

DESCRIPTIONS
OF
SOUTH AFRICAN SPONGES
PART III.

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In the present paper the Monaxonida and Keratosa, obtained by Dr. J. D. F. Gilchrist from Cape Colony and Natal, are described. The collection comprises 61 specimens, representing 33 species and 3 varieties, of which 19 species and all the varieties are new; of the genera, one is new to science. Among the points of special interest are the following: (1) the occurrence of a large and massive new species of *Placospongia* characterised by a great development of the internal skeletal partitions; (2) a new stalked species of *Latrunculia* near *L. (Podospongia) lovenii* Bocage; (3) a new Spirastrellid genus near *Spirastrella* but with an ectosomal crust of euasters in place of spirasters.

With regard to geographical distribution, 3 species (*Tragosia infundibuliformis* (J); *Sollasella hystrix* Topsent; *Halichondria pachastrelloides* Topsent) are common to the North Atlantic and Natal. Two species (*Latrunculia lovenii* Bocage, and *Histoderma appendiculatum*, Carter) from the North Atlantic very nearly resemble the Natal species *Latrunculia natalensis* sp. n., and *Histoderma natalense* sp. n., respectively. *Hamacantha esperioides* R. and D. is common to Cape Colony and Rio de la Plata. Three species (*Clathria typica*, Carter; *Hircinia arena*, Lendenfeld; and *Hircinia arbuscula*, Lendenfeld) are common to Australia and South Africa. From these few data no conclusions can be drawn, though it may be mentioned that Carter has drawn attention to resemblances

between the sponge fauna of South Africa and Australia. The following is a list of the species :—

Order **MONAXONIDA**

Sub-Order **HADROMERINA.**

Section I. **CLAVULIDA.**

Family **Placospongiæ.**

Placospongia labyrinthica, sp. n.

Family **Spirastrellidæ.**

Latrunculia natalensis, sp. n.

Kalastrella vasiformis, gen. et sp. n.

Kalastrella vasiformis, var. *minor*, var. nov.

Section II. **ACICULIDA.**

Family **Coppatiidæ.**

Coppatias baculifer, sp. n.

Family **Tethyidæ.**

Tethya magna, sp. n.

Trachya nuda, sp. n.

Sub-Order **HALICHONDRINA.**

Family **Axinellidæ.**

Hymeniacidon caliculatum, sp. n.

Hymeniacidon caliculatum, var. *osculatum*, var. nov.

Phakellia microxephora, sp. n.

Tragosia infundibuliformis (Johnston), var. *natalensis*, var. nov.

Axinella, sp.

Axinella, sp.

Syringella gorgonioides, sp. n.

Axinyssa tethyoides, sp. n.

Sigmaxinella arborea, sp. n.

Sigmaxinella incrustans, sp. n.

Higginsia bidentifera (Ridley and Dendy).

Sollasella hystrix (Topsent).

Family **Poeciloscleridæ.**Sub-Family **Bubarinæ.***Bubaris reptans*, sp. n.Sub-Family **Ectyoninæ.***Clathria typica* (Carter).*Clathria mollis*, sp. n.*Stylostichon involutum*, sp. n.Sub-Family **Dendoricinæ.***Histoderma natalense*, sp. n.*Dendoryx incrustans* (Esper).Sub-Family **Esperellinæ.***Desmacidon ramosum* (Ridley and Dendy).*Desmacidon grande* (Ridley and Dendy).*Hamacantha esperioides* (Ridley and Dendy).Family **Haploscleridæ.**Sub-Family **Renierinæ.***Phlœodictyon eumitum*, sp. n.*Reniera*, sp.*Halichondria pachastrelloides* (Topsent).Order **KERATOSA.**Family **Spongidæ.**Sub-Family **Eusponginaæ.***Coscinoderma concentricum*, sp. n.Sub-Family **Stelosponginaæ.***Stelospongia*, sp.*Hircinia arenosa* (Lendenfeld).*Hircinia arbuscula* (Lendenfeld).Family **Spongelidæ.***Psammopemma inordinatum*, sp. n.

Family **Placospongiadæ.**Genus **Placospongia** (Gray).**Placospongia labyrinthica**, sp. n.

Plate V., Fig. 1, 1a, 1b. Plate VI., Fig. 1a-f.

Sponge massive. The small circular oscules, .75 mm. in diameter, restricted to circular, oval, or irregular plaques with slightly raised margin and depressed area, the plaques being for the most part aggregated over a certain area.

Circular pores, .4 mm. in diameter, more or less uniformly distributed over an extensive rough hummocky area. The surface, where it is devoid of pores and oscules, quite smooth.

Colour of specimens (in spirit), pale yellow, with a faint purplish tinge over the oscular areas.

Skeleton composed of a dense pseudo-sterrastral cortex, and of labyrinthine walls of the same structure dividing the body mass into numerous cavities, some being small and spherical, others large and elongated. Sterrasters scattered in the soft tissues, also megascleres and microscleres.

Spicules. Megascleres.—Sub-tylostyle, or style thickened at the base, $2125 \times 36 \mu$, slightly curved, gradually tapering from the base to the usually blunt point.

Oxea and strongyle, $2425 \times 45 \mu$, curved at the centre.

Sterrasters varying in size up to $160 \times 100 \mu$, ellipsoidal.

Microscleres.—Somal chiaster 16μ , with 9-11 actines and a small centrum.

Another kind (not figured), 32μ in diameter, with five roughened truncate actines and a small centrum.

Pynaster (or small spheraster), mostly ectosomal, 6 to 14μ in diameter.

Locality A.—East London coast, 85 fathoms.

This remarkable species is represented by two large massive specimens. The first is massively flabellate, slightly cleft at the thick rounded margin so as to form three thick lobes; the height is 10 cm., the width 14 cm., and thickness 8 cm. The oscular areas vary from 1 to 2.5 cm. in diameter; a ridge surrounds the extensive poral area. The second specimen, which slightly resembles in shape a kneeling camel, is 11 cm. in thickness; a sharp "dorsal" ridge runs along the upper edge; one side (the "near" side) is smooth and imperforate; the other is provided with oscular plaques over one-half, while the rough poral region occupies the other.

Both specimens have been torn from their attachment and reveal at their bases the broken labyrinthine cavities.

I was unable to find a definite sterrastral axis. On making vertical sections, the smaller spherical chambers were in one

place at the base of the sponge, and in another near the periphery. The walls of the larger cavities branched in a dichotomous manner. The smallest cavities were 1 cm. in diameter, and the largest 5×2.5 cm. in size. The average thickness of the partition walls was about 3 mm., but in one place the cortex attained a thickness of 1.5 cm. The distinctive features of the species are the labyrinthine skeleton, the presence of chiasters, and absence of spirasters.

The other species of this genus (*P. carinata* Bowerbank; *P. melobesioides* Gray; *P. intermedia* Sollas; *P. decorticans* Hanitsch; *P. mixta* Thiele) all possess well-marked tyles.

The presence of chiasters is so exceptional that I thought at first that I had to deal with a Geodine sponge, but there were no triaenes to be found.

Genus *Latrunculia* (Bocage).

Latrunculia natalensis, sp. n.

Plate V., Fig. 2. Plate VI., Fig. 2a-e.

Sponge small, with long slender stalk and pyriform head with an oscule at the summit surrounded by a fringe of spicules. Surface (when viewed through a lens) slightly hirsute. Colour sandy. Skeleton formed of an axial stalk projecting about half way into the body, and of spicule bundles radiating out from a point below the centre; ectosome formed of a thick crust of sterrasters. Discasters of two kinds, somal and choanosomal.

Spicules. Megascleres.—Styles (rare) $700 \times 10 \mu$, smooth, slightly curved.

Strongyle $500 \times 23 \mu$, slightly curved near the centre.

