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Demospongiae (Porifera) of the Chatham Islands and Chatham Rise, collected by the Chatham Islands 1954 Expedition

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Abstract

Twenty-two species of siliceous sponges are described from the Chatham area, of which five are new and three recorded for the first time from New Zealand.

The five new species represent a strong endemic element, while the new records are all species of northern origin.

INTRODUCTION

All previous publications dealing with the marine fauna of the Chatham area have omitted to mention the sponges. The only species recorded from the islands are the four mentioned by Lendenfeld in his works on the Australian Sponges (1887; 1888):

Cacochalina pandaea (= *Placochalina pandaea*);
Ceraochalina multiformis var. *digitata* (= *Callyspongia ramosa*);
Euspongia irregularis var. *silicata;*
Tethya multistella.

Of the above, two are represented in the present collection, which contains 31 specimens obtained from 12 stations. Twenty-two species of siliceous sponges are described here, of which five are new, and three recorded for the first time from New Zealand.

Owing to our present inadequate knowledge of the composition and distribution of the sponge fauna of New Zealand as a whole, it is impossible to do more than comment on the relationships of the Chatham collection.

The five new species represent a strong endemic element, while the new records are all species of *northern* origins (Australia, 2; Northern Hemisphere, 1).

Within New Zealand, six species are northern, one subantarctic and two cosmopolitan. Three species—*Haliclona clathrata, Callyspongia robusta* and *C. ramosa*—are widespread throughout New Zealand, Australia and the tropics.

Several species of Keratosa and two of Calcarea were included in this collection. These will be described in a later paper. All type specimens are deposited in the Canterbury Museum, and all colour notations are made from Munsell's Colour Charts (1942).

LIST OF SPECIES

Class **DEMOSPONGIAE** Sollas

Order **HAPLOSCLERINA** Topsent

Family HALICLONIDAE de Laubenfels
Haliclona clathrata (Dendy)

Family CALLYSPONGIDAE de Laubenfels
Callyspongia robusta (Ridley)
Callyspongia ramosa (Gray)

Order **POECILOSCLERINA** Topsent

Family ADOCIIDAE de Laubenfels
Adocia semitubulosa (Lieberkühn)

Family COELOSPHAERIDAE Hentschel
Coelosphaera globosa nov. sp.

Family PHORBASIDAE de Laubenfels
Anchinoe novaezealandiae Dendy

Family MYXILLIDAE Hentschel
Iophon semispinosus nov. sp.

Family TEDANIIDAE Ridley and Dendy
Tendania diversiraphidophora Brøndsted

Family RASPAILIIDAE Hentschel
Raspailia agminata Hallmann

Order **HALICHONDRINA** Vosmaer

Family HALICHONDRIIDAE Gray
Halichondria rugosa Ridley and Dendy
Halichondria knowltoni Bergquist nom. nov.

Family AXINELLIDAE Ridley and Dendy
Axiamon novaezealandiae Brøndsted
Axinella lamellata nov. sp.

Order **HADROMERINA** Topsent

Family CHOANITIDAE de Laubenfels
Latrunculia spinispiraefera Brøndsted

Family CLIONIDAE Gray
Cliona celata (Grant)

Order **EPIPOLASIDA** Sollas

Family TETHYIDAE Gray
Tethya compacta nov. sp.
Tethya multistella (Lendenfeld)

Order **CHORISTIDA** Sollas

Family ANCORINIDAE Gray
Thenea novaezealandiae nov. sp.
Penares tylotaster Dendy

Sub-Family STELLETTINAE de Laubenfels
Stelletta novaezealandiae Brøndsted
Myriastra purpurea (Ridley)

Class **HYALOSPONGIAE** Vosmaer

Family ASKONEMATINAE Gray
(material cannot be ascribed to a genus)

SYSTEMATIC NOTES AND DESCRIPTION OF SPECIES

Class **DEMOSPONGIAE** Sollas

Order **HAPLOSCLERINA** Topsent

Family HALICLONIDAE de Laubenfels

Genus **Haliclona** Grant

Haliclona clathrata (Dendy) (fig. 1)

Reniera clathrata Dendy, 1894, p. 237.
R. spec. 6 Sollas (Miss), 1902, p. 211.
R. spec. 4 Hentschel, 1912, p. 410.
Reniera clathrata Brøndsted, 1923, p. 125.
Reniera clathrata Brøndsted, 1924, p. 453.
Haliclona clathrata Burton, 1934, p. 532.
Haliclona clathrata Bergquist, 1960 (in press).

Locality

Sta. 26, Waitangi Wharf.

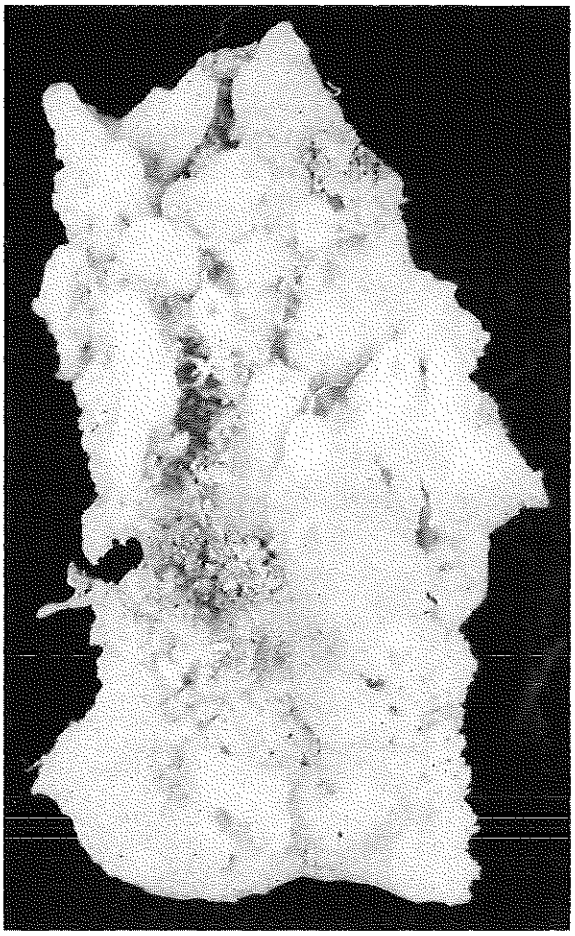

Fig. 1: *Haliclona clathrata* (Dendy).

Remarks

Spicules are larger than those of the type, but approach closely the dimensions of the Great Barrier Reef specimen.

Dimensions

Locality	*Oxea* dimensions (μ)
Chatham Is.	141 × 5–6
Great Barrier Reef	120 × 5
Australia (South Coast)*	83 × 5
Campbell Is.	85–115 × 5
New Zealand	95–105 × 6
Mainland	80–95

*Type locality.

Distribution

Australia (south coast); New Zealand; Campbell Is.; Malaya; Great Barrier Reef.

Family CALLYSPONGIDAE de Laubenfels

Genus **Callyspongia** Duchassaing and Michelotti

Callyspongia robusta (Ridley) (fig. 2a, b, c)

Toxochalina robusta Ridley, 1884, p. 403, pl. xxxix, G; pl. xli, n, n'.
Toxochalina robusta Ridley and Dendy, 1887, p 50.
Toxochalina chalmeri Brøndsted, 1927, p. 5, fig. 4.
Toxochalina robusta Brøndsted, 1934, p. 17, figs. 14 and 15.

Fig. 2, a: *Callyspongia robusta* (Ridley).

Toxochalina robusta Dendy, 1905, p. 139.
Toxochalina robusta var. *ridleyi* nov., Dendy, 1905, p. 140, pl. ix, fig. 2.

Localities

Sta. 6, Chatham Rise (2 specimens), 220 fm.
Sta. 23, North of the Sisters, 33 fm.

Remarks

In assigning these specimens to *Callyspongia* I am following Burton (1934) and de Laubenfels (1936 and 1950). These workers relegate *Toxochalina* into *Callyspongia;* de Laubenfels (1936) maintained *Patuloscula* (Carter), but in 1950 agreed that this too fell to *Callyspongia.*

Dimensions

Species	Chalmeri	Chatham sp.	Robusta (Ridley)	Robusta (Brøndsted)
Oxeas	55 × 2·7μ	56 × 4μ	100 × 3 2–4·2μ	95 × 5·6μ
Toxas	15–50μ	16–52μ	50–63μ	20–40μ
Main fibres	100μ	100μ	50–75μ	----
Dermal fibres	15–20μ	15μ	50–100μ	18μ*
Secondary fibres	----	50μ	35–50μ	----
Oscules	1–2 mm	2–7 mm	3–6 mm	1–2 mm

*Brøndsted notes that the dermal fibres are thicker at the nodes; it would appear that Ridley's measurements were made at the nodes.

Fig. 2, b: *Callyspongia robusta* (Ridley).

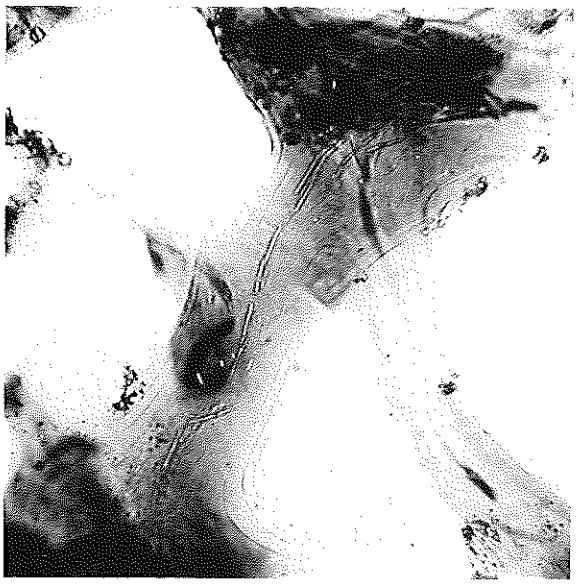

Fig. 2, c: *Callyspongia robusta* (Ridley), portion of the skeleton (× 80).

C. robusta as described by Ridley differs from the present specimens chiefly in possession of larger oxea. Ridley and Dendy describe a specimen with overall smaller dimensions. Brøndsted's *chalmeri* compares very closely with his *robusta,* save in the dimensions of the oxea. On the basis of the comparison tabulated below, very little, if any, reason can be seen for maintaining the two species.

Burton (1934) relegates *Toxochalina robusta* and *chalmeri* with many other species to *Callyspongia ramosa,* making this species an almost indefinite entity. It appears that in the Callyspongidae presence or absence of microscleres is certainly not a generic character. I think it unwise to ignore microscleres completely and consequently, while referring the above species to *Callyspongia,* would hold them apart as a separate species from *ramosa.* The recognition of difference is useful until such time as synonymies can be put on a firm basis.

Distribution

Port Jackson (Australia); Bahia; Port Chalmers.

Callyspongia ramosa (Gray) (fig. 3)

For synonymy see Burton, 1934, p. 603.

Localities

Sta. 6, Chatham Rise, 220 fm .....(1)
Sta. 3, Mernoo Bank, 41 fm .....(2)
Sta. 37, Between South East Is. and Little Pitt Is., 30 fm .....(3)

Remarks

The specimens conform to *C. ramosa* as described by Dendy (1897) and Burton (1934), number 2 coming very close to the lectotype of the species (Dendy, pl. xxxiii A) in general appearance and skeletal characteristics. In specimen 2 the branches are perfectly tubular, oscules very frequent, level with the surface, fibres multispicular incorporating much foreign matter—sand and spicules (acanthostyles, rhabdostyles). Specimen 3 conforms in exterior form to the illustration of *Ceraochalina euplax* (Lendenfeld, 1887, pl. xix, no. 13). This species was relegated to *C. ramosa* by Burton (1934).

Distribution

New Zealand; Australia; Mauritius.

Order **POECILOSCLERINA** Topsent

Group **PHORBASIFORMES** de Laubenfels

Family ADOCIIDAE de Laubenfels

Genus **Adocia** Gray

Adocia semitubulosa (Lieberkühn) (fig. 4a, b)

Halichondria semitubulosa Lieberkühn, 1859, p. 363.
Pellina semitubulosa Topsent, 1925, p. 709.
Pellina semitubulosa Dickinson, 1940, p. 11, pl. 13, figs. 25, 26.

Localities

Sta. 3, Mernoo Bank, 41 fm.
Sta. 37, Between South East Is. and Pitt Is., 30 fm.

Description

A massive, lump-like sponge, fragile in texture.

Dimensions

Height 21 mm, length 60 mm, width 30 mm. Long hollow fistulae, 6–30 mm high and 4–7 mm wide, arise randomly from the dorsal and lateral aspects of the body of the sponge. Where these fistulae have been broken, a vent is left lying flush with the surface of the sponge. *Colour*: in spirit, pale yellow-white, Munsell GY 8/4; in life, Munsell RY 8/4.

A dermal membrane is present in and below

which is a layer of tangentially disposed oxea. The membrane overlies a system of small subdermal cavities and is pierced by numerous pores. These occur in groups of 6–7 and thus form inconspicuous "pore areas"; they lie flush with the surface of the basal mass and never extend on to the fistulae. The texture of the specimens is fragile and crumbly.

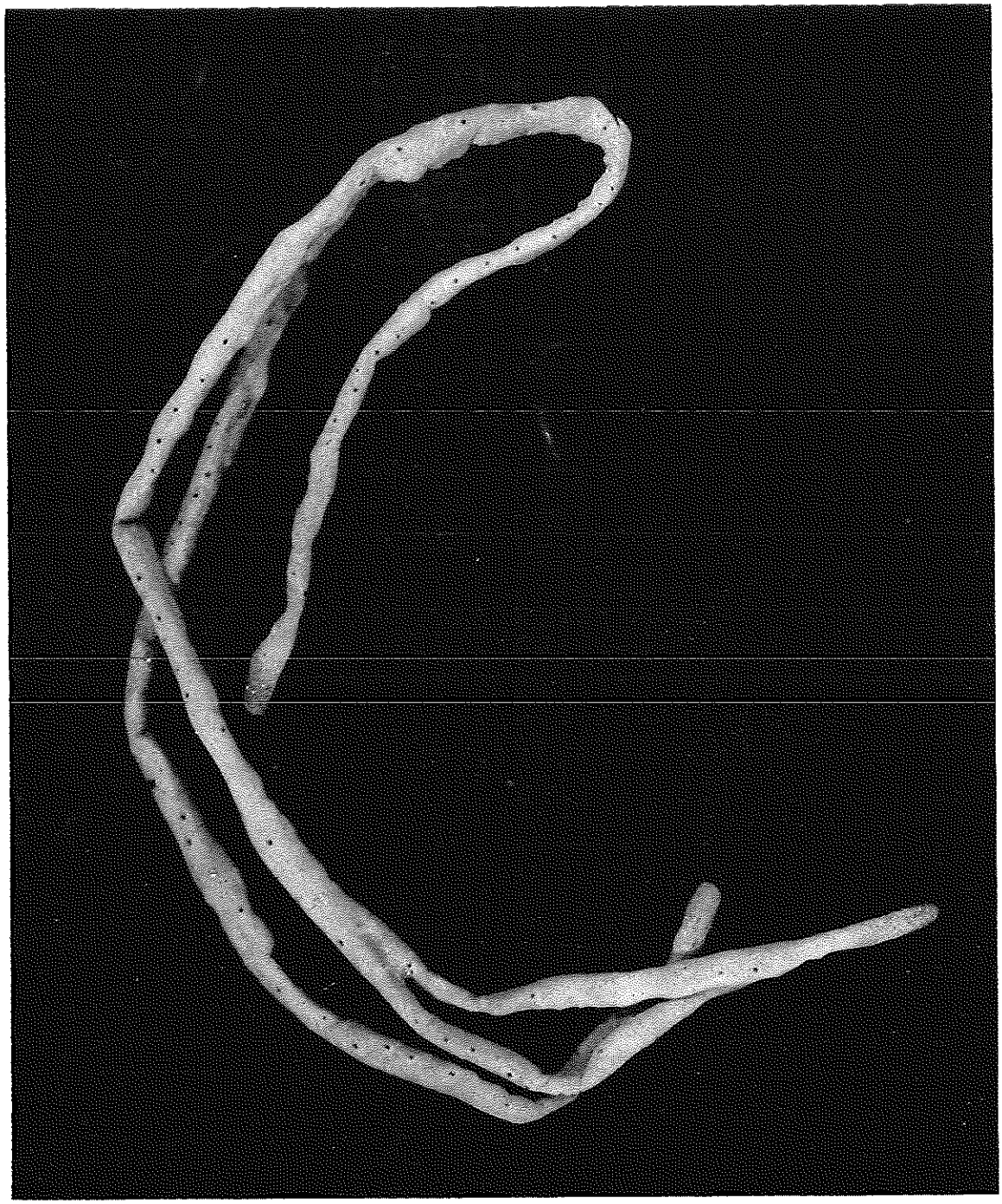

Fig. 3: *Callyspongia ramosa* (Gray).

