NOTES

ON A

COLLECTION OF SPONGES

FROM THE

WEST COAST OF PORTUGAL.

—BY—

R. HANITSCH, Ph.D.

WITH PLATES XII. and XIII.

From Trans. L'pool Biol. Soc., Vol. IX., 1895, pp. 205 to 219.

NOTES on a COLLECTION of SPONGES from the WEST COAST of PORTUGAL.

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With Plates XII. and XIII.

[Read May 17th, 1895.]

The following pages contain a description of a small, but interesting collection of Portuguese Sponges, which were sent to me by Professor Paulino de Oliveira, Coimbra. They are all marine, with the exception of one, *Euspongilla lacustris*, Autt., the only species of Fresh-water Sponges thus far obtained from the Iberian Peninsula.

I have not, in all cases, succeeded in specific indentification, and with some of the forms I have not even attempted it. Many of the specimens which I received were mere fragments cut from larger specimens, and this often made identification more difficult, especially with the Horny Sponges. In the case of the genera *Halichondria*, *Reniera* and *Chalina*, I did not seriously attempt specific identification, as I consider a vast number of species of those genera to be quite insufficiently defined, and before somebody takes the trouble to work out those genera, I do not think it of much use to attempt specific identification.

The collection comprises twenty-eight forms. Two of them represent new genera and species, and are very interesting, viz., *Amphiute paulinæ*, so far the first instance of a calcareous sponge containing large, longitudinally arranged, oxeote spicules both in the dermal and gastral cortex, and *Physcaphora decorticans*, a tetractinellid sponge, with a new type of microscleres. There

are also four new species, belonging to the genera *Leucandra*, *Gellius*, *Raspailia* and *Pœcillastra* respectively.

Regarding the locality of the Sponges, it may be understood, unless expressly stated to the contrary, that they were all obtained from the neighbourhood of Sines, West Coast of Portugal.

CALCAREA.

Order HOMOCŒLA.

Leucosolenia coriacea, Fleming.

Several specimens of the usual character.

Order HETEROCŒLA.

Leucandra aspera, O. Schmidt.

Von Lendenfeld (*6*, p. 125) in the year 1891 mentions this species as "beschränkt auf das Mittelmeer." Topsent (*9*, p. 23) in the following year, describes it as from the Azores. This is therefore only the second instance of this species being obtained outside the Mediterranean.

Leucandra bulbosa, n.sp.

Solitary, sessile, of bulb-like, or sometimes irregular, shape, tapering upwards to a terminal osculum, which is provided with a very small oscular fringe. Surface somewhat corrugated and hispid. The larger and more regular specimens measuring about 22 mm. in diameter and 20 mm. in height. Width of osculum 2·5 mm. Colour (in spirit) white or yellowish grey.

Canal system typical. Inhalant pores 0·04—0·07 mm. in diameter, flagellated chambers 0·075 mm., exhalant canals 0·6 mm., or slightly more in diameter, sometimes uniting in slit-like depressions.

Skeleton: (1) Castral tetracts: apical ray 0·1 by 0·01 mm., basal ray 0·17—0·27 by 0·01 mm., oral rays 0.39—0.45 by 0·01 mm. The basal and oral rays lie in and parallel to the gastral cortex, the apical ray projects at

right angles into the gastral cavity. The basal rays of all the spicules are directed vertically downwards, the lateral rays laterally and slightly upwards. (2) Triacts of chamber layer: basal ray 0·4 by 0·022 mm.; oral rays 0·34 by 0·022 mm. (3) Dermal triacts: basal ray 0·2 by 0·018 mm.; oral rays 0·17 by 0·018 mm. (4) Dermal oxea, radially arranged and projecting, up to 1·4 by 0·075 mm. (5) Dermal club-shaped spicules, radially arranged, only slightly projecting, 0·45—0·75 by 0·05 mm. (6) Dermal hastates, minute, 0·07 by 0·002 mm. (7) Oscular rhabds 0·42 by 0·0013 mm.