Amphioxea or tornote in bundles and forming the oscular fringe) $540 \times 10 \mu$, frequently pointed abruptly at one end and gradually at the other.

Microscleres.—Somal discaster, total length and breadth $36 \times 23 \mu$; with a basal verticil of four simple spines, two large central oppositely directed verticils of compound spines, and a small verticil of simple spines appressed to the apical spine.

Choanosomal discaster with simple spines, 86μ long, with two oppositely directed verticils each composed of four simple spines 21μ long.

Locality E.—Cone Point, Natal, 34 fms.; growing attached to *Tethya magna*.

The one specimen is 19 mm. in length, the head being 4.5 mm. in length by 2 mm. in breadth.

The resemblance, both in form and spiculation, to *Podospungia lovenii*, Bocage, [1, p. 159, pl. x., fig. 1] is so close as to suggest that the new form should be regarded merely as a variety of the latter. The North Atlantic species is without the large discasters with simple spines, which are plentifully scattered in the choanosome of the new species; and the somal discasters ($40 \times 20 \mu$), in Bocage's species, are longer and more slender, and with the superior verticil of simple spines almost or entirely fused with the terminal spike, which is often bifurcated; lastly, the styles are abundant and straight in *P. lovenii*.

Family Spirastrellidæ.

Kalastrella, gen. nov.

Spirastrellidæ pedicellate, vasiform or sub-caliculate, with tyles, styles, and oxeas for megascleres, and for microscleres euasters forming an ectosomal layer and distributed in the body.

Kalastrella vasiformis, sp. n.

Plate V., Fig. 3. Plate VI., Fig. 3a-f.

Sponge vase-shaped, pedicellate, the wall being formed of a network with narrow longitudinal meshes, with the strands mainly composed of styles and oxeas, with small bundles of the same projecting out at right angles to the outer surface.

Surface (in the specimens) partly covered with a pale yellowish white cortex, composed of asters leaving the glassy-looking skeleton, visible in places, especially at the upper half of the sponge.

Spicules. Megascleres. — Tyle (or sub-tylostyle), length 128μ by 5μ , often with one or two sharp prickles at the summit.

Style, $2150 \times 50 \mu$, curved about the middle.

Strongyle, $1762 \times 54 \mu$, curved at the middle.

Oxea, $2150 \times 50 \mu$, curved at the middle.

Microscleres.—Euasters of all sizes up to 30μ with centrum of 8μ , with about 10 stout, blunt, roughened actines.

Locality C.—Mouth of Tugela River, 65 fms.; bottom, hard ground.

The new genus comes near *Spirastrella*, the ectosomal layer of spirasters of the latter being replaced by euasters (hence the generic name).

The three specimens of the new species are of about the same size and shape; the height is 2 cm., diameter of mouth

2 cm., length of stalk .5 cm., and thickness of wall about 1.2 mm., not including the glassy bristles which extend about 1 mm. beyond the outer surface.

The specimens, which look like small Hexactinellids, are probably in an early stage of growth, and, if this be so, would possibly grow to resemble, in outward appearance, the variety described below.

Kalastrella vasiformis, var. *minor*.

Plate V., Fig. 4. Plate VI., Fig. 4a-c.

Sponge pedicellate, sub-caliculate, with a finely papillated surface of greyish purple hue. Pores in cribriform areas between the papillae on the outer surface; oscules 1 mm. in diameter on the inner surface.

Spicules. Megascleres.—Tyles (rare) as in the typical form. Oxeas and styles of uniformly smaller size than in the type; style $860 \times 26 \mu$; oxea, $1200 \times 26 \mu$.

Microscleres.—Euasters of all sizes up to 60μ in diameter, with centrum 11μ , similar in character to those of the typical form.

Locality E.—Cone Point, Natal; depth, 34 fms.; bottom, broken shells.

The one specimen is shaped like a funnel incomplete on one side, the height being 7 cm., width 2.5 cm., and thickness of wall 4 cm. The stalk is 2.5 cm. in length and 8 mm. in thickness.

It might be supposed that the variety was merely the fully grown condition of the typical form, and that in course of growth the ectosome of the latter would become much thicker and darker; but apart from the differences in form and colour, the uniform and great difference in size of the oxeas and styles, which are much smaller in the variety, constitutes a well-marked varietal distinction.

Family Coppatiidæ.

Genus **Coppatias** (Sollas).

Coppatias baculifer, sp. n.

Plate V., Fig. 5. Plate VI., Fig. 5a, b.

Sponge massive, irregular in shape. Surface rough; texture hard, almost stony; colour, in dry state, reddish brown; lighter in section. Oscules 1-2 mm. in diameter, forming irregular cribriform areas; pores not visible.

Skeleton consisting of a confused mass of oxeas of various sizes, and of somal microstrongyles, which form a thin but compact dermal layer.

Spicules. Megascleres.—Oxeas of various sizes, from $360 \times 9 \mu$ to $1550 \times 62 \mu$, curved, often slightly centrotylote.

Locality K.—Durnford Point, Natal, 90 fms.; bottom, broken shells.

The new species is represented by one specimen, which is firmly attached by a large base to *Stelletta horrens*, Kirkp. The dimensions are $8 \times 9 \times 9$ cm.

For the most part the dermal layer has disappeared, the eroded surface showing matted masses of spicules (oxeas).

The new species possesses microstrongyles, usually centrotylote, these being probably modified euasters.

In the genus *Coppatias*, as defined by Sollas, only one form of aster, the euaster, occurs; accordingly an enlargement of the definition is necessary, if it is to include the present species. The new definition of *Coppatias* would run:—*Coppatiida*, with megascleres without order; the microscleres being either euasters or microstrongyles.

Genus *Tethya* (Lamarck).

Tethya magna, sp. n.

Plate V., Fig. 6. Plate VI., Fig. 6a-d.

Sponge oval or spherical, attached at the base by banyan-tree-like rootlets, surface with well-marked conules in the young state, expanding later into polygonal plates.

Cortex including intercortical cavities.

Pores in cribriform groups between the conules over certain areas; oscules not visible.

Colour, in spirit, purple-brown; on section, cortex silvery, pith bright yellow.

Spicules. Megascleres.—Strongyloxea $4805 \times 75 \mu$.

Microscleres. Cortical spherasters $60-110 \mu$ in diameter, sharp conical actines about 35μ .

Somal chiasters $12-17 \mu$, with a relatively large centrum about 6μ ; usually with six actines with spinous truncate ends.

Choansomal asters $35-45 \mu$ in diameter, with centrum about 5μ ; usually with 6 or 7 actines, truncate, bent at the extremity, and with rough surface.

Locality E.—Cone Point, Natal, 34 fms.; bottom, broken shells.

There are three specimens, the two smaller being oval with their long diameter, 4 and 6 cm.; the largest specimen, which is spherical, is 7 cm. in diameter. The new species belongs to

the series, *T. ingalli*, *seychellensis*, *maza*, and *japonica*, the last three of which Sollas is inclined to regard as varietal modifications of a single species.

The megascleres of the Natal species are much larger than those of the other forms; also the spherasters are larger. The measurements are given below in microns:—

	<i>T. magna.</i>	<i>T. ingalli.</i>	<i>T. seychellensis.</i>	<i>T. maza.</i>	<i>T. japonica.</i>
Strongyloxeas	4805×75	1700×32	1910×23	1680×32	1510×26
Spherasters	120	85	95	55	67

Genus *Trachya* (Carter.)

Trachya nuda, sp. n.

Plate V., Fig. 7. Plate VI., Fig. 7a, b.

Sponge massive; without a cortex; surface partly smooth, partly finely papillate; pores not visible; a few minute oscules at the ends of small conical papillae.

