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The Marine Fauna of New Zealand:
Porifera, Demospongiae, Part 2
(Axinellida and Halichondrida)

by

PATRICIA R. BERGQUIST

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THE MARINE FAUNA OF NEW ZEALAND:
PORIFERA, DEMOSPONGIAE, PART 2
(AXINELLIDA AND HALICHONDRIDA)
*Halichondrida moorei* Bergquist. Point Chevalier Reef. Intertidal. (Accompanying algae are *Colpomenia sinuosa* and *Corallina officinalis.)*
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PATRICIA. R. BERGQUIST
Department of Zoology,
University of Auckland, New Zealand

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FOREWORD

In the present volume the author continues her examination of the New Zealand marine sponges with a discussion of the systematics and ecology of two more orders of the Demospongiae. Material for this study has come from the author’s own collections and those of the Dominion Museum, Wellington; Canterbury Museum, Christchurch; Zoology Department, University of Wellington; and N.Z. Oceanographic Institute.

The present monograph is a further contribution to studies of the marine fauna of New Zealand published in this memoir series. The preliminary editing of the manuscript was carried out by Miss B. Davison.

J. W. BRODIE, Director,
N.Z. Oceanographic Institute,
Wellington.
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The Marine Fauna of New Zealand:  
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(Axinellida and Halichondrida)

by  
PATRICIA R. BERGQUIST  
Department of Zoology,  
University of Auckland, New Zealand.

ABSTRACT

The New Zealand sponges belonging to the orders Axinellida and Halichondrida are described and discussed with respect to their systematics and general ecological characteristics. Thirty species belonging to 16 genera within the Axinellida are described—one genus (Acanthoclada) and 10 species are new. The Halichondrida are represented by five genera and 15 species, of which one is new.

INTRODUCTION

This second part of the Demospongiae of New Zealand deals with two orders, the Axinellida and the Halichondrida. Forty-five species are considered; of these, 11 are new and four are recorded for the first time from the New Zealand region. One new genus is described.

The Axinellida are particularly well represented in New Zealand waters. Thirty species belonging to 16 genera are assigned to the order. The systematics of axinellid sponges pose problems at all levels: the early literature is often inadequate, and the limits of the taxon Axinellida have been construed differently by almost every worker. For these reasons a definition is given in this paper of each family and genus described.

The classification used for other New Zealand Tetractinomorpha (Bergquist 1968) is basically that of de Laubenfels (1936). However, the adoption of an order Axinellida and the present arrangement of families within it does not follow de Laubenfels's classification, in which the Axinellida were a single family within the Halichondrida. The families here grouped into the Axinellida were in de Laubenfels's classification scattered throughout the Poecilosclerida, Epipolasida, and Halichondrida. Hallmann (1917 a, b) and Levi (1956) have argued for the separation of the Axinellida from the Halichondrida. The families here grouped into the Axinellida were in de Laubenfels's classification scattered throughout the Poecilosclerida, Epipolasida, and Halichondrida. Hallmann (1917 a, b) and Levi (1956) have argued for the separation of the Axinellida from the Halichondrida, and the definitions of the families adopted here are in the main those of Hallmann.

Levi has suggested many times that the Axinellida were a distinct order, but, rather than giving a formal definition of the group, he recognised one large order, the Clavaxinellida, which includes the Hadromerida, Epipolasida, and Axinellida. Bergquist (1967) has defined the order Axinellida.

Features of great significance in distinguishing the orders Halichondrida and Axinellida are the differences in reproduction and larval development. The Axinellida are oviparous, producing small eggs, which, after fertilisation, develop to free-swimming larvae outside the parent body.

The Ceractinonorma, including the Halichondrida, are viviparous. Their larvae develop from large eggs and are incubated for varying periods within the parent body before release.

In using reproductive and larval characteristics to support the separation of the Axinellida from the Halichondrida and the alliance of the former group with the Tetractinomorpha, the comparison within the Tetractinomorpha is only with the Hadromerida and Epipolasida, where reproductive characteristics are now known for several genera. There is need for much more information on reproductive processes in all forms. At the time Levi proposed the alliance of the Axinellida with the Tetractinomorpha (1953), sexuality was unknown.
in the Choristida proper and known for only four species of Homosclerophorida. Such information as is now available on sexual reproduction in the Choristida applies only to the development of _Stelleta_ (Liaci and Sciscioli 1967) and does not include a description of the larva.

Sexual reproduction is known for the family Tetilliidae (order Spirophorida) (Sollas 1888; Watanabe 1957). Larvae almost ready to be released have also been discovered recently in _Tetilla australis_ Bergquist. The larvae, which resemble miniature adults, are subcortical in position, and sperm balls are abundant towards the interior of the sponge. This suggests strongly that these larvae have a sexual origin, but without knowledge of early development stages it is impossible to be sure that they have not originated from gemmules. It is obvious that some species of Spirophorida, at least, among the Tetractinomorpha incubate their larvae to such an extent that the free-swimming stage is deleted, a tendency quite consistent with the unattached habit of some species of _Tetilla_ and _Cinachyra_ (Bergquist 1968).

The Halichondrida are represented by 15 species belonging to five genera. One species is new and all the genera are widespread. With the exception of _Acanthella cristagalli_ and _Ciocalypta penicillus_ the New Zealand Halichondrida are essentially intertidal or shallow-water species. Sponges belonging to this order are true Cerratinomorpha in having incubated stereogastrula larvae arising from large eggs.

In summary, all the evidence indicates that the Axinellida and the Halichondrida have life-cycle patterns that are so distinctive that it is reasonable to conclude that each group is of ordinal status.

ACKNOWLEDGMENTS

The author wishes to acknowledge the support of the University Research Grants Committee who have financially aided this project, and of the Marine Department for the generous provision of sea time on _m.v. Ikateri_.

The following persons have given substantial technical assistance, Mr J. Kerr (histologist), and Mrs C. A. Tizard (preparator).

COLLECTIONS EXAMINED

The data for most of the stations from which material is described in this bulletin were given in Part 1 of this series.

Details of additional stations are presented in the following supplementary station list.

**CHATHAM ISLANDS EXPEDITION**

**Sta. 27** 30 Jan 1954, 43°57.5'S, 176°44.5'E, Petre Bay, 45 fm, DL.

**TH. MORTENSEN EXPEDITION**

6 Dec 1914, Carnley Harbour, sandy clay, 45 fm.
LIST OF SPECIES DESCRIBED

Subclass TETRACTINOMORPHA Levi
Order AXINELLIDA Bergquist
Family AXINELLIDAE Ridley and Dendy
Genus Homaxinella Topsent, 1917
  Homaxinella erecta (Brøndsted)
Genus Axinella Schmidt, 1862
  Axinella globula Brøndsted
  Axinella sinclarii (Gray)
  Axinella brondstedi nom. nov.
  Axinella australiensis sp. nov.
  Axinella tricalyciformis nom. nov.
  Axinella richardsoni sp. nov.
  Axinella torquata Brøndsted
Genus Pararhaphoxya Burton, 1934
  Pararhaphoxya pulchra (Brøndsted)
Genus Phakellia Bowerbank, 1862
  Phakellia dandyi sp. nov.
Genus Ceratopsion Strand, 1929
  Ceratopsion cuneiformis sp. nov.
Genus Bubaris Gray, 1867
  Bubaris vermiculata (Bowerbank)
  Bubaris elegans Dendy
Genus Hymerhabdia Topsent, 1892
  Hymerhabdia oxeata (Dendy)
Genus Thrinacophora Ridley, 1885
  Thrinacophora dubia Brøndsted
Genus Pseudaxinella Schmidt, 1875
  Pseudaxinella australis sp. nov.
Family TRACHYCLADIDAE Hallmann
Genus Trachycladus Carter, 1879
  Trachycladus stylifer Dendy
Family DESMOXYIDAE Hallmann
Genus Parahigginsia Dendy, 1924
  Parahigginsia phakellioioides Dendy
Genus Acanthoclada gen. nov.
  Acanthoclada prostrata sp. nov.
Family SIGMAXINELLIDAE Hallmann
Genus Biemma Gray, 1867
  Biemma novaezealandiae Dendy
  Biemma flabellata sp. nov.
  Biemma rhabderemoides Bergquist
  Biemma stylotata (Brøndsted)
Family RASPAILLIIDAE Hentschel
Genus Raspailia Schmidt 1862
  Raspailia agminata Hallmann
  Raspailia flaccida sp. nov.
  Raspailia inaequalis Dendy
  Raspailia topsenti Dendy
  Raspailia compressa sp. nov.
Genus Clathriodendron Ledenfeld, 1888
  Clathriodendron rubrum Kirk
Genus Eurypon Gray, 1867
  Eurypon hispida sp. nov.
List of Species—continued

Subclass CERACTINOMORPHA Levi

Order HALICHONDRIA Topsent

Family HALICHONDRIIDAE Gray
Genus Halichondria Fleming, 1828
Halichondria knowltoni Bergquist
Halichondria moorei Bergquist
Halichondria panicula (Pallas)
Halichondria punctata nom. nov.
Halichondria intermedia Brøndsted

Genus Trachyopsis Dendy, 1905
Trachyopsis halichondrioides Dendy

Genus Ciocalypta Bowerbank, 1864
Ciocalypta polymastia (Lendenfeld)
Ciocalypta penicillus Bowerbank

Family HYMENIACIDONIDAE de Laubenfels
Genus Hymeniacidon Bowerbank, 1861
Hymeniacidon hauraki Brøndsted
Hymeniacidon indistincta Brøndsted
Hymeniacidon perleve (Montague)
Hymeniacidon racemosa Brøndsted
Hymeniacidon spherodigitata sp. nov.
Hymeniacidon conica (Kirk)

Genus Acanthella Schmidt, 1862
Acanthella crista-galli (Dendy)
SYSTEMATICS

(i) An asterisk (*) before a species name indicates species was 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 15 measurements for each spicule type.

Order AXINELLIDA Bergquist

These are Tetractinomorpha that have an axially condensed or plumoreticulate skeleton, usually rich in spongin B. The megascleres are monaxons, oxeas, styles or strongyles in all combinations. The spicules are frequently curved or contort.

Microscleres are often absent but a variety of forms can occur. Raphides and microxeas are the commonest; asterose and sigmoid types are found in the Astraxinellidae and Sigmaxinellidae respectively.

A stiff axial region, distinct from a softer extra-axial region, is typical although variations toward massive form are found. The surface can be smooth but is usually hispid with projecting spicules. The colour of the living sponge is characteristically dark brown, orange or yellow.

In the few species where reproductive processes have been recorded, the sponges are oviparous.

Axinellida are similar in many morphological features to such groups of Ceractinomorpha as the Clathridiidae. Several families such as the Raspailiidae and the Sigmaxinellidae are difficult to place between the Poecilosclerida and the Axinellida. In placing these families in the Axinellida considerable importance has been attached to reproductive characteristics.

Family AXINELLIDAE Ridley and Dendy

Axinellida in which microscleres are absent.

Genus Homaxinella Topsent

Axinellidae of ramose form, with simple spiculation, styles or subtylostyles only.

Homaxinella erecta (Brøndsted). (Pls. 1a, b; 14a)

_Hymeniacidon erecta_ Brøndsted, 1924, p. 479, fig. 32a–b.
_Axiamon erecta_, de Laubenfels, 1936, p. 130.
_non Axiamon erecta_, Bergquist, 1961a, p. 41, fig. 12.

**Neotype**


**Material Examined**

Shag Rock, Waiheke 6-10 fm; Takatu Pt, 6 fm (Neotype); 10 miles south-east of East Cape 20 fm; Manukau Harbour, 6 fm.

**Description**

Ramose, either with thin whip-like branches arising from a small attachment base or of simple erect cylindrical form. The stalk is extremely hard and tough, the extremities softer, sometimes a little compressed. This sponge is always found attached to a shell, usually a living one, commonly _Tawera spissa_ and _Atrina._

**Dimensions:** Height up to 20.0 cm; diameter of branches up to 4.0 mm; diameter of stalk 1.5-2.5 mm.

**Colour:** In life, dull yellow (rY 7/6) fading to yellow white or grey when preserved (rY 7/2 to rY 8/4).

**Texture:** Firm and flexible. The axis is very tough and stringy; the euctosomal region relatively soft and easily torn.

**Surface:** The surface is hispid; less markedly so in the stiff axial stalk region than toward the extremities where the euctosomal tissues cling tightly to the axis. No pores or oscules have been observed.

**Skeleton:** The skeleton consists of an axial endosomal region, half the total diameter of the sponge, composed of a dense mass of spicules organised into interlocking fibres. Spongin B elements are present but surround only the central fibres. The spicule tracts curve outward from the central axis to the subdermal position, where they merge with a thin but definable dermal spicule layer. The euctosomal region is 0.25-0.5 mm in diameter, and somewhat disorganised interstitial spicules with no precise orientation tend to mask the plumose spicule tracts. The dermal spicules tend to be arranged at right angles to the axis, but in many areas they are almost parallel.

**Spicules:**

**Megascleres:**

Styles to subterminal tylostyles. Usually straight, but wavy or strongly curved forms are common particularly in the axial region. A recurring modification of the styles is that the stylole end is reflected at approximately 45° to the axis.
**SPICULE DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Styles</th>
<th>Oxeas</th>
<th>Styles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little Barrier 1</td>
<td>250-650</td>
<td>× 2.0-8.0</td>
<td>200-680</td>
</tr>
<tr>
<td>Hauraki Gull, 30 fm</td>
<td>× up to 8.0</td>
<td>2.0-8.0</td>
<td></td>
</tr>
<tr>
<td>Takatu Pt, 30 fm (Neotype)</td>
<td>(390 × 4.5)</td>
<td>(320 × 5.0)</td>
<td></td>
</tr>
<tr>
<td>East Cape</td>
<td>220-700</td>
<td>× 2.5-9.0</td>
<td>220-700</td>
</tr>
</tbody>
</table>

**REMARKS**

*Homaxinella erecta* is typical of the genus *Homaxinella* as defined by Topsent (1917). His suggestion of similarity between species of *Homaxinella* and species of *Hymeniacidon* is valid with respect to spiculation and the emphasis in *Homaxinella* of the axinellid skeletal arrangement. However, the axinellid pattern is still discernible in the ectosome, and the universal presence of a rigid axis argues for inclusion of *Homaxinella* in the Axinellida.

*Homaxinella erecta* was described originally by Brøndsted in *Hymeniacidon*, where clearly it does not belong. The single type specimen has been lost*, so the specimen described above, from Takatu Point, is nominated as neotype. This specimen is similar to Brøndsted’s in all features mentioned in his description and was found only 10 miles from the type locality. The neotype specimen is lodged with the Dominion Museum (Wellington).

**DISTRIBUTION**

Little Barrier 1, 30 fm.

**Genus Axinella** Schmidt

Axinellidae of variable form, always with some axial condensation and with extra-axial skeleton diverging in plumose fashion. Spiculation: oxeas, styles and strongyles together or separate. No special dermal spicules.

**Axinella globula** Brøndsted

*Axinella globula* Brøndsted, 1924, p. 475, fig. 28.

**DISTRIBUTION**

East of North Cape, 55 fm.

**Axinella sinclarii** (Gray)

*Spongia sinclarii* Gray, 1843, p. 295.

**Axinella sinclarii**, Dendy, 1897b, p. 317, pl. xxxiv, fig. g.

**DISTRIBUTION**

New Zealand, details unknown.

Bøndsted's northern New Zealand collections were returned to the Zoological Museum in Copenhagen unlabelled and mixed with much undescribed material. I have re-examined these collections, but the type of *Hymeniacidon erecta* is not among them. The specimen is not listed in the Copenhagen museum, and all efforts to locate it there have failed.

**Axinella torquata** Brøndsted

*Axinella torquata* Brøndsted, 1923, p. 147, fig. 25 a-h.

**DISTRIBUTION**

Carnley Harbour, 45 fm.

**Axinella brondstedi** nom. nov.

*Axinella verrucosa* Brøndsted, 1923, p. 148, fig. 26 a-b.