As is typical of the Adociidae, the skeleton is an isodictyal reticulation which extends to the tangential spicules of the dermis. Some organisation of the skeleton into fibres is seen in the endosome, but the greatest concentration into fibres is in the sub-dermal region. Here the fibres consist of 15–20 oxea tightly packed together and expanding, fan-like, immediately below the surface. Few spicules penetrate the dermal membrane, none project further than 30μ

Spicules

Megascleres:

Oxea—100–180 $\times$ 6μ; usually slightly flexed, but often straight, evenly tapered to a sharp point. Developmental forms

microxea are present, always dispersed, never forming part of fibre or reticulum.

Remarks

Burton (1934) relegated *Pellina* (Schmidt) to *Adocia* on features of the dermal skeleton. De Laubenfels (1936) retains the two genera because of the distinctive external appearance of the latter. In the two Chatham specimens, some small variations are apparent in external form, none, however, in the skeleton. They cannot, on skeletal features, be separated from *Adocia*; the distinction is, therefore, not maintained.

Distribution

Mediterranean; California.

Fig. 4, a: *Adocia semitubulosa* (Lieberkühn).

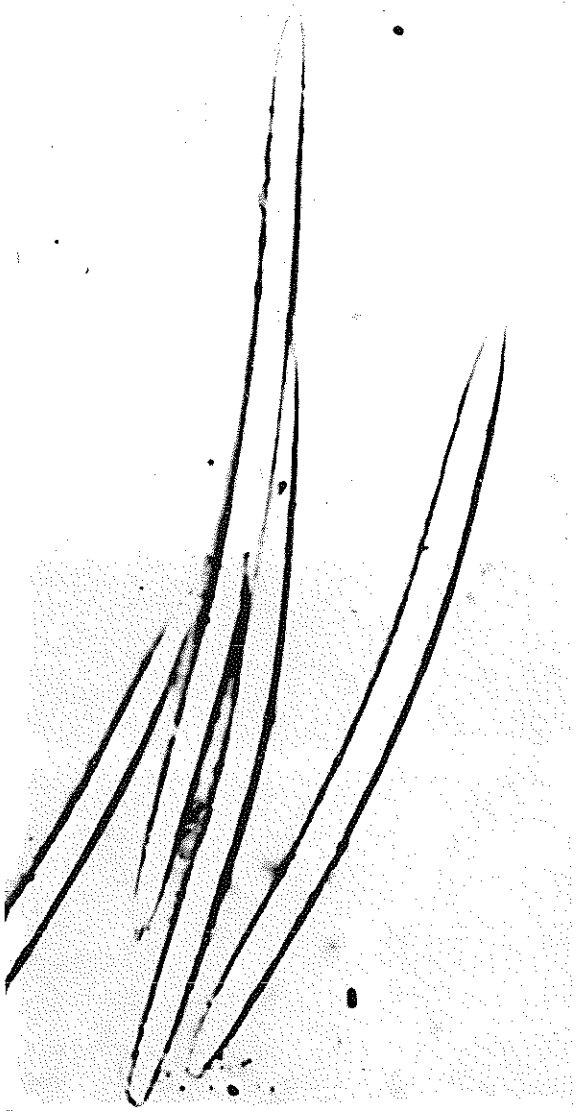

Fig. 4, b: *Adocia semitubulosa* (Lieberkühn), oxea; (× 550).

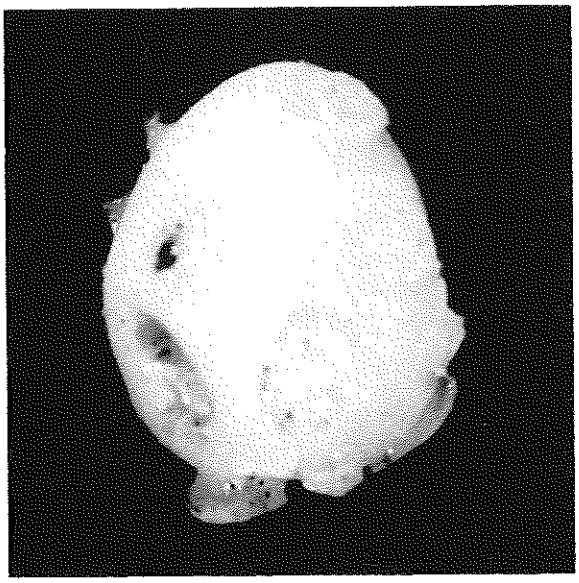

Fig. 5, a: *Coelosphaera globosa* (nov. sp.).

Fig. 5, b: *Coelosphaera globosa* (nov. sp.), isochelae, side view (× 500).

Family COELOSPHAERIDAE Hentschel

Genus **Coelosphaera** Thomson

Coelosphaera globosa (nov. sp.) (fig. 5a, b, c, d)

Locality

Sta. 59, Chatham Rise, 290 fm.

Description

A spherical sponge, 2·18 cm in diameter, with fistulae in the shape of low cones scattered over the surface. (Nine in this specimen.) These range from 2·75 to 4·75 mm outside diameter and are closed to the exterior by a fine much-perforated membrane divided into 4–5 distinct sections by inward extensions of the fistular wall. Stolons arise in adventitious fashion from the base; they are extensively branched and have much fine debris entangled in their ramifications. *Colour*: in life, white; in spirit, grey-white.

The ectosome is stiff and smooth, its constituent megascleres being tangentially dispersed. Spicules

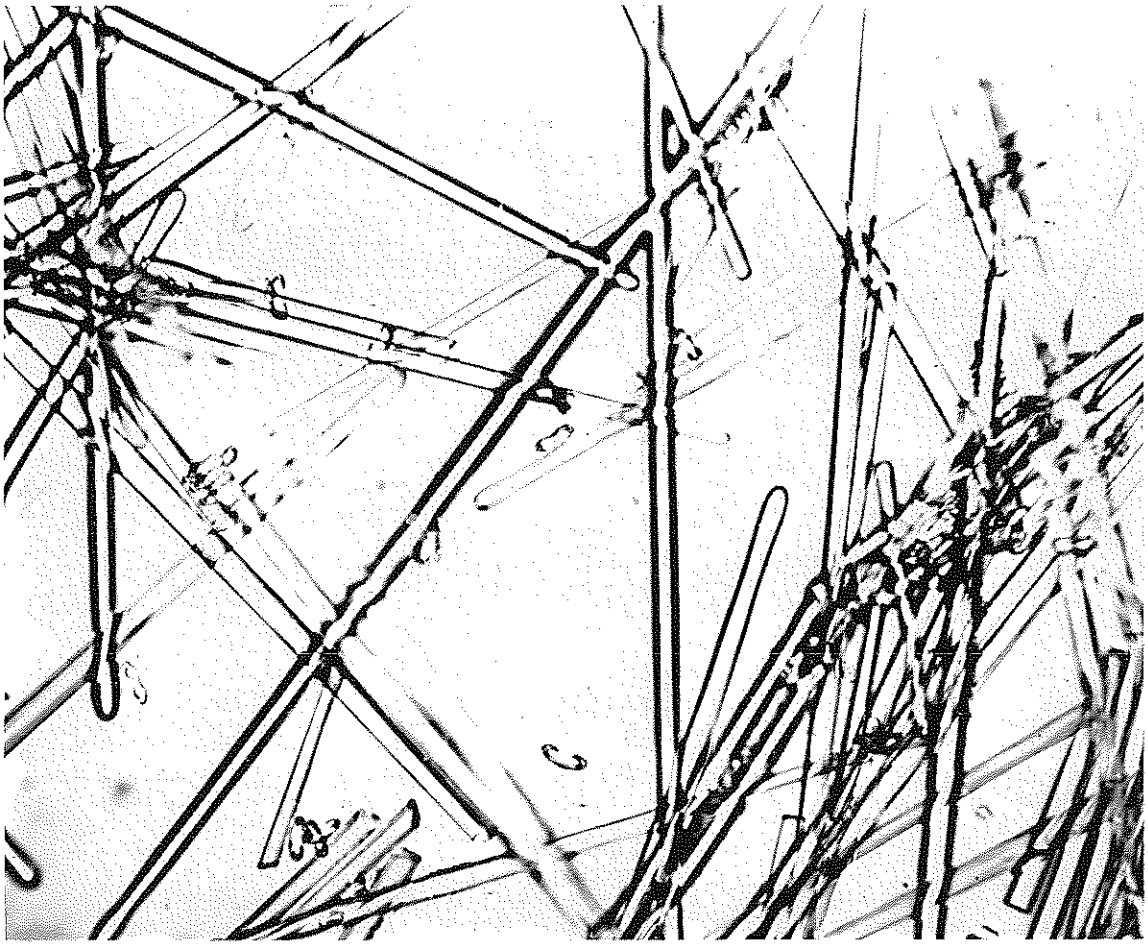

Fig. 5, c: *Coelosphaera globosa* (nov. sp.), tylota, strongyla and isochelae (× 150.)

extend to the walls of the fistulae and to the stolons. The ectosome is 0·5 mm thick and completely invests the pulpy structureless endosome.

The skeleton has no definitive arrangement other than the tangential placing of the dermal megascleres and the restriction of the sigmata to the endosome.

Spicules

Megascleres:

(a) Tylota—subtylota; 600–725 × 18μ.

(b) Strongyles—rare; 650–700 × 18μ.

Microscleres:

(a) Tridentate acuate isochelae, 25–28μ chord. The central tooth at each end is much reduced, being approximately a quarter of the length of the two laterals.

(b) Sigmata—slightly but sharply incurved; 25–40μ.

Remarks

In external appearance this specimen approaches closely *Histoderma physa* (O. Schmidt).

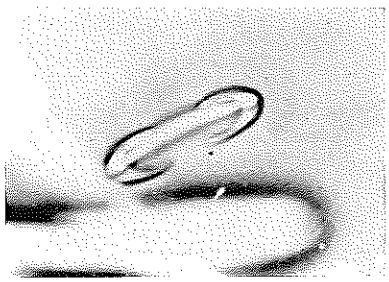

Fig. 5, d: *Coelosphaera globosa* (nov sp.), isochelae, face view (× 500).

Fig. 6, a: *Anchinöe novaezealandiae* (Dendy).

The spiculation is different, there being no trichodragmata and few strongyla. The genus *Coelsphaera* is recorded here for the first time in New Zealand waters, previous records ranging from Great Barrier Reef (Burton, 1934), through the tropics and north temperate seas.

Family PHORBASIDAE de Laubenfels

Genus **Anchinoe** Gray

Anchinoe novaezealandiae Dendy (fig. 6a, b, c)

Localities

Sta. 23, North of the Sisters; 33 fm.

Sta. 37, Between South East Islands and Pitt Islands; 30 fm.

Description

A large, irregularly lobate sponge. *Dimensions*: Height 110 mm; width 65 mm; 15 mm thick. *Colour* in spirit: Munsell RYR 5/8.

The surface is smooth and oscula (0·5 mm diam.) are scattered infrequently overall. There is a distinct dermal membrane overlying an extensive system of sub-dermal cavities. The dermal membrane is packed with profusely spined small acanthostyles. The main structural spicules are tornota, which are predominantly organised into fibres. These fibres terminate at, but do not

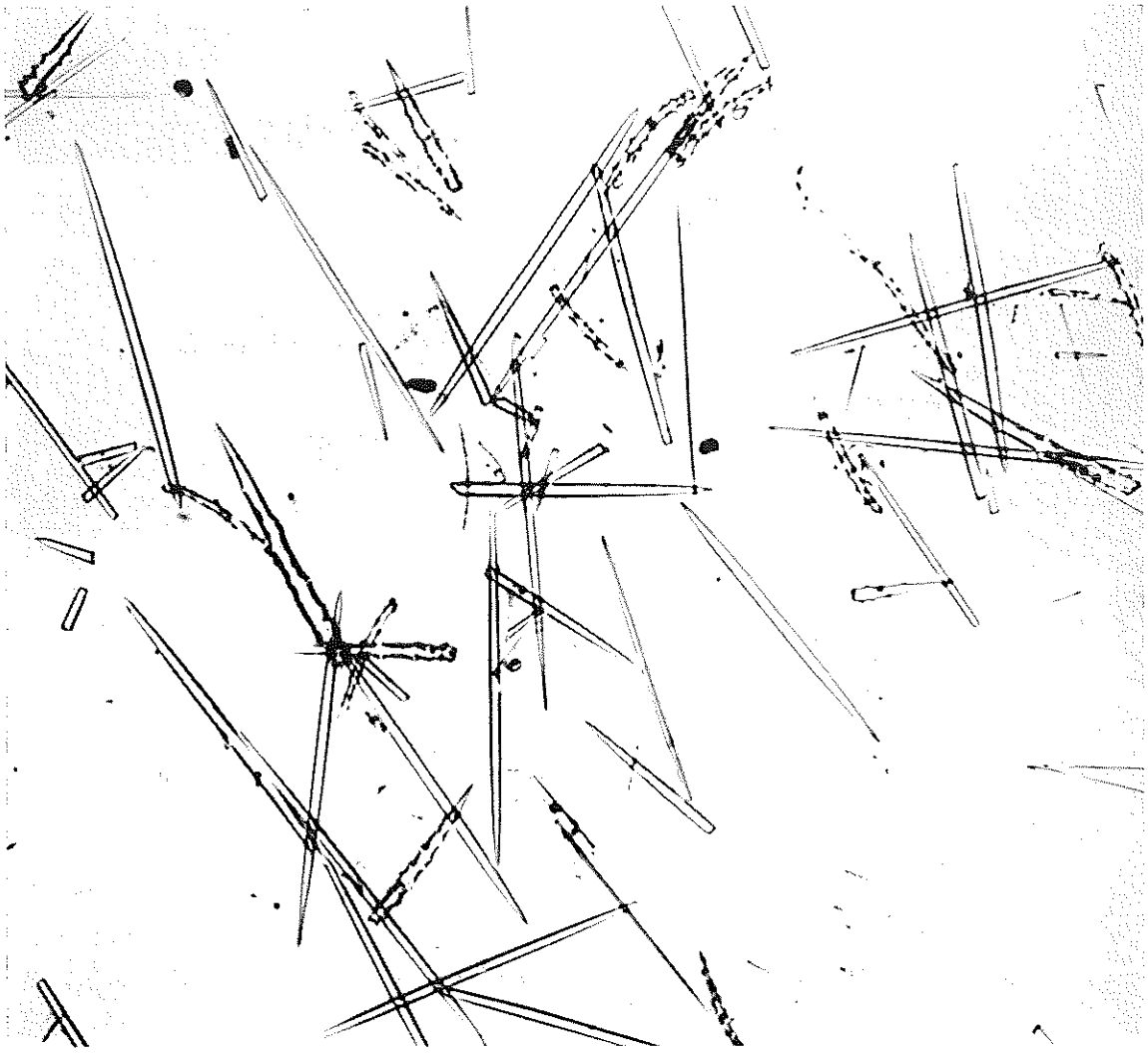

Fig. 6 b: *Anchinöe novaezealandiae* Dendy, endosomal and dermal acanthostyli and tornota (× 150).

