

**ON SOME DEEP SEA SPONGES FROM THE GULF OF
MANNAR, WITH DESCRIPTIONS OF THREE NEW SPECIES**

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INTRODUCTION

In this paper, 9 species of Demospongiae collected during the cruises of the I.N.P. fishing vessel "Klaus Sunnana" in the Gulf of Mannar are dealt with. Of these, 3 species, viz., *Hymedesmia mannarensis*, *H. stylophora*, *Ectyodoryx lissostyla* are new to science and two, *Microciona rhopalophora* (Hentschel) and *Poecillastra schulzii* (Sollas) are new records from the Gulf of Mannar. All these specimens were collected by trawl net from depths varying between 180 and 325 metres. The type material are deposited in the Reference Collection Museum of the Central Marine Fisheries Research Institute Regional Centre, Mandapam Camp.

LIST OF SPECIES

Order Poecilosclerida Topsent

Family Myxillidae Hentschel

Genus *Ectyodoryx* Lundbeck

Ectyodoryx lissostyla sp.nov.

Genus *Hymedesmia* Bowerbank

Hymedesmia mannarensis sp.nov.

Hymedesmia stylophora sp.nov.

Family Ophlitaspongiidae de Laubenfels

Genus *Clathria* Schmidt

Clathria frondifera (Bowerbank)

Family Microcionidae Hentschel

Genus *Microciona* Bowerbank

Microciona rhopalophora (Hentschel)

Order Halichondrida Vosmaer

Family Axinellidae Schmidt

Genus *Axinella* Schmidt

Axinella domani (Bowerbank)

Order Carnosida Carter

Family Halinidae de Laubenfels

Sub-family Halininae de Laubenfels

Genus *Halina* Bowerbank*Halina plicata* (Schmidt)

Sub-family Corticiinae Vosmaer

Genus *Plakina* Schmidt*Plakina monolopha* Schulze

Family Plakinastrellidae de Laubenfels

Genus *Poecillastra* Sollas*Poecillastra schulzii* (Sollas)

SYSTEMATIC ACCOUNT

Ectyodoryx lissostyla sp. nov.

(Figs. 1-3)

Material : Sponge attached to the carapace of a *Lithodid* crab. Holotype, CMFRI No. 167.

Description : Body thickly encrusting ; height from 1 to 3 mm. ; irregular in outline. Area occupied, 23 × 14 mm. Colour is pale yellow when fresh. Consistency is hard when fresh.

Surface corrugated and conulose. Oscules small, 1 to 2.5 mm. in diameter. Ectosome consists of tangentially placed styles supported by the distal extremities of the main fibres ending in the surface. Dermal membrane, thin and transparent. When dry the dermal membrane sinks down following the contour of the subdermal cavities. Subdermal cavities extensive ; width, 1 to 1.5 mm. Endosome, crumb-of-bread-like.

The skeletal arrangement is irregularly reticulate. In the deeper parts the styles get arranged in a confusing manner, and as they come close to the surface may get arranged in bundles of 3 to 4 spicules in cross section. Smooth styles echinate the spicular bands in groups. Spongin sparsely present. Towards the surface, the reticulation becomes quite well defined ; polygonal or irregular in outline. Tornotes are found either singly or in groups both in the ectosome and endosome.

Spicules : 1. Styles. Slightly curved and sharply pointed. Size varies from 0.377 to 0.509 (0.462)* × 0.008 to 0.025 (0.019) mm. 2. Tornotes. Straight ; size 0.188 to 0.339 (0.245) × 0.006 to 0.008 (0.0067) mm. 3. Echinating styles. Head somewhat well developed. Shaft straight and without spines. Size, 0.084 to 0.106 (0.086) × 0.005 to 0.007 (0.0067) mm. 4. Isochelas. Tridentate. Chord length 0.021 to 0.037 (0.031) mm. 5. Sigmas. C or S-shaped. Chord length from 0.050 to 0.063 (0.054) mm. ; thickness about 0.0025 mm.

