SPONGES

BY

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The following report on the sponges collected by the expedition of T. R. H. the Prince and Princess Leopold of Belgium comprises the 28 species mentioned below :

Stelletta clavosa RIDLEY;
Donatia diploderma (O. SCHMIDT);
Spirastrella vagabunda RIDLEY;
Chondrilla sacciformis CARTER;
Tetilla enoi nov. sp.;
Jaspis bandae nov. sp.;
Terpios fugax DUCH. and MICH.;
Reniera cinerea GRANT;
Reniera pulvinar TOPSENT;
Chalina bandae nov. sp.;
Chalina sorongae nov. sp.;
Cladochalina doorae nov. sp.;
Cladochalina lobata (RIDLEY);
Toxochalina robusta RIDLEY;
Echinodictyum pulchrum nov. sp.;
Clathria lendenfeldi RIDLEY and DENDY;
Rhaphidophlus orientalis nov. sp.;
Rhaphidophlus cervicornis THIELE;
Halichondria panicea PALL.;
Stylotella suberitoides nov. sp.;
Dendrilla rosea LENDENFELD var. *digitata* (CARTER);
Spongelia fragilis (MONT.);

Spongelia elastica SCHULZE;
Euspongia officinalis LINNÉ;
Phyllospongia papyracea (ESPER);
Phyllospongia vermicularis LENDENFELD;
Ianthella flabelliformis (LINNÉ);
Aplysina purpurea CARTER.

8 species are described as new. The remaining 20 species have all been recorded from various places in the Indo-Australian area, it will therefore not surprise to find them in the East Indian waters.

The material is dry or preserved in spirit. Several of the specimens are exceptionally beautiful.

I wish to express here my sincere thanks to Prof. Dr. VAN STRAELEN for handing me over this interesting sponge collection for examination.

TETRAXONIDA

STELLETTIDAE.

Stelletta clavosa Ridley.

1884. *Stelletta clavosa* Ridley (11), p. 474.
1888. *Myriastra clavosa* Sollas (14), p. 116.
1897. *Myriastra clavosa* Topsent (16), p. 433.
1905. *Myriastra clavosa* Dendy (6), p. 72.

Mansfield Eiland, 1-III-1929. Nr. 15. In spirit.

One kidney-shaped specimen, 1,5 × 0,8 cm. Surface smooth; osculum at the concave surface, 1,5 mm. in diameter. Consistence compressible, colour light gray. Cladi of *anatriaenes* 40-60μ, of *triaenes about* 84μ, of *dichotriaenes :* protocladi 96μ, deuterocladi 90μ. *Oxea* 1800-2400μ. *Chiaster* 7-15μ in diameter, the bigger ones mostly found in the interior of the sponge.

Geographical distribution ranging from Ceylon to the waters North of Australia.

DONATIIDAE.

Donatia diploderma (O. Schmidt).

1870. *Tethya diploderma* Schmidt (13), p. 52.
1924. *Donatia diploderma* Burton (1), p. 1033.

Several specimens. Banda Neira, 24-II-1929. Nr. 1*d*. Nr. 2*a*, *b*. Nr. 4; two specimens on algae; six specimens, 1-2 cm., spherical shape, three of them with smooth, three with scaly surface; one specimen with a gemule. Sorong door, 2-III-1929. Nr. 20. Nr. 22. Nr. 24 three specimens. All specimens preserved in spirit.

Burton (1924) is certainly right in stating : « The genus *Donatia*, itself so singularly well defined, contains a number of species which approximate so closely one to the other that their definition becomes a matter of almost insuperable difficulty ». It certainly is. In using Burton's valuable little paper above quoted I was still unable to determine with certainty the specimens in hand, although I think they will come very near to *Donatia diploderma* as bordered by Burton.

The specimens conform with *D. diploderma* in having two sets of normally developed micrasters (fig. 1, 2), viz. *cortical tylasters* and *somal oxy-tylasters.*

The fact that the latter category has tylote rays should, in accordance with Burton's definition, exclude the specimens from *diploderma* and approach them to *D. japonica;* but in this latter species-still in accordance with Burton-only one type of micraster is present, a tylaster; but in the specimens in hand the two types of tylasters are certainly separate, no intermediate forms have been found. Moreover, the oxy-tylasters are here closely related to simple oxyasters which is shown by the fact that several of them are not yet provided with terminal

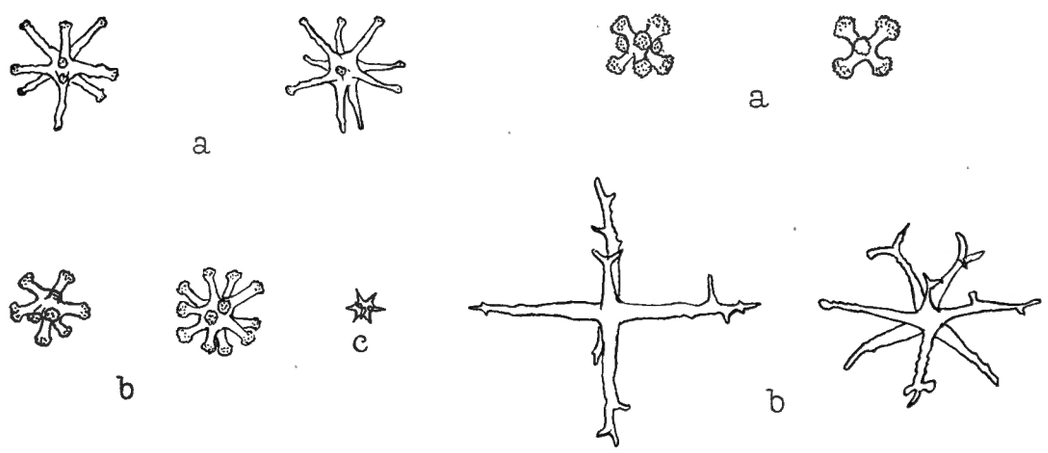

FIG. 1-2. — *Donatia diploderma* (SCHMIDT).
FIG. 1. — *a*, somal oxytylasters. *b*, cortical tylasters. *c*, young aster.
FIG. 2. — *a*, cortical tylasters. *b*, somal oxyasters.

knobs; I am much inclined to regard them as spicules not yet entirely grown. In the species from Banda Neira the dermal *tylasters* range from 10-18μ, the *somal oxy-tylaster* from 15-30μ. In the specimens from Sarong door the *oxy-(tyl)asters* have split ends and reach a largeness of ca. 40μ.

It is to be considered, whether *Donatia japonica* is not synonymous with *D. diploderma.*

GEOGRAPHICAL DISTRIBUTION : Atlantic, Indian, Pacific Ocean.

SPIRASTRELLIDAE.

Spirastrella vagabunda RIDLEY.

