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The Keratosa (Porifera) collected by the Chatham Islands 1954 Expedition

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

Abstract

Six species of Keratosa (Porifera) were collected by the Chatham Island 1954 Expedition. The genera *Euryspongia* and *Darwinella,* which have not previously been recorded from New Zealand waters, are each represented by a new species.

INTRODUCTION

The Chatham Sponge Collection includes six species of Keratosa all of different genera. Two are new species, namely, *Euryspongia arenaria* and *Darwinella oxeata.* The occurrence of these two specimens from the Chatham area is interesting in being the first record of both genera from New Zealand waters. *Euryspongia* is a northern hemisphere and tropical genus, which has extended its range to Australia and to Chile. Its occurrence in New Zealand is therefore not surprising; *E. arenaria* is, however, clearly distinguishable from other southern species. *Darwinella* is probably an almost cosmopolitan genus with a very few, variable species. The Chatham specimen is distinctive in possessing solely exeote spicules; Australian specimens of the genus all fall into *D. müilleri* which has a monact to hexact spicule complement.

Two species, *Leiosella levis* and *Polyfibrospongia australis,* are redescribed from earlier works by Lendenfeld, whose descriptions were pronounced unrecognisable by de Laubenfels (1948). In both cases, the specimens are easily identifiable with Lendenfeld's descriptions.

Dendrilla cactus is widely distributed throughout Australian seas, the Ceylon area and the Antarctic, but until now has not certainly been collected from New Zealand.

Dysidea fragilis is cosmopolitan; this is the second record of the species from New Zealand.

Previous records of Keratosa from the Chathams are:

Euspongia irregularis var. *silicata* Lendenfeld (now *Spongia zimocca* sub-sp. *irregularis*)

and

Thorecta meandrinus Lendenfeld (now *Thorecta murrayi*)

All specimens described are to be deposited in the Canterbury Museum. All colour notations given refer to Munsell's Colour Charts. (1942)

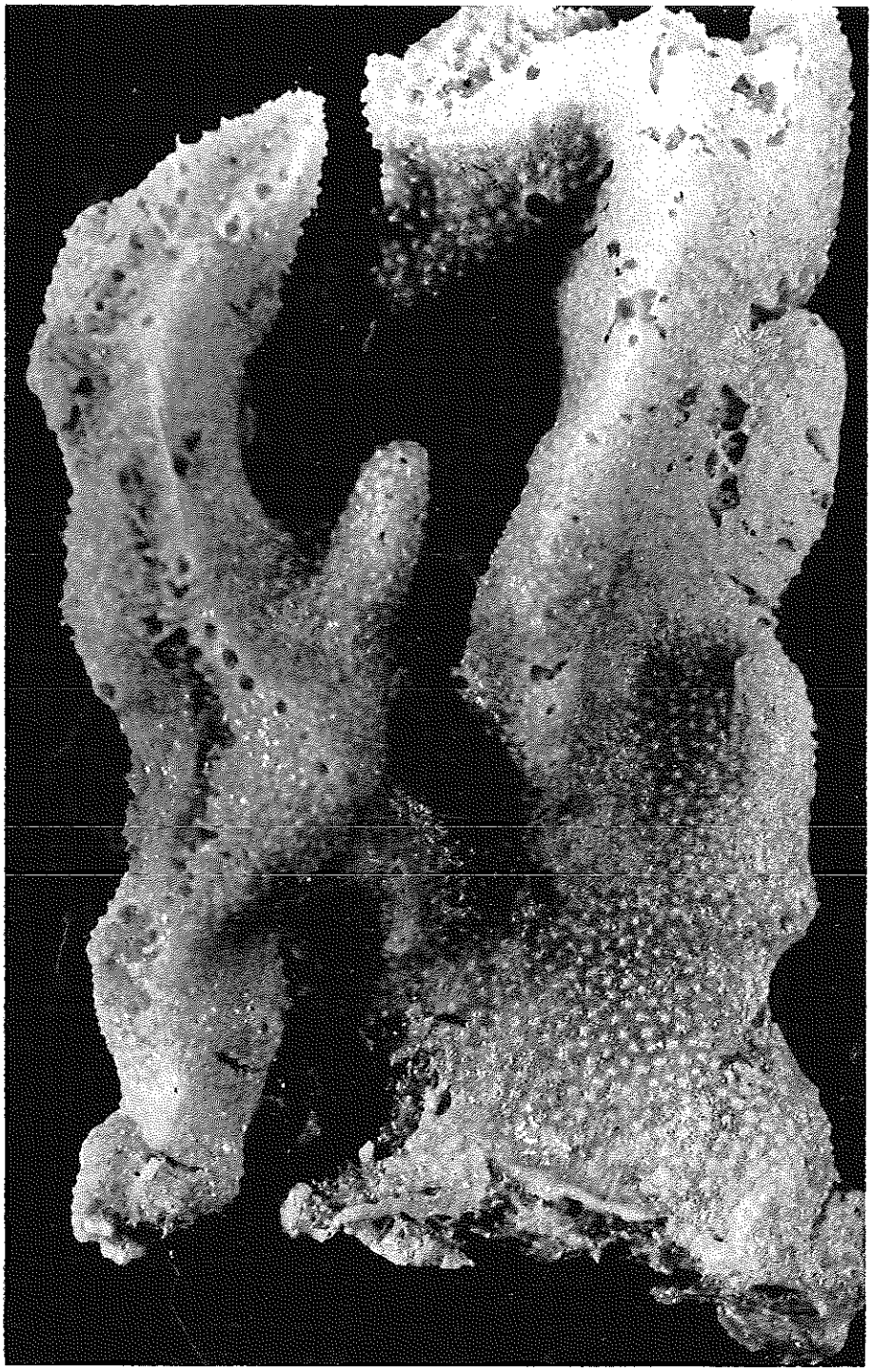

Fig. 1a: *Leiosella levis* (Lendenfeld).

