

duous ; but the oblique band on the metasternum seems to be very persistent.

Isacantha bimaculata.

I. sat angusta, fusco-ferruginea, supra disperse albo-pilosa ; rostro prothorace haud longiore, basi latiore et supra paulo excavato, crebre punctato ; antennis art. basali breviusculo ; prothorace confertim granulato, versus basin canaliculato ; elytris parallelis, apice rotundatis, confertim granulatis, singulis macula alba e pilis condensatis pone medium sitis ; corpore infra longo albo-piloso ; pedibus ferrugineis, femoribus anticis infra dentibus minutis, duobus apicalibus majoribus, instructis ; tibiis intus denticulatis. Long. $3\frac{1}{2}$ lin.

Hab. Tasmania.

A small, rather narrow form, noticeable for the two spots on the elytra and the denticulation of the inner margin of the tibiae.

Pachyura papulosa.

P. oblonga, postice ampliata, picea, supra confertim granulata, pube silacea maculatum varia, elytris nigro-maculatis ; rostro longitudine prothorace cum capite aequali, crebre oblongo-punctato ; antennis ferrugineis, art. basali paulo elongato, tertio aequali ; prothorace sparse silaceo-maculato ; elytris singulis maculis nigris in seriebus quatuor notatis ; corpore infra pedibusque rufo-piceis, griseo pilosis ; tarsis nigris. Long. 6 lin.

Hab. New South Wales (Rope's Creek).

This species, having the femora unarmed and foveiform scrobes, must be placed with *Pachyura* ; in habit, however, it closely resembles *Isacantha*.

XII.—*Description and Illustrations of a new Species of Tethya, with Observations on the Nomenclature of the Tethyadae.* By H. J. CARTER, F.R.S. &c.

[Plate IV.]

Tethya casula, n. sp. Pl. IV. figs. 1-9.

Massive, erect, sessile, consisting of a hemispherical head or body (Pl. IV. fig. 1, *a*) supported on a conical or umbrella-like expansion (fig. 1, *b b*), which, *in situ*, is sunk into the sand, and serves the purpose of a root. Colour light greyish yellow. Surface of the head rough, hispid, from the projection of fine spicules in lines corresponding with polygonal interspaces in which the pores (fig. 2, *a*) and vents (fig. 2, *b*) are respectively situated. Ends of the spicules radiating from the surface generally, short and erect on the summit, becoming

longer and more inclined towards the base, where they are continuous with those of the conical expansion, thus giving the whole of the outer surface a white, glistening, asbestine appearance. Conical expansion (fig. 1, *b b*) smooth, even, thinning towards the circumference, composed of long spicules overlapping each other in parallel bundles, which, radiating from a common centre at the summit, in continuation with the lowermost structure of the head, become more or less mixed with sand downwards (fig. 1, *d*), and at length end freely at the circumference in a circular, fringed border (fig. 1, *c* and fig. 3). Pores chiefly confined to the upper part of the head (fig. 2, *a*); vents occupying the larger polygonal interspaces at the base (fig. 2, *b*). Vault or inner summit of the conical expansion apparently occupied by a few pores and vents, from which point the bundles of long spicules radiate in all directions, to end in the fringed border just mentioned; more or less concealed in their course by a zonular layer of sand, which covers two-fifths of the distance between the fringe and the summit (fig. 1, *d*). Spicules of the body, and conical expansion probably, radiating in bundles from a common point or denser portion of the internal structure, called the nucleus, to the periphery generally; held together by sarcodæ, and permeated by the branches of the excretory canal-system. Spicules of five kinds, viz.:—1, the longest, consisting of a delicate, smooth shaft, pointed internally, and terminated externally by a trifid forked head (figs. 5, *a*, & 6, *a*); 2, shorter than the last, but still long, straight, smooth, fusiform, acerate (figs. 5, *b*, & 6, *b*); 3, short, smooth, stout, curved, fusiform, acerate (figs. 5, *c*, & 6, *c*); 4, minute, consisting of an extremely delicate, flexible shaft, pointed inwardly and terminated at the other end by a bifid or trifid, unequal-armed, forked head (figs. 6, *d*, & 7); 5, very minute, bihamate, contort, C- or S-like (figs. 6, *e*, & 8). These spicules average respectively, as they are described, 5-12ths, 1-5th, 1-18th, 1-60th, and 1-1800th of an inch long. The two former, which are by far the longest, are alone found in the conical expansion; and the first, being much longer than the second, extends beyond the latter, so that the extreme border of the fringe is exclusively composed of the trifid heads of the longest spicule (fig. 3, *b*, *c*, fig. 4). The other three are confined to, and form the greater part of, the structure of the head, mixed, also, with trifid and straight acerate spicules of all sizes, like those of the conical expansion, but much shorter. While the shafts of the trifid spicules are by far the longest, those of the acerate ones again are by far the stoutest, being in the proportion of 1- to 3-1800ths of an inch. Size of specimen:—height of summit of conical expan-

sion or root 8-12ths, height of head or body $\frac{1}{2}$, total height 14-12ths, diameter of circumference of conical expansion $1\frac{1}{2}$, diameter of base of head 11-12ths of an inch.