Colour, in spirit, pale brown, lighter in the interior; the ground-substance tough-gelatinous, semi-transparent. Consistence rather hard, but sponge easy to cut with a knife.

Skeleton formed of long ill-defined bundles of oxeas radiating from the attached base to the surface.

Spicules.—Oxea, $1700 \times 45 \mu$, curved at the centre, gradually attenuating to sharp points.

Locality E.—Cone Point, Natal, 34 fms.; bottom, broken shells.

The single specimen forms a rounded mass rising from a broad base; it is 5 cm. in height, 6 cm. in thickness, and 6 cm. in length.

The new species differs from *Trachya pernucleata* Cr. and *T. horrida* Cr. in being devoid of a cortical palisade of diactinal microscleres.

Both in outward appearance, in section, and skeletal arrangement this sponge bears a remarkable resemblance to *Trachya durissima*, Carter, from the Cape; the latter, moreover, becomes comparatively soft on immersion in water, while *T. nuda* becomes very hard on drying. There is, however, a great difference in the spiculation, Carter's species having styles—but not tylostyles—and coming under the Suberitid family of the Clavulida [Topsent, 18, p. 111].

Genus *Hymeniacidon* (Bowerbank).

Hymeniacidon caliculatum, sp. n.

Plate V., Fig. 8. Plate VI., Fig. 12.

Sponge stipitate, sub-caliculate. Surfaces slightly rough from

the projection of vertical tufts of spicules, and showing beneath the reddish dermal membrane, a fine lace-like reticulum. Pores and oscules not distinguishable.

Skeleton, a network with rectangular meshes, $.1 \times .05$ mm. in diameter; the meshes arranged serially and longitudinally in a central lamina; but on each side of the central lamina meshes with the long diameter more or less vertical to the lamina and sponge surface; strands of long sides of meshes 5 to 10 spicules thick, of short sides 2 to 3.

Spicules.—Style, $225 \times 12 \mu$, smooth, curved at junction of upper and middle third.

Colour brick-red, with here and there small patches of blue on the outer surface where the latter has been bruised by pressure.

Locality A.—East London coast, 85 fathoms.

The one specimen is 21 cm. in height by 12 cm. broad, and 1 cm. thick. The rounded stalk is 5.5 cm. in height by 2 cm. in thickness. The stalk grows into a sub-calliculate flabellate expansion, the shallow cup at the summit of the stalk being 1.5 cm. deep.

The skeleton shows well the transition between the Renierid and Axinellid type.

Hymeniacidon caliculatum, var. *osculatum*.

Plate VI., Fig. 13.

The sponge is brick-red in colour and forms a flat flabellate expansion 19 cm. in height by 17 cm. in breadth and 7 mm. in thickness, rising from a broad, short stalk.

One surface is covered with small oscular depressions 2 mm. in diameter. The spicules are styles $200 \times 16 \mu$; they are shorter, thicker, and more curved than in the type.

Locality A.—East London coast, 85 fathoms.

Genus *Phakellia* (Bowerbank).

Phakellia microxephora, sp. n.

Plate V., Fig. 9. Plate VI., Fig. 9a-d.

Sponge stipitate, forming a thin, flat flabellate expansion, which in the thinner peripheral parts is seen to be composed of a very close-meshed network, covered on both surfaces by a close pile of vertical tufts; on one surface white-branched bands apparent.

Smaller circular orifices about 1 mm. in diameter on both surfaces.

Spicules. Megascleres.—Vermicular strongyles, abundant, 670 to 1250×12 to 16μ , smooth.

Oxea (rather rare) $620 \times 18 \mu$, curved near the centre.

Style (rare) $560 \times 20 \mu$.

Microscleres.—Microxeas, abundant, $70 \times 3 \mu$, slightly curved at the centre.

Colour in spirit, pale yellow.

Locality A.—East London coast, 85 fathoms.

The one specimen, of which half has been sent, is 22 cm. in height and the same in breadth, and the flattened stalk is 4 cm. in height and 3 cm. in thickness.

The characteristic feature of the new species is the presence of microscleres in the form of microxea.

The new species is a typical *Phakellia* in all respects, excepting in the occurrence of the microscleres; if, however, the presence of these spicules should render necessary the establishing of a new genus, the latter would come between *Higginsia* and *Phakellia*.

Genus *Tragosia* (Gray).

Tragosia infundibuliformis (Johnston), var. *natalensis*, var. nov.

Plate V., Fig. 10. Plate VI., Fig. 10a-c.

There are two small cup-shaped specimens of a new variety of Johnston's species, each 3 cm. in height, 3 cm. in diameter at the mouth, and with walls 1.5 mm. in thickness; their colour is pale yellow.

In the new variety there is a dermal skeleton composed of bundles of spicules arranged tangentially to the surface, but the vertical tufts which project from the surface in Johnston's type are almost absent.

The spicules are straight styles (very rare), $450-1200 \times 12-13 \mu$, narrowed at their base to 10μ ; and oxeas, $300 \times 12 \mu$, slightly curved at the centre.

In Johnston's type (in the British Museum) the oxeas, about the the same size as the latter, have an abrupt bend at the centre; and the style, which are very abundant and uniform in size, are only $285 \times 13 \mu$, and curved. In spite of the variation in the styles, which have almost disappeared from the Natal variety, and of the much greater development of the dermal skeleton of the latter, this form seems to be only a well-marked variety of *T. infundibuliformis*, Johnston.

Localities.—C, off Tugela River mouth, 65-80 fathoms, hard ground; and D, off Cape Vidal, Natal, 80-100 fathoms, rock.

Genus *Axinella* (Schmidt).

Axinella, sp.

Sponge thick flabelliform, of the consistence of indiarubber,

i.e., flexible and rather tough; marked with radiating ridges or series of conuli; colour, grey. A few small oscules, .75 mm. in diameter, scattered about; cortex absent; ground substance semi-transparent.

Skeleton formed of radiating bundles of large styles branched in a fan-like manner.

Spicules.—Large style, $1230 \times 22 \mu$, curved at the junction of the upper and middle third.

Oxea, $620 \times 5 \mu$, straight, sharp pointed.

Locality E.—Cone Point, Natal, 34 fathoms; bottom, broken shells.

The specimen, which is 6 cm. in height, 4 cm. in breadth, and .5 cm. in thickness, expands upwards from a thickened base which appears to have been cut off from its attachment. No specific name has been attached to it.

Axinella, sp.

Sponge consisting of a simple, erect, unbranched stem-like growth of pale brick-red colour, and with a fluffy surface.

Skeleton formed of a dense axial core of styles, giving off tuft-like bundles which are directed obliquely upwards.

Spicules.—Style, $590 \times 28 \mu$, with a sharp curve near the basal end.

Locality C.—Off Tugela River mouth, 65-80 fathoms; bottom, hard ground.

The specimen is 5.5 cm. in height, by .5 cm. in diameter at the thickest central part. The stem above its attachment is at first smooth, but soon becomes tufted.

The sponge is shaped like a cypress tree, the stem being at first smooth, then tufted, and terminating in a point. The species is near *Axinella erecta*, Carter, which occurs in the South Atlantic and Southern Oceans, but chiefly differs from the latter in the absence of the crooked strongyles.

The one specimen probably represents a new species, but is too immature to be made the type of a species.

Genus *Syringella* (Schmidt).

Syringella gorgonioides, sp. n.

Plate V., Fig. 11. Plate VI., Fig. 11a, b.

Sponge forming a thin flabelliform clathrate expansion, flexible but inelastic, spreading from a thick hard stem; surface rough and granular, slightly hirsute from projecting glassy

spicules (which show clearly on the borders of the meshes). Pores and oscules not discernible.

Colour, slaty-gray, bleaching to brown.