Amphiute, n.g.

This genus belongs to Dendy's family *Heteropidæ* (Dendy, *1*, p. 75) as possessing a distinct and continuous dermal cortex, covering the chamber layer and pierced by inhalant pores, and also subdermal sagittal triacts. Its flagellated chambers are sometimes elongated and radially arranged, starting finger-like from large exhalant canals, at other times quite irregular. Of the other three genera belonging to this family (viz., *Grantessa*, v. Lendenfeld, *Heteropia*, Carter, *Vosmaeropsis*, Dendy) *Amphiute* stands nearest to *Heteropia*, as possessing large oxea, lying in the dermal cortex, and arranged parallel to the long axis of the sponge, but it differs from *Heteropia* in having a similar layer of oxea in the gastral cortex. We find a strong resemblance to *Amphiute* in two genera belonging to the *Grantidæ*, viz., *Ute*, O. Schmidt, with a layer of longitudinally arranged oxea in the dermal cortex, and *Utella*, Dendy, with a similar layer in the gastral cortex. In proposing the name *Amphiute* in my preliminary definition (*4*) of this genus, I had paid more attention to these characters, than to the presence or absence of subdermal triacts. If we accept Dendy's classification,

the presence of those triacts brings *Amphiute* under the family *Heteropidæ*. Their absence would have shown this genus to belong to the *Grantidæ*.

Diagnosis of *Amphiute*, n.g. The flagellated chambers are sometimes elongated and radially arranged, sometimes irregular. Dermal cortex and gastral cortex are both well developed and both contain large oxea arranged parallel to the long axis of the sponge.

Amphiute paulini, n.sp. (Pl. XII., figs. 1—5; Pl. XIII., fig. 1).

Two specimens were sent to me for examination. The larger of the two is a colony of eight individuals, united together at their bases (Pl. XII., fig. 1). The individuals have a somewhat curved elongated cylindrical form, tapering very slightly towards the distal osculum which bears a small fringe. The larger individuals measure up to 19 mm. in length and 3 mm. in diameter, the osculum fringe is 1 mm. in length. The surface is smooth, and shows a distinct longitudinal striation, due to the presence of huge oxea in the dermal cortex. Colour (in spirit) greyish or whitish.

The canal system is sylleibid, and resembles closely that of *Vosmaeropsis macera*, as described by Dendy (2, p. 182). The dermal pores are from 0·052 to 0·096 mm. in diameter, and lead into inhalant canals which soon become narrower. The flagellated chambers are in many cases elongated (0·44 by 0·1 mm.) and open into very wide exhalant canals, which narrow again before opening into the gastral cavity. Thus the flagellated chambers seem to be radially arranged less with respect to the gastral cavity, than to the exhalant canals (Pl. XIII., fig. 1). Sections, longitudinal or transverse, through the sponge show also a large number of spherical, oval, and irregular chambers. But whether the chambers are really of those

shapes, or whether this appearance is due more to the direction of the section passing at different angles through the chambers, is difficult to decide.

The skeleton is composed of seven kinds of spicules: (1) Gastral tetracts, the facial rays measuring 0·132 to 0·16 mm. by 0·004 to 0·008 mm., the apical ray 0·056 to 0·076 mm. by 0·004 to 0·008 mm. (2) Subgastral triacts, the basal ray 0·28 by 0·012 mm., the oral rays 0·092 to 0·1 mm. by 0·012 mm. (3) Subdermal triacts, fewer in number than the subgastral triacts, but of about the same dimentions. (4) Dermal triacts, regular, each ray 0·1 to 0·12 mm. by 0·01 mm. (5) Huge oxea, 1·2 to 2·5 mm. by 0·06 to 0·09 mm., occurring both in the gastral and dermal cortex and arranged parallel to the long axis of the sponge. (6) Rhabds, situated in the dermal cortex and projecting at right angles, 0·2 by 0·0025 mm., or longer. (7) Ocular rhabds; 1·2 to 2 mm., by 0·007 mm., forming a dense fringe.

