

New Records of *Thecacineteta cothurnioides* and *Trematosoma rotunda* (Ciliophora, Suctorea) as epibionts on nematodes from the Indian Ocean

Igor Dovgal¹, Tapas Chatterjee² and Baban Ingole³

¹ *Schmalhausen Institute of Zoology, B. Khmelnytsky str, Kiev, Ukraine,*

² *Department of Biology, Indian School of Learning, I.S.M. Annexe, Dhanbad, Jharkhand, India,*

³ *Biological Oceanography Division, National Institute of Oceanography, Dona Paula, Goa, India*

Summary

This article deals with the report of two suctorian ciliates species viz. *Thecacineteta cothurnioides* Collin, 1909 and *Trematosoma rotunda* (Allgén, 1952) as epibionts on *Tricoma* sp. and *Pseudochromadora* sp. (Nematoda) respectively from Ratnagiri, west coast of India, Arabian Sea (Indian Ocean). Redescription of two species with distribution and nomenclatural notes are given. Both species are recorded here first time from Indian coast and the Indian Ocean. Genus *Tricoma* Cobb, 1894 is also recorded here first time as a host of *Th. cothurnioides*.

Key words: Suctoria, fauna, Indian Ocean, *Trematosoma*, *Thecacineteta*

Introduction

Suctorian ciliates are common epibionts on benthic marine and interstitial invertebrates such as harpacticoid copepods, nematodes, halacarid mites etc (Jankowski, 1981, 2007, Dovgal, 1996, Dovgal et al., 2008). Several specimens of suctorian ciliates which correspond to species *Thecacineteta cothurnioides* Collin, 1909 and *Trematosoma rotunda* (Allgén, 1952) from nematodes have been collected from central west coast of India. Both species are recorded here first time from Indian Ocean. Nematode genus *Tricoma* Cobb, 1894 is also recorded here first time as a host of *Th. cothurnioides*. The original description

from type locality for both species are fragmentary, the modes of reproduction were unknown. Redescription with distribution and nomenclatural notes are also given.

Material and Methods

The meiofauna were collected from Ratnagiri (Lat: 17° 00' 38" N, Long: 73° 15' 34" E), west coast of India, Arabian Sea (Indian Ocean). Collection was part of the sediment sampling conducted using Van Veen grab (0.04m² area) in the water depth of 14.5 meters on 14 th January 2006 (Ingole et al.,

2008). The infested nematodes were isolated from the meiofauna. Salinity of the bottom water was 33.8 PSU. Dissolved oxygen: 3.7 ml per litre. The sediment has very high content of sand 98%, 1.5% silt and low clay content 0.5% and sedimentary chlorophyll was 0.4 microgram per gram.

10 individuals of *Thecacineteta cothurnioides* were found on one specimen of nematode whereas the *Tematosoma rotunda* were investigated from three individuals of nematode host with 6, 3 and 7 ciliate individuals respectively for each nematode.

The measurements of ciliates were made using the computer program ScopePhoto 2.0 for processing of digital images. Five similarly aligned individuals were measured for each ciliate species. For slide preparing the material was stained by Boehmer's hematoxylin and mounted in Canada balsam. The permanent slides of infested nematodes are deposited in the collections of the Department of Fauna and Systematics of Invertebrate Animals of Schmalhausen Institute of Zoology NAS of Ukraine.

SYSTEMATICS

Class SUCTOREA Claparede et Lachmann, 1859

Subclass VERMIGENIA Jankowski, 1978

Order SPELAEOPHRYIDA Jankowski, 1978

Family THECACINETIDAE Matthes, 1956

Thecacineteta cothurnioides (Collin, 1909) charact. emend. (Figs 1-3)

= *Acineta cothurnioides* Collin, 1909

= *Lissacineta cothurnioides* (Collin, 1909)

Diagnosis. Marine loricate suctorian. Cell body no flattened laterally, entirely fill up the lorica and clamped to their bottom. Apical part of the body conical pared-down. About 15 tentacles placed at the upper body surface and just projected from lorica. Macronucleus spherical posterior located. Contractile vacuole small, single and placed closed under macronucleus. Lorica smooth. Stalk long, slightly curved, in the area of junction with lorica fitted with very small widening (physon). Reproduction by vermigemmic budding.