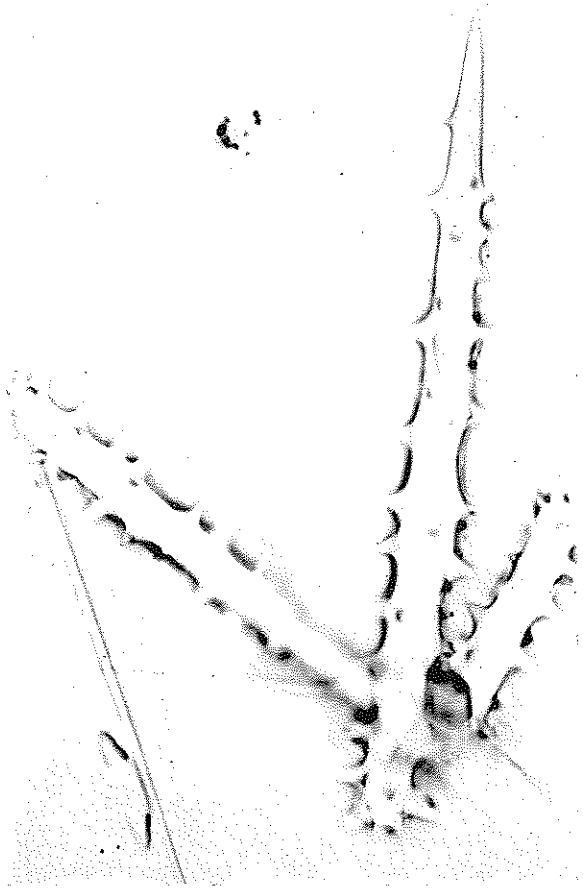

Fig. 6, c: *Anchinöe novaezealandiae* (Dendy), dermal acanthostyli and isochela (× 500).

pierce, the dermal membrane. Abundant large, relatively sparsely spined acanthostyles are scattered throughout the endosome and echinate the fibres.

The sponge is growing from a shell of *Waltonia inconspicua* on the inner surface of which it forms a very thin encrustation.

Spicules

Megascleres:

(a) *Tornota*: 190 × 8μ; of very uniform size throughout, abruptly tapered.

(b) Acanthostyli:

(i) Dermal—100 × 11μ; profusely and uniformly spined.

(ii) Endosomal—165 × 13μ; spines concentrated on the stylote end, very infrequent on the lower third of the spicule. Show a slight tendency toward tylote modifications.

Fig. 6, d: *Anchinöe novaezealandiae* (Dendy), portion of skeleton showing sub-dermal cavities and spicule fibres (× 60).

Microscleres:

Arcuate isochelae; 16μ chord.

Remarks

There is some doubt as to the validity of *Anchinöe*, some workers having suggested that it fall to *Phorbas*. The New Zealand species of *Anchinöe* are quite distinct from the type descriptions of *Phorbas* and *Anchinöe* and until such time as a full investigation is made, I think it preferable to retain *Anchinöe* for this species.

Distribution

T.N. off North Cape—14–30 fm; Wellington Harbour—5–10 fm; Little Barrier—30 fm; New Plymouth, Queen Charlotte Sound—3–10 fm; Paterson Inlet—5–15 fm.

Group **MYXILLIFORMES** de Laubenfels

Family MYXILLIDAE Hentschel

Sub-Family MYXILLINAE de Laubenfels

Genus **Iophon** Gray

Iophon semispinosus nov. sp. (fig. 7a, b, c)

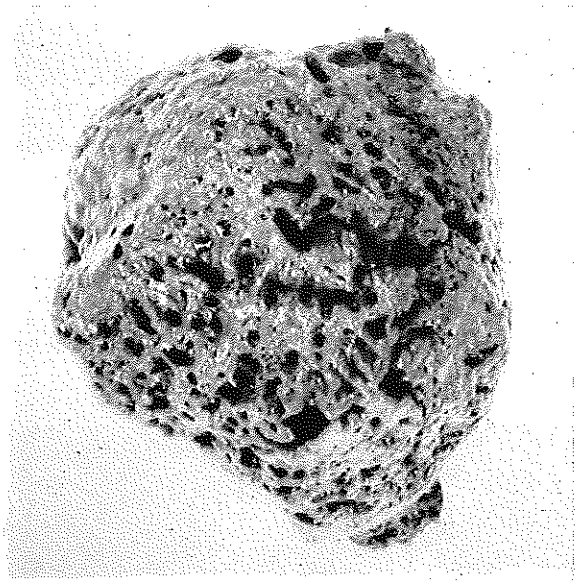

Fig. 7, a: *Iophon semispinosus* (nov. sp.).

Localities

Sta. 14, Hanson Bay, 15 fm.
Sta. 19, off Cape Young, 25 fm.

Description

An unevenly hemispherical sponge. The surface is weakly conulose, and the texture spongy. *Dimensions*: height 22 mm, length 42 mm and 38 mm. *Colour*: differs slightly in the two live specimens, Munsell YR-Y 6/6 and R 1/2; in spirit, identical, Y-R-Y 3/4, a colouration which is a distinguishing feature of the genus *Iophon*. Oscula are scattered over the upper surface of the sponge and range from 1 to 4 mm in diameter. The dermal membrane is extremely fine and transparent, pierced between conules by small pore groups. An extensive system of small subdermal cavities is visible beneath the membrane, which, in most cases, has collapsed.

In section, the endosomal skeleton is seen to be in the form of a weakly isodictyal reticulation of acanthostyli with no true fibres developed. A dermal skeleton is provided by stout brushes (80–100μ wide) of acanthotylota ascending to the surface and supporting the dermal membrane, which contains some tangential acanthostyles and acanthotylotes.

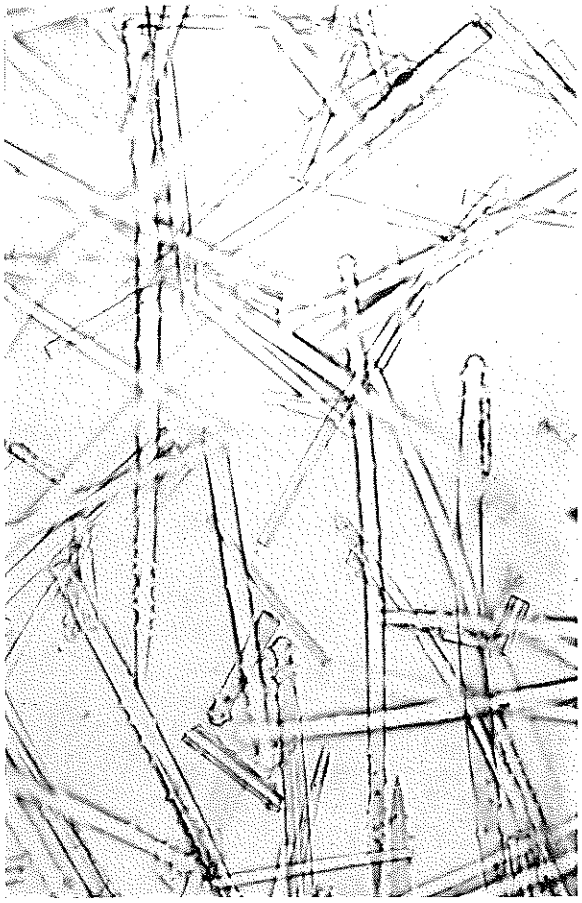

Fig. 7, b: *Iophon semispinosus* (nov. sp.), acanthostyli (× 500).

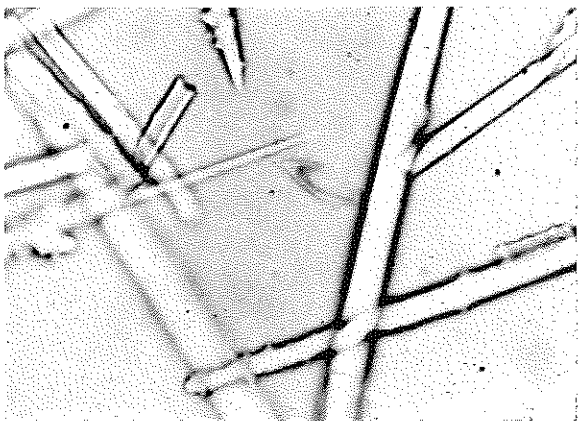

Fig. 7, c: *Iophon semispinosus* (nov. sp.), anisochela (× 500).

Spicules

Megascleres:

(a) Acanthostyli—sparsely spined, often smooth in the middle; 150–170 × 6μ.

(b) Acanthotylota—185–200 × 5μ; microspined at both ends.

Microscleres:

(a) Tridentate anisochelae—15 × 5μ.

(b) Bipocilli—8–10μ, sharply incurved terminally; tips only slightly expanded.

Remarks

Iophon is a genus credited with an origin in the European side of the North Atlantic (Burton, 1932), and a later southern migration with accompanying speciation. Those species already recorded from the Australasian. [*I. laevistylus* (Dendy) and *I. omnivorus* (Ridley and Dendy)] and Antarctic regions [*I. radiatus* (Topsent)] are distinctive and specialised.

The addition of this second species from New Zealand is interesting for two reasons. Firstly, it emphasises the divergent nature of the Southern

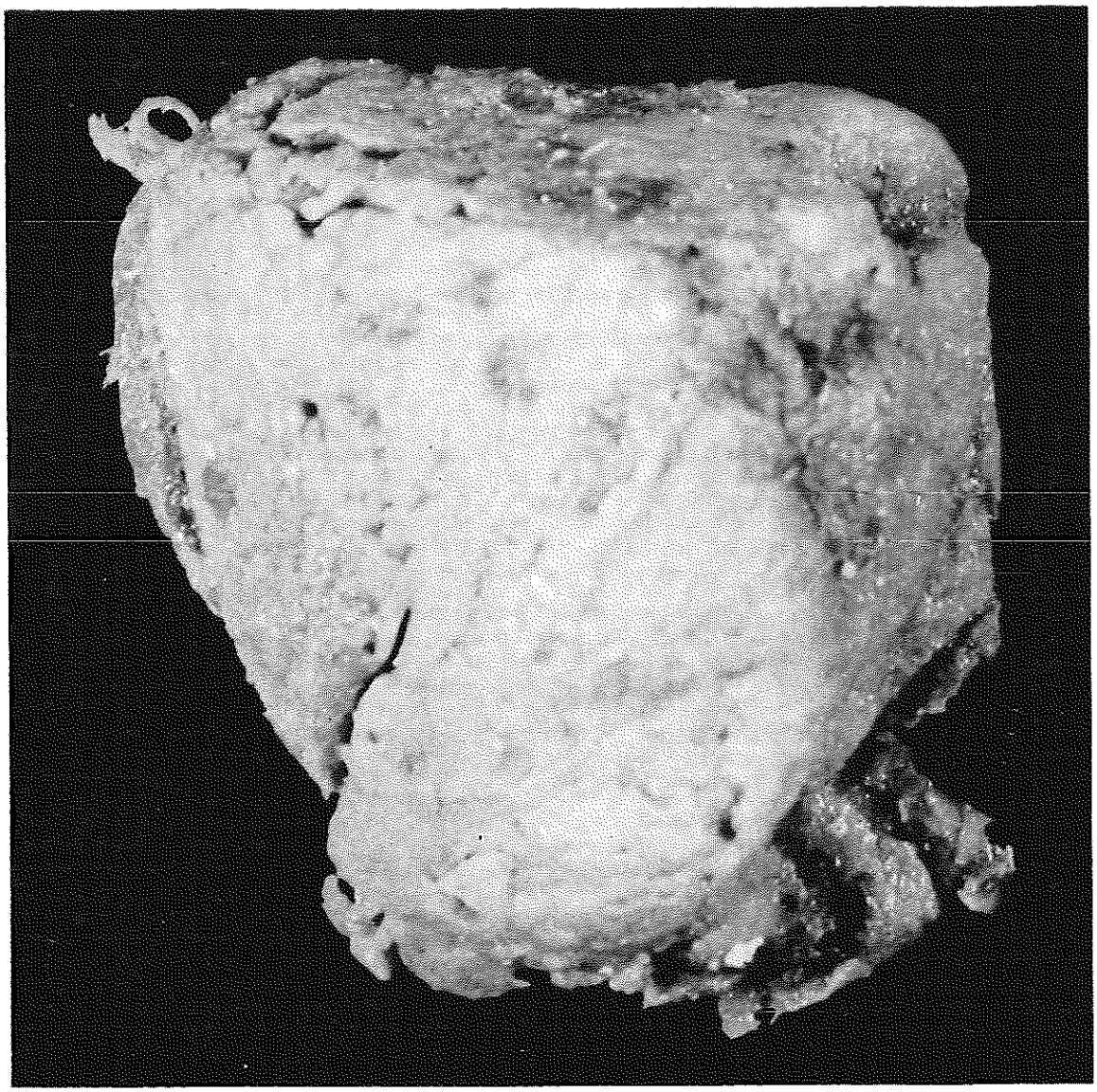

Fig. 8, a: *Raspailia agminata* Hallmann.

Iophonae. Secondly, in the absence of any smooth styli, but in possessing sparsely spined major spicules it is perhaps intermediate between *I. laevistylus* and the variable *I. proximum*, from which this group of species has presumably originated.

Family TEDANIIDAE Ridley and Dendy

Genus **Tedania** Gray

Tedania diversiraphidophora Brøndsted

Tedania diversiraphidophora Brøndsted, 1923, p. 133, fig. 15, a–e.

Locality

Sta. 6, Chatham Rise, 220 fm.

Description

A disc-shaped specimen of rubbery consistency.

Dimensions: height 28 mm, width 58 mm. *Colour*: in spirit, Munsell PR 6/4. A thin dermal membrane 4 mm thick is discernible; it is smooth and skin-like, not pierced by any spicule tufts.

The main skeleton is arranged as a series of ascending tracts of styli and tylostyli dissociating externally to form subdermal tufts. It is here the tylota occur in greatest concentration, diacts and rhaphides are frequent in the interfibrillar regions.

In details of spiculation this specimen differs from the type; there are no strongyla, and raphides were not observed to form trichodragmata.

Spicules

Megascleres:

(a) Styli—in some cases gently curved anteriorly; 250–320 × 3–6μ.

(b) Tylota—180–325 × 2·5–3μ (shaft diameter).

(c) Tylostyli—255–320 × 3–6μ.

Microscleres:

Rhaphides in all cases slightly roughened. Two distinct size groups in equal abundance.

(a) 100—150 × 1μ.

(b) 50–70 × 0·5μ.

Distribution

Carnley Harbour (45 fm. Adams Is.).

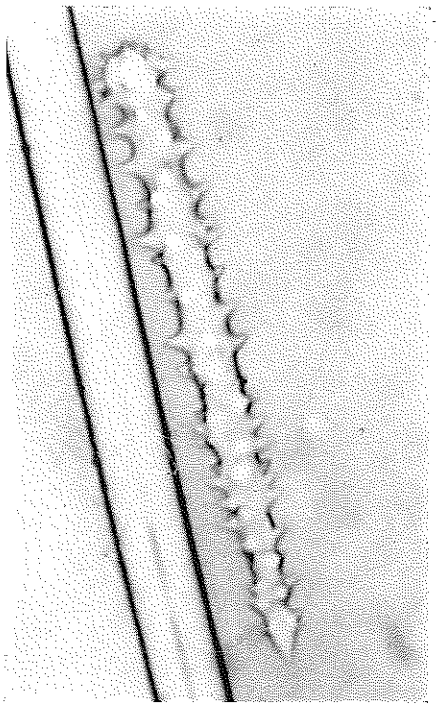

Fig. 8, b: *Raspailia agminata* Hallmann, acanthostyle (× 350).

Family RASPAILIIDAE Hentschel

Genus **Raspailia** Schmidt

Raspailia agminata Hallmann (fig. 8a, b, c)

Halichondria rubra var. *digitata* Lendenfeld, 1888, p. 80–81, pl. ii, fig. 1.