Remarks : This species is unique in having smooth echinating spicules.

* Average based on the measurements of 10 spicules.

***Hymedesmia mannarensis* sp.nov.**

(Figs. 5, 5A, 5B)

Material : Two encrustations on a coral (*Pachyseris* sp.) collected from a depth of 180 metres. Holotype, CMFRI. No. 169.

Description : Body encrusting, spreading uniformly in irregular patches. Area occupied, 34×15 mm. Colour is dark brown in dry condition.

Surface hispid, which is brought about by the projecting tips of acanthostyles. Oscules and pores are not detectable due to the dry nature of the specimen. Ectosome is charged with brown pigment granules varying in diameter from 0.008 to 0.016 mm.

Skeletal arrangement is in typical *Hymedesmia* pattern. The large acanthostyles are erect on the substratum with their heads buried deep in spongin spreading over the substratum. Sometimes large acanthostyles gather in groups or in definite columns running towards the surface. Smooth styles are arranged tangentially in the surface. Microscleres are distributed irregularly in the interior with greater concentration towards the surface.

Spicules : 1. Acanthostyles. Slightly curved; head prominent and with re-curved spines. Spination becomes sparse towards the apex. Size 0.357 to 0.411 (0.352)×0.008 to 0.012 (0.010) mm. Another type of acanthostyle also is met with. They have very slender shaft with uniformly rounded head. Size as in the former, but quite slender (about 0.006 mm.). Younger forms in this case are usually straight. 2. Small acanthostyles. Shaft straight or slightly curved. Uniformly and densely spined. Size from 0.094 to 0.170 (0.126) × 0.003 to 0.009 mm. 3. Styles. Straight, head prominent in most cases. Tips sharply pointed or rarely blunt. Polytylote forms are rarely met with. Size from 0.168 to 0.21 (0.18) mm., and width upto 0.003 mm., but usually slender. 4. Isochelas. Arcuate, chord length varies from 0.04 to 0.05 mm.

The genus *Hymedesmia* Bowerbank has been revised by Lundbeck (1910) who provided a key for about 70 species. This species is closely related to *Hymedesmia irregularis* Lundbeck (1910) but differs from that in the possession of two distinct types of acanthostyles, less prominent and polytylote nature of styles and in the structure of arcuate chelas.

***Hymedesmia stylophora* sp.nov.**

(Figs. 6, 6A)

Material : A coral (*Pachyseris* sp.) with a small encrustation of this sponge, collected from a depth of 180 metres. Holotype, CMFRI. No. 168.

Description : Body encrusting, thickness about 0.6 mm.; uniformly spreading on the under surface of the coral. Area occupied, about 18×15 mm. Colour is pale yellow when fresh. Consistency, papery; easily detachable from the substratum. Surface is smooth and uniform. Ectosome is densely charged with isochelas,

