

SPONGES COLLECTED ABOARD R. V. SKIPJACK FROM
THE SOUTHEAST COAST OF INDIA

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ABSTRACT

Eight species of sponges collected aboard R. V. *Skipjack* in the area between 11° 43' - 11° 44' N and 79° 57' E - 79° 58' E from a depth of 48 metres are described with suitable illustrations. Of these, 3 species viz. *Biemna microstyla*, *Bubaris gorgonoides* and *Acanthella megaspicula* are new to science. *Penares intermedia* (Dendy), a species so far known to occur only in the Gulf of Mannar, is here recorded from outside its native limits for the first time. It appears from the collection that this depth zone harbours a rich population of *Cinachyra cavernosa* (Lamarck).

INTRODUCTION

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE'S Research Vessel '*Skipjack*' during her cruise No. S. J. 10/83 on the southeast coast of India made extensive trawl net surveys and some interesting species of sponges taken aboard on 23-6-1983 in the area between 11° 43' - 11° 44' N and 79° 57' - 79° 58' E from a depth of 48 metres are dealt with in the present communication.

A total of 8 species has been collected from this area of which three are new to science. Of these three new species, one had already been reported under the generic name *Biemna* (Thomas, 1968, unpublished) since the material at hand at that time was insufficient to make any specific identification. Detailed descriptions of all the species collected are furnished in this account along with all necessary figures of spicules, their measurements etc. No attempt is made to give elaborate synonymy in any case and on the contrary, it is limited to a few recent citations. Dimensions of spicules are expressed in mm based on the measurements of 10 spicules from each category taken at random, and a pattern, i.e., lower limit-upper limit-mean

(the last one always in parenthesis), is uniformly followed.

Except *Cinachyra cavernosa* (Lamarck) no other species was numerically abundant in the area surveyed. *Penares intermedia* (Dendy) is here reported outside the Gulf of Mannar for the first time.

The author is thankful to Shri C. Mukundan, Dr. P. N. Radhakrishnan Nair and Dr. N. Gopalakrishna Pillai, Vizhinjam Research Centre of C. M. F. R. I., Vizhinjam for collecting the specimens aboard R. V. '*Skipjack*' during the cruise No. S. J. 10/83. He is also thankful to Dr. C. S. Gopinadha Pillai, for the photograph of specimens presented herein.

SYSTEMATICS

Class DEMOSPONGIAE Sollas

Order POECILOSLERIDA Topsent

Family *Amphilectidae* de Laubenfels

Biemna microstyla n. sp. (Fig. 1 b)

Biemna sp. Thomas, 1968 (unpublished)

Material: One specimen.

Description: Sponge with a tuberos base which is often buried in sand and with conical

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horn-like projections arising from the tuberos part. The conical projection ends in a terminal oscule of about 6 mm in diameter. There more openings may be noted on the sides of the horn-like projection, but these may represent broken ends of branchlets or fistules (?) given off from the main projection. The specimen described by Thomas (1968) from Tuticorin also resembled a bull's horn tapering distally where it opened outside by a wide opening of about 6 mm. The basal portion, in this case, was not represented. The cavity inside the horn-like part, in both specimens, was rather wide and the wall measured 2 mm on an average. Tuberos portion, in the present specimen, measured 6 X 6 cm and the conical part was about 6 cm in diameter basally, with a height of 6 cm.

Colour: Sandy grey and consistency friable.

Surface microscopically hispid due to the presence of styles projecting out at an angle to the surface. Ectosome and endosome inseparable. Pores not traceable, but some small openings which are oval in outline with an average size of 0.37 X 0.18 mm piercing right through the entire wall and communicating with the general cavity may be noted.

Skeleton of the wall consists of irregular bands of spicules running length-wise. In a longitudinal section of the wall about 6-10 such bands may be noted. Each band is composed of about 3-8 spicules lying side by side and as they go may curve out to the surface forming a tangential skeleton at the surface. In some places these spicules may project out at an angle to the surface. Skeleton of the tuberos portion is irregular and confused.

Spicules: (1) Styles. Slightly curved and sharply pointed (Measurements are given below in a tabularform). (2) Large sigmas. C or S shaped. (3) Small sigmas. Shape as in the former. (4) Raphides. In bundles. (5) Microxeas. Not seen in the present specimen.