Heteropegma nodus-gordii, Poléjaeff (7).

Represented in our collection by a single small colony, easily recognised by the huge subdermal tetracts. Poléjaeff described this species first as from off the Bermudas and Cape York.

SILICEA.

Order MONAXONIDA.

Halichondria, sp.?

A single small encrusting specimen, 2 mm. in thickness, yellowish-grey (in spirit), very soft and pulpy. Oxea 0·125 by 0·005 mm.

Reniera (*cinerea*, Grant?).

Fistulous, consisting of three conical branches, the largest of them being 22 mm. in height, 12 mm. in its greatest diameter, and the osculum 3 mm. in diameter.

Very soft and elastic. Dermal skeleton unispiculous, primary fibres of the choanosomal skeleton unispiculous, sometimes bispiculous, secondary fibres unispiculous. Oxea 0·088 by 0·005 mm.

Reniera, sp.?

Small ridge-like specimen, 25 mm. in length, 8 mm. in width, 8 mm. in height, with four large oscula along its summit, the oscula 2 mm. in diameter. Colour (in spirit) almost black. Very soft, somewhat elastic. Skeleton fibres unispiculous, rarely bispiculous. Oxea 0·084 by 0·0035 mm.

Reniera, sp.?

Small sessile specimen, 2 cm. in diameter, 5 mm. in thickness, with three oscula each about 2 mm. in diameter. Very soft and pulpy. Colour (in spirit) greyish brown. Skeleton: meshes irregular, unispiculous. Oxea slender, 0·088 by 0·003 mm., sometimes stouter.

Reniera, sp.?

About a dozen small finger-like specimens, attached to the severed claw of a Crustacean, each about 12 mm. in length, 1·5 mm. in thickness. Soft and elastic. Colour (in spirit) brown. Oxea 0·104 by 0·005 mm.

Dactylochalina cylindracea, v. Lendenfeld (?).

The specimen in question offers a strong resemblance in its external characters to the above species, as figured by von Lendenfeld (5, Pl. II., fig. 1) in his Monograph of the "Horny Sponges," Pl. II., fig. 1. The sponge is digitate, and consists of a number of slender cylindrical branches arising from a common trunk. The entire height of the specimen is 14 cm., the diameter of the branches 3 to 4 mm. The oscula are very small, less than 1 mm. in diameter, and not raised. Consistency elastic. Colour (in spirit) brown. The fibres are stout and contain a large amount of spongin. The primary fibres, 0·045 mm. in diameter, are multispiculous; the secondary fibres are nearly as thick, but unispiculous. The oxea are stout, 0·108 by 0·009 mm. The dimensions of the spicules of the type-specimen (from Australia) as given by von Lendenfeld, are considerably less, and therefore I am in doubt in regard to the identity of the two forms. Locality: Leça.

Chalina, sp.?

Three small finger-like specimens, about 20 mm. in length, 2 mm. in thickness. Oscula very minute. Colour (in spirit) yellowish-grey. With very little spongin. Primary fibres multispiculous, about three spicules side by side; secondary fibres unispiculous. Oxea stout, 0·076 by 0·006 mm. Locality: Buarcos.

Chalina, sp.?

Small, irregular specimen, encrusting *Corallina*. Primary fibres, with a considerable amount of spongin, unispiculous, 0·024 mm. thick; secondary fibres very thin, spongin scarcely covering the spicules. The spicules are slender oxëa, 0·076 by 0·003 mm.

Euspongilla lacustris, Autt.

A single specimen, from a small river near Caldas de Nixella, North Portugal.

Gellius pyrrhi, n.sp.

This new species is represented by two fragments, the larger of which is apparently a piece of a sessile, branching specimen. It is 3·5 cm. in its greatest horizontal expansion, 1 cm. in thickness, with about fifteen oscula which are not raised, and are 1 mm. in diameter. Consistency pretty firm and elastic. Colour (in spirit) greyish-yellow. The skeleton consists of oxea which are very variable in size, averaging 0·15 by 0·006 mm., and of sigmata which are exceedingly slender, measuring 0·012 by 0·0004 mm. or even thinner.