From another species of the genus *Thecacineteta* the species is differs by not ribbed smooth lorica and by characteristic stalk widening (physon).

Body dimensions. Measurements are made using materials from India, in parentheses measurements of individuals given by Collin, 1909. Lorica length 33-39 μm (50 μm after Collin, 1909), lorica width,

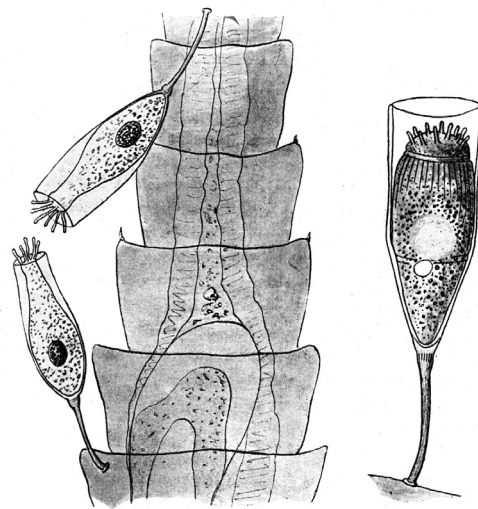


Fig. 1. *Thecacineteta cothurnioides* from harpacticoid copepode *Cletodes longicaudatus* (after Collin, 1912).

wide of lorica mouth 17-21 μm , (18-20 μm), stalk length 3-18 μm (28 μm), macronucleus diameter 7-10 μm .

Distribution and host prevalence. The species was described (Collin, 1909) from abdomen of interstitial harpacticoid copepode *Cletodes longicaudatus* (Boeck) (type host, indicated here) from Banyuls-sur-Mer at Mediterranean coast of France (type locality, indicated here) (Fig. 1). *Th. cothurnioides* was also listed for river Seversky Donets basin in Ukraine (Dovgal, 1988). However, the species is not characteristic for freshwater biotopes and we believe that it was erroneous identification. We found *Th. cothurnioides* on nematode *Tricoma* sp (Superfamily



Fig. 2. The arrangement of *Thecacineteta cothurnioides* at the body of nematode *Tricoma* sp. from Ratnagiri, India.

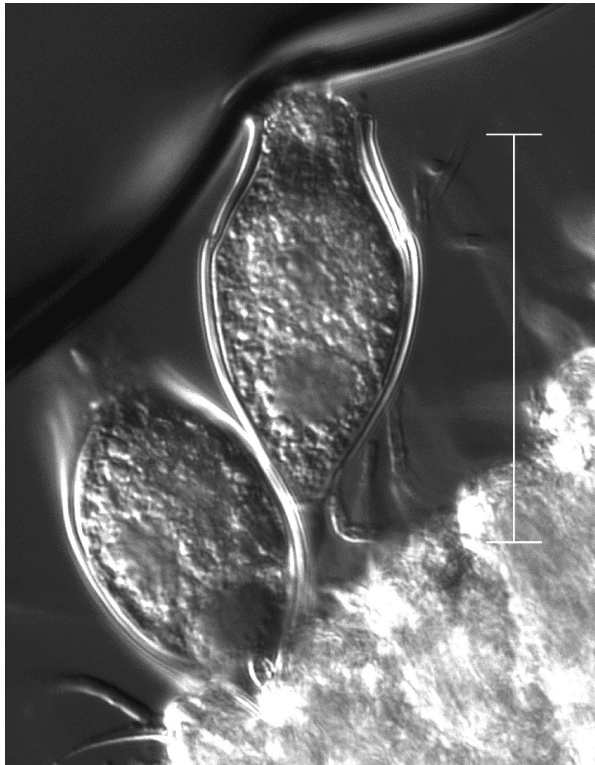


Fig. 3. *Thecacineta cothurnioides* from nematode *Tricoma* sp. from India. Scale bar: 50 µm.

Desmoscolecoidea Shipley, Family Desmoscol-
ecidae Shipley, Subfamily Tricominae Lorenzen,
Genus *Tricoma* Cobb) from Ratnagiri, Maharastra
state, central west coast of India (Arabian Sea).