Spicule dimensions of Biemna microstyla n. sp. (in mm)

Spicules	Material examined <i>Biemna</i> sp. (Thomas, 1968)	Present specimen
Style	0.398-0.528 (0.475)X 0.006-0.016 (0.009)	0.21 -0.50 (0.45) X 0.004-0.008 (0.006)
Sigmas (large)	0.088-0.121 (0.104)X 0.001-0.004 (0.002)	0.147 X 0.004 maximum
Sigmas (small)	0.025-0.033	0.035-0.048
Raphides	0.105 (hair-like)	0.1 (hair-like)
Microxeas	0.029	Not represented

Remarks: Specimen described here has considerable similarity with *Biemna* sp. collected from Tuticorin on 3-1-1966 (Thomas, 1968) with regard to morphology and spicular details. The specimen from Tuticorin has already been deposited in the Reference Collection Museum of the C. M. F. R. I., at Mandapam Camp (Tamil Nadu) under the Reg. No. CMFRI S-75 and this forms the type of the present new species. Taking the smaller size of styles represented herein, the specific name *microstyla* is suggested.

Order HALICHONDRIDA Vosmaer

Family *Axinellidae* Ridley and Dendy

Bubaris gorgonoides n. sp. (Fig. 1 f, g; Pl. I A)

Material: Two specimens

Description: Sponge branching in one plane and attached to the substratum by a stalk whose terminal portion is flattened to form a button-like disc. The stalk and branches are circular in cross section for the most part, but a tendency to get flattened in the same plane is noted in one specimen which is designated here as the type, while in the other

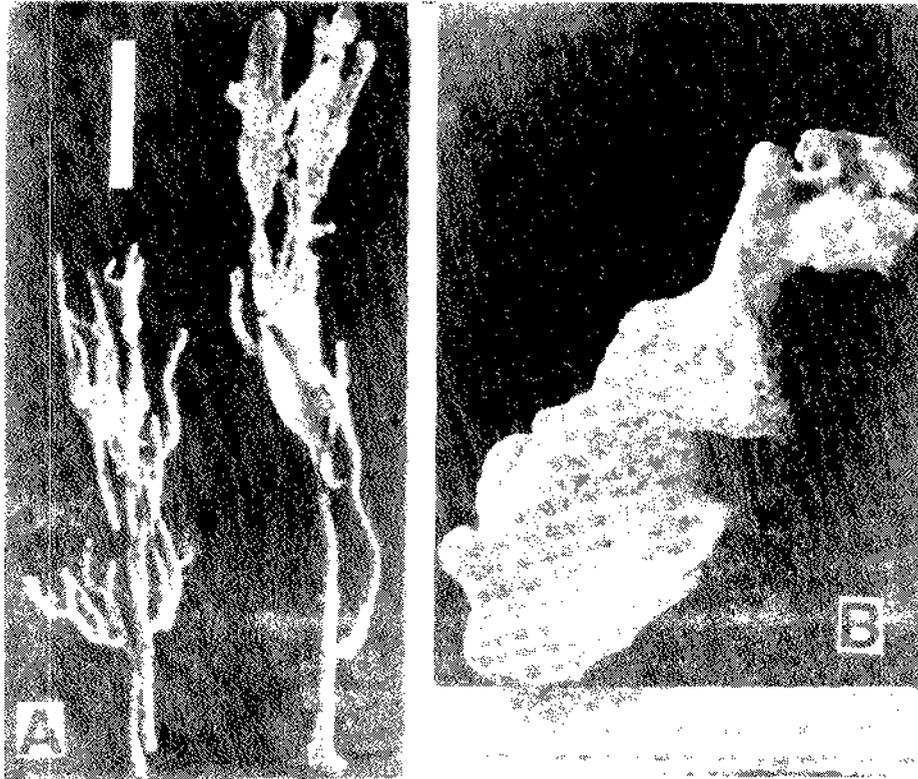


PLATE I A. *Balanus gorgonioides*: Incomplete specimen (paratype) and complete specimen (Type) and B. *Anaca globosellata*: a broken piece.

specimen, the junction of adjacent branches show a tendency to get flattened. Fusion of branches, either partial or complete, is also noted. When fusion is incomplete a semitransparent 'web' is seen covering the portion which is not fully fused. The total height of type specimen is 17 cm and width, 3.5 cm, while in the other the dimensions are 12 cm (height) and 2.5 cm (width). The disc portion of the stalk is preserved only in the type while in the other it is lacking. Disc is irregular in shape with a maximum diameter of 10 mm. Diameter of stalk, in the type, is 4 mm while the same in the other is 3 mm. Branches have, on an average, a diameter of 2 mm and are pointed terminally. Branches divide in an irregular dichotomous pattern and may also get interconnected loosely as in some gorgonids. In the other specimen, which is here designated as the paratype, two stalks may be noted, and it is not sure whether two specimens growing side by side got fused in the early stage of their growth, or not. *Colour*: Sandy grey and consistency, leathery.