1884. *Spirastrella vagabunda* RIDLEY (11), p. 468.
1897. *Spirastrella solida* TOPSENT (16), p. 440.
1921. *Spirastrella vagabunda* DENDY (8), p. 139.
1925. *Spirastrella vagabunda* WILSON (18), pp. 343-346.

Mansfield Eiland, 1-III-1929. Nr. 12. In spirit.

Of this rather polymorphic species there is a big anastomosing, lumpshaped specimen, 10 × 15 × 5 cm. The *tylostyli* (or *styli*) are from 280-600μ × 10-16μ. The *spirasters* about 15 × 1μ (without spines).

GEOGRAPHICAL DISTRIBUTION : Common in the Indian Ocean and adjacent eastern waters.

CHONDROSIDAE.

Chondrilla sacciformis CARTER.

1879. *Chondrilla sacciformis* CARTER (4), p. 299.
1916. *Chondrilla sacciformis* DENDY (7), p. 268.

Mansfield Eiland, 1-II-1929. Nr. 16. In spirit.

One specimen, 2 × 3 cm., 3-4 mm. thick. The big *asters* are 120-130μ in diameter; many of them have corrugated rays.

GEOGRAPHICAL DISTRIBUTION : Indian Ocean.

TETILLIDAE.

Tetilla enoi nov. spec.

Eiland Enoe (Aroe), 24-III-1929. Nr. 9. Holotype. In spirit.

One specimen, cavernous, pierced by tunnels excavated by worms; this has moulded the sponge into a curious folded and sheathed shape; dimensions

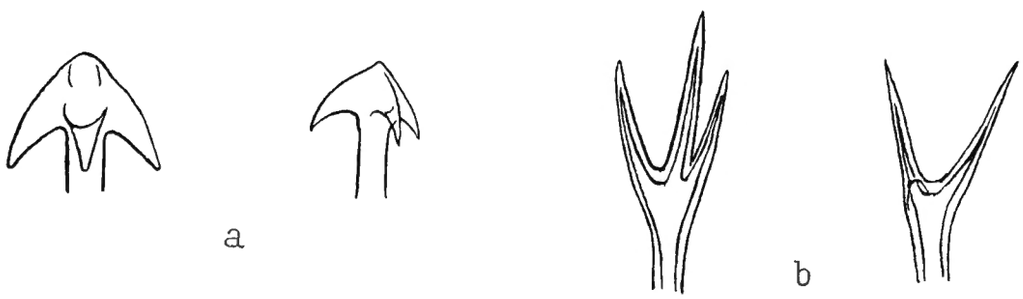

FIG. 3. — *Tetilla enoi* nov. spec.
a, anatriaenes. *b*, protriaenes.

2 × 3 cm. Colour light gray, consistance soft. True apertures of the sponge itself could not with certainty be detected.

The skeleton is that of a typical *Tetilla :* a rather dense feltwork of spicules radiating towards the surface; the fibres are built up of straight oxea and triaenes, both ana- and protriaenes, the cladi of which are lying near to, or

even in the outermost layer of the sponge. The innermost parts of the triaenes are curved and interwoven with one another and with the oxea, so giving the whole texture a felt-like consistence. This mode of skeletal structure is *Tetilla*-like to a degree leaving no doubt as to the right genus-determination.

SPICULES :

1. *Oxea,* straight, fusiform, varying in length from about 1200 × 12μ to about 2200 × 20μ; in the interior of the sponge-body their ends may be somewhat curved.

2. *Protriaenes;* the shaft may attain a length of 4000 × 6μ; they are mostly strongly curved. The three small cladi (fig. 3*b*) are 25-40μ long, sometimes of unequal length; they are rather scarce.

3. *Anatriaenes;* the shafts are of about the same dimensions as those of the protriaenes; the three small claw-shaped cladi (fig. 3*a*) are 15-22μ in straight line from the shaft to the tip of the cladus.

4. *Spheres,* about 1-2μ, not very numerous.

Sigmata do not seem to be present.

Perhaps this species will by further discoveries prove to be a liposigmatous variety of some other already known species.

EPIPOLASIDAE.

Jaspis bandae nov. spec.

Banda Neira, 23-II-1929. Nr. 52. Dry.

One beautiful specimen, about 35 × 20 × 10 cm. (fig. 4, 5). The body is subglobular; several stalked outgrowths from the sponge have connected it with the supporting substrate, a coral, the skeleton of which in pieces still adhere to the surface of the sponge. The upper surface is furnished with warty prominences, most closely set and largest at the free upper margin; at the older part of the sponge and at the lower surface the valleys between the warts have been raised by subsequent growth almost to the level of the tips of the warts, so that these have almost vanished. The surface is harsh to the touch, and in the dry condition quite as if it were powdered.

The inhalant openings are only to be seen with a strong hand-lens; they are situated mostly on the warts; the exhalant openings are very numerous and very large; they are placed everywhere in the valleys between the warts; they are often subdivided, the subdivision in reality being produced by several efferent canals opening into a mutual, shallow efferent chamber. The consistence of the sponge is quite stony, the body, when hammered with a hard object, giving sound as a piece of hard wood.

The *skeleton*, accordingly, is very compact; it consists of longitudinally arranged fibres or rather spicula-tracts lying closely together, thus giving the impression that the sponge-body is quite filled up with spicules mostly lying parallelly with the direction of the fibres; only in the interior of the warts the skeleton is rather loose, consisting of rather few spicules lying isolated and in

FIG. 4-5. — *Jaspis bandae* nov. spec.
FIG. 4. — Upper surface. — FIG. 5. — Lower surface.

every direction; here also is located a collective efferent canal. The main fibres or tracts sometimes reach the surface at very acute angles, they sometimes run parallel with and touch the dermal skeleton.

The *dermal skeleton* consists of microxea placed at different angles to the surface; the crust is about 120-150μ thick.

SPICULES :

1. *Oxea* (fig. 6*a*), large, building up the main fibres; slightly bent in the middle, tapering into sharp-pointed apices; sizes about 1000-1200μ are most common, thickness about 35-40μ.

2. *Styli* (fig. 6*b*), large, apparently only abbreviated oxea; they are placed in

the main fibres; length about 800-900μ, thickness the same as that of oxea; these spicules are rather scarce.

3. *Microxea* (fig. 6*c*), mostly accompanying the large oxea in the main fibres, but also placed in the soft interior and in the dermal skeleton; the surface is slightly roughened; the spicules sometimes show a tendency to be centrotylote; the are slightly curved, tapering evenly from the middle to both sides; length very variable, commonly about 120-150μ × 4-5μ.

4. *Microxea* (fig. 6*d*), mostly centrotylote, with slightly roughened to more or less spined surface; size very variable, commonly about 25-28 × 3-4μ (but may go down to 9 × 3μ and intermediate spicules (fig. 6*e*) with 3) occur rather abundantly.

5. *Strongylaster* to *tylaster* (fig. 6*f*, *g*), with sligthly roughened rays; number of rays commonly 8-12μ; entire diameter of aster 15-25μ.