Raspailia agminata Hallmann, 1914, p. 438–440, fig. 22.

Locality

Sta. 6, Chatham Rise, 220 fm.

Description

A massive sponge, firm and fleshy in texture, with a few lobe-like projections which, in the spirit specimen, are pressed into the body of the sponge. *Dimensions*: height 63 mm, width 43 mm. *Colour*: in spirit, Munsell YY-R 6/4. In colour, size and texture, the specimen agrees closely with Lendenfeld's *H. rubra*. A skin-like, smooth dermis 1 mm thick is present, and is not pierced by the weakly-developed spicule fibres of the endosome.

Only the smooth spicules are represented in the dermis, the diacts (oxea) predominate.

Sections reveal this to be a much compacted and infolded specimen, hence the overall uniform

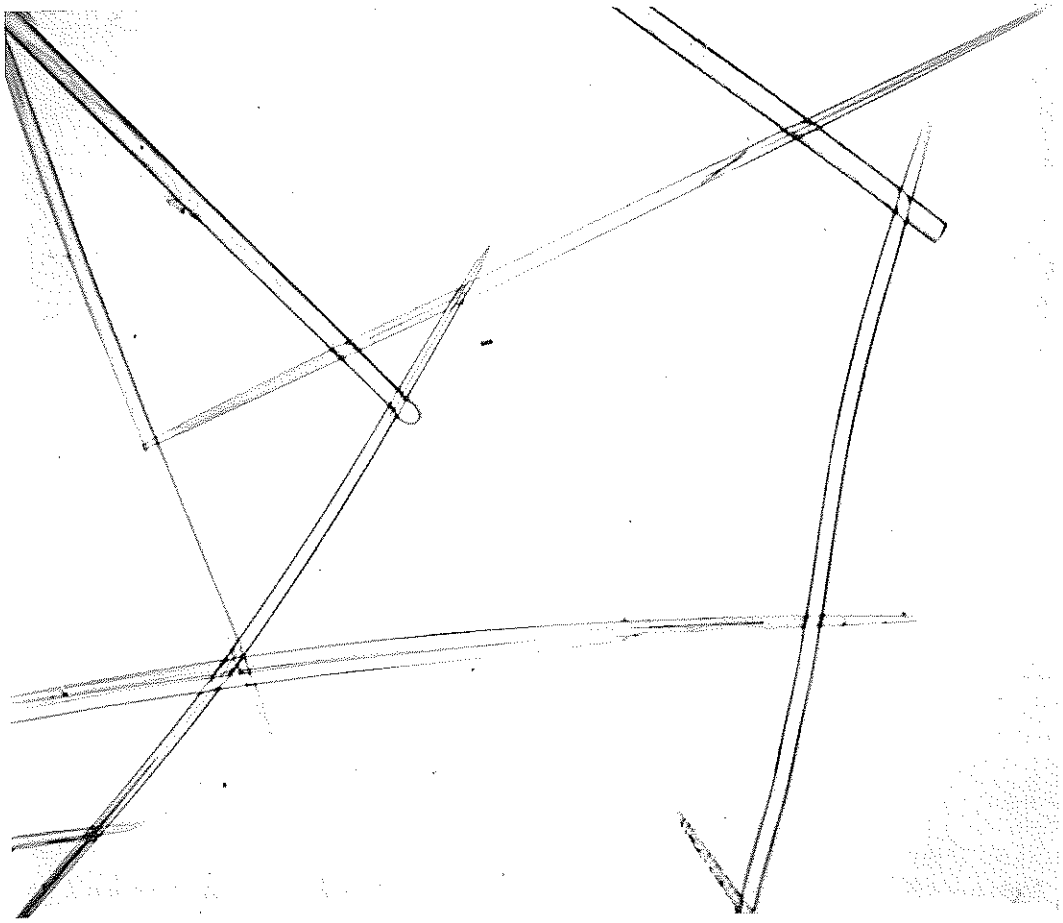

Fig. 8, c: *Raspailia agminata* Hallmann, oxea and subtylostyli (× 150).

appearance. This is atypical of the genus and further work may lead to a different generic diagnosis for both Australian and New Zealand specimens.

There is little development of fibres in the endosome, slender styli and tylostyli are the structural spicules, and acanthostyli and acanthotylostyli, the echinating and dispersed spicules. The structural spicules are also found as auxillary types, dispersed between the fibres.

Oscula are visible on the dorsal and lateral surface, and are 1–2mm in diameter.

Spicules

Megascleres:

(a) Styli—in general lightly curved in the apical third; 1060–2200 × 17·5–20μ.

(b) Sub-tylostyli—of similar size range and more frequent than the true styli.

(c) Acanthostyles—90–120 × 5–7μ. Densely spined overall, the larger spines are apical; some of these spicules are acanthotylostyles.

(d) Oxea—330–600 × 3–6μ, chiefly dermal spicules; developmental forms of the oxea are frequent and simulate raphides.

Remarks

In internal structure and spiculation, this specimen agrees closely with Hallmann's description. Externally there are vast differences between them. This is probably attributable to the great plasticity which sponges reveal under varying habitat conditions. The Chatham specimen does serve to emphasise the danger of diagnosing any sponge family on the basis of external appearance. The Raspailiidae have always been described as

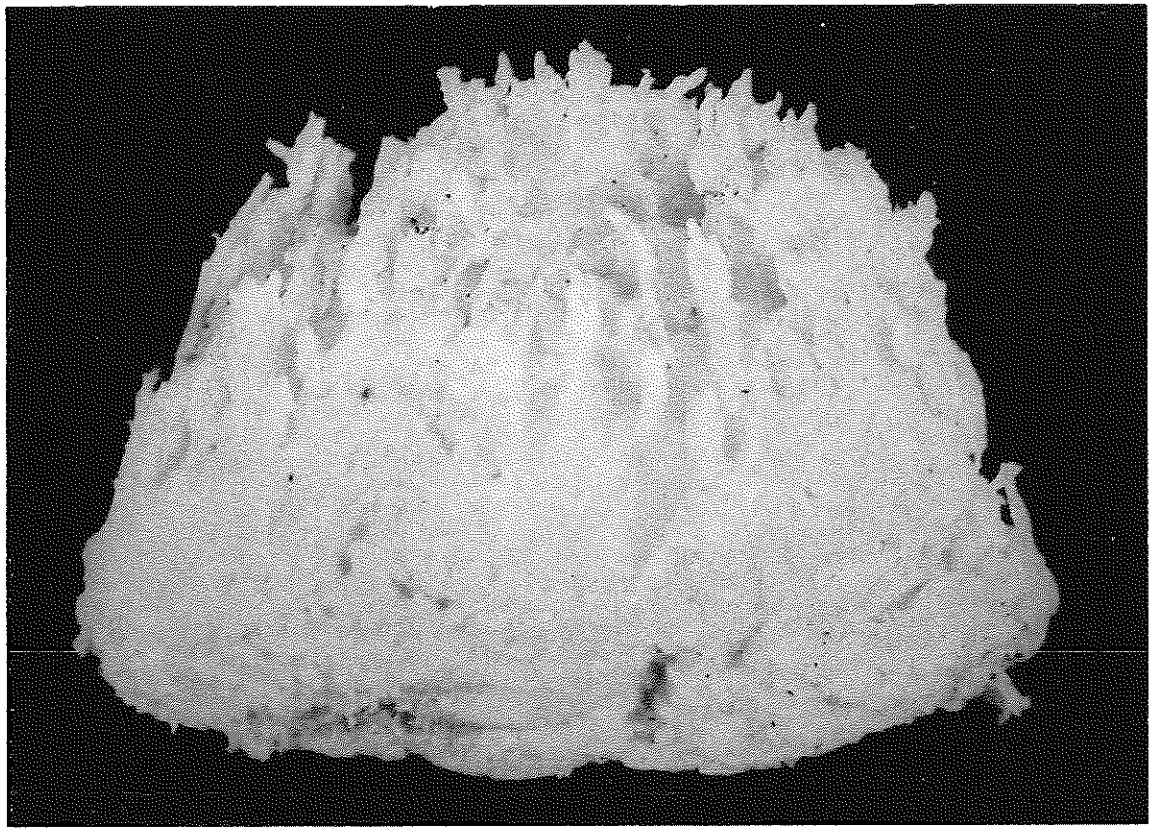

Fig. 9, a: *Halichondria rugosa* Ridley and Dendy.

"whiplike" or "digitiform" in appearance, never massive as in the present specimen.

Distribution

Port Jackson (Australia).

Order **HALCHONDRINA** Vosmaer

Family HALICHONDRIIDAE Gray

Genus **Halichondria** Fleming

Halichondria rugosa Ridley and Dendy (fig. 9a, b)

Halichondria solida var. *rugosa* Ridley and Dendy, 1885, p. 4.

Locality

Sta. 3, Mernoo Bank, 41 fm.

Description

A single specimen, massive, roughly triangular in profile, with the surface raised into jagged projections. *Dimensions*: height 65 mm; width (a) basal, 40 mm; (b) apical, 10 mm; length 100 mm. *Colour*: in spirit, white; in life Munsell Y-YR 7/10.

Oscules are frequent, predominantly single, sometimes in groups of 2–3; they range in diameter from 0·25 mm to 2·5 mm and are slightly sunken below the surface of the sponge.

The dermal membrane is well-developed and is constituted chiefly of tangentially placed oxea. The sub-dermal cavities are poorly developed, thereby giving the sponge a solid texture.

Fibres are not developed in the main skeleton; here oxeas of two sizes are indiscriminately intermingled. In a very few instances the larger oxeas are aggregated into bundles of 8–10, and resemble short fibres.

Spicules

Megascleres:

Oxea of two sizes:

(a) 500–750 × 14–22μ;

(b) 80–114 × 3·5–5μ.

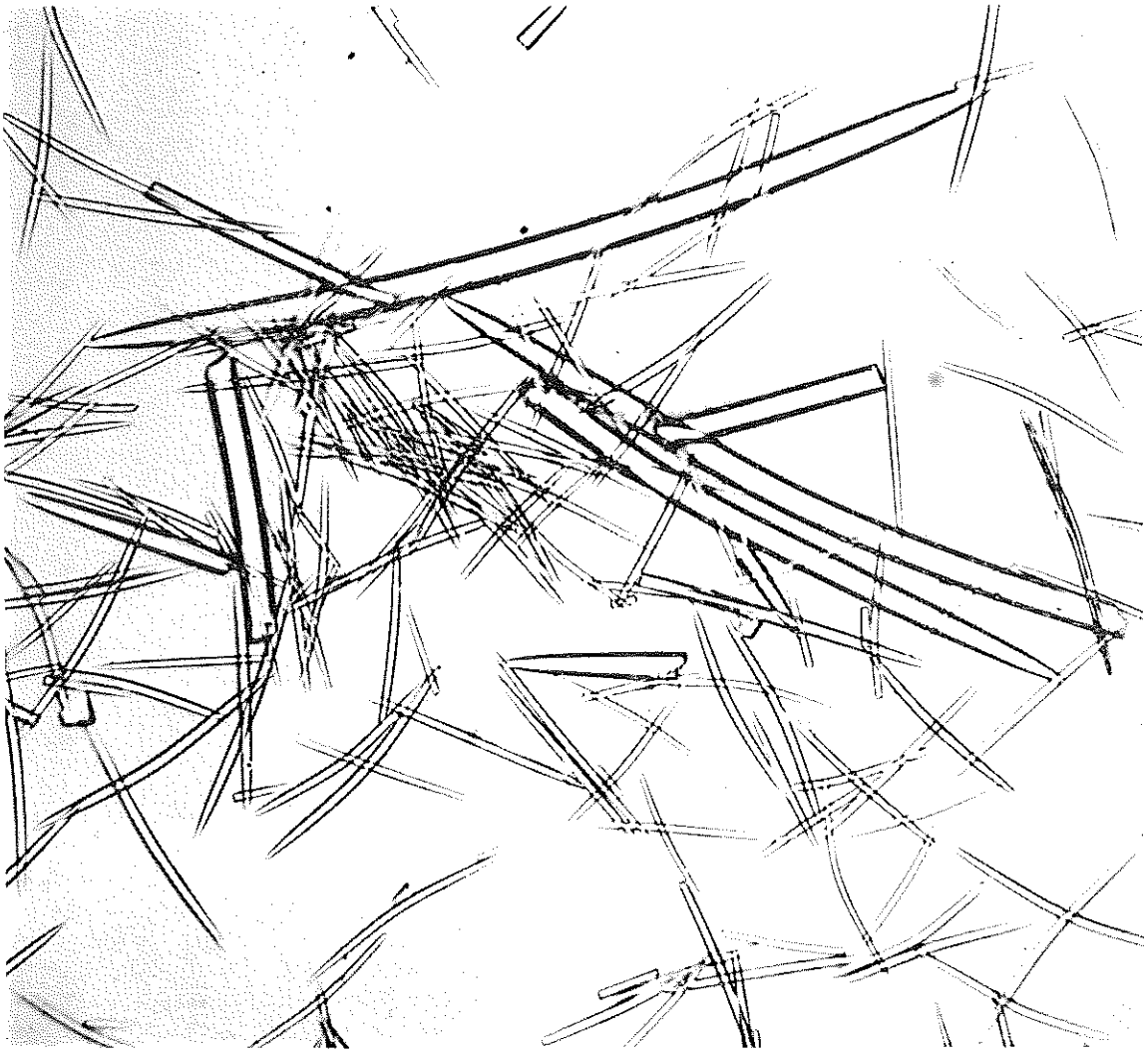

Fig. 9, b: *Halichondria rugosa* Ridley and Dendy, oxea (× 150).

Remarks

This species, originally described as var. *rugosa* by Ridley and Dendy, is markedly distinct from *H. solida.* Some differences have been previously noted, others are:

(1) The possession of two distinct categories of megascleres.
(2) The possession of distinct dermal membrane.
(3) The possession of oscula.

The maximum size of the megascleres in this species is much less than in *H. solida* (1100 × 38μ).

As described for *H. solida* var. *rugosa,* the ends of the oxea are sometimes irregular or blunted, this condition is restricted in the Chatham specimen to the larger spicules and even there is not common.

Distribution

Api (New Hebrides).

Halichondria knowltoni Bergquist nom. nov.
(fig. 10)

Halichondria reticulata Brøndsted, 1924, p. 450, fig. 9.

Locality

Sta. 26, Waitangi Wharf.