LIST OF SPECIES

Order **KERATOSA** Grant

Family SPONGIIDAE Gray

Sub-Family SPONGIINAE de Laubenfels

Leiosella levis Lendenfeld

Polyfibrospongia australis (Lendenfeld)

Family DYSIDEIDAE Gray

Dysidea fragilis (Montagu)

Eurypongia arenaria nov. sp.

Dendrilla cactus (Selenka)

Family APLYSILLIDAE Vosmaer

Darwinella oxeata nov. sp.

SYSTEMATIC ACCOUNT AND DESCRIPTION OF SPECIES

Family SPONGIIDAE Gray

Sub-Family SPONGIINAE de Laubenfels

Genus **Leiosella** Lendenfeld

Leiosella levis (Lendenfeld) (fig. 1a, b)

Euspongia levis Lendenfeld, 1886.

Leiosella levis Lendenfeld, 1889, p. 213, pl. 12, fig. 14; pl. 15, fig. 6; pl. 20, fig. 14.

Locality

Sta. 6, Chatham Rise; 220 fm. (3 specimens).

Description

Massive, irregularly lobose sponges, the smallest specimen 7 cm high, 5 cm wide, 2 cm thick, the largest 12 cm high, 7 cm wide, the various lobes 1–1·75 cm thick.

The surface is minutely conulose, the hemispherical conuli coinciding with the apices of the primary fibres. Conuli are 0·25–0·3 mm high, and regularly spaced 0·3–0·5 mm apart over the whole surface save in the immediate vicinity of oscula.

Oscula may occur anywhere over the surface, but are chiefly confined to the ridges; they range from 0·5 to 2·25 mm diameter. The texture is firm, rather elastic, fleshy; colour in spirit greyish-white externally, red-brown, (Munsell Y-R 6/4) internally.

Skeleton is a reticulation of primary and secondary fibres overlain at the surface by a dermal membrane 0·25 mm thick, which contains a regular network of sand grains. All primary fibres are fascicular, cored with detritus (spicule fragments, and sand grains). Secondary fibres are uniformly full of inclusions. The fibre network is roughly polygonal.

Fibre Dimensions

Primary	*Secondary*
87–121μ (mean 108μ)	48–62μ (mean 56μ)

There is a distinct sand cortex.

Flagellate chambers can only just be discerned, due to the poor state of preservation of the specimens. They appear to range from 13·0–23·18μ (mean 20·9μ) in diameter and are roughly spherical.

Remarks

Leiosella levis was pronounced unrecognisable except as to genus by de Laubenfels (1948).

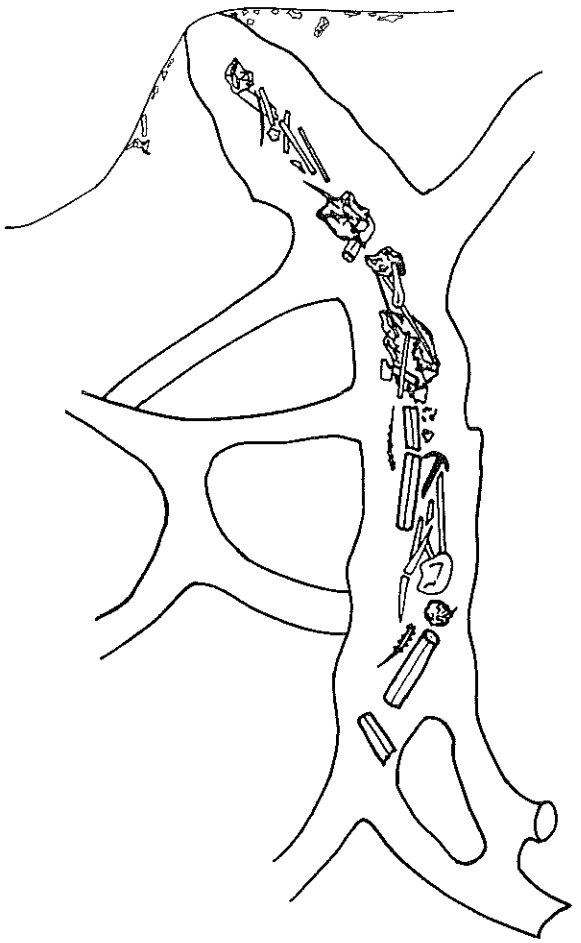

Fig. 1b: *Leiosella levis*, portion of skeleton showing primary and secondary fibres.