Surface minutely conulose, each conule supported usually by one style originating directly from the axial column of strongyles. Oscules and pores are not traceable.

Skeletal arrangement is in typical *Bubaris* pattern. Axial skeleton is well developed, consisting of strongyles in a dense feltwork occupying almost 3/4 th diameter of the branch. Styles stand erect with their heads buried in the axial part and their tips supporting the conules.

Spicules : (1) Small styles. Straight or slightly curved at the basal 1/3rd. Basal part of the spicule less wider than the middle portion. Size, 0.18 - 0.25 X 0.001 - 0.009 mm. (2) Long styles. Slightly curved, size, 0.75 - 1.2 X 0.002 - 0.012 mm. (3) Strongyles. Long and sinuous, one end less wide than the other. Size, 0.75 - 1.13 X 0.004 - 0.010 mm (width taken at the wider portion).

Remarks: The nearest relative of this species is *B. carcisis* (Vacelet) from the Mediterranean (Pulitzer-Finali, 1983 for details on *B. carcisis*) in spicular details, but differs from it in the absence of sinuous oxeas.

Taking the growth pattern, which is so similar to that seen in some gorgonids, the specific name *gorgonoides* is suggested here.

Family *Hymeniacidonidae* de Laubenfels

Acanthella cavernosa Dendy (Fig. 1c)

Acanthella (?) *stiptata* var. Ridley and Dendy, 1887, p. 178.

Acanthella cavernosa Dendy, 1921, p. 120, pl. 7, fig. 7; pl. 17, fig. 3. Burton, 1937, p. 36, pl. 6, fig. 36. Thomas, 1973, p. 47, pl. 2, fig. 23; pl. 7, fig. 7.

Material : One specimen

Description : Body a clathrous mass of flattened trabeculae united together to form a subglobular body and a more or less constricted stalk. The entire outer surface of the body is covered with a transparent dermal membrane which is pierced here and there by pseudosculas. The total height of the present specimen is 50 mm and maximum width, 30 mm.

Colour grey when dry and consistency, compressible with poor resiliency.

The skeletal arrangement and other details tally well with those of the type.

Spicules : (1) Slender styles. Slightly curved and gradually pointed. Size, 0.28 - 0.95 (0.58) X 0.004 - 0.015 (0.007 mm). (2) Strongyles Sinuous, one end less wide than the other; size, 0.5 - 1.5 X 0.004 - 0.008 (0.006 mm).

Distribution : Widely distributed in the Indian Ocean.