Dendoryx incrustans, Gray, v. *viscosa*, Topsent (*9*, p. 98).

The larger of the two pieces sent to me for examination is roughly cylindrical, 5 cm. in height, 2 cm. in diameter, and is apparently cut off from a much larger specimen. The meandering ridges of its surface are very similar to those of *Dendoryx incrustans* of the British Coast. The strongyla of the ectosome have two minute spines at each end, and measure 0·16 by 0·005 mm. The spined styli of the choanosome are 0·136 by 0·008 mm. The microscleres are isochelæ, 0·016 mm. in length or less and sigmata, 0·024 mm. in length.

Echinoclathria seriata, Grant.

One specimen, of the usual character.

Raspailia formidabilis, n.sp.

One single specimen, 4 cm. in height, consisting of a large number of bushy branches from a common trunk, the trunk being 8 mm. in diameter. Entire surface of the sponge exceedingly spiny, the spicules projecting a good distance beyond its surface. Skeleton consisting of two kinds of spicules, (1) smooth styli, straight or slightly curved 1·5 by 0·02 mm., and (2) echinating spined styli, 0·095 by 0·008 mm.

Hymeniacidon carunculum, Bowerbank.

One specimen, massive, measuring 3·5 by 2·5 cm. horizontally and 1·5 cm. in thickness, of the usual characters.

Tethya lyncurium, Lin.

A single small specimen, 1·5 cm. in diameter.

Order Monoceratina.

Euspongia (*osculata*, v. Lendenfeld ?). See v. Lendenfeld (*5*).

Represented by a piece apparently cut off from a large specimen. Colour (in spirit) reddish-brown.

Aplysilla (*archeri*, Higgin ?). See v. Lendenfeld (*5*).

Represented only by a worn out fragment of the skeleton.

Aplysinopsis, sp. ?

Two of the specimens are flat, sessile, not branching, measuring 4 cm. horizontally and 7 mm. in thickness, their surfaces being raised into blunt conuli. A third specimen, possibly belonging to a different species of *Aplysinopsis*, is apparently cut off from a larger specimen. It consists of a basal portion with three branches and measures 5 cm. in length, each branch being about 12 mm. in thickness. Its surface is covered by sharp-pointed conules, arranged in irregular ridges. Consistency elastic and very tough. Colour (in spirit) yellowish.

Oligoceras collectrix, F. E. Schulze. See v. Lendenfeld (*5*).

Two specimens, of a very crumbling consistency.

Hircinia variabilis, F. E. Schulze. See v. Lendenfeld (*5*).

Two specimens, the larger of the two being flat and sessile, measuring 5 cm. horizontally, 6 mm. in thickness. Thickness of the fibres 0·07 to 0·12 mm., thickness of the filaments 0·002 mm.

Order Tetractinellida.

Pœcillastra armata, n.sp.

This species differs from all other known species of the genus by possessing anatriæna in addition to other spicules.

Sponge massive, irregular, measuring 10 by 5 by 5 cm. Surface even, rough to touch. Oscula 1 mm. in diameter, scattered. Examined in the dried condition.

The skeleton appears very confused, and is made up as follows: Megascleres: (1) Oxea, of huge dimensions, somewhat slantingly arranged towards the surface, straight, or only slightly curved, measuring 3 by 0·055 mm. (2)

Calthrops, the actines 0·45 by 0·045 mm. (3) Orthotriæna, mostly deformed, rhabdome only slightly longer than the cladi, of about the same dimensions as the calthrops. (4) Anatriæna, fewer in number than the other megascleres, projecting beyond the surface of the sponge, with wide and distinct axial canal in rhabdome and cladi, the rhabdome measuring 2·5 by 0·02 mm., the cladi 0·09 by 0·02 mm.

