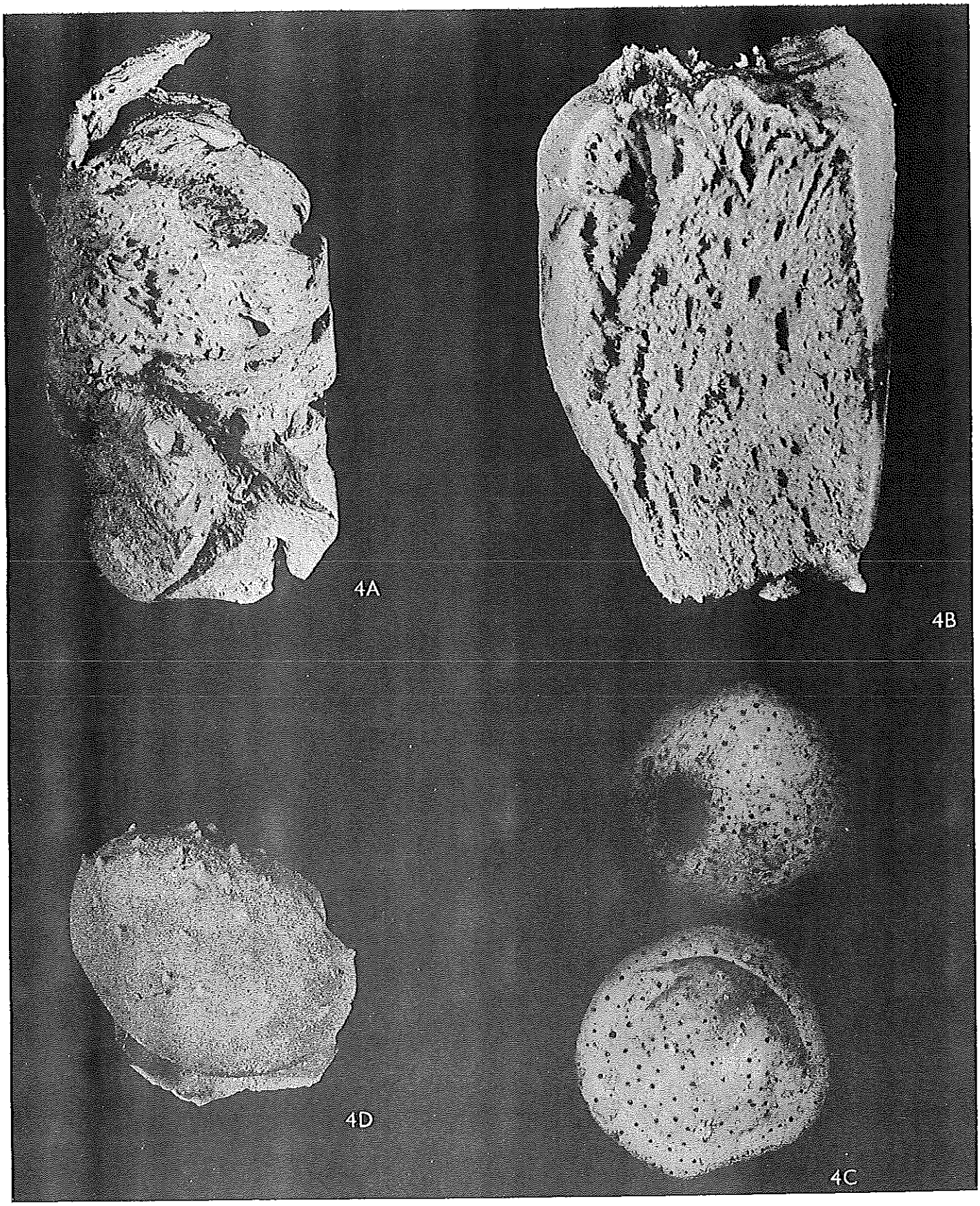

4A
4B
4D
4C

PLATE 5

A. *Tethya aurantium* (Pallas)

B. *Tethya ingalli* Bowerbank

C. *Epipolasis novae-zelandiae* (Dendy

D. *Ancorina alata* Dendy
Intertidal form

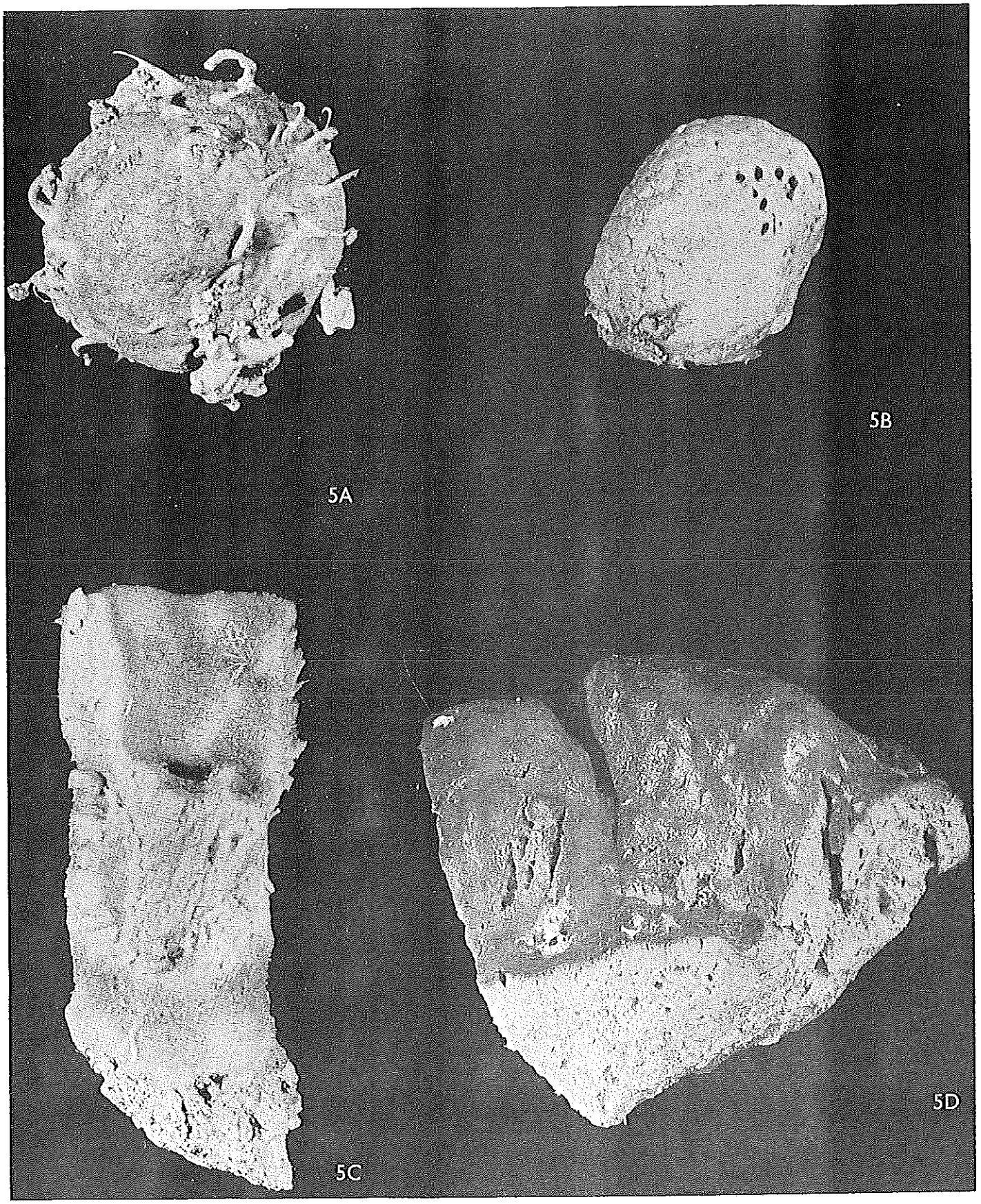

5A
5B
5C
5D

PLATE 6

A. *Ancorina alata* Dendy
Offshore form

B. *Penares tylotaster* Dendy

C. *Thenea novae-zelandiae* Bergquist

D. *Monosyringia mortenseni* Brøndsted

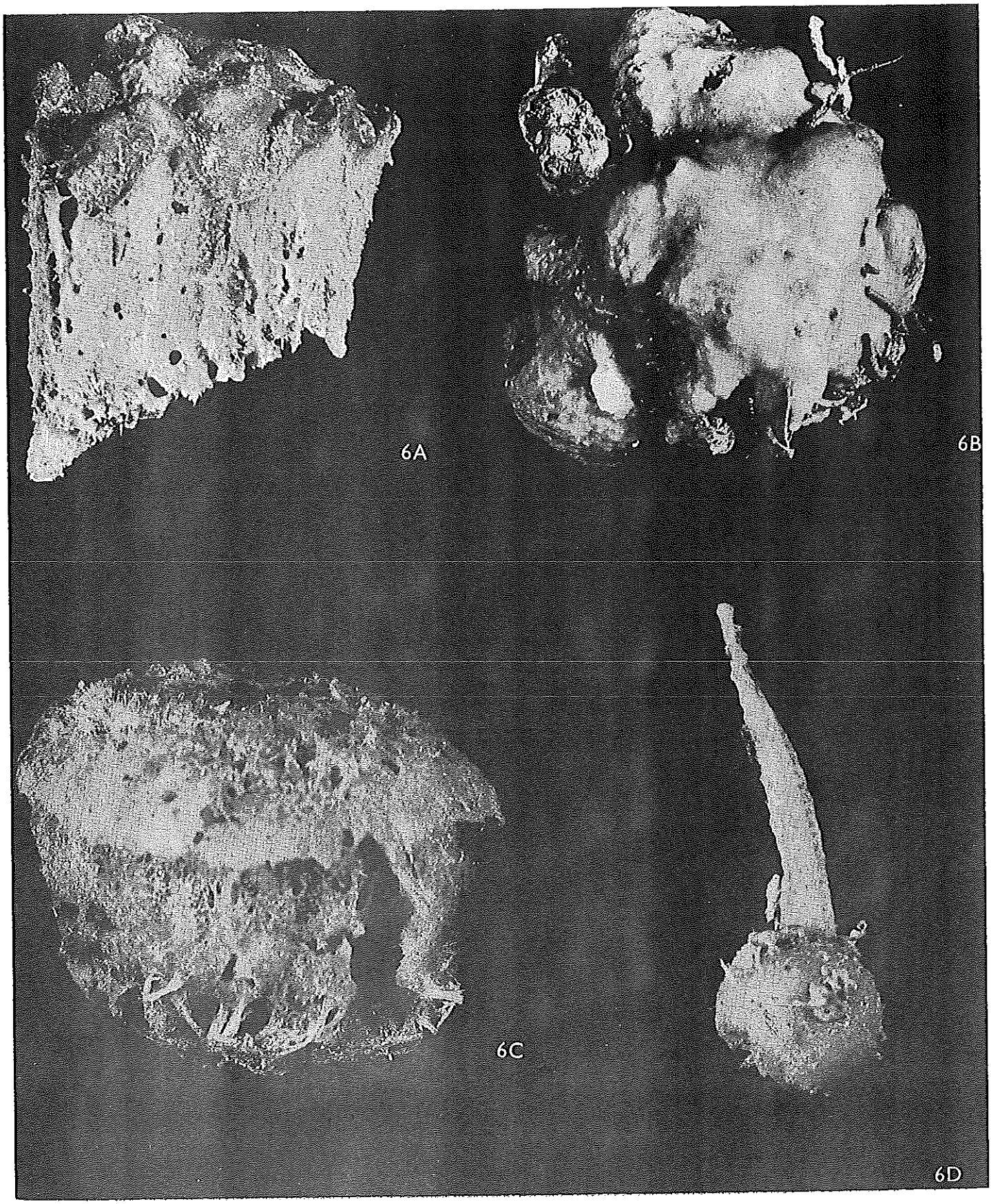

6A
6B
6C
6D

PLATE 7

A. *Stelletta crater* (Dendy)

B. *Stelletta arenaria* nov. sp.

C. *Stelletta purpurea* Ridley

D. *Stelletta crater* Dendy

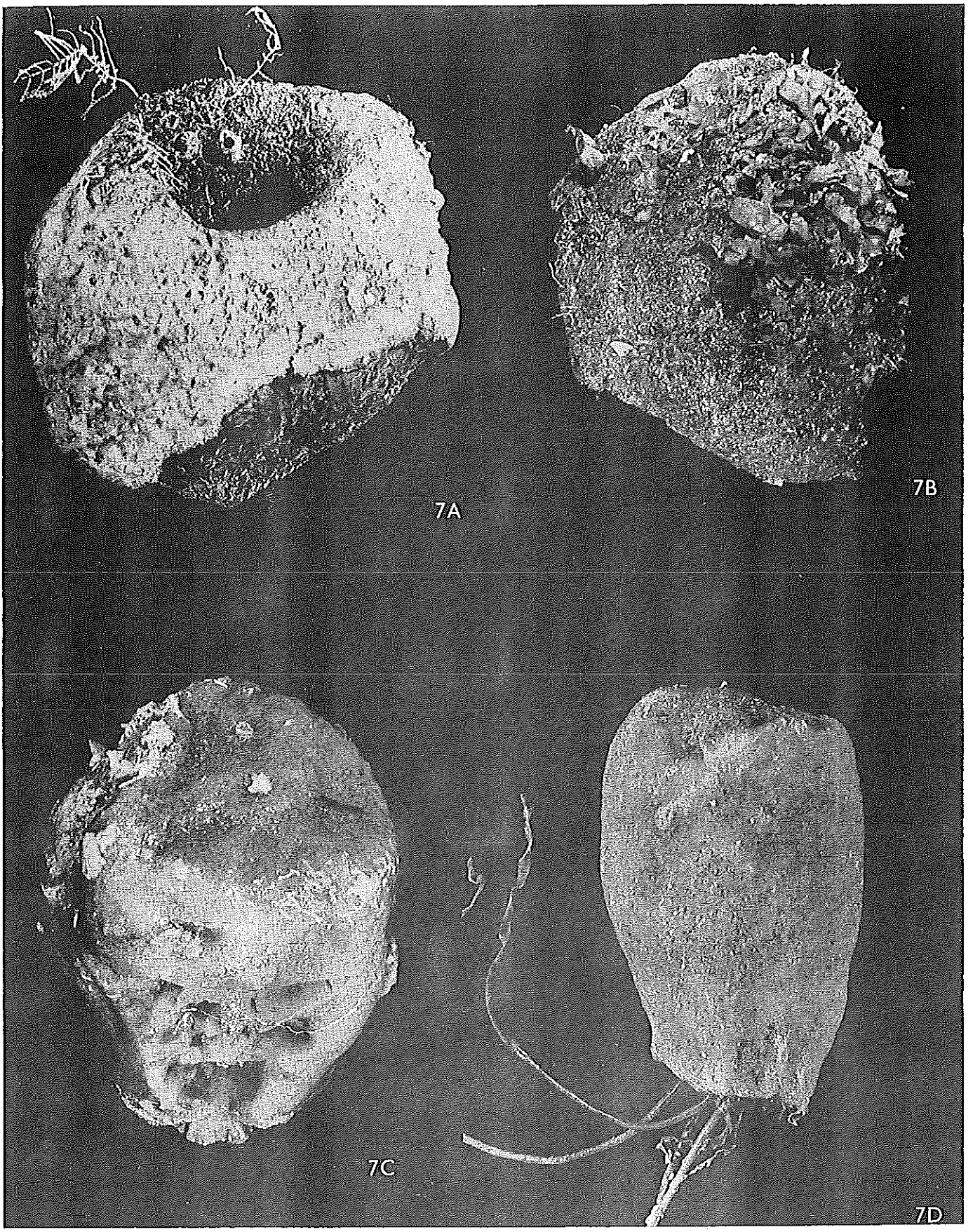

7A
7B
7C
7D

PLATE 8

A. *Stelletta maori* Dendy

B. *Stelletta conulosa* nov. sp.