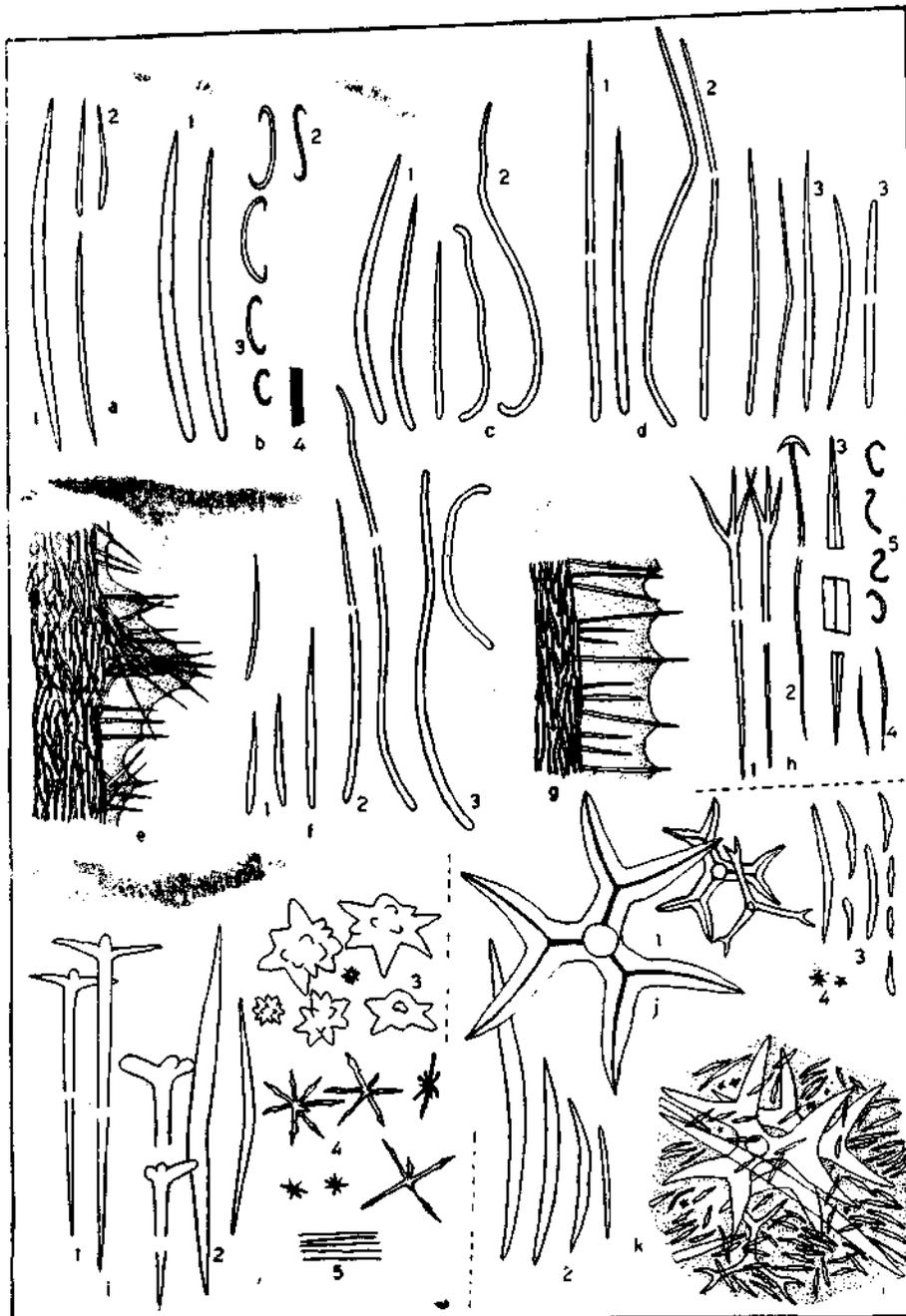


Fig. 1 a. *Prostylissa foetida*: 1. Oxeas, 2. Styles. b. *Biemna microstyla*: 1. Styles, 2. Large sigmas, 3. Small sigmas, 4. Raphides. c. *Acanthella cavernosa*: 1. Styles, 2. Strongyles. d. *Acanthella megaspicula*: 1. Long styles, 2. Strongyles, 3. Small oxeas/Strongyles/Styles. e. *Acanthella megaspicula*: Longitudinal section of a branch showing the skeletal arrangement. f. *Bubaris gorgonoides*: 1. Small styles, 2. Long styles, 3. Strongyles. g. *B. gorgonoides*: Longitudinal section of a branch showing the skeletal arrangement. h. *Cinachyra cavernosa*: 1. Protriaenes, 2. Anatriaene, 3. Oxea, 4. Microoxeas, 5. Sigmaspikes. i. *Aurora, globostellata*: 1. Orthotriaenes, 2. Oxeas, 3. Spherasters, 4. Oxyasters (different stages of growth), 5. Raphides. j. *Penares intermedia*: 1. Dichotriaenes (young and well developed forms are shown), 2. Large oxeas, 3. Small oxeas (some with stylote modification are also given), 4. Oxyasters. k. *Penares intermedia*: Dermal skeleton.

Acanthella megaspicula n. sp. (Fig. 1 d, e)

Material : One specimen

Description: Sponge stalked with flattened branches arising in a bushy pattern, branches, 1 - 3 mm wide, rebranch in a vague dichotomous pattern and these get interconnected in a scalariform manner. Height of the specimen, 38 mm and width 25 mm. The branches, at their extremities, are blunt or spatulate.

Colour: Pale white externally and the spatulate structures, pale brown to black.

Consistency : Hard but compressible and resiliency, very poor.