Remarks on the systematics and nomenclature.
Jankowski (1981) has been proposed the new genus
Lissacineta for representatives of *Thecacineta* that
have the lorica without folds and indicated the *Th.*
cothurnioides Collin, 1912 as the type species of

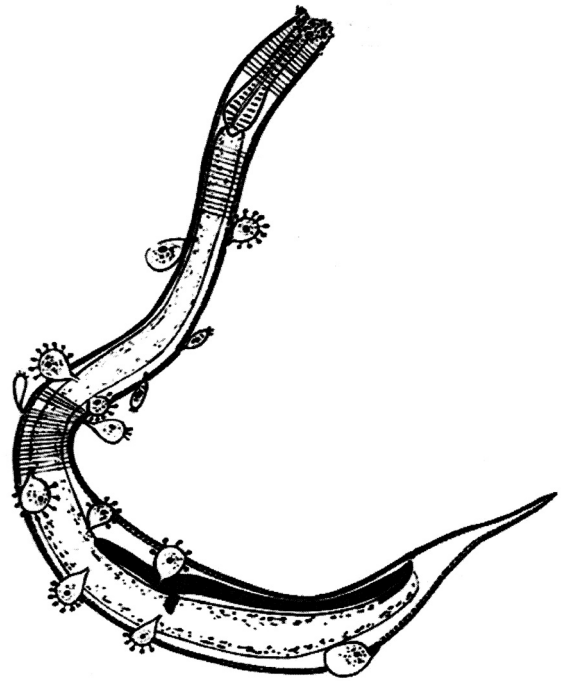


Fig. 4. *Trematosoma rotunda* at the nematode
Desmodora sp. (after Allgén, 1955).

the genus. However the generic name *Lissacineta*
Jankowski, 1981 was synonymized with *Thecacineta*
Collin, 1909 by Dovgal (2002).

Subclass ENDOGENIA Collin, 1912
Order ACINETIDA Raabe, 1964
Family ACINETIDAE Ehrenberg, 1838

Trematosoma rotunda (Allgén, 1952) charact.
emend. (Figs 4-8)



Fig. 5. The arrangement of *Trematosoma rotunda* at
the body of *Pseudochromadora* sp. from India.

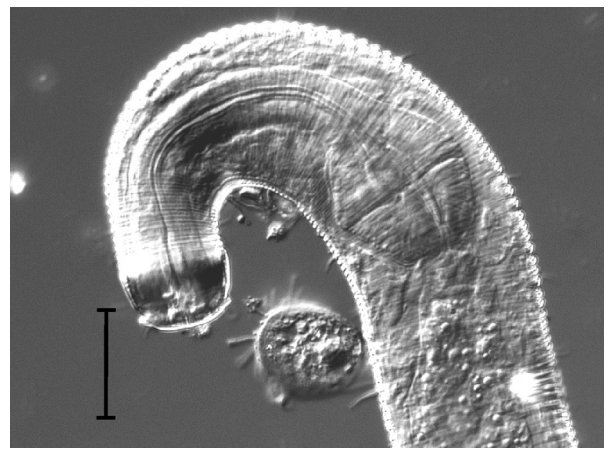


Fig 6. Frontal view of *Trematosoma rotunda* from
Indian specimen. Scale bar :20 µm.