The asters and smaller microxea are found in the dermal crust of the sponge and in tracts in the interior.

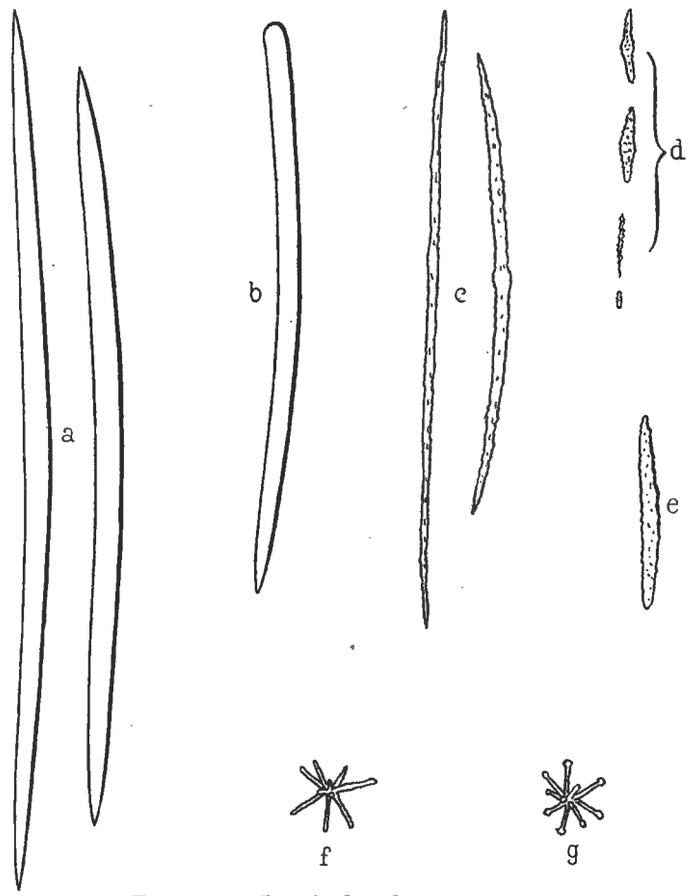

FIG. 6. — *Jaspis bandae* nov. spec.

a, oxea in main fibres. *b*, styl. *c*, microxea. *d*, microxea, small forms. *e*, oxe, intermediate form. *f*. strongylaster. *g*, tylaster.

SUBERITIDAE.

Terpios fugax Duch. & Mich.

1864. *Terpios fugax* Duchassaing and Michelotti (9), p. 2.
1900. *Terpios fugax* Topsent (17), p. 193.

Mansfield Eiland, 1-III-1929. Nr. 14. In spirit.

One specimen, somewhat macerated, incrusting many foreign bodies, mostly corallo-débris, as a 0,5-1 mm. thick ligth-gray layer. The skeleton is comparatively dense with tendency to form wisps and fans.

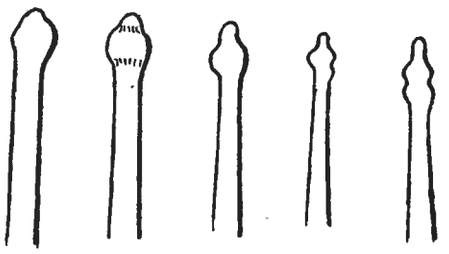

Fig. 7. — *Terpios fugax*, Duch. & Mich.
Heads of tylostyli.

This is a very difficult sponge to determine with certainty, having only few and vague characters. The general make-up of the specimen in hand justifies the determination. I am, however, quite aware that the spicules here are a good deal larger than is generally the case in this species, viz. from 260-700μ, commonly about 400μ.

Geographical distribution : Altantic, Indian Ocean.

HAPLOSCLERIDAE.

Reniera cinerea Grant.

Eiland Enoe (Aroe), 24-III-1929. Nr. 10. In spirit.

Oxea 120 × 7μ forming an unispicular reticulation tending towards triangular meshes united with a small amount of spongin at the internodes. There is no difference between main and dermal skeleton.

Lampasing (Lampong, Sumatra), 12-IV-1929. Nr. 26. In spirit.

One specimen, somewhat branching, 8 cm. high, oscules serially arranged, 1 mm. in diameter. The skeleton shows tendency to fibre-building, and there

is a little more spongin than in the foregoing specimen. The *oxea* about 145-160 × 9μ.

Lampasing (Lampong, Sumatra), 12-IV-1929. Nr. 27. In spirit.

Some branched fragments, up to 7 cm. long, on shells. The *oxea* are 108-115μ × 5-6μ.

GEOGRAPHICAL DISTRIBUTION : Cosmopolitan.

Reniera pulvinar TOPSENT.

1897. *Reniera pulvinar* TOPSENT (16), p. 475.

Poelo Enoe (Aroe), 24-III-1929. Nr. 45. Dry.

Two specimens. The skeleton and oxea seems to correspond fairly well with Topsent's *pulvinar*. But the outer growth is very different, being encrusting in the type, branching in the specimens in hand and with spinulous surface. There seems to have been no special dermal skeleton. The oxea are rather variable in size, from about 220-360μ by 8-17μ, thus being somewhat smaller than the oxea in the type (300μ by 17μ to 415μ by 14μ).

It is with hesitation that I refer our specimens to this species; identification is not easy on account of the meagre descripion given of the type. Until further material in more satisfying condition for a closer examination is forthcoming, I think we must leave the specimens in hand here.

GEOGRAPHICAL DISTRIBUTION : East Indian waters.

Chalina bandae nov. spec.

Banda Neira, 24-II-1929. Nr. 3. In spirit.

Following Burton 1927, p. 505 f. I refer the specimens in hand to *Chalina* on account of the fact that a dermal skeleton is not at hand; else the species should in accordance with older tradition be named a *Pachychalina* on account of its thick multispicular fibres.

In reviewing the literature I find it impossible to identify our specimens with any known « species », although I am quite aware that they probably enough are identical with one or another named or described species. It must remain the task of investigators disposing over several type-specimens from time to time to redescribe insufficiently described types, and in so doing establish a sound and reliable synonymy. In the mean time it is the task of all spon-

giologists to give reliable descriptions of found specimens, and rather too many new descriptions than too few and scanty.

Four fragments, presumably of the same individual. Cylindric, slender stems giving off branches of the same thickness which in places do anastomose. Length of biggest fragment 11 cm., thickness 1,5-2 mm. Consistence elastic. Colour violet. Surface somewhat ruggish on account of the minute groves which have been built by the dermal membrane which by the conservation in spirit has sunk down between the skeletal fibres. The oscules, about 0,5 mm. in diameter, are found in several places at the sides of the body.

FIG. 8. — *Chalina bandae* nov. spec.
Main skeleton.

FIG. 9.
Chalina bandae nov. spec.
Oxea.