Hab. Marine; growing in sandy bottom.

Loc. Port Elizabeth, Natal, Cape of Good Hope.

Obs. This specimen, described and illustrated at the request of Dr. J. E. Gray, is in the British Museum. It has been considerably injured, as will presently be mentioned; and, as the specimen is unique, it has been thought desirable not to extend the injury by sections: hence several parts are doubtfully described; but the Tethyadæ are so much alike, that what is not present here can, almost with certainty, be supplied from the known structure of other and similar species.

Unless such sponges are carefully removed from their habitat in the sea, soaked in fresh water at once, and as carefully dried, the ends of the delicate asbestiform spicules which project from their surface are almost sure to be broken off, and the sarcodæ, if allowed to decompose, to become charged with the mycelium and sporidia of Mucoridæ, which are very likely to be mistaken for parts of the sponge: hence I feel now assured that my figure of a trifid spicule bearing a number of globular cells was erroneously supposed to be a part of *T. arabica* (Annals, 1869, vol. iv. pl. 2. fig. 20).

The Mucoridæ, too, feed upon the soft parts; and thus the dermal sarcodæ, as there is no cortex here, especially disappears, which, of course, removes at once the pores and the more circumscribed parts of the orifices of the excretory canals or vents, so that the situation and form of both become problematical. This is the case in the present instance; but *T. casula* being closely allied in structure and composition to *T. arabica*, which I found myself *in situ*, and have minutely described and illustrated (Ann. l. c.), it is not difficult for me to supply these particulars, as before stated, with almost perfect certainty.

Indeed, with the exception of the absence of the anchor-head, and the presence of the delicate unequal-armed trifid spicule of the sarcodæ in *T. casula*, we have every other kind that I have delineated in *T. arabica*. The surface of the latter is equally silky and asbestiform, from the presence of the projecting ends of the delicate spicules arranged in lines circumscribing polygonal interstices in which the pores and vents are respectively situated; and as the outward structure of *T. arabica* so closely corresponds with that of *T. casula*, we may fairly infer that the internal structure does so also, and therefore that it is most probably the same as that given in the above description; without cortex, but with an extremely dense

and contractile sarcode, which, after death, from its stringent contractility, renders the branching of the excretory canal-system almost imperceptible.

In addition to the form, then, of the entire sponge, we have the absence of the anchor-head and the presence of the minute unequal-armed trifid spicule of the sarcode as the peculiarities of *T. casula*.

The absence of sarcode also in the summit of the conical expansion of *T. casula* renders it very doubtful if there ever were any pores and vents in this part of the cavity, especially as, *in situ*, the whole of the cavity must have been shut out from the sea by insertion in the sand of the greater part, at least, if not the whole, of the conical expansion, in no part of which are there any polygonal interstices or other indications of pores and vents such as are seen on the surface of the head or body.

Of the colour it can only be stated, as above, that in the dried state it is light greyish yellow, exactly like that of *T. arabica* in a similar condition, but which, when fresh, presents internally an orange-yellow sarcode with pinkish nucleus; while *Tethya dactyloidea*, Cart., and *T. atropurpurea*, C., are both dark purple on the surface and, for the most part, throughout.

Of the habitat of *T. casula* we know nothing further than may be learnt from the specimen, viz. that it did not grow in a pendent position, but in the sand at the bottom of the sea, as the presence of the sand testifies; that is to say, we do not know whether it lived in deep or shallow water. The specimen of *T. arabica*, which I found *in situ* on the south-east coast of Arabia, was growing on the basaltic rocks of the shore, where, having been left uncovered by the tide at low water, I found it; and so resistant was it, that I had to dig it off in pieces with hammer and chisel. All that is stated of *T. cranium* is that it adhered "to stones in deep water" (Johnston, Brit. Spong. p. 83). Schmidt (Atlant. Spong. Faun. p. 66) also mentions that *T. cranium* was found off Florida in 152-183 fathoms; but nothing is stated in this respect of his *Tetilla euplocamus* or *T. polyura*.