C. *Stelletta lithodes* nov. sp.

D. *Stelletta maxima* Thiele

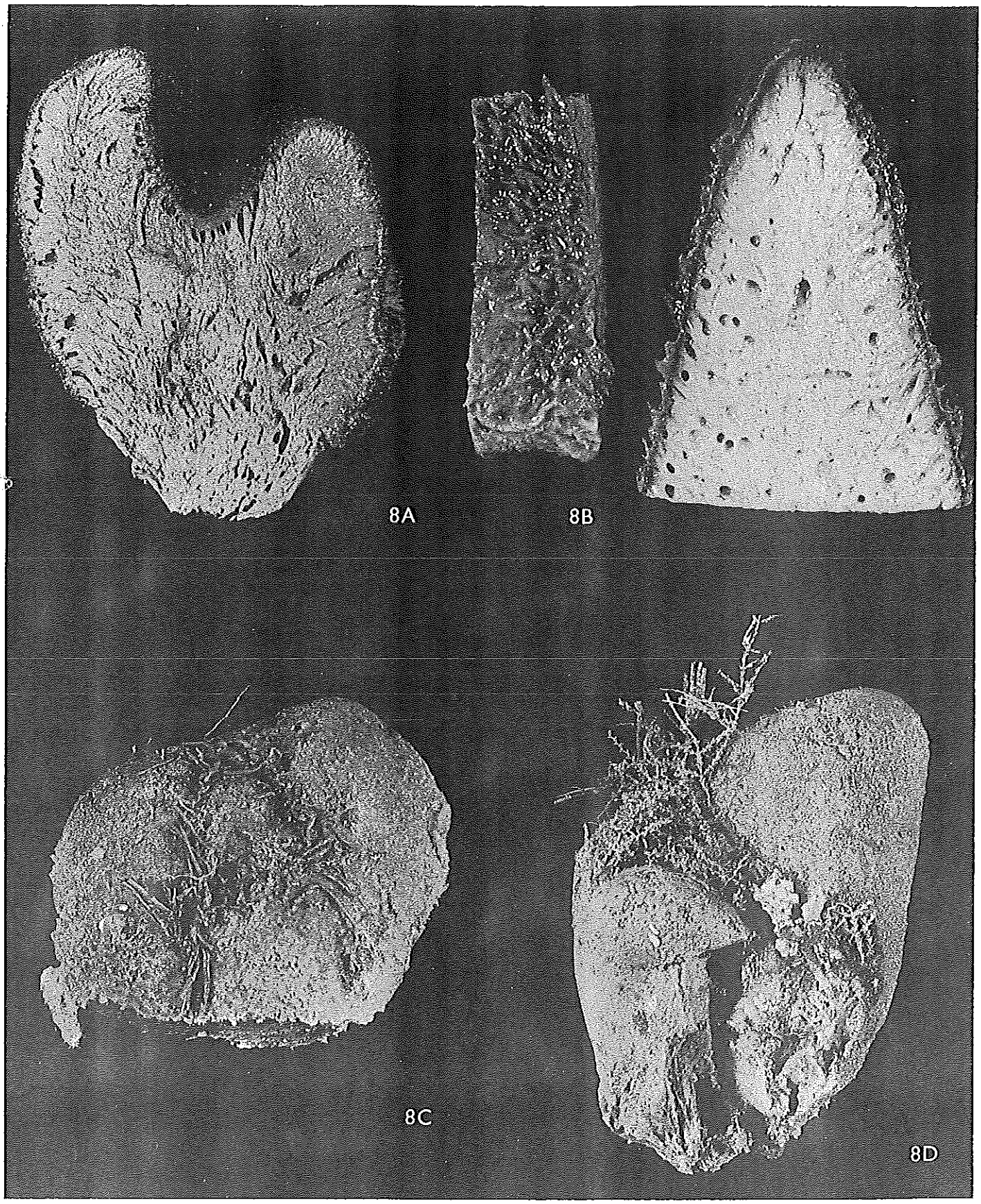

8A
8B
8C
8D

PLATE 9

A. *Geodia regina* Dendy

B. *Tetilla australe* nov. sp.

C. *Erylus nigra* nov. sp.

D. *Rhabdastrella aurora* (Hentschel)

E. *Stelletta sandalinum* Brøndsted

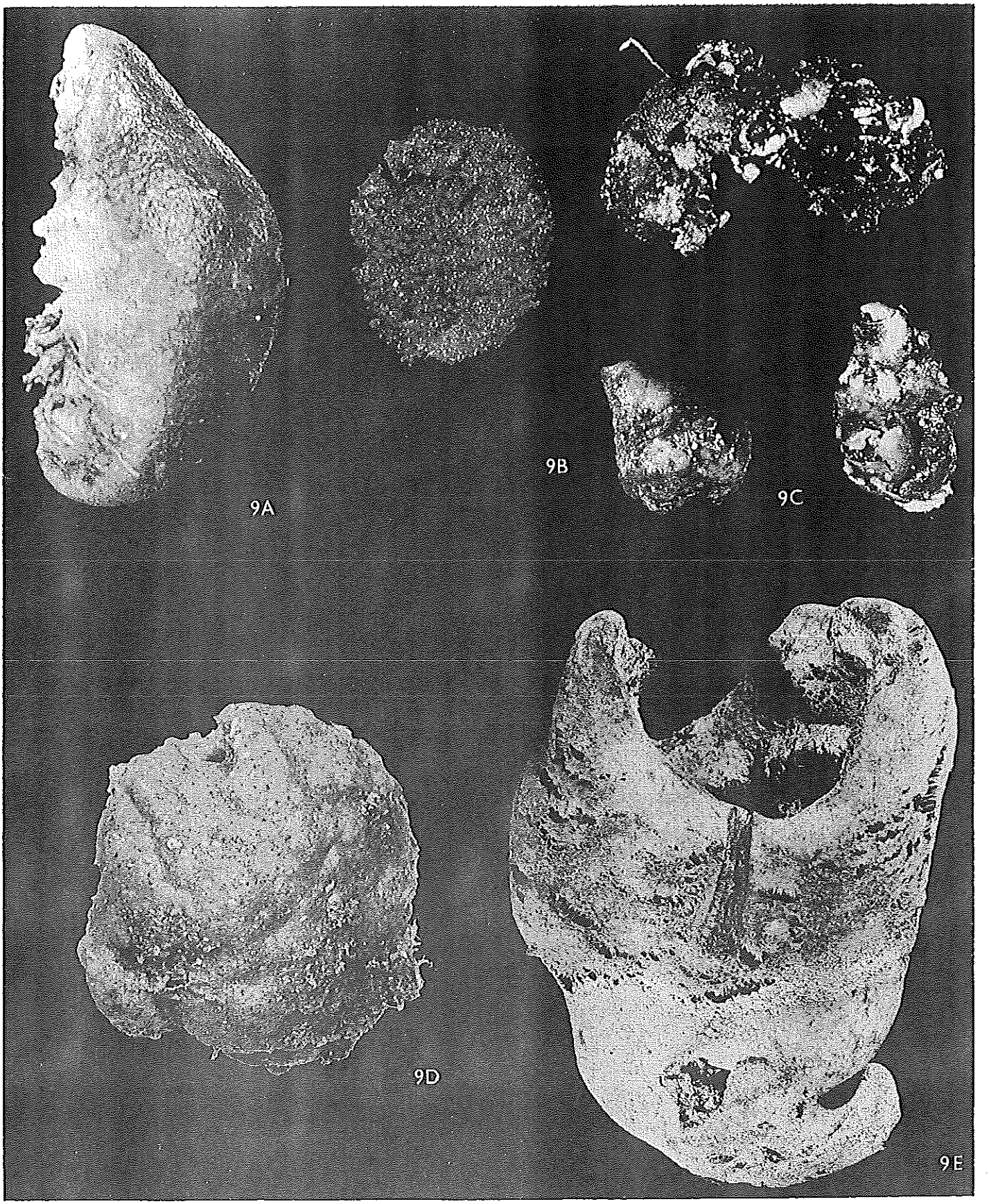

9A
9B
9C
9D
9E

PLATE 10

A. *Aciculites pulchra* Dendy
B. *Geodinella vestigifera* Dendy
C. *Cinachyra uteoides* Dendy
D. *Geodinella vestigifera* Dendy

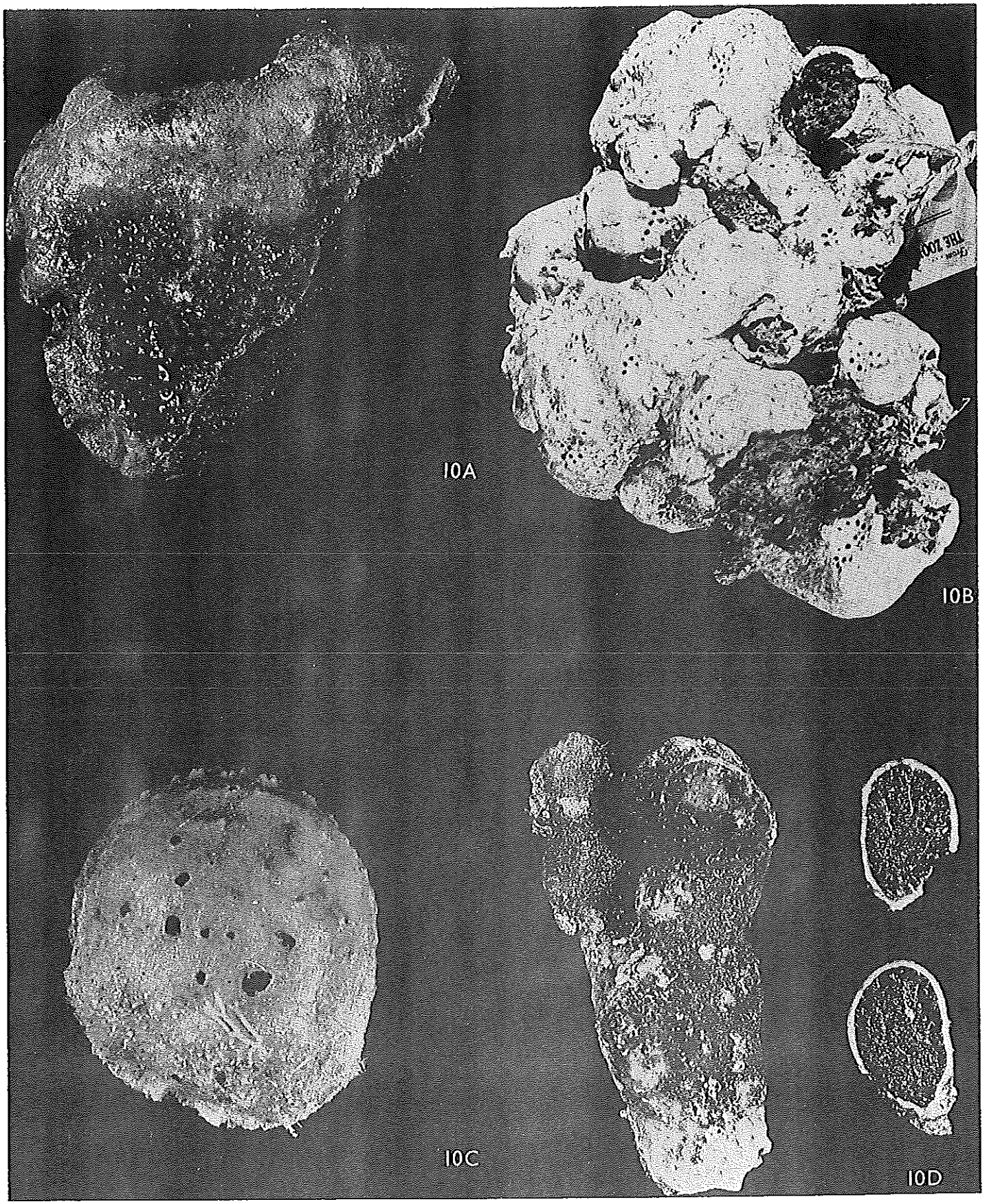

10A
10B
10C
10D

PLATE 11

A. *Cliona euryphylla* Topsent
Spirasters

B. *Timea alba* nov. sp.
Strongylospheraster (× 650)

C. *Timea aurantiaca* nov. sp.
Tylospheraster (× 820)
Spherasters (× 820)