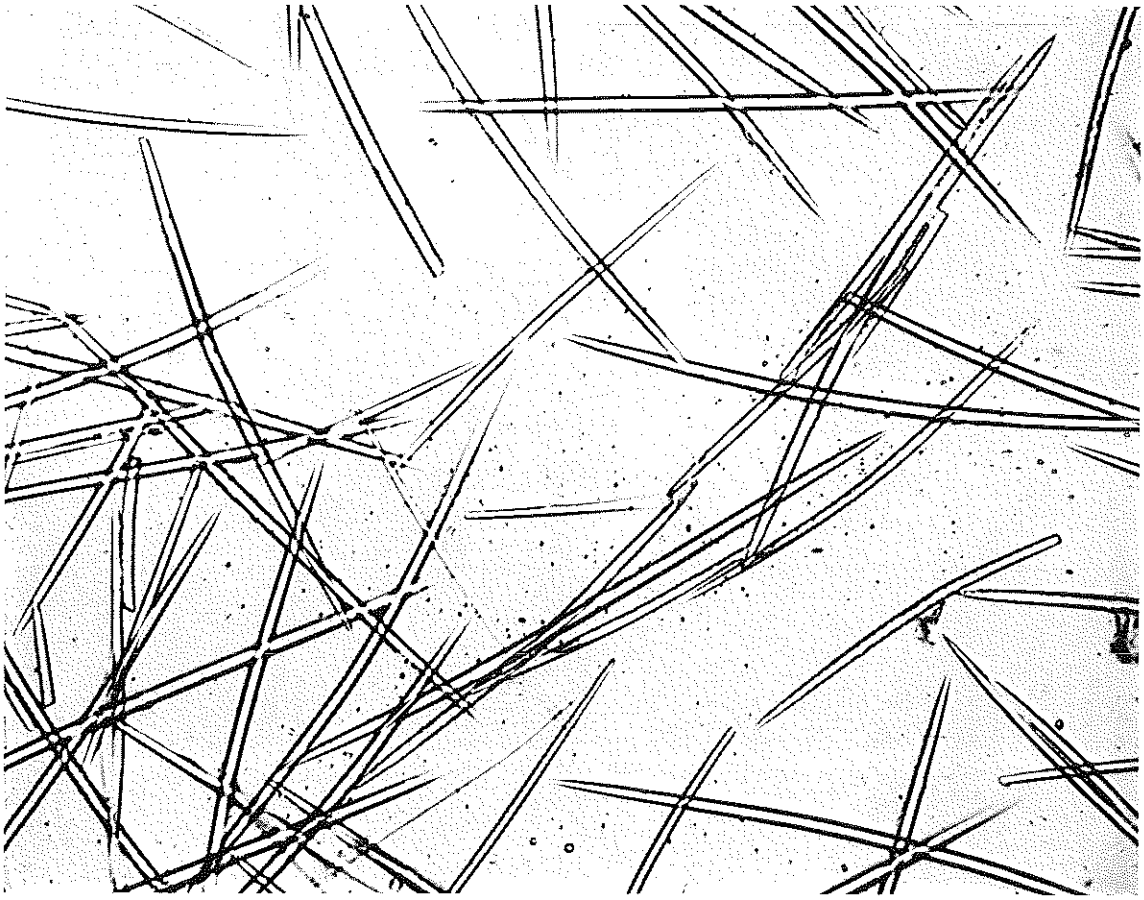

Fig. 10: *Halichondria knowltoni* Bergquist, oxea (× 150).

Description

Colour: in life, biscuit (notation not given); in spirit, yellow-white, Munsell RY 8/4. *Spicules*: oxea, 300–475 × 9–14μ.

Remarks

De Laubenfels (1936, p. 133) indicates that Brøndsted, in naming his species *H. reticulata*, used this name for the fourth time in *Halichondria*. Since *reticulata* is preoccupied, I propose for this species the name above in honour of the late Mr D. L. Knowlton, botanist, of Auckland.

The present specimen agrees in all except colour with Brøndsted's description. The Chatham sponge is a biscuit colour.

Distribution

Wellington Harbour, 5–10 fm.

Family AXINELLIDAE Ridley and Dendy

Sub-Family AXINELLINAE de Laubenfels

Genus **Axiamon** Hallmann

Axiamon novaezealandiae (Brøndsted) (fig. 11a, b)

Hymeniacidon novae-zealandiae Brøndsted, 1924, p. 477, fig. 31.

= Raspailia topsenti Dendy

Locality

Sta. 3, Mernoo Bank, 41 fm.

Spicules

Megascleres:

(a) Styles—of two sizes:
(i) 425–500 × 18μ;
(ii) 180–300 × 8μ.
Styles may be either straight or slightly to sharply flexed.

(b) Oxea—300–325 × 8μ; much smaller developing forms of each are frequent.

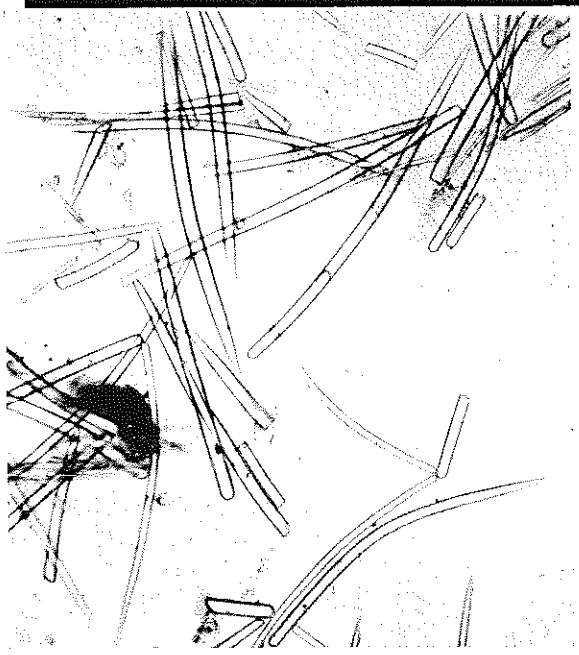

Fig. 11, a: *Axiamon novaezealandiae* (Brøndsted).

Fig. 11, b: *Axiamon novaezealandiae* (Brøndsted), oxea and styles (× 100).

Remarks

The specimen agrees very closely with Brøndsted's description. The colour in life is orange-red, Munsell YR 6/10; in spirit, greyish-white.

Distribution

Little Barrier Island, 30 fm.

Genus **Axinella** Schmidt

Axinella lamellata nov. sp. (fig. 12a, b, c)

Locality

Sta. 27, Petre Bay 45 fm.

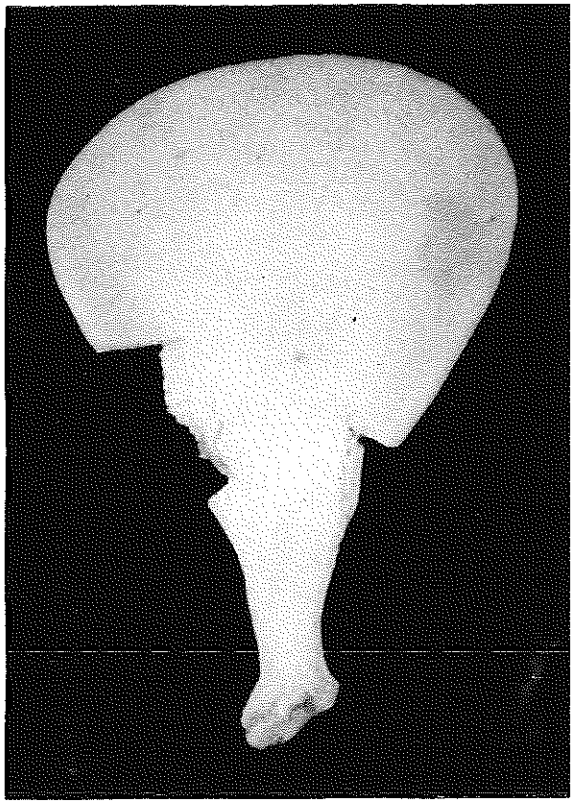

Fig. 12, a: *Axinella lamellata* (nov. sp.).

Description

A small, ear-shaped sponge, with an almost cylindrical stalk, 4 mm wide at the base. *Dimensions*: height 41 mm, width 28 mm, thickness 3 mm. *Colour*: in life, Munsell YR-Y 6/5 (deep cream); in spirit YR-Y 7/6. The surface is evenly conulose each conule receiving a small tuft of spicules which pierce its apex. Central, within the slight curve of the lamella, is a single large elevated osculum; both sides of the lamella are porous. The texture is cartilaginous.

Pronounced spicule fibres compose the skeleton. These are arranged at right angles to both surfaces and take their origin from the central region. Fibres are 38–80μ across and may contain as many as 30 spicules, though more often about 15.

Spicules

Megascleres:

Oxea—slightly flexed, occasionally straight, equiended, evenly tapered; 312–407 × 10–14μ.

Remarks

This species is typically axinellid in showing axial condensation. It differs markedly from normal axinellids, however, in the absence of branching, absence of monactines and in the possession of a relatively smooth surface.

Order **HADROMERINA** Topsent

Family CHOANITIDAE de Laubenfels

Sub-Family CHOANITINAE de Laubenfels

Genus **Latrunculia** du Bocage

Latrunculia spinispiraefera Brøndsted (fig. 13)

Latrunculia spinispiraefera Brøndsted, 1924, p. 480, fig. 33, a–e.

Locality

Sta. 6, Chatham Rise, 220 fm. 2 specimens.

Remarks

The single fragment in the collection conforms well with Brøndsted's description except in the absence of spinispirae. This specimen is badly macerated, however, and if these microscleres were confined to the endosome, it is likely that they have been lost.

Occurring very occasionally are strange spicules, rhabdostrongyles. These may be foreign, and I hesitate to make any alteration in my species determination on their account.

Spicules

Megascleres:

(a) Styles—tending slightly toward tylostyli and slightly flexed; 350 × 6μ.

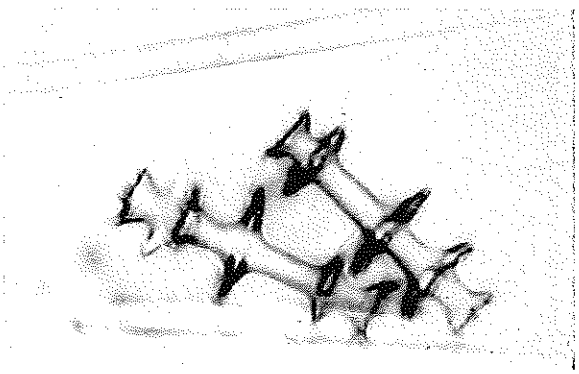

Fig. 13: *Latrunculia spinispiraefera* (Brøndsted), discorhabds (× 500).

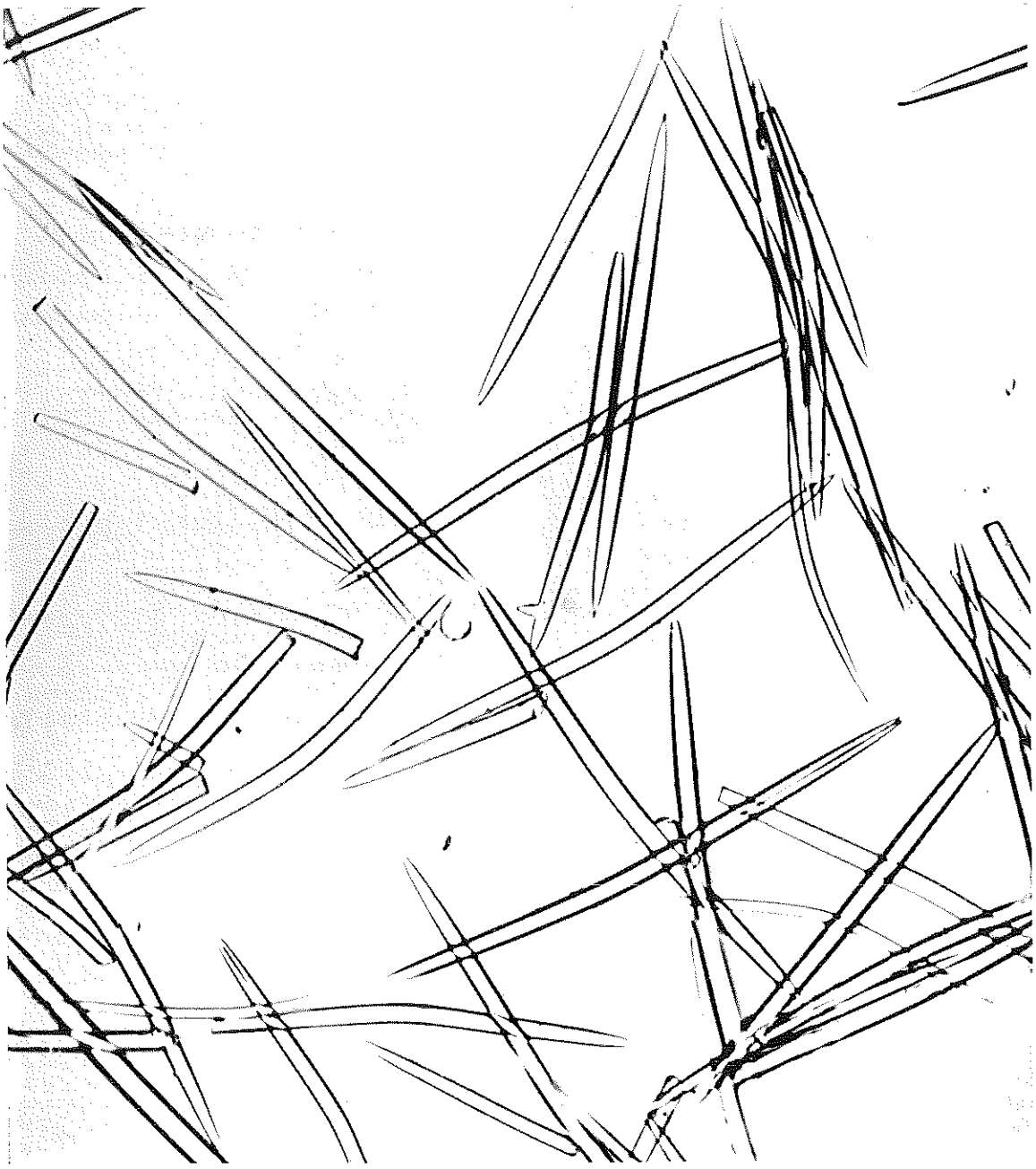

Fig. 12, b: *Axinella lamellata* (nov. sp.), oxea (× 350).

(b) Rhabdostrongyles—150 × 12μ.

Microscleres:

Discorhabds—42μ long.

Distribution

North Cape, 55 fm.

Family CLIONIDAE Gray

Genus **Cliona** Grant

Cliona celata Grant (fig. 14a, b, c)

Cliona celata Grant, 1826, p. 79.

(For synonymy up to 1900, see Topsent, 1900, p. 32–34.)

Fig. 12, c: *Axinella lamellata* (nov. sp.), portion of the skeleton showing the spicule fibres and the dermal membrane (× 120).

(For synonymy up to 1933, see Vosmaer, 1933, p. 349–383.)
Cliona celata Hartmann, 1958, p. 16.
Cliona celata Bergquist, 1960 (in press).

Locality

Sta. 23, North of Sisters, 53 fm.

Remarks

The two specimens are infesting shells of *Glycymeris laticostata* and are both at the α stage of development. As is often the case in young Clionids many of the more diagnostic spicules are lacking; no spirasters or oxea are present in either case.

The spicules present are tylostyles (262 × 4μ; head 7μ), and a few styli of similar dimensions. Excavations range in diameter from 0·3–1 mm, average 0·6 mm.

Although this sponge is a common member of the intertidal fauna of New Zealand, I can find no reference to it here prior to 1960.

Distribution

Cosmopolitan.