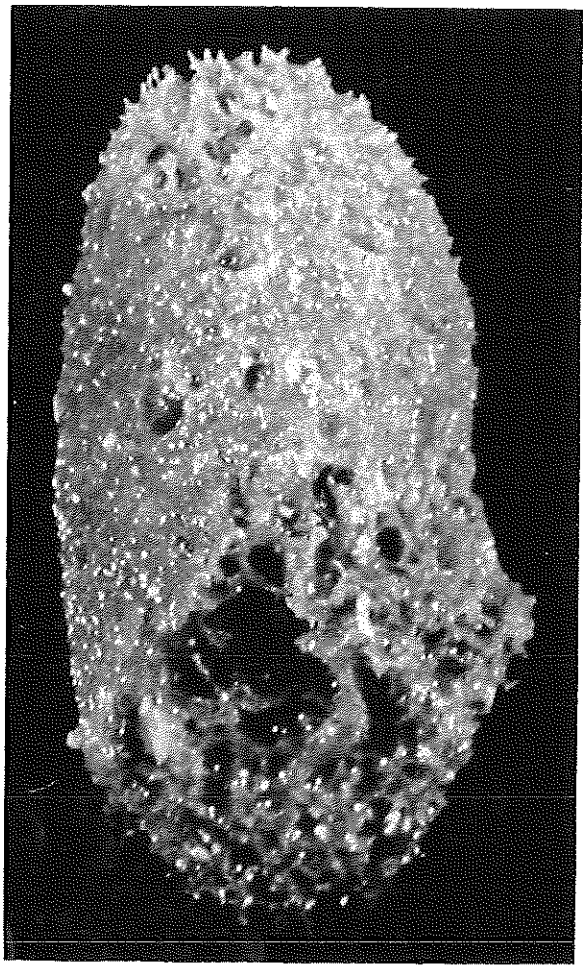

Fig. 2a: *Polyfibrospongia australis* (Lendenfeld).

Lendenfeld's description and figures (1889) appear adequate for the recognition of this species, particularly when considered in terms of de Laubenfels' more specific diagnosis of *Leiosella*. *L. levis* is consequently restored as a valid species of *Leiosella*.

Distribution

East, west and south coasts of Australia; 5–10 fm.

Genus **Polyfibrospongia** Bowerbank

Polyfibrospongia australis (Lendenfeld) (new comb.) (fig. 2a, b)

Stelospongos levis Hyatt, 1877, p. 530, pl. 15, fig. 16.
Stelospongos levis, var. *rotundus*, Hyatt, 1877, p. 530, pl. 17, figs. 23, 24.
Stelospongus levis Carter, 1885, p. 303.
Stelospongia australis Lendenfeld, 1886, p. 166.
Stelospongia australis, var. *conculata?*, Lendenfeld, 1889, p. 516, pl. 25, fig. 3; pl. 29, fig. 3; pl. 30, figs. 12, 13; pl. 31, figs. 2, 8.

Locality

Sta. 3, Mernoo Bank, 41 fm.

Description

A small, cylindrical sponge 2·2 cm high, 1 cm diameter. The surface is almost smooth; the conuli formed by the ends of the primary fibres, only just protect. The meshes of the skeleton form a regular rectangular pattern at the surface, the meshes are 0·25–1 mm in diameter externally, up to 2·5 mm internally.

Oscula are level with the surface and range from 1 to 2 mm in diameter.

The texture is soft, compressible but elastic, the colour in the dried specimen is a rich golden brown (YR 3/4).

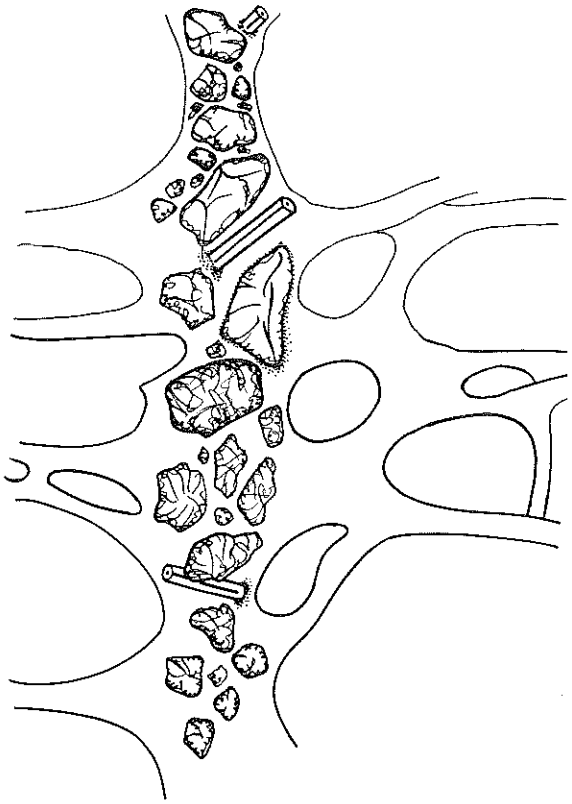

Fig. 2b: *Polyfibrospongia australis*, portion of skeleton showing primary and secondary fibres.

The skeleton is a reticulation of fascicular, trellised, cored, primary fibres and uncored slender secondaries. Inclusions in the primary fibres are chiefly sand grains; a few spicule fragments are present. A plumose configuration is formed by the ascending fibres.

Fibre Dimensions

	Nodes	Normal Diameter	
Primary fibres	145–180μ	63–106μ	(mean 90μ)
Secondary fibres		22– 48μ	(mean 31·9μ)

The outlines of the primary fibres are extremely wavy and irregular, their shape depending largely on the type of coring material.

