



## Short Communication

### New record of Sphenopid Zoanthid species *Palythoa tuberculosa* (Esper, 1805) from Gulf of Mannar, India

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Coral reefs provide a suitable habitat for many marine flora and fauna. Zoanthid is one of the most common inhabitants in coral reef habitats. A sub-massive colony of Sphenopid Zoanthid species *Palythoa tuberculosa* belonging to the order Zoantharia was documented for the first time from Gulf of Mannar (GoM) during an intensive coral reef monitoring survey conducted in Manoli, Manoliputti and Shingle Island. Photographic evidence of the colony along with its morphological characteristics are described in the present study.

[**Keywords:** Gulf of Mannar, Manoli and Manoliputti Island, *Palythoa tuberculosa*, Shingle Island, Zoanthid]

## Introduction

Coral reefs in marine ecosystem support enormous diversity of marine and coastal species. Numerous marine invertebrates inhabit in this ecosystem for food, shelter and favorable breeding and nursing ground<sup>1</sup>. However, one of relatively lesser known marine invertebrate group is zoanthids which belong to the class Anthozoa under the phylum of Cnidaria<sup>2</sup>. Zoanthids are found almost in all marine habitats and are widely used for their bioactive compounds such as Pylatoxin and Zoanthimine<sup>3</sup>. *Palythoa tuberculosa* which belongs to the family Sphenopidae consists of two genera namely, *Palythoa* and *Zoanthus*, which are quite common in coral reefs and are popular for pet industry<sup>4</sup>. Non distinct morphological characteristics and high level of intra specific variation are the major cause of difficulties in species level identification of zoanthids and consequently it becomes a neglected group for the taxonomist. In India, few important researches on taxonomy and diversity of zoanthids

have been carried out recently from the Gujarat coast<sup>2,5,6</sup>. A total of 302 species of Zoanthids are documented from all over the world of which only 8 species are reported from Indian waters<sup>2,7</sup>. In India, zoanthids are reported from Gulf of Kachchh, Saurashtra coast, coast of Goa and Andaman waters<sup>2,4,5,8,9</sup>. However, Coastal and marine habitats in Gulf of Mannar Biosphere Reserve (GoMMBR) are composed of sand, mud, coral reefs, mangroves and exposed rubble mounds which support variety of marine life. A total of 4223 species of macro flora and fauna are recorded from Gulf of Mannar Biosphere Reserve<sup>10</sup>. But till date, there is no information and record in the literature on *P. tuberculosa* from Gulf of Mannar. Therefore, the present study reports the species *P. tuberculosa* as first distribution record with photographic evidence from the islands of GoM biosphere reserve.

## Materials and Methods

Extensive marine faunal survey was carried out at various location of Mandapam group of Islands by skin diving at a depth range of 1 – 5 m. Specimen was observed during the underwater survey from the study locations (Site 1: Manoli Island - 09°12.377' N, 079°08.406' E, Site 2: Manoli Island - 09°13.276' N, 079°08.325' E and Site 3: Shingle Island - 09°14.550' N, 79°13.813' E) and has been marked with GARMIN e-Trex handheld GPS device. In Manoli Island, habitat is comprised of sand and rubbles with maximum coverage of dead corals with algae (DCA) and the specimen was found at a depth of 2 m on the surface of a dead rock. Area in Shingle Island is comprised of live reef and the colonies of zoanthids found on rocky substratum scattered like a mat. Field photographs of zoanthid colony were documented by using NIKON Coolpix underwater camera. Earlier literature of Kumari *et al.*<sup>2</sup>, Ubare *et al.*<sup>4</sup> and Pandya & Mankodi<sup>5</sup> have been used for species identification by analyzing morphological features of the colony.

## Results and Discussion

### Morphological characteristics

Colonies were encrusting, and yellow in colour. The common tissue was thick, rubbery and spread like a mat which was divided into several pieces (Figs. 1a & b).

