

Prof. Owen has said that among the Marsupials "the Koala has the best claim to typical preeminence" (Todd's Cyclop. vol. iii. p. 329); and certainly from the foregoing account it will be seen that this animal presents, in its muscular system, a greater number of structural divergences from the general placental type than, perhaps, any other Didelphian.

XX.—On a new Genus of Hexaradiate and other Sponges discovered in the Philippine Islands by Dr. A. B. Meyer.

By Dr. J. E. GRAY, F.R.S. &c.

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DR. ADOLF BERNHARD MEYER has brought with him some beautiful species of hexaradiate sponges, which he obtained at Talisay on Cebu, in March 1872, and they are now in the collection of the British Museum.

The two principal sponges discovered by Dr. Meyer would form two very distinct families according to the classification published in the Ann. & Mag. Nat. Hist. 1872, June, p. 442. They both belong to the order Coralliospongia. Before I proceed to define them I may remark that the order may be divided into three groups:—

I. The normal Coralliosponges have elongate subulate rays to the hexaradiate spicules, which are generally smooth, but one or more of them may be covered with spines or lobes directed towards the tip. This group contains the first ten families in the paper above referred to. The genus *Crateromorpha* here described appears to belong to it.

II. This group, which may be considered the abnormal form of the order, has the hexaradiate spines with short uniform rays of equal length, each ending in a number of reflexed lobes, and forming in their completely developed state a cube.

It will contain two families, and may be thus divided:—

A. *Sponge sessile, attached.*

Fam. 1. *Carteriadae*.

B. *Sponge free, attached to the bottom of the sea by tufts of elongate anchoring fibres.*

Fam. 2. *Meyerinidae*.

Sponge elongate, tubular, covered with a cobweb-like netted coat, with a circle of tufts of anchoring fibres at the base, which extend more than halfway through the length of the body, and

then, by repetition of a shorter kind, are continued on to the apex, where they also form a circle of tufts round the margin of the apical aperture.

Genus 1. *Meyerina*.

III. This group, which is equally abnormal, has the hexaradiate spicules with very short cubic rays. The genus *Axos* alone belongs to this group.

I have described this sponge under the name of "*Meyerella claviformis*," Ann. & Mag. Nat. Hist. for July 1872, p. 76; but as I am told that the generic name of "*Meyerella*," has been used for a genus of small Lepidoptera, I propose to alter this name to *Meyerina claviformis*.

Dr. Meyer brought a second specimen of this beautiful sponge. The club is rather smaller compared with the size of the stem, which is considerably thicker than in the other specimen. The elongate transparent spicules by which the sponge is anchored to the bottom are placed in very numerous cylindrical fascicles rather close together in a circle on the edge of the truncated circular base of the stem of the sponge. These cylindrical rope-like fascicles may be seen to extend in the way above mentioned throughout the whole length of the body, terminating in small tufts of naked spicules round the apex of the club; while the whole surface appears covered with hexaradiate spicules, like those of *Holtenia*—that is to say, with the external end of the axis abortive.

Mr. Carter has kindly examined this sponge microscopically, and in a note observes:—"It is a true *Carteria*, so nearly allied in the form of the spicules that but for its general form it might be a second species of the genus. The net-like structure over this sponge is just that of *Carteria* in spicular composition, as already mentioned."

The discovery of a second species of the genus, or rather family *Carteriadae*, decidedly shows that the sponge that is found parasitic on the *Hyalonema* cannot be a part of that genus, as Dr. Bowerbank, Dr. Wyville Thomson, and others have supposed; for no one can believe for a minute that the free claviform Philippine *Carteria* is any part of a *Hyalonema*, which it ought to be if the attached Japanese *Carteria* is only a state of that genus, or that one species of the genus is only a state of another most distinct genus, and the other species a distinct genus by itself; for surely *Meyerina claviformis* is not a state of *Hyalonema*! Indeed Mr. Carter observes that "*Meyerina* is more nearly allied to *Holtenia* than *Carteria*; but they are both allied in their spicules and differ chiefly in their

general structure and form." I am glad to state that Mr. Carter has undertaken to examine this sponge more in detail.

The other sponge is of the shape and size of a large goblet, with a cylindrical stem nearly as long as the cup, which I propose to describe as

CRATEROMORPHA.