Skeleton (fig. 8). There is no difference between a main and a dermal skeleton. Primary and secondary fibres cannot be separated. Thickness of fibres vary between 22 and 60μ, commonly about 35μ; in the dermal part of the skeleton where new fibres are being formed much thinner fibres are of course found. In the dermal membrane intself many isolated spicules are found; elsewhere the spicules are mostly imbedded in the spongiolin-fibres, lying multiserially, 10-20 side by side.

The spicules are slender and delicate *oxea* (fig. 9), rather uniform in shape and size; slightly bent, mostly gradually tapering to the sharp points, often,

however, with the apices rather sharply set off. Size 80-90μ × 2,5-3μ. It is a curious fact that the isolated dermal *oxea* are often a little thicker than those imbedded in the fibres.

Chalina sorongae nov. spec.

Sorong door (Nova-Guinea), 23-III-1929. Nr. 18. In spirit. Type-specimen same locality. Nr. 23. In spirit.

Mansfield Eiland, 1-III-1929. Nr. 13*b*. In spirit.

Poelo Enoe (Aroe), 24-III-1929. Nr. 46. Dry.

The body is somewhat flattened, irregular, growing on some coralbranches; dimensions about 8 × 2,5 × 1 cm. Surface mostly smooth, in a few places it is conulous; the conules are about 0,5 mm. high, 1-2 mm. apart. This feature is

FIG. 10. — *Chalina sorongae* nov. spec. Skeleton, vertical section.

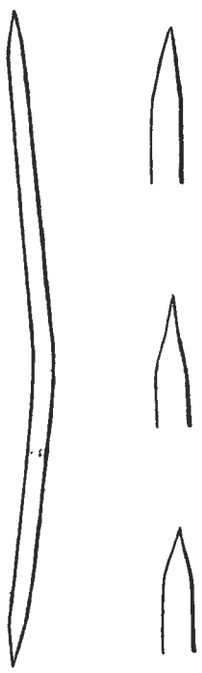

FIG. 11. — *Chalina sorongae* nov. spec. Oxea.

very interesting in so far as it gives warning not to draw too farreaching conclusions from the outer make up of a sponge.

Numerous oscules, about 4 mm. in diameter, are found. Several subdermal cavities can be seen with small orifices leading into them. Texture elastic, colour brown.

The *skeleton* (fig. 10) is made up of mostly quadrangular meshes; primary fibres curving towards the surface with secondary fibres connecting them; the primary fibres are separated one to three spicule's length from one another. Plenty of isolated spicules are lying pell-mell in the choanosome. The fibres are built up of spongin and spicules, but these two components partake in very varying degree; the primary fibres are commonly polyspiculated, with, say, 4-6 oxea in the row. The spongin is very pale.

There is no special dermal skeleton, but the primary fibres expand beneath the dermal membrane in tufts; it may be assumed that these outer spicules will come to serve partly as secondary fibre-builders along with the growth of the sponge.

The spicules are *oxea* (fig. 11), very slender, mostly 80-100μ × 2,5-3μ; the apices are set off rather abruptly; this feature seems to be rather constant.

The specimen Nr. 13*b* may be reckoned to the same species. It is a sponge building a 1 mm. thick coating layer about some macerated tubes of some chitineous sort; the sponge itself is also somewhat macerated. The skeleton corresponds fairly well with that of the type, only the amount of spongin is here much smaller, thus giving the skeleton a somewhat renieroid feature. The spicules are *oxea* of the same shape as in the type, only smaller, about 72 × 2,5μ.

Nr. 23 and 46 are also encrusting sponges, somewhat macerated; the *oxea* resembles those of the type.

Cladochalina doorae nov. spec.

Sorong door (Nova-Guinea), 2-III-1929. Nr. 25. In spirit.

One specimen, irregularly shaped, about 2,5 × 1 × 0,7 cm. A few oscules are seen, 1-2 mm. in diameter; consistence elastic, soft. Surface a little harsh. Colour gray-brown. Dermal cavities, close to one another, are easily seen through the dermal membrane.

The *dermal skeleton* is a fine tangential reticulation of unispicular spongin-fibres; the meshes are often quadrangulate, the sides being about 120μ long; the dermal fibres are about 12μ thick; each fibre building up a side of the meshes envelopes an ox. This fine dermal reticulation is connected with a stouter reticulation lying somewhat deeper; this reticulation is built up of a set of fibres which are stouter (about 25μ thick) and wider apart from one another, say 300-400μ; these fibres, constituting the main skeleton, are nearly all multispicular.

The *main skeleton* (fig. 12) consists of spongin-fibres just described, but they are growing thicker inward in the sponge-body; in the outer part of the sponge there can easily be distinguished primary fibres running more or less vertically towards the surface; but in the interior of the sponge the skeleton presents itself as a rather irregular reticulation of fibres growing up to 60μ in thickness.

The spicules are nearly straight *oxea* (fig. 13), about 90μ × 1,5μ. In the dermal reticulation they are finely pointed; in the main skeleton, especially in the coarse fibres, the points are blunt, the spicules thus tending to be strongylote.

FIG. 12. — *Cladochalina doorae* nov. spec.
Main skeleton.

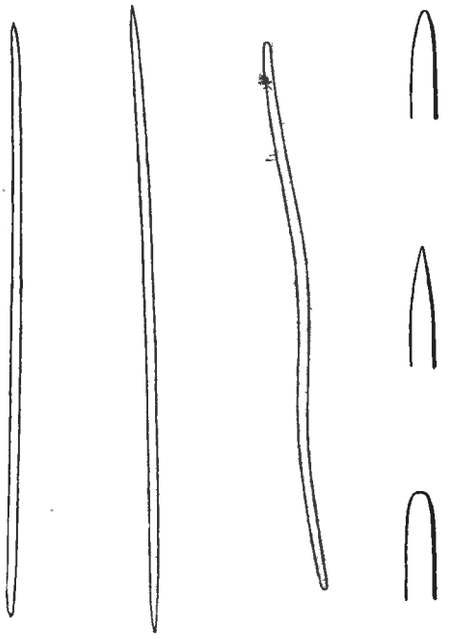

FIG. 13. — *Cladochalina doorae* nov. spec.
Oxea and strongyle.

Cladochalina lobata (RIDLEY).

1884. *Pachychalina lobata* RIDLEY (11), p. 404.
1887. *Pachychalina lobata* RIDLEY and DENDY (12), p. 22.
1927. *Cladochalina lobata* BURTON (2), p. 510.

Kemabaai (Celebes), 13-II-1929. Nr. 34*b*. In spirit.

One specimen, a fragment, part of a branched body, diameter of branch about 1 cm. Numerous oscules. The specimen corresponds fairly well to the type. The skeleton is rather confused, nearly halichondrioid; only few tri-or quadrangular meshes are clearly outstanding in the main skeleton; in contradiction to this vague character of the main skeleton the dermal skeleton is so very characteristic, that I do not hesitate to ascribe the specimen in hand to the species *lobata*.