D. *Asteropus simplex* (Carter)
Sanidasters (× 950)
Oxyasters (× 650)

E. *Lamellomorpha strongylata* nov. sp.
Three Kings specimen
Microrhabd (× 800)
Plesiasters (× 1200)

F. *Lamellomorpha strongylata* nov. sp.
Campbell Plateau specimen
1. Microrhabds (× 1100)
2. Abnormal microrhabd (× 1100)
3. Plesiasters (× 1300)

G. *Spirastrella spinispirulifera* (Carter)
Spinispirae (× 1725)

H. *Rhabderemia stellata* Bergquist
1. Acanthostyle
2. Contort sigmata (× 700)

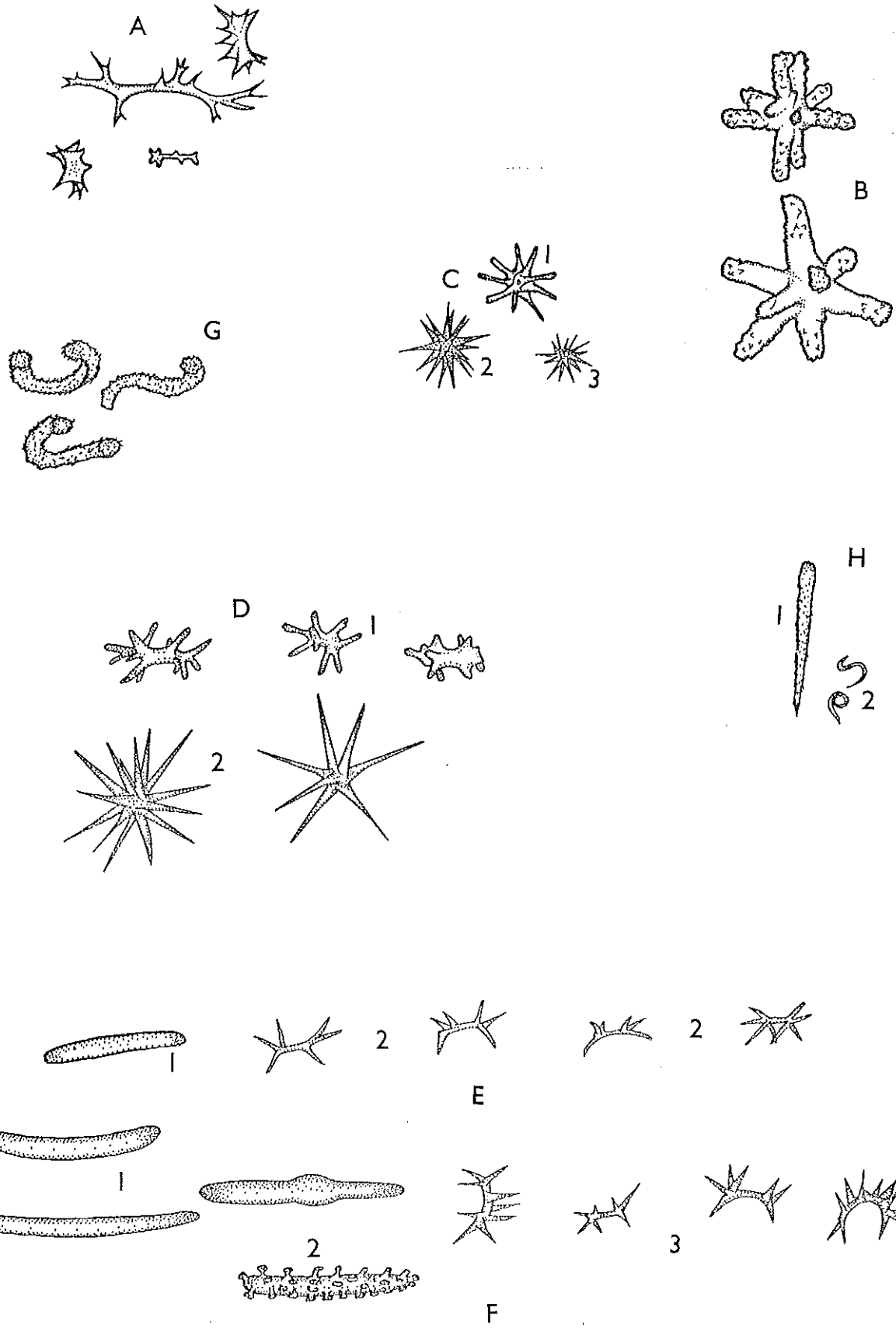

A
B
C
1
2
3
G
D
1
2
H
1
2
E
1
2
F
1
2
3

PLATE 12

A. *Thenea novae-zealandiae* Bergquist
   1. Dichotriaene (× 50)
   2. Smooth plesiaster (× 140)
   3. Spined plesiasters (× 140)
   4. Anatriaene (× 80)
   5, 6. Streptasters (× 500)