No accurate measurements could be made of flagellate chambers; all indications are that they are small, about 20–25μ in diameter.

Remarks

Since the allocation of this specimen to the Spongiidae depends largely on measurement of flagellate chambers and since these are not preserved intact, there is a possibility that this diagnosis may prove to be wrong. All published accounts of the genus *Polyfibrospongia* seem, however, to admit this specimen easily.

Lendenfeld's *Stelospongia australis* was designated unrecognisable by de Laubenfels (1948) except as *Polyfibrospongia*. Allowing for variation in external form, it seems to me highly probable that this specimen is typical of the *S. australis* var. *conulata* group which has been previously recorded from Dunedin by Lendenfeld.

Family DYSIDEIDAE Gray

Genus **Dysidea** Johnston

Dysidea fragilis (Montagu) (fig. 3a, b)

For synonymy see Burton, 1934, p. 583; de Laubenfels, 1948, pp. 137–142.

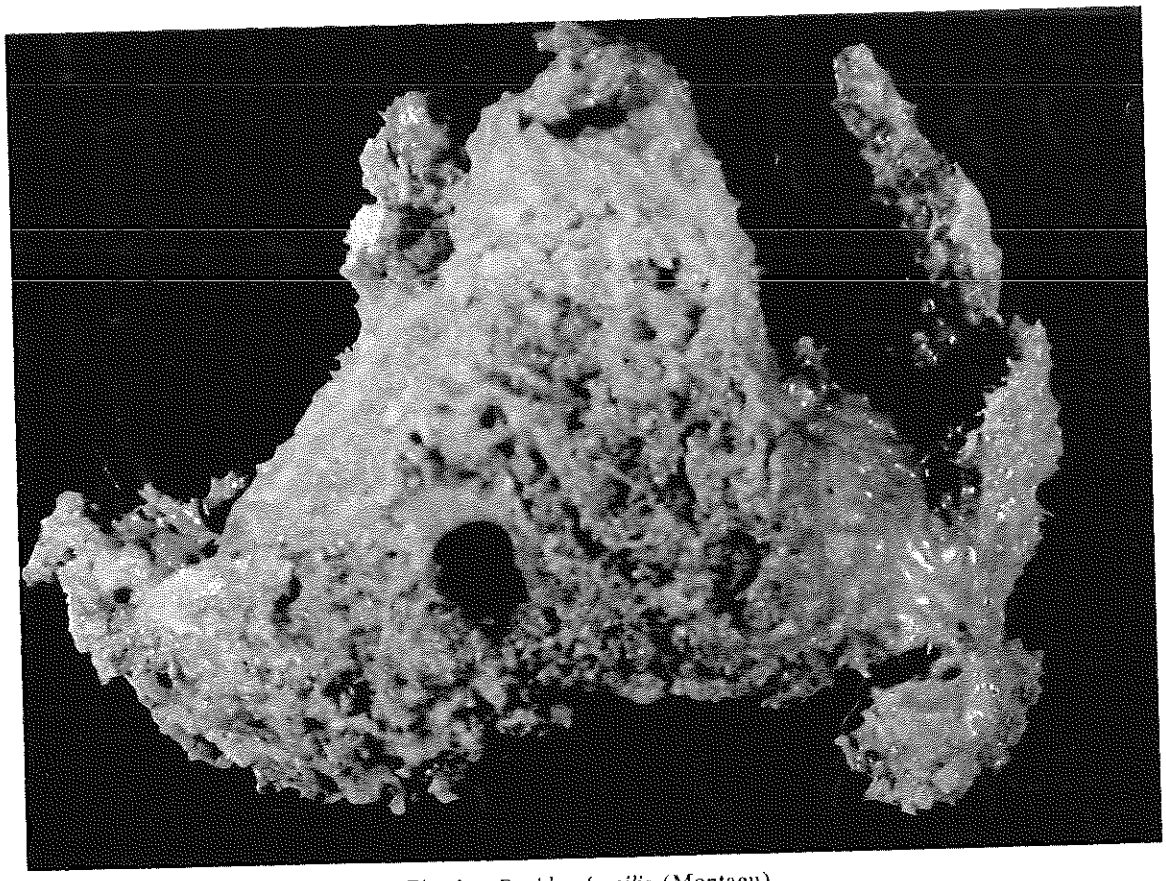

Fig. 3a: *Dysidea fragilis* (Montagu).

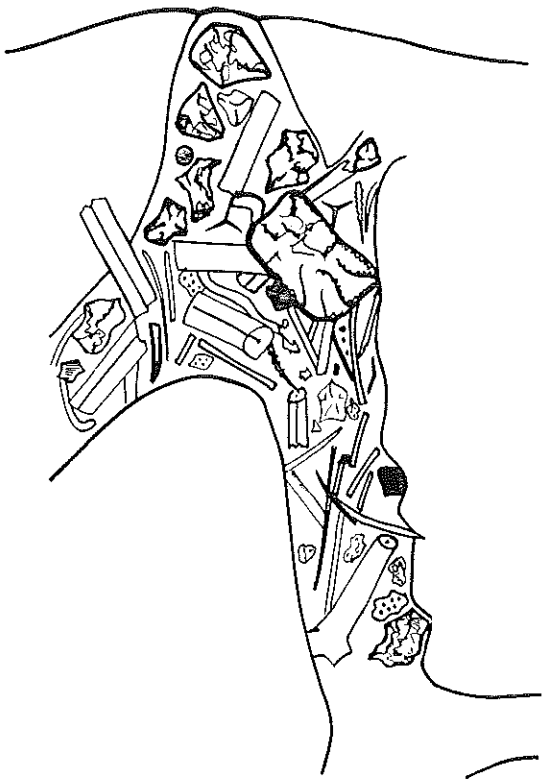

Fig. 3b: *Dysidea fragilis*, portion of skeleton showing primary and secondary fibres.