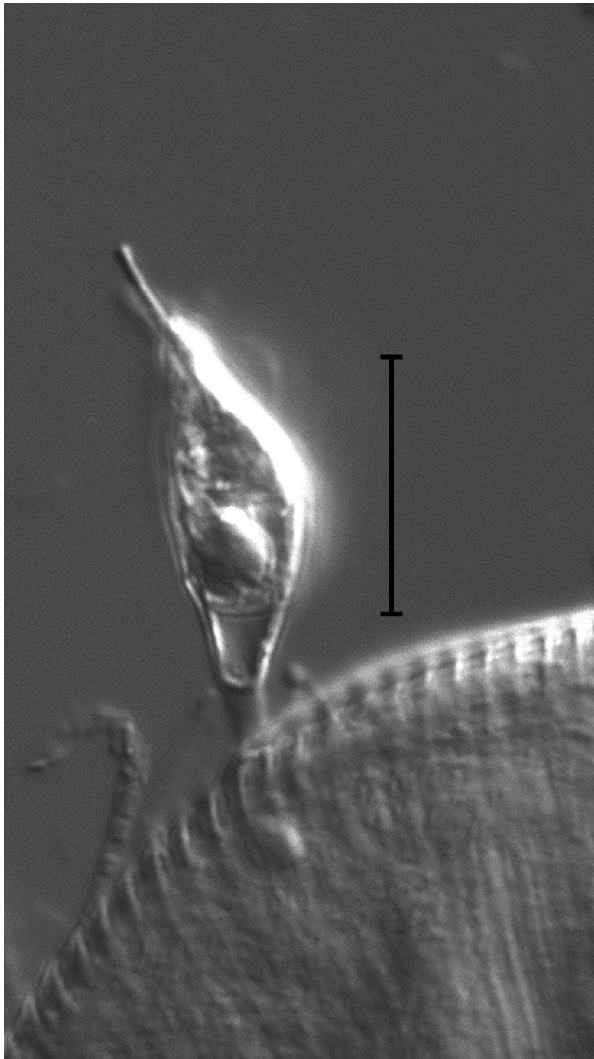


Fig. 7. Lateral view of *Trematosoma rotunda* from India. Scale bar: 20 μm .

- = *Acineta rotunda* Allgén, 1952
- = *Nematacineta rotunda* (Allgén, 1952)
- = *Conchacineta rotunda* (Allgén, 1952)
- = *Acineta ovoidea* Allgén, 1952

Diagnosis. Marine loricated suctorian. Cell body short, rounded, laterally flattened, entirely fills up the lorica and clamped to their aperture border. Lorica delicate, gently striated. Tentacles clavate, short, arranged at the upper body surface as a row in two groups. Macronucleus spherical or oval, centrally located. Stalk short, thin, slightly ribbed. Reproduction by endogemmie budding.

Body dimensions. Measurements were made using materials from India, in parentheses measurements of individuals given by Allgén, 1955. Lorica length 7–14 μm (26.52–32.64 μm after Allgén, 1955), lorica width 6–14 μm (15.30–28.56 μm), body length

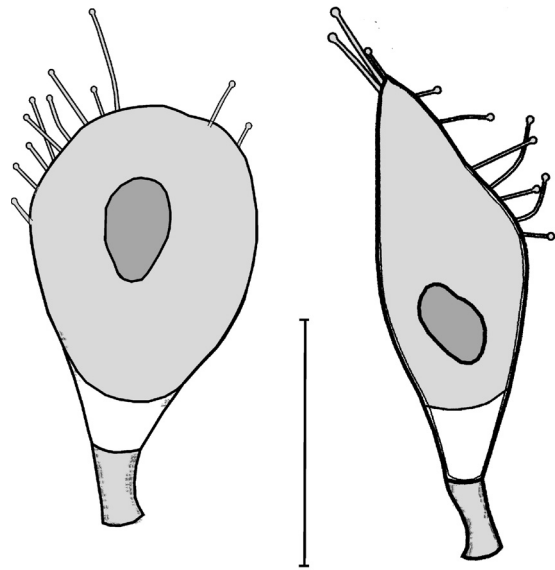


Fig. 8. Frontal (left) and lateral (right) view of *Trematosoma rotunda* from India. Scale bar: 20 μm .

15–22 μm , body thickness 8 μm , stalk length 4–16 μm (7.14–16.32 μm), stalk thickness 1.51–2.04 μm (after Allgén, 1955), length of tentacles 3–9 μm (4.08–6.12 μm), macronucleus diameter 6–8 μm (5.1 \times 4.8–6.12 \times 4.08 μm).

Distribution and host prevalence. The species was described by Allgén (1952, 1955) from nematodes *Desmodora tenuispiculum* Allgén (type host, indicated here) and *D. stateni* Allgén from the Antarctic (Graham Land, type locality, indicated here) and Falkland Islands. We found *Tr. rotunda* on nematode *Pseudochromadora* sp. (Superfamily Desmodoroidea Filipjev, Family Desmodoridae Filipjev, Subfamilia Desmodorinae Filipjev, Genus *Pseudochromadora* Daday) from Ratnagiri, Maharashtra state, central west coast of India (Arabian Sea). Microphotograph of unidentified suctorians, Fig. 1 of Fisher, 2003, found at nematode *Pseudochromadora cazca* Gerlach, 1956 from intertidal zone of North-Eastern Queensland, Australia we identified it as (probably) *Tr. rotunda*.