Skeleton formed of a dense axis of styles enveloped in spongin, with conical tufts of styles projecting from the axis at right angles and with the apices outwards.

Spicules.—Style, $340-530 \times 12-25$, usually curved near base or centre, or sometimes nearly straight, of the same thickness from base to junction of middle and lower third, then attenuating gradually to a sharp point.

Locality A.—East London coast, 85 fms.

There are two fine specimens of this species, the largest being 50 cm. in height and 19 cm. in width, the stem being 6 cm. in length and 2 cm. in diameter.

The meshes are elongated, and average about $1.5 \times .5$ cm.; the strands diminish in diameter from stem to periphery, but average about 2.5 mm. from side to side, and 3 mm. from before backwards.

There are two other clathrate species of *Syringella*, viz. *S. clathrata*, Ridley, and *S. falcifera*, Topsent; but the differences in general character and spiculation are so great that it is needless to specify them.

Genus *Axinyssa* (Lendenfeld).

Axinyssa tethyoides, sp. n.

Plate V., Fig. 12. Plate VI., Fig. 8a, b.

Sponge sub-spherical; surface covered with conical papillae about 4 mm. high, and easily detachable. Pores and oscules not visible; texture loose and friable.

Colour, in spirit, black outside, dark brown in the interior.

Skeleton consisting of dendritically branched fibres from 500-1000 μ thick, which can be easily detached from the loose flesh of the sponge, leaving tubular cavities; also loose oxeas scattered in the soft tissues.

Spicules.—Oxeas, varying in size, up to $700 \times 34 \mu$, sharp-pointed, slightly curved at the centre.

Locality E.—Cone Point, Natal, 34 fms.; bottom, broken shells.

The solitary specimen, which is sub-spherical, is about 6 cm. in diameter. At the flattened base is a deep depression, where apparently the sponge was attached. The new species calls to mind *Axiuella tubulata*, Bowerbank [3, p. 29, pl. viii.], which is more or less spherical and has surface papillae; but there are no commensal worms in the new form, while the spicules are oxeas, and not, as in Bowerbank's species, styles.

Axinella (?) *paradoxa*, Ridley and Dendy [15, p. 187], a small massively lobate sponge with oxeas for its spicules, would come under *Axinyssa*, which genus, with *A. topsentii*, Lendenfeld [12, p. 116] includes three species.

Sigmaxinella (Dendy).

Sigmaxinella arborea, sp. n.

Plate V., Fig. 13. Plate VI., Fig. 14a-c.

Sponge erect, ramose, with long stem and long dichotomous branches, the lower ones compressed, the upper cylindrical. Surface formed by the apices of hispid tufts. Oscules scattered, very small, about 1 mm.

Colour (in spirit) pale brown.

Skeleton formed of a dense axis of reticulating fibres of spongin with megascleres, the tufts, simple or branched, radiating out horizontally from the axis.

Spicules. Megascleres.—Styles, $800-1150 \times 25-37 \mu$, curved near the upper end, which is attenuated to 17μ .

Strongyles, $700-870 \times 25-30 \mu$.

Rhaphide-like oxeas (very rare) $825 \times 12.5 \mu$, straight, slender.

Microscleres — Rhaphides solitary or as trichodragmas, slightly fusiform, 70μ long.

Sigma 15μ long and 1μ thick.

Localities A, D, G.—East London, 85 fms.; Cape Vidal, Natal, 80-100 fms., bottom rocky; and O'Neil Peak, Natal, 55 fms., bottom broken shells.

There are three specimens, the largest being 31 cm. in height and 21 cm. in breadth, the stem being 12 cm. in length and 2×1 cm. in diameter.

The new species is very near *Sigmaxinella australiana*, Dendy [7, p. 240] which forms a bushy bunch of short slender branches. The main difference lies in the spiculation; the styles, for instance, in the Australian species are only $300 \times 6 \mu$, and the raphides only 25μ .

Sigmaxinella incrustans, sp. n.

Sponge forming a pale-brown woolly-looking crust about 6 mm. thick.

Skeleton formed of branched plumose columns rising vertically from base to surface, the latter being covered with an ectosomal layer of microscleres. Spongin present, but not to a great extent.

Spicules. Megascleres. — Style, $1085 \times 33 \mu$, being 31μ at the base, with a gradual curve in the upper third.

Microscleres.—Sigma, 27.5 μ in length by 2.7 in thickness.

Rhaphides, 60 μ in length, solitary or in trichodragmata.

Locality A.—East London coast, 85 fms., encrusting *Placospongia labyrinthica*.

The new species differs from *S. arborea mihi*, not merely in its form but in comparatively slight development of spongin. The styles are markedly different in shape, those of *S. arborea* being much narrowed at the base. Further, the sigmas in the latter are very considerably shorter and more slender.

Genus **Higginsia** (Higgins).

Higginsia bidentifera (Ridley and Dendy).

1886. *Dendropsis bidentifera*, Ridley and Dendy [14, p. 483].

1887. Do. do. [15, p. 192, pls. xxxviii., xl., xlvii.]

1898. *Higginsia bidentifera*, Topsent [18, p. 93].

Four fine specimens of this species are in the present collection, the largest being 250 cm. in height, and with a stem 4 cm. thick.

The "Challenger" specimens were obtained from Simons Bay, 20 fms.

Locality A.—East London coast, 85 fms.

Genus **Sollasella** (Lendenfeld).

Sollasella hystrix (Topsent).

1892. *Trachya hystrix*, Topsent [16, p. 75, pl. i., figs. 8-10; and pl. xi., figs. 12-14].

1898. *Sollasella hystrix*, Topsent [18, p. 111].

One small specimen of this species occurs in this collection. The specimen is white in colour and pyriform, 2 cm. in height, and 1.3 cm. in its greatest width. No oscules are perceptible. On section, the cortical layer of microxea shows us a well defined white line. In one point the present specimen differs from those described by Topsent; the slender oxeas in the choanosome are not only separate, but also united to form trichodragmata. The size of the spicules is as follows:—

Tyles 5270 \times 64 μ , often with the base surmounted by a small rounded knob; microxea 165 \times 6, smooth, straight, fusiform. Certain small tyles (170 \times 5.5 μ) and asters present in the slides are very probably adventitious.

The type specimens came from 173.3 fms. and 247.5 fms. off the Azores.

Locality C.—Off Tugela River mouth, 65-85 fms.; bottom, hard ground.

Genus *Bubaris* (Gray)*Bubaris reptans*, sp. n.

Plate V., Fig. 14. Plate VI., Fig. 15a-c.

Sponge encrusting, growing in the form of narrow sharp-edged ligulate bands averaging about 1 mm. in diameter, but wider at the origin of branches; the bands branching and occasionally anastomosing so as to form an incomplete reticulate pattern (on the surface of *Halichondria pachastrelloides*, Topsent).

Here and there minute oscular (?) papillae about .25 mm. high, only visible in the specimen preserved in formalin.

Colour, in spirit, greenish; in formalin, pale yellow with purple streaks.

Skeleton composed of a basilar layer of styles partly tangential, partly forming root-like fascicles proceeding obliquely downwards and outwards into the *Halichondria*, and of a dense superficial layer of vertically arranged tyles.

Spicules.—Style, 530 μ in length by 15 μ in breadth at the centre, and 9 μ in breadth at the base, fusiform, straight or slightly curved near the base.

Tyle, 16 \times 6 μ , decidedly curved near the head; head sub-spherical, slightly knobbed at summit, 6.5 μ in diameter, neck 5 μ .

Microscleres, 0.

Locality E.—Cone Point Natal, 34 fms.; bottom, broken shells.

The new species is placed, not without hesitation, in the genus *Bubaris*, under which is grouped a somewhat heterogeneous collection of species.