**REMARKS**

Brøndsted (1923) described *A. verrucosa* as a new species from Campbell Island. This species name is preoccupied in *Axinella* by *Spongia verrucosa* Esper (Schmidt, 1862).

**DISTRIBUTION**

Carnley Harbour, 45 fm.

**Axinella australiensis** sp. nov. (Pls. loci: 12d; 14b)

**HOLOTYPE**

Dom. Mus. Por. 18.

**MATERIAL EXAMINED**

East of Alderman I., 56 fm juvenile: Poor Knights Is., 25 fm (holotype).

**DESCRIPTION**

A tall, ramose sponge with cylindrical branches flattened at points of dichotomy and a thick, bilaterally compressed axis. The juvenile form is a perfect inverted cone rising from a short cylindrical stalk.

**DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Height</th>
<th>Sister Diameter</th>
<th>Branch Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Knights Is. (holotype)</td>
<td>35.0 cm</td>
<td>3.0-3.5 cm</td>
<td>1.0-2.5 cm</td>
</tr>
<tr>
<td>Alderman I.</td>
<td>1.5-2.0 cm</td>
<td>1.2 mm</td>
<td>2-4-0 mm (apical diameter)</td>
</tr>
</tbody>
</table>

**COLOUR:** In life, bright red (Y-R 4/4) to brick red (Y-R 5/8); in spirit, brown (Y-R 5/4).

**SURFACE:** The surface is hispid; projecting spicules are in tufts of 6–12 extending about half their length beyond the dermal membrane. In the juvenile specimen 4–12 ovoid oscules (0.5 x 1.0 mm maximum dimension) are arranged in a rosette around a central axis. In the mature sponge the oscules are distributed over the whole surface in groups of 2–10. When the dermal membrane collapses or is rubbed off these appear as stellate depressions.

**PORES:** Are grouped into small areas, 80–120 μ across, dispersed over the whole surface.

**SKELETON:** The axial portion, a system of fine inter-lacing spongin B fibres cored by oxeas and styles, is three-quarters of the total branch diameter. The fibres, 35.0-95.0 in diameter, rarely contain more than 8 spicules at any one point. Between the fibres a great deal of cellular tissue persists. The extra-axial region is fleshy; the fibres contain a low proportion of spongin to spicule.
The fibres, 300–400 µ₂ apart, curve out from the axis and contain 1–8 spicules at any given point. They are interconnected by a series of short fibres, 1–2 spicules in diameter, which mask the basic plumose arrangement of the extra-axial skeleton. Just below the surface the arrangement of the skeleton becomes irregular and dermal tufts terminate most fibres. The dermal spicules are predominantly styles.

**SPICULES:**

**MEGASCLERES:**

(a) OXEAS, stout, centrally flexed spicules, sometimes twice angulate. The ends are faintly “stepped”; the axial canals frequently open at both ends.

(b) STYLES, curved in the proximal third, otherwise conventional with the same variation as the oxeas in termination and with prominent axial canals (open at one end). There are very fine styles present, interpreted as developmental forms.

**SPICULE DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Oxeas (µ)</th>
<th>Styles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Knights Is. (holotype)</td>
<td>140–400 × 3–16 (340 × 10)</td>
<td>120–320 × 1.5–16 (210 × 6.0)</td>
</tr>
</tbody>
</table>

**REMARKS**

*Axinella australiensis* is typical of the genus *Axinella* in spiculation, skeletal arrangement, and external form. It accords well with the view Vosmaer (1912) takes of *Axinella*.

The stellate pattern on the surface of dead specimens suggests that *A. australiensis* should be compared with *A. sinclarii* (Gray) and *A. stelliderma* Carter. *Axinella sinclarii* has flexuous strongyles and is best placed in *Plakellia*, although the sponge itself is poorly known and barely recognisable. *Axinella stelliderma* has styles only and has distinctive dermal tufts with one long, central style surrounded by shorter styles. This arrangement is characteristic of *Raspailia*, not of *Axinella*. There has been no detailed redescription of *A. stelliderma* and thus no recommendation is made as to its true generic position. It cannot, however, be confused with *A. australiensis*.

*Axinella australiensis* differs from all other species of *Axinella* recorded from the Southern Hemisphere in the combination of ramose form with a mixed spiculation and a stellate pattern of oscular channels.

**Axinella tricalyciformis** Bergquist nom. nov. (Pls. 2a, b: 14c)

*Axinella lamellata* Bergquist, 1961b, p. 188, figs 12a–c.

**HOLOTYPE**


**MATERIAL EXAMINED**

CIE 27 Petre Bay, Chatham I., 45 fm (Holotype); B 176 Auckland Is., 46 fm; Dunedin Heads, 20 fm; Paterson Inlet, Stewart I., 20 fm; off Patea, 20 fm.

**DESCRIPTION**

An erect, stipitate sponge, which has the form of a slightly concave lamella when young. As it ages the two edges of the lamella grow together to form a closed funnel. Further growth produces a second and possibly a third enclosed funnel.

**DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Height (cm)</th>
<th>Width (mm)</th>
<th>Stalk Diameter (mm)</th>
<th>Lamella Thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petre Bay (holotype)</td>
<td>4.1</td>
<td>2.8</td>
<td>6.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Stewart I., 20 fm</td>
<td>6.0</td>
<td>8.5</td>
<td>1.2</td>
<td>3.0</td>
</tr>
<tr>
<td>Patea, 30 fm</td>
<td>14.0</td>
<td>16.0</td>
<td>3.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Campbell Plateau, 12.0 cm</td>
<td>14.0</td>
<td>2.8</td>
<td>4.5</td>
<td></td>
</tr>
</tbody>
</table>

**COLOUR:** In life, dull yellow (Y–R–Y 6/5) to brown; in spirit, yellowish brown (Y–R–Y 5/4) to orange (Y–R–Y 7/6).

**TEXTURE:** Pliable, firm, incompressible.

**SURFACE:** The surface looks smooth, but under low magnification is seen to be minutely conulose and hispid. There is a concave exhalant and a convex inhalant surface. In the young specimen a single elevated osculum is visible.

**SKELETON:** The skeleton is made up of ascending, plumose fibres cored by oxeas and invested by spongin. The solid core of fibres passes from the stalk into the centre of the lamella and secondary fibres curve outward toward the surface. The fibres are 30.0–90.0 µ₂ in diameter and may contain up to 30 tightly packed spicules but usually only 12–15. The apicoseus dermal membrane, 0.1 mm thick, is raised into small conules where the fibres intersect the surface. The terminal oxeas penetrate the dermal membrane.

**SPICULES:**

**MEGASCLERES:**

OXEAS; evenly tapered, usually strongly flexed but may be straight. Stylole forms are rare: thin developmental forms of the oxeas are common.

**SPICULE DIMENSIONS:** 300–520 × 10–140 µ₂; (392 × 13.2 µ); developmental forms 280–350 × 3.0–8.0 µ₂.

**REMARKS**

The original description of *Axinella tricalyciformis* (Bergquist 1961b) was based on a single specimen, which has proved to be a young form. The species is now known to be a relatively common southern New Zealand and subantarctic sponge. The description is expanded above to accommodate the mature specimens. Burton (1959a) published a reference to *A. lamellata* (Dendy) from Ceylon and Arabia which refers to a new transfer to *Axinella* of *Spongosites lamellata* Dendy. De Laubenfels (1936) referred this species (misspelled *lamella*) to *Epiplolis*. From Dendy's description (1905) it is likely that Burton is correct in placing this species in the Axinellidae. Thus the species name *lamellata* is preoccupied in *Axinella*, and *tricalyciformis* is proposed to replace it (Bergquist, 1961b).
Axinella richardsoni sp. nov. (Pls. 2c; 10e)

**Holotype**

Dom. Mus. Por. 19

**Material Examined**

VUZ 55 Cook Strait, 40-100 fm.

**Description**

The sponge is a low-growing, stalked, concave lamella slightly dissected into lobes.

**Dimensions:** Height 4.5 cm; width of lamella 5.5 cm; thickness of lamella 5.0 mm; diameter of stalk 8.0 mm.

**Colour:** In life, dull orange (YR-6/8); in spirit, pale yellow (Y-R-Y 7/4).

**Texture:** Lamella firm but compressible; stalk solid.

**Surface:** The surface is uneven and uniformly hispid. The concave side of the lamella is differentiated as an oscular surface. The oscules, 0.08-0.1 mm in diameter, are in stellate groups 2.0-3.0 mm apart. The pores occur on the convex surface.

**Skeleton:** The skeleton is a compact reticulum of spongin fibre cored by oxeas and styles. Primary ascending fibres are emphasised and are often cored by two or three rows of spicules. The connecting fibres and many of the ascending fibres contain only one spicule row.

Ascending fibres are 60.0-70.0 µm in diameter; connecting fibres rarely exceed 15.0 µm. A dermal membrane, 0.16 mm thick, is present.

**Spicules:**

**Megascleres:**

(a) **Oxeas,** stout spicules strongly flexed to irregularly wavy, evenly tapered to sharp points.

(b) **Styles,** varying considerably in width. They are often as stout as the oxeas, but usually are much finer and evenly curved. Slightly less abundant than the oxeas.

*Genus Pararhaphoxya* Burton

Axinellida with an axial core of sinuous strongyles mingled with curved oxeas and styles. Extra-axial spicules oxeas and styles.

*Pararhaphoxya pulchra* (Brøndsted). (Pls. 2d, 3a, 13b).

*Sigmaxinella pulchra* Brøndsted, 1923, p. 151, fig. 28.


**Material Examined**

VUZ 55 Cook Strait, 40-100 fm; Cape Palliser, 56 fm; Carnley Harbour, 45 fm.

**Description**

An erect, stalked sponge, with cylindrical branches that often have bifid ends and deeply grooved surfaces. Some of the branches are anastomosed.

**Dimensions:** Height 9.0 cm; diameter of stalk 7.0 mm; width at apex 6.0 cm; length of branches 0.4-4.5 cm; diameter of branches 3.0-7.0 mm (5.6 mm).

**Colour:** In life, bright orange (YR 6/8); in spirit, grey.

**Texture:** Stiff and cartilaginous.

**Surface:** The surface is extremely hispid; raised into shaggy lumps in many places. Some areas appear smooth macroscopically due to loss of the extra-axial structures during dredging. No pores or oscules are visible.

**Skeleton:** The skeleton is composed of a dense axial core of interwoven spicules in which no separate fibres are discernible. A small amount of spongin B is distributed along the axis. The axial region makes up three-quarters of the diameter of each branch.

The extra-axial region is not densely packed with spicules. Towards the surface, groups of 2-3 oxeas orientated at right angles to the axis are the only skeletal elements. In the area immediately around the axis, groups of spicules diverge obliquely and pass toward the surface. There is, however, no regularity in the skeleton in this region. Many spicules lie without order around the axis. The dermal membrane, stretched between the groups of oxeas, is very fine. Over most of the surface it has broken down and a general hispid appearance is presented by the full depth of the ectosomal skeleton.

The axial spicules are sinuous strongyles, styles, and occasionally oxeas. The ectosomal spicules are oxeas with some styles.

**Spicules:**

**Megascleres:**

(a) **Oxeas,** stout spicules strongly flexed to irregularly wavy, evenly tapered to sharp points.

(b) **Styles,** varying considerably in width. They are often as stout as the oxeas, but usually are much finer and evenly curved. Slightly less abundant than the oxeas.
REMARKS

The specimens described by Brøndsted (1923) as *Sigmaxinella pulchra* do not belong in *Sigmaxinella*, but, with the two additional specimens described above, in *Pararhaphoxya* Burton.

In the type description of *Sigmaxinella pulchra*, three spicule types are recorded which, in fact, belong to a *Biemma* collected at the same time, preserved in the same container and described as *Sigmaxinella styloreta*. The sigmas, raphides (or microaxes), and the stouter styles described for *Sigmaxinella pulchra* are all contaminants from *Biemma styloreta*.

It is thus not surprising that Burton (1934) overlooked *Sigmaxinella pulchra* when he erected the genus *Pararhaphoxya* for *P. temuiramosa* from Australia.

The only differences between the New Zealand and Australian specimens are that the former exhibit a greater container and described as *Sigmaxinella pulchra*, *Pararhaphoxya* Burton.

In the region where the extra-axial spicules arise from the axis many styles occur in an irregular manner, overlying the axial strongyles.

**SPICULE DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Oxeas (µ)</th>
<th>Styles (µ)</th>
<th>Strongyles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brøndsted 1923</td>
<td>260-530</td>
<td>390-710</td>
<td>up to 1600</td>
</tr>
<tr>
<td>Carnley Harbour (as</td>
<td>× 10</td>
<td>× 11-24</td>
<td>× 10</td>
</tr>
<tr>
<td><em>Sigmaxinella pulchra</em></td>
<td>(480)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brøndsted 1923</td>
<td>256-680</td>
<td>208-600</td>
<td>750-1650</td>
</tr>
<tr>
<td><em>S. pulchra</em> (holotype re-measured)</td>
<td>× 5.0-13.5</td>
<td>× 8.0-14.0</td>
<td>× 2.5-10.0</td>
</tr>
<tr>
<td>(435×11.0) (450×10.0) (1050×6.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burton 1934</td>
<td>up to</td>
<td>up to</td>
<td>up to</td>
</tr>
<tr>
<td>Great Barrier Reef</td>
<td>600×6.0</td>
<td>600×6.0</td>
<td>1500</td>
</tr>
<tr>
<td><em>P. temuiramosa</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cook St. 40–100 fm</td>
<td>339–765</td>
<td>325–697</td>
<td>1200–2500</td>
</tr>
<tr>
<td></td>
<td>(502×14.8)</td>
<td>(460×7.8)</td>
<td>(1880×5.0)</td>
</tr>
</tbody>
</table>

**DISTRIBUTION**

Carnley Harbour, 45 fm; Great Barrier Reef, 20 fm; Caroline I., 4 m (2 fm).

**Genus Phakellia** Bowerbank

Axinellidae in which the axis is a dense mass of interwoven spicules; usually sinuous strongyles only very feebly organised into fibres. Spongin B development is sparse. The extra-axial skeleton is never dense, often merely individual spicules aligned at right angles to the axis. Spiculation: strongyles, styles, oxeas, no microscleres.

*Examination of one of de Laubenfels’s specimens, USNM 23063, shows the range of spicule sizes to be very much greater than described.

**Phakellia dendyi** sp. nov. (Pls. 3b, c, d; 12b; 14d; 15a)

**HOLOTYPE**


**MATERIAL EXAMINED**

Alderman I., 56 fm (Holotype); Cape Kari Kari, 30 fm; VUZ 55 Cook Strait, 40–100 fm.

**DESCRIPTION**

An erect, stipitate sponge with extremely conulose surface and fleshy, pseudokeratose appearance; ramose or lamellate.

**DIMENSIONS**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Height (cm)</th>
<th>Stalk Diameter (cm)</th>
<th>Height of Conules (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alderman I.</td>
<td>20.0</td>
<td>1.1</td>
<td>2.0–8.0</td>
</tr>
<tr>
<td>Cape Kari Kari</td>
<td>16.0</td>
<td>1.6</td>
<td>2.0–10.0</td>
</tr>
<tr>
<td>Cook St.</td>
<td>11.0</td>
<td>0.9</td>
<td>2.0–12.0</td>
</tr>
</tbody>
</table>

**COLOUR:** In life, bright orange red (RY-R 5/10 and RY-R 6/10); in spirit, pale yellow (Y 8/4) to chocolate brown (YR 5/4).

**TEXTURE:** Tough and incompressible particularly in the axial region, more flexible distally.

**SURFACE:** The surface, between conules, is very smooth with a skin-like dermal membrane (0.4 mm thick) stretched between the ends of the fibres. Spicules pierce the dermal membrane only near the tips of conules and on the hispid stalk. Some conules are simple, but multiple forms are more typical.

**SKELETON:** The axis is a dense interwoven mass of sinuous strongyles around which small quantities of spongin B are dispersed. Spicule tracts in the axial region are definable for only a very short distance before becoming obscured in the general spicule mass. All axial spicules are disposed longitudinally. Branches from the axis ramify throughout the sponge and terminate in the conules.