B. *Stelletta maxima* Thiele
   1. Oxyspheraster (× 420)
   2. Oxyspheraster (× 350)

C. *Stelletta crater* (Dendy)
   Oxyspheraster. Little Barrier specimen (× 610)

D. *Stelletta crater* (Dendy)
   Oxyspheraster from Three Kings specimen (× 630)

E. *Stelletta arenaria* nov. sp.
   1. Terminations of oxeas (× 250)
   2. Cladi of the plagiotriaenes (× 250)
   3. Chiasters (× 900)
   4. Tylaster (× 980)

F. *Erylus nigra* nov. sp.
   1. Orthotriaene (× 50)
   2. Aspidaster (× 140)
   3. Oxyspheraster (× 280)
   4. Oxyasters (× 250)
   5. Microstrongyles (× 280)

G. *Plakina trilopha* Schulze
   Trilophotriaene (× 450)

H. *Plakina monolopha* Schulze
   Monolophotriaene (× 450)

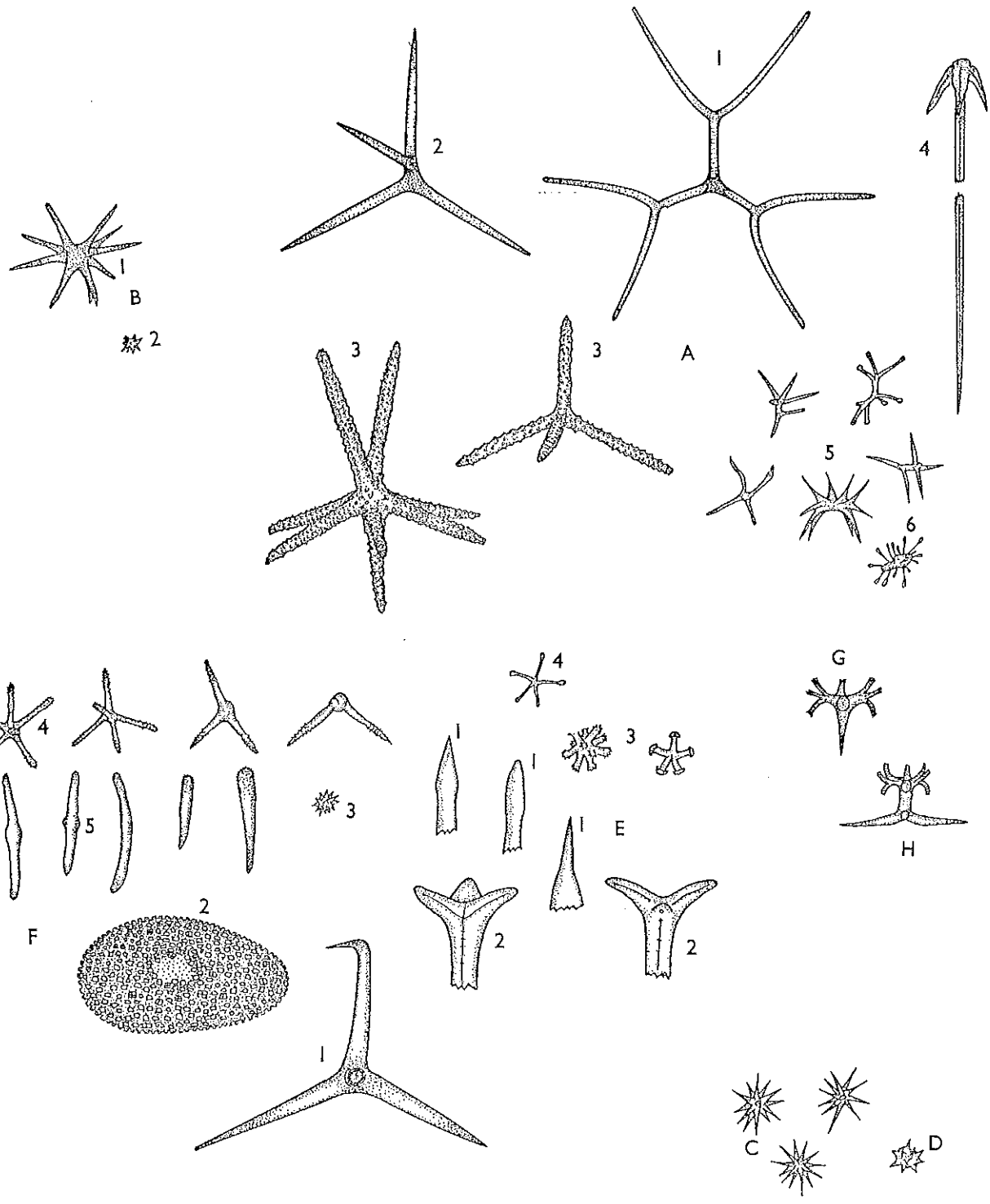

1
2
3
4
5
6
A
B
C
D
E
F
G
H

PLATE 13

A. *Tethya aurantium* (Pallas)
Burgess Bay
1. Spherasters (× 525)
2. Tylasters (× 600)

B. *Tethya aurantium* (Pallas)
Cook St.
1. Spherasters (× 525)
2. Tylasters (× 630)

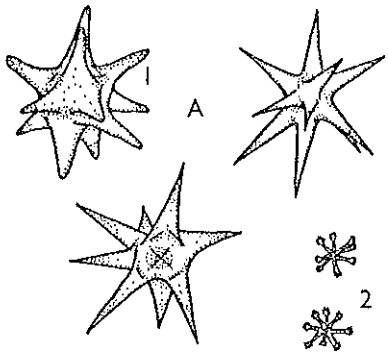
C. *Tethya ingalli* Bowerbank
Goat Island Bay
1. Spheraster (× 550)
2. Tylasters (× 550)

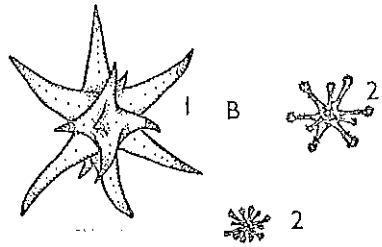
D. *Tethya aurantium* (Pallas)
Rangitoto
1. Spheraster (× 630)
2. Tylasters (× 600)

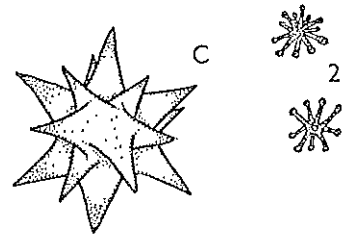
E. *Tethya ingalli* Bowerbank
Chatham Rise
1. Large spherasters (× 500)
2. Small spherasters (× 500)
3. Tylaster (× 500)
4. Euaster (525)

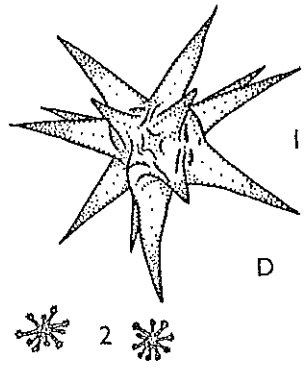
F. *Ancorina alata* Dendy
1. Microrhabds (× 875)
2. Tylasters (× 775)

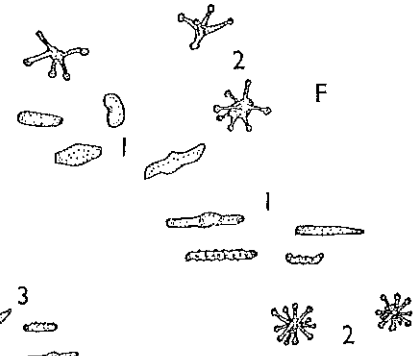
G. *Ancorina alata* Dendy
Three Kings
1, 2. Anatriaenes (× 25 & × 100)
3. Microrhabds (× 850)
4. Tylasters (× 730)

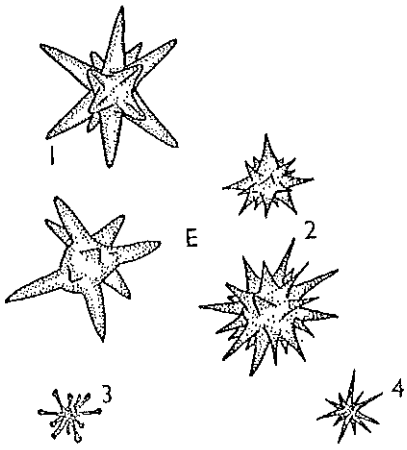

1
A
2


1
B
2
2


C
2


1
D
2


2
F
1
1
2


1
E
2
3
4

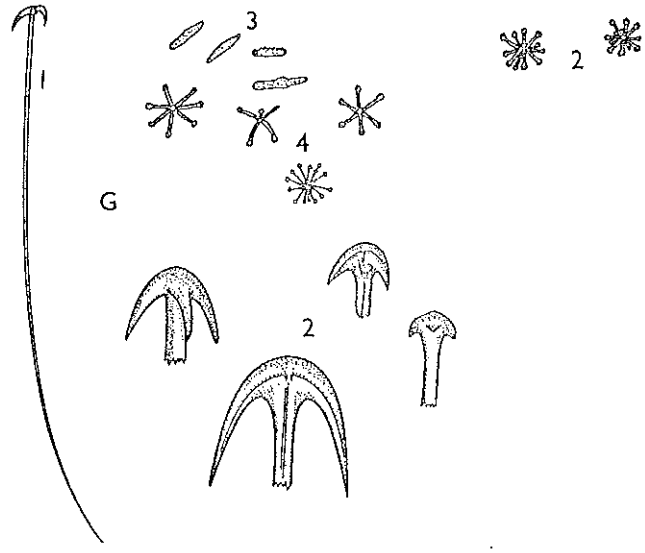

1
3
4
G
2

PLATE 14

A. *Monosyringia calcifera* nov. sp.
1. Dichodiaene and dichotriaenes (× 45)
2. Anatriaene (× 45)
3. Protriaene (× 55)
4. Tylasters (× 575)
5. Euasters (530)