Locality

Sta. 3, Mernoo Bank; 41 fm.

Description

An irregular specimen 5 cm long, 3 cm wide, with cylindrical processes rising from the basal mass. At the apex of each cylinder is a single osculum 1–1·5 mm in diameter partially closed by a thin membrane. The surface is conulose, conuli up to 3 mm high and 1–3 mm apart. Colour in life Munsell Y-R-Y 5/2, brownish-grey; in spirit Y-R-Y 7/2.

Primary and secondary fibres are densely cored with debris and much foreign matter lies in the interfibrillar regions.

Fibre Dimensions

Primary fibres 150–340μ.
Secondary fibres 35–48μ.

Flagellate chambers

60–80μ.

Distribution

Cosmopolitan.

Genus **Eurypongia** Row

Eurypongia arenaria nov. sp. (fig. 4a, b, c)

Locality

Sta. 14, Hanson Bay; 15 fm.

Description

A small, almost cylindrical sponge 2·9 cm high by 1·5 cm wide. The surface is conulose, conuli 1·5 mm high, 2–3·5 mm apart. Capping each conule is an agglomeration of sand grains, sparsely surrounded by spongin. This is an external continuation of each primary ascending fibre. A delicate dermal skeleton is present, regularly arranged between the conuli and giving a web-like appearance to the dermal membrane.

Oscula are scattered over the surface and are 0·4–0·5 mm in diameter; inhalant pores are present over the whole surface and give access to a series of subdermal cavities.

The texture is granular and incompressible as a result of the incorporation of quite coarse debris into the body of the sponge. Colour in life Munsell YR-Y 7/4, a biscuit colour; in spirit Y 8/2, dull yellow gray.

The skeleton is a definite reticulation of spongin fibres; primaries are cored with spicule fragments and the secondaries, branching at right angles to them, are free of any inclusions. As the mesh formed by the fibres is irregular, no measurement can be given.

Fibre Dimensions

Primary fibres 170–242μ.
Secondary fibres 38–121μ.

Flagellate chambers are eurypyllous and occasionally very large; average diameter is 86–120μ.

Remarks

This species is close in many respects to *E. lactea* Row, but the fibres are much stouter and the flagellate chambers considerably smaller. In the possession of sandy material capping the fibres it is reminiscent of *E. arenofibrosa* from West Australia, but in the New Zealand specimen well-marked conuli are retained.