The extra-axial region is very thin, never more than 1.0 mm on either side of an axis 3.0–10.0 mm thick. The extra-axial spicules are predominantly styles and, less frequently, oxeas arranged (either singly or in groups of 2–15) at right angles to the axis. Cells laden with pigment are abundant in the euctosomal region and are concentrated in the dermal membrane.

In the region where the extra-axial spicules arise from the axis many styles occur in an irregular manner, overlying the axial strongyles.

**SPICULES:**

**MEGASCLERES:**

(a) **STRONGYLES**, sinuous, variable length and diameter. Occasional stylole modifications occur.

(b) **STYLES**, normal form, broadly rounded apically, and reaching their greatest dimension two-thirds of the distance from the head. Usually slightly curved; occasional strongyle modifications in the specimen from Alderman Island.
(c) Oxeas, straight or slightly curved. Rare in the specimen from Alderman Island.

**SPICULE DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Strongyles (μm)</th>
<th>Styles (μm)</th>
<th>Oxeas (μm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Kari Kari</td>
<td>600–1450</td>
<td>450–580</td>
<td>250–360</td>
</tr>
<tr>
<td></td>
<td>(1180×11.0)</td>
<td>(512×14.0)</td>
<td>(295×10.0)</td>
</tr>
<tr>
<td>Alderman I.</td>
<td>650–1350</td>
<td>400–650</td>
<td>290–320*</td>
</tr>
<tr>
<td></td>
<td>(1050×9.0)</td>
<td>(560×16.0)</td>
<td></td>
</tr>
</tbody>
</table>

*Four spicules only

**REMARKS**

Vosmaer (1912) contends that Acanthella Schmidt should be reserved for sponges with no distinction between axial and extra-axial regions. Species belonging to Phakellia Bowerbank have a well defined axial region and an extra-axial skeleton arranged more or less at right angles to the axial fibres.

This distinction was drawn with reference to the type species of each genus—Acanthella acuta Schmidt and Phakellia strigosa (Pallas) of which P. ventilabrum (Linne) is a synonym.

If this criterion of skeletal arrangement is used, some Pacific and Indian Ocean sponges described as Acanthella need to be referred to Phakellia. They are: Acanthella carduus (Lamarck) redescribed by Topsent (1930), A. cavernosa Dendy, and A. vulgata Thiele with its synonyms A. aculeata, A. simplex, and A. insignis.

All of the species described by Carter as Acanthella, or its synonym Acanthellina, are poorly documented, and it is difficult to be sure of their affinities. There is, however, sufficient data in the type description of A. stipitata Carter (1881) to exclude it from Acanthella (see Burton, 1934).

Acanthella stipitata Carter was understood by Dendy (1897a) to be the senior synonym for a variable species described under several names by Carter: A. cactiformis, A. hircinopsis, Acanthellina parvicornulata, A. rugolineata. Dendy assigned his own material from Port Phillip Bay to Acanthella stipitata. This is obviously an incorrect assignation, since A. stipitata Carter possesses only styloate megascleres. Acanthella cactiformis Carter was equated by Burton (1934) with the specimens recorded by Dendy (1897a) as A. stipitata, and the whole group of specimens assigned to Rhaphoxya Hallmann. I have examined the holotype of Acanthella cactiformis Carter (Pl. 4a) (B.M.86.12.15.91) and agree with Burton that this species is a Rhaphoxya; the skeleton is lax, non-condensed, and composed of variously ended fine oxeas and styles. This sponge is, however, quite distinct from Dendy’s Port Phillip specimens. I have re-examined several of these (R.N. 389: 465: 740); all can be equated with the specimens described above from New Zealand, and are correctly placed in Phakellia as Phakellia dendyi.

There are only very small differences between P. dendyi, and species such as P. carduus (Lamarck), P. vulgata (Thiele) and P. cavernosa (Dendy). For instance, P. carduus is distinct in lacking styles and in the form of oxeas; P. cavernosa, in lacking oxeas and in details of spicule dimension. Phakellia vulgata is poorly described but appears very variable in spicule dimensions and complement. It is retained as a separate species mainly because the arrangement of the skeleton is unknown.

It is possible that further study will show that all of the above species can be grouped as a single wide-ranging Indo-Pacific species, Phakellia carduus (Lamarck).

**DISTRIBUTION**

Port Phillip Bay, Australia.

**Genus Ceratopsis Strand**

Axinellidae of erect lamellate form with an axially condensed skeleton in which spongin B is sparse. Axial spicules are styles, additional spicules can be either long styles or flexuous strongyles*. Dermal spicules raphidiform oxeas or styles.

**Ceratopsis cuneiformis** sp. nov. (Pls. 4b, 15b; fig. 1)

**MATERIAL EXAMINED**

NZOI Sta. B 93 Three Kings, 30–60 fm.

**HOLOTYPE**

NZOI Type No. 38.

**DESCRIPTION**

A thin, erect sponge with a cylindrical stalk which expands into a paper-thin triangular lamella.

**DIMENSIONS:** Height 6.5 cm width (apically), 3.1 cm; diameter of stalk, 4.0 mm; thickness of lamella, 3.0 mm basally; 1.5 mm apically.

**COLOUR:** In life, pale yellow (R 8/8); in spirit, white.

**TEXTURE:** Firm, elastic, incompressible.

**SURFACE:** The surface is granular with long styles and dermal spicules giving a hispid appearance; pores are distributed over both surfaces; no oscules visible.

**SKELETON:** The axial skeleton is a single broad tract of styles cemented by a small quantity of spongin. From both sides of the axial column extra-axial styles arise singly or in tufts of 2–4 and extend almost to the surface. The appearance is that of a single spicule tract echinated profusely by spicules of similar type.

At intervals along the axial column long styles arise and pass obliquely to the surface. These are surrounded at the point where they pierce the surface by groups of fine oxeae or styloate spicules. They may stand slightly out from the surface but most frequently are tangential. Fine oxeas occur occasionally in the extra-axial region.

*Only if Ceratopsis clavata Thiele is included. This seems doubtful.
SPICULES:

MEGASCLELES:

(a) smooth styles
   (i) Very long, fine, evenly curved: tapering to a sharp point.
   (ii) Shorter, stouter; strongly and often irregularly curved in the anterior third. These are the structural spicules.
(b) OXOTE or styloste dermal spicules; usually toxiform. Oxeas predominate.

SPICULE DIMENSIONS:

<table>
<thead>
<tr>
<th>Locality</th>
<th>Stout Styles</th>
<th>Long Fine Styles</th>
<th>Dermal Styles or Oxeas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Kings Is.,</td>
<td>449-560 µ</td>
<td>978-1699 µ</td>
<td>552-780 µ</td>
</tr>
<tr>
<td>30-60 fm (holotype)</td>
<td>(490 x 20.0)</td>
<td>(1450 x 10.0)</td>
<td>(670 x 3.0)</td>
</tr>
</tbody>
</table>

REMARKS

This species falls easily within the genus Ceratopsis as redefined by Hallmann (1917a). It is necessary to comment on one point in his definition, the interpretation of the dermal spicules described by Thiele (1898) as microxeas. The dimensions of these given by Thiele for the type species C. expansa are 1000 x 2-3µ, in C. erecta 1000µ. Only in C. ramosa, where they measure 70-80µ, are these spicules real microxeas. It would be less misleading if the term “microxeas” was replaced by “dermal oxeas”.

Ceratopsis cuneiformis differs from other sponges in this genus in having a thin lamellate body, in details of spicule dimensions, and in having long echinating styles.

Genus Bubaris Gray

Axinellida having an axial or basal concentration of veriform strongyles associated with extremely long styles at right angles to the axis or substrate.

Bubaris vermiculata (Bowerbank). (Pl. 15c)

RESTRICTED SYNONYMY:
Hymeraphia vermiculata Bowerbank, 1866, p. 141.
Bubaris vermiculata Dendy, 1924, p. 351.
(For detailed synonymy see Dendy, 1924.)

MATERIAL EXAMINED

Three Kings Is., 30-60 fm NZOI Sta. 93.

REMARKS

As indicated by Dendy, New Zealand specimens of this cosmopolitan sponge are typical. They are always encrusting, with veriform strongyles and large styles. My specimens are growing intermingled with Discorhabdella incrustans. It is necessary only to add spicule measurements.

SPICULE DIMENSIONS

<table>
<thead>
<tr>
<th>Locality</th>
<th>Styles</th>
<th>Strongyles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Kings Is.,</td>
<td>800-1570 x 14.5-20.0</td>
<td>230-280 x 8.0-12.0</td>
</tr>
<tr>
<td>30-60 fm</td>
<td>(1246 x 17.0)</td>
<td>(256 x 10.2)</td>
</tr>
</tbody>
</table>

DISTRIBUTION

Cosmopolitan (Dendy 1924).

*Bubaris elegans* Dendy

Bubaris elegans Dendy, 1924, p. 350, pl. X, fig. 5, pl. XIV.
Uplexoa elegans, de Laubenfels, 1936, p. 132.

REMARKS

This sponge is atypical in lacking flexuous axial strongyles but in all other respects conforms to the definition of *Bubaris*. Burton (1928) considered *B. elegans* a valid species of the genus. *Bubaris elegans* can be compared to *B. ligulata* Burton where the axial spicules, although strongyles, are not veriform but flexed, as are the styles and oxeas of *B. elegans*. De Laubenfels (1936) proposed the genus *Uplexoa* for *B. elegans* and *B. oxeata* Dendy. This genus is determined by the presence of flexed oxeas, rather than flexuous strongyles, as auxiliary spicules. Considering the irregular occurrence of strongyles, oxeas, and even styles in axinellid and epipolarid species, it seems ill-advised to found a genus on this single characteristic, particularly without reference to type material.

DISTRIBUTION

Three Kings Is., 100 fm
Genus Hymerhabdia Topsent

Encrusting sponges with all spicules directed towards the surface. Spiculation typically very long styles in association with shorter styles and/or oxeas. Some or all of these spicules have contorted or reﬂexed bases. It is difﬁcult to decide whether Hymerhabdia belongs to the Axinellidae or to the Halichondridae. It is included here because of strong similarities to Bubaris.

*Hymerhabdia oxeata* (Dendy)

Bubaris oxeata Dendy, 1924, p. 349, pl. XIV, ﬁg. 20, 21.
Hymerhabdia oxeata, Topsent, 1928, p. 41.
Uplexoa oxeata, de Laubenfels, 1936, p. 132.

Remarks

No new material has been collected and nothing can be added to Dendy’s description. The species is difﬁcult to assign but seems to be related closely to Hymerhabdia oxytruncata Topsent. There is no question of its becoming the type species of a new genus Uplexoa as proposed by de Laubenfels (see discussion above). Uplexoa is thus recognised here as a synonym of Hymerhabdia.

Distribution

Three Kings Is., 100 fm (Terra Nova Station).

Genus Thrinacophora Ridley

Axinellida with plumose skeleton and microscleres in the form of raphides.

Thrinacophora dubia Brøndsted

Thrinacophora dubia Brøndsted, 1923, p. 157, ﬁg. 31 a–c.
Rhaphidectyon dubia, de Laubenfels, 1936, p. 102.

Remarks

De Laubenfels referred Thrinacophora dubia to Rhaphidectyon because diactinal megascleres are absent and the raphides are the only microscleres. It is not possible to comment further on its classiﬁcation until the type specimen or new material is examined.

Distribution

Coleridge Bay, Carnley Harbour, 25 fm.

Genus Pseudaxinella Schmidt

Massive Axinellida with typical spiculation but semi-reticulate skeletal arrangement.

Pseudaxinella australis sp. nov. (Pls. 4c, 12c)

Holotype

Dom. Mus. Por. 26

MATERIAL EXAMINED

East of Little Barrier, 40 fm; Whangarei Harbour, 4 fm; Takatu Channel, 6 fm (Holotype); off Shag Rock, Waiheke, 27 fm.

Description

A massive, low-lying sponge, which thickly encrusts, and eventually encloses, dead shells of Glycymeris laticostata. When removed from the water it exudes great quantities of a sticky slime.

Dimensions: Encrusting specimens: length up to 5.0 cm; width up to 4.2 cm; 0.8–1.5 cm thick.

Massive specimens: length 10.5 cm; width 9.0 cm; 2.0–5.5 cm thick.

Colour: In life, bright scarlet (RY–R 5/8); in spirit, pale yellowish (RY 8/4) to fawn (yY–R 6/2).

Texture: Firm, incompressible, brittle.

Surface: The surface is extremely ridged and corrugated by stout ascending ﬁbrous columns 1.0–2.5 mm in diameter perpendicular to the surface; the columns are up to 0.5 mm apart. The columns are rounded terminally and extremely hispid. A delicate dermal membrane is stretched between the ridges.

Oscules, only evident in larger specimens, are 1.0–4.0 mm in diameter and arranged in groups of 3–4.

Skeleton: The skeleton is made up of a series of stout ascending columns of oxesas and styles, which are very sparsely invested by spongin. In each column there is a thin, often unispeciﬁc core of oxesas surrounded and echinatized by the styles. The oxesas increase in numbers in the surface layer of the sponge, where very ﬁne styles also occur. The ﬁbres range in diameter from 70.0–120.0 µ.

Spicules:

Megascleres:

(a) Styles, stout, smooth with broadly rounded heads. They may be straight, gently curved, or sharply ﬂexed anteriorly. Also, ﬁne dermal styles usually with a sharp anterior ﬂexure, occasionally oxecte.

(b) Oxeas, smooth, stout, often irregular, with a strong ﬂexure centrally or slightly to one side of centre.

Spicule Dimensions:

<table>
<thead>
<tr>
<th>Locality and author</th>
<th>Styles (a)</th>
<th>Ectosomal styles (a)</th>
<th>Oxeas (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. rosacea Bermuda</td>
<td>300–400</td>
<td>not present</td>
<td>300–120</td>
</tr>
<tr>
<td>De Laubenfels</td>
<td>× 8.0–10.0</td>
<td>× 8.0</td>
<td></td>
</tr>
<tr>
<td>also 235 × 11.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P. australis Takatu Channel, 6 fm (holotype)</td>
<td>203–560</td>
<td>320–406</td>
<td>217–339</td>
</tr>
<tr>
<td></td>
<td>× 9.0–22.0</td>
<td>× 3.0–5.7</td>
<td>× 8.2–10.4</td>
</tr>
<tr>
<td></td>
<td>(402×15.0)</td>
<td>(367×4.0)</td>
<td>(260×9.6)</td>
</tr>
</tbody>
</table>

Remarks:

Pseudaxinella australis is very similar to P. rosacea as redescribed by de Laubenfels (1950). It differs mainly...
in the thickness of the styles and in having a special category of ectosomal styles.

The characteristic feature of *P. australis* is the presence of distinct ascending columns of plumose spicule tracts, which resemble, quoting de Laubenfels for *P. rosacea*, “an aerial view of a coniferous forest”. Slime production and bright red colour are two further significant features in which *P. australis* and *P. rosacea* are similar. The small differences quoted above, in conjunction with geographic discontinuity, seem sufficient to warrant treating these sponges as distinct, but closely related, species.

Family TRACHYCLADIDAE Hallmann

Axinellida with microscleres of spiraster type, sometimes with the addition of short rhabds.

Genus *Trachycladus* Carter

*Trachycladus stylifer* Dendy. (Pls. 5a, 10c)

*Trachycladus stylifer* Dendy, 1924, p. 377, pl. XII, fig. 7, pl. XV, fig. 39–42.

MATERIAL EXAMINED

East of North Cape, 55 fm (Th. Mortensen 2/1/1915).
Poor Knights Is., 15–20 fm.

DESCRIPTION

A much-branched sponge with a stout, cylindrical, basally expanded stalk. The branches are cylindrical and taper to points; the pattern of branching is extremely irregular, but no anastomoses are formed.

DIMENSIONS: Height 31.0 cm; width (with branches compressed) 13.0 cm; diameter of stalk 6.0–8.0 mm; height of stalk 6.0 cm; diameter of branches 2.0–5.0 mm.

