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STUDIES ON INDIAN SPONGES—I*

TWO NEW SPECIES OF SILICIOUS SPONGES BELONGING TO THE GENERA *ECHINODICTYUM* RIDLEY AND *RHADBEREMIA* TOPSENT

(CLASS : DEMOSPONGIAE SOLLAS, ORDER : POECILOSCLERIDA TOPSENT)

By P. A. THOMAS

Central Marine Fisheries Research Institute, Mandapam Camp

OUR knowledge of the sponges of the Indian region is still in its infancy. The only area which has been studied somewhat extensively is the Gulf of Mannar by various spongologists like Carter (1880, 1881), Dendy (1905), Burton (1930, 1937) and Rao (1941). Besides these, some occasional reports are there about the sponges of Madras or of Gulf of Kutch ; but such information often is too fragmentary when the vast shore line of about 4800 km of India is taken into consideration.

With the idea of studying the Indian sponges in a comprehensive manner, the present author took up this work in 1964. Collections from various parts of India by the author himself over the years have been supplemented by those forwarded by many other scientists from different parts of the country including Andamans and Laccadive Islands. The Mandapam region, however, has been surveyed in greater detail, with particular stress given to the Palk Bay, since the sponges of Palk Bay is poorly known.

The sponge fauna of the Indian region has been found to be quite rich and varied and its relationship with those of adjacent parts like the Red Sea and the Australian region is quite striking. The taxonomy of those species that are of special interest is presented here, in a series ' Studies on Indian Sponges ' of which the present communication forms the first part.

All types described here are deposited in the Reference Collection Museum of the Central Marine Fisheries Research Institute, Mandapam Camp.

Family PHORBASIDAE de Laubenfels

Genus *Echinodictyum* Ridley

Phorbasidae with reticulated skeleton. Megascleres, oxeas in fibres, accompanied by styles projecting partially. Fibres echinated with acanthostyles. Miscroscleres are absent. Type of the genus is *E. topsenti* de Laubenfels (1936) (S.D.).

Species belonging to this genus so far reported from Indian region include *E. nervosum* (Lamarck), *E. asperum* (Ridley and Dendy, 1887), *E. clathratum* Dendy (1905) and *E. gorgonoides* Dendy (1916).

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Styles of *E. nervosum* reach up to a length of 0.7 mm (Burton and Rao 1932). In *E. asperum* Ridley and Dendy (1887) no mention made about the long styles in the original description. But after examining the holotype, Burton and Rao (1932) confirmed the presence of long styles in the species, as also in their specimens from Andamans (but the measurements were not given). *E. clathratum* possesses long styles (1.3 mm) (Dendy 1905) and *E. gorgonoides* has peculiar tornotoxeas (Dendy, 1916).

The following new species records styles of 4.8 mm length.

Echinodictyum longistylum n. sp.

(Pl. I, Figs. A, B. Pl. II, Figs. 1-3)

Material : Four specimens from Palk Bay washed ashore during strong gales.

Description : Body consisting of a flattened stalk, with a number of foliaceous and spatulate branches bearing longitudinal ridges, arising from the distal part of the stalk. Rarely these branches fuse together. The largest specimen has a height of 90 mm, width of 130 mm with branches 1 to 3 mm thick (No. 129).

Colour, dark gray when dry, and with leathery consistency. Oscules and pores are not visible. Surface hispid due to the presence of long styles. No differentiation between ectosome and endosome. Pigment granules are abundant in the outer part. Endosome is cavernous.

Skeleton consists of main tracts running longitudinally along the stalk and branches. These tracts are not well defined in outline and the connectives, uniting the main tracts, make the entire reticulation rather confusing. Spongin scarce in main tracts but rather abundant in the connectives. Acanthostyles echinate the fibres and are set at an angle. Long styles have their heads buried deep in the main tracts.

Spicules : 1. Oxeas. Coring; tips sharply pointed, stair-stepped, or blunt. (See Table I).

2. Small oxeas. Slender, rarely straight. Abundant in the dermal part.

3. Styles and subtylostyles. Slightly curved and with hair-like terminations. They project out of the surface at right angles.

4. Small styles. Hair-like, probably younger forms of the former.

5. Acanthostyles. Conical with distinct head, shaft entirely spined or smooth. Head densely spined.

Remarks : Long styles or subtylostyles projecting vertically from the interior is characteristic of this species and taking the length of the styles into consideration, the specific name *longistylum* is proposed here.

Locality, Register Number etc. : Palk Bay, C.M.F.R.I. No. 129 (Type)—20-10-1964; C.M.F.R.I. No. 130 A-6-6-1966; C.M.F.R.I. No. 130 B-11-4-1964; C.M.F.R.I. No. 130 C-8-9-1966 (All washed ashore from the Palk Bay).