There are no diactinal megascleres in the present species, which agrees in this respect with *B. constellata*, Topsent, in which last, however, oxyasters replace the typical basilar diactinal megascleres.

The small papillae on the surface are probably oscular, since it is possible to trace canals passing down in a radiate manner into the body of the sponge, the canals being mapped out by cells containing purple granules.

Genus *Clathria* (Schmidt).*Clathria typica* (Carter).

1881. *Echinonema tyficum*, Carter [4, p. 378].

1881. *Echinonema achoratum*, Carter [4, p. 379].

1896. *Clathria tyfica*, Dendy [6, p. 32].

One small stalked flabellate specimen of this sponge, attached to a piece of rock, occurs in this collection. The height is

10 cm., the breadth 3.5 cm., the thickness of body 6 mm., and length of stalk 2 cm.

The surface is covered with small conical papillae, which show a radial tendency towards the periphery; the colour is brown.

The fibres of keratode are thick and rather hard. The megascleres are:—Smooth styles, $530 \times 10 \mu$, slightly curved near the base; echinating spined style, $120 \times 10 \mu$, straight; dermal styles, $250 \times 11 \mu$, spined at the base.

The microscleres are:—Toxa, $154 \times 4 \mu$, spined at the ends; slender palmate isochelae, 11μ in length; thick contort sigmata, $65 \times 3 \mu$.

In the British Museum collection there are several thin stipitate flabellate specimens of this species from Port Elizabeth, labelled *Echinonema anchoratum*, Cr.

Locality E.—Cone Point, Natal, 34 fms.; bottom, broken shells.

Distribution.—S. and S. W. Australia; Port Elizabeth and Natal.

Clathria mollis, sp. n.

Plate V., Fig. 15. Plate VI., Fig. 16a-d.

Sponge forming a thick-walled soft sub-calliculate growth, with thick rounded rim.

Surface smooth. A few small circular oscules, 1-2 mm., scattered over both surfaces. Consistence like soft rubber.

Colour, grayish-brown, speckled with numerous whitish specks due to foreign particles, the latter being plentiful on the surface and in the interior.

Skeleton formed of a network of very thick, soft fibres of spongin, sometimes cored with spined styles, sometimes without core, but echinated by similar spined styles usually half immersed in the keratode; foreign bodies present in the fibres and in the ground substance; with a dermal layer of oxeads.

Spicules. Megascleres.—Spined style, $130 \times 11 \mu$, straight, with short vertical prickles.

Dermal ampliitornote, $165 \times 5.5 \mu$, usually more gradually attenuated at one end than at the other.

Microscleres.—Sigmas, abundant and varying greatly in size, the largest being $38 \times 2 \mu$, contort and with sharp points.

Isochele, 17.5μ in length, tridentate, the central tooth being 5μ in length; with strongly curved keel.

Locality A.—East London coast, 85 fms.

In one important point the new species differs from the typical *Clathria*, viz., in the absence of smooth styles forming a

core to the spongin fibres. If a core is present at all it is formed of spined styles or foreign bodies.

Toxas also are apparently absent.

The solitary specimen, which apparently has been cut in half, expands upwards from a contracted base to a height of 27 cm, the width of the piece being 20 cm., and the thickness of the wall 1.5 cm. Near the base the wall is perforated by a large hole.

Genus *Stylostichon* (Topsent).

Stylostichon involutum, sp. n.

Plate V., Fig. 16. Plate VI., Fig. 17a-e.

Sponge forming a thick, firm but flexible, plate, growing from a narrow base and with its lateral edges coiled inwards. Surface presenting a finely hispid woolly appearance, this being due to plumose dermal tufts of oxeas and included foreign particles. Pores and oscules not visible.

Colour (in spirit) brown.

Skeleton composed of branching plumose columns diverging obliquely from the central plane, and composed of spined styles echinated by smaller spined styles. Dermal skeleton composed of fan-shaped tufts of oxeas at the summits of the plumose columns.

Spicules. Megascleres.—Large style, $360 \times 24 \mu$, slightly curved near the base, spined at the lower third, the thorn-like spines pointing backwards.

Small echinating style, $120 \times 6 \mu$, with a marked bend at an angle of 45° at the basal end, spined at the lower half.

Oxea of dermal skeleton, $1010 \times 8 \mu$, straight, slender, fusi-form.

Microscleres.—Large sigma, $120 \times 4 \mu$.

Locality E.—Off Cone Point, Natal, 34 fms. ; bottom, broken shells.

The specimen representing the new species is 8 cm. high, and 8 cm. wide, the wall being 2 cm. thick.

The species is distinguished by its peculiarly arranged ectosomal skeleton.

Genus *Histoderma* (Carter).

Histoderma natalense, sp. n.

Plate V., Fig. 17. Plate VI., Fig. 18a-e.

Sponge small, bulbous, free or attached, with cylindrical tubular oscules, with a smooth and firm cortex inclosing a soft pith. Colour, white.

Skeleton. — Cortex formed of alternating transverse and longitudinal layers of amphityles, these latter also being scattered in the soft tissues.

Spicules. Megascleres. — Amphityle, $530 \times 22 \mu$, smooth, curved; with long oval head 28μ long, and 14μ broad.

Acanthoxea (rare), $200 \times 44 \mu$, slightly curved, fusiform, sharp-pointed, smooth at the ends, but with pyramidal spines on each side of the middle line directed towards the middle.

Microscleres. Sigma, $38 \times 3.5 \mu$, contort smooth.

Isochele, tridentate, 20μ long.

Trichites, rarely joined into trichodragmas, 275μ long.

Spined coiled microsclere, 11μ by 4μ in total breadth; and spined cruciate form (fig. 18e).

Locality C.—Off Tugela River mouth, Natal, 65-80 fms.; bottom, hard ground.

There are two specimens of the new species, one attached by one of its tubular processes to a worm tube, the other free.

The free specimen is 11μ in total length, it possesses 4 oscular distinct tubes and indications of 4 others; the size of the largest tube is 3×1 mm.

This species is near *Histoderma appendiculatum*, Cr., from the N. Atlantic, but there are distinct specific differences. The acanthoxeas and spined coils are absent in the Atlantic species, and the large styles occurring in the latter are not present in the Natal form; further, the other spicules common to both species vary greatly in size, as will be seen from the following table:—

	Amphityles.	Isocheles.	Sigmas.
<i>H. appendiculatum</i>	- $1085 \times 20 \mu$	35μ long	$132 \times 5 \mu$.
<i>H. natalense</i>	- - $530 \times 22 \mu$	20μ long	$38 \times 35 \mu$.

Dendy's supposition [6, p. 26] that *Sideroderma*, Ridley and Dendy, is identical with *Histoderma*, is undoubtedly correct.

The microscleres, which I have termed spined coils, at first seemed to me to be spined spirulae, but they are possibly modified sigmas. They resemble in some measure the spined isocheles of *Leptosia schmidti*, Topsent [19, pp. 232, 250, fig. 2b].

Genus *Dendoryx* (Gray).

Dendoryx incrustans (Esper).

1805-1830. *Alcyonium incrustans*, Esper [9, *Alcyonium*, tab. xv.].

1842. *Halichondria incrustans*, Johnston [10, p. 122, pl. xii., fig. 3; and pl. xiii., fig. 5].

1866. *Halichondria incrustans*, Bowerbank [2, ii. p. 249, iii. p. 107, pl. xlv., figs. 7-12].

1894. *Dendoryx incrustans*, Topsent [17, p. 13].

The sponge forms an irregular incrustation round the stem of a large Hydroid. The ectosomal spicules are all amphi-

tornote, and not styles with a tornote point such as Bowerbank figures.

The specimen is crowded in parts with small developing seed-like embryos, solitary or in clusters, each coated with a special layer of spined styles, more slender and less spined than the spicules of the general network.