COLOUR: In spirit, dark maroon (RY-R 3/4); in life, bright orange (yR 6/10).

TEXTURE: The stalk is hard and incompressible; the branches soft and velvety, easily broken.

SURFACE: The surface is extremely hispid owing to the plumose ectosomal styles, columns of which project from the central axis of each branch. In the terminal regions of the branches where the axis is attenuated the ectosomal styles give the sponge a furry appearance. No pores or oscules are visible, and there is no trace of the dermal membrane although numerous spinispirae are scattered over all other specimens. These undoubtedly result from the breakdown of the dermal crust in formalin.

SKELETON: The skeletal arrangement is very simple and conforms to Dendy’s description. Each branch has a compact, central, more or less rigid axis made up of longitudinally disposed styles. This axis occupies approximately one-third of the diameter of each branch and gives off loose, oblique, plumose columns of styles that curve toward the surface. These columns are 580–1200 µ long. There is no visible spongian in the axis of the branches but there are traces in the stalk. Microscleres are abundant, particularly the spinispirae.

**SPICULES:**

**MEGASCLEERES:**

(a) **STYLES**, relatively slender, slightly curved spicules with a rounded base. Occasional strongyles occur.

(b) **OXEAS**, present in the proportion of 1:50. They are wavy or centrally flexed, always sharply pointed.

**MICROSCLERES:**

(a) **SPINISPIRAE**, extremely abundant, completely spined. They are characteristically coiled in 1½–2 complete turns, but may be simple C-shape or almost straight.

(b) **MICRORHABDS**, stout, often centrotylote spicules, smooth or faintly microspined and bluntly rounded at each end.

**SPICULE DIMENSIONS**, see Table 1.

REMARKS

The above description is of an intact specimen of *Trachycladus stylifer* in the Mortensen collections from the Copenhagen Museum. The material has been studied previously by Brøndsted (1924), but this specimen was undescribed. In the same bag of specimens were the types of *Latrunculia spinispiraefera*, *Lissoplocamia prima*, and *Merriamuim crelloloides*, all liberally coated with spinispirae freed by the breakdown of the dermal crust of *Trachycladus stylifer*.

Brøndsted (1924, p. 480) described *Latrunculia spinispiraefera* from North Cape, noting the occurrence of spinispirae and stressing, on this ground, the close relationship of *Latrunculia* to the Spirasterellinae.

I have recorded *Latrunculia spinispiraefera* from the Chathams (Bergquist, 1961b, and 1967), Campbell Plateau, and Three Kings and have examined the holotype. Spinispirae are never a normal component. Those seen in preparations of the holotype are randomly

<table>
<thead>
<tr>
<th>Localities and Author</th>
<th>Styles (µ)</th>
<th>Oxeas (µ)</th>
<th>Spinispirae (µ)</th>
<th>Microrhabds (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dendy, Three Kings Is., 10 fm (holotype)</td>
<td>about 500×17.0</td>
<td>absent</td>
<td>12.0</td>
<td>up to 20.0×8.0</td>
</tr>
<tr>
<td>East of North Cape, 55 fm</td>
<td>439–520 × 11.5–18.0</td>
<td>250–560 × 13.0–18.0</td>
<td>8.0–12.0</td>
<td>13.0–16.0 × 4.6–6.0</td>
</tr>
<tr>
<td></td>
<td>(472×14.8)</td>
<td>(408×15.2)</td>
<td>(10.1)</td>
<td>(14.5×5.0)</td>
</tr>
</tbody>
</table>
distributed contaminants from *Trachycladus*. Measurements given by Dendy (1924), and Brøndsted (1924) for the spinispirae correspond perfectly. One important difference between my specimen and the holotype is that, in mine, oxeas are present as a minor component of the skeleton. This weakens Dendy's case for maintaining *T. stylifer* as a distinct species from *T. laevispirulifer*. Carter from Australia and casts doubt on the validity of the several species defined by Hallmann (1917a). It is likely that all specimens of *Trachycladus* described so far will prove to be synonyms of *T. laevispirulifer*.

**Distribution**

Three Kings Is., 100 fm.

**Family DESMOXYIDAE Hallmann**

Axinellida with microscleres in the form of spined or smooth microxeas.

**Genus Parahigginsia** Dendy

*Parahigginsia phakellioïdes* Dendy. (Pl. 15d)

*Parahigginsia phakellioïdes* Dendy, 1924, p. 375, p. XI, fig. 4, pl. XV, fig. 32, 33.

**Remarks**

The holotype has been examined and Dendy's initial classification affirmed.

De Laubenfels (1936) referred *Parahigginsia* to his subfamily Rhaphidiinae on the assumption that the acanthoaxes were *Ancorina* type rhabds. This is not the case. The acanthoaxes are in every respect comparable to the acanthoaxes of *Higginsia*, and *Parahigginsia* and *Higginsia* fall naturally into the Axinellida.

**Distribution**

East of North Cape, 70 fm.

**Genus Acanthoclada** gen. nov.

The genus *Acanthoclada* is proposed for an encrusting to massive sponge with skeletal construction like that of *Higginsia* but with the addition of echinating spicules (rhabdostyles). The skeleton is fibrous, lax, and reinforced along the fibres with small quantities of spongin B. All fibres are cored by long smooth styles to subtylostyles and echinated profusely by rhabdostyles. Dermal spicules are long centrally angulate oxeas. In addition there are two categories of spiny microscleres; a large "cladotoxa" and a small curved birotule, which can be oxeote.

**Acanthoclada prostrata** sp. nov. (Pls. 5b; 10a, f; 16a, b)

**Holotype**

Dom. Mus. Por. 27

**Material Examined**

North Channel, 10 fm (Holotype); Takatu Pt, 6 fm.

**Description**

This sponge occurs as a thick slimy encrustation on dead shells of *Glycymeris laticostata* and *Chione stitchesburyi*.

**Dimensions**: Length, 2.5–6.0 cm; width, 1.0–3.0 cm; thickness 0.4–1.5 cm; surface conules 0.5–3.0 mm high; 0.2–1.0 mm wide.

**Colour**: In life, pale pinkish purple (RY–R 7/4) to dull orange (Y–R 6/10); in spirit, whitish.

**Texture**: Firm, compressible, easily torn.

**Surface**: Granular, raised up into conules, which are pierced by bundles of dermal oxeas.

**Skeleton**: This is made up of ascending fibres 300–400 μ thick, cored by long more or less straight styles and echinated profusely by rhabdostyles. The long axial styles also project outward from the fibres. Spongin B is present as a thin investment around the fibres. The dermal membrane is 0.1–0.3 mm thick, densely packed with the small birotule microscleres and contains many cladotoxas. The fibres terminate in stout bundles of oxeas, which raise the dermal membrane into conules and penetrate the apex of each one.

**Spicules**

**Megascleres**:

(a) **Styles of two types**:

(i) long stout gently curved styles; often subtylostyles.

(ii) **Rhabdostyles**: shorter, more slender; curved sharply near the anterior end.

(b) **Oxeas**, long, centrally angulate of variable width. Fine forms of these spicules resemble enormous toxas.

**Microscleres**:

(a) "**Cladotoxas**", similar in general form to cladotylotes of *Acarnus* with a smooth curved shaft with one or many stout spines on one or both sides. The spines on the shaft may be reduced to one. At each end the shaft is expanded into a cladome bearing 3-8 sharp spines with no constant disposition. Cladotoxas occur throughout the sponge.

(b) **Birotules**, small, slightly curved spicules with spines distributed evenly over the shaft and with both ends expanded to form a nail-like head. The shaft edge of the head is encircled by a ring of backwardly directed spines.

**Spicule Dimensions**, see Table 2.
TABLE 2. Spicule Dimensions of Acanthoclada prostrata.

<table>
<thead>
<tr>
<th>Locality</th>
<th>Oxeas (µ)</th>
<th>Subtylostyles (µ)</th>
<th>Rhabdostyles (µ)</th>
<th>Cladotoxas (µ)</th>
<th>Birotules (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Channel, 10 fm (holotype)</td>
<td>960–1320</td>
<td>× 1.2–9.2</td>
<td>677–1850</td>
<td>× 9.2–18.5</td>
<td>213–600</td>
</tr>
<tr>
<td></td>
<td>(1206 × 7.2)</td>
<td>(1420 × 14.8)</td>
<td>(420 × 7)</td>
<td>(90 × 4.9) incl. spines up to 11.5 wide</td>
<td>(66)</td>
</tr>
</tbody>
</table>

REPRODUCTIVE PRODUCTS

One specimen, collected 19.11.60, contains many roughly spherical eggs, 30–60 µ long and 25–45 µ wide with nuclei 9.0–20.0 µ. These eggs, each in a distinct cavity bounded by a fine membrane, are distributed from the base of the sponge to the surface. No segmentation stages are present, indicating that this sponge is oviparous.

REMARKS

This well characterised genus is difficult to assign to a family and is placed in the Desmoxyidae with some misgivings. The chief objection to this placement lies in the absence of oxeote microscleres. The overall skeletal pattern is, however, very similar to that of Higginsia. There is no trace of axial specialisation, but this axinellid characteristic is also de-emphasised in Higginsia and Desmoxya.

The presence in Acanthoclada of what appears to be an oviparous reproductive sequence supports its inclusion in the Axinellida.

Certain genera of Raspailiidae, e.g., Endectyon have cladotylote spicules like the cladotoxas described for Acanthoclada. In Acanthoclada these spicules are, from their size and disposition, obviously microscleres. The cladose spicules of Endectyon, however, are replacements for the echinating acanthostyles of more typical raspailiids.

Family SIGMAXINELLIDAE Hallmann

Axinellida with sigmoid microscleres; often with microxeas or microrhabds.

Genus Sigmaxinella Dendy

REMARKS

Four sponges from Carnley Harbour were described by Brøndsted (1923) as new species of Sigmaxinella. Re-examination of the holotypes of all four indicates that none belongs to Sigmaxinella. They are dealt with in greater detail under the appropriate genera, but, to summarise, they are reassigned as follows:

* Sigmaxinella pulchra to Pararhapshoxyzyla pulchra
* Sigmaxinella stylotata to Bienna stylotata
* Sigmaxinella florida—unrecognisable except as a fragment of Rhizaxinella
* Sigmaxinella papillata to Ciocalypta penicillus

The sigmas and microxeas described by Brøndsted are foreign spicules in all except Bienna stylotata, which was the source of the contaminants.

Genus Bienna Gray

Sigmaxinellidae in which the form is massive to lamellate; usually with little axial condensation. The surface is usually conulose. Skeleton fibrous, sometimes plumoteticate. Megascleres styles only. Microscleres invariably sigmas and microxeas, the latter frequently occurring in dragmata. Small commas and/or spheres may be added.

*Biennea novaeezealandiae Dendy

Bienna novaeezealandiae Dendy, 1924, p. 346, pl. XIV, fig. 1–4
Burton, 1930, p. 319.

REMARKS

No new material has been collected. B. novaeezealandiae is a well characterised species of Bienna differing from all other Southern Hemisphere species, except B. in-crustans Kirkpatrick, in the large size of the megascleres (Table 3). The combination of large megascleres, encrusting form, and three categories of oxeote microscleres is distinctive. Bienna thielei Burton is very close to B. novaeezeelandiae, but its megascleres and sigmas are substantially smaller and it has “commas”. The latter spicules are easily overlooked, however, and are thus of little value in assessing older species descriptions.

DISTRIBUTION

Three Kings Is., 100 fm.

Bienna flabellata sp. nov. (Pl. 5c; 17a)

HOLOTYPE

Dom. Mus. Por. 28.

MATERIAL EXAMINED

AUZ 056, 140 fm (Holotype); Three Kings Is., 30–60 fm, NZOI Sta. B 93.

DESCRIPTION

An erect, stalked, lamellate sponge with distinct inhalant and exhalant surfaces. Two identical specimens...
were collected at one station and two smaller ones at another.

**DIMENSIONS:** Height, 5–19 cm; width of stalk, 0.5–2.8 cm; width of lamella 3.0–8.0 cm; thickness of lamella 2.0–8.0 mm.

**COLOUR:** In life, dull yellow (rY 7/8); in spirit, straw coloured (Y 7/4), or white.

**TEXTURE:** Soft and crumblly around the edge of the lamella, firm in centre and stalk region.

**SURFACE:** The surface is micro-hispid and feels rough. One surface has numerous oscules, 0.8–1.2 mm in diameter, flush with surface and spaced regularly 2.0–2.5 mm apart. The pores are small, 0.1–0.3 mm in diameter, and distributed over one surface.

**SKELETON:** The skeleton is a rectangular reticulation of fibres with a tendency to become plumoreticulate. Ascending fibres are prominent in the stalk region and in the centre of the lamella. The structural spicules are smooth styles. The primary fibres are 50.0–80.0 μm in diameter with 3–5 spicule rows invested by spongilla. There is no differentiation of dermal spicules. The microxeas and sigmas are particularly abundant interstitially and the former often lie in dragmata.

**SPICULES:**

**MEGASCLERES:**

- **Styles:** smooth, stout; broadly rounded at the proximal end and slightly curved.

**MICROSCLERES:**

- **Microxeas:** fusiform; two distinct size groups; larger ones may be raphide-like. It is impossible to decide whether they are raphides or developing microxeas.
- **Spheres:**

**SPICULE DIMENSIONS:** see Table 4.

---

**Table 4. Spicule Dimensions of Biemna flabellata.**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Styles (μ)</th>
<th>Microxeas</th>
<th>Sigmas</th>
<th>Comma or Spheres (μ)</th>
<th>Body Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Kings Is., 30–60 fm</td>
<td>266–400 x 16.0–23.0, 332 x 19.9</td>
<td>Large: 98–125, 2.3–2.5; Med. 28–50, 1.2; Small 27–40, 11.5–13.8</td>
<td>27–40, 11.5–13.8, abs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three Kings Is., 140 fm (holotype)</td>
<td>280–496 x 10–30.0, 380 x 21.0</td>
<td>Large: 96–140, 2.0–2.5; Med. 26–45, 1.2; Small 28–40, 9.6–15.0</td>
<td>9.6–15.0, 11.8, up to 8.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Biennia rhaderoemioides Bergquist. (Pl. 16c)

**Holotype**

Dom. Mus. Por. 11.

**Material Examined**

Rangitoto I., under stones, mid tidal (holotype); MacGregors Bay, Whangarei Heads Peninsula, under stones, low tide; North Channel, 4–5 fm, on shell.

**Description**

This is an encrusting or cushion-like sponge found on the undersides of mid-to-low-tidal boulders and on shallow-water shell bottoms (e.g., *Tawera/Glycymeris* community).

**Dimensions**: Length 2.0–4.0 cm; width 1.5–3.0 cm; thickness 1.0–2.0 cm.

**Colour**: In life, yellow (rY 8/6); in spirit, pale yellowish brown (ry 6/4)

**Texture**: Firm, compressible.

**Surface**: The surface is minutely reticulate, conulose, and hispid. Oscules are small, 0.8–1.0 mm, are level with the surface and are fed by prominent subdermal channels.

**Skeleton**: This is an irregular reticulation of styles to subtylostyles. Near the surface short tracts of spicules arise and pass to the dermal membrane, where they subtend the surface conules. Spongin B is sparse. It is dispersed throughout the sponge and found in greatest concentration binding the ascending tracts just below the surface. There are no distinct echinating spicules, but styles like those in the reticulum occasionally occur in an echinating position.

The dermal membrane is thin, with only a few sigmas and some fine detritus.

The abundance of all microsclere categories is characteristic of the genus *Bienna*, and *B. rhaderoemioides* is typical in this respect. Microxeas occur most frequently in trichodragmata, but individual spicules are dispersed throughout the sponge. There are two size categories of both microxeas and sigmas, and all occur throughout the sponge.