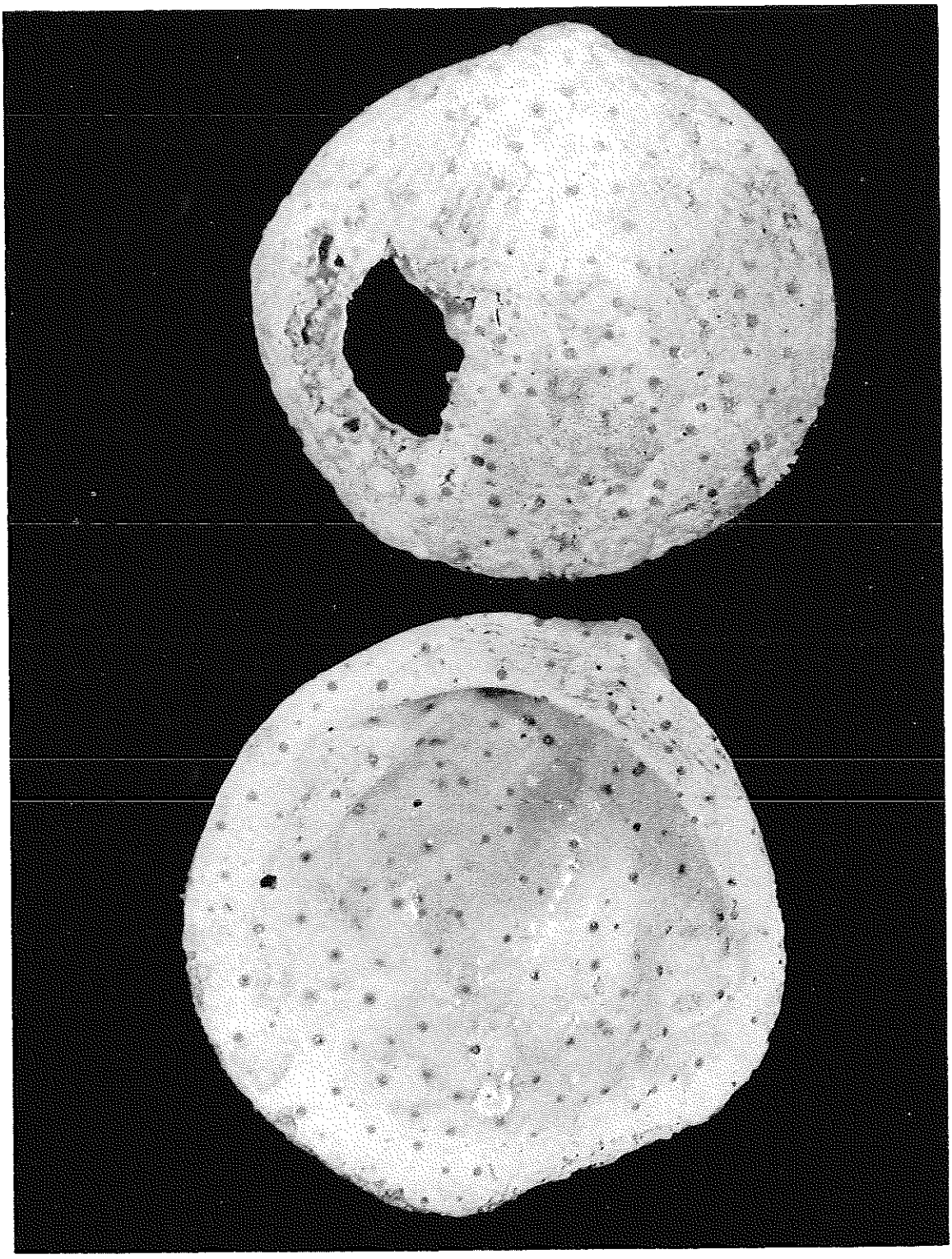

Fig. 14, a: *Cliona celata* Grant.

Fig. 14, b: *Cliona celata* Grant, tylostyle (× 300).

Order **EPIPOLASIDA** Sollas

Family TETHYIDAE Gray

Genus **Tethya** Lamarck

Tethya compacta nov. sp. (fig. 15)

Locality

Sta. 6, Chatham Rise, 220 fm.

Description

The form of this sponge is unlike anything hitherto described in this genus, and it could be set aside specifically on these grounds alone. It is a rhomboid structure, with lateral fan-like projections (0·5–2·5 mm long), which are continuations of large cortical spicule brushes. *Dimensions*: height 5 mm, length 8 mm. *Colour*: in spirit, Munsell RY–R 2/4, a mid brown. The texture is stony and the surface coated with sand and shell particles. No external apertures were visible in the single preserved specimen.

Ectosome and endosome are clearly demarcated. The former is 1·2 mm deep and composed of closely packed spicule tracts 356–722μ across. These alternate with thin but dense tracts of tylasters, which are aggregated to a distinct dermal layer. The endosome displays the typical radiate structure and has the fleshy parts completely reduced. Microscleres occur profusely throughout the endosome.

Spicules

Megascleres:

Strongyloxeas—definitely inequiended; 1218 × 18μ to 1574 × 21μ.

Microscleres:

(a) Spherasters—25–43μ in diameter, with an average 12–16 rays of uneven length.

(b) Tylasters—7–12μ in diameter, with 8–12 unequal, smooth rays.

Remarks

In details of spiculation this species approaches *T. japonica* (Sollas). Similarities extend no further than the skeletal morphology; the distinctive external appearance of this sponge is unparalleled in the genus.

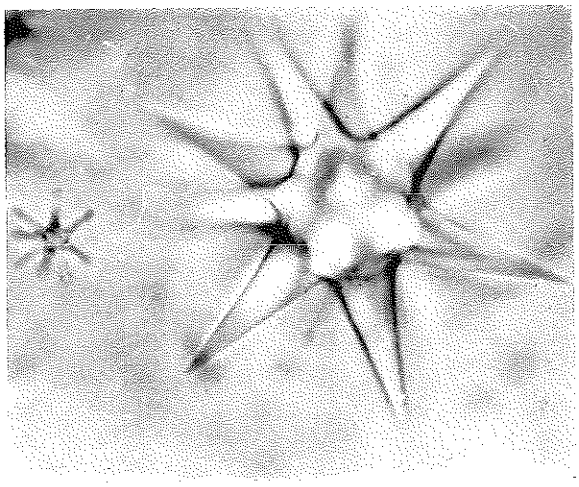

Fig. 15: *Tethya compacta* (nov. sp.), spheraster and tylaster (× 500).

Tethya multistella Lendenfeld (fig. 16a, b)

Tethya multistella Lendenfeld, 1888, p. 46–47.
Tethya multistella Hallmann, 1914, p. 270–273.
Donatia multistella Burton, 1924, p. 1038.
Donatia multistella Dendy and Frederick, 1924, p. 495–496.

Locality

Sta. 22, The Sisters, shore.

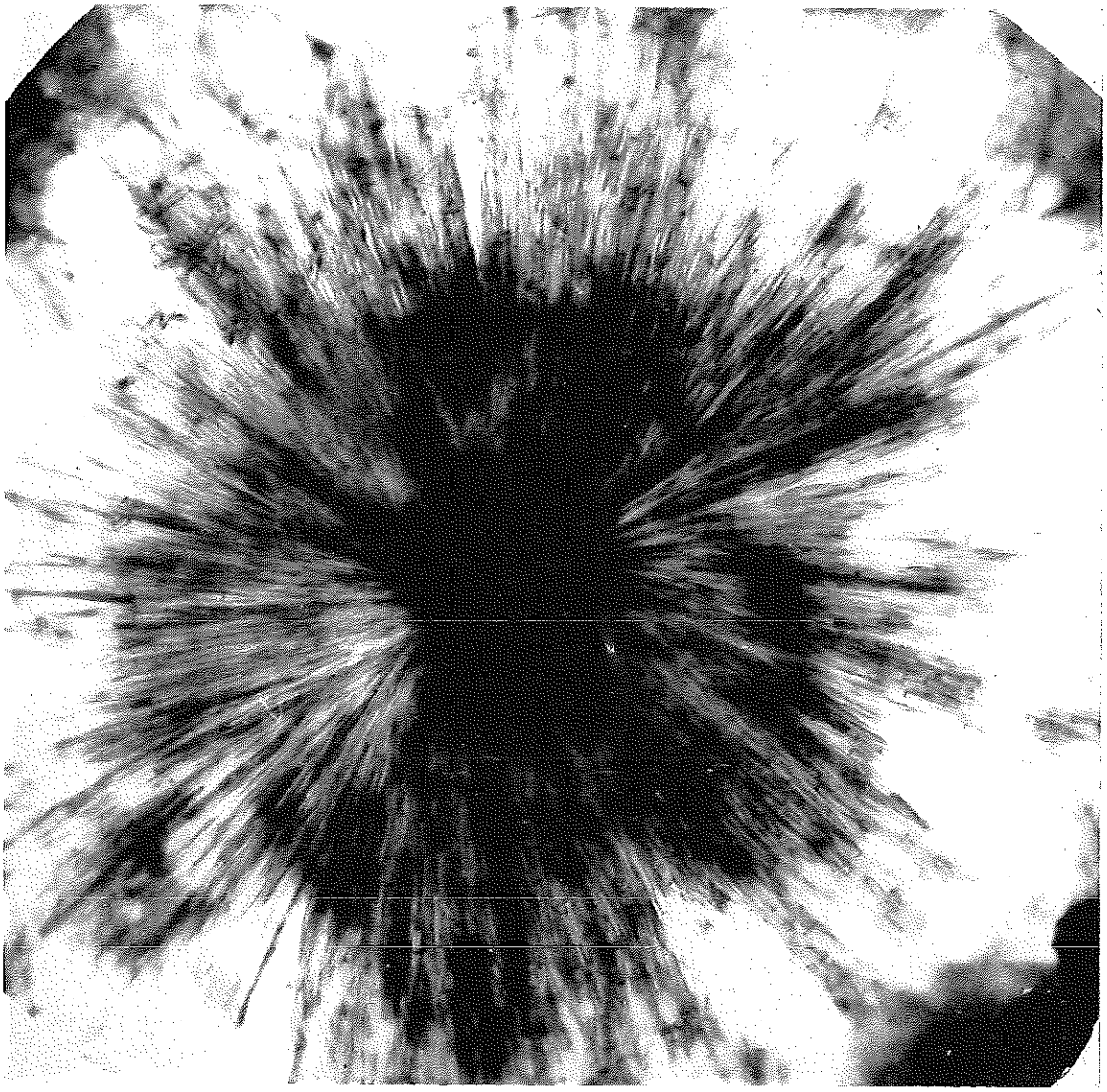

Fig. 14, c: *Cliona celata* Grant, section showing the disposition of the skeleton inside the excavations (× 80).

Description

A subhemispherical sponge, with several root-like processes springing from its ventrolateral border. *Dimensions*: height 20·2 mm, diameter 27·4 mm. *Colour*: in spirit, white. The surface is weakly tuberculate, the tubercles being 0·5 mm high × 2·5 mm wide. The usual division into cortex and endosome is very pronounced, the former being 3·5 mm deep, cartilaginous, and fawn in colour; the latter is strongly radiate and light brown in colour.

Spicule brushes in the cortex range from 255–390μ in diameter; between and among them are frequent loose megascleres and dense concentrations of tylasters. The spherasters are not organised to any distinct layer but are frequent in the cortex toward the inner edge. The endosome is composed of a solid radiate mass of spicule tracts which diverge at the junction of endosome and cortex; some enter the cortical region and the terminal spicules of these pierce the surface. Microscleres are present, but sparse in the endosome.

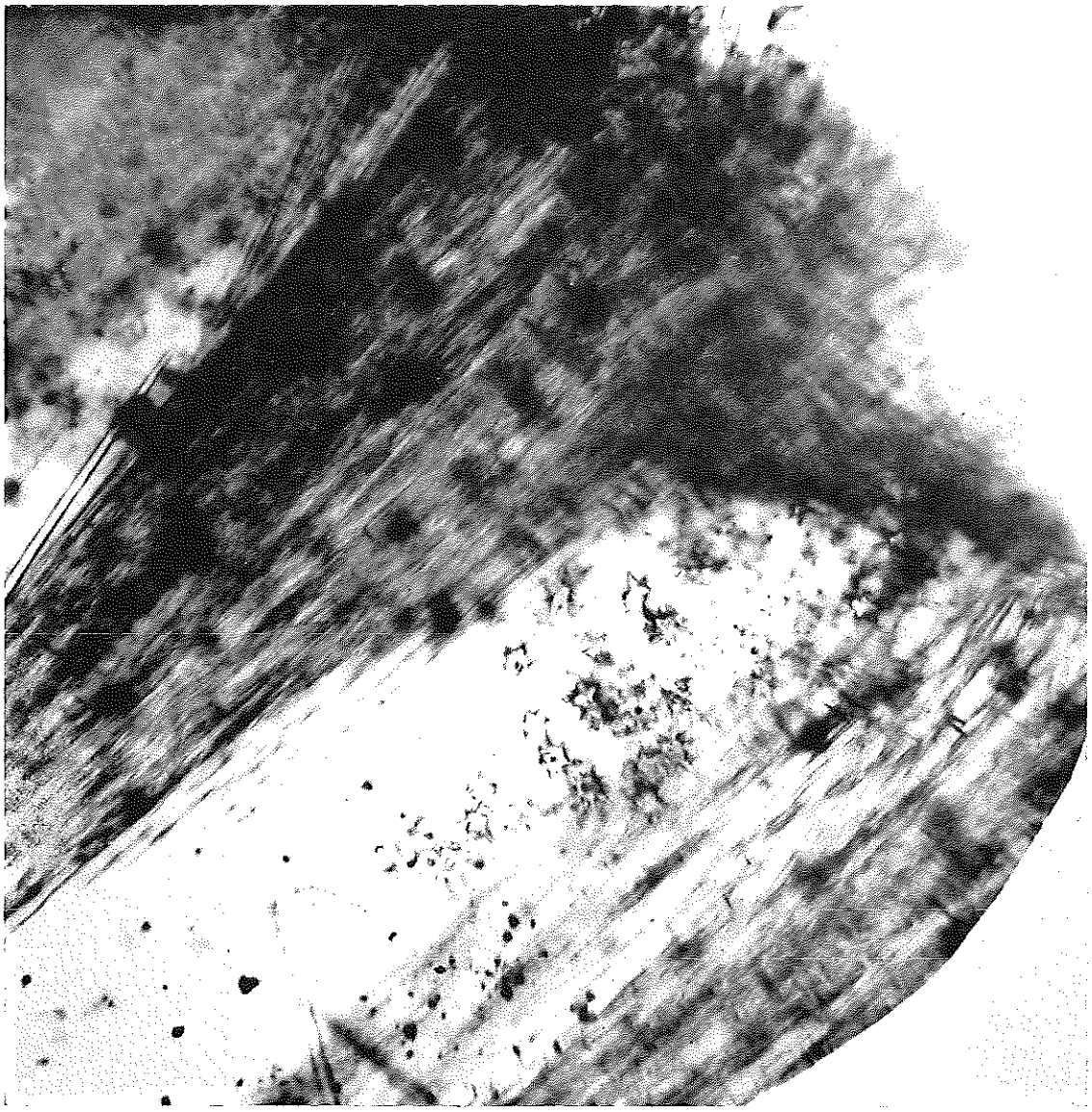

Fig. 16, a: *Tethya multistella* Lendenfeld, section of cortex showing spicule brushes and microscleres (× 80).

Spicules

Megascleres:

(a) Strongyloxeas—840–1250 × 12–16μ; these are the structural spicules, chiefly straight but can be slightly curved.

(b) Styles—200–730 × 4μ; these are abruptly and unevenly narrowed at the oxeote end.

Microscleres:

(a) Spherasters—20–35μ diameter with conical rays, 8–12μ long; the number of rays ranges from 12 to 18.

(b) Tylasters—8–10μ in diameter with an average of 8 tylote, terminally spined rays.

(c) Oxyasters—8–10μ in diameter; not spined, rare.

Remarks

The known species of this genus are on the whole poorly described and figured, hence the full

Fig. 17, a: *Thenea novaezealandiae* (nov. sp.).

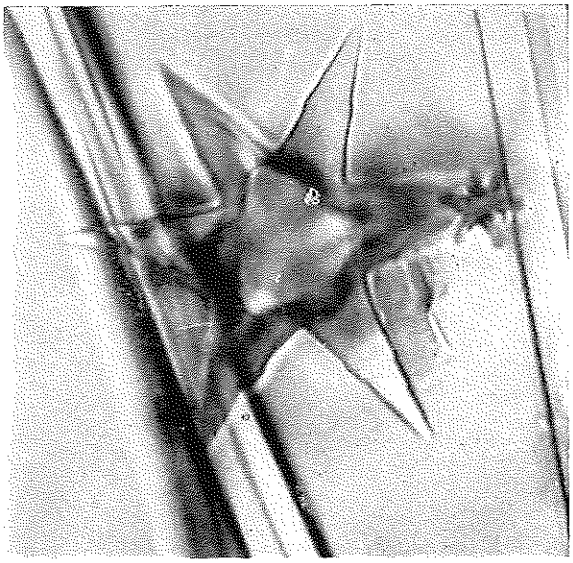

Fig. 16, b: *Tethya multistella* Lendenfeld, spheraster and tylaster (× 500).

description in this case. In the absence of accurate descriptions of type material, it is impossible to decide whether *T. multistella* should be maintained or united with *T. aurantia* (Pallas).

