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SUPPLEMENTARY NOTES TO THE REPORT ON SPONGES FROM THE COASTAL BEACHES OF NEW SOUTH WALES.

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A CONSIDERABLE time after the Report was printed off, Professor Arthur Dendy offered to the Trustees of the Australian Museum the loan of a large collection of fragments of sponges, from which sections might be obtained. The specimens were selected and labelled by R. Kirkpatrick, of the British Museum, from examples acquired by that institution from Dr. R. von Lendenfeld. The collection embraces 478 specimens, representing 462 species. All —except about six—are from Australasian waters. A large percentage of the examples are species described as new by Dr. R. von Lendenfeld; the rest consist of species identified by him, and others which bear what I presume are manuscript names. These fragments add very largely to the Museum collection, and if the species prove valid, to the known fauna of New South Wales. By this donation, the Museum gains five species enumerated in the "Catalogue of Sponges," which have hitherto been wanting in the collection (two of these are therein described as new) and which practically complete the specimens as published in the Catalogue. Of the 295 species and varieties described in the latter work, 156 are represented in this collection. Some of these are evidently bits of the types now on exhibition in the Invertebrate Gallery.

In 1887, Dr. R. von Lendenfeld published a paper in the Zoologische Jahrbücher, under the title of "Die chalineen des Australischen Gebietes."[1] In this paper 183 species and varieties are described; 144 of these are represented in the collection presented by Professor Dendy.

It is highly probable that the greater part of these fragments are portions of the types; the localities in nearly every instance agree with the habitat given at the end of each description. Eight examples bear the word "type" on the label; these are, however, mostly calcareous sponges.

This extremely valuable collection affords material which explains some of the ill-defined species in the Lendenfeldian collection, and also adds largely to the number of uncertainties. With the latter I hope to deal in the near future, and the former are herein

1 Lendenfeld—Zool. Jahrb., Bd. ii., 1887, pp. 723-828.

dealt with in so far as they bear on my paper. The collection contains eight species which have been more or less fully described in the report; of these, six were enumerated in the Catalogue as new species. There is also one species which, although well represented in the Fisheries donation, was omitted from the report on account of my inability to identify it.

The results obtained by the examination of the fragments from the British Museum, are confirmatory of the descriptions of the Lendenfeldian types as published in my report. The species dealt with are as follows:—

Arenochalina mirabilis, Lendenfeld, from Torres Straits.—The spicules are styli, and occur in both the main and secondary fibres. A recently collected specimen from Port Jackson exhibits numerous similar styli in the ground substance.

A fragment of *Clathria (Plectispa) arborea*, Lendenfeld, appears under the name of *Thalassodendron reticulata*, Lendenfeld. The echinating spicules in this example are spined styli; the question as to what particular sponge was described under the above name still requires an answer, inasmuch as the fibres are described as being echinated by smooth styli.

A specimen labelled *Clathria macropora*, Lendenfeld, agrees with the type as redescribed in my paper. The same remarks also apply to a spirit specimen, bearing the name of *Echinonema levis*, Lendenfeld. *Echinonema rubra*, Lendenfeld, does not differ in its spicular characters from the two preceding; in this example the spicules in the fibres are oxea, and not styli as stated in the original diagnosis.

A specimen labelled *Euspongia officinalis*, var. *sertalis*, Lendenfeld, proves to be identical with *Euspongia pikei*, Hyatt. The first name is that used in the manuscript list, and also occurs on the label of the specimen described and figured in my report. An examination of the specimen from the British Museum confirms my description of the fibres. There are distinct threads of sand grains cemented in the interstices of the trellised fibres.

Euspongia officinalis, var. *dura*, Lendenfeld.—My surmise regarding this form proves to be correct. The British Museum piece corresponds in texture, surface, colour, and state of preservation with our named example. From Western Australia.