**Remarks** (see also Table 3)

*Bienna flabellata* differs from most other species of *Bienna* in having a pronounced lamellate form. *Bienna chilliensis* Thiele has a similar habit but has bigger megascleres and lacks proper microxeas. *Bienna pedonculata* Levi is closely related to *B. flabellata*, differing in having sigmas and bigger microxeas. One specimen of *B. flabellata* had many spheres, two others had very few, and there appears to be none in the fourth.

*Bienna rhabderemioides* differs from most other species of *Bienna* in having a pronounced lamellate form. *Bienna pedonculata* Levi is closely related to *B. flabellata*, differing in having sigmas and bigger microxeas. One specimen of *B. flabellata* had many spheres, two others had very few, and there appears to be none in the fourth.

**Spicules:**

**Megascleres:**

Styles to subtylostyles, bent sharply in the proximal third.

**Microscleres:**

(a) Microxeas, straight, narrow and fusiform; very abundant; two size groups.

(b) Sigmas; of normal “C” shape, relatively stout; two sizes; very abundant.

(c) Spheres, bean-shaped to spherical lumps of silica; constantly present but varying enormously in abundance.

**Spicule dimensions**:

<table>
<thead>
<tr>
<th>Locality</th>
<th>Styles (µ)</th>
<th>Microxeas (µ)</th>
<th>Sigmas (µ)</th>
<th>Spheres (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rangitoto I.</td>
<td>40–58 x 1.6</td>
<td>53 x 1.6</td>
<td>42–50</td>
<td>4.0</td>
</tr>
<tr>
<td>(mid-tidal rocks)</td>
<td>80–120 x 1.0</td>
<td>12.0–16.0</td>
<td>(98.0 x 1.0)</td>
<td>(14.6)</td>
</tr>
</tbody>
</table>

**Remarks** (see also Table 3)

*Biemna rhabderemioides* is distinct from other species of *Bienna* in having two categories of sigmas, two categories of microxeas and spheres as microscleres with styles as principal spicules. *Bienna megalosigma* Hentschel from Aru Island is close to *B. rhabderemioides* but differs in having three categories of sigmas, which are, in general, larger than those of the New Zealand species.

Burton’s key (1930) to the species of *Bienna* cites *B. megalosigma* as having two categories of sigmas, yet his description states clearly that there are three. Hentschel’s (1912) description mentions three types of sigmas.

In the type description of *B. rhabderemioides* Bergquist (1961a) a wrong figure (fig. 10b) was given. The correct figure is given here (Plate 16c).

**Bienna stylotata** (Brndsted). (Pls. 5d, 16d)

*Sigmaxinella stylotata* Brndsted, 1923, p. 150, fig. 27.

**Remarks**

Hallmann (1917a) has raised valid arguments for restricting *Sigmaxinella* Dendy to ramose sponges of axinellid construction as in the type species of the genus, *Sigmaxinella australiana* Dendy. On these grounds alone *S. stylotata* must be removed to *Bienna*.

This species is reasonably well described by Brndsted, and only a few points will be enlarged upon. Spicule dimensions are given in Table 5.

The skeleton is dense at the base of the sponge and has a centre 3.0 mm above the lower surface. From this level, short plumose spicule tracts pass downward to the lower surface where they expand into indistinct subdermal brushes. From the same point plumose tracts pass upward to the lateral and upper surfaces. The tracts are sparingly branched and have a considerable amount of spongin B distributed unevenly along their length.
TABLE 5. Spicule Dimensions of *Biemma stylotata*.

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Styles</th>
<th></th>
<th></th>
<th>Sigmas</th>
<th></th>
<th></th>
<th>Microxeas</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large (µ)</td>
<td>Small (µ)</td>
<td>Large (µ)</td>
<td>Medium (µ)</td>
<td>Small (µ)</td>
<td>Small (µ)</td>
<td>Large (µ)</td>
<td>Spheres (µ)</td>
<td></td>
</tr>
<tr>
<td>Carnley Harbour, Brøndsted, <em>S. stylotata</em></td>
<td>455-676</td>
<td>190-403</td>
<td>48-0-86</td>
<td>28-0-38</td>
<td>14-0-18</td>
<td>48-0-72</td>
<td>180-240</td>
<td>up to 50</td>
<td>not recorded</td>
</tr>
<tr>
<td>Holotype remeasured</td>
<td>416-690</td>
<td>166-352</td>
<td>48-0-86</td>
<td>28-0-38</td>
<td>14-0-18</td>
<td>48-0-72</td>
<td>180-240</td>
<td>up to 5.0</td>
<td></td>
</tr>
</tbody>
</table>

The large styles form the skeletal columns and many of these spicules are echinating. The smaller styles are almost entirely interstitial.

Microscleres are abundant throughout the sponge. None of the oxote microscleres lie in trichodragmata.

It is debatable whether the smaller styles are a second megasclere category, since there is some overlap in the width of small and large spicules. Because of their interstitial distribution, I believe they are distinct.

This species is very close to *Biemma megalosigma* Hentschel; the main differences are the absence of the very large sigmas and the presence of the smaller megascleres (see Table 3).

**Distribution**

Carnley Harbour, 45 fm.

**Note**

Brøndsted (1923) recorded a specimen of *Biemma rhaphidophora* from Carnley Harbour. This sponge had tylostyles of two sizes, the skeletal arrangement of a *Suberites*, and sigmas and microxeas as microscleres.

It was collected in the same dredge haul as *Biemma stylotata* and the microscleres described for *B. rhaphidophora* are contaminants from that species. If the foreign microscleres are disregarded it is clear that *B. rhaphidophora* is a synonym of *Suberites affinis* Brøndsted, described from the same locality.

Burton (1930) proposed a new genus *Carleia* for *Biemma rhaphidophora*; this genus is thus a synonym of *Suberites*.

**Family RASPAILIIDAE** Hentschel

Axinellida in which the typical skeleton is supplemented by dermal spicule brushes, usually of fine styles grouped around a long central style and by echinating acanthostyles or rhabdostyles. No microscleres.

In some species of *Raspailia* the echinating acanthostyles are of poecilosclerid type, and this has given rise to much uncertainty over the position of this family. It is desirable that many sponges hitherto classified as *Raspailia* be removed to other genera.

**Genus Raspailia** Schmidt

Characteristically ramose sponges with some axial condensation. The structural spicules are styles or subtylostyles, the echinating spicules acanthostyles. The dermal spicules, present in fans, are styles or oxeas typically grouped around one long central spicule.

**Raspailia agminata** Hallmann. (Pls. 6a, 13a, 18a, b)

*Halichondria rubra var. digitata* (err.), Lendenfeld, 1888, p. 80, pl. II, fig. 1.


**Material Examined**

CIE 6 Chatham Rise, 220 fm; wharf piles, Auckland Harbour; North Channel, 6 fm; low tide, Pt Chevalier.

**Description**

This sponge can be massive, somewhat conical, with several lateral finger-like projections; a thick mat with vertical cone-like projections; or a thick encrustation.

**Dimensions**: Height 6.3 cm; width 4.3 cm. Projections: height 3.8-4.6 cm; width 1.0-1.6 cm.

**Colour**: In life, dark brown (Y 2/2); in spirit, (yY-R 6/4).

**Texture**: Firm but compressible.

**Surface**: The surface is conulose in patches, otherwise smooth. Projecting spicules give an overall silver appearance. Oscules, 1.0-2.5 mm in diameter, are sometimes situated on the apex of the conical projections.

**Skeleton**: A plumose series of fibres composed of long subtylostyles, usually three or four only, invested with a fine layer of spongin B and echinated by acanthostyles. Towards the surface of the sponge the arrangement of the fibres is more plumoreticulate and the echinating spicules are less abundant. The terminal subtylostyles pierce the surface, which is distinctly hispid. The ectosomal oxeas are arranged in subdermal fans, the groups being sufficiently close to form a complete superficial palisade of oxeas. The oxeas are not arranged around a large central subtylostyle, nor is there any tendency...
toward axial concentration. Interstitial spicules, oxeas, fine styles, and acanthostyles are abundant.

**SPICULES:**

**MEGASCLERES:**

(a) **STYLES**, long, relatively slender; curved in their anterior third.

(b) **SUBTYPYLES**, similar size, shape, and function to the above, but far more abundant.

**ACANTHOSTYLES**: Strongly spined spicules, often acanthothyte.

**OXEAS**: Slight, slightly curved spicules, chiefly ectosomal. Developmental forms of the oxeas are abundant and simulate raphides and fine styles.

**SPICULE DIMENSIONS**:

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Styles and Subtytylestes</th>
<th>Oxeas</th>
<th>Acanthostyles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hallmann 1914, Port</td>
<td>450-2800</td>
<td>245-400</td>
<td>80-190</td>
</tr>
<tr>
<td>Jackson, (holotype)</td>
<td>28.0</td>
<td>6.0</td>
<td>12.5 thick</td>
</tr>
<tr>
<td>Chatham Rise, 220 fm</td>
<td>30-200</td>
<td>30-60</td>
<td>50-70</td>
</tr>
<tr>
<td></td>
<td>(1840 × 19.2)</td>
<td>(420 × 5.0)</td>
<td>(106 × 6.6)</td>
</tr>
</tbody>
</table>

**REMARKS**

The massive form of this sponge is atypical in *Raspailia*. Spreading specimens with conical projections are comparable with *R. aculeata* (Johnston), as figured by Topsent (1925). In spiculation *R. agminata* is typical of the genus and particularly like *R. gracilis* (Lendenfeld) and *R. tenella* (Lendenfeld) from Port Jackson. The ramose habit of these species clearly distinguishes them from *R. agminata*.

**DISTRIBUTION**

Port Jackson (Australia).

*Raspailia flaccida* sp. nov. (Pls. 6b, 10b, 18c)

**HOLOTYPE**

Dom. Mus. Por. 29.

**MATERIAL EXAMINED**

Menzies Bay, Christchurch, 60 fm.

**DESCRIPTION**

This sponge is typically raspsalid, composed of long thin cylindrical branches. The branching is irregularly dichotomous. The axis is stiff; the branches simple, and flaccid toward the tips.

**DIMENSIONS**: Height 23.0 cm; width of axis 2.0 cm; diameter of branches 6.0 mm basally, 2.4 mm apically.

**COLOUR**: In life, bright orange (R-Y = 6/10); in spirit, dull yellowish brown (Y-R-Y = 6/4).

**TEXTURE**: Pliable and rather hard if compressed; furry to the touch.

**SURFACE**: Hispid with projecting ectosomal oxeas. No pores of oscules are visible.

**SKELETON**: The axial skeleton, one half the diameter of each branch, is made up of plumericulate spongion B fibres cored by styles, and oxeas. Fine fibres, 3-4 spicules wide, branch toward the surface and form a distinct extra-axial region. The spicules in this region are predominantly styles, with raphides lying in poorly defined groups at the surface. The fibres are 48.0-120.0 µ in diameter and the enclosed spicules in 2-4 rows. The echinating spicules, acanthostyles and occasional acanthoexae are more abundant in the extra-axial region. Connections between the radial spicule tracts are rare, and when they occur are only single spicules.

**SPICULES**

**MEGASCLERES**:

(a) **STYLES**, smooth, relatively slender spicules that vary greatly in length and shape. They may be almost straight, curved, or strongly contorted. The stylet end often bears a single mucronate projection.

(b) **OXEAS**, slightly curved or contort, with a variety of terminations, often mucronate.

(c) **ACANTHOSTYLES OR OCCASIONAL ACANTHOEXAE**, acanthostyles in the form of rhabdostyles finely spined over the posterior two-thirds; the acanthoexae are entirely spined and centrally flexed.

(d) **RAPHIDES**, very fine, slightly curved or toxiform.

**SPICULE DIMENSIONS**, see Table 6.

**REMARKS**

*Raspailia flaccida* is an atypical *Raspailia* in lacking dermal spicule tufts and in having occasional acanthoexae. These peculiarities, in conjunction with the abundance of cortort spicules (as variants of the megascleres), the presence of a dense spongion, and of variously ended styles and oxeas, are sufficient to differentiate *R. flaccida* from species such as *R. freyeri* Schmidt and *R. radiosis* Topsent, which also have contort oxeas. Raspailia

---

### Table 6. Spicule Dimensions of *Raspailia flaccida*.

<table>
<thead>
<tr>
<th>Locality</th>
<th>Styles (µ)</th>
<th>Oxeas (µ)</th>
<th>Acanthostyles (µ)</th>
<th>Raphides (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menzies Bay,</td>
<td>314 × 600</td>
<td>464-790</td>
<td>121-145</td>
<td>up to 340 × 1.5</td>
</tr>
<tr>
<td>Christchurch, 60 fm</td>
<td>9.8-14.2</td>
<td>9.8-14.2</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>(holotype)</td>
<td>(428 × 11.5)</td>
<td>(620 × 9.7)</td>
<td>(134 × 5.7)</td>
<td></td>
</tr>
</tbody>
</table>

---
Raspailia inaequalis Dendy. (Fig. 2)

Raspailia inaequalis Dendy, 1924, p. 355, pl. XXI, fig. 1; pl. XIV, fig. 17–19.

Remarks

No new material has been collected, but because of the uncertainty of its generic position the holotype (BM. 23.10.1.138) has been re-examined.

Dendy (1924) commented on the similarity between Echinaxia frondula Hallmann and Raspailia inaequalis: both lack dermal tufts of fine spicules. Dendy did not recognise Echinaxia as distinct from Raspailia. I agree on this point, but I am of the opinion that the genus Raspailia needs some revision.

Hallman (1917b) erected Echinaxia for Axinella frondula Whitelegge, a species with complex lamellate form, a semi-reticulate axial region, extra-axial fibres with a peculiar mode of origin from the axial region, and no cross-connections between the extra-axial fibres.

To admit Raspailia folium (Thiele) and R. horuta Thiele to Echinaxia, Hallmann widened the concept of the genus to include ramose forms with greatly reduced extra-axial skeleton or with well developed extra-axial tracts and dermal tufts of long styles. The inclusion of these two species in Echinaxia makes it impossible to differentiate between Raspailia and Echinaxia. The latter genus, if it can be recognised at all, contains only one species, E. frondula, in which the extra-axial skeleton is reduced greatly.

One point not easily dismissed is the presence in all the above-mentioned species of peculiar rhabdostylote acanthostyles. Topsent (1913b) erected Raspaxilla almost entirely because of the presence of such spicules, and it is difficult, within the concept of Raspailia, to think of these spicules as equivalent to the typical acanthostyles of such species as R. viminalis and R. agminata. (See also under Raspailia topsenti, p. 29).

Certain points of the skeletal morphology of Raspailia inaequalis are stressed here although the description given by Dendy is precise and accurate.

The extra-axial tracts arise at right angles to the axis and are plumose with echinating acanthostyles. There is no special development of tufts of styles to terminate the fibres; the terminal spicules do, however, extend for two-thirds of their length beyond the sponge surface.

Distribution

East of North Cape, 70 fm.

Raspailia topsenti Dendy. (Pls. 6c, d; 7a; 10d; 18d; 19d. Fig. 3b)

Raspailia topsenti Dendy, 1924, p. 354, pl. XII, fig. 4; pl. XIV, fig. 14–16. Raspaxilla topsenti, de Laubenfels, 1936, p. 102. Axaxa novaezelandiae, Bergquist, 1961b, p. 187, fig. 11a–b.

Material Examined

Poor Knights, 25 fm; Takatu Pt, 6 fm; North Channel, 5 fm; Rangitoto Channel, 7 fm; off Onetangi, 6 fm; Cook Strait, 50 fm; CIE 3 Mernoo Bank, 41 fm.

Description

A stiff, erect, dichotomously branched sponge distributed widely throughout New Zealand and common in shallow water in the Hauraki Gulf. In most specimens, some of the branches Anastomose.

Dimensions: A great number of specimens have been collected by dredging. They range from young specimens 5.0 cm high with a single dichotomy to large much-branched specimens 20.0 cm high and 15.0 cm wide. The axis is 1.0–1.5 cm in diameter; the branches 0.5–1.0 cm in diameter.

Colour: In life, deep dull orange (YR 6/10); in spirit, light yellowish (Y 8/4) to pale red brown (Y–R 6/6).