The Microscleres are of two kinds, (1) Smooth Microxea, present in vast numbers and forming a felted mass throughout the whole sponge, 0·17 by 0·0035 mm., (2) Spiraster, 0·02 mm. in length.

Physcaphora decorticans, n.g. & sp. (Pl. XIII., figs. 2 & 3).

The collection contains only a single fragment of this highly interesting sponge, and that fragment apparently represents only the ectosome of a tetractinellid sponge which had become peeled off, as often happens in cases where the cortex is highly developed. The specimen is a thin flat piece, of stony consistency, measuring horizontally 4 by 3 cm. and 0·5 to 1 mm. in thickness. The surface is raised in minute conuli which may bear the oscula at their summits. Its colour (in spirit) is yellowish white or greyish, here and there rusty, in some parts almost transparent.

The skeleton consists of megascleres and microscleres. The former are tylostyli, 0·51 by 0·008 mm., arranged in bundles converging towards the surface of the sponge, and raising it up in little conuli, and forming also a support for the tissue round and below the oscula (Pl. XIII., fig. 3). The microscleres are of four kinds: (1) Spirasters, 0·014 mm. in length, forming a thin crust along the surface of the sponge. (2) Spherasters, with large centres and very short rays, forming a layer just below the Spirasters, 0·012 mm. in diameter. (3) Spherasters, few in number, with small centres and long rays, 0·016 mm. in diameter, occurring here and there in the lowermost part of the specimen. (4) "Selenasters," forming a thick layer below the spherasters with large centres, in fact constituting the chief mass of the specimen. These spicules correspond in structure and position to the sterrasters of the genera *Pachymatisma*, *Cydonium*, etc., and I have chosen the name from their faint resemblance to a half-moon. They are really more sausage-like in shape and the generic name *Physcaphora* has been adopted to express this. The full-grown spicule measures 0·08 by 0·028 mm., and fortunately a number of young stages were met with, so that the development of the spicule could be traced. In the youngest condition present the spicules had the shape of rods, nearly straight or slightly twisted, beset with minute spines (Pl. XIII., fig. 2*a*). In the next stage the spicule is still pretty straight, but the spines are large and numerous, although still distinctly separated (Pl. XIII., fig. 2*b*). In the next stage, the spicule has already its typical sausage-shape, the spines are very closely set, but still recognisable in their individuality (Pl. XIII., fig. 2*c*). The last stage is the full-grown selenaster, in which the spines, except their most distal ends, are all fused so as to form one solid mass (Pl. XIII., fig. 2*d*). The distal ends of the spines project a short distance beyond the surface of the spicule, and being polygonal, chiefly hexagonal in transverse section, offer a delicate pattern, when the spicule is being focussed at different depths. A bilus is present as in the Sterrasters. We thus see a great resemblance in the structure and development of Sterrasters and Selenasters. The chief difference is that in the Sterrasters all rays start from a point, whilst in the Selenasters the rays start from a line.

Regarding the systematic position of *Physcaphora*, we have apparently to place it in the family *Placospongidæ*, Sollas (*8*), provided we are right in our supposition that the specimen in question is only the ectosome of a sponge, and that the choanosome, when discovered, will not show spicules of a different type. The *Placospongidæ* are sterrastrose *Tetractinellida*, possessing, however, no tetract, but only monaxonid megascleres. Of the two genera of this family, *Physcaphora* is more closely allied to *Placospongia*, Gray, both possessing tylostyli, whilst *Antares*, Sollas, possesses diactine spicules.

Thus we may perhaps propose the following diagnosis of *Physcaphora*: *Placospongidæ* in which the megasclere is tylostyle and in which the cortex is formed chiefly of selenasters.

I now give a list of all the Sponges contained in the collection. The classification is the same as used in my "Revision of Bowerbank's Nomenclature" (*3*).

CALCAREA.

Order HOMOCŒLA.

Leucosolenia coriacea, Fleming.

Order HETEROCŒLA.