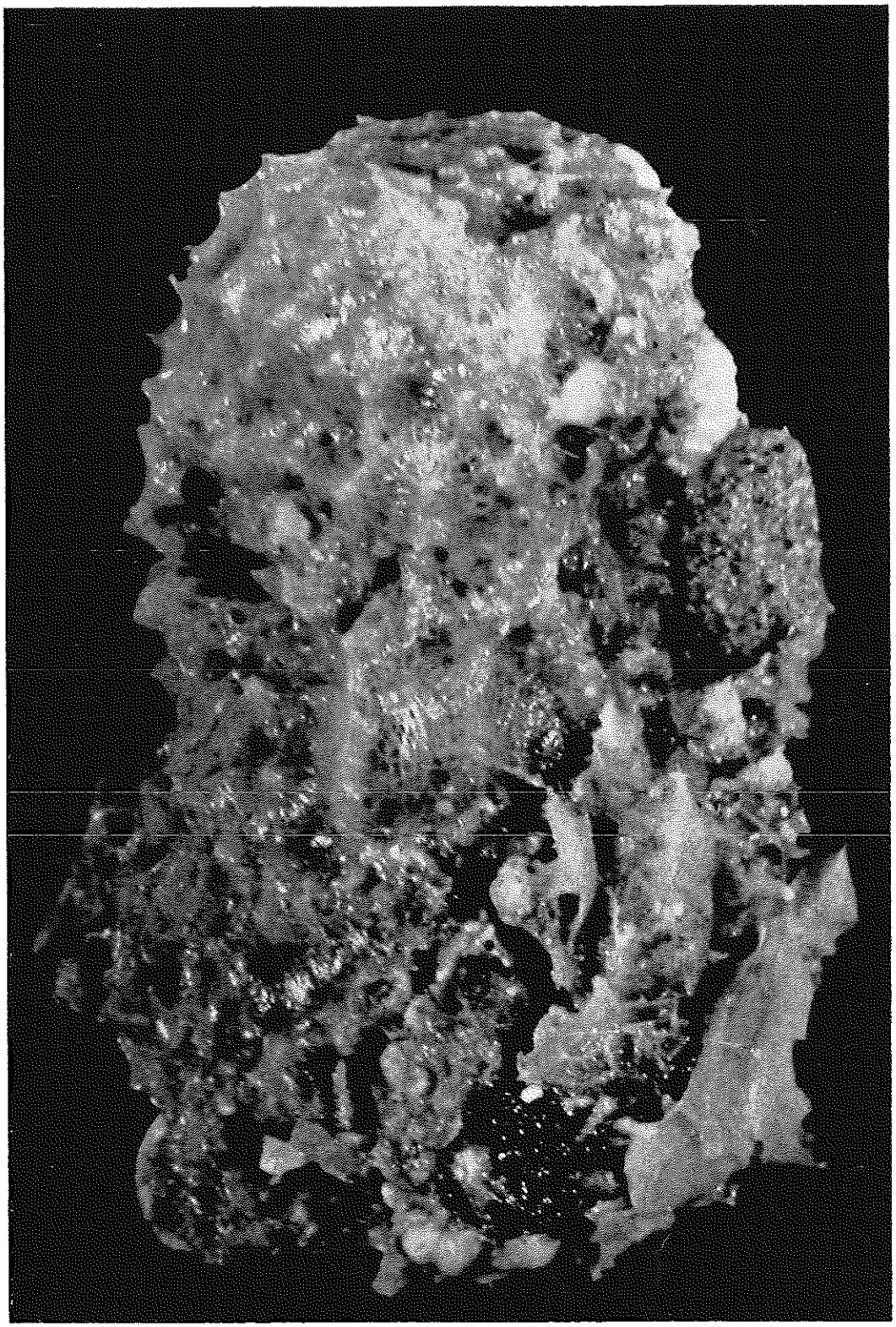

Fig. 4a: *Eurypongia arenaria* (nov. sp.).

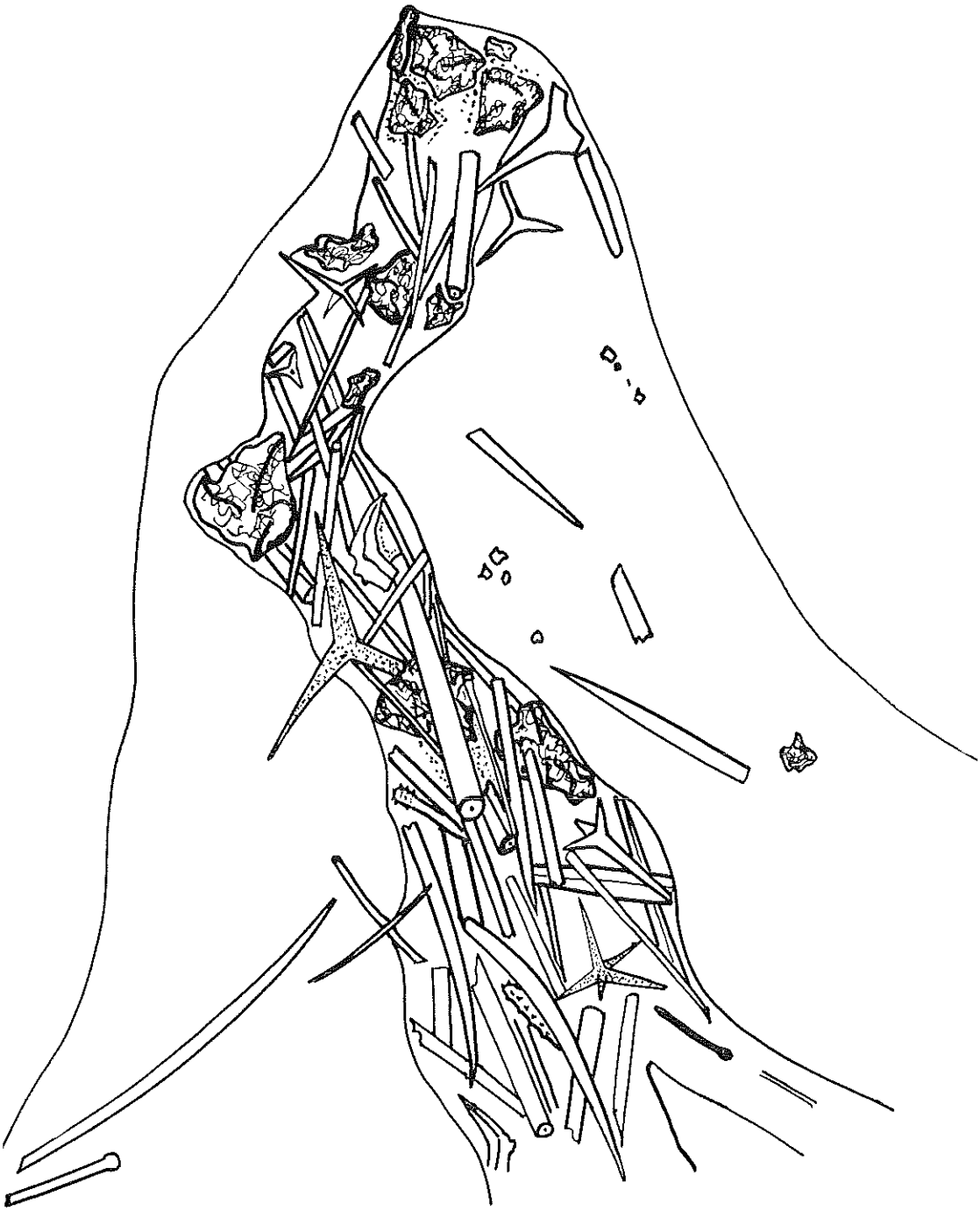

Fig. 4b: *Eurypongia arenaria*, portion of skeleton showing primary and secondary fibres. Primaries with irregular cap of sand grains.