B. *Monosyringia mortenseni* Brøndsted
1. Chiaster (× 550)
2, 3. Oxyasters (× 600)

C. *Stelletta lithodes* nov. sp.
1. Small oxyspheraster (× 350)
2. Large oxyspheraster (× 1050)

D. *Stelletta novae-zealandiae* Brøndsted
1. Large oxyaster (× 1150)
2. Small oxyspheraster (× 1750)
3. Chiaster (× 875)

E. *Stelletta sandalinum* Brøndsted
1. Oxyasters (× 500)
2. Small oxyasters (× 1000)
3. Strongylospheraster (× 700)

F. *Stelletta maori* Dendy
1. Oxyspherasters (× 900)
2. Small oxyaster (× 475)

G. *Geodia regina* Dendy
1. Small strongylospheraster (× 850)
2. Oxyspherasters (× 250)

H. *Stelletta conulosa* nov. sp.
1. Oxyasters (× 1050)
2, 3. Oxyspherasters (× 1400)

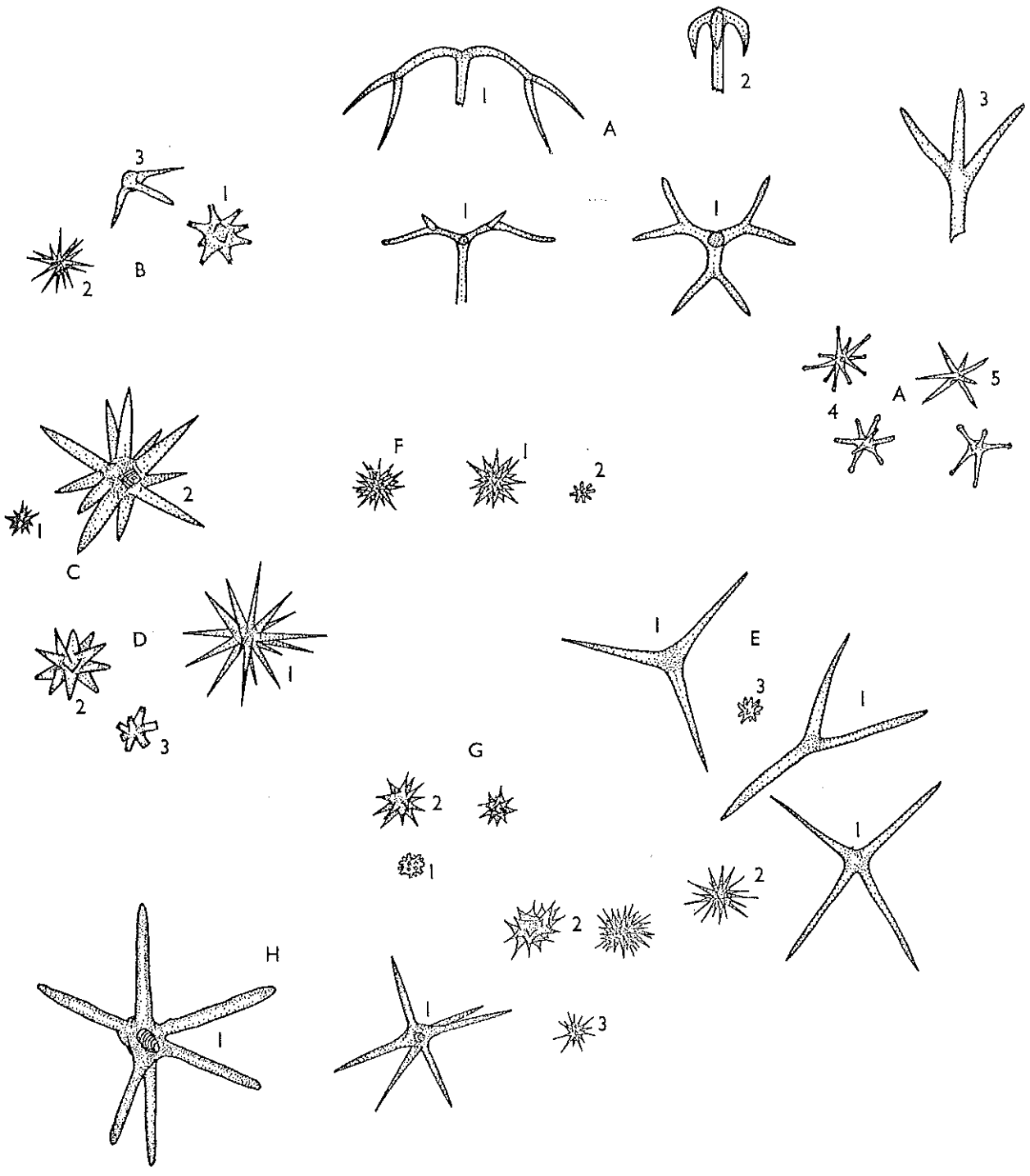

1
2
A
3
1
2
B
1
1
3
1
4
A
5
F
1
2
2
1
C
D
2
1
3
1
E
3
1
G
2
1
2
2
1
H
1
1
3

PLATE 15

A. *Geodinella vestigifera* Dendy
   1. Triaenes with vestigial clads (× 160)
   2. Abnormal oxeote or reduced triaene (× 55)
   3. Large oxyaster (× 630)
   4. Small strongylospheraster (× 795)
   5. Small strongylaster (× 585)
   6. Small oxyaster (× 585)

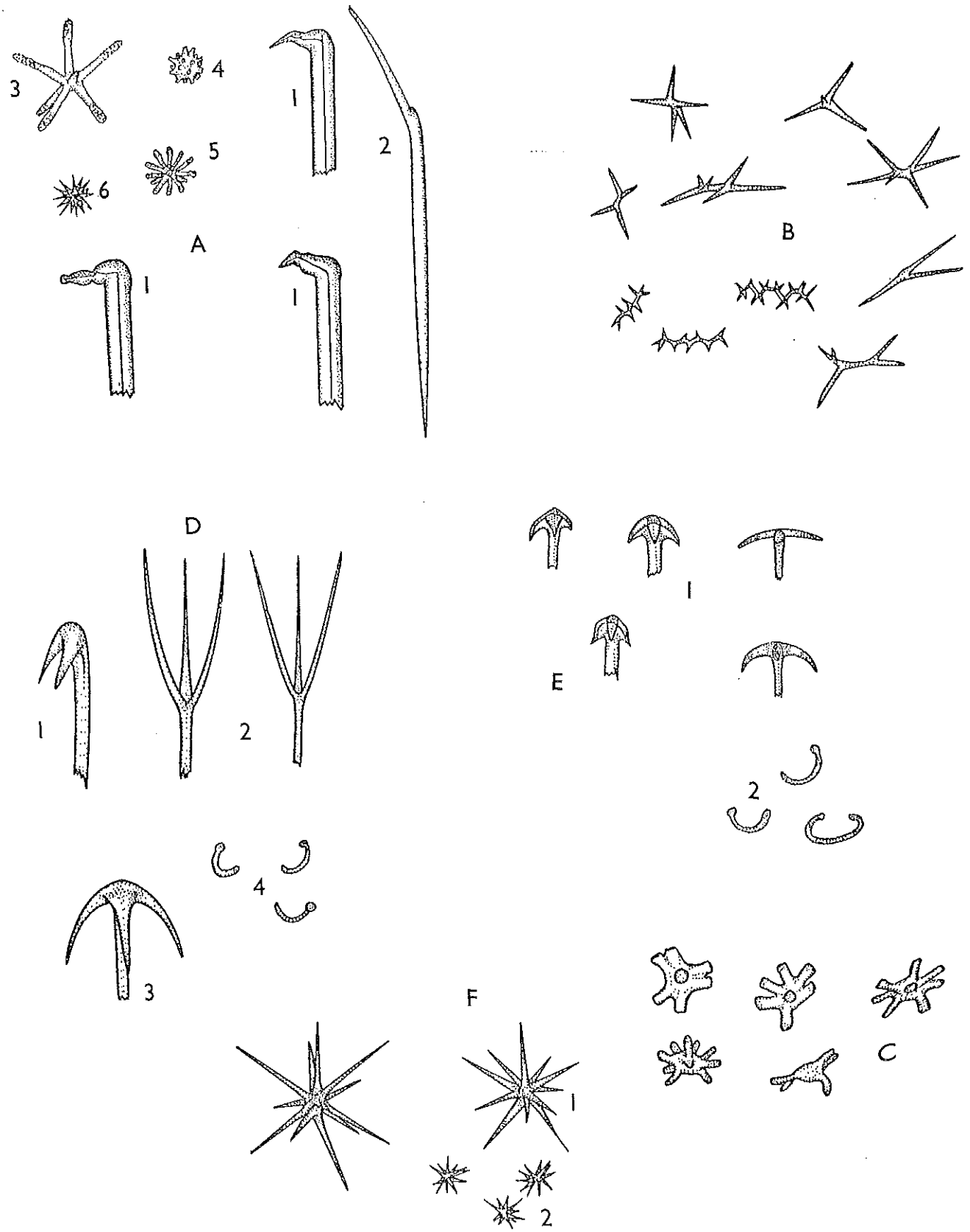
B. *Pachastrella incrustata* nov. sp.
   Spirasters (× 900) and metasters (× 630)

C. *Corticellopsis novae-zealandiae* (Bergquist)
   Strongylasters (× 1800)

D. *Tetilla australe* nov. sp.
   1. Anadiaene (× 165)
   2. Trichotriaenes (× 340)
   3. Anatriaene (× 200)
   4. Sigmaspirae (× 495)

E. *Cinachyra uteoides* Dendy
   1. Anatriaenes (× 115)
   2. Sigmaspirae (× 745)

F. *Stelletta maori* Dendy
   Campbell Plateau
   1. Oxyasters (× 900)
   2. Oxyspherasters (× 450)


3
4
5
6
1
2
A
1
1
B
D
1
2
4
3
E
1
2
F
1
2
C

INDEX

Aaptos, 14, 21
  aaptos, 14, 21, 70, 71
aaptos,
  Aaptos, 14, 21, 70, 71
  Ancorina, 21
acervus,
  Ancorina, 14, 38, 40
  Ecionemia, 38
Aciculites, 15, 63, 64
  ciliata, 64
  pulchra, 15, 63, 64, 88, 89
actinia, Tethya, 37
Adociidae, 10
affinis, Suberites, 14, 26
Africa, 36, *see also* South Africa
Agilardiella radiata, 9, 44
agminata,
  Hymeniacidon, 24
  Stylotella 14, 24
Ahipara, 22, 23, 35, 36
alata, Ancorina, 14, 38–40, 60, 78–81, 94, 95
alba, Timea, 14, 18, 20, 90, 91
Alcithoe, 27
Alcithoe arabica, 27
Alcyonium aurantium, 35
Alderman Island, 13, 55
alleni, Erylus, 55
Amodeo Bay, 35
Anastomosus, 24, 26
Anawhata, 22, 23, 29, 35
Ancorina, 14, 32, 38–41
  aaptos, 21
  acervus, 14, 38, 40
  alata, 14, 38–40, 60, 78–81, 94, 95
  arabica, 27
  novaezealandiae, 38, 40
  osculifera, 38
  progressa, 14, 40, 41
  progressa var. *diplococcus*, 40
  stalagmoides, 14, 40, 41
Ancorinidae, 14, 38–55
Ancorininae, 14, 38–42
Antarctic, 19, 24, 45, 60, 63
antarctica,
  Latrunculia, 17, 19
  Polycheria, 21, 28
Anthastra
  communis, 49
  parvispicula, 49
Anthosigmella spinispirulifera, 16
apicalis, Lutrunculia, 19
arabica,
  Alcithoe, 27
  Ancorina, 27
arenaria, Stellata, 15, 45, 48, 82, 83, 92, 93
Argentine, 19, 26, 30
Arctic, 30, 42
Asteropus, 14, 32, 33
  cherbonnieri, 32
  kaena, 32
  ketostea, 32
  sarasinorum, 32
  simplex, 14, 32, 33, 76, 77, 90, 91
Atlantic, 19, 30, 36, 42, 59, 63
Auckland, 27
Auckland Islands 9, 12
  Carnley Harbour, 23, 26
  Musgrave Peninsula, 12, 26
  Sarah's Bosom, 12
aurantiaca, Timea, 14, 20, 21, 90, 91
aurantium,
  Alcyonium, 35
  Tethya, 14, 35–37, 78, 79, 94, 95
Aurora, 54
  cribriporosa, 33, 54
  providentiae, 54
  rowi, 54
aurora,
  Rhabdastrella, 15, 54, 56, 86, 87
  Stelletta, 54
aurora var. *arenosa, Stelletta*, 54
australe, Tetilla, 15, 57, 59, 60, 86, 87
Australia, 21, 24, 28, 30, 33, 37, 40, 45, 46, 48, 54, 55
  Melbourne, 27, 48, 49
  National Museum of Victoria, 11
  Port Phillip Bay, 11, 27
  Sydney, 11
  Tasmania, 27, 37
  Victoria, 33
  Western Port, 17
Australian Museum, 11
australiensis, Suberites, 14, 27, 28, 74, 75
Axinella sinclarii, 9
axinelloides, Suberites, 14, 25–27

