

## Title:

*Cavernularia malabarica* Fowler, 1894 (Order: Pennatulacea, Family: Veretillidae) from the Bay coast of Visakhapatnam, Andhra Pradesh

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## Abstract

Many initiatives have come up to investigate the fauna around India. Due to accidental sighting and dislocation caused due to fishing and forming a part of the trash brought ashore is how the organisms are located. During regular sampling carried out from Mangamaripeta fish landing centre of Visakhapatnam, delicate shallow-water sea pens were collected and investigated. No previous records are available pertaining to the presence of these animals from this area and the species have not been identified from these waters. This report identifies and describes the species as *Cavernularia malabarica* Fowler, 1894 for the first time from these waters.

Key words: Sea pen, benthic fauna, India

## Introduction

Pennatulaceans are quite common in benthic communities from depths of a few metres to more than 6000 m (Williams 1995). Thirty-two genera in fifteen families of living pennatulaceans are currently recognized. Shallow-water sea pens occur in some veretillid genera such as *Veretillum* Cuvier, 1798 and *Cavernularia* Valenciennes in Milne-Edwards & Haime, 1850 (Williams 1995). The Veretillids are considered the least derived of the extant sea pens and exhibit a high diversity in the relatively shallow waters of the Indo-Pacific; whereas a great variety of more derived sea pen taxa are present worldwide with unrestricted bathymetric ranges (Williams 1997).

Subsequent to the work on information of the genus (Williams 1995), the genus *Cavernularia* comprises 14 species, out of which 4 species are known to occur from the Indian waters. The study of pennatulaceans from in and around India was studied by Thomson & Henderson (1905); Thomson & Crane (1909); Thomson & Simpson

(1909); Gravely (1927); Panikkar & Aiyar (1937); Sankolli & Neelakantan (1971); Gosliner *et al.* (1996), Williams (1993) and Harkantra & Rodrigues (2003). Past record of *Cavernularia malabarica* from Indian waters is from Puri, Orissa coast, Bay of Bengal obtained by Dr Imms (Marshall & Fowler 1888).

Radhakrishna (1964) has mentioned the presence of *Cavernularia* genus from Visakhapatnam. Pennatulids were also collected from Kakinada (Radhakrishna 1964) but no species has been noted. As there is no previous record of *Cavernularia malabarica* Fowler, 1894 made from Visakhapatnam waters, our present communication tends to highlight the identification of *Cavernularia* to the species level for the first time from Visakhapatnam coast as well as adding this species as a new record to the benthic fauna from this area.

#### Materials and methods

The materials studied here were collected from Mangamaripeta, Visakhapatnam at 10-15 m depth. Mangamaripeta (17°51'3.35"N and 83°24'50.45"E) is a small fishing centre about 30 kms from Visakhapatnam. The seapen colonies were fixed in buffered formaldehyde (4% in sea water) and then transferred to 70% ethanol. The following morphologies of the specimens were examined. Colorations of colonies were done of fresh specimens. The species identification was done using the key given by Williams (1995).

Sclerites were isolated from different parts of the colonies for microscopic examination following the procedure given by (Bayer 1961). In order to observe morphology of sclerites, a large number of sclerites were laid on glass cavity slides using a pipette and covered with a cover slip. The shape of the sclerites was carefully observed and the size was measured under a light microscope fitted with ocular and stage micrometers. All the photographs were taken under 10x & 40x magnification using Sony W220 12.1 megapixels mounted on Olympus compound microscope. Colony and sclerite terminology was mainly adapted from Bayer *et al.* (1983) and Williams (1993).

#### Results

Colony was clavate and elongate. Total length was 48mm, with peduncle length about 56% of colony length, 27 mm long and 3 mm width. The rachis length was about 44% of colony length, 21 mm long and 7 mm width (maximum width). Both rachis and peduncle were thick and fleshy. Autozooids and siphonozooids were distributed on the rachis surface with no orderly pattern of arrangement. The zooids were all completely retracted. Some were equal with the surface of the rachis and others forming dents on surface, all of which were represented as dark brown to black pores, 0.03-0.10 mm diameter. The polyps were separated by distances varying from 0.5-1.0 mm. The siphonozooids were smaller than autozooids present in between them (Fig. 1).

Calcium carbonate internal axis was present, 19mm in length. It was seen extending between rachis to about 1/4<sup>th</sup> of the peduncle, 39% of colony length. Shape of the axis was rod shaped with median whorl of projections, 1 mm in maximum diameter (Fig. 2). Colour of specimens was greyish white in the rachis, with dark brown to black zooids.

Sclerites were present in the surface of rachis. They were crutches 0.06-0.08 mm, bone shaped rods 0.04-0.06 mm and spindles 0.04-0.06 mm (Fig. 3). Sclerites from the interior of rachis were similar in shape and size to those of rachis surface. Peduncle surface sclerites were present, represented by ovals with premedian whorls of

projections sides being bluntly pointed 0.03-0.06 mm (Fig. 4). Peduncle interior sclerites sparsely present similar in shape and size to those of peduncle surface.

Autozoid/Siphonozoid sclerites present, more of crutches and rods with 3 terminal whorls of projections on one side and 2 on the other side, 0.03-0.08 mm (Fig. 5).

#### SYSTEMATIC ACCOUNT

Order - Pennatulacea Verrill, 1865

Family - Veretillidae Herklots, 1858

Genus – *Cavernularia* Valenciennes in Milne-Edwards & Haime, 1850

Scientific Name - *Cavernularia malabarica* Fowler, 1894 (Fig. 6)

The specimen has been deposited in the Visakhapatnam Regional centre of Central Marine Fisheries Research Institute Museum, India.

#### Discussion

The area under surveillance here is a small fishing region where operation of gillnets is most common. The specimens were dislodged from their habitat and brought ashore by fishermen along with the fish catch. Benthic fauna from in and around Visakhapatnam have been studied by Radhakrishna (1964); Raman (1980); Sudarsan (1983); Adishesasai (1992) and Vijayakumaran (2003). The previous records have mentioned the collection of specimens of *Cavernularia* from these waters but the species have not been identified until now.

A recent National Academy of Sciences study concluded that bottom trawling reduces the complexity, productivity, and biodiversity of seafloor habitats. Bottom trawling is not the only fishing technique that threatens bottom fauna, although it is the most damaging (Queiros *et al.* 2006). There is reason to believe that some human influences on the coastal environment can adversely affect the integrity of these communities, at least on a local scale, and they are therefore worthy of investigation from a conservation-related perspective. As there is no previous record of *Cavernularia malabarica* from Visakhapatnam waters, our present objective tends to highlight the identification of *Cavernularia* to the species level for the first time from Visakhapatnam coast as well as adding this species as a new record to the benthic fauna of this area.

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Figure legends

Fig. 1 Arrangement of Autozooids and Siphonozooids

Fig. 2 Axis

Fig. 3 Rachis Surface Sclerites

Fig. 4 Peduncle Surface Sclerites

Fig. 5 Autozoid Sclerites

Fig. 6 *Cavernularia malabarica*