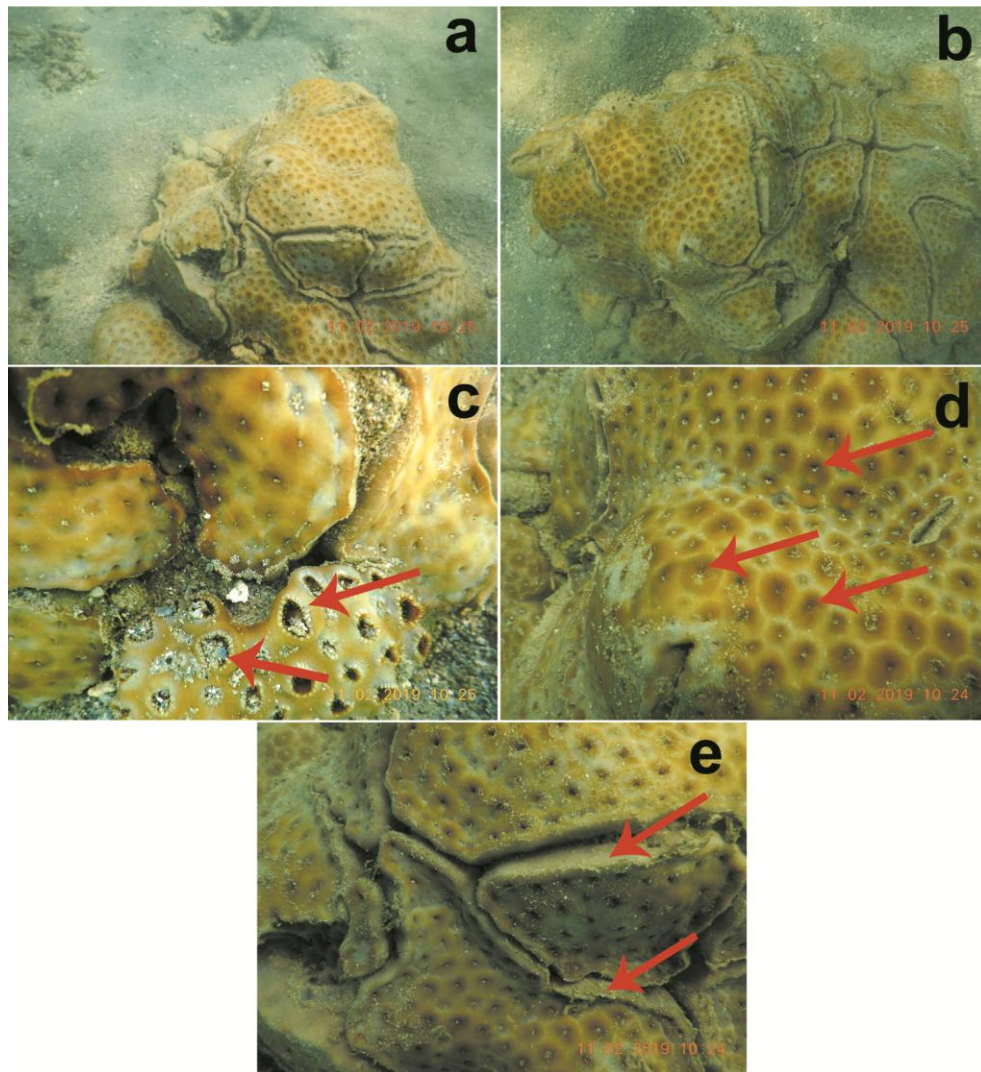


Fig. 1 — Detailed observation on a colony of *Palythoa tuberculosa*: a) Encrusting colony of zoanthid *P. tuberculosa*, b) Colony has thick rubber like appearance with several cracks on the surface, c) Polyps contain two rows of tentacles, d) Polyps embedded within the thick tissue under the layer of coenenchyme, and e) Deposition of sand and debris on grooves of thick tissue of *P. tuberculosa*