Locality B.—Cape St. Blaize, 45 fms. ; bottom, fine sand.

Distribution.—Great Britain, West Indies, South Africa, Falkland Islands.

Genus *Desmacidon* (Bowerbank).

Desmacidon ramosum (Ridley and Dendy).

1886. *Desmacidon* (?) *ramosa*, Ridley and Dendy [14, p. 346].

1887. *Desmacidon* (?) *ramosa*, Ridley and Dendy [15, p. 107, pl. xxiii. fig. 4-4c, pl. xxiv. fig. 4, pl. xvii. fig. 6].

One small cylindrical fragment.

Locality C.—Off Tugela River mouth, 65-80 fms. ; hard ground.

Distribution.—South of Cape of Good Hope, 150 fms., and Marion Island, 50-75 fms. ("Challenger").

The collection contains one small cylindrical fragment. Although the skeleton approximates more to a radial than to a reticulate type, yet a certain amount of reticulation is present ; accordingly the specimen is here definitely placed in the genus *Desmacidon*.

Desmacidon grande (Ridley and Dendy).

1886. *Homoeodictya grandis*, Ridley and Dendy [14, p. 347].

1887. *Desmacidon grandis*, Ridley and Dendy [15, p. 111, pl. xxii., pl. xxix., figs. 7, 7a].

This collection includes a fine series of specimens of this species, showing interesting variations in form.

All expand from a short thick rounded stem into a thin soft flabellate growth. In some the flap is entire, in others the margin is continued into flat digitate flaps longer than the undivided basal portion.

The largest specimen is 40 cm. high and 32 cm. broad.

The type specimen obtained by the "Challenger" from Simon's Bay has a much smoother surface and more clearly defined oscules than any of the present series, the surfaces of which are strongly tufted. A well-marked umbo is usually (and not exceptionally) present at the centre of the concavity of the keel of the isocleles in Dr. Gilchrist's specimens.

Localities A, B.—East London coast, 85 fms.; Cape St. Blaize, 45 fms.; bottom, fine sand; Simons Bay, 10-20 fms. ("Challenger").

Genus **Hamacantha** (Gray)

Hamacantha esperioides (Ridley and Dendy).

Vomerula esperioides, Ridley and Dendy [14, p. 337].

Vomerula esperioides, Ridley and Dendy [15, p. 60, pl. xii. fig. 1, pl. xvii. figs. 2, 4, 12].

One large conical specimen resembling in size and shape the type specimen, figured in the Challenger Report (*loc. cit.*)

Locality.—South-east of Cape Colony, 47 fms.

Distribution.—Agulhas Bank, 150 fms, and off Rio de la Plata, 600 fms. ("Challenger").

Sub-Family **Renierinæ**.

Genus **Phlæodictyon** (Carter).

Phlæodictyon eumatum,¹ sp. n.

Plate V., Fig. 18. Plate VI., Fig. 19a, b.

Sponge club-shaped, with expanded, flattened upper end, presenting several circular oscules, each subdivided by partitions and with raised rims.

Consistence firm. Surface smooth. Colour dark brown.

Skeleton consisting of a central loose network of slender spiculo-fibre surrounded by a hard rind, and with a dermal layer of tangential oxeas not united into bundles; loose scattered oxeas in the choanosome.

Spicules.—Oxea, $190 \times 9 \mu$, slightly curved, terminating abruptly in sharp points.

Locality E.—Off Cone Point, Natal, 34 fathoms; bottom, broken shells.

The one specimen representing this species is 6 cm. high, 2 cm. in diameter at the base, and 5 cm. in diameter at the flat summit. The specimen, which apparently has been torn from its attachment, reveals a loose network in the interior; the torn skeleton fibres form long loose shreds. There are three oscules with rims, the largest being 6 mm. in height, 10 mm. in diameter, and with nine circular sub-divisions; some smaller oscules are almost flush with the surface.

The new species is near *P. cohærens*, Carter [5, p. 446], from Port Phillip, but the latter is narrower at the summit than at

¹ εὐμίτος, with fine threads.

the base, the oscules are all level with the surface, and the oxeas blunt-pointed and only $1.45 \times 6 \mu$.

Lundbeck [13, p. 56] abolishes Carter's group Phœodictyinae, placing the genus *Phlæodictyon* (of which *Rhizochalina* in the sense of later authors than Schmidt is a synonym) under Renierinae near *Petrosia*. In the preliminary examination of the specimen I had labelled it *Petrosia*.

Genus *Pellina* (Schmidt).

Pellina, sp.

A small damaged funnel-shaped specimen 5 cm. in length, and 2.5 cm. in diameter at the summit, of brownish colour uniformly speckled with light grey spots. There is a well marked dermal membrane with oval meshes $370 \times 310 \mu$, the pore areas being in the meshes.

The skeleton is formed of rectangular meshes about $300 \times 150 \mu$, the long strands being about 10 spicules thick, and the short transverse strands 2 or 3 spicules thick.

The spicules are oxeas, $165 \times 6.5 \mu$, curved at the centre, and tapering gradually to sharp points.

Locality C.—Off Tugela River mouth, 65-80 fathoms; hard ground.

Genus *Halichondria* (Fleming).

Halichondria pachastrelloides (Topsent).

1892. *Halichondria pachastrelloides*, Topsent [16, p. 66, pl. ix. fig. 3].

I have little hesitation in identifying with the above species two massive specimens, the larger of which is 10 cm. long, 5 cm. high, and 6 cm. broad. One specimen, in spirit, is of a rich yellow colour in section, the other in formalin is greenish.

The oxeas vary from $150 \times 4 \mu$ to $700 \times 28 \mu$, and have a slight bend in the centre. Both specimens are encrusted by *Bubaris reptans mihi*.

Locality E. - Cone Point, Natal, 34 fathoms; bottom, broken shells.

Distribution.—Azores, 401 fathoms; Natal, 34 fathoms.

Genus *Coscinoderma* (Carter).

Coscinoderma concentricum, sp. n.

Plate VI., Fig. 19, 19a.

Sponge bowl-shaped, with a short thick stem.

The surface covered with a thin cortex, 60μ thick, composed chiefly of sand particles; the cortex on the outer surface being

finely reticulated with the pores in the meshes, that on the inner surface (in the few places where it had not become eroded) being smooth and apparently imperforate.

On the outer surface slightly raised longitudinal ridges of oscules, two-deep, radiating up from base to edge and branching dichotomously; on the inner surface several concentric ridges of oscules, the latter also being arranged two-deep.

Texture firm but compressible, and soft and elastic in water.

Colour in dry state greyish-white where the cortex persists; skeleton dark amber brown.

Skeleton (as in *Euspongia*). Main fibres filled with sand grains and spicules, rather knotted and irregular, 60-100 μ thick, radiating in fan-like manner from central plane to surface, about 1 mm. distant from each other at the surface, and with irregular meshes about 0.4 mm. in diameter between the main fibres.

Secondary fibres, about 30 μ in diameter, without foreign particles, and with only a thread-like axial core.

Locality J.—Lat. 33° 53' S., long. 25° 51' E.; 30 fathoms; bottom, mud, sand and specks.

There are two dried specimens, the larger being 16 cm. high, 16 × 28 cm. in diameter at the mouth, and in the cavity of the cup 13 cm. deep; the stalk is 2.5 cm. long, and the wall 1 cm. thick.

The second specimen is much smaller and worn into holes.

The concentric oscular ridges on the inner surface do not form complete circles; the ridges are about 8 mm. high, and 10 mm. broad at the base, the oscules being each about 1 mm. in diameter. The shape of the specimens and the presence of the concentric ridges on the inner surface recall the *Spongia agaricina*, var., figured by Esper [8, p. 206, pl. lix.], from Surinam.