bacillifera,
  Ecionemia, 38
  Stelletta, 38
baculifer,
  Coppatias, 30, 32
  Jaspis, 32
Balanus, sp., 30
Banks Peninsula, 11
  Akaroa, 13, 29, 62
  Diamond Harbour, 35
  Lyttelton, 24
  Wainui, 62
Bermuda, 37
Bethells Beach, 35
biformis, Myriastra, 44, 45
bocagei, Latrunculia, 17, 19
boglicii, Stelletta, 50
bonaventura, Tetilla, 60
Bracebridge Wilson Collections, 11
Bream Head, 35
brevis,
  Latrunculia, 14, 17–19, 70, 71
  Stelletta, 46
Britain, Shetland, 22
British Museum, 10, 33, 36
brøndstedi,
  Monosyringia, 43
  Suberites, 24, 26
Burbaris vermiculata, 16
Burton, Dr M., 10, 36, 42

Calcera, 10
calcifera, Monosyringia, 14, 39, 42, 43, 96, 97
Callyspongia ramosa, 9
Calthropella, 62
Campbell Island, 9, 24, 26
  Perseverence Harbour, 12, 24
Campbell Plateau, 12, 17, 22, 23, 31, 32, 42, 50, 53
Canterbury Museum Collections, 11
Canterbury University Collections, 11
Cape Brett, 13, 17, 29, 36, 41
Cape Colville, 22, 23, 35, 38
Cape of Good Hope, 40
Cape Maria van Dieman, 33, 44
Cape Palliser, 12, 35
Cape Runaway, 13
capitatostellifera,
  Hymedesmia, 20
  Timea, 20

Carnosa, 10
carnosa, Halichondria, 27
carnosus, Suberites, 14, 27
carnosus var. *novae-zealandiae, Suberites*, 27
Carpophyllum maschalocarpum, 45
celata, Cliona, 14, 29, 30, 76, 77
centrotylota, Therea, 42
Cerbaris
spinispirulifera, 16
torquata, 16
Ceylon, 42, 45, 48, 50
Chalina ramosa, 9
Chatham Islands, 29
Cape Young, 11
Forty Fours, 41
Hanson Bay, 11
Pitt Island, 12
South East Island, 12
The Sisters, 12
Waitangi Wharf, 52, 53
Chatham Rise, 11, 12, 17, 35, 36, 41, 45
Chathams Expedition, 11
cherbonniere, Asteropus, 32
Chile, 30
chilensis, Cliona, 30
Chlamys, 12
Chondrilla nucula, 63
chondrophylla, Xiphophora, 45
Chondrosia
chucalla, 63
collectrix, 63
Chondrosiidae, 10
Choristida, 14, 33, 38–61
Christchurch, 11, 50, 52
Christmas Island, 37
chuculla, Chondrosia, 63
ciliata, Aciculites, 64
Cinachyra, 15, 60
novae-zealandiae, 15, 60
uteoides, 15, 60, 61, 88, 89, 98, 99
Cliona, 14, 29, 30
celata, 14, 29, 30, 76, 77
chilensis, 30
eurphylla, 14, 30, 31, 90, 91
Clionidae, 14, 29, 30
collectrix, Chondrosia, 63
columna, Stelletta, 33, 46, 48
Colville Channel, 13, 38, 40
communis,
Anthastra, 49
Stelletta, 15, 48, 49, 51
compacta, Tethya, 35, 36
conica,
Hymeniacidon, 9
Stylohalina, 9
corigera, Polymastia, 14, 21, 22, 24, 25, 72, 73
conulosa, Stelletta, 15, 49–51, 53, 84, 85, 96, 97
Cook Strait, 11, 13, 27–29, 35, 36, 38, 44, 56, 58
Copenhagen Museum Collection, 11, 36, 63
Coppatias, 33
baculifer, 30, 32
Corallina officinalis, 23, 24
corallioides, Rhabderemia, 14, 19
corticata,
Sigmatella, 9
Stellettinopsis, 32
Corticella
novae-zealandiae, 63
stelligera, 62
Corticellopsis, 15, 62
novae-zealandiae, 15, 61, 62, 98, 99
shelligera, 62
Corticinae, 15, 62, 63
Craniella zetlandica, 59
Craniellopsis zetlandica, 15, 59, 60
crassa, Timea, 20
Crassostrea, 29
crater,
Myriastra, 44
stelletta, 15, 44, 45, 48, 82, 83, 92, 93
cribriporosa,
Aurora, 54
Rhabdastrella, 54
cribum, Pachastrella, 61
cupuloides, Suberites, 14, 25, 27, 74, 75
Cuvier Island 13, 27, 28, 52, 53

Dactylia palmata, 9
deformis,
Donatia, 37
Tethya, 14, 37
dendyi,
Desmacella, 32, 46
Dorypleres, 33
Jaspis, 33
Desmacella, 44
dendyi, 32, 46
Desmacidonidae, 10
Diastra, 54
Sterrastrea, 33, 54
Dictyoceratida, 11
digitata, Stylotella, 9, 24
dilatata, Spirastrella, 16
dilifera, Pachastrella, 60, 61
diploderma,
Donatia, 36
Tethya, 36, 37
Dirrophalum, 9
neozelanicum, 9
distincta, Rhabdastrella, 33, 54
Dominion Museum Collections 11, 19, 20, 22, 23, 27, 45, 46, 49, 55, 60, 62
domuncula, Suberites, 27, 28
Donatia deformis, 37
diploderma, 36
ingalli, 36
japonica, 35
lyncurium, 35
lyncurium var. *australis*, 37
robusta, 37
Dorypleres dendyi, 33
novae-zealandiae, 33
splendens, 33
Dosinia, 12
Dotonella, 14, 17
mirabilis, 14, 17
Doubtless Bay 13
Dunedin Harbour, 11, 13, 36

East Cape, 27, 28
Ecionemia, 32
acervus, 38
bacillifera, 38
Elminius modestus, 24
Endeavour Ice Edge Cruise, 12
Epipolasida, 10, 14, 30–37
Epipolasis, 14, 33–35
novae-zealandiae, 14, 33–35, 78, 79
salomonensis, 35
suluensis, 35
Erylus, 15, 55, 57
alleni, 35
nigra, 15, 55–57, 86, 87, 92, 93
proximus, 35
Europe, 24, 27, 30, 36
euryphylla, Cliona, 14, 30, 31, 90, 91

Falkland Islands, 26
ficus, Suberites, 27, 28
fissurata, Tethya, 9, 35, 36
Foveaux Strait, 12, 29, 30, 54
France, 21, 29, 63
Fusca, Polymastia, 14, 22–24, 72, 73

Galathea, 11
Gastrophenellidae, 64
Geodia, 15, 58, 59
regina, 15, 56, 58, 59, 86, 87, 96, 97
rex, 15, 58
Geodiidae, 15, 55–59
Geodinella, 15, 56–59
vestigifera, 15, 56–59, 88, 89, 98, 99
globostellata,
Rhabdastrella, 54
Stelletta, 54

Glycimeris, 29
laticostata, 24, 30, 76, 77
Goat Island Bay, 20, 22, 23, 29, 35–37, 45, 48
granulosa, Polymastia, 14, 23, 24, 72, 93
grayi, Thenea, 42
Great Barrier Island, 13, 22, 23, 28, 29, 35, 40, 41, 48
Whangapoura, 20, 28, 29, 41, 45
Kaiarara, 29
Greymouth, 11
Gulf of Guinea, 30
Gulf of Manaar, 33

Haast, 11
Hadromerida, 10, 14, 16–30, 33, 64
Haiti, 33
Halichondria carnosa, 27
Halichondriidae, 10
Haliclonidae, 10
Halinidae, 15, 60–63
Halininae, 15, 60, 61
hallezi, Timea, 21
hallezi var. *crassa Timea*, 20
Haplosclerida, 9, 11
Hartman, Dr W. P., 10
Hauraki Gulf, 11, 13, 30, 40
hentscheli, Spongorites, 35
Hen and Chicken Islands, 60
Hen Island, 13, 35
herdmani, Stelletta, 50
Heteroxyae, 35
hirsuta, Polymastia, 14, 23, 24, 74, 75
Hokianga Heads, 23
Homosclerophorida, 10, 15, 60–63
Hyalonoecia, 12
Hymedesmia capitatostellifera, 20
spinatostellifera, 20
stellata var. *centrifera*, 20
Hymeniacidon agminata, 24
conica, 9
Hymeniacidonidae, 10

Ikatere, 11
incrusta,
Pachastrella, 15, 60, 61
Lepidospongia, 64
incrustans
Lepidothenea, 15, 64
Suberites, 24, 26
Indian Ocean, 19, 21, 22, 27, 30, 32, 33, 37, 40, 45, 55, 59
indica, Topsenti, 35
Indo-Pacific, 16, 21, 24, 30, 37, 40, 45, 60
ingalli,
Donatia, 36
Tethya, 14, 36, 37, 78, 79, 94, 95
Islington Bay, 29
invaginata, Polymastia, 24

Japan, 37, 42, 45, 46, 48, 61, 63
japonica, Donatia, 35
Jaspidae, 14, 30–33
Jaspis, 14, 30, 32, 33, 35, 55
baculifer, 32
dendyi, 33
novae-zealandiae, 14, 33
serpentina, 32
Jasplakina, 55

kaena, Asteropus, 32
Kaikoura, 11, 23, 35
Kapiti Island, 11
Karekare, 29, 35
Kawau Island, 23, 28, 41
Bon Accord Harbour 29
Burgess Bay 22, 23, 35, 36, 38, 41
North Channel 11, 23, 24, 26, 29, 35, 37
Kermadec Islands, 9, 10, 37
Keratosa, 9
ketostea, Asteropus, 32