TABLE I

Spicular measurements of Echinodictyum longistylum *n. sp.*

	Length	Width
Oxeas (Large)	.. 0.283-1.703 (0.849)	(0.016)
Oxeas (Small)	.. 0.377-0.660 (0.414)	0.003-0.005 (0.0037)
Styles (or tylostyles) ..	.. 0.81-4.811 (3.11)	0.006-0.029 (0.014)
Styles (Slender)	.. 0.566-0.899 (0.611)	(0.004)
Acanthostyles	.. 0.067-0.1 (0.088)	(0.006)

Measurements in mm
Averages are given in parentheses.

Family RASPAILIIDAE Hentschel

Genus *Rhabderemia* Topsent

Topsent established this genus in 1892, with type *R. guernei*. The genus is characterised by encrusting, massive or tubular habit. Principal spicules are styles with hockey stick-like modifications. Microscleres, contorted sigmas, microstyles and/or thraustoxeas.

The characteristic spiculation of the genus *Rhabderemia* is rhabdostyles, microstyles, toxas and sigmas. Spiny rhabdostyles are met with in a good number of species [*R. spinosa* Topsent (1896), *R. coralloides* Dendy (1924), *R. mutans* Topsent (1927) and *R. fascicularis* Topsent (1927)], whereas smooth forms are recorded in species like *R. pusilla* (Carter, 1876), *R. guernei* Topsent (1892), *R. toxigera* Topsent (1892), *R. indica* Dendy (1905), *R. prolifera* Annandale (1915) and *R. bistylifera* Levi (1961). Microstyles may or may not be granulated either partly or completely; or absent totally. Thraustoxeas are present in most cases, but *R. pusilla*, *R. indica*, *R. prolifera* and *R. bistylifera* are exceptional in this respect. Contorted sigmas are, as a rule, present.

This species, hence, is of great interest for its possession of two kinds of rhabdostyles—acanthose and ordinary—together with other spicules characteristic of the genus.

Rhabderemia acanthostyla n. sp.

(Pl. II, Figs. 4, 5)

Material: Four coral rocks completely encrusted with this species, from Galaxea reef (Gulf of Mannar) from a depth of 1.5 metres. Examined in fresh condition.

Description: Sponge encrusting. Maximum thickness 2 mm; uniformly spreading on the substratum, usually grows on the well-lighted upper zone of coral rocks. Colour is dark brown when living. In alcohol a yellow pigment oozes out immediately after preservation. Consistency, soft and slimy when fresh.

Surface conulose, conules correspond to the vertical tracts of acanthostyles. Pores are in between the conules, minute and contractile, diameter about 0.13 mm ; rather abundant. Oscules not seen. Ectosome and endosome are not well differentiated.

The main skeleton consists of vertical tufts of acanthorhabdostyles springing up from the substratum. Rarely, solitary acanthorhabdostyles are found erect on the substratum. Spongin is seen binding together the spicules. Smooth styles (rhabdostyles) also are present, vertically arranged. The contorted sigmas are distributed abundantly in the endosome.

Spicules : 1. Rhabdostyles. Shape as in those of *R. indica* Dendy. Length varies from 0.084 to 0.258 (average, 0.158 mm) and width from 0.002 to 0.004 (average, 0.003 mm) ; rarely met with.

2. Acanthorhabdostyles. Resemble the above-mentioned type in general structure but stout and spiny all over except at the curved head. Length varies from 0.109 to 0.315 (average, 0.196 mm) and width from 0.006 to 0.012 (average, 0.009 mm) ; fairly abundant.

3. Contorted sigmas. Shape as in the other typical species of *Rhabderemia*. Scattered throughout the endosome but rarely present in the ectosome also. Size 0.012 to 0.025 (average, 0.016 mm).

This species is of much interest because of the combination of acanthorhabdostyles and smooth rhabdostyles. The characteristic sigmas of *Rhabderemia* are well represented.

Locality, Register Number etc. : Gulf of Mannar (Galaxea Reef) C.M.F.R.I. No. 131 (Type) ; C.M.F.R.I. No. 131 A ; 131B ; 131C—26-2-1967.

Summary

Two new species of sponges *Echinodictyum longistylum* (Family Phorbasidae de Laubenfels) and *Rhabderemia acanthostyla* (Family Raspailiidae Hentschel) are described herein.