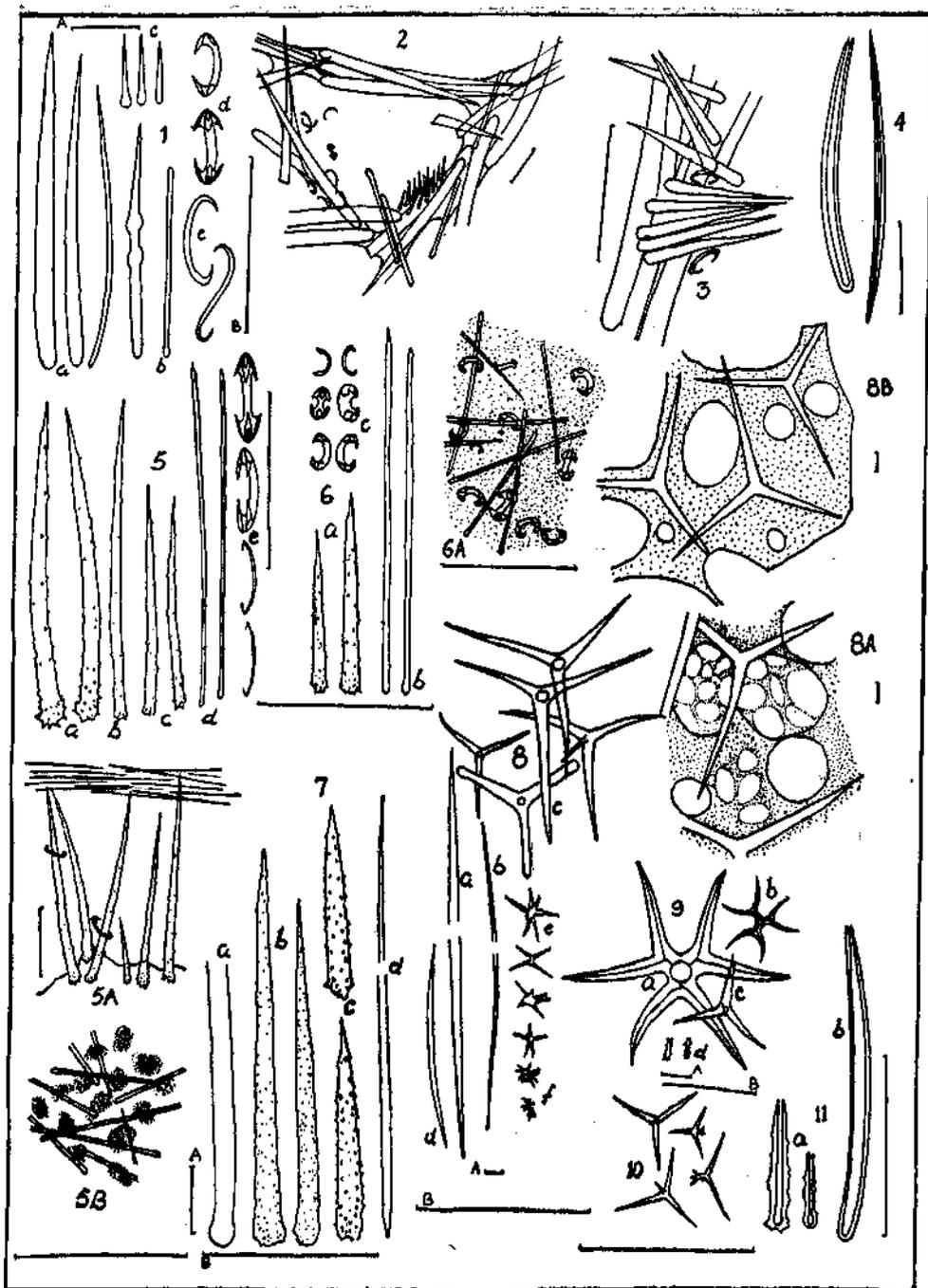


FIG. 1: 1-3. *Ectodoryx lissostyla* sp. nov. 1. Spicules. a. Style; b. Tornote; c. Echinating styles; d. Isochela; e. Sigma. (Megascleres-Scales A; Microscleres-Scale B); 2. Skeletal arrangement. Main fibres and part of the dermal reticulation are shown; 3. Echinating spicules, a magnified view; 4. *Axtnella donnani* (Bowerbank) Spicules, Styles and Oxeas; 5. *Hymedesmia mannarensis* sp. nov. Spicules. a. Acanthostyle (Large); b. Slender acanthostyle; c. Small acanthostyle; d. Style; e. Isochela, young and well developed forms; 5A. A vertical section; 5B. Dermal skeleton; 6. *Hymedesmia stylophora* sp. nov. Spicules. a. Acanthostyle; b. Style and subtylostyle; c. Isochela; 6A. Dermal skeleton; 7. *Microciona rhopalophora* (Hentschel); a. Tylostyle; b. large acanthostyle; c. Small acanthostyle; d. Dermal styles. (a-Scale A, Others-Scale B); 8. *Poecillastra schulzii* (Sollas); Spicules. a. Oxea; b. Slender oxea; c. Calthrops; d. Microxea; e. Metastars; f. Spiraster. (a and c-Scale A, others-Scale B); 8A. Pores in groups; 8B. Pores distributed singly; 9. *Halina plicata* (Schmidt); a. Dichotriaene; b. Small dichotriaene; c. Calthrops; d. Streptasters (a, b, c-Scale A, d-Scale B); 10. *Plakina monolopha* Schulze; Trioda and Calthrops; and 11. *Clathria frondifera* (Bowerbank); a. Acanthostyle; b. Style. (Inset scale 0.1 mm. throughout).