Ladies Bay, 23, 27, 29, 62
lamellata, Spongosorites 35
Lamellomorpha, 14, 30–32
strongylata, 14, 30–32, 76, 77, 90, 91
lapidiformis, Spongosorites, 35
laticosta, Glycimeris, 24, 30, 76, 77
Latrunculia, 14, 17–19
antarctica, 17, 19
apicalis, 19
bocagei, 17, 19
brevis, 14, 17–19, 70, 71
lendenfeldi, 17, 19
spinispiraefera, 17, 19
Leigh, 49
lendenfeldi, Latrunculia, 17, 19
Lepidopteran, 54
Lepidospongia incrustans, 64
Lepidothenea, 15, 64
incrustans, 15, 64
Levi, Dr C., 10
Lithistida, 15, 63, 64
lithodes, Stelletta, 15, 46, 49, 84, 85, 96, 97
Little Barrier Island, 13, 23, 36, 38, 40, 44, 45
longispinum, Monosyringia, 43
Lyall Bay, 23
lyncurium, Donatia, 35
lyncurium var. *australis, Donatia*, 37

Mackenzie, Miss M., 10
Macquarie Island, 12
Madagascar, 37, 55
Mahia Peninsula, 11, 23, 35, 38, 46, 48, 50, 52, 53, 56, 58, 62, 63, 64
Malaya, 21, 30, 37, 55
Manukau Harbour, 11, 13, 29, 30
Maoricolpus, 12, 26
maori, Stelletta, 15, 50, 51, 53, 84, 85, 96, 97
maschalocarpum, Carpophyllum, 45
maxima, Stelletta, 15, 33, 46–48, 84, 85, 92, 93
Mayor Island, 13, 19, 22, 23, 28, 35, 36, 38, 40, 41, 52, 53, 56, 58
McMurdo Sound, 33, 41, 45, 52, 59
Mediterranean, 21, 24, 36, 63
megaspina, Thenea, 42
Melophus, 32
Menzies Bay, 36, 37, 50, 53
Mercury Bay, 22
Mercury Reef, 29, 38
Milford, 27
mirabilis, Dotonella, 14, 17
modestus, Elminius, 24
Monaxonida, 10
monolopha, Plakina, 15, 62, 63, 92, 93
Monosyringia, 14, 42–44
brøndstedi, 43
calcifera, 14, 39, 42, 43, 96, 97
longispinum, 43
mortenseni, 14, 43, 44, 80, 81, 96, 97
mortenseni, Monosyringia, 14, 43, 44, 80, 81, 96, 97
Mortensen's Expedition, 9, 11, 44
Collections, 10, 11
Motutapu, 35
Mount Maunganui, 35
multistella, Tethya, 9, 36
Munida, 12
muricata, Thenea, 42
Myriastra, 44, 45
biformis, 45
crater, 44
purpurea, 45

Napier, 13
Narrow Neck, 20, 23, 24, 26, 36, 38, 62
Narrow Neck Reef, 29, 62
Nelson, 24
neozelanicum, Dirrophalum, 9
New Guinea, 30, 35
New Plymouth, 11, 38, 45, 63
New Zealand Marine Department, 10
New Zealand Oceanographic Institute Collections, 11, 12, 20, 31, 59
nigra, Erylus, 15, 55–57, 86, 87, 92, 93
Noises Island, 35
North America, 24, 30, 36, 37, *see also* U.S.A.
North Cape, 10, 17, 19, 22, 23, 27, 32–38, 40, 41, 44–46, 48, 52, 53, 56, 58–61, 63, 64
Northern Hemisphere, 21, 27–29
Notovola, 24, 29

novae-zealandiae,
Ancorina, 38, 40
Cinachyra, 15, 60
Corticella, 62
Corticellopsis, 15, 61, 62
Dorypleres, 33
Epipolasis, 14, 33–35, 78, 79
Jaspis, 14, 33
Spongosorites, 33–35
Stelletta, 15, 52, 53, 96, 97
Thenea, 14, 41, 42, 80, 81, 92, 93
nucula, Chondrilla, 63

officinalis, Corallina, 23, 24
osculifera, Ancorina, 38
Ostrea sinuata, 29, 30

Pachamphilla, 33, 55
Pachastrella, 15, 60, 61
cribum, 61
dilifera, 60, 61
incrustata, 15, 60, 61, 98, 99
Pachastrellidae, 10, 31
Pacific, 24, 26, 30, 37–39, 59
Ternate, 16, 17
palmata, Dactylia, 9
Panama, 26
Patea, 11, 13
parvispicula,
Anthastra, 49
Stelletta, 48, 49
Penares, 14, 33, 41
tylotaster, 14, 39–41, 80, 81
Pentagonaster, 12
perfectus, Suberites, 14, 28, 29, 76, 77
Philippines, 33, 64
Piha, 22, 23, 29, 35, 36
Pilochrota purpurea, 45
Pilumnus, 27
placenta, Spongosorites, 35
Plakina, 15, 62, 63
monolopha, 15, 62, 63, 92, 93
tribolopha, 15, 63, 92, 93
Point Chevalier, 23
Point Chevalier Reef, 29
Plumularia, 49
Polycheria antarctica, 21, 28
Polymastia, 14, 21–24
conigera, 14, 21, 22, 24, 25, 72, 73
fusca, 14, 22–24, 72, 73
granulosa, 14, 23, 24, 72, 73
hirsuta, 14, 23, 24, 74, 75
invaginata, 24
robusta, 24
tubulifera, 22
Pomatoceras, 29
Ponapé, 30
Ponui Channel, 29
Ponui Island, 35
porites, Spongosorites, 35
Poor Knights, 23, 35, 36
Port Jackson, 28, 48, 49
Portland Island, 13
Portobello, 11, 35
progressa, Ancorina, 14, 40, 41
progressa var. *diplococcus, Ancorina*, 40
Prosuberites, 26
aurora, 54
providentiae, Rhabdastrella, 54
proximus, Erylus, 55
Psammopemma, 63
Pseudosuberites, 14, 24–26
sulcatus, 14, 24–26
Puerto Rico, 55
pulchra, Aciculites, 15, 63, 64, 88, 89
Punakaiki, 35
purpurea,
Myriastra, 45
Pilochrota, 45
Stelletta, 15, 45, 47, 82, 83
Pyrosoma, 12

Queen Charlotte Sound, 11, 35

radiata, Agilardiella, 9, 44
ramosa,
Callyspongia, 9
Chalina, 9
Spongia, 9
ramosus, Suberites, 24, 26
Ranfurly Bank, 13
Rangitoto Channel, 21, 26–29
Rangitoto Island, 19. 21, 27, 35, 36, 38, 41, 62, 63
Raoul Island, 37
Red Sea, 27, 30, 37, 45
regina, Geodia, 15, 56, 58, 59, 86, 87, 96, 97
rex, Geodia, 15, 58
Rhabdastrella, 15, 54, 55
aurora, 15, 54, 55, 86, 87
cribriporosa, 54
distincta, 33, 54
globostellata, 54
providentiae, 54
rowi, 54, 55
sterrastrea, 54, 55
Rhabderemia, 14, 19
corallioides, 14, 19
stellata, 14, 18, 19, 70, 71, 90. 91
robusta,
Donatia, 37
Polymastia, 24
Tethya, 15, 36
rosaeum, Stephopoma, 30
rowi,
Aurora, 54
Rhabdastrella, 54, 55
Russell, 35

salomonensis, Epipolasis, 35
Samson, Capt W., 10
sandalinum, Stelletta, 15, 52, 53, 57, 86, 87, 96, 97
sarasinorum, Asteropus, 32
Saxostrea, 26
Saya de Malha, 22
Scleretodermidae, 15, 63, 64
Serolis, 12
serpentina, Jaspis, 32
Sertularella, 20
seychellensis, Tethya, 37
Shag Rock, 40, 41
Sigmatella corticata, 9
simplex,
Asteropus, 14, 32, 33, 76, 77, 90, 91
Stellettinopsis, 32
Triptolemus, 31
sinclarii,
Axinella, 9
Spongia, 9
sinuata, Ostrea, 29, 30
Slipper Island, 41, 52, 53, 56, 58, 59
solida, Stelletta, 48
Sollasellidae, 14, 33–35
South Africa, 30, 60, *see also* Africa
Port Elizabeth, 16, 17
South America, 36
Southern Hemisphere, 19
spherastraea, Timea, 21
spinatostellifera,
Hymedesmia, 20
Timea, 20
spinispiraefera, Latrunculia, 17, 19
spinispirulifera,
Anthosigmella, 16
Cerbaris, 16
Spirastrella, 16, 17
Suberites, 16
Spirastrella, 14, 16, 17
dilatata, 16
spinispirulifera, 14, 16–18
Spirastrellidae, 14, 16–21, 90, 91
Spirits Bay, 22–24, 33, 35, 36, 45, 52, 53, 56, 58, 59
splendens, Dorypleres, 33
Spongelia varia, 9

Spongia
ramosa, 9
sinclarii, 9
varia, 9
Spongosorites, 33, 35
hentscheli, 35
lamellata, 35
lapidiformis, 35
novae-zealandiae, 33–35
placenta, 35
porites, 35
suluensis, 35
stalagmoides, Ancorina, 14, 40, 41
Stanley Bay 21, 23, 24, 25
Stanmore Bay 22, 23, 35, 36
stellata, Rhabderemia, 14, 18, 19, 70, 71, 90, 91
stellata var. *centrifera*,
Hymedesmia, 20
Timea, 20
Stelletta, 15, 33, 44–53, 59
arenaria, 15, 45, 48, 82, 83, 92, 93
aurora, 54
aurora var. *arenosa*, 54
bacillifera, 38
boglicii, 50
brevis, 46
columna, 33, 46, 48
communis, 15, 48, 49, 51
conulosa, 15, 49–51, 53, 84, 85, 96, 97
crater, 15, 44, 45, 48, 82, 83, 92, 93
globostellata, 54
herdmani, 50
lithodes, 15, 46–49, 84, 85, 96, 97
maori, 15, 50, 51, 53, 84, 85, 96–99
maori var. *bistellata*, 50
maxima, 15, 33, 46–48, 84, 85, 92, 93
novae-zealandiae, 15, 52, 53, 96, 97
parvispicula, 48, 49
purpurea, 15, 45, 47, 82, 83
sandalinum, 15. 52, 53, 57, 86, 87, 96, 97
suluensis, 35
tethyopsis, 48
vestigium, 45
Stellettinae, 14, 42–55
Stellettinopsis
corticata, 32
simplex, 32
stelligera,
Corticella, 62
Corticellopsis, 62
Stephopoma rosaeum, 30
sterrastrea,
Diastra, 33, 54
Rhabdastrella, 54
Stewart Island, 23, 35, 36
Halfmoon Bay, 11
Paterson Inlet, 11
Pegasus Bay, 11
Strasbourgh, 10
strongylata, Lamellomorpha, 14, 30–32, 76, 77, 90, 91
stylifer, Trachycladus, 19
Stylohalina conica, 9
stylotella, 14, 24
agminata, 14, 24
digitata, 9, 24
Subantarctic, 10, 19, 22
Suberites, 14, 26–29
affinis, 14, 26
anastomosus, 24, 26
australiensis, 14, 27, 28, 74, 75
axinelloides, 14, 25–27
brøndstedi, 24, 26
carnosus, 14, 27
carnosus var. *novae-zealandiae*, 27
cupuloides, 14, 25, 27, 74, 75
domuncula, 27, 28
ficus, 27, 28
incrustans, 24, 26
perfectus, 14, 28, 29, 76, 77
ramosus, 24, 26
spinispirulifera, 16
stylifera, Tethya, 60
Tetilla, 60
Suberitidae, 14, 21–29
sulcatus, Pseudosuberites, 14, 24–26
suluensis,
Epibolasis, 35
Spongosoribes, 35
Stelletta, 35