The diameter of the whole colony was 50 – 80 cm (Fig. 1b). The encrusted soft body of the colony makes rubbery sensation when pressed with hand. The polyp has a thick and short body column, topped by a wide oral disk edged with tentacles in two rows (Fig. 1c). Very few polyps are extending during the day time (Fig. 1c). A total of 30-36 tentacles were counted in each polyp. Tentacles were pale brown in colour. Polyps are immersed within the oral disk and scarcely extending above the well-developed coenenchyme which is uniformly white in colour (Fig. 1d). The upper and inner surface of the tissue incorporated with many sand and debris particles which make their tissue surface rough when touched (Fig. 1e).

#### Taxonomic references

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#### Remarks

The specimen was found at a depth of 2 m in reef area of Manoliputti and Shingle Island. Substratum was made of sand and rubbles. The tropical zoanthid

*P. tuberculosa* is widely distributed in Red Sea, Maldives, Japan, South Africa and Taiwan. This species is known to form extensive mats in the shallow water reef zone<sup>11</sup>. In India, *P. tuberculosa* was recently reported from Andaman waters and Gujarat coast<sup>2,4,5</sup>. Hence, this is the new distributional record of *P. tuberculosa* from Manoli and Manoliputti and Shingle Island in Gulf of Mannar, South east coast of India.

*P. tuberculosa* is also known as sea mat species or sphenopid zoanthellate zoanthid whose polyps possess symbiotic dinoflagellates called zooxanthellae<sup>12</sup>. A similar species *P. caesia* has also been widely distributed in Fiji, Australia and in the Indian Ocean but not reported from India<sup>13</sup>. Hibino *et al.*<sup>13</sup> described the comparative morphological characteristics of these two species, where *P. caesia* had more number of tentacles than *P. tuberculosa* and it would appear possible means of discern between these two species based on morphological characters. According to the present study, *P. tuberculosa* tentacles count was 30-36 in adult polyp whereas in *P. caesia* 40-50 tentacles were reported in an adult polyp<sup>11</sup>. Polyps of *P. tuberculosa* spreads very fast which often form individual clumps on the colony and several cracks appear in the mat due to those fast growing clumps<sup>14</sup>. The same appearance has been found in the sighted specimen (Figs. 1a & b). Another similar species called *Palythoa mutuki* found in India differ from *P. tuberculosa* by their elongated cylindrical polyps with under developed coenochyme and green or brown oral disk colouration<sup>15</sup>. The sub-massive appearance of this species is sometimes confused with the ascidians and sponges also. The genus, *Palythoa* contain the highly toxic Palytoxin which acts as contributing agent of several cases of human seafood poisoning resulting in systemic symptoms<sup>4</sup>. It is reported that some communities from Hawaiian used to make poisoned arrows by rubbing the tips on the zoanthid *Palythoa toxica*<sup>14</sup>. This very potent marine toxin was also isolated from *P. tuberculosa* and studied to determine the effect of isolated smooth muscles<sup>16</sup>. Therefore, the present study reported a highly potent source of bioactive compounds Palytoxin which is a hemolytic natural product<sup>17,18</sup>, and also a source of mycosporine-like amino acids (MAAs) that function as UV absorbents and antioxidants<sup>19</sup>. The present study also concludes that, coral reefs in GoM is rich in many important unknown lower taxa which needs to be investigated before they disappear from this ecosystem due to various natural and anthropogenic

stress factors. NCCR has initiated long term coral reef monitoring programme to assess the health of coral reefs and to investigate its associated marine biota in the Gulf of Mannar.

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### Conflict of Interest

Authors do not have any conflict of interest to declare.

### Author Contributions

KS, RC & TS did field surveys, collected the data and wrote manuscript. TS & MVRM coordinated the scientific work and edited and approved the manuscript.

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