

Report of epibiont *Thecacineta calix* (Ciliophora: Suctorea) on deep sea *Desmodora* (Nematoda) from the Andaman Sea, Indian Ocean

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Suctorian epibionts *Thecacineta calix* attached on the cuticle of nematodes *Desmodora sphaerica* and *D. pontica* are reported here from the deep sea hexactinellid sponge *Pheronema* sp. from the Andaman Sea (Indian Ocean). The epibiont *T. calix* is reported here for first time from the Andaman Sea.

Keywords: epibionts; Suctorians; *Thecacineta calix*; deep sea; nematodes; *Desmodora*; Andaman Sea, Indian Ocean

INTRODUCTION

Suctorian ciliates are common epibionts on benthic marine and interstitial invertebrates like harpacticoid copepods, nematodes, halacarid mites etc (Jankowski, 1981; Dovgal, 1996; Dovgal et al., 2008). A number of suctorian ciliate ectocommensals have been observed occurring on the cuticle of various members of family Desmodoridae (Allgen, 1952, 1955; Matthes, 1956). In the present study, suctorian ciliates have been recovered on the cuticle of two nematode species, *Desmodora sphaerica* and *D. pontica* belong to the Desmodoridae family isolated from the deep sea sponge (*Pheronema* sp.) from the Andaman Sea. Scrupulous microscopic observations revealed suctorian epibionts are conspecific with *Thecacineta calix*. *Thecacineta calix* is reported here for first time from the Andaman Sea.

MATERIAL AND METHODS

As part of a deep-sea study of benthic biodiversity, sediment sampling was performed in the Andaman Back Arc Basin (Figure 1) during the RV 'SONNE' cruise (NIO-RVS-II 17 October to 1 December 2007). Seabed samples were obtained by deploying a TV camera guided grab (area: 0.6 m²) which consists essentially of a set of steel jaws with a video camera in the centre. It collected sediment and rock samples and transmitted pictures of the ocean floor to the deck unit. Some specimens of hexactinellid sponge were collected along with the sediment and rock samples taken from the upper slope of the Northern Seamount located off Nicobar Island, 9°59'31.52"N 93°57'15.48"E, from a water depth of 1301 m. Upon collection, the sponges were carefully separated from the sediment and immediately preserved with absolute alcohol. In the laboratory, the sponge samples were washed carefully and the entire faunal community associated with sponge spicules were sorted out carefully and identified to the lowest possible taxa. All the nematodes were separated and fixed in 5% formalin. Nematodes were identified to genus/species level according to (Platt & Warwick, 1983) and using online recent literature (www.nemys.ugent.be).

Measurements of ciliates were made using the computer program Scope Photo v. 2.0 for processing of digital images. For slide preparation the material was stained by Boehmer's haematoxylin and mounted in Canada balsam. Permanent slides of infested nematodes were deposited in the collections of the Department of Fauna and Systematics of Invertebrate Animals of the Schmalhausen Institute of Zoology, National Academy of Sciences, Ukraine and in the museum of Biological Oceanography, National Institute of Oceanography, Goa, India.

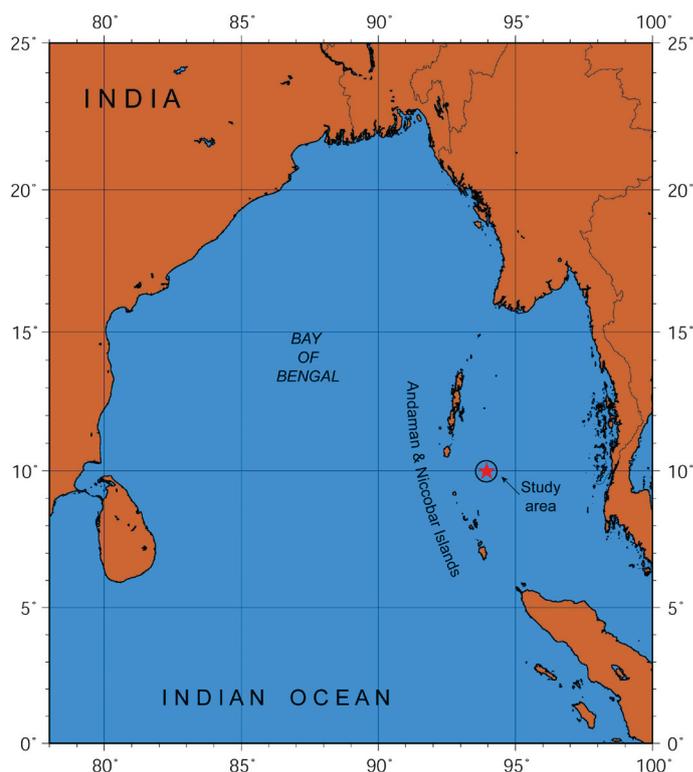


Figure 1. Map showing sampling location (indicated with *).