Table Cape, 13
Takatu Channel, 45
Takatu Point, 23, 30, 35, 38, 40, 49, 50, 53
Terra Nova, 10, 11
Sta. 17, 22, 38, 60
Tetillidae, 15, 59, 60
Thenea, 14, 41, 42
centrotylota 42
grayi 42
megaspina 42
muricata 42
novae-zealandiae 14, 41, 42, 80, 81, 92, 93
Theonellidae, 15, 64
Three Kings, 10–13, 17, 20–22, 29, 31–34, 38, 40, 41, 43–45, 48, 49, 58–61, 64
Timea, 14, 20, 21
alba, 14, 18, 20, 90, 91
aurantiaca, 14, 20, 21, 90, 91
capitatostellifera, 20
crassa, 20
hallezi, 21
hallezi var. *crassa*, 20
spherastraea, 21
spinatostellifera, 20
stellata var. *centrifera*, 20
Topsentia indica, 35
torquata, Cerbaris, 16
Trachycladus, 16, 17
stylifer, 19
tribolopha, Plakina, 15, 63, 92, 93
Trinidad, 63
Triptolemus simplex, 31
tubulifera, Polymastia, 22
Tui, Pacific II Cruise, 12
tylotaster, Penares, 14, 39–41, 80, 81
Tyndalls Beach, 35, 36
Tethya, 10, 14, 35–37
actinia, 37
aurantium, 14, 35–37, 78, 79, 94, 95
compacta, 35, 36
deformis, 14, 37
diploderma, 36, 37
fissurata, 9, 35, 36
ingalli, 14, 36, 37, 78, 79, 94, 95
multistella, 9, 36
robusta, 14, 37
seychellensis, 37
stylifera, 60
zetlandica, 59
Tethyidae, 10, 14, 35–37
Tethyopsilla zetlandica, 59
Tethyopsis, 44
tethyopsis, Stelletta, 48
Tetilla, 15, 59, 60
australe, 15, 57, 59, 60, 86, 87, 98, 99
bonaventura, 60
stylifera, 60

Umbelliferae, 62
University of Copenhagen Collection, 11
University of New Zealand Research Grants Committee, 10
Uruguay, Maldonado, 19
U.S.A., *see also* North America
California, 60
East Haven, Conn., 29
South Georgia, 26
U.S. National Museum, 35
uteoides, Cinachyra, 15, 60, 61, 88, 89
varia,
Spongelia, 9
Spongia, 9

vermiculata, Burbaris, 76
vestigium, Stelletta, 45
Victoria University of Wellington Zoology Department Collections, 11, 12, 58
Viti Fox Cruise, 12

Waiheke, 16
  Onetaingi, 16, 27, 29, 35
Waitaki River, 13
Waitawa Bay, 29
Waitemata Harbour, 26
Waiwera, 23, 29
  Channel, 38, 45, 49, 50, 53
Wellington Harbour, 11, 29
West Coast, 22
West Indies, 21, 30, 63
Westport, 11
Whale Island, 13
Whangarei Harbour, 21, 35
Whangaroa, 23, 35
Wilhoite Subantarctic Cruise, 12
Wolff, Dr Torben, 11

Xiphophora chondrophylla, 45

Yale University, 10

Zanzibar, 21
zetlandica,
  Craniella, 59
  Craniellopsis, 15, 59
  Tethya, 59
  Tethyopsella, 10, 14, 35–37

MEMOIRS OF THE NEW ZEALAND OCEANOGRAPHIC INSTITUTE

Memoir No.	*Year*	*Title*
[1]	1955	Bibliography of New Zealand Oceanography, 1949–1953. By N.Z. OCEANOGRAPHIC COMMITTEE. *N.Z. Dep. scient. ind. Res. geophys. Mem. 4.*
[2]	1957	General Account of the Chatham Islands 1954 Expedition. Part 1. By G. A. KNOX. *Bull. N.Z. Dep. scient. ind. Res. 122.*
3	1959	Contributions to Marine Microbiology. Compiled by T. M. SKERMAN, *N.Z. Dep. scient. ind. Res. Inf. Ser. No. 22.*
4	1960	Biological Results of the Chatham Islands 1954 Expedition. Part 1. Decapoda Brachyura, by R. K. DELL; Cumacea, by N. S. JONES; Decapoda Natantia by J. C. YALDWYN. *Bull. N.Z. Dep. scient. ind. Res. 139(1).*
5	1960	Biological Results of the Chatham Islands 1954 Expedition. Part 2. Archibenthal and Littoral Echinoderms. By H. BARRACLOUGH FELL. *Bull. N.Z. Dep. scient. ind. Res. 139(2).*

Memoir No.	Year	Title
6	1960	Biological Results of the Chatham Islands 1954 Expedition. Part 3. Polychaeta Errantia. By G. A. KNOX. *Bull. N.Z. Dep. scient. ind. Res. 139(3).*
7	1960	Biological Results of the Chatham Islands 1954 Expedition. Part 4. Marine Mollusca, by R. K. DELL; Sipunculoidea, by S. J. EDWARDS. *Bull. N.Z. Dep. scient. ind. Res. 139(4).*
8	1961	Hydrology of New Zealand Coastal Waters, 1955. By D. M. GARNER. *Bull. N.Z. Dep. scient. ind. Res. 138.*
9	1962	Analysis of Hydrological Observations in the New Zealand Region, 1874–1955. By D. M. GARNER. *Bull. N.Z. Dep. scient. ind. Res. 144.*
10	1961	Hydrology of Circumpolar Waters South of New Zealand. By R. W. BURLING. *Bull. N.Z. Dep. scient. ind. Res. 143.*
11	1964	Bathymetry of the New Zealand Region. By J. W. BRODIE, *Bull. N.Z. Dep. scient. ind. Res. 161.*
12	1965	Hydrology of New Zealand Offshore Waters. By D. M. GARNER and N. M. RIDGWAY. *Bull. N.Z. Dep. scient. ind. Res. 162.*
13	1961	Biological Results of the Chatham Islands 1954 Expedition. Part 5. Porifera: Demospongiae, by PATRICIA R. BERGQUIST; Porifera: Keratosa, by PATRICIA R. BERGQUIST; Crustacea Isopoda: Bopyridae, by RICHARD B. PIKE; Crustacea Isopoda: Serolidae, by D. E. HURLEY; Hydroida, by PATRICIA M. RALPH. *Bull. N.Z. Dep. scient. ind. Res. 139(5).*
14	1963	Submarine Morphology East of the North Island, New Zealand. By H. M. PANTIN. *Bull. N.Z. Dep. scient. ind. Res. 149.*
15	In prep.	Marine Geology of Cook Strait. By J. W. BRODIE. *Bull. N.Z. Dep. scient. ind. Res.*
16	1963	Bibliography of New Zealand Marine Zoology 1769–1899. By DOROTHY FREED. *Bull. N.Z. Dep. scient. ind. Res. 148.*
17	1965	Studies of a Southern Fiord. By T. M. SKERMAN (Ed.) *Bull. N.Z. Dep. scient. ind. Res. 157.*
18	1961	The Fauna of the Ross Sea. Part 1 Ophiuroidea. By H. BARRACLOUGH FELL. *Bull. N.Z. Dep. scient. ind. Res. 142.*
19	1962	The Fauna of the Ross Sea. Part 2. Scleractinian Corals. By DONALD F. SQUIRES. *Bull. N.Z. Dep. scient. ind. Res. 147.*
20	1963	*Flabellum rubrum* (Quoy and Gaimard). By DONALD F. SQUIRES. *Bull. N.Z. Dep. scient. ind. Res. 154.*
21	1963	The Fauna of the Ross Sea. Part 3. Asteroidea. By HELEN E. SHEARBURN CLARK. *Bull. N.Z. Dep. scient. ind. Res. 151.*
22	1964	The Marine Fauna of New Zealand: Crustacea Brachyura. By E. W. BENNETT. *Bull. N.Z. Dep. scient. ind. Res. 153.*
23	1963	The Marine Fauna of New Zealand: Crustaceans of the Order Cumacea. By N. S. JONES. *Bull. N.Z. Dep. scient. ind. Res. 152.*
24	1964	A Bibliography of the Oceanography of the Tasman and Coral Seas, 1860–1960. By BETTY N. KREBS. *Bull. N.Z. Dep. scient. ind. Res. 156.*
25	1965	A Foraminiferal Fauna from the Western Continental Shelf, North Island, New Zealand. By R. H. HEDLEY, C. M. HURDLE, and I. D. J. BURDETT. *Bull. N.Z. Dep. scient. ind. Res. 163.*
26	1964	Sediments of Chatham Rise. By ROBERT M. NORRIS. *Bull. N.Z. Dep. scient. ind. Res. 159.*
27	1965	The Fauna of the Ross Sea. Part 4. Mycidacea. By OLIVE S. TATTERSALL. Part 5. Sipunculoidea. By S. J. EDMONDS. *Bull. N.Z. Dep. scient. ind. Res. 167.*
28	1966	Sedimentation in Hawke Bay. By H. M. PANTIN. *Bull. N.Z. Dep. scient. ind. Res. 171.*
29	1964	Biological Results of the Chatham Islands 1954 Expedition. Part 6. Scleractinia by D. F. SQUIRES. *Bull. N.Z. Dep. scient. ind. Res. 139(b).*
30	1966	Geology and Geomagnetism of the Bounty Region East of the South Island, New Zealand. By D. C. KRAUSE. *Bull. N.Z. Dep. scient. ind. Res. 170.*
31	In prep.	Marine Biology, Hydrology, Physiography of Manihiki Atoll, Cook Islands. Compiled by C. MCCANN and J. S. BULLIVANT. *Bull. N.Z. Dep. scient. ind. Res.*
32	1967	The Fauna of the Ross Sea. Part 5. General Accounts, Station Lists, and Benthic Ecology. By JOHN S. BULLIVANT and JOHN H. DEARBORN. *Bull. N.Z. Dep. scient. ind. Res. 176.*
33	1967	The Submarine Geology of Foveaux Strait. By D. J. CULLEN. *Bull. N.Z. Dep. scient. ind. Res. 184.*
34	In prep.	Benthic Ecology of Foveaux Strait. By E. W. DAWSON. *Bull. N.Z. Dep. scient. ind. Res.*
35	1966	The Marine Fauna of New Zealand: Spider Crabs, Family Majidae (Crustacea Brachyura). By D. J. GRIFFIN. *Bull. N.Z. Dep. scient. ind. Res. 172.*
36	1967	Water Masses and Fronts in the Southern Ocean South of New Zealand. By TH. J. HOUTMAN. *Bull. N.Z. Dep. scient. ind. Res. 174.*

R. E. OWEN, GOVERNMENT PRINTER, WELLINGTON, NEW ZEALAND—1968

1,420/11/66—28423