Fig. 4c: *Eurispongia arenaria*, section (× 120) showing large flagellate chambers.

Genus **Dendrilla** Lendenfeld

Dendrilla cactus (Selenka) (fig. 5, a and b)

For synonymy see Burton, 1934, p. 595; de Laubenfels, 1948, pp. 152–153.

Locality

Sta. 6, Chatham Rise; 220 fm. (2 specimens).

Description

Few descriptive details are required for so well documented a species. The surface is conulose, externally very like a *Dysidea*; conuli are 3–5 mm high and irregularly spaced. The dermal membrane is delicate and spiculous.

None of the fibres contain any debris and the skeleton appears dendritic; occasional anastomoses

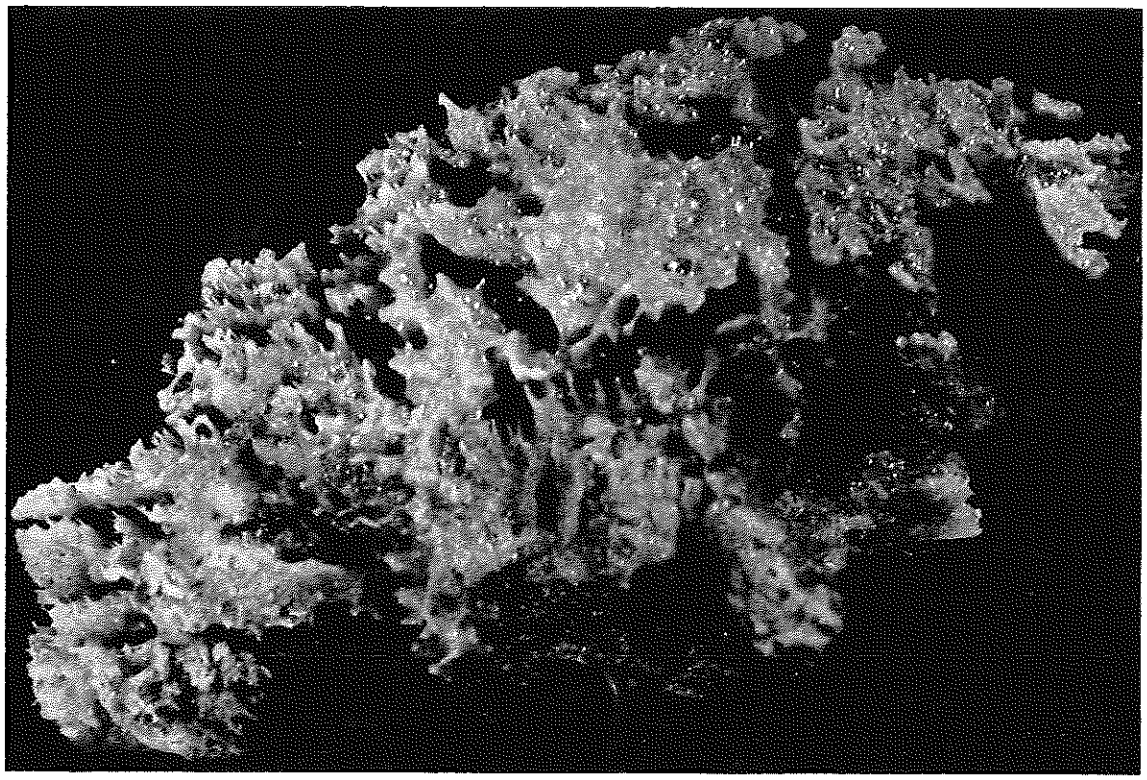

Fig. 5a: *Dendrilla cactus* (Selenka).

are discernible. A distinctive feature of these specimens is the presence of an armoured dermal region constructed entirely of spicule fragments.

Fibres taper somewhat as they branch, but there is no clear distinction between primaries and secondaries.

Range in fibre diameter is 4·8μ–4·9μ. Flagellate chambers are oval, 52–80μ long.

Distribution

Australia, Ceylon, Mediterranean (?), Antarctic and Subantarctic.

Family APLYSILLIDAE Vosmaer

Genus **Darwinella** Schultze

Darwinella oxeata (nov. sp.) (fig. 6a, b, c)

Locality

Sta. 14, Hanson Bay; 15 fm.

Description

A small, soft, semi-encrusting sponge, 2 cm long, 1 cm wide, 0·5 cm thick. The surface is smooth and skinlike; there are no oscula visible. The texture is soft and fleshy, the spongin skeleton accounting for very little of the body bulk. There is a distinct dermal region formed by the external skin. This layer is compact, 0·5 mm thick, and sharply demarcated histologically from the underlying layers.

The colour in spirit is a dark maroon (YR 3/4). It is, however, certain that the colour in life is identical, for red and brown sponge pigments are perfectly stable in alcohol.

As is typical of *Darwinella,* the skeleton includes spongin spicules. In this specimen the spicules constitute the bulk of a rather sparse skeleton. The main fibres are dendritic, uncored, with distinctly concentric aplysillid construction. Diameter 106–193μ (mean 148μ). The spicules are dispersed randomly throughout the body of the sponge. Dimensions 0·530μ–2083μ (mean 1754·7μ) $\times$ 24·2–29·8μ.