Undoubtedly the office of the conical expansion in *T. casula*, of the twisted cord in *Tetilla euplocamus*, Sdt., of the beard-like tufts in *T. polyura*, Sdt., and of the beard of *Tethya dactyloidea*, Cart., is the same as that of the stem in *Hyalonema*, already noticed by Schmidt; but while the longest spicules in the Tethyadæ do not exceed half an inch, those of *Hyalonema* are more than half a yard. Still, when it is stated that the anchor-headed spicules are for the purpose of fixing the Te-

thyadæ *in situ*, it should be remembered that there are no anchor-heads at all in *T. casula*, and that where (in most of the species) they are present they are as plentiful in the upper portion and free surface of the body of the *Tethya* as in any other part; while in the fixed or sessile form of *T. arabica* the base of this hemispherical sponge is agglutinated to the rock by a layer of horny sarcode; and therefore it is probable that the agglutination of the spicules in the conical expansion of *T. casula* to the sand serves to fix it there as much as the spicules.

The minute bihamate and contort C- and S-shaped spicules, with which the sarcode of the head in *T. casula* is densely charged, finds its equal in every respect in *T. cranium* (Bowerbank, Brit. Spong. vol. ii. p. 85) and in *T. arabica* (l. c.). It is also present in like manner in *T. atropurpurea* (Annals, 1870, vol. vi. p. 176, pl. 13), but larger and spinous towards the extremities. It, together with the anchor-headed spicule, might have existed in *T. dactyloidea* (ib. 1869, vol. iii. p. 15); but, unfortunately, I had given the specimen to Dr. Bowerbank before I saw the desirableness of examining it more minutely.

So the presence of this minute spicule would appear to be characteristic of the Tethyadæ generally; for it is mentioned by Schmidt in *Tetilla polyura* (Atlant. Spong. Faun. 1870, p. 66), although it is unnoticed in his passing observations on *Tetilla euplocamus* (Spong. Algier. 1868, p. 40, and Atlant. Spong. Faun. p. 66), which came from Desterro, on the coast of Brazil, and, having no separate description allotted to it, may have had no special examination.

Why Schmidt should have changed the name of *Tethya* to *Tetilla* (Atlant. Spong. Faun. p. 60, *Tetilla cranium*) and have retained it for the sponges of which *Tethya lyncurium* is the type, I am at a loss to conceive.

Nomenclature of the Tethyadæ.

In 1750 Donati* introduced the word "Tetie" for that sponge to which, among others, Lamarck, in 1802, gave the name of *Tethya lyncurium*†.

Risso, in 1826, first used the name of *Tethya cranium*‡, which was applied to the British species by Fleming in 1828§. In 1833 Nardo introduced the term of *Donatia aurantium* for

* Nat. Mar. dell' Adriat. 64, tav. 9. fig. A, B, &c. (ap. Johnston).

† Ann. du Mus. t. i. p. 71. no. 5 (ap. Blainville, Man. Actinol.).

‡ L'Europ. Mérid. vol. v. p. 364 (ap. Johnston).

§ Hist. Brit. An. p. 519 (ibidem).

* *Tethya lyncurium**; and in Deshayes and Milne-Edwards's edition of Lamarck (1836-45) *Tethya lyncurium* and *T. cranium* are still continued under the head of *Tethya*†. In 1867 Dr. J. E. Gray adopted Nardo's name of *Donatia* in part for the genus of *D. aurantium*‡; and in 1870 Schmidt called *Tethya cranium* by the name of *Tetilla cranium*§, adding it to his genus *Tetilla* of 1868 ||, but still retaining the name of *Tethya* for *Tethya lyncurium*.

Thus Nardo would change *Tethya lyncurium* to *Donatia aurantium*, and Schmidt retain the former but change *Tethya cranium* to *Tetilla cranium*, while Dr. Gray adopts Nardo's name for *T. lyncurium*, and continues *Tethya* for *T. cranium*.

Now, in the 'Annals' of 1869 (l. c.), I have described and illustrated *Tethya arabica* (which is almost identical with *T. cranium*) in conjunction with *Tethya lyncurium*, partly for the purpose of contrasting the differences between them; and any one who chooses to refer to this will at once see the wisdom of Nardo in giving a new name (that is, "*Donatia aurantium*," called after Donati, the first describer) to *Tethya lyncurium*; while any one referring to Dr. Gray's proposed arrangement, may equally see the wisdom of retaining the term "*Tethya*" for the Tethyadæ of which *T. cranium* is the type specimen, since so great are the differences between *Tethya lyncurium* and *T. cranium*, that it was impossible for these two sponges to be long continued under the same generic distinction.

Nardo, then, changed the name of *T. lyncurium* to *Donatia aurantium* in 1833, and Gray adopted this in 1867, still retaining the name of "*Tethya*" for the Tethyadæ of which *T. cranium* is the type specimen; and there, I think, Schmidt would have done well to have left it, instead of not only reversing Nardo's change, but of introducing a new term, viz. that of "*Tetilla*," for the Tethyadæ of which *T. cranium* is the type, in 1868.