RESULTS AND DISCUSSION

Nematodes species *Desmodora sphaerica* and *D. pontica*, belonging to the genus *Desmodora* of the family Desmodoridae associated with a deep sea hexactinellid sponge *Pheronema* sp., were used for the present study. A total of 71 specimens of nematodes belonging to 6 species were isolated from the deep-sea *Pheronema* sp. Of these 5 (*Desmodora sphaerica*; *D. Pontica*; *D. schulzi*; *Desmodora* sp1; *Desmodora* sp2) belonged to the family Desmodoridae and one specimen could not be identified as it was damaged. Among these, *D. sphaerica* (17 individuals out of 71 specimens of nematodes collected) and *D. pontica* (12 individuals out of 71 specimens of nematodes collected) together made ~41 % of nematode population. Among 17 individuals of *D. sphaerica* collected, 13 (76%) were infested with suctorians and among 12 individuals of *D. pontica* 9 (75%) were infested with suctorians. Among the infested *D. sphaerica* 54% were female and 46% were male; among the infested *D. pontica* 67% were female and 33% were male. The suctorians were mostly noticed on the tail region but a few specimens were also found in mid-region.

The detailed taxonomic study of the suctorian revealed that they belong to the ectocommensal *Thecacineta calix* (Schroder, 1907). *Thecacineta calix*, a marine loricate suctorian ciliate with a single apical fascicle of tentacles, was described from marine nematodes (Schroder, 1907). Subsequently, (Collin, 1909) combined all known species that had a similar morphology into the genus *Thecacineta*. Later, (Matthes, 1956) investigated *T. calix* as epibionts on harpacticoid copepode *Laophonte cornuta* from the Mediterranean Sea. This epibiont is also reported from various meiobenthic organisms such as halacarid mites, harpacticoid copepods and nematodes.

SYSTEMATICS

Class SUCTOREA Claparede et Lachmann, 1859

Subclass VERMIGENIA Jankowski, 1978

Order SPELAEOPHYRIDA Jankowski, 1978

Family THECACINETIDAE Matthes, 1956

Genus *Thecacineta* Collin, 1909

Thecacineta calix (Schroder, 1907) (Figure 2)

= *Acineta calix* Schroder

= *Thecacineta desmodorae* Schulz

= *Thecacineta subantarctica* Allgen

= *Thecacineta donsi* Allgen

= *Thecacineta paradesmodorae* Allgen

= *Thecacineta laophontis* Jankowski

= *Paracineta moebiusi* Kahl

Diagnosis

Marine loricate, suctorian. Cell body entirely fills the lorica and attached to their bottom. Lorica totally ribbed transversely. Apical part of body protrudes beyond lorica aperture. Up to 30 clavate tentacles with length about 90 µm arise from upper body surface. Macronucleus large, oviform, located at the bottom of the cell body. With large contractile vacuole placed in basal body part usually near macronucleus.

Measurements

Measurements (µm) of four individuals from Andaman Sea, in parentheses measurements of individuals from copepode host (after Matthes, 1956): body length 14–24 (47–49 under colonization of the copepode host); width in the middle of body 12–17 (22–30 in copepode host); macronucleus diameter 6–8 (13–16 in copepode host); length of the lorica 44–60 (103–164 in copepode host), lorica width 25–26 µm, stalk length 15–21 µm, stalk thickness 1.5–3 µm.

Distribution and host specificity

Earlier *T. calix* was reported as epibiontic on nematodes, crustacean copepods, halacarid mites from the Atlantic, Pacific, Antarctic and Indian Oceans (Kerguelen Island) (Schroder, 1907; Allgen, 1949, 1952, 1955; Matthes, 1956; Gelmboldt & Dovgal, 2005; Dovgal et al 2008). Among nematodes *T. calix* has been reported as epibiontic on *Desmodora campbelli*, *D. microchaeta*, *D. odhneri*, *D. reducta*, *D. stateni*, *Acanthopharynx japonicas*, *Epsilonema symbioticum*, *E. pocillothrix* and *Paradesmodora* sp. (Schroder, 1907; Schulz, 1931; Allgen, 1949; Steiner & Hoeppli, 1926; Steiner, 1931; Matthes, 1956; Susetiono, 2006; Jankowski, 2007). The present report is the first to record *T. calix* from the Andaman sea. *Thecacineta calix* also has been reported from freshwater in Thailand (Charubhun & Charubhun, 2000), however the latter find calls for further investigation because *T. calix* is a marine species.



Figure 2. (A) *Thecacineteta calix* attached with *Desmodora pontica* from the Andaman Sea; (B) magnified view of *Thecacineteta calix* attached with *Desmodora* from the Andaman Sea.

Remarks

In many cases the suctorians were attached close to the cloaca of the nematodes. Probably that observed location may be connected with mode of reproduction of thecacinetid suctorians, including *T. calix*, by vermigemmic budding. The swimmers (migratory stages, devoid of ciliature, vermiform and unable to swim) are formed during reproduction. These swimmers crawl onto the new host over the surfaces of the copulating hosts therefore localization of the commensals near the zone of joining of copulating nematodes may possibly give priority to epibionts for expansion.

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