Family *Grantidæ*: *Leucandra aspera*, O. Schmidt.
Leucandra bulbosa, n.sp.
Family *Heteropidæ*: *Amphiute paulini*, n.g. & sp.
Family *Amphoriscidæ*: *Heteropegma nodus-gordii*, Poléjaeff.

SILICEA.

Order MONAXONIDA.

Family *Haplosclerida*: *Halichondria*, sp.?
Reniera (*cinerea*, Grant?)

Reniera, sp.?
Reniera, sp.?
Reniera, sp.?
Dactylochalina cylindracea, v. Lendenfeld (?).
Chalina, sp.?
Chalina, sp.?
Euspongilla lacustris, Autt.
Gellius pyrrhi, n.sp.
Family *Pœciloscleridæ*: *Dendoryx incrustans*, Gray, var. *viscosa*, T.
Echinoclathria seriata, Grant.
Raspailia formidabilis, n.sp.
Family *Axinellidæ*: *Hymeniacidon carunculum*, B.
Family *Tethyidæ*: *Tethya lyncurium*, Lin.

Order MONOCERATINA.

Family *Spongidæ*: *Euspongia* (*osculata*, v. Lendenfeld?)
Aplysilla (*archeri*, Higgins?)
Aplysinopsis, sp.?
Oligoceras collectrix, F. E. Schulze.
Hircinia variabilis, F. E. Schulze.

Order TETRACTINELLIDA.

Family *Pachastrellidæ*: *Pœcillastra armata*, n.sp.
Family *Placospongidæ*: *Physcaphora decorticans*, n.g. & sp.

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EXPLANATION OF THE PLATES.

PLATE XII.

Fig. 1. *Amphiute paulini*, n.g. and sp. Natural size. [One or two individuals of the colony may be somewhat misleading. The surface of the sponge should appear smooth, not spiny, and the spicules less pronounced.]

Fig. 2. Gastral tetract. The three straight rays are facial, the fourth, curved ray is apical. (× 150.)

Fig. 3. Represents both subgastral and subdermal triacts. (× 150.)

Fig. 4. Dermal triact. (× 150.)

Fig. 5. Vertical section through the upper portion of one of the individuals of *Amphiute paulini*. *o.*, osculum; *g.c.*, gastral cavity. [In this figure as well in fig. 1, Pl. XIII., Dendy's plan has been adopted to represent the collar cells diagrammatically by red dots.] (× 50.)

PLATE XIII.

Fig. 1. Portion of a transverse section through one of the individuals of *Amphiute paulini*. *d.p*, dermal pore; *i.c*, inhalant canal; *f.c*, flagellated chamber; *e.c*, exhalant canal; *g.c*, gastral cavity. (× 80.)

Fig. 2. Microscleres of *Physcaphora decorticans*, n.g. and sp. *a*, *b*, *c*, young stages of Selenaster; *d*, adult stage of the same. The somewhat eccentrically placed marking in 'd" is the hilus. *f*, various forms of spiraster; *e* and *g*, forms of spheraster. (× 500.)

Fig. 3. Vertical section through the ectosome of *Physcaphora decorticans*. *o*, osculum. (× 50)

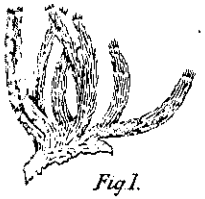

Fig 1.

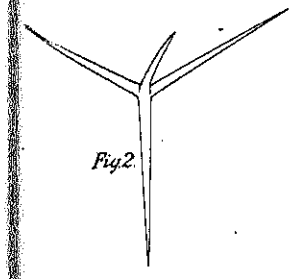

Fig 2.

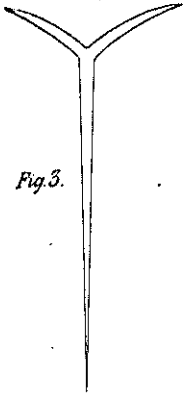

Fig 3.