The *oxea* are 150-160μ × 8-9μ.

GEOGRAPHICAL DISTRIBUTION : Australian and adjacent waters.

Toxochalina robusta Ridley.

1884. *Toxochalina robusta* Ridley (11), p. 403.
1887. *Toxochalina robusta* Ridley and Dendy (12), p. 50.
Sorong door, 2-III-1929. Nr. 50. In spirit.

The specimens in hand may well come into the variational range of the above species.

The specimens are growing on corals; they are of irregular shape with tendency to form either barrel-shaped bodies or sometimes more slender bran-

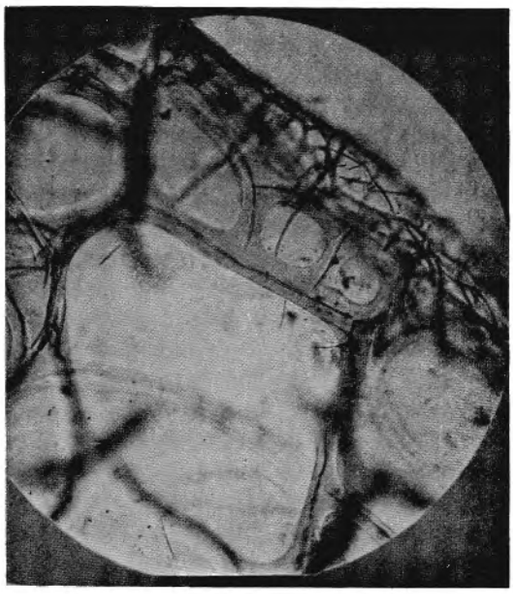

Fig. 14. — *Toxochalina robusta* Ridley. Skeleton, vertical section.

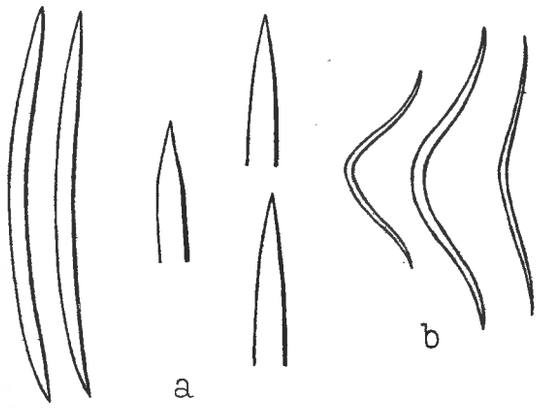

Fig. 15. — *Toxochalina robusta* Ridley. *a*, oxea. *b*, toxa.

ches; they are a few cm. in length and up to 1 cm. thick. The habitus so ressembles that of many *Reniera*-species. Surface even. Several oscules, 1-2 mm. in diameter; the spacious subdermal cavities are easily seen through the dermal membrane. Texture elastic. Colour yellow to light brown.

The *dermal skeleton* (fig. 14) is a fine-meshed reticulation of spongin-fibres with uniserially arranged oxea; the sides of the meshes are rarely of one spicule's length; the meshes are generally tri-or quadrangular; the fibres are about 18μ thick, except at the internodes, where they are much thicker. In the dermal membrane numerous toxa are scattered.

The *main skeleton* is connected with the dermal one by short vertical columns of about 50μ length. It consists of fibres of various stoutness; it is impossible to discern between primary and secondary fibres, the whole skeleton being somewhat confused, though in places the tendency to become quadran-

gularly meshed with fibres vertical to the surface is unmistakable. 40μ is a common thickness of the fibres. The oxea are placed uni-or polyserially in the fibres.

The spicules are : 1) *Oxea* (fig. 15*a*), slightly and often uniformly bent, tapering to sharp points, length about 95μ × 5-6μ in thickness; 2) *Toxa* (fig. 15*b*), the bending may be more or less strongly marked; they vary in length from ca. 20-40μ.

Geographical distribution : Off Bahia, Indian Ocean, Port Jackson.

DESMACIDONIDAE.

Echinodictyum pulchrum nov. spec.

Poelo Mariri (Aroe), 25-III-1929. Nr. 47. Holotype. Dry.
Poelo Enoe (Aroe), 23-III-1929. Nr. 37. Dry.

Sponge a beautiful, flabellate, clathrous body, extended into one plane; 37 × 30 cm., but only 6-8 mm. thick; attached to a piece of coral with a basal plate about 5 cm. in diameter; from this arises a short, thick stem which soon

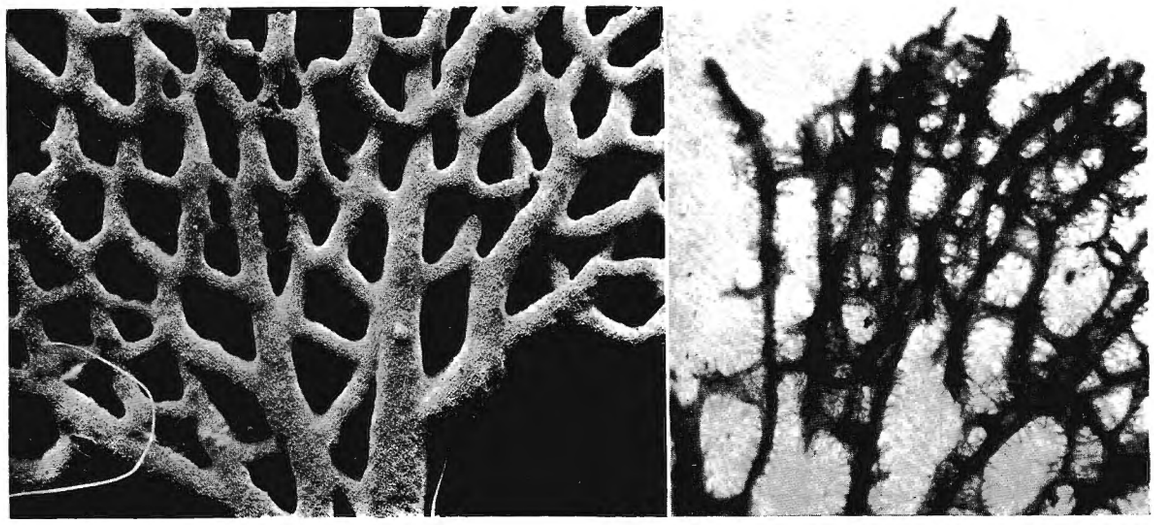

Fig. 16-17. — *Echinodictyum pulchrum* nov. spec.
Fig. 16. — Detail of body. — Fig. 17. — Skeleton, vertical section.

branches into anastomosing slender branches; the windows between the branches are generally oval, of about the same breadth as the branches. The specimen is dry, the dermal membrane therefore not to be seen; surface finely grooved (fig. 16), the grooves being the interstices between the distal ends of the fibres. Probably the surface has in the living state been rather smooth without spiny processes visible to the naked eye.