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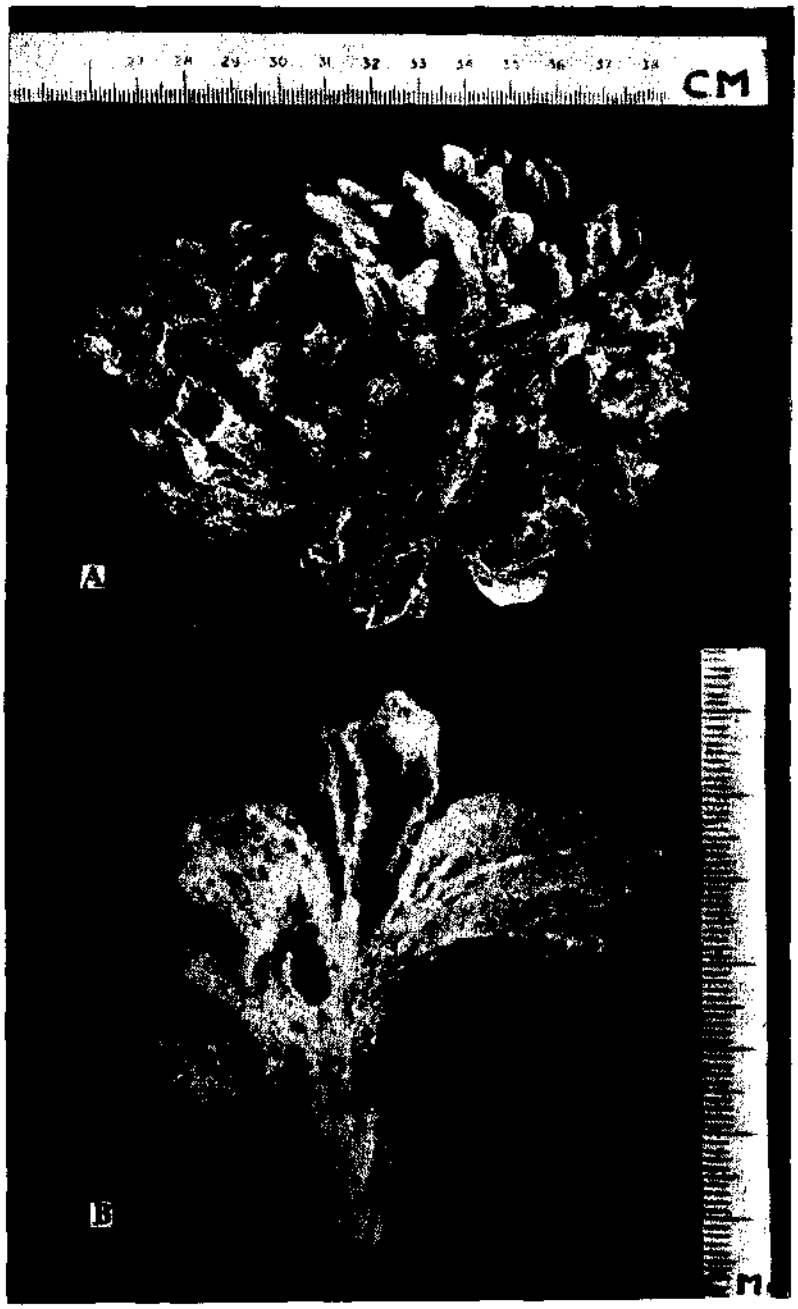

PLATE 1. *Echinodictyum longistylum* n.sp. A—Entire view of the type.
B—A branch of the type.