The existence of the fine sandy cortex seems to me sufficient to exclude this form from *Euspongia*. Lendenfeld observes [11, p. 227] that a dense cortex is never present in this genus. Other characters which Lendenfeld attributes to *Coscinoderma*, such as the existence of "large continuous sub-dermal cavities without vestibular spaces," I have not been able to make out in the dried specimens. The comparatively small size of the meshes and of the axial core of the fibres excludes this species from *Thorecta*.

Genus *Stelospongia* (Schmidt).

Stelospongia, sp.

Sponge pyriform. Colour, where covered by dermal membrane, pale grey; colour of skeleton, brown. Conuli, from

3-4 mm. high, arranged in spiral lines, with grooves 3 mm. wide between the lines. Oscules, numerous, about 2-2.5 mm. in diameter, opening obliquely in the grooves. Pore areas, .5 mm. in diameter in the meshes of a dermal reticulum. Main fascicles of skeleton, 1-1.5 mm. in diameter; diameter of separate fibres 35μ , a second more slender kind being only 13μ .

Locality D.—Cape Vidal, Natal, 80-100 fathoms; bottom, rock.

The species is probably new, its chief characters being the spiral grooves containing the many small oscules.

The pyriform varieties of *S. australis*, Lendenfeld, differ from the present form in having a single large osculum.

The specimen is 8 cm. high, and 5 cm. broad at the broadest part.

In the hope that more specimens will be obtained, I have not given a name to the species.

Genus *Hircinia* (Nardo).

Hircinia arenosa (Lendenfeld).

1889. *Hircinia arenosa*, Lendenfeld [11, p. 583, pl. xxxvi. fig. 3].

There are two specimens of this species, one being small and cup-shaped, the other forming a large saddle-shaped mass 20 cm. in height, 19 cm. in width, and varying from 4 to 7 cm. in thickness. The pore areas are on the under or outer, and the small circular oscules on the upper or inner surface. Colour, brownish pink.

The skeleton is formed of a central layer giving off on each side parallel main fibres running obliquely to the surface; the secondary fibres form a double row of narrow elongated meshes between the main fibres. The main fibres are cored with large sand grains, the secondary fibres being free of foreign particles, excepting that one sand particle is situated at each central node of the secondary meshes.

The filaments are 6μ broad, the oval heads being 16.5 long by 11μ broad. The ciliated chambers are 27μ in diameter, and nearly spherical.

Locality A.—East London coast, 85 fathoms.

Distribution.—W., S., and E. coasts of Australia; South Africa.

Hircinia arbuscula (Lendenfeld) [11, p. 571].

Plate VI., Fig. 20, 20a, b, and Plate VII., Fig. 20.

There are eight specimens of this species. The colour in spirit is yellow, and the consistence firm but compressible; in

the dry state the colour is dirty white, and the consistence hard and leathery. The specimens vary considerably, four being single, and four multiple; the former are smooth and swollen at the lower half, and terminate in a conical tube with conulated surface, and with an oscule at the summit. The multiple specimens have from two to five oscular tubes rising from the fused basal portion. The largest specimen has a massive sub-globular base 8 cm. in diameter, with two cones, each 7 cm. in length. The whole surface is covered with a very fine sandy layer, which clothes also the main ex-current canal passing from base to summit. The conules (1-2 mm. high) cover the whole surface in some specimens, but only the upper part in others. The finely reticulate poral area (with meshes $100\ \mu$ in diameter) is either sharply limited to the upper half or extends over nearly the whole surface. The skeletal scaffolding, which conforms more or less to the shape of the specimens, consists of vertical main fascicles of fibres ($350\ \mu$) extending from base to summit, and joined web-like layers of horny network. Sometimes the fascicles and single fibres are accompanied by lines of foreign spicules, and occasionally the latter form a core in the centre of the fascicles or the fibres themselves. Fibres vary from $15\text{-}60\ \mu$ in diameter, and are usually free of foreign bodies.

The filaments, which form a fasciculated network in the body and a felt-like layer beneath the cortex, are wavy, $2.75\ \mu$ wide, with pyriform heads $11 \times 5.5\ \mu$ in diameters; these bodies are thicker ($6\ \mu$) and with more globular heads in the Australian specimens, and the brown spots present in the latter do not occur in the South African specimens.

Localities.—C. Tugela River mouth, 65-80 fathoms; bottom, hard ground. D. Cape Vidal, Natal, 80-100 fathoms; bottom, rock. G. O'Neil Peak, Natal, 55 fathoms; bottom, broken shells.

Distribution.—Port Phillip and Port Jackson, Australia; Natal.

Genus *Psammopemma* (Marshall).

Psammopemma inordinatum, sp. n.

Plate VI., Fig. 21, 21a.

Sponge massive, hemispherical, attached by a flat base. Surface rendered irregular by numerous foreign bodies beneath the dermal membrane. Dermal membrane smooth, but with irregularly shaped finely reticulate poral areas. Small circular oscules, few in number, 1-2 mm. in diameter, flush with the surface.

Colour (in spirit) grey, with a faint pink tinge.

Skeleton consisting of confused masses of various kinds of foreign bodies (pieces of shell, Polyzoa, lumps of sand, etc.), without areniferous fibres. The ground substance crowded with large spherical cells, 12μ in diameter, loaded with granules.

Localities C and D.—Off Tugela River mouth, 65-80 fathoms, hard ground; and off Cape Vidal, Natal, 80-100 fathoms, rock.

There are two specimens of this species. The larger, which has been torn from its attachment, is 6 cm. in its basal diameter, and 4 cm. in height. The smaller specimen is a nodule growing on *Hircinia arbuscula*, Lendenfeld.

On section little else is seen but a mass of shells, sand, etc. The flagellated chambers are large and nearly spherical, averaging about 33μ in diameter; but they are often distorted by pressure, one for instance being oval and measuring $55 \times 17.5 \mu$.

LIST OF LOCALITIES.

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- A. No. 907. From East London coast, Lat. $33^{\circ} 6' 30''$ S., Long. $28^{\circ} 11'$ E., with dredge. Depth, 85 fathoms.
- B. No. 1264. Cape St. Blaize bearing N.E. by E., $27\frac{1}{2}$ miles, with large trawl. Depth, 45 fathoms. Bottom, fine sand.
- C. No. 11340. Tugela River mouth bearing N.W. by N. $\frac{1}{4}$ N., 24 miles, with large dredge. Depth, 65-80 fathoms. Bottom, hard ground.
- D. No. 11958. Cape Vidal, Natal coast, bearing N.N.E. $\frac{1}{4}$ N., $9\frac{1}{2}$ miles, with dredge. Depth, 80-100 fathoms. Bottom, rock.
- E. F. Nos. 12014. Cone Point, Natal coast, bearing N.W. $\frac{1}{2}$ W., 4 miles, with dredge. Depth, 34 fathoms. Bottom, broken shells.
- G. No. 12095. O'Neil Peak, Natal coast, bearing N.N.W. $\frac{1}{4}$ W., 8 miles, with dredge. Depth, 55 fathoms. Bottom, broken shells.
- H. No. 12553. Cape Natal bearing W. by N. $\frac{3}{4}$ N., 11 miles, with shrimp trawl. Depth, 185-200 fathoms. Bottom, sand and mud.
- J. No. 707. Lat. $33^{\circ} 53'$ S., Long. $25^{\circ} 51'$ E. 30 fathoms. Bottom, mud, sand and specks. By dredge.
- K. Nos. 12162. Durnford Point, Natal, bearing N.W. $\frac{3}{4}$ W., 12 miles. Depth, 90 fathoms. Bottom, broken shells.
- L. No. 12713. East London bearing N.W. $\frac{1}{2}$ N., 18 miles. Depth, 250-300 fathoms. Bottom, broken shells.