An *après-moi-le-déluge* system of adding new names to objects of natural history unnecessarily is most undesirable. If it be necessary to change the name when two totally different species have been placed under the same generic heading, this change, when once effected, should be considered inviolable; and this precedence and propriety give in favour of Nardo.

Hence I shall continue, with Dr. Gray, to use the term

* Isis, 1833, p. 522 (ib.).

† Lamarck, Anim. sans Vert. vol. ii. p. 592.

‡ "Notes on the Arrangement of Sponges," Proc. Zool. Soc. May 1867, p. 541.

§ Atlant. Spong. Faun. p. 66.

|| Spong. Küste Algier, p. 40.

"*Tethya*" for the sponges of which *Tethya cranium* is the type, and adopt Nardo's name of "*Donatia*" for those of which *Tethya lyncurium* is the type—thus applying the former to Schmidt's *Tetilla euplocamus* and *T. polyura*, which are genuine species of the group of *Tethya cranium*, and to the four others which I have described and illustrated in the 'Annals' under the specific designations of *dactyloidea*, *arabica*, *atropurpurea*, and *casula*.

EXPLANATION OF PLATE IV.

Fig. 1. *Tethya casula*, n. sp., natural size: *a*, head or body; *b b*, conical expansion, which, *in situ*, is imbedded in the sand; *c*, fringe or ciliated border; *d*, sand.

Fig. 2. The same, portion of surface of body, magnified, to show polygonal arrangement of lines of projecting spicules, indicating:—*a*, pore-areas; *b*, vents.

Fig. 3. The same, cilium or free extremity of radiating bundle of spicules in conical expansion, magnified, showing:—*a a a*, bundles of spicules constricted at the margin; *b*, continuation of bundle in a cylindrical form; *c*, free extremity a little expanded, consisting exclusively of the forked ends of the long trifold spicule; *d*, agglutinated grains of sand still adhering to the bundles.

Fig. 4. The same, trifold end of forked spicule of cilium, magnified, on the scale of 1-12th to 1-6000th of an inch: *a*, neck, slightly constricted; *b*, axial canal.

Fig. 5. The same, spicules magnified fourteen times their natural length, relatively: *a*, trifold forked spicule of bundles of conical expansion; *b*, straight, long, fusiform, acerate spicule of the same; *c*, thick, short, curved spicule of the body-substance; *d, e, f*, real lengths of the same respectively.

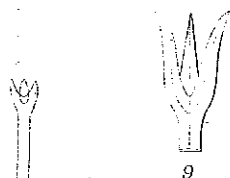
Fig. 6. The same, specimen of each form of spicule, magnified, on the scale of 1-12th to 1-1800th of an inch, to show their relative thicknesses respectively: *a*, trifold forked spicule of bundles of conical expansion; *b b*, half-length of straight, fusiform, acerate spicule of the same; *c c*, half-length of thick, short, curved, acerate spicule of the body; *d*, unequal-armed, minute, trifold spicule of the sarcode of the body; *e*, minute, bihamate, contort, O- and S-like spicules of the same.

N.B. Part of the half-spicule has been taken out in the figures *b b* and *c c*, for convenience.

Figs. 7 & 8. The same, minute forms of spicule in fig. 6, *d, e*, magnified, on the scale of 1-12th to 1-6000th of an inch.

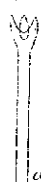
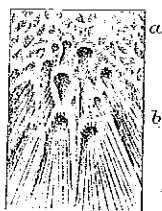
Fig. 9. The same, head of large, trifold, forked spicule of body-substance, magnified, on the same scale, to contrast with the trifold head at the circumference of the conical expansion, fig. 4.

N.B. In the body, besides the minute spicules with which the sarcode is densely charged (fig. 6, *d, e*), there are straight acerate and trifold spicules, similar to those of the conical expansion, of various lengths and sizes, together with slight variation in the form of the trifold heads, but all much shorter in the shaft.



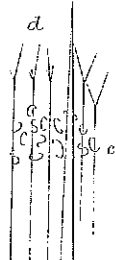
9

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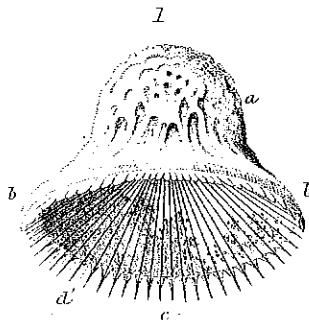
a

6



d

c



1

a

b

b

d

c

5

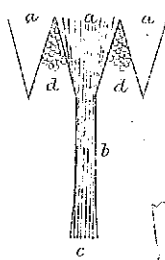
b

c

b

c

3



a

a

a

d

d

b

c

4

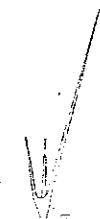


b

a



8



7