Oscules and pores are not traceable. Skeleton consists of vague bands of strongyloxeas and oxeas running through the centre of each branch. Styles may be seen erect on these bands with their heads buried deep in them. At places small hillock-like structures resembling conules may be located all along the sides of branches. Since these structures have an extension of main band of interior they are to be considered branchlets which are at their initial stage of development. Spongin is poorly developed.

Spicules: (1) Long styles. Slightly curved, maximum size 1.7 X 0.012 mm. (2) Strongyles. Crooked in varying degrees; size, 2.2 X 0.008 mm when well developed. (3) Oxeas/strongyles/styles. Oxeas may be centrangulated or biangulated; in some one end slightly thicker than the other. Size upto 0.75 X 0.024 mm.

Remarks: The present species can easily be distinguished from all the other species falling under the genus *Acanthella* from the Indian seas by the presence of flat branches originating from a stalk and also by larger spicules which it contains. The growth pattern noted in the other species may be either "thick walled with tubular branches" (as in *A. lyrata* (Esper), *A. elongata* (Dendy) and *A. ramosa* Kumar) or "with flattened trabeculae anastomosing and

with parchment like dermal membrane" and "possessing large pseudosculas" (as in *A. cavernosa* Dendy). Spicules are represented by oxeas and styles in *A. lyrata*; oxeas, styles and strongyles in *A. elongata* and *A. ramosa*, and styles and strongyles in *A. cavernosa*. Spicules represented in the present new species are of three types - styles, strongyles and oxeas, the measurements of which, especially of the former two types, are well above those recorded for any earlier species and hence the specific name *megaspicula* is suggested.

Order EPIPOLASIDA Sollas

Family *Jaspidae* de Laubenfels

Prostylyssa foetida (Dendy) (Fig. 1 a)

Hymeniacidon foetida Dendy, 1889, p. 87, pl. 4, fig. 5.

Prostylyssa foetida Burton, 1937, p. 37, pl. 7, fig. 45 (synonymy). Thomas, 1981, p. 36, pl. 2, fig. 20 (synonymy).

Material: one specimen

Description: Body irregularly tuberous, size 8 X 5 X 4 cm and attached to the substratum at many points. The upper part of the body, at places, with several papillar projections averaging to 10 mm (height) and 3 mm (diameter). These papillae end blindly.

Colour sandy grey, and consistency, friable when dry. Oscules not traceable, surface smooth at places where sand grains are not incorporated.

Dermal skeleton detachable, thickness about 0.8 mm when free of sand grains. Meshes polygonal or triangular at the dermal part; pores one per mesh and upto 0.07 mm in diameter. At places the dermal skeleton may assume an irregular arrangement with oxeas strewn irregularly. Styles are abundant at the dermal part ornamenting the dermal bands. Main skeleton is rather irregular with scanty spongin binding the main spicular bands.

Spicules: (1) Oxeas. Uniformly curved and sharply pointed; size, 0.2 - 1.13 (0.68) X 0.004 - 0.023 (0.015 mm). (2) Styles. Slightly curved and sharply pointed, greatest width at the central part. Size, 0.16 - 0.25 (0.17) X 0.004 - 0.006 (0.005 mm).

Distribution: Indo - Australian

Order CHORISTIDA Sollas

Family *Anchorinidae* Gray

Subfamily *Anchorininae* de Laubenfels

Penares intermedia (Dendy) (Fig. 1 j, k)

Plakinastrella intermedia Dendy, 1905, p. 67, pl. 1, fig. 4; pl. 2, fig. 2. *schulzei* Dendy, 1905, p. 69, pl. 2, fig. 3.

Material: One specimen

Description: Sponge encrusting; thickness 1-1.5 mm. The present specimen was found encrusting on a rock already encrusted partly with polyzoan.

Colour: White when dry, and consistency, friable.

Surface smooth, but foreign objects may be found incorporated on the surface. Oscules and pores are not traceable.

The skeleton of the dermal part is composed of dichotriaenes with their shafts pointing inwards and oxeas arranged tangentially over the clads of dichotriaenes. Smaller oxeas are generally scattered irregularly, but at places they may be arranged side by side compactly. Large oxeas may be seen just below or intermingled with the layer of smaller oxeas arranged irregularly or in bands of 2-3. Clads of younger dichotriaenes are seen just beneath those of the well developed dichotriaenes. The main skeleton is poorly developed and is composed of bands of large oxeas arising from the substratum in a slanting manner. These

bands, after meeting the dermal skeleton, run in parallel courses, reinforcing the dermal skeleton.