Stelospongia canalis, Lendenfeld.—A spirit specimen, bearing the name of *Cacospongia canalis*, Lendenfeld, is in the collection. The main fibres of this example contain an axial string of foreign spicules, thus confirming the account given in my report.

Thalassodendron viminalis, Lendenfeld.—When writing of this species I expressed the opinion that it did not agree with the description. The British Museum example agrees as to habit

and dimensions, but not in its spicular characters. The specimen proves to be identical with an example exhibited in the cases as the type of *Ceraochalina multiformis*, var. *dura*, Lendenfeld, from Illawarra.

ARENOCHALINA MIRABILIS, *Lendenfeld.*

The British Museum specimen from Torres Straits, and probably a bit of the type, confirms my identification of the examples from New South Wales, and also proves that the spicules are styli. The proper stylote spicules are not confined to the secondary fibres, as might be inferred from the diagnosis. There is a distinct axial core present in the main fibres at the apices, the number of spicules being at least equal to those in the secondaries. A longitudinal section through the apex of a branch, displays a series of main fibres which are gradually tapering, elongated, and pointed at the summit; about half or two-thirds of each fibre is cored by an axial string of closely placed styli. At a short distance below the apex, a few small distant sand grains are enclosed. As the base of the fibre is approached, the sand-grains become larger and closer together, with an occasional space in which the axial core of spicules can be seen intact. In the parts of the fibre occupied by sand grains the core is displaced, and is visible first on one side and then on the other, or is spread out so as to form an irregular sheath of spicules around the enclosed sand grains. The arrangement of the sand-grains, their unequal distribution and size, their absence from a considerable portion of the growing apices, suggest the question as to how the sand grains are taken in the fibres. Time will not permit of an extended search as to what is known on this point. I failed to find any reference to the question in the "Monograph of Horny Sponges."

Mr. E. A. Minchin,[2] in dealing with the matter, states that sand grains "become included in the fibres, apparently by adhering to the tip of the fibre at its growing point, where it is continuous, in all probability, with the external cuticle of the sponge."

After a careful study of the fibres of *Arenochalina mirabilis*, Lendenfeld, I have arrived at the conclusion that the main fibres do not take in the sand grains at their growing apices. In this species (and also in many others possessing sand grains) the growing apical portion of the fibre is attenuated and pointed, and if any sand grains are present they are remote from each other and often also from the apex. At a short distance from the summits of the fibres the enclosed sand grains are larger and closer, but rarely exceed the diameter of the fibre. Nearer the base they form one or two rows, and frequently some of the grains are five or six times greater in diameter than the fibre in its normal

[2] Minchin—A Treatise on Zoology, 1900, Pt. ii., Porifera, p. 42.

condition. I have never observed any large sand grains in the fibres near the growing apex; and, further, I have failed to find any figures indicating the presence of sand grains exceeding the fibre in diameter. From the above data, I infer that the sand grains, large or small, are taken in by the fibres at any point of their surface, and at a distance below the growing apex.

THALASSODENDRON VIMINALIS, *Lendenfeld.*

For the sponge described under this title (No. 365) in my report I propose the name of *Echinoclathria intermedia*, sp. nov. The fragment of *T. viminalis* received from Prof. Dendy agrees with the description of the outward form, and is identical in every character with a specimen in the Museum collection labelled *Ceraochalina multiformis*, var. *dura*, Lendenfeld (No. 332.)

The specimen consists of a series of cylindrical branches, from 40 to 240 mm. in length, and from 3 to 5 mm. in thickness; the mode of branching is dichotomous, rarely alternate; in life the branches were probably arranged in a single plane. The example is somewhat waterworn; the surface is finely reticulate and is minutely porous, without any trace of vents. The texture firm, tough, and moderately elastic, and the colour brownish-yellow.

The skeleton, as revealed by the fragment from the British Museum, consists of an axial plexus of densely horny main fibres; the latter are cored with stylote spicules; there are generally four or five in a row, and their apices are often wide apart. The main column of trellised fibres gives off slender branches, which curve gracefully outwards and terminate at the surface; these are also cored with styli; there are two or three in a row; they are frequently divergent at their apices, and sometimes project beyond the fibre. The axial column and its radiating branches are joined together by slender, transverse connecting fibres; these are mostly aspiculous.