The skeletal arrangement is in typical *Hymedesmia* pattern. Acanthostyles have their heads buried in the basal coating of spongin. They seldom pierce the ectosome. In the dermal part the spicules are usually arranged in a tangential form.

Spicules: 1. Acanthostyles. Straight with distinct head. Spines minute and more prominent on the head. Size from 0.084 to 0.117 (0.105) \times 0.005 to 0.008 (0.007) mm. 2. Styles or subtylostyles. May show considerable variations in their terminations; rarely stronglyylote. Size from 0.168 to 0.21 (0.184) \times 0.001 to 0.003 (0.002) mm. 3. Isochela. Tridentate and semicircularly curved. Chord 0.016 to 0.025 mm.; shaft, in side view, about 0.004 mm.

This species belongs to the group with strongly curved isochelas; which in the absence of true strongyles stands separate from the rest of the group. The main spicules are much smaller than those of the dermal part.

***Microciona rhopalophora* (Hentschel)**

(Fig. 7)

Hymeraphia rhopalophora Hentschel, 1912, p. 380, pl. 20, fig. 37.

Microciona rhopalophora Burton, 1959, p. 248.

Material: A small encrustation on the under surface of a coral (*Pachyseris* sp.) collected from the depth of 180 metres.

Description: Body encrusting irregularly, thickness 0.5 to 1.5 mm. Surface hispid due to the presence of projecting tylostyles. Area occupied is 4 \times 12 mm. Colour is pale dark when fresh.

Skeleton consists of tylostyles in bundles with their heads resting on the substratum, and of smaller spicules arranged in bundles at the surface. Acanthostyles are erect on the substratum or lie scattered irregularly in the endosome. At the surface styles are arranged in a brush-like pattern.

Spicules: 1. Tylostyles. Size upto 2 \times 0.02 mm. 2. Large acanthostyles. Head well developed and with spines; shaft uniformly spined. Size varies from 0.189 to 0.231 \times 0.012 mm. 3. Acanthostyles (small). Head not prominent; spined uniformly, size 0.084 to 0.109 \times 0.006 to 0.012 mm. 4. Styles. Dermal, slightly curved. Size upto 0.754 \times 0.005 mm.

Distribution: Australian region, Indian Ocean.

***Clathria frondifera* (Bowerbank)**

(Fig. 11)

Halichondria frondifera Bowerbank, 1875, p. 288.

Clathria frondifera Ridley, 1884, p. 448, 612, pl. 42, fig. 1, pl. 53, fig. j; Burton, 1959, p. 243 (Synonymy).

Clathria corallitincta Dendy, 1889, p. 85, pl. 4, fig. 8; Dendy, 1921, p. 65.

Material: One specimen from 325 metres.

Description : Body composed of a clathrous mass of flattened trabeculae uniting together at irregular intervals like a honeycomb. The tips of these trabeculae, at the outer surface of the sponge, form pointed conules of 3 mm. high. Colour is brick-red when fresh.

The skeletal arrangement and spicular dimensions tally well with those recorded by previous workers. But an interesting point noted in the nature of spicules is that almost all the styles are provided with wide axial canals.

Distribution : Red Sea, Indian Ocean, Australian region.