Spicules: (1) Dichotriaenes. Shaft short and pointed, size of protoclad about 0.08 X 0.05 mm and deuteroclad 0.28 X 0.005 mm and chord 0.66 mm when well developed. Protoclad usually longer than deuteroclad in younger forms. (2) Large oxeas. Biangulated or not; rarely stylote. Size upto 0.79 X 0.03 mm. (3) Small oxeas. Dermal, slightly curved and with or without a swelling in the central part. Stylote or strongylote spicules may also be noted. Size upto 0.19 X 0.006 - 0.012 mm. (4) Oxyasters. Rays 6-12 and minutely spined or not. Diameter upto 0.018 mm; fairly common in the dermal part.

Distribution: Previously known only from the Gulf of Mannar.

Subfamily *Stellettinae* Sollas

Aurora globostellata (Carter)
(Fig. 1 i; Pl. I B)

Stellata globostellata Carter, 1883, p. 353, pl. 4, fig. 5.

Aurora globostellata Sollas, 1888, p. 187.

Material: One specimen.

Description: Sponge more or less repent and attached to the substratum by many points. Length of the specimen 110 mm and greatest width 40 mm.

Colour: Dark yellow externally and pale yellow internally in dry condition.

Consistency: Hard and incompressible when dry. Surface smooth, oscules in groups and pores scattered irregularly. Cortex rather thick, about 0.3 mm and densely charged with spherasters. Subcortical space extensive. Skeletal arrangement tallies well with that of the type.

Spicules: (1) Orthotriaenes. Shaft straight and sharply pointed. Size, when well developed, 0.98 X 0.037 mm, clads 0.15 X 0.032 mm; suppression of clads quite common. (2) Oxeas. Slightly curved and sharply pointed, size upto 1.13 X 0.021 mm. (3) Anatriaenes. Not represented. (4) Spherasters. Centrum seldom spherical, suppression and malformation of ray quite common; diameter upto 0.08 mm. Length of ray, when well developed, 0.029 mm. (5) Oxyasters. With 6-12 terminally spined rays; centrum indistinct, total diameter upto 0.04 mm. (6) Raphides. In groups, individual size 0.08 mm, hair-like.

Distribution: Widely distributed in the Indian Ocean.

Family *Craniellidae* de Laubenfels

Cinachyra cavernosa (Lamarck) (Fig. 1 h)

Cinachyra australiensis Burton, 1934, p. 523 (synonymy).

Cinachyra cavernosa Thomas, 1973, p. 79, pl. 4, fig. 3 (synonymy).

Material: Six specimens.

Description: Sponge spherical and attached to the substratum by a broad base. Oscules rather inconspicuous, porocalyces small and scattered all over. Surface, in all specimens examined, with a thick layer of silt and sand.

Colour: Pale yellow internally. The colour of the surface assumes the colour of silt it lodges in.

Consistency: Tough and incompressible.

Skeleton radial, protriaenes and anatriaenes project out of the surface considerably. Oxeas radiate from a centrally placed 'nucleus' and diverge just beneath the surface. Microxeas abundant in some specimens examined, but never at right angles to the surface.

Spicules: (1) Protriaenes. Protriaenes with stout clads project considerably out of the surface especially around poriferous pits. Size of shaft upto 2.8 X 0.008 - 0.019 mm. Length of clad upto 0.21 mm and width, 0.018 mm. Clads may be suppressed in varying degrees. (2) Anatriaenes. Shaft long and slender, average size, 1.7 X 0.008 mm. Clads about 0.048 mm and chord 0.084 mm; clads may be suppressed or malformed in some. (3) Oxeas. Slightly curved, size 1.1 - 4.4 X 0.010 - 0.050 mm. (4) Microxeas. Slightly curved and sharply pointed; roughened or not. Size, 0.25 X 0.004 mm; fairly common in some specimens examined. (5) Sigmastyles. Roughened and contorted; chord upto 0.016 mm, fairly abundant.

Remarks: From the numerical abundance of the specimens in the collection it appears that this depth zone harbours a rich population of this species.

Distribution: Red sea, Indian Ocean, Australian region, Pacific Ocean and Atlantic Ocean.

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