Texture: The whole body, except the hard woody axis, is firm but compressible.

Surface: A fine transparent dermal membrane stretches above the projecting ends of the extra-axial fibres. It is rarely intact after preservation, the surface becoming extremely hispid and velvety. In almost all specimens the oscules are visible, 0.4–0.8 mm in diameter, and of stellate form with branched channels draining into each. Pores approximately 0.1 mm in diameter are visible over the whole surface. In one specimen...
(from Ti Point) the surface is relatively smooth and the oscules are aligned along the sides of the branches.

**SKELETON:** The axial skeleton is a very dense region of interlacing longitudinal spongion B fibres, 100.0–150.0 µ in diameter, cored by stout styles arranged in 4–5 rows. One-third to half of the diameter of each branch is axial fibre. The extra-axial structures are soft and easily removed from the central portion.

Extra-axial spicule columns of stout styles arise from the axis and pass obliquely toward the surface. The origin and inner third of these columns is obscured by the great number of interconnections between adjacent tracts giving an almost reticulate appearance to the skeleton in this region. Toward the surface the individual fibres are more clearly defined. Feeble tufts of styles terminate the fibres and the dermal region contains brushes of slender styles or raphides.

These dermal spicule brushes vary in their constitution, number and arrangement from specimen to specimen. One specimen has a continuous palisade of raphide brushes (Ti Point), but usually they are sparse with 200–500 µ between tufts. Often a tuft is just one or two spicules lying tangentially in the dermal region.

The acanthostyles are rhabdostyles, and occur throughout the sponge, but are particularly abundant in the outer half of the extra-axial region.

Examination of the holotype confirms the skeletal arrangement described above.

**SPICULES:**

**MEGASCLERES:**

(a) **STYLES** smooth, stout, often curved sharply; oxeote and stronglyte modifications occur.

(b) **ACANTHOSTYLES** small, spining only on the posterior half. They may be almost straight and curved sharply at the apex, but more commonly are flexed about one-third of the distance from the head.

(c) **RAPHIDES** or **FINE STYLES**, long and slender: almost straight.

**SPICULE DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Styles (µ)</th>
<th>Acanthostyles (µ)</th>
<th>Raphides (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dendy, east of North Cape, 70 fm (type)</td>
<td>440 × 20.0</td>
<td>100 × 8.0</td>
<td>160 × 1.3</td>
</tr>
<tr>
<td>Cook St., 55 fm</td>
<td>217–392</td>
<td>82–106</td>
<td>120–290</td>
</tr>
<tr>
<td></td>
<td>× 11.0–17.0</td>
<td>× 5.7–6.9</td>
<td>× 1.1</td>
</tr>
<tr>
<td></td>
<td>(296 × 15.0)</td>
<td>(95 × 6.2)</td>
<td>(214 × 1.1)</td>
</tr>
<tr>
<td>Takatu Channel</td>
<td>260–400</td>
<td>80–120</td>
<td>130–260</td>
</tr>
<tr>
<td></td>
<td>× 12.0–18.0</td>
<td>× 5.7–7.0</td>
<td>× 1.3</td>
</tr>
<tr>
<td></td>
<td>(360 × 16.0)</td>
<td>(106 × 6.2)</td>
<td>(200 × 1.3)</td>
</tr>
</tbody>
</table>

**REMARKS**

*Raspailia topsenti* was referred by de Laubenfels (1936) to *Raspaxilla* Topsent. Dendy (1924) stated that *R. topsenti* was closely allied to *Raspaxilla phakellina* Topsent, but did not recognise *Raspaxilla* as being distinct from *Raspaxilla*.

*Raspaxilla* was based chiefly on the structure and arrangement of the rhabdostylote acanthostyles. It is not, as de Laubenfels contends, a genus lacking dermal spicules. *Raspaxilla phakellina* has long styles (1200–1400 µ) typical of a *Raspaxilla*; short fine dermal styles, tufted and grouped around longer spicules as in *Raspaxilla*; and is distinct only in having rhabdostyles and in lacking oxeas.

*Raspaxilla topsenti* lacks long styles and never has the dermal spicules grouped around a central style and therefore does not correspond in detail to the definition of *Raspaxilla*.

**DISTRIBUTION**

East of North Cape, 70 fm.

**Raspaxilla compressa** sp. nov. (Pls. 7b, 11a; Fig. 3a)

**Holotype**

Dom. Mus. Por. 30

**Material Examined**

North-east of North Cape, 173° 04′ E, 34° 28′ S. 27 fm.
DESCRIPTION

A short, dichotomously branched sponge with flattened branches, oval in transverse section and tapering to points distally.

DIMENSIONS: Height 7.0 cm; Axis 5.0 mm–8.0 mm wide, 3.0 mm thick.

COLOUR: In life, bright yellow (Y 8/8); in spirit, grey-white (YG–Y 8/4).

TEXTURE: Firm and flexible.

SURFACE: The surface is extremely hispid, with the projecting long styles of the dermal spicule brushes. Below the level of these the general surface is hispid from projecting dermal styles and acanthostyles.

SKELETON: The axial skeleton is a dense interlacing mass of longitudinal spongin B fibres cored by short styles and making up half the diameter of each branch. Many spicules have a transverse or oblique disposition and give a pseudo-reticulate appearance to the axial column.

The extra-axial columns arise from the axis at about 70° but within a short distance are orientated at right angles. A few styles are present in the columns at their point of origin, but the echinating acanthostyles are profuse. The axis of each column is made up of one or two extremely long styles.

All extra-axial columns end in a tuft of acanthostyles approximately 300 μ below the surface. Long styles pass beyond this point, pierce the surface where they are surrounded by a tuft of fine dermal spicules (styles or oxeas), and extend for up to 600 μ beyond the surface.

They appear to be no acanthostyles in the axial region proper. They appear around the base of the extra-axial columns and constitute almost their entire spicule complement.

SPICULES: MEGASCLERES:

(a) Axial Styles or, occasionally, oxeas; slightly curved to sharply flexed spicules.
(b) Long Extra-axial Styles, straight or very slightly curved, occasionally strongylote.
(c) Acanthostyles, rhabdostyle type, spined in the distal half, sharply curved a third of the distance from the head. Straight forms are not infrequent.
(d) Dermal oxeas or Styles, almost fine enough to be raphides. Straight or slightly curved spicules.

SPICULE DIMENSIONS, see Table 7.

REMARKS

Partly spined, rhabdostyle ocanthostyles are characteristic of the genera, Aulospongus Norman, Echinaxia Hallmann, and Raspaxilla Topsent. Four New Zealand species assigned to Raspaxilla have these spicules.

Aulospongus has a specialised tubular habit, and the acantho-rhabdoctyes are arranged around the cylinder in a characteristic fashion. The acantho-rhabdoctyes resemble rhabdoctyes of a distinct genus close to Raspaxilla. Aulospongus schoenus de Laubenfels should be removed to Thalysias.

Raspaxilla was erected because of the presence of acantho-rhabdoctyes in a sponge otherwise difficult to distinguish from Raspaxilla. Raspaxilla compressa corresponds closely in skeletal morphology with Raspaxilla phakellina except for the preponderance of acanthostyles in the extra-axial region, presence of oxeas, and the termination of the extra-axial columns some distance below the surface. Both species are atypical in Raspaxilla only because of the peculiar acanthostyles.

Echinaxia Hallmann lacks very long extra-axial spicules and has no oxeas or dermal brushes of fine spicules.

Echinaxia frondula and Raspaxilla compressa are similar in having a preponderance of acanthostyles in the extra-axial columns. This preponderance is particularly marked in R. compressa. It is notable that Echinaxia frondula is a flattened lamella and that Raspaxilla compressa has flattened branches.

On these features it appears impossible to separate Raspaxilla and Echinaxia from Raspaxilla on any grounds but acanthostyle morphology.

It would be desirable to examine the holotype of Raspaxilla phakellina Topsent before deciding to separate the four New Zealand Raspaxilla and Echinaxia frondula from Raspaxilla. For the present I regard Raspaxilla and Echinaxia as synonyms of Raspaxilla.

Raspaxilla compressa is distinct from other species of Raspaxilla possessing rhabdoctyes, in the detailed structure of the extra-axial region, the preponderance of acanthostyles in the extra-axial columns, and in the large size of the acantho-rhabdoctyes.

Genus Clathriodendron Lendenfeld

Raspaxillidae with spicule complement similar to that of Raspaxilla (long subtyloctyes, oxeas, acanthostyles) but having a reticulate spongin skeleton throughout, with no trace of axial condensation. Dermal spicules absent, interstitial spicules abundant.

| Table 7. Spicule Dimensions of Raspaxilla compressa. |
|---|---|---|---|
| Locality | Axial Styles (µ) | Extra-axial Styles (µ) | Acanthostyles (µ) | Dermal Styles (µ) |
| | (290 × 9.0) | (1120 × 18.5) | (260 × 7.5) | (278 × 2.0) |
**Clathriodendron rubrum** Kirk

*Clathriodendron rubrum* Kirk, 1911, p. 580, fig. 6, pl. XXVII, fig. 1. Fell, 1950, p. 11.

**Remarks**

I have examined the syntype slides, which, unfortunately, are very poor. The ascending fibres are 80.0–100.0 µ in diameter and the connecting fibres 50.0–70.0 µ in diameter.

**Spicules**

Most of the spicules are broken. The oxeas, much larger than indicated by Kirk, are definitely megascleres and of characteristic raspailid form. The small rods mentioned in the type description are foreign spicules belonging to an *Ancorella*.

**Spicule dimensions**, see Table 8.

**Distribution**

Denham Bay, Raoul Island.

**Genus Eurypon** Gray

Raspailiidae of permanently encrusting form in which the spicules tend to be tylole to subtylole. Because of the encrusting form the “echinating” spicules are usually vertical to the substrate.

**Eurypon hispida** sp. nov. (Pl. 12a)

**Holotype**

Dom. Mus. Por. 31.

**Material Examined**

Leigh Reef, 20 fm.

**Description**

A thin encrustation, never more than 1.0 mm deep, over dead shells of *Glycymeris*.

**Colour**: In life, dull orange (rY-R6/6); in spirit, grey (rY 7/2).

**Texture**: Brittle.

**Surface**: The extremely hispid, granular surface is the most notable macroscopic feature. The long stylole megascleres extend up to 800 µ beyond the surface. No inhalant or exhalant channels or apertures have been observed.

**Skeleton**: The skeleton is composed of a basal spongine B plate, in which are embedded vertical acahontyle and large single subtyloles. A few acahontyle lie horizontal to the substrate, but this is likely to be an artifact of sectioning.

Fine styles or tylostyles are occasionally found in groups of 2–3 around the point where one of the large megascleres pierces the surface. These probably represent not a category of dermal megascleres, but developmental stages of the larger megascleres.

**Spicules**:

**Megascleres**:

(a) **Subtylostyles or bulbous tylostyles**, large, curved. Developmental forms have an extremely fine axis and a most pronounced tylole head. The tylole head is often asymmetric, having developed to one side of the axial filament. Incipient polytylole forms are found.

(b) **Acahontyle tylostyles**, strong spining around the axial end of the head and thus tending toward cladotylees. The acahontyle are straight or slightly curved, tapering along their whole length to a very sharp point.

**Spicule dimensions**:

<table>
<thead>
<tr>
<th>Locality</th>
<th>Subtylostyles or Tylostyles (µ)</th>
<th>Acanthostyles (µ)</th>
</tr>
</thead>
</table>
| Leigh Reef, 20 fm | 304–1550 × 3.0–16.0  
(1060 × 12.0) | 70–352 × 3.0–12.0  
(174 × 9.0) |

**Remarks**

De Laubenfels (1936) considered that the genus *Eurypon* Gray (type species, *Hymeraphia clavata* Bowerbank) differed from *Epicles* Gray (type species, *Hymedesmia radiata* Bowerbank) in having acahontyle principal spicules. There is no basis in the literature for de Laubenfels’s statement, and I consider *Epicles* a synonym of *Eurypon*. *Acantheurypon* Topsent, however, can be differentiated from *Eurypon* by its spined principal spicules.

*Eurypon hispida* is remarkably like the type species of the genus, *E. clavata*, differing only in having smaller main megascleres and in lacking dermal spicule brushes.

*E. hispida* is comparable to *E. bulboretorta* (Carter) from the Gulf of Manaar in having bulbous, asymmetric tylostyles. *Eurypon bulboretorta*, however, has tufts of fine

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**Table 8. Spicule Dimensions of Clathriodendron rubrum.**

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Styles (µ)</th>
<th>Tylostyles (µ)</th>
<th>Oxeas (µ)</th>
<th>Acanthostyles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kirk, 1911, Denham Bay (holotype)</td>
<td>500 × 5.0</td>
<td>700 × 8.0</td>
<td>45.0</td>
<td>50 × 7.0</td>
</tr>
<tr>
<td>(Syntype)</td>
<td>2100–5400</td>
<td>620–860</td>
<td>420–800</td>
<td>80–110</td>
</tr>
<tr>
<td></td>
<td>× 7.0–12.0</td>
<td>× 7.0–10.0</td>
<td>× 4.0–6.0</td>
<td>× 7.0–9.0</td>
</tr>
<tr>
<td></td>
<td>(4200–18.8)</td>
<td>(740 × 9.0)</td>
<td>(550–5.2)</td>
<td>(94 × 8.2)</td>
</tr>
</tbody>
</table>
dermal oxeas. One further species needs mention, *E. graphidophora* (Hentschel) from South Australia. This differs from *E. hispida* in possessing dermal styles and in the morphology and size of the acanthostyles.

**DISCUSSION**

The systematic position of the Raspaliidae is difficult to define. Some authors (Hallman, 1914, 1917a; Levi, 1956) have argued their relationship to the axinellid complex, and certainly the habit, with frequent axial condensation, is like that of *Axinella*. The tufted arrangement of dermal spicules in some species, commonly of smaller oxeas around a long central style, is reminiscent of *Higginsia*; the presence of finely spined oxeas and styles in some species reinforces this comparison. Finally, Levi (1956) has established that *Raspailia pumila* is oviparous.

Other workers (Dendy, 1905, 1921; de Laubenfels, 1936) have been impressed with the presence of echinating acanthostyles of poceliosclerid type in many species of *Raspailia* and have used this to argue that the affinities of the group lie with the Ectyoninae (Dendy) or Myxilliformes and Microcioniformes (de Laubenfels, 1936).

Much detailed morphological evidence has been cited in support of both views. I think that much of the difficulty arises because it is almost impossible to derive a clear concept of *Raspailia* from the literature. There has been no extensive revision of the genus since 1912 and many new species have been described subsequently. It is clear that species allied to *Raspailia* (*Raspaxilla phakellina* can be separated from *Raspailia* on the base of acanthostyle morphology. However, it is not clear that all such species could be transferred to the genus *Raspaxilla*.

This leaves within *Raspailia* species such as the type of the genus, *R. viminalis* Schmidt, which has acanthostyles of typically poceliosclerid form (here the comparison must be to the Clathriidae) in conjunction with tufted dermal spicules grouped around a long central style, long subtylostyles, moderate amounts of spongin B making up the axial fibres and ramose form.

There are other species, such as *Raspailia agminata*, which have no axial condensation, very little spongin fibre, and a modified arrangement of dermal spicules. The speculation of *R. viminalis* and *R. agminata* is similar in detail.

Between these types are many species that are nontypical in one or two characters but conform in others. Because of the lack of information on the reproductive biology of almost all of the species concerned it is undesirable to subdivide the genus *Raspailia* at the present time. It is, however, true to say that the group fits most comfortably within the Axinellida, but each species must be viewed critically to ascertain whether it belongs in *Raspailia*.

Order **HALICHONDRIIDA** Topsent
Family **HALICHONDRIIDAE** Gray

**Genus Halichondria** Fleming

**Halichondria knowltoni** Bergquist

*Halichondria reticulata* Brønndsted, 1924, p. 450, fig. 9.
*Halichondria knowltoni* Bergquist, 1961b, p. 186, fig. 10.