Sponge attached to marine bodies, goblet-shaped.

Body hollow, vasiform, with a circular mouth, swollen at the bottom, placed at the top of the stem, and of very different structure from it, the line of demarcation being distinctly marked. Vase rather dilated and thick at the bottom, very thin towards the edge, which is terminated by a very thin membrane-like margin. The outer surface of the vase pierced with cylindrical cavities, and the whole surface covered with a minute network formed of the four rays of hexaradiate spines, which are so placed as to form square meshes. The internal cavity large, reaching nearly to the bottom of the vase, and furnished at the base with very large irregularly shaped oscules, which become smaller, more regular, and oblong-lanceolate about the middle of the walls, and circular in the upper part, gradually diminishing in size as they approach the margin of the cavity, where they are smallest.

Stem thick, cylindrical, with numerous parallel, similar, longitudinal, cylindrical tubular spaces in a felt of spicules; covered externally with a layer of short robust ones arranged longitudinally, and on this, again, the minute network with square meshes, like that on the club, finally ending below in a multitude of spiculiferous filaments extending some way into the mass of sandy mud at its base.

Crateromorpha Meyeri.

Hab. Philippine Islands, Talisay, on Cebu, March 1872 (Dr. A. B. Meyer).

This sponge is like a large goblet, with the body about $3\frac{1}{2}$ inches long, and a thick stem of nearly the same length, which is attached to a mass of hard mud. The stem is pale reddish brown, and the body greenish white; in its dry state, and most probably bleached.

The cruciform central rays of the hexaradiate spicules are short and placed regularly perpendicularly—that is to say, parallel to the longitudinal axis of the body—and the others horizontally, or transversely with regard to the imaginary axis of the sponge. The rays of each spicule are free from those of its neighbour, but overlap each other to their full extent, and so form a regular network of square meshes, as in the genus

Farrea, where the spicules are united by their rays but imbedded in glassy fibre; hence, as Mr. Carter observes, Dr. Bowerbank's mistake of calling it "fistulous siliceous fibre" (B. S.); whereas in the genus *Holtentia* and allied genera the cruciform rays of the hexaradiate spicules are placed obliquely with regard to the axis, forming a network of rhombic meshes.

This sponge evidently belongs to the first group of the Coralliospongia, and the first section of them, as defined in my paper above referred to (p. 450), and will form a family distinct from those there defined, which may be thus characterized:—

Fam. Crateromorphidæ.

Sponge cup-shaped, attached by an elongated pedicel, formed of numerous short spicules. Body of sponge covered externally with hexaradiate spicules, the outer ray of which is aborted, placed in longitudinal and transverse lines, making a square mesh; hollow, with large oscules, which diminish in size as they reach the margin of the cup. Stem formed of numerous cylindrical tubes, situated in a spiculous felt; ending in a bunch of filaments sunk in the mud.

Rossella philippensis.

Dr. Meyer also brought from Cebu a sponge the size of a moderately large walnut (that is, about $1\frac{1}{4}$ inch long), regular, oblong, smooth, thick, spongy, truncated at the top, with large circular apertures, and with a large deep cavity occupying nearly the whole of the body of the sponge. The hinder half of the sponge has sundry distant cylindrical tufts of elongated siliceous fibres spreading out from the sponge and then directed backwards.

This is very like the *Tetilla polyura* of Schmidt (Atlantic Sponge-Fauna, t. vi. f. 8), the type of my genus *Lophurella*; but the Philippine sponge is oblong, longer than broad, smooth on the external surface, and truncated above, with a large mouth, in fact like a round-based tumbler.

If this is the young state of another sponge of a different form, which is possible, it is a giant of its kind. The *Tetilla polyura* of Schmidt is only $\frac{1}{2}$ inch long; and the young form of *Tethya antarctica* described by Mr. Carter is much smaller, in fact microscopic; whereas this is more than an inch long and comparatively broad, and resembles the goblet of *Crateromorpha Meyeri*. It is not the young of that sponge, as Mr. Carter shows that the spicules are markedly different; and we have no other Philippine sponge of which it could be the young. Mr. Carter has kindly sent me the following account of his examination of the sponge:—

"This is a *Rossella*, as you will see directly, not *R. antarctica*, simply because the arms of the surface or body in *R. antarctica* are spined; in the Philippine one they are smooth.