The main fibres measure from 0·1 to 0·15 mm. in diameter; the radiating branches are 0·5 to 0·07 mm. in diameter, and from 0·1 to 0·15 mm. apart. The transverse connecting fibres are 0·2 to 0·5 mm. in diameter, about 0·1 apart. The mesh in the central region is oval or elongate, and gradually becomes quadrangular as the surface is approached.

The original description states that the fibres are echinated by very scarce smooth styli 0·5 mm. long, and 0·005 mm. thick. I have not seen any styli that might be safely described as echinating; scattered spicules have been observed, and also some projecting out of the fibres, but these in many cases were enveloped in a sheath of pale spongin, and I regard them as incipient branches.

The Magascleres are as follows:—Straight or slightly curved smooth styli, tapering from the basal third to the base, and also to the acute apex. Size, from 0·12 to 0·2 mm. by 0·004 to 0·006 mm. A few very slender styli are present in the angles of the mesh, and here and there in the fibres.

EUPLACELLA MOLLISSIMA, *Lendenfeld.*

Euplacella mollissima, Lendenfeld, Zool. Jahrb., Bd. ii., 1887, p. 790, pl. xxi., fig. 37.

This extremely common sponge has been a mystery for a long time. Scarcely any donation from the coast is without one or more specimens. I have repeatedly attempted its identification, but without success. When about fifty specimens arrived in the Fisheries collection, I renewed my efforts to locate it, but failed, and finally it was left out of the report. The British Museum specimen explains the reason why the species could not be identified. In the original description it is stated to possess very small oxea, 0·04 mm. long, and 0·001 mm. thick. During the whole of my examination of this species, I have never seen the slightest trace of spicules in the fibres. In the section from the above mentioned example, I found two small patches of scattered oxeote spicules, under 0·05 mm. in length. These were only observed in one section, and consisted of ill-arranged spicules, disposed between the fibres without any trace of sarcode or horny matter. I therefore conclude that they are of foreign origin, and do not belong to the sponge. I have made many sections from two or three of the best preserved specimens, and failed to find any proper spicules in the fibres or ground substance, and I consider it highly probable that this species is destitute of spicules.

In order to render the identification of this species less difficult in the future, the following brief description is given:—

Sponge irregularly cup-shaped, generally growing on sea-weeds, and attached by flat root-like processes, rarely with a single peduncle. The inner surface of the cup in its lower two-thirds bears numerous closely placed vents from 0·5 to 1 mm. in diameter. The upper third is minutely porous. The outer surface is strongly and reticulately ridged or studded with compressed processes from 2 to 5 mm. or more in height. In some specimens large smooth areas are exhibited, with a few ridges or compressed papillæ scattered here and there. The walls of the cup vary from 1 to 8 mm. in thickness.

Texture close, fine and elastic. Colour yellowish stone. Height of largest example 100 mm. Diameter of cup 140 mm., diameter of main fibres 0·05 mm., distance apart 0·25 mm., diameter of secondary fibres, 0·02 mm. Mesh subquadrangular, very close and irregular.

From a scientific point of view it is much to be regretted that the author of the Catalogue of Sponges did not exercise more care in the description of the spicular characters, considering that they are in many cases the most reliable factors which determine the limits of genera and species. The carelessness displayed in the descriptions contained in the Catalogue vitiates the whole of the work done, and has created an intricate tangle, which will take years of patient investigation to unravel; further, no amount of study will rectify the wrong identifications based on such descriptions, or reduce the number of synonyms.

A scanty and superficial description is rightly characterised by Dr. Lendenfeld as "worthless." On the other hand, what term shall we apply to a description that is apparently full of detail, but which detail is opposed to the actual structure?