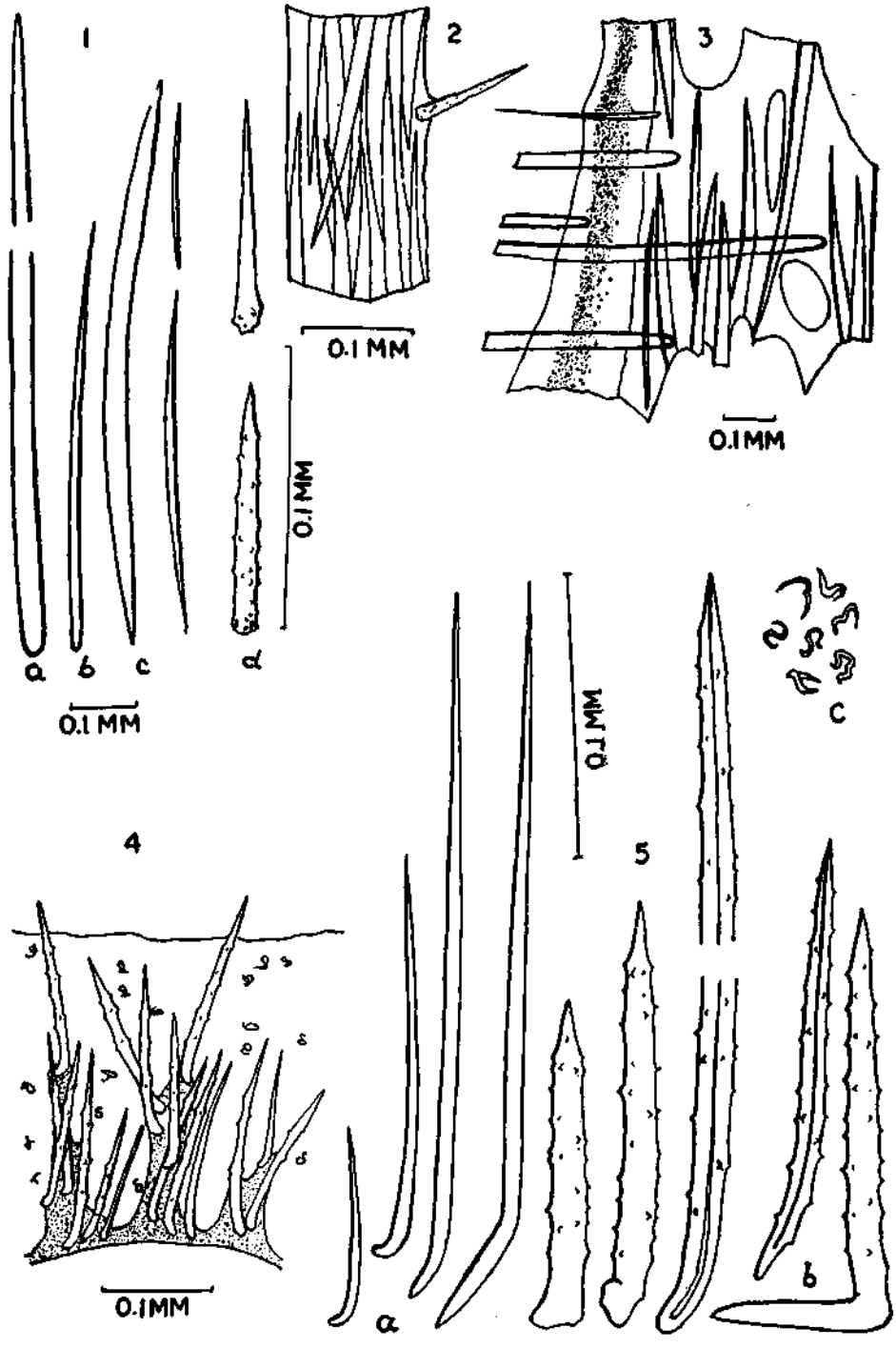

PLATE II, Figs. 1, 2, and 3. *Echinodictyum longistylum* n.sp. *a*. style ; *b*. small style ; *c*. oxeas (two types) ; *c*. acanthostyles. Fig. 2, A portion of fibre enlarged. Fig. 3 L.S. of branch. Figs. 4 and 5. *Rhabderemia acanthostyla* n.sp. Section showing the arrangement of spicules Fig. 5 *a*. Rhabdostyles; *b*. acanthorhabdostyles ; *c*. contorted sigmas.

REFERENCES

ANNANDALE, N. 1915. Some sponges parasitic on Clionidae with further notes on that family. *Rec. Indian Mus.*, **11** : 457-478.

BURTON, M. 1930. Additions to the sponge fauna of Gulf of Mannar. *Ann. Mag. nat. Hist.* Ser. 10, **5** : 665-676.

————. 1937. Supplement to the littoral fauna of Krusadai Island. *Bull. Madras Govt. Mus.*, **1**(2) : Pt. 4 : 1-58.

————. AND RAO, H. S. 1932. Reports on the shallow-water marine sponges in the collection of the Indian Museum. *Rec. Indian Mus.*, **34**, Pt. 3 : 299-356.

CARTER, H. J. 1876. Description and figures of deep-sea sponges and their spicules, from the Atlantic Ocean, dredged up on board H.M.S. 'Porcupine', chiefly in 1869 (concluded). *Ann. Mag. nat. Hist.* ser 4, **18** : 226-240 ; 307-324 ; 388-410 ; 458-479.

————. 1880. Report on specimens dredged up from the Gulf of Mannar and presented to the Liverpool Free Museum by Capt. W. H. Cawne Warren. *Ibid.*, Ser. 5, **5** : 437-457.

————. 1881. Supplementary report on specimens dredged up from the Gulf of Mannar, together with others from the sea in the vicinity of the Basse Rocks and from Bass's Straits respectively, presented to the Liverpool Free Museum by Capt. W. H. Cawne Warren. *Ibid.*, ser. 5, **7** : 361-385.