Distribution

Port Jackson, Port Phillip (Australia); Abrolhos Islands (S.W. Australia); Chatham Islands.

Order **CHORISTIDA** Sollas

Family ANCORINIDAE Gray

Sub-Family ANCORININAE de Laubenfels

Genus **Thenea** Gray

Thenea novaezealandiae nov. sp. (fig. 17a, b, c, d, e)

Locality

Sta. 34, East of Forty-fours, 130 fm.

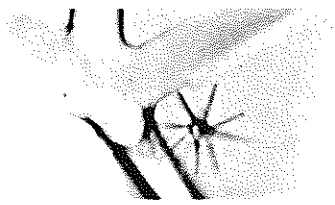

Fig. 17, b: *Thenea novaezealandiae* (nov. sp.), plesiaster (× 500).

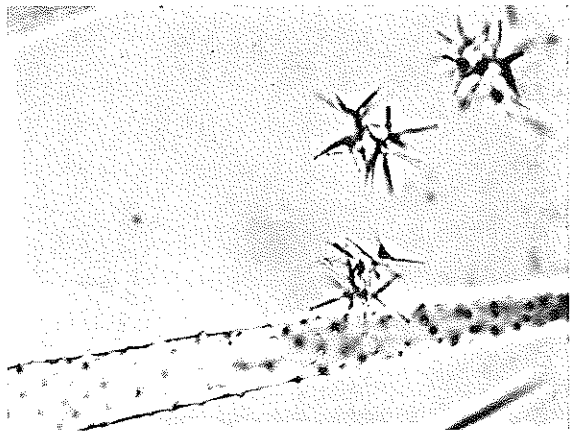

Fig. 17, c: *Thenea novaezealandiae* (nov. sp.), metasters (× 500).

Description

A sub-spherical sponge with a definite external form, a more or less flattened summit and rounded base. *Dimensions*: height 24 mm, width 28 mm. *Colour*: in spirit, grey. Oscula congregated on upper surface, range of size considerable, largest 0·3 cm diameter; not in any way fringed with protecting spicules; membranes delicate. Rootlets are small and relatively inconspicuous, arising abruptly from the ventral and ventrolateral surfaces of the sponge. Body of the sponge compact, architecture radiate as typical of the order; the texture is spongy. Surface is uniformly hispid; no large and obviously projecting spicules present, however. There is no differentiation of the body into ectosomal and endosomal regions. An equatorial recess is formed by the projection of the summit over the base and here a delicate poriferous membrane covers a series of sub-dermal cavities.

The chief structural spicules are oxea, radially disposed, and calthrops, scattered throughout the body of the sponge.

Spicules

Megascleres:

(a) Oxea—400 × 25μ; slightly curved.

(b) Calthrops—with evenly microspined rays, 162μ. Usually 4 rays not necessarily tetrahedrally disposed; 3–4–5–6 rays. Arms may be secondarily bifurcate.

(c) Anatrienes—250μ; fine (6μ) shaft with short (0·025μ) sharply recurved cladi, occasional.

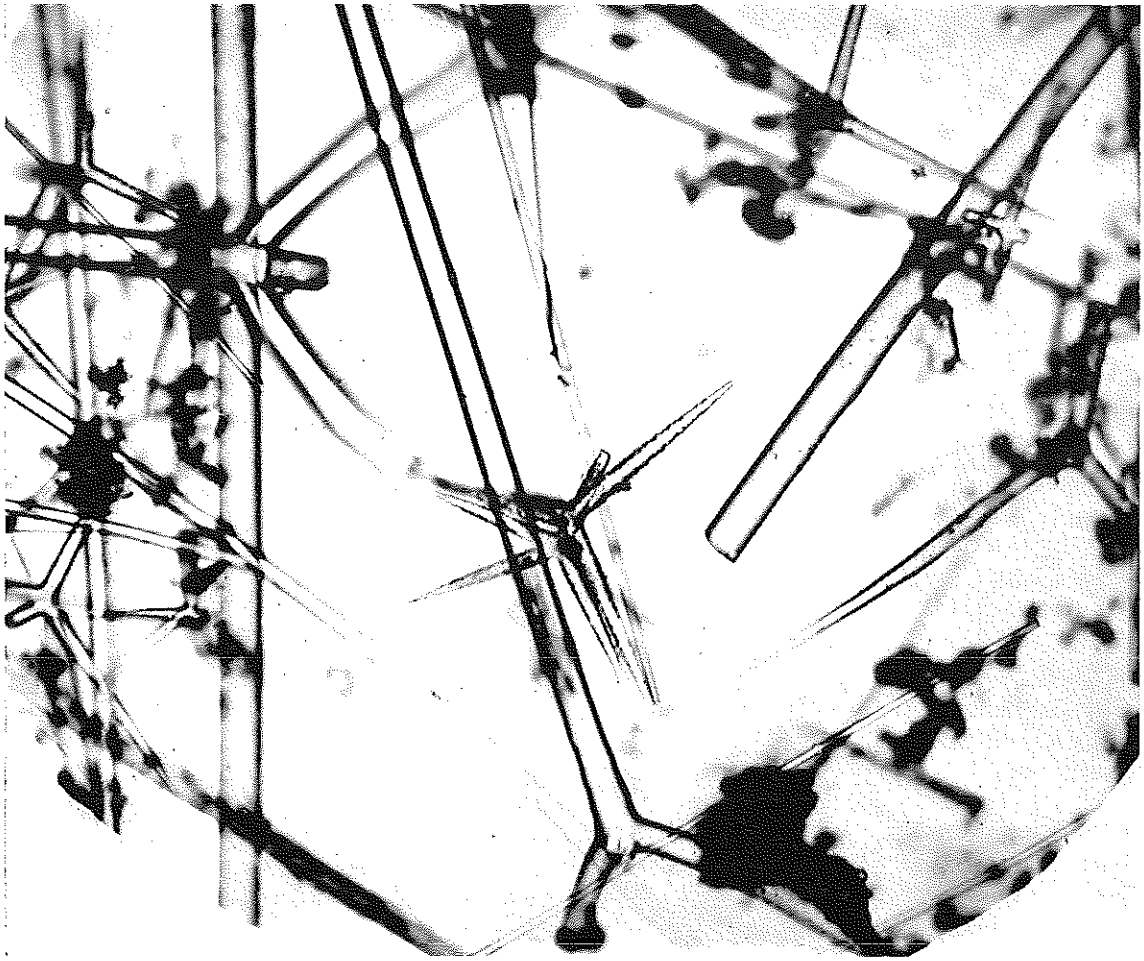

Fig. 17, d: *Thenea novaezealandiae* (nov. sp.), smooth and spined calthrops, oxea and portions of large dichotriaenes (× 80).

(d) Dichotrienes—with very long cladi (400μ) and extremely short rhabd, rare.

(e) Smooth calthrops—ranging in size from just smaller than average spiny calthrops to large microscleres.

Microscleres:

(a) Amphiasters—21μ.

(b) Metasters—21μ.

(c) Plesiasters—41μ.

All microscleres uniformly microspined.

Remarks

This species appears closest to *T. megaspina* (Lendenfeld, 1907), but differs from it in the absence of tylostyles and protrienes, and in the dimensions of the plesiasters, which here are considerably smaller. These two species stand apart from all hitherto described species of *Thenea* in having spined plesiasters. It is appropriate here, to emphasise the distinctness of *Thenea* and *Ancorina*. The presence in the former of large calthrops and in *T. megaspina* and *T. novaezealandiae* of spinose calthrops and microscleres would support Sollas in maintaining his family Theneidae which is discredited by de Laubenfels (1936).

Genus **Penares** Gray

Penares tylotaster Dendy

Penares tylotaster Dendy, 1924, p. 303, pl. vii, figs. 16–19.

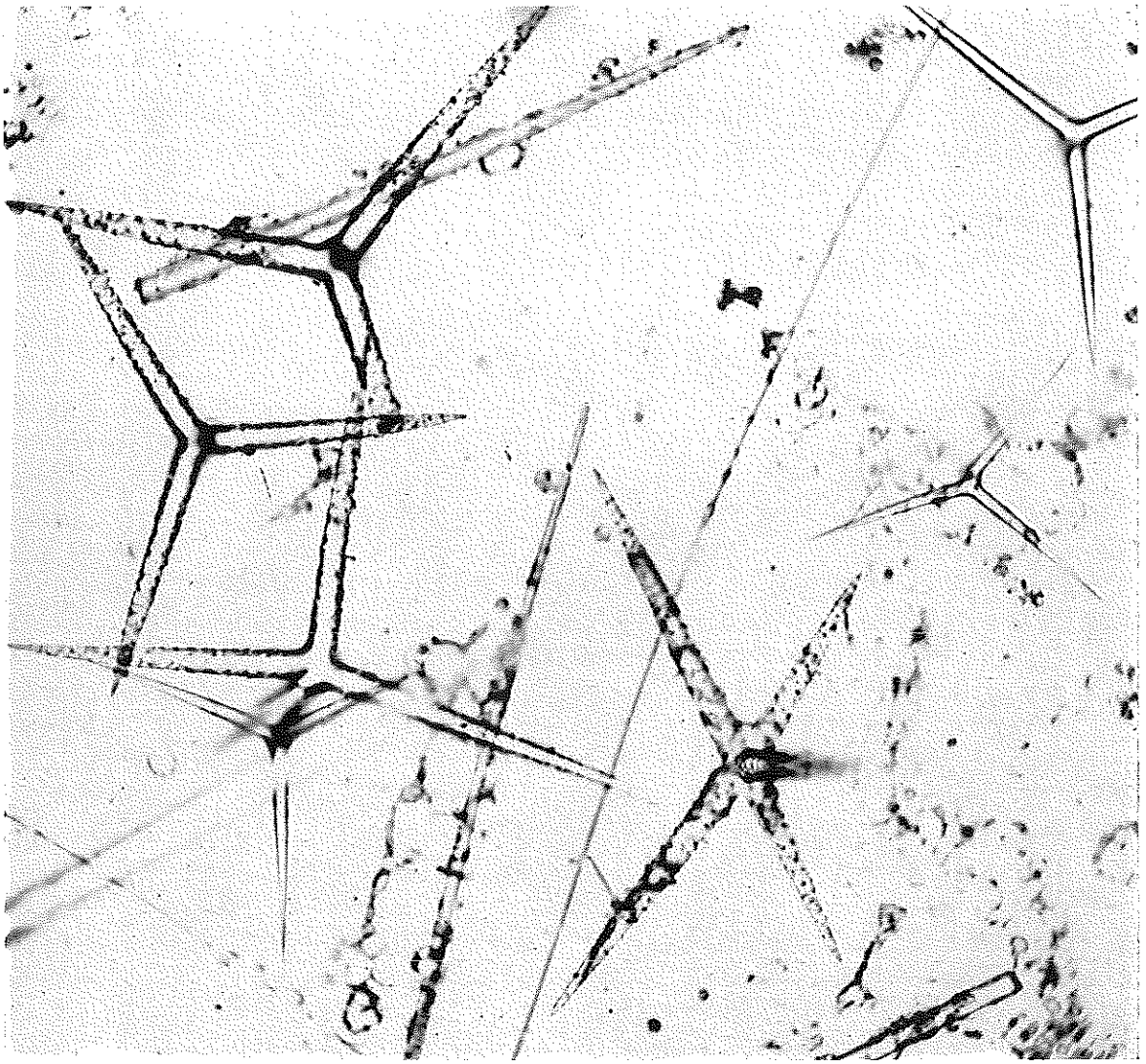

Fig. 17, e: *Thenea novaezealandiae* (nov. sp.), smooth and spined calthrops (× 80).

Penares tylotaster Brønsted, 1924, p. 440.
Penares tylotaster Burton, 1929, p. 415.

Locality

Sta. 6, Chatham Rise, 220 fm.

Remarks

This single fragmentary specimen concurs with the type description in all major respects. It contains only rare dichotriaenes and in this feature resembles Brøndsted's specimen. The sponge contains much calcareous debris and appears to have been of a semi-encrusting habit.

Distribution

North Cape (70 fm.); Slipper Is. (coast); McMurdo Sound (140 fm.).

Sub-Family STELLETTINAE de Laubenfels

Genus **Stelletta** Schmidt

Stelletta novaezealandiae Brøndsted (fig. 18a, b)

Stelletta novaezealandiae Brøndsted, 1924, p. 436, fig. 2, a–e.

Locality

Sta. 26, Waitangi Wharf.

Fig. 18, a: *Stelletta novaezealandiae* Brøndsted.

Spicules

Megascleres:

(a) Oxea—of two distinct sizes:
  (i) Large—1570–2002 × 7–11μ.
  (ii) Small—75 × 1·7μ.

(b) Plagiotriaenes—1575 × 35μ; cladome 162μ.

(c) Dichotriaenes—2000–2100 × 50μ; cladome 150–200μ.

Microscleres:

(a) Chiasters—with 4–6 truncated rays.

(b) Oxyeuasters—of two types:
  (i) Small—3μ across, with many smooth, short spines.
  (ii) Large—less frequent, 12–20 × 7–12μ; few smooth spines.

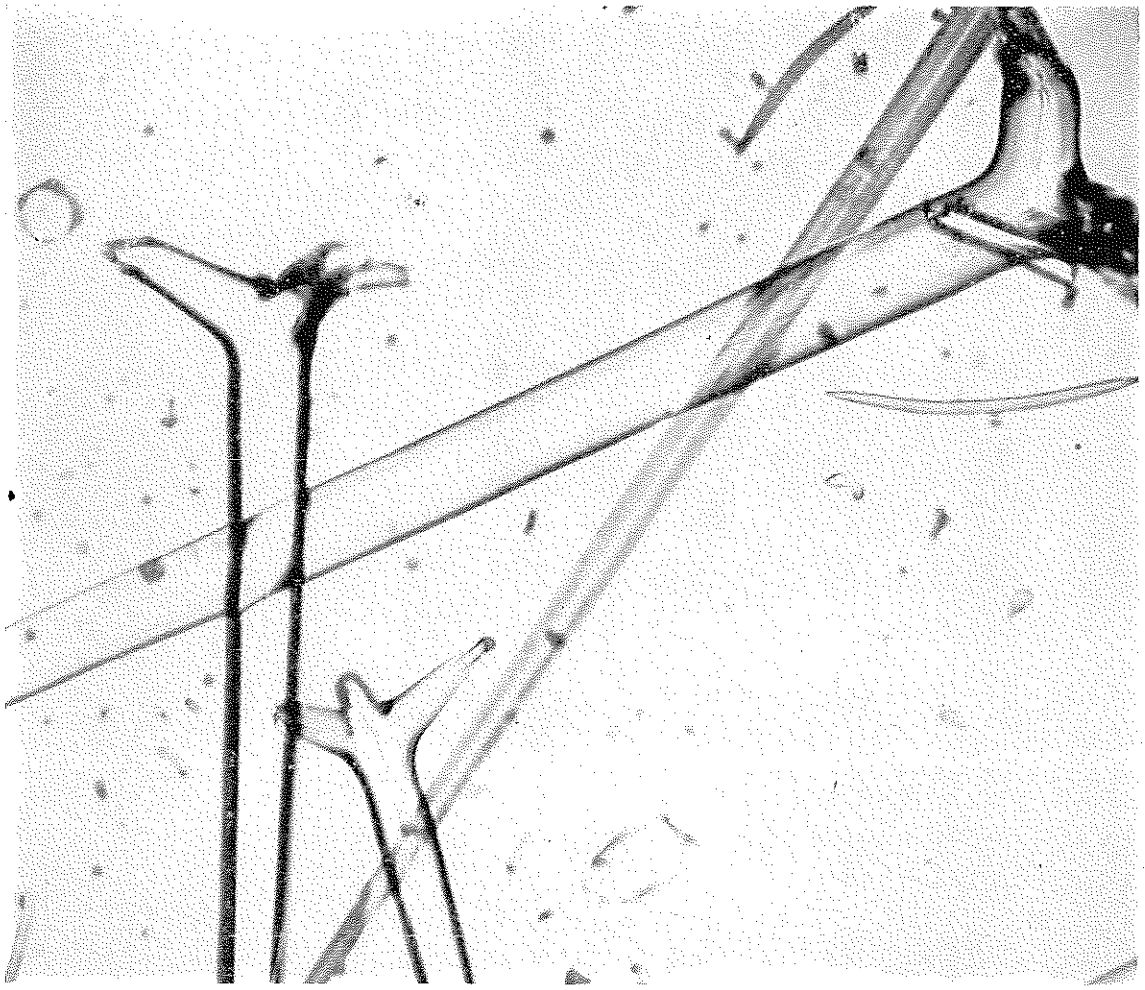

Fig. 18, b: *Stelletta novaezealandiae* Brøndsted, dichotriaene, plagiotriaene and small oxea (× 150).