Axinella donnani (Bowerbank)

(Fig. 4)

Isodictya donnani Bowerbank, 1873, p. 28, pl. 6.

Axinella donnani Dendy, 1887, p. 158, pl. 11, fig. 1 ; Burton, 1956, p. 134.

Phakellia donnani Dendy, 1905, p. 190 ; Dendy, 1921, p. 116.

Material : One specimen from 325 metres.

Description : Body funnel-shaped with a maximum diameter of 80 mm. Oscules are arranged in groups in a radiating pattern. Pores are scattered along the surface with slight concentration at the outer part. Surface hispid due to the presence of radiating fibres ending at the surface. These brushes may give a distinct conulose appearance to the surface. In most places these conules are arranged in a linear fashion giving a ridged appearance to the surface.

There are no peculiarities worth mentioning about the skeletal arrangement or spicular dimensions, except that most (nearly 80%) of the spicules were with wide axial canals.

Distribution : Red Sea, Indian Ocean, Atlantic Ocean.

Halina plicata (Schmidt)

(Fig. 9)

Corticium plicatum Schmidt, 1868, p. 2, pl. 2, fig. 11.

Samus simplex Carter, 1880, p. 60, pl. 5, fig. 26 ; 1887, p. 57.

Stoeba plicata Annandale, 1915, p. 458 (Synonymy).

Halina plicata Thomas, 1969, (in press).

Material : Found infesting the coral (*Pachyseris* sp.) collected from depth of 180 metres.

Description : Cavities inside the coral small, 1 to 4 mm. diameter circular or oval in outline. The growth pattern resembles well with that described by previous workers.

Spicules : 1. Dichotriaenes. Shaft conical, 0.06 mm. \times 0.018 mm. in size and chord 0.33 mm. when well developed. Smaller forms and calthrops resembling those figured by Topsent (1896, pl. 22, 0' d') were in plenty at the growing parts of the specimen. Chord length of the smallest spicule observed came to about 0.084 mm. Such spicules were not usually seen in specimens collected previously from the Indian region. 2. Streptasters. Size 0.008 to 0.016 \times 0.002 mm. (including spines).

Distribution : Mediterranean Sea, Indian Ocean, Australian region.

***Plakina monolopha* Schulze**

(Fig. 10)

Plakina monolopha Schulze, 1880, p. 407, pl. 20, figs. 1-7, pl. 22, figs. 22-20.

Spicules of this species were seen intermingled with the spicules of other species especially of *H. plicata* (Schmidt), collected from a depth of 180 metres. Triods and calthrops have rays with 0.029 mm. length.

***Poecillastra schulzii* (Sollas)**

(Figs. 8, 8A, 8B)

Normania schulzii Sollas 1886, p. 185.

Poecillastra schulzei Sollas 1888, p. 79, pl. 9, figs. 1-29.

Poecillastra schulzii Burton 1959, p. 182, (Synonyms).

Material : One highly damaged specimen from 325 metres.

Description : Body lamellar, thickness of the lamella 3 to 5 mm. Colour is pale white and the consistency hard but friable.

Surface hispid. Pores in groups roofing the incurrent canals, diameter from 0.02 to 0.4 mm. Osculus simple ; oval or rounded, diameter upto 1.8 mm. There is no difference between the ectosome and endosome. Spirasters and metasters are densely scattered in the dermal membrane.

Spicules : 1. Oxeas. Size upto 3.77 \times 0.067 mm. 2. Slender oxeas. Slightly curved or crooked, size upto 2.6 \times 0.016 mm. 3. Calthrops. Rays upto 0.933 \times 0.088 mm. in size ; pointed or blunt. 4. Orthotriaenes. Not seen. 5. Microxeas. Slightly curved, size 0.117 \times 0.007 mm. 6. Metasters. Diameter from 0.021 to 0.032 mm. 7. Spirasters. Size 0.008 mm.

Distribution : Indian Ocean, Australian region, Pacific Ocean.

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