There is no difference between the two sides of the flabellum. No oscules could be detected.

The skeleton (fig. 17) is a rather beautiful isodictyal reticulatum of primary fibres connected by secondaries of about the same thickness, both 70-100μ thick. They are composed of oxea held together by some spongiolin; they are echinated by blunt acanthostyles.

SPICULES :

1. *Oxea* (fig. 18*a*), a little bent in the middle, finely pointed; commonly from 280-340μ in length by 10-17μ in thickness.

2. *Acanthostyli* to *Acanthotylostyli* (fig. 18*b*) with blunt apices and rather often well marked heads; commonly about 140 × 12μ (diameter of head); spines coarse, curved backward.

3. Only a few *styli* are observed, aboud 290 × 8μ.

No microscleres.

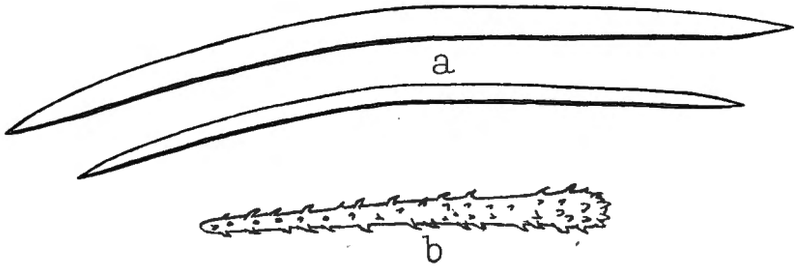

FIG. 18. — *Echinodictyum pulchrum* nov. spec.
a, oxea. *b*, acanthostyl.

This species is well characterised by its mode of growth and by its spiculation. It certainly is closely related to *E. rugosum, asperum, elegans* and *clathratum* and should be taken in consideration, when the kinship of these species is taken up for a closer discussion.

Clathria lendenfeldi RIDLEY & DENDY.

1887. *Clathria lendenfeldi* RIDLEY and DENDY (12), p. 148.
1932. *Clathria lendenfeldi* BURTON and RAO (3), p. 334.

For synonymi see this latter paper.
Poelo Enoe (Aroe), 23-III-1929. Nr. 39, 40, 41, 42. All dry.
Four large and beautiful specimens.

This is a very variable species, both as to external shape and skeletal features. The hitherto known specimens are mostly of low growth. The specimens in hand are of erect, branching and anastomosing shape (fig. 19); the skeletal struc-

ture is, however, unmistakably conspecific with that of *lendenfeldi*, and so is the spiculation.

Main skeleton consists of stout horny fibres, commonly about 25-60μ thick, richly anastomosing, cored by *subtylostyli* (or *styli*) echinated by *acanthostyli*. *Chelae* may or may not be present.

Nr. 42 has *subtylostyli* basally slightly spined, 220-240μ. *Acanthostyli* about 84μ. No microscleres.

Nr. 39 has smooth *styli*, 164-204μ; *acanthostyli* 50-60μ. *Chelae* 10-12μ.

Geographical distribution : Indian Ocean, Australian waters.

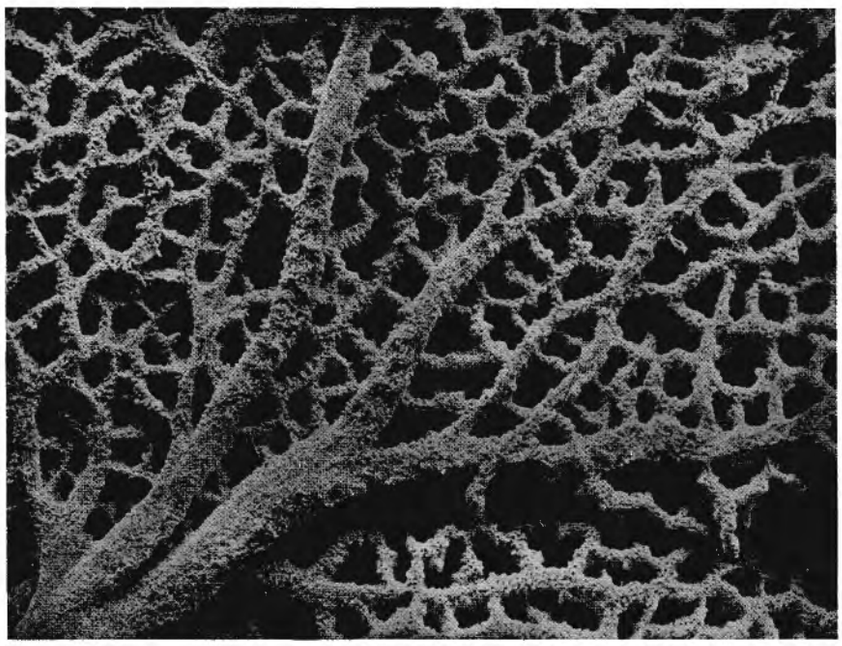

Fig. 19. — *Clathria lendenfeldi* R. et D.
Detail of body.

Rhaphidophlus orientalis nov. spec.

Poelo Enoe (Aroe), 23-III-1929. Nr. 38, type specimen. Dry.
Poelo Enoe (Aroe), 23-III-1929. Nr. 48. Dry.

Sponge erect, branched (fig. 20), with about 4 mm. thick anastomosing branches growing out from a short stem. Surface even, smooth, only very faintly rough to the touch. Oscules few, about 1 mm. in diameter.

Skeleton (fig. 21) a rather irregular, isodictyal reticulation of thick skeletal fibres of varying thickness, commonly about 80-100μ thick. The tylostyles building up the fibres are lying mostly parallel with one another, but many of them

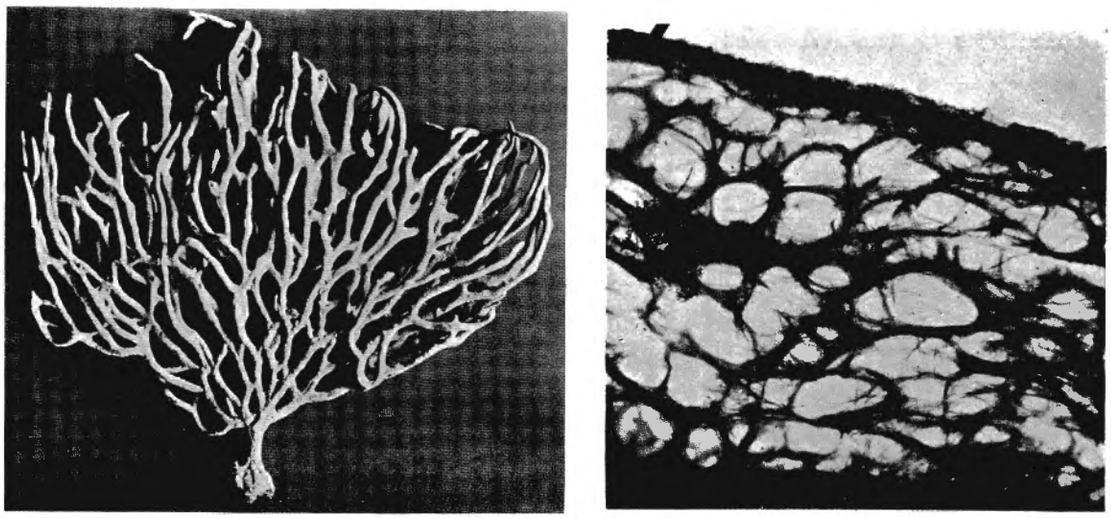

FIG. 20-21. — *Rhaphidophlus orientalis* nov. spec.
FIG. 21. — Skeleton, vertical section.