**MATERIAL EXAMINED**


**DESCRIPTION**

Little can be added to the type description since my specimen is badly damaged.

**DIMENSIONS**: 4.0 cm high; 3.5 cm long; 0.4 cm wide.

**COLOUR**: In life, biscuit (notation not given by collector); in spirit, yellow-white (*rY* 8/4).

**TEXTURE**: Soft and spongy, easily torn.

**SURFACE**: Smooth with a marked dermal spicule reticulation.

**SKELETON**: Is very like that of the holotype; fibres are 60.0–168 µ (110.0 µ) in diameter.

**SPICULES**:

**MEGASCLERES**:

(a) OXEAS of two sizes: large, smooth slightly curved spicules forming the endosomal skeleton, and small similarly shaped spicules making up the dermal skeleton.

(b) SMALL, similarly shaped spicules of the dermal skeleton.

**SPICULE DIMENSIONS**:

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Dermal Oxeas (µ)</th>
<th>Endosomal Oxeas (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brønndsted</td>
<td>140–360 × 6.0–10.0</td>
<td>165–540 × 8.0–15.0</td>
</tr>
<tr>
<td><em>Wellington Harbour</em></td>
<td>(280 × 8.0)</td>
<td>(409 × 12.0)</td>
</tr>
<tr>
<td>Waitangi Wharf</td>
<td>230–320 × 7.0–11.0</td>
<td>302–496 × 9.0–15.0</td>
</tr>
<tr>
<td>Chatham Is.</td>
<td>(295 × 8.4)</td>
<td>(420 × 12.7)</td>
</tr>
</tbody>
</table>

*Figures based on re-examination of type material.*

**DISTRIBUTION**

Wellington Harbour 5–10 fm.

**Halichondria moorei** Bergquist. (Frontispiece)

*Halichondria moorei* Bergquist, 1961a, p. 40, fig. 11 a, b.

**HOLOTYPE**

Dom. Mus. Por. 8.

**MATERIAL EXAMINED**

Rangitoto I., Motutapu; Milford; Stanmore Bay; Gt Barrier; Russell; Westmere; Ladies Bay; Karaka Bay;
Parnell reef (all intertidal), Mt Maunganui, Bay of Plenty; Goat Island Bay, Leigh.

**DESCRIPTION**

A massive spreading sponge with marked surface reticulation and prominent oscules lying flush with the surface.

**DIMENSIONS:** Frequently greater than 35.0 cm long, 15.0 cm wide and up to 10.0 cm thick.

**COLOUR:** In life, pink-orange to dull yellow (rY 6/6), usually pink (rY-R 7/8).

**TEXTURE:** Soft and fleshy, rather fragile.

**SURFACE:** Irregularly wrinkled and folded, mamillate in some specimens. Oscules are up to 3.0 cm in diameter; pores are abundant and give a finely punctate appearance to the surface.

**SKELETON:** The endosomal skeleton is a confused mass of oxeas, which in patches tend to be radially disposed. The dermal skeleton is a tangential reticulation of oxeas not differentiated in size or form from the endosomal spicules. In the deeper parts of the sponge, traces of spongin B are found cementing groups of oxeas and surrounding reproductive structures.

**SPICULES:**

**MEGASCLERES:**

oxeas, smooth, straight, not clearly divisible into two categories.

**SPICULE DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Oxeas Dermal (µ)</th>
<th>Oxeas Endosomal (µ)</th>
<th>Styles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt Chevalier (type)</td>
<td>300–800 × 5.0–17.0</td>
<td>(628 × 13.2)</td>
<td>None present</td>
</tr>
<tr>
<td>Motutapu I.</td>
<td>339–750 × 6.2–17.3</td>
<td>(612 × 14.0)</td>
<td></td>
</tr>
</tbody>
</table>

**REPRODUCTION**

Developing embryos are present in most specimens from April to July. They are ellipsoid, 400.0–1600.0 µ long, 110.0–400.0 µ in maximum diameter.

**REMARKS**

The distinctive characters of this species are the salmon pink to dull orange colour, combined with a mamillate surface.

_Halichondria moorei_ is an extremely common sponge in the mid-tidal zone particularly in the inner Hauraki Gulf. At the type locality, Point Chevalier reef, it is a physiognomic species growing in crevices, under stones, and most abundantly around the edges of pools. It is associated most frequently with _Coralina officinalis_ and _Hymeniacidon perleve_. The species is named after Dr Lucy B. Moore who first collected it.

**Halichondria panicea** (Pallas). (Pls. 7c, 19b)

**RESTRICTED SYNONMY**

_Spongia panicea_ Pallas, 1766, p. 388.


(For synonymy see Vosmaer 1932, p. 522. For segregation of _H. bowerbanki_ synonyms see Hartmann, 1958, p. 24. For figures see Bowerbank, 1874, pl. XXXIX, XL.)

**MATERIAL EXAMINED**

Bay of Islands; Gt Barrier; Goat Island Bay; Narrow Neck, Pt Chevalier, Piha; Anawhata; Mayor I.; Menzies Bay (all intertidal) off Waiheke 6 fm; Rangitoto Channel 4 fm; Manukau Harbour 3–6 fm.

**DESCRIPTION**

This sponge varies considerably in form in New Zealand. Specimens from the east coast are massive or encrusting with delicate detachable dermal membrane and flush oscules. Specimens from more exposed stations on the west coast have a tough skin-like dermal membrane, with prominent, thick-lipped oscules raised and aligned along ridges. The latter specimens resemble that figured by Bowerbank (1874, pl. XL, fig. 3).

**COLOUR:** In life, yellow (rY 8/6) to dull orange (rY-R 6/8), or lemon yellow (gY 8/8) with khaki ridges (gY 8/4); in spirit, grey to white.

**TEXTURE:** Soft, easily torn.

**SURFACE:** Smooth or slightly corrugated with a characteristic dermal skeleton. Oscules are 0.8–2.0 mm in diameter.

**SKELETON:** The endosomal skeleton is made up of loose tracts of oxeas with no constant alignment. The clearly defined ectosomal region is composed of vertical tracts of smaller oxeas traversing extensive subdermal spaces and intersecting the dermal membrane where they fan out into brushes. The dermal membrane is 0.3–0.8 mm thick and has the characteristic skeletal arrangement figured by Hartman (1958, p. 35).

**SPICULES:**

**MEGASCLERES:**

(a) oxeas of two sizes.

(b) styles, occasional in the ectosome and dermal membrane.

**SPICULE DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Oxeas Dermal (µ)</th>
<th>Oxeas Endosomal (µ)</th>
<th>Styles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milford</td>
<td>286–369</td>
<td>363–426</td>
<td>None present</td>
</tr>
<tr>
<td></td>
<td>× 4.6–7.2</td>
<td>× 9.0–12.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(297 × 5.1)</td>
<td>(387 × 10.2)</td>
<td></td>
</tr>
<tr>
<td>Piha-Anawhata</td>
<td>290–320</td>
<td>305–387</td>
<td>170–290</td>
</tr>
<tr>
<td></td>
<td>× 3.4–5.7</td>
<td>× 5.7–11.5</td>
<td>× 4.0–6.2</td>
</tr>
<tr>
<td></td>
<td>(308 × 4.0)</td>
<td>(350 × 9.2)</td>
<td>(190 × 4.8)</td>
</tr>
<tr>
<td>church</td>
<td>× 4.0–5.7</td>
<td>× 5.7–9.2</td>
<td>× 4.6–5.2</td>
</tr>
<tr>
<td></td>
<td>(340 × 4.9)</td>
<td>(403 × 6.8)</td>
<td>(235 × 4.8)</td>
</tr>
</tbody>
</table>
REMARKS

_Halichondria panicola_ is a common, intertidal species particularly on basalt and Waimata sandstone substrates in sheltered northern localities. It is, however, more consistently found on loose shell substrates in shallow offshore waters.

**Distribution**

Arctic; Atlantic coasts of Europe and North America; Mediterranean; Azores; Antarctic; extreme south South America; Japan; Sea of Japan; New Zealand (Bay of Islands; New Plymouth, 8 fm).

*Halichondria punctata* nom. nov.

_Halichondria incurstans_ Brøndsted, 1923, p. 117, fig. Ja, b.

**Remarks**

De Laubenfels (1936, p. 133) indicated that _incrustans_ is three times preoccupied in _Halichondria_. The name _H. punctata_ is proposed to replace _H. incurstans_ Brøndsted.

**Distribution**

Port Ross; Auckland Is., intertidal.

*Halichondria intermedia* Brøndsted

_Halichondria intermedia_ Brøndsted, 1923, p. 119, fig. 2.

**Remarks**

Brøndsted was doubtful of the position of the species. As the type was unavailable for study, I cannot amplify the published description.

**Distribution**

Carnley Harbour, 45 fm.

Genus _Trachyopsis_ Dendy

**Trachyopsis halichondrioides** Dendy

**Restricted Synonymy:**

_Trachyopsis halichondrioides_ Dendy, 1905, p. 147, pl. X, fig. 10.

_Halichondria rugosa_, Bergquist, 1961b, p. 185, fig. 9a, b.

**Material Examined**

CIE 3 Mernoo Bank, Chatham Rise, 41 fm.

**Remarks**

This specimen was tentatively referred to _Halichondria rugosa_. Further study of the literature leaves little doubt that the sponge belongs in _Trachyopsis_. Whether _Trachyopsis_ Dendy is a synonym of _Amorphinopsis_ Carter as suggested by Burton (1959a) is debatable, but from the available evidence this is unlikely.

**Distribution**

Indian Ocean; Phillipines; Australia.

Genus _Ciocalypta_ Bowerbank

_Ciocalypta polymastia_ (Lendenfeld).

**Stylotella polymastia** Lendenfeld, 1888, p. 186, pl. IV, fig. 1.

_Ciocalypta polymastia_ Hallmann, 1914, p. 353, fig. 7.

**Material Examined**

North Channel 10 fm; Manukau Harbour, low tide to 6 fm. Kaipara Harbour, Maretahi Peninsula, low tide; Narrow Neck, Takapuna.

**Description**

The range in form is from a thick encrustation to a massive sponge, always with long finger-like projections from the upper surface. Encrusting forms are common on the rocky substrates of inner harbour reefs; massive forms on shell detritus of mud flats or offshore locations.

**Dimensions**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Ocular Elevations</th>
<th></th>
<th>Oscule Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Long (mm)</td>
<td>Short (mm)</td>
<td>(mm)</td>
</tr>
<tr>
<td>North Channel</td>
<td>30-38</td>
<td>2-10</td>
<td>2.5-3</td>
</tr>
<tr>
<td>Kawau, 10 fm</td>
<td>(34×9)</td>
<td>(6.5×3.1)</td>
<td>(2.6)</td>
</tr>
</tbody>
</table>

**Colour:** In life, pale yellow (yY-R 7/10); in spirit, almost white.

**Texture:** Firm, but compressible.

**Surface:** Smooth, but, on close examination, slightly hispid.

**Skeleton:** The skeletal arrangement is confused in the endosomal region; spicule tracts become definite nearer the surface. The dermal region contains tufts of small styles and some tangential styles. It is continuous over large subdermal cavities, between which tracts of large styles pass toward the surface. Small- and medium-sized spicules are abundant throughout the sponge but never in spicule tracts. Spongin B occurs in small quantities binding groups of spicules particularly near the base of the sponge.

**Spicules:**

**Megascleres:**

styles: three sizes, all of characteristic shape, the shaft tapering in the proximal quarter and often with a slight flexure (Hallmann, 1914, fig. 7).

**Spicule Dimensions:**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Large (µ)</th>
<th>Subtylostyles (µ)</th>
<th>Medium (µ)</th>
<th>Dermal Subtylostyles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Channel 10 fm</td>
<td>605-677</td>
<td>×12.7-22.0</td>
<td>271-385</td>
<td>5.7-7.0</td>
</tr>
<tr>
<td></td>
<td>635×16.2</td>
<td></td>
<td>328×6.5</td>
<td>(159×4.6)</td>
</tr>
</tbody>
</table>

**Remarks**

Australian and New Zealand specimens are alike in all details.

**Distribution**

East coast of Australia (Lendenfeld).
Ciocalypta penicillus Bowerbank. (Pls. 8a, b; 19d; 20a)

**DESCRIPTION**
A very distinctive sponge with lumplike base, which is produced above into many long fine, tapering fistules. It is often taken in dredge hauls in the Hauraki Gulf from muddy sand and shell deposits but usually only the broken fistules are obtained.

**DIMENSIONS:** See Table 9.

**COLOUR:** In life, pale yellow (rY 8/8); in spirit, greyish white.

**TEXTURE:** The base is firm but compressible and the fistules very crisp and delicate.

**SURFACE:** The surface is weakly hispid, and patterned with small irregular lumps with grooves between them, the lumps and grooves being less evident on the base than on the fistules. The grooves on the fistules are longitudinally disposed, and the ridges between may be up to 3.0 mm high. There are 4–6 ridges on each of the fistules, which are consequently star-shaped in section.

**SKELETON:** This is composed of dense columns of styles curving toward the surface. In the fistules these become a nearly solid axial core. The arrangement of spicule columns is obscured somewhat by spicules around and across the line of the columns. These interstitial and disoriented spicules are chiefly oxeas or smaller styles, but there are occasional short tracts of large styles at right angles to the main skeletal columns. The dermal layer is a dense, felted layer of tangential oxeas.

**SPICULES:**

**MEGASCLERES:**
(a) **STYLes**, of considerable size range, straight or slightly curved.
(b) **OxeASes**, always curved, often strongly flexed.

**SPICULE DIMENSIONS:**  

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Oxeas (µ)</th>
<th>Styles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowerbank (Axinella colvillii), Little Barrier I., 30 fm</td>
<td>170–320</td>
<td>500–900</td>
</tr>
<tr>
<td></td>
<td>164–170</td>
<td>314–860</td>
</tr>
<tr>
<td></td>
<td>× 7.0–9.0</td>
<td>× 14.0–25.0</td>
</tr>
<tr>
<td>Waiteke I., 8 fm</td>
<td>6.9–10.0</td>
<td>10.0–25.0</td>
</tr>
<tr>
<td></td>
<td>(242×7.1)</td>
<td>(392×18.6)</td>
</tr>
<tr>
<td>Campbell Plateau</td>
<td>8.0–12.0</td>
<td>10.0–28.0</td>
</tr>
<tr>
<td></td>
<td>(372×10.2)</td>
<td>(682×20.0)</td>
</tr>
</tbody>
</table>

**Remarks**
There are no noteworthy differences between New Zealand, Australian, and Northern Hemisphere specimens of this almost cosmopolitan sponge.

The synonymy of Sigmaxinella papillata Brøndsted with Ciocalypta penicillus requires some comment. The type description of S. papillata refers to sigmas and microxeas. These spicules are contaminants from Biemna stylotata. Two other of Brøndsted's species are synonyms of Ciocalypta penicillus; they are Axinella colvillii Brøndsted and Hymeniacidon novaezealandiae Brøndsted. Hymeniacidon novaezealandiae was referred to Axiamon Hallmann by de Laubenfels (1936), but there is no basis for this opinion.

Campell Plateau specimens differ from northern New Zealand specimens in having slightly larger spicules and a smoother surface. The longitudinal furrows on the fistules are just visible externally but do not cause grooving.

**Family HYMENIACIDONIDAE de Laubenfels**

**Genus Hymeniacidon Bowerbank**

**Hymeniacidon hauraki** Brøndsted. (Pls. 8c, d; 17b)

**DESCRIPTION**
A massive sponge with numerous fine conulose processes. Alive, and immediately after fixation, it produces great amounts of slime.

**DIMENSIONS:** See Table 10.

**COLOUR:** In life, bright orange (Y–R 6/12); in spirit, pale dull orange (Y–R 7/6).

**TEXTURE:** Soft and fleshy.

**SURFACE:** This is jagged, with irregular rows of conules, and hispid since each conule is lifted by a brush of dermal styles that pierce its tip. No pores or oscules have been observed.