"Dr. Wyville Thomson sent me a woodcut of this sponge, noticing its resemblance to Schmidt's *Tetilla polyura*. I wrote back and said it was allied to *Rossella antarctica* and not a *Tethya* at all, for all its spicules, of which there are only two kinds apparent in the figure, are, or should be, four-armed."

"No *Tethya* has more than three-armed spicules; but his artist had put in three-armed at the end of the tailed ones. Now I see how the artist has overlooked this important character, just as Schmidt states, at the end of his preface to his Adriatic sponges, 'an artist by profession fails here.'

"There is no such spicule, four-armed recurved, in any other sponge. Was I wrong in stating this as the peculiarity of *Rossella*? Have we not now found out a Philippine one by it?"

"Has not Thomson's artist, because he did not know the value of this fourth arm in the tailed spicules, omitted to put in more than three, although he has put in four in the body-spicules? And do we not here see the disadvantage under which a professed artist labours, as Schmidt has stated?"

"I find the Philippine *Rossella* has been put into a bottle with the two other species that you sent down in the box, or at least with the goblet-sponge and the *Euplectella**, because it contains spicules of the latter. When the heads of spicules with recurved spines get into other sponges they break off and remain there, because being barbed like an arrow they easily go in, but never come out again; and you can always tell that they do not belong to the species, because they have their heads where their tails ought to be. No spicule has a head like this in the sponge: it is always at the extremity of the long spicule, of course. Hence it was that I found so many of the four-armed headed spicules stuck into *Tethya antarctica*, and was thus able to make out the antarctic deep-sea genus *Rossella*.

"There are several of the spicules of the goblet-shaped sponge [*Crateromorpha*] in the surface of the Philippine *Rossella*, especially the minute spicules, somewhat like in structure though not in form to those of *Euplectella*."

Mr. Carter, in a subsequent note, states that the minute spicules in *Crateromorpha* and *Rossella* are very much alike, and that they both contain crucial-headed ones which are almost undistinguishable from each other.

He also adds that Dr. W. Thomson has sent him the specimens of *Rossella* above alluded to, and that it turns out to be a

* [It was contained in the same bottle of spirits as *Euplectella*.—J. E. G.]

third species of that genus, being widely different from the antarctic and Philippine ones.

Euplectella aspergillum.

Dr. A. B. Meyer has brought home, and placed in the British Museum, two specimens of this sponge in spirits from the Philippines, which are entirely covered with a thick coat of sarcodé like the bark on a *Gorgonia*, but softer, so that the siliceous fibres are entirely hidden from view. No one would suspect that this sponge had such a beautiful lace-like structure, but simply a netted or pierced tube, with irregular, circular, thicker hoops. The flesh or sarcodé is of a dark brown colour, but most likely is coloured by the action of the spirit.

Esperiadae.—Along with these sponges were sent some fragments of a sponge, according to Mr. Carter's examination, "nearly allied to *Halichondria incrustans*, with three kinds of spicules:—1, large, subulate, smooth; 2, bihamate; 3, equi-anchorate, larger than the bihamate."

Mr. Carter's microscopical examination of *Meyerina claviformis* and *Crateromorpha Meyeri* will be found at pp. 110–113 of this Number of the 'Annals.'

XXI.—On Codiophyllum, a new Genus of Unicellular Green Alga from Port Natal. By Dr. J. E. GRAY, F.R.S. &c.

[Plate IX.]

AMONG a large collection of corals and corallines from Port Natal, sent by Colonel Bolton, I observed some specimens of a green spongy alga of a thick cloth-like texture, more or less of a wedge-shape, and borne on a solid, cylindrical stem, which is branched at the bottom, and may be a distinct RhodospERM Alga on which it is parasitic. This stem pierces and supports the broad, expanded frond, and is branched so that the branches support the different parts of the expansion. When the felt-like cloth is carefully examined, it is found to consist of a very fine network of fine cylindrical tubular fibre, which inosculates in every direction, leaving a minute mesh. When looked at in a mass, the mesh seems to be arranged in very obscure circles concentric to the outer margin, indicating the lines of growth, the mesh of the outer edge being incomplete. The stem is tough and fleshy when soaked in water, but becomes cartilaginous when dry; in the younger specimens it is tortuous and slightly branched, each branch