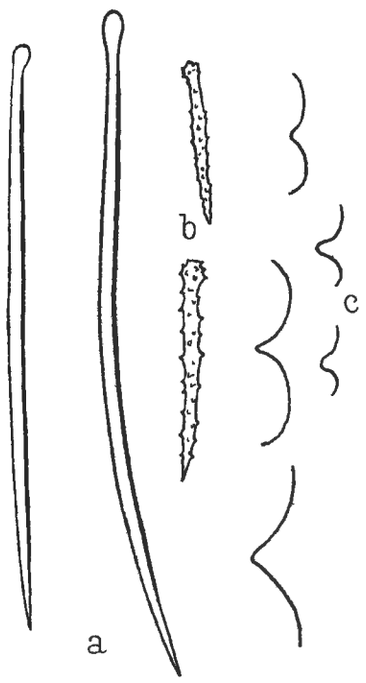

FIG. 22.
Rhaphidophlus orientalis n. sp.
a, tylostyli. *b*, acanthostyli. *c*, toxa.

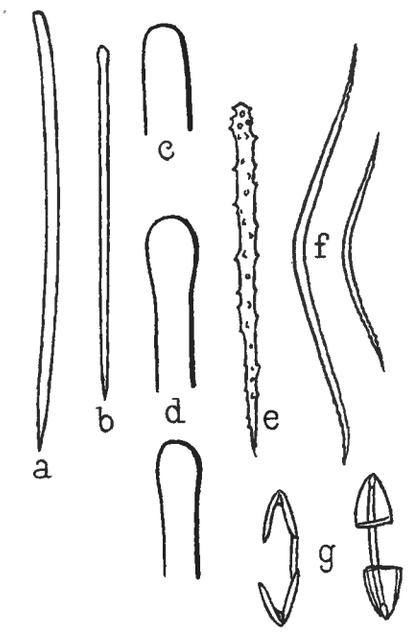

FIG. 23.
Rhaphidophlus cervicornis THIELE.
a, styl. *b*, subtylostyl. *c*, head of styl. *d*, heads of subtylostyli. *e*, acanthostyl. *f*, toxa. *g*, isochel.

are placed out of order or even outside the fibres thus giving these a somewhat indistinct outline. The acanthostyles are mostly placed in the fibres themselves, parallel with the tylostyles; but some of them are echinating the fibres. There can be drawn no distinction between primary and secundary fibres.

The dermal skeleton consists of closely set tufts of tylostyli intermingled with a tangential layer of the same spicules, thus giving the surface of the sponge a firm structure. Also in the dermal skeleton acanthostyles in great numbers are placed between the *tylostyli*.

SPICULES :

1. *Tylostyli* to *subtylostyli* (fig. 22*a*), smooth, slightly bent, tapering to a finely pointed apex. There is no marked difference between the dermal and somal *tylostyli;* they are varying in length from 100-250μ, 210-240μ being a common length; thickness up to 12μ.

2. *Acanthostyli* (fig. 22*b*), coarsely spined, about 65 × 9μ.

3. *Toxa* (fig. 22*c*), rather sharply bent in the middle; about 20-60μ.

This species is closely related to *R. filifer* and allied species.

Rhaphidophlus cervicornis THIELE.

1903. *Rhaphidophlus cervicornis* THIELE (15), p. 959.
Eiland Enoe (Aroe), 24-III-1929. Nr. 7. In spirit.

One specimen consisting of several mostly anastomosing branches lying in one plane; the whole colony about 5 cm. high and 5 cm. broad; the branches nearly cylindrical, about 2 mm. thick when isolated; the coalescing part of branches may be several mm. thick. Consistence elastic. Colour (spirit) dark gray. Surface rather macerated, shaggy; it seems, however, that the young, slender, isolated branches have had tolerably even and cylindric surface; the older parts of the sponge are conulosed and ridged. Oscules could not with certainty be detected.

The *skeleton* consists of rather stout horny fibres cored by spicules; the main fibres are running longitudinally through the body, bending now and then towards the surface; they are mostly about 50μ thick, but may in the older parts of the sponge attain 70-80μ; they are interlaced in a very irregular manner by other fibres which are commonly somewhat thinner. The *styli* and *subtylostyli* are lying longitudinally in the fibres and filling them up in a very varying degree; sometimes they are lying uniserially, sometimes densely packed and filling up the fibre to its surface. The points of the spicules are generally, if not always, directed outwards. Numerous of the smooth megascleres are lying freely in the choanosome, outside the fibres; and so are many *acanthostyli*, but many also are imbedded in the horny fibres with their heads and then poin-

ting more or less vertically outwards in the usual manner. The microscleres are scattered apparently without order, although it seems that the isocheles are especially numerous in the ectosome.

SPICULES :

1. *Styli* (fig. 23*a*, *c*) in the main skeleton, slightly bent, tapering gradually to the fine point; varying from, say, 165-315μ in length by 6-10μ in thickness.

2. *Subtylostyli* (fig. 23*b*, *d*) in main skeleton and in the ectosome, generally more straight and more delicate than the *styli;* head only faintly set off; the spicules are with all intermediate stages connected with the shape of *styli;* they are about 160-180 × 4μ.

3. *Acanthostyli* (fig. 23*e*), straight, of the usual shape and medium spinulous, 60-82μ × 6μ.

4. *Toxa* (fig. 23*f*), beautifully curved, with finely roughened surface, varying in length from 40-90μ.

5. *Isochelae palmatae* (fig. 23*g*), very delicate, about 12μ.

I think there can be but little doubt as to the identity of this species with Thiele's cervicornis in spite of some trifling divergencies.

GEOGRAPHICAL DISTRIBUTION : East Indian waters.

AXINELLIDAE.

Halichondria panicea PALL.

Sorong door (Nova-Guinea), 2-III-1929. Nr. 53. Dry.

A few specimens, biggest one 5 × 3 × 2,5 cm. Colour red-brown; lumpshaped with oscules in several places on the subglobular upper surface, 1-2 mm. in diameter. The surface exhibits a reticulum of quite typical panicea-

FIG. 24. — *Halichondria panicea* PALL.
Oxe.

structure; the skeletal structure of the choanosom is also quite typical, and so is the whole consistence.