It is the spicule structure which differentiates this species clearly from others described. Without exception, the spicules are oxeote, slightly wavy,

Fig. 5b: *Dendrilla cactus*, section (× 65) showing dendritic skeleton.

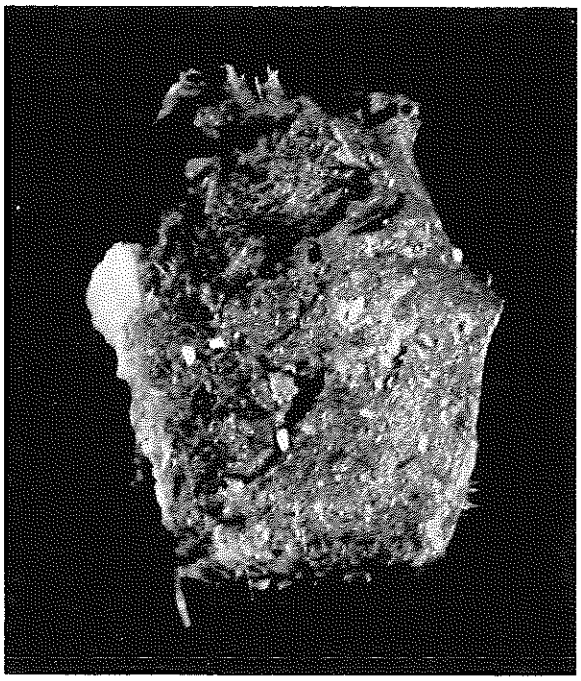

Fig. 6a: *Darwinella oxeata* (nov. sp.).

with small projections (3·5μ long) scattered over all but the middle third of the spicule.

Flagellate chambers are small, 50–60μ in diameter.

Remarks

This species and *D. gardneri* Topsent 1905 are the only species of *Darwinella* described with solely diactinal spicules. De Laubenfels (1948) relegates *D. gardneri* into *D. mülleri,* arguing that there is, even within the sponge, great variation in spicule structure. I can not say that this is not correct for *gardneri,* but it certainly is not so for *D. oxeata.* In the Chatham specimen the spicules have small surface projections, giving them a weakly roughened appearance. This feature is thus far unique in *Darwinella* and in combination with the uniformly oxeote spicules gives sufficient justification for holding this specimen apart from *D. mülleri.*

ACKNOWLEDGMENTS

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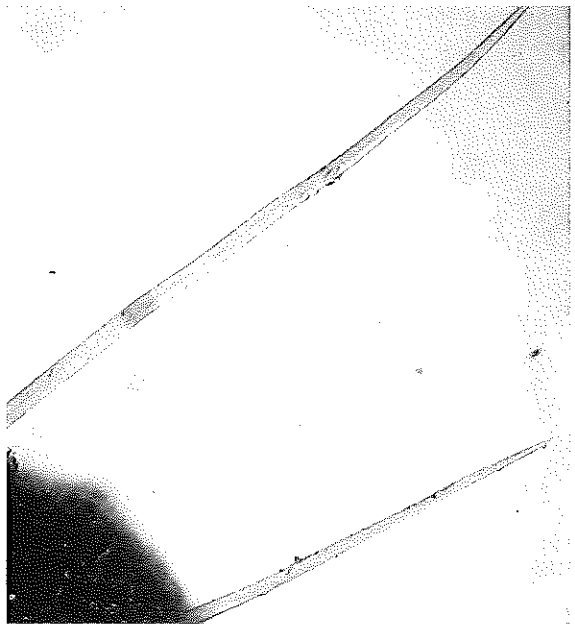

Fig. 6b: *Darwinella oxeata,* (× 100), spongin spicules.

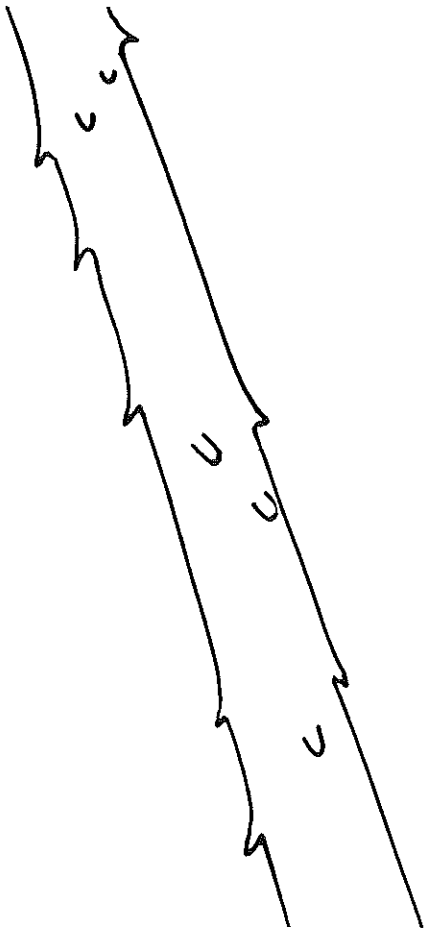

Fig. 6c: *Darwinella oxeata*, portion of spicule showing surface texture (× 500).

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