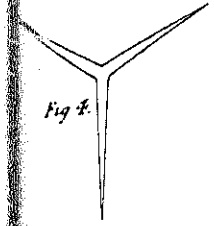

Fig 4.

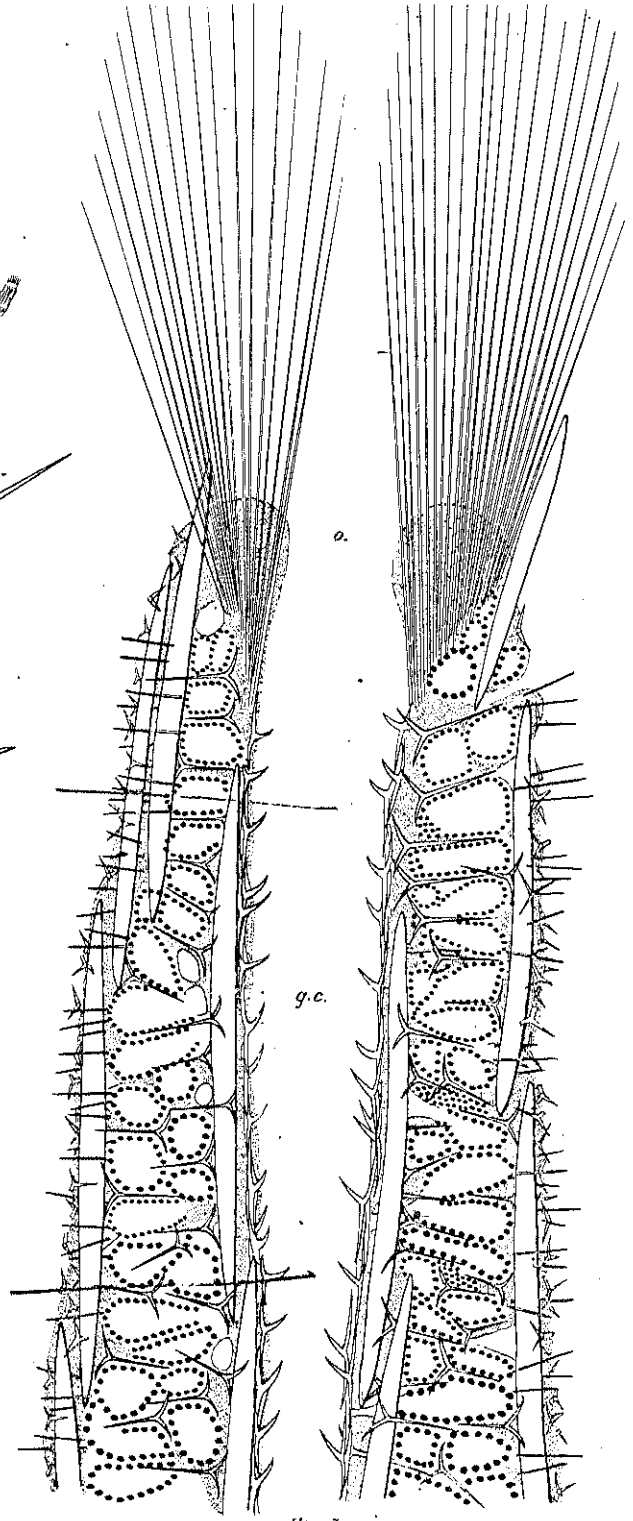

Fig 5

AMPHIUTE PAULINI M.C. and S.P.