The spicules are *oxea* (fig. 24); but these are not typical; they are a little bent, but not sharply, in the middle as in a typical panicea-oxe, but more evenly over the entire length; they are tapering only from the outer third to the not too sharply pointed apices; the length is varying from about 260-300 × 8-10μ.

GEOGRAPHICAL DISTRIBUTION : Cosmopolitan.

Stylotella suberitoides nov. spec.

Mansfield Eiland, 1-III-1929. Nr. 13*a*. In spirit.

One specimen (fig. 25), irregularly cake-shaped, about $14 \times 10 \times 4$ cm. Surface even, slightly harsh to the touch. True apertures could not with certainty be made out; some irregular openings seem to be holes made by foreign organisms.

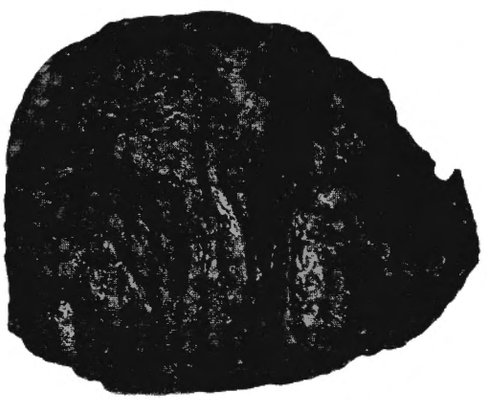

FIG. 25. — *Stylotella suberitoides* nov. spec.

Texture very firm, reminding of hard leather. The choanosome is very compact with narrow and inconspicuous canals reminding of several Suberites-species.

In the living state this sponge has naturally been more soft, but it is improbable that the sponge has been of « soft texture » which Lendenfeld's diagnosis of the genus *Stylotella* requires. But a character of this kind I regard of minor importance; I therefore do not hesitate in referring the specimen in hand to the genus *Stylotella*. Colour at surface black, in the interior dark red.

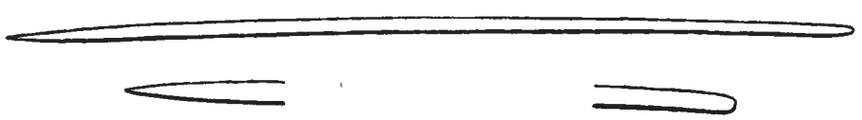

FIG. 26. — *Stylotella suberiteroides* nov. spec.
Styli.

Skeleton very simple : loose strands and wisps are building up the framework; they are directed in curves towards the surface which they are reaching at more or less right angles; the spicules only seldom pierce the dermal membrane, and then only with the outermost tip. No special dermal skeleton is at hand. Spongin hardly present.

The spicules are *styli* (fig. 26), slender, of even thickness throughout, tapering rather abruptly to the finely pointed apex. Length commonly from 900-1100μ × 15-23μ in thickness.

EUCERATOSA

Dendrilla rosea Lbf. var. digitata (Carter).

1885. *Luffaria digitata* Carter (5), p. 201.
1889. *Dendrilla rosea* var. *digitata* Carter, Lendenfeld (10), p. 718.

Poelo Enoe (Aroe), 23-III-1929. Nr. 44. Dry.
Banda Neira, 24-II-1929. Nr. 1*c*. In spirit.
Poelo Babi (Aroe), 21-III-1929. Nr. 17. In spirit.

Nr. 44 is a big specimen, about 50 cm. high. 5-6 branches are given off from the main stem; they are extended in one plane, about 2,5 cm. broad. Nr. 1*c* is a small fragment, a few cm. long, of one branch; colour dark red, very firm and rigid. Nr. 17 some small fragments, strongly encrustated with débris.

Geographical distribution : Australian Seas.

Spongelia fragilis (Mont).

Eiland Enoe (Aroe), 24-III-1929. Nr. 8. In spirit.

One little very macerated specimen, which apparently has been of subglobular shape; the fibres are up to 230μ thick; meshes very irregular; main fibres heavily charged with foreign material, mostly spicula-fragments. I think this rather indeterminable specimen comes near to *S. fragilis*.

Geographical distribution : Australia, Indian Ocean, Atlantic Ocean.

Spongelia elastica Schulze.

Sorong door (Nova-Guinea), 2-III-1929. Nr. 36. In spirit.

One small specimen encrusting on a shell, very macerated; fibres from 30-60μ thick, overcrowded with foreign spicules and spicula-fragments, only few sandgrains, etc.

Euspongia officinalis Linné.

Paloebaai near Dongola (Celebes), depth 1 m lowwater, 5-II-1929. Nr. 31. In spirit.
Pisang Eiland (Nova-Guinea), 18-III-1929. Nr. 35. Dry.

Nr. 31 is a dark, subspherical specimen, about 8 cm. in diameter, with finely conulous surface, cones about 1 mm. apart. Primary fibres, about 60μ thick

with rather many spicula-fragments; secondary fibres without foreign material, about 20μ thick; meshes from 100-200μ broad.

Nr. 35, dry, in every respect typical.

GEOGRAPHICAL DISTRIBUTION : Tropical and subtropical Seas.

Phyllospongia papyracea (ESPER).

1905. *Phyllospongia papyracea* DENDY (6), p. 217.

Eiland Weeim (N. of Misoöl) on reef, 26-II-1929. Nr. 33. Dry.
One beautiful specimen.

GEOGRAPHICAL DISTRIBUTION : Indian Ocean, Australian waters.

? Phyllospongia vermicularis LENDENFELD.

1889. *Phyllospongia vermicularis* LENDENFELD (10), p. 201.
Banda Neira, 24-II-1929. Nr. 6. Dry.

The specimen in hand forms a richly branched bushy structure with cylindrical to somewhat flattened branches. The specimen is dry.

The inner structure conforms pretty well with the description given of the type. The fibres are here 20-50μ thick, the meshes often about 300μ in diameter.

GEOGRAPHICAL DISTRIBUTION : Western coast of Australia.

Ianthella flabelliformis (LINNÉ).

1889. *Ianthella flabelliformis* LENDENFELD (10). p, 696.

Poelo Enoe (Aroe), 23-III-1929. Nr. 43. Dry.
Several large and beautiful specimens.

GEOGRAPHICAL DISTRIBUTION : Australian Seas, Phillipines.

Aplysina purpurea CARTER.

1905. *Aplysina purpurea* DENDY (6), p. 224.
Kemabaai (Celebes), 13-II-1929. Nr. 34a. In spirit.

Only the skeleton is at hand; the fibres are about 100μ thick, with voluminous pith; the meshwork is very coarse, fibres about 1 mm. apart. The sponge has apparently been subglobular.

GEOGRAPHICAL DISTRIBUTION : Indian Ocean, Australian waters.

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