**SKELETON:** The endosomal skeleton is a confused mass of styles slightly organised into ascending tracts. The dermal membrane, 0.1 mm thick, appears as a transparent skin-like film over extensive subdermal cavities. The conules are elevations of this membrane, each with a core of one to ten styles.
TABLE 9. Dimensions of *Ciocalypta penicillus*.

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Height (cm)</th>
<th>Width of Base (cm)</th>
<th>Length of Fistules (cm)</th>
<th>Diameter of Fistules (mm)</th>
<th>Dermal Membrane (mm)</th>
<th>Spines (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brandsted, Little Barrier I.</td>
<td>9.5</td>
<td>—</td>
<td>55.0</td>
<td>12.0</td>
<td>—</td>
<td>4.0</td>
</tr>
<tr>
<td>Waiheke I.</td>
<td>9.0</td>
<td>2.5</td>
<td>5.5</td>
<td>1.5–6 cm (4.3 cm)</td>
<td>2.0–6.0 basally</td>
<td>0.5</td>
</tr>
<tr>
<td>Campbell Plateau, 46 fm, B 176</td>
<td>5</td>
<td>2.0</td>
<td>5.0</td>
<td>1.9–4.5 cm (3.2 cm)</td>
<td>4.0–8.0 basally</td>
<td>1.0</td>
</tr>
</tbody>
</table>

TABLE 10. Dimensions of *Hymeniacidon hauraki*.

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Height (cm)</th>
<th>Width (cm)</th>
<th>Length (cm)</th>
<th>Height of Processes (cm)</th>
<th>Diameter of Processes (mm)</th>
<th>Conule Height (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brandsted, North Channel, (holotype)</td>
<td>4.5</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1.0</td>
</tr>
<tr>
<td>Takatu Pt, 6 fm</td>
<td>2.5 and 9.0</td>
<td>2.0 and 4.8</td>
<td>2.0 and 11.0</td>
<td>0.5–2.5</td>
<td>2.0–4.0 (including conules)</td>
<td>up to 1.0</td>
</tr>
</tbody>
</table>

**Spicules:**

**MEGASCLERES:**

Stages, smooth, evenly curved, of uniform diameter throughout.

**SPICULE DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Styles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brandsted, North Channel (type)</td>
<td>400–800 x up to 14.0</td>
</tr>
<tr>
<td>Takatu Channel, 6 fm</td>
<td>605–847 x 5.7–15.0 (720 x 12.8)</td>
</tr>
</tbody>
</table>

**DISTRIBUTION:** North Channel, Kawau I. 10 fm.

**Hymeniacidon indistincta** Brandsted

*Hymeniacidon indistincta* Brandsted, 1923, p. 146, fig. 24.

**DISTRIBUTION**

Masked I., Carnley Harbour (low tide).

**Hymeniacidon perleve** (Montague) (Pls. 9a, d; 20b, c)

**RESTRICTED SYNONYMY**

*Spongia perleve* Montague, 1818, p. 86.

*Hymeniacidon caruncula* Bowerbank, 1866, p. 166.

*Hymeniacidon sanguinea* Bowerbank, 1866, p. 168.

*Hymeniacidon perlevis* Burton, 1956, p. 135; Burton, 1959b, p. 47.

**MATERIAL EXAMINED**

Tom Bowling Bay; Spirits Bay; Russell; Stanmore Bay; Whangarei Heads; Gt Barrier; Rangitoto; Motutapu; Noises Is; Milford; Narrow Neck; Stanley Bay; Pt Chevalier; Ladies Bay; Cape Colville; Piha; Anawhata. (All intertidal).

**DESCRIPTION**

A thin or thickly encrusting sponge, which varies greatly in form according to habitat. In areas of considerable exposure (Tom Bowling Bay; Piha; Gt Barrier) it is spreading and smooth. In sheltered or moderately exposed localities, where it often occurs with *Corallina officinalis*, *Hymeniacidon perleve* has erect processes springing from a thin basal mat. The processes may be smooth or spiny. *Hymeniacidon perleve* is a common sponge in the intertidal region in the north of New Zealand.

**DIMENSIONS:** Length up to 6.0 cm, width up to 4.0 cm, thickness up to 1.8 cm. Processes 0.8–2.0 cm high, 0.1–0.25 cm wide.

**COLOUR:** In life, dull orange-yellow (rY 7/8) throughout, or brownish externally (Y–R–Y 5/4) and brick-orange internally (rY–R 5/8); in spirit, pale yellowish to white, or reddish (rY–R 7/6).

**TEXTURE:** Soft and fleshy.

**SURFACE:** Uneven owing to extensive subdermal cavities into which the dermal membrane sinks giving a characteristic wrinkled appearance. Oscules are elevated on low cones or on digitate processes and are 0.5–1.5 mm in diameter. The oscular cones, when present, are open down one side and rolled inward. The point of inrolling marks the entry of a single large channel from the subdermal spaces.

**LARVAE:** Larvae are found in mid-tidal specimens from February to April.

**SKELETON:** The endosomal skeleton is a confused mass of styles not organised into spicule tracts. The dermal membrane is thick (1.0 mm) and skinlike but contains no spicules.
SPICULES:
MEGASCLERES:
- **STYLES**, smooth, straight, or slightly curved, with somewhat expanded, rounded heads. The spicules are narrow behind the head and widest in the middle.

**SPICULE DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Styles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H. caruncula</strong></td>
<td>218 x 3.0</td>
</tr>
<tr>
<td>Bowerbank</td>
<td></td>
</tr>
<tr>
<td>Pt Chevalier</td>
<td>189-329 x 4.6-9.2</td>
</tr>
<tr>
<td>(272 x 7.6)</td>
<td></td>
</tr>
<tr>
<td>Tom Bowling Bay,</td>
<td>220-314 x 1.6-5.7</td>
</tr>
<tr>
<td>North Cape</td>
<td>(260 x 4.6)</td>
</tr>
</tbody>
</table>

**REMARKS**

The identification of this material as the cosmopolitan *H. perleve* and my selection of *H. perleve* as the correct specific name in preference to *H. sanguinea* or *H. caruncula* are based on advice received from Dr M. Burton. I have not seen the type of *H. perleve*, but Dr Burton has studied the Montague and Bowerbank types and states (pers. comm.) that Bowerbank’s species are synonyms of *H. perleve*.

**DISTRIBUTION:** Cosmopolitan.

**Hymeniacidon racemosum** Brandsted

_Hymeniacidon racemosum_ Brandsted, 1924, p. 476, fig. 29.

**MATERIAL EXAMINED**

Hen and Chickens Is., 30 fm; North Channel 10 fm.

**REMARKS**

Both specimens are fragments, consisting of the upper portions of delicate, anastomosing, somewhat flattened processes, which give no idea of the morphology of the whole sponge. The surface is slightly hispid; the dermal membrane 0.15 mm thick; the subdermal spaces well developed. The texture is elastic, the colour yellow.

**SPICULES:**

**MEGASCLERES:**
- **STYLES**, smooth, straight or slightly curved spicules, broadly rounded anteriorly, slightly narrowed behind the head.

**SPICULE DIMENSIONS:**

<table>
<thead>
<tr>
<th>Locality and Author</th>
<th>Styles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brendsted</strong></td>
<td>300 x 7.0-8.0</td>
</tr>
<tr>
<td>Three Kings Is.,</td>
<td></td>
</tr>
<tr>
<td>65 fm (holotype)</td>
<td></td>
</tr>
<tr>
<td><strong>North Channel</strong></td>
<td>220 x 450 x 5.7-10.4</td>
</tr>
<tr>
<td>10 fm</td>
<td>(340 x 7.6)</td>
</tr>
</tbody>
</table>

**DISTRIBUTION**

Three Kings Is., 65 fms.

**Hymeniacidon spherodigitata** sp. nov. (Pls. 9b, c; 11b; 20d)

**HOLOTYPE**

Dom. Mus. Por. 32.

**MATERIAL EXAMINED**

North Channel, 8 fm.

**DESCRIPTION**

Three specimens, identical except externally, were collected. The holotype is subspherical, with short pointed processes arising obliquely all over the surface, and was growing upon a dead shell of *Glycymeris laticostata*. The other two specimens are roughly spherical, with stout pointed processes arising from their bases, and were growing attached to rocks. This sponge exudes a considerable amount of slime when removed from the water.

**DIMENSIONS:** See Table 11.

**COLOUR:** In life, bright red (rY-R 5/10) to (rY-R 6/10); in spirit, pale whitish yellow.

**TEXTURE:** Firm and elastic.

**SURFACE:** This is granular and shaggy with numerous projections. Oscules apparent in one specimen, are 1.0-3.6 mm in diameter, and are located near the apex of the digitate processes.

**SKELETON:** The skeleton is a confused mass of styles showing faint organisation into tracts in the subdermal region, where the spicules curve outward, obliquely to the dermal membrane.

---

**Table 11. Dimensions of Hymeniacidon spherodigitata.**

<table>
<thead>
<tr>
<th>Habit</th>
<th>Height (cm)</th>
<th>Length (cm)</th>
<th>Width (cm)</th>
<th>Height of Processes (µm)</th>
<th>Width of Processes (mm)</th>
<th>Dermal Membrane (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spherical shaggy</td>
<td>11.0</td>
<td>9.0</td>
<td>9.2</td>
<td>1.0-5.0</td>
<td>1.0-3.0</td>
<td>0.3</td>
</tr>
<tr>
<td>(holotype)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digitate</td>
<td>7.0</td>
<td>10.0</td>
<td>8.0</td>
<td>4.5-6.6</td>
<td>3.0-7.0</td>
<td>0.25</td>
</tr>
</tbody>
</table>

---

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**Spicules:**

**Megascleres:**

**Styles,** smooth spicules, broadly rounded anteriorly and slightly to strongly curved. Otherwise, identical fine styles occur, but do not form a special dermal skeleton.

**Spicule Dimensions:**

<table>
<thead>
<tr>
<th>Locality</th>
<th>Styles (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Channel, 8 fm (holotype)</td>
<td>556–750 × 11.5–18.0</td>
</tr>
</tbody>
</table>

**Remarks**

This species is a typical *Hymeniacidon* in spiculation and in having fleshy, slimy texture. No other Australasian species have the latter character combined with a massive habit; nor are any other species of *Hymeniacidon* like this one in spicule dimensions, colour, and habit.

---

*Hymeniacidon conica* (Kirk)

*Stylohalina conica* Kirk, 1909, p. 539, pl. XXV, fig. 1–3.

*Hymeniacidon conica*, de Laubenfels, 1936, p. 139.

**Remarks**

De Laubenfels (1936) pointed out that *Stylohalina* as defined by Kirk was indistinguishable from *Hymeniacidon*. Burton (1932, 1940) has referred species to *Stylohalina* but has not redefined the genus.

**Distribution**

Perseverance Harbour; Campbell I. (intertidal).

---

**Genus Acanthella Schmidt**

*Acanthella crista-galli* (Dendy). (Pl. 13d)

*Tedania crista-galli* Dendy, 1924, p. 365, pl. XII, fig. 8.

*Acanthella crista-galli*, Burton, 1932, p. 346.

**Remarks**

Burton (1932), in revising *Tedania*, suggested that *T. crista-galli* be removed to the Axinellidae. Dendy (1924) stated that the species approached very closely to *Acanthella* in skeletal disposition.

If, however, the type of *Acanthella* is *A. acuta* Schmidt, there is little resemblance beyond the possession of long styles, fleshy texture, and conulose surface. In *A. crista-galli* there is no trace of axial specialisation, very little spongin, and the skeletal tracts are poorly organised.

**Distribution**

Spirits Bay, 11–20 fm.
REFERENCES


———. 1917a: A revision of the genera with microles included, or provisionally included in the family Axinellidae; with descriptions of some Australian species. Ibid. 41 (1) : 453-91; 41 (2) : 495-552; 41 (3) : 634-75.
———. 1917b: On the genera Echinaxia and Rhabdosome. Ibid. 42 (2) : 391-404.


MONTAGU, G. 1818: An essay on sponges, with descriptions of all species that have been observed on the coasts of Great Britain (1812). Mem. Werner Soc. Edinb. 2 : 67-122, pls 3-16.


PLATES
PLATE 1

A. Homaxinella erecta (Brøndsted). Takatu Point, 6 fm.
B. Homaxinella erecta (Brøndsted). Shag Rock, 6–10 fm.
C. Axinella australiensis nov. sp. Poor Knights Is., 25 fm. Holotype.
D. Axinella australiensis nov. sp. Alderman 1., 56 fm. (Juvenile.)
PLATE 3

A. *Pararhaphoxya pulchra* (Brøndsted). Carnley Harbour, 45 fm. Holotype (as *Sigmaxinella pulchra* Brøndsted.)
B. *Phakellia dendyi* nov. sp. Cape Kari Kari, 30 fm. Holotype.
C. *Phakellia dendyi* nov. sp. Alderman L., 56 fm. Paratype.
D. *Phakellia dendyi* nov. sp. Cook Strait, 40–100 fm. Paratype.
PLATE 4

A. *Rhaphoxyz (Acanthella) cactiformis* (Carter). Holotype (B.M.86.12.15.91.)
C. *Pseudaxinella australis* nov. sp. Takatu Point, 6 fm. Holotype.
B. *Acanthoclada prostrata* nov. sp. North Channel, 10 fm. Holotype.
D. *Biemna stylotata* (Brondsted). Holotype (as *Sigmaxinella stylotata* Brondsted).

PLATE 5
PLATE 6

B. *Raspailia flaccida* nov. sp. Menzies Bay, 60 fm. Holotype.
C. *Raspailia topsenti* Dendy. Ti Point, 3 fm.
D. *Raspailia topsenti* Dendy. Takatu Point, 6 fm.
PLATE 7
A. Raspailia topsenti Dendy. Cook Strait, 50 fm.
B. Raspailia compressa nov. sp. N.E. of North Cape, 27 fm. Holotype.
C. Halichondria panicea (Pallas). Manukau Harbour, 3-6 fm.
D. Ciocalypta polymastia (Lendenfeld). North Channel, 10 fm.
PLATE 8

A. Ciocalypta penicillus Bowerbank. Waiheke I., 8 fm.
B. Ciocalypta penicillus Bowerbank. Carnley Harbour, 45 fm. (Holotype of Sigmaxinella papillata Brøndsted.)
C. Hymentacidon hauraki Brøndsted. North Channel, 10 fm.
D. Hymentacidon hauraki Brøndsted. Takatu Point, 6 fm. Large specimen, cut in section.
PLATE 9

B. *Hymeniacidon spherodigitata* nov. sp. North Channel, 8 fm. Holotype.
C. *Hymeniacidon spherodigitata* nov. sp. North Channel, 8 fm. Paratype.
PLATE 10

A. *Acanthoclada prostrata* nov. sp. 1, cladotoxa; 2, birotule.

B. *Raspallia flaccida* nov. sp. 1, acanthostyle; 2, acanthoxea; 3, various terminations of the styles.

C. *Trachycladus stylifer* Dendy. 1, microhabd; 2, spinispirae.

D. *Raspallia topsenti* Dendy. Acanthostyles.

E. *Axinella richardsoni* nov. sp. Oxeas and styles.

F. *Acanthoclada prostrata* nov. sp. 1, rhabdostyles; 2, centrally flexed oxea; 3, structural style.
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A. *Raspailia compressa* n. sp. 1, extra-axial style; 2, axial style; 3, acantho-styles; 4, dermal oxea.

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A. *Eurypon hispida* nov. sp. 1, acanthotylostyles; 2, enlarged view of head of acanthotylostyle; 3, subtylostyle; 4, bases of subtylostyles.

B. *Phakellia dendyi* nov. sp. Strongyles, styles, and oxea.

C. *Pseudaxinella australis* nov. sp. Oxeas and styles.

D. *Axinella australiensis* nov. sp. Oxeas and styles.
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A. *Raspailia agminata* Hallmann. Style, oxeas, and acanthostyle.
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A. *Ciocalypta penicillus* Bowerbank. Styles and oxeas (×150).
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A. *Ciocalypta penicillus* Bowerbank. Styles and oxeas (×150).
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