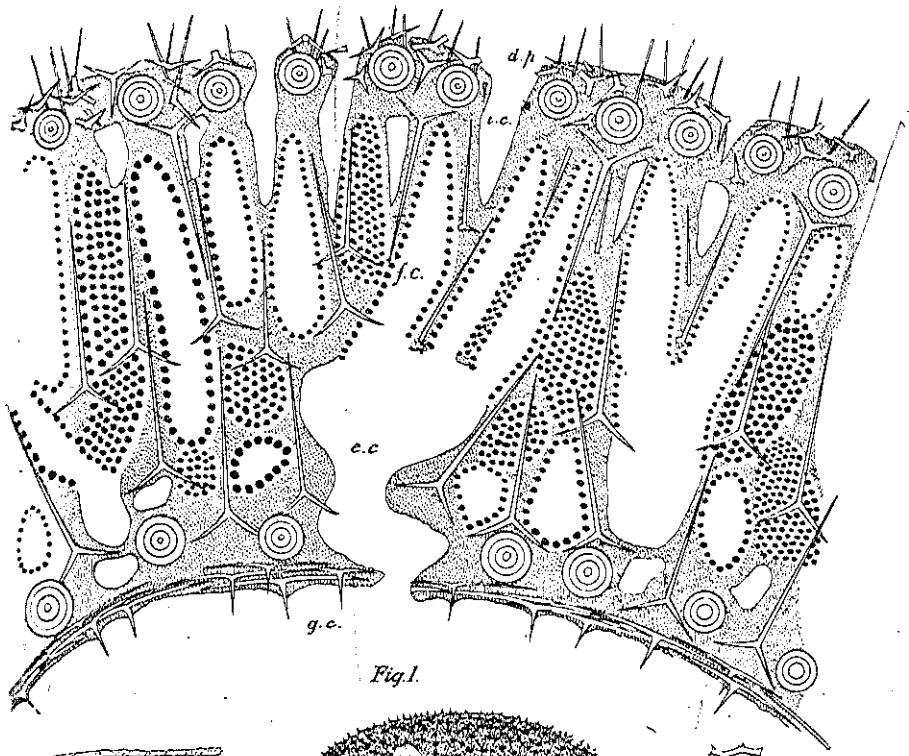

Fig.1.

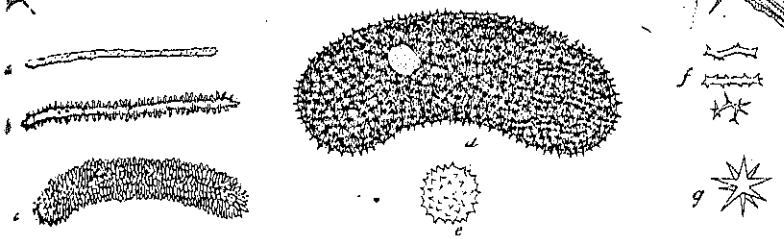

Fig.2.

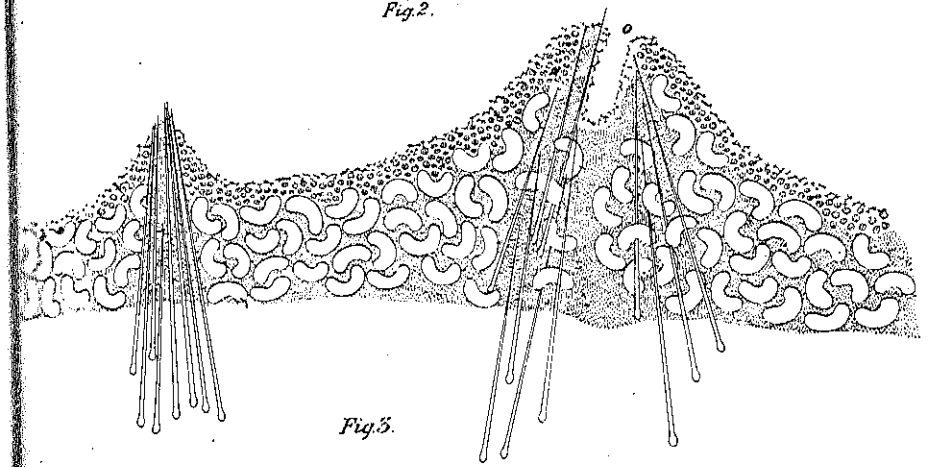

Fig.3.

AMPHIUTE PAULINI, n.g. and sp.
PHYSCAPHORA DECORTICANS, n.g. and sp.