Remarks

The specimen conforms moderately well to the type, although the shape is rather irregular. This is probably caused by growth in a strong current. Brøndsted figures only euasters in his type figure; it is diagnostic of *Stelletta* that microscleres are of two types—euasters and chiasters. These are both present in this specimen.

Distribution

North Cape (55 fm).

Genus **Myriastra** Sollas

Myriastra purpurea (Ridley) (fig. 19a, b)

Stelletta purpurea Ridley, 1884, p. 473, pl. xl, fig. e; pl. xliii, fig. j, j'.
Stelletta purpurea var. *retroflexa* Ridley, 1884, p. 473.
Stelletta purpurea var. *parvistella* Ridley, 1884, p. 627.
Pilochrota purpurea Sollas, 1886, p. 190.
Pilochrota longancora Sollas, 1886, p. 190.
Myriastra biformis Brøndsted, 1924, p. 437, fig. 1, a–e.
(For further synonymy see Burton, 1926, p. 45–46.)

Locality

Sta. 6, Chatham Rise, 220 fm.

Description

A larger specimen than Brøndsted's; turbinate, growing attached to a small rock. *Dimensions*: height 50 mm; width (a) base, 27 mm; (b) apex, 43 mm. *Colour*: in spirit, Munsell RY-R 6/4. No pores or oscula are visible owing to the contracted

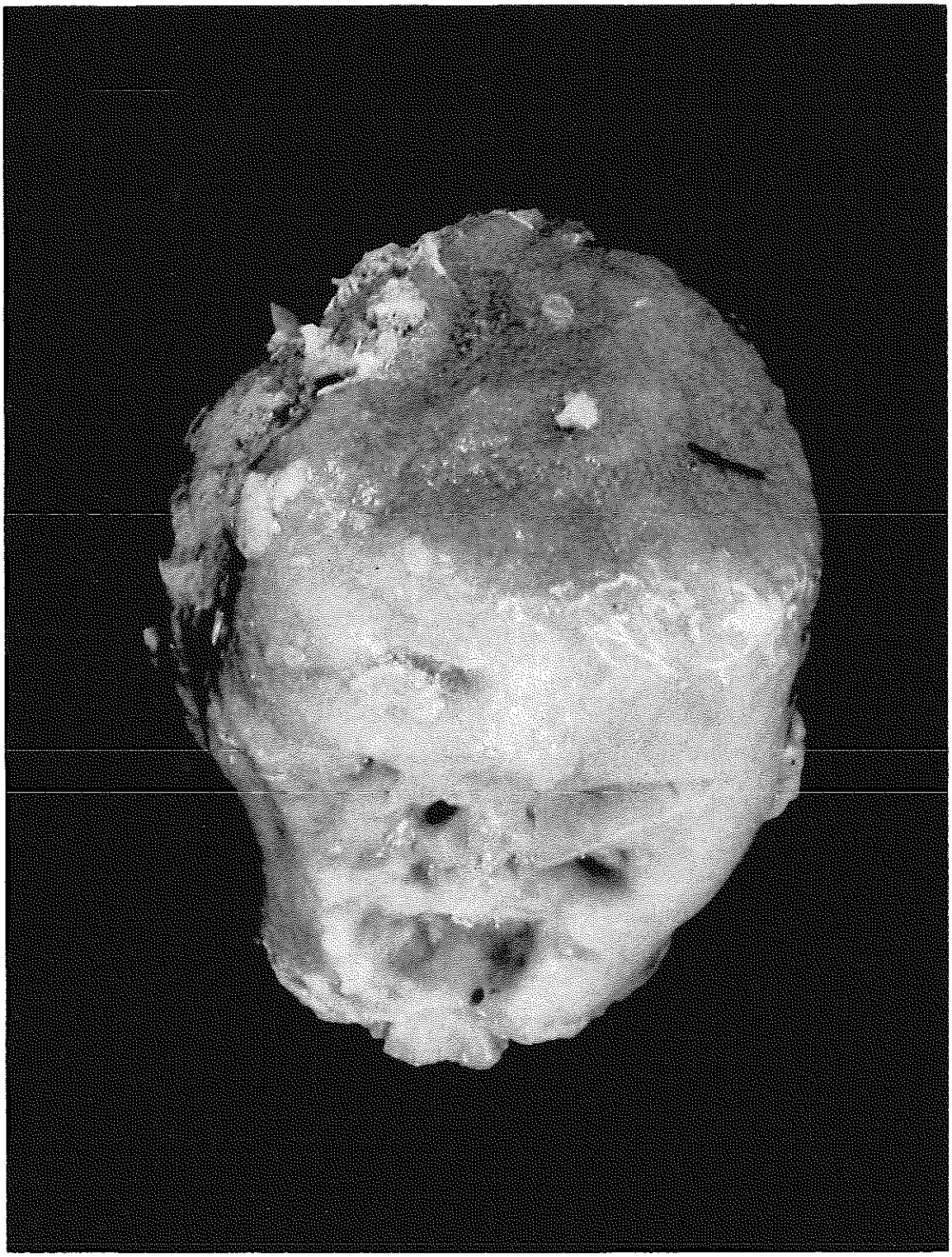

Fig. 19, a: *Myriastra purpurea* (Ridley).

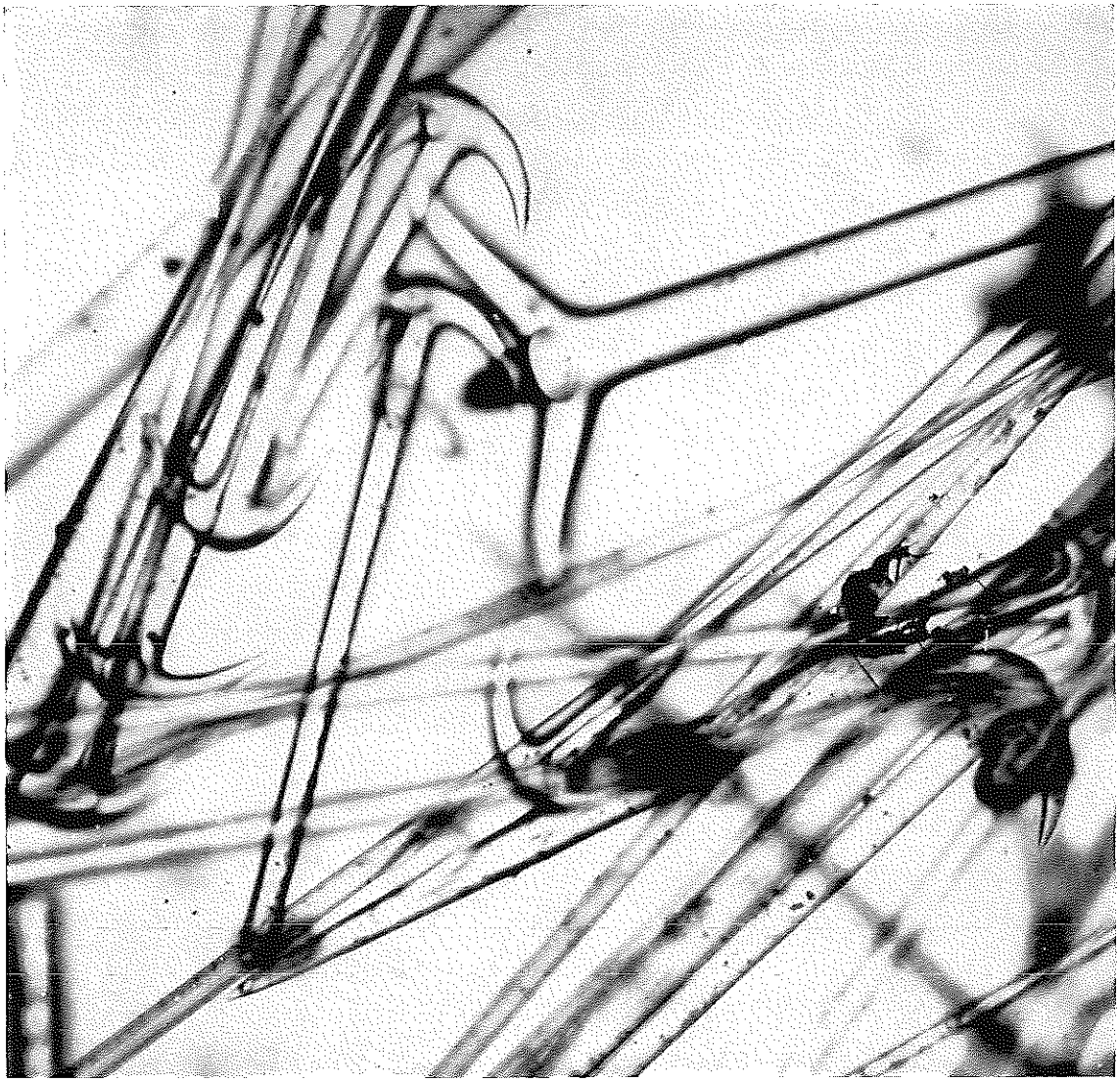

Fig. 19, b: *Myriastra purpurea* (Ridley), anatriaenes, orthotriaene and oxea (× 150).

condition. The consistency is soft and flabby, the dense ascending spicule tracts serving to maintain a definite shape. The cortex is distinct, 0·4 mm thick. The interlocked cladi of the orthotriaenes form a dense external layer. Colour is red (Munsell RY-R 6/4).

Spicules

Megascleres:

(a) Anatriaenes — 1540–1860 × 14–17·5μ. Cladi 71–98μ.

(b) Orthotriaene—2435–2700 × 35–40μ.

(c) Oxea—500–600 × 4·75μ.

Microscleres:

Chiasters—with numerous short, blunt rays, up to 8μ in diameter.

Remarks

Burton (1929) relegates this species to *Stelletta purpurea* (Ridley), this being consistent with his earlier work on Stellettids (Burton, 1926). This decision takes no account of the microsclere differentiation of the genera involved. De Laubenfels (1936) upholds *Myriastra,* on good grounds, stressing the importance of the single microsclere, the chiaster. It seems evident that *S. purpurea* is

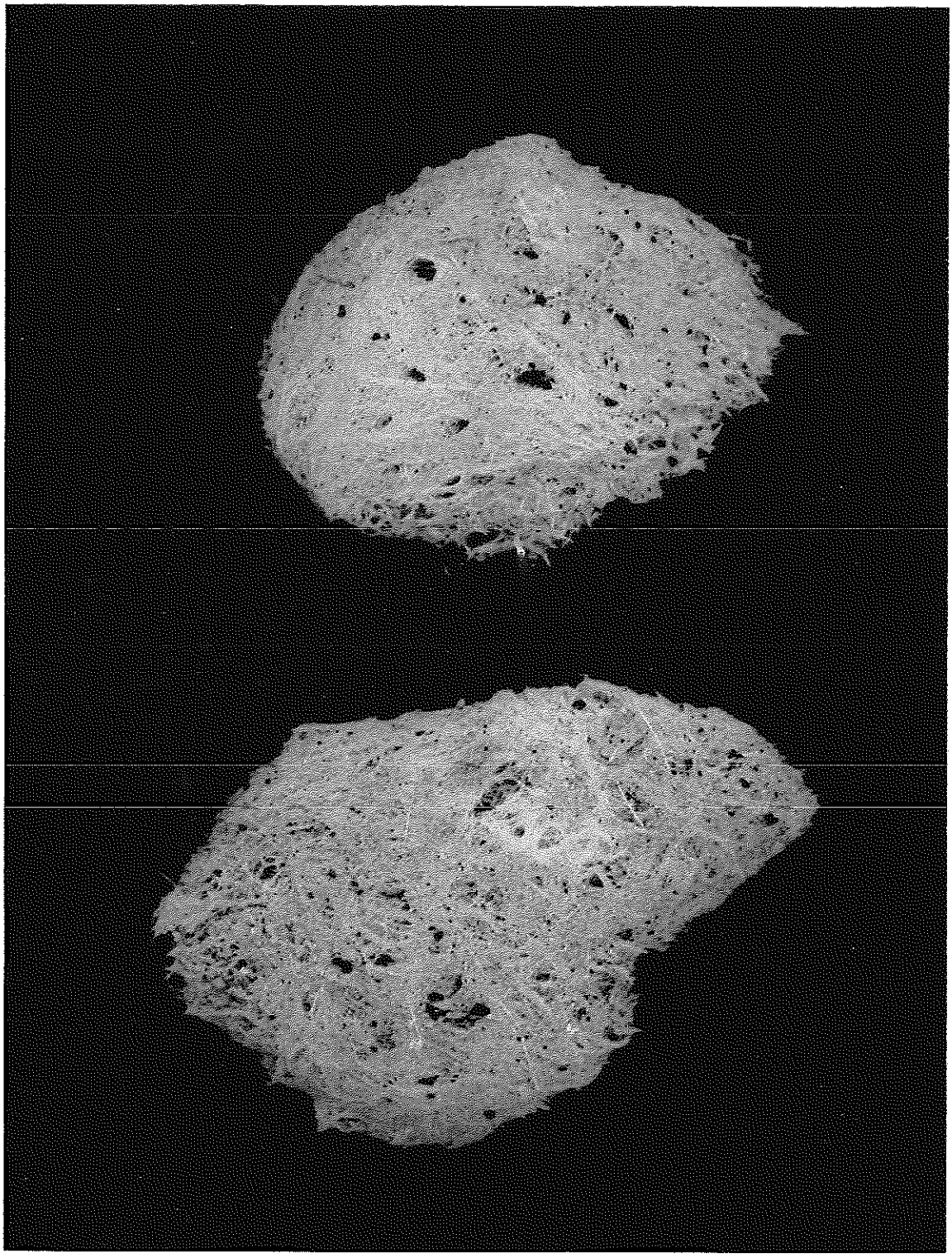

Fig. 20: Hexactinellid fragments.

in fact conspecific with *M. biformis,* but contrary to earlier suggestion, *S. purpurea* should be considered as *Myriastra purpurea,* and *Stelletta* (Schmidt) could then be retained for Stellettids with two distinct microsclere categories.

Distribution

Red Sea; Indian Ocean; Indo-Pacific and Japan; Australia; New Plymouth (8 fm.).

Class **HYALOSPONGIAE** Vosmaer

Order **HEXASTEROPHORA** Schulze

Family ASKONEMATINAE Gray
(fig. 20.)

Locality

Sta. 7, Chatham Rise, 280 fm.

Description

The material, which cannot be assigned to a genus, represents fragments from the interior of a large hexactinellid. The fragments are amorphous, with many pores, 0·2–0·5 mm–0·5 mm, scattered indiscriminately.

Much grit and mud is incorporated into the spicule weft.

Spicules

Megascleres:

Oxea:

(a) Large and smooth, 6050–9282 × 50μ.

(b) Thin with spinose ends, 5300–6700 × 6μ; often with 1 or more swellings along the length.

Microscleres:

(a) Oxyhexasters—with rays up to 20μ.

(b) Discohexasters—with rays up to 30μ; very irregular.

Remarks

Hexactines and pentactines, which are characteristic of the dermal regions of hexactinellids of this type, are lacking. It is upon these dermal spicules that the generic identification rests. The limitation of the microscleres of two types renders these spicules useless for diagnosis.

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