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EXPLANATION OF PLATES.

PLATE V.

- Fig. 1.—*Placospongia labyrinthica*, sp. n., showing oscular areas, the large poral surface being on the opposite side, $\times \frac{1}{2}$; 1b, poral surface, $\times 1$.
- Fig. 2.—*Latrunculia natalensis*, sp. n., $\times 2$.
- Fig. 3.—*Kalastrella vasiformis*, sp. n., $\times 1$.
- Fig. 4.—*Kalastrella vasiformis*, var. *minor*, $\times \frac{1}{2}$.
- Fig. 5.—*Coppatias baculifer*, sp. n., on *Stelletta horrens*, Kirkp., $\times \frac{1}{2}$.
- Fig. 6.—*Tethya magna*, sp. n., $\times \frac{1}{2}$; 6a, poral areas, $\times 2$.
- Fig. 7.—*Trachya nuda*, sp. n., $\times \frac{1}{2}$.
- Fig. 8.—*Hymeniacion caliculatum*, sp. n., $\times \frac{1}{3}$.
- Fig. 9.—*Phakellia microxephora*, sp. n., $\times \frac{1}{2}$.
- Fig. 10.—*Tragosia infundibuliformis*, var. *natalensis*, var. nov., $\times \frac{1}{2}$.
- Fig. 11.—*Syringella gorgonioides*, sp. n., Fragment, $\times 1$.
- Fig. 12.—*Axinyssa tethyoides*, sp. n., $\times \frac{1}{2}$.
- Fig. 13.—*Sigmaxinella arborea*, sp. n., $\times \frac{1}{2}$.
- Fig. 14.—*Bubaris reptans*, sp. n., on *Halichondria pachastrelloides*, Topsent, $\times \frac{1}{2}$; Fig. 14a, a small piece, from a specimen preserved in formalin, showing oscular (and poral?) papillæ, $\times 2$.
- Fig. 15.—*Clathria mollis*, sp. n., $\times \frac{1}{3}$.
- Fig. 16.—*Stylostichou involutum*, sp. n., $\times \frac{1}{2}$.
- Fig. 17.—*Histoderma natalense*, sp. n., $\times 2$; 17a, portion of another specimen attached to worm tube, $\times 2$.
- Fig. 18.—*Phloxodictyon cumitum*, sp. n., $\times \frac{1}{2}$.
- Fig. 19.—*Coscinoderma concentricum*, $\times \frac{1}{3}$; 19a, sandy cortex from outer surface showing poral areas, $\times 4$.

Fig. 20.—*Hircinia arbuscula*, $\times \frac{1}{2}$; 20a, section, $\times \frac{1}{2}$; 20b, cortex at junction of poral and imperforate surface, $\times 4$.

Fig. 21.—*Psammopemma inordinatum*, $\times \frac{1}{2}$; 21a, ditto., poral area, $\times 5$.

PLATE VI.

Fig. 1.—*Placospongia carinata*: a, subtylostyle, $\times 80$; b, strongyle, $\times 80$; c, oxea, $\times 80$; d, sterrasters, $\times 80$, with sketches showing development of ends of actines; e, somal chiaster, $\times 730$; f, pycnaster, $\times 730$.

Fig. 2.—*Latrunculia natalensis*: a, strongyle, $\times 80$; b, tornote, $\times 80$; c, c', curved and straight styles, $\times 80$; d, d', discaster, side and end view, $\times 730$; e, choanosomal discaster, $\times 730$.

Fig. 3.—*Kalastrella vasiformis*: a, strongyle, $\times 80$; b, oxea, $\times 80$; c, style, $\times 80$; d, thick straight style, very rare, $\times 80$; e, small tyle or subtylostyle, $\times 420$; f, euasters, $\times 730$.

Fig. 4.—*Kalastrella vasiformis*, var. *minor*: a, oxea, $\times 80$; b, style, $\times 80$; c, small tyle, $\times 420$; other spicules as in Fig. 3.

Fig. 5.—*Coppatias baculifer*: a, a', oxeas, $\times 80$; b, microstrongyles, $\times 730$.

Fig. 6.—*Tethya magna*: a, strongyloxea, $\times 80$; b, cortical spheraster, $\times 730$; c, somal chiaster, $\times 730$; d, choanosomal aster, $\times 730$.

Fig. 7.—*Trachya nuda*: a, vertical section, $\times 5$; b, oxea, $\times 80$.

Fig. 8.—*Axinyssa tethyoides*: a, branching skeleton fibres, $\times 5$; b, oxea, $\times 80$.

Fig. 9.—*Phakellia microxephora*: a, vermicular strongyles, $\times 80$; b, style, $\times 80$; c, oxea, $\times 80$; d, microxea, $\times 80$.

Fig. 10.—*Tragosia infundibuliformis*, var. *natalensis*: a, ectosomal skeleton network, $\times 5$; b, style, $\times 80$; c, oxea, $\times 80$; d, e, style and oxea from Johnston's type, $\times 80$.

Fig. 11.—*Syringella gorgonioides*: a, transverse section of a small twig, $\times 2$; b, style, $\times 80$.

Fig. 12.—*Hymeniacidon caliculatum*: styles, $\times 80$.

Fig. 13.—*H. caliculatum*, var. *osculatum*: styles, $\times 80$.

- Fig. 14.—*Sigmaxinella arborea* : *a, a'*, styles ; *b*, strongyle ; *c*, oxea ; *d*, raphides—all $\times 80$; *d', d''*, raphides, $\times 730$; *e*, sigmas, $\times 730$.
- Fig. 15.—*Bubaris reptans* : *a*, vertical section, $\times 6$; *b*, style, $\times 80$; *c*, tyles, $\times 80$.
- Fig. 16.—*Clathria mollis* : *a*, spined style, $\times 80$; *a'*, the same, $\times 420$; *b*, dermal oxea, $\times 80$; *b'*, the same, $\times 420$; *c*, sigma, $\times 730$; *d, d'*, tridentate isochele, side and front view (the web extending from tooth to shaft, not from tooth to tooth), $\times 730$.
- Fig. 17.—*Stylostichon involutum* : *a*, vertical section showing plumose columns and superficial layer of tufts of oxeas ; *b*, central styles, $\times 80$; *c*, echinating styles, $\times 80$; *d*, dermal oxea, $\times 80$; *e*, sigma, $\times 730$.
- Fig. 18.—*Histoderma natalense* : *a*, amphitylotes, $\times 80$; *b*, acanthoxea, $\times 80$; *b'*, the same, $\times 200$; *c*, sigma, $\times 730$; *d*, tridentate isochele, side view, $\times 730$; *e*, spined, coiled and cruciate spicules, $\times 730$.
- Fig. 19.—*Phlaodictyon eumitum* : *a*, network of skeletal fibres, $\times 5$; *b*, oxeas, $\times 80$.
- Fig. 20.—*Hircinia arbuscula* : main fascicle and web-like network, $\times 50$.





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"	10,	"	10,	"	Lanchester,	"	Lanchester.
"	12,	"	39,	"	Xavia,	"	Xaiva.
"	13,	"	37,	"	bypunctulatus,	"	bipunctulatus.
"	15,	"	32,	"	1873,	"	1893.
"	15,	"	30,	"	bisponosa,	"	bispinosa (twice).
"	16,	"	10, 12,	"	bisponona	"	bispinosa.
"	18,	"	21,	"	Dé Cap,	"	Décap.
"	18,	"	30,	"	Dromiace,	"	Dromiaceæ.
"	19,	"	1,	"	Homoldromiidae,	"	Homolodromiidae.
"	19,	"	22,		Insert date 1888.		
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"	78,	"	28,	"	W., in	"	W. that on.
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