DENDY, A. 1905. Report on the Sponges collected by Prof. Herdman, at Ceylon, in 1902. *Rep. Govt. Ceylon Pearl Oyster Fish. Gulf of Mannar*, suppl. 18 : 57-246.

————. 1916. Report on the non-calcareous sponges collected by Mr. James Hornell at Okhamandal in Kattiawar in 1905-1906. *Rep. Govt. Baroda Mar. Zool. Okhamandal*, ser. 2, **17** : 96-146.

————. 1924. Porifera Pt. I. Non-Antarctic Sponges. British Antarctic ('Terra Nova') Expedition 1910. *Nat. Hist. Rep. Br. Antarct. Terra Nova Exped. Zool.*, **6**(3) : 269-392. (British Museum Natural History).

HALLMANN, E. F. 1917. On the Genera Echinaxia and Rhabdosigma. *Proc. Linn. Soc. N.S.W.*, **42** : Pt. 2 : 391-405.

LEVI, C. 1961. Les Spongiaires de l'Ile Aldabra : *Result. scient. Comp. Calypso.*, **5**(2) : 3-32.

RAO, H. S. 1941. Indian and Ceylon sponges in the Naturhistoriska Riksmuseet, Stockholm, collected by K. Fristedt. *Rec. Indian Mus.*, **43** : 417-469.

RIDLEY, S. O. 1881. On the Genus Plocamia, Schmidt, and on some other sponges of the Order Echinonemata. Pt. 1. *J. Linn. Soc.*, Lond., **15** : 476-497.

————. AND DENDY, A. 1887. Report on the Monaxonida collected by H.M.S. '*Challenger*' during the years 1873-1876. *Rep. Sci. Res. Challenger Zool.*, **20** : 1-275.

TOPSENT, E. 1890. Notice preliminaire sur les Spongiaires recueillis durant les campagnes de l'Hirondelle. *Bull. Soc. zool. Fr.*, **15** : 26-32.

————. 1892. Contribution a l'etude des Spongiaires de l'Atlantique Nord. *Result. Camp. scient. Prince Albert* I, Fasc. II : 1-165.

————. 1896. Materiaux pour servir a l'etude de la Faune des Spongiaires de France. *Mem. Soc. zool. Fr.*, **9** : 113-133.

————. 1927. Diagnoses d'Eponges nouvelles recueillies par le Prince Albert 1 er de Monaco. *Bull. Inst. oceanogr. Monaco* No. 502 : 1-19.

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STUDIES ON INDIAN SPONGES—II*

TWO NEW SPECIES OF SILICIOUS SPONGES BELONGING TO THE GENERA *Aka* DE LAUBENFELS AND *Damirina* BURTON

By P. A. THOMAS

Central Marine Fisheries Research Institute, Mandapam Camp

DURING an extensive collection of sponges from the coral rocks of the Gulf of Mannar, the author has come across two new species of sponges. The first one, *Aka diagonoxea*, is a boring sponge and the other, *Damirina papillata*, usually grows with its base rooted deep in the coral. Detailed descriptions of these species are given here.

All specimens are deposited in the Reference Collection Museum of the Central Marine Fisheries Research Institute.

Family CLIONIDAE Gray

Genus *Aka* de Laubenfels

de Laubenfels proposed this new name in 1936 for *Acca* Johnson (1899) with type *Acca insidiosa*. Johnson originally described three species, *A. insidiosa*, *A. rodens* and *A. infesta* from Madeira. Of these, the first was found boring into the shells of *Ostrea* and *Chama*; the second into the coral *Dendrophyllia ramea* and the third from a shell attached to another sponge. The other species transferred to this genus by de Laubenfels include *Cliona nodosa*, *C. labyrinthica*, both by Hancock (1849), and *C. coralliophaga* Stephens (1915). *Aka trachys* de Laubenfels (1954), from West Central Pacific, has acanthoxeas.

Aka diagonoxea n. sp.

(Figs. 1-5)

Material: Three coral rocks excavated by this sponge.

Description: Sponge boring, chambers found inside the corals are large (20 mm diameter) and irregular in outline. Fistules projecting from the substratum long, 20-50 mm; diameter 2-4 mm, and branching dichotomously or polychotomously. Pore bearing fistules short and stumpy. Pores terminal, 0.046 mm diameter. Oscules terminal, single, 2-3 mm in diameter.

The chambers formed inside the coral communicate with adjacent ones by two types of openings (1) wide openings of about 3 mm diameter and (2) small openings

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