Remarks on the systematics and nomenclature. *Acineta rotunda* was described by Allgén (1952) found attached to the nematodes from genus *Desmodora*. In the same paper another species (*A. ovoidea*) was described from the same host, however Curds (1985) synonymized *A. ovoidea* with *A. rotunda* showing that *A. ovoidea* is nothing but lateral view of *A. rotunda*. Jankowski (1978) proposed a new genus *Nematacineta* Jankowski, 1978 for *A. rotunda* with short diagnosis: “*Ac. rotunda* Allgén; with an arcu-

ate row of tentacles". In turn Curds (1985) believed that this characteristic is obscured by diagnosis of already described genus *Conchacineta* Jankowski, 1978. Dovgal (2002) synonymized the generic name *Conchacineta* with *Trematosoma* Batisse, 1972 and all species assigned by Jankowski and Curds to the genus *Conchacineta* were transferred to *Trematosoma* including *A. rotunda*.

Acknowledgements

We are thankful to Dr. Maarten Raes, University of Ghent, Belgium for confirming the taxonomic identification of nematode hosts. Third (BI) author acknowledge a research grant from Dept. of Biotechnology (Govt. of India) for project entitled "Molecular characterization of microbial and invertebrate diversity from the west coast of India".

References

- Allgén C. A. 1952. Uber zwei neue antarktische Suctorien aus dem Gracham Land. Kungliga Fysiografiska Sällskapet i Lund Forhandlingar. 21, 173-176.
- Allgén C. A. 1955. Die Suctorien der schwedischen Sudpolar-Expedition (1901-1903). Zoologischer Anzeiger. 154, 36-48.
- Collin B. 1909. Diagnoses preliminaires d'Acinetiens nouveaux ou mal connus. Comptes rendus hebdomadaires des séances de L'Académie des Sciences. 149, 1094-1095.
- Collin B. 1912. Etudes monographiques sur les Acinetiens. II. Morphologie, physiologie, systematique. Archives de Zoologie Expérimentale et Générale. 51, 1-457.
- Curds C. R. 1985. A revision of Suctoria (Ciliophora, Kinetofragminifera) I. *Acineta* and its morphological relatives. Bulletin of the British Museum (Natural History), Zoology series. 48, 75-129.
- Dovgal I. V. 1988. The knowledge state of tentaculous ciliates (Ciliophora, Suctoria) in Ukrainian SSR. Deposit manuscript in All-Russian Institute of Scientific and Technical Information. 3135-88, 1-36 (in Russian).
- Dovgal I V 1996 Keys for identification of tentaculous infusoria (Ciliophora, Suctoria) of the Ukrainian fauna. Vestnik Zoologii, Suppl., N2, 1-42 (in Russian with English summary).
- Dovgal I. V. 2002. Evolution, phylogeny and classification of Suctorea (Ciliophora). Protistology. 2, 194-270.
- Dovgal I., Chatterjee T. and Ingole B. 2008. An overview of suctorian ciliates (Ciliophora, Suctorea) as epibionts of halacarid mites (Acari, Halacaridae). Zootaxa. 1810, 60-68.
- Fisher R. 2003. Ciliate hitch-hikers-nematode ecto-commensals from tropical Australian sea-grass meadows. Journal of the Marine Biological Association, U.K. 83, 407, 1/1-2.
- Ingole B., Sivadas S., Nanajkar M., Sautya S. and Nag A. 2008. A comparative study of macrobenthic community from harbours along the central west coast of India. Environmental Monitoring and Assessment (published on line on 20 June 08).
- Jankowski A. V. 1978. Phylogeny and divergence of suctorians. Doklady Akademii Nauk SSSR. 242, 493-496 (in Russian).
- Jankowski A. V. 1981. New species, genera and families of tentacled infusoria (class Suctoria). Proceedings of the Zoological Institute. 107, 80-115 (in Russian with English summary).
- Jankowski A. V. 2007. Review of taxa Phylum Ciliophora Doflein, 1901: In: Protista: Handbook on Zoology (Alimov A. F, ed.). Nauka. St. Petersburg: Pt. 2, pp. 415-993 (in Russian with English summary).

Address for correspondence: Igor Dovgal. Schmalhausen Institute of Zoology, B. Khmelnytsky str, 15, 01601, Kiev-30, Ukraine, e-mail: dovgal@izan.kiev.ua