

The first record of *Paracineta irregularis* (Ciliophora, Suctorea) as epibiont on *Rhombognathus* halacarid mite (Acari, Halacaridae) from the Sea of Marmara, Turkey

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Summary

This study presents the data on the new finding of suctorian ciliate *Paracineta irregularis* on halacarid mite *Rhombognathus* sp. from the Sea of Marmara, Turkey. Diagnostic characters of *P. irregularis* such as contractility of tentacles and position of macronucleus are emended based on the material collected from the new locality. The mode of the species reproduction by semi-circumvaginate exogemmic budding is described for the first time.

Key words: suctorian ciliate, halacarid host, diagnosis, reproduction, Sea of Marmara

Introduction

Thalassarachna basteri (Johnston, 1836) is the first halacarid mite described by G. Johnston in 1836 from the North Sea (Edinburgh, Scotland) and also the first mentioned host of a suctorian. Later on, two suctorians (*Vorticella* sp. and *Acineta* sp.) were found on this mite by P. H. Gosse in 1855. Since those days, several more records of suctorians on halacarid mites have been published but still the number of such species is limited (Durucan and Boyaci, 2016, 2019).

Paracineta irregularis Dons, 1928 was described by C. Dons (1928) from the setae of a marine polychaete *Pherusa plumosa* (Müller, 1776) near Lyen Island (Norway) at the depth of 10–12 m. Although this study has been cited in the well-

known works by Kahl (1934) and Curds (1987), the original description of the species was incomplete. In addition, the later findings of the species are unknown. The present study deals with the new finding of *Paracineta irregularis* on *Rhombognathus* sp., a halacarid mite from the Sea of Marmara, and presents a redescription of the species.

The presence of lorica in the form of stylothecca (or thecostyle) with a cup-like part, which covers the total cell body or only one third or half of the body, and stalk-like protuberance (pseudostyle) are common characteristics of the genus *Paracineta* Collin, 1911 (Curds, 1987; Dovgal, 2002, 2013). Reproduction is by semi-circumvaginate budding with formation of a single apical or subapical ciliary swarmer. The genus *Paracineta* includes eight (after Curds, 1987) to 20 (after Dovgal, 2002) species;

however, several of those species have not observed since their description.

Material and methods

Six ciliates infested to *Rhombognathus* sp. specimens were collected from the north-west part of the Sea of Marmara, Turkey, at a depth of 1 and 14 m (August, 2014) (40°31.222 N 26°52.386 E/40°30.751 N 26°52.706 E and 40°33.294 N 26°58.696 E/40°32.660 N 26°58.872 E) Coll. M.L. Artüz (Fig. 1).

Sampling conducted as part of MAREM (Marmara Environmental Monitoring) project using air sucker in quadrated parts (each 1 m² area) in seagrass meadows in 15 stations. All the collected material was preserved in 5% formalin buffered seawater. Behalf of the work fifteen stations are examined, ten of them was *Posidonia oceanica* and five *Zostera marina* habitats. The meiofauna was extracted from the seagrasses and marine mites were sorted for further examination.

The light microscopy photographs were taken with a DCM 500 microscope camera and Nikon D5100 with custom-modified light microscopy and lighting system using with MiniSee and Helicon Remote, and finally post-prepared by HeliconFocus software.

Measurements of ciliates (n=3) were made by using the software TopView 3.7 for the processing of digital images. Identification, clarifying of the diagnosis, terminology, and systematic position of suctorian ciliate follows Dovgal (2002, 2013) which supported in the framework of the research topic of Kovalevsky Institute of Marine Biological Research “Fundamental research of population biology in marine animals, their morphological and genetic diversity AAAA-A19-119052700035-1”.

The materials were deposited in the collections of the MAREM (Marmara Environmental Monitoring Project), Sevinç – Erdal İnönü Foundation, Istanbul, Turkey.

Results and discussion

Class Suctorea Claparede et Lachmann, 1859
Subclass Exogenia Collin, 1912
Order Metacinetida Jankowski, 1980
Family Paracinetidae Jankowski, 1975
Genus *Paracineteta* Collin, 1911
Paracineteta irregularis Dons, 1928 (Figs 2, 3)

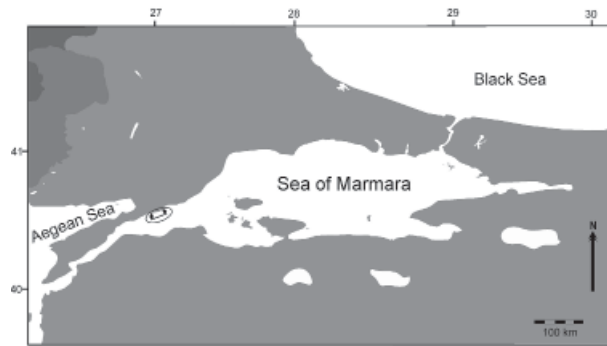


Fig. 1. Map of study area.

Diagnosis (character emend). Suctorian ciliate with a stylothecha, ovoid to irregularly shaped cell body occupies the entire lorica, protrudes to a greater or lesser extent beyond the mouth rim of stylothecha although the latter half of the zooid is always enclosed by lorica. From eight to 14 contractile tentacles cover the apical surface of the exposed part of the zooid. Basal part of stylothecha irregularly triangular, tapering posteriorly to form a rigid hollow pseudostyle that is at least half the length of the cup-like part. Ovoid macronucleus located centrally, near the bottom of the cup-like part of lorica. Reproduction by semi-circumvaginate budding with formation of a single subapical swarmer (Fig. 2 C).

Commensal of marine polychaetes and halacarid mites.

Dimensions (in μm): body length 14-20 (15-25 after Dons, 1928), body width 9-18 (20-30 after Dons, 1928), cup-like part of stylothecha length 9-13, width 9-17, pseudostyle length 2-10 (10-25 after Dons, 1928), diameter 1-4 (2-4 after Dons, 1928), size of macronucleus 4-6 \times 2-4 (8-14 after Dons, 1928).

Type host: *Pherusa plumosa* (Müller, 1776).
Other hosts: *Rhombognathus* sp.

Type locality: coast of Lyen Island, Norway.

Suctorian ciliates are common commensals on the representatives of marine meiofauna including nematodes, halacarids, harpacticoid copepods, kinorhynchans etc. from different regions around the world (Precht, 1935; Fernandez-Leborans and Tato-Porto, 2000a, 2000b; Dovgal et al., 2008a, 2008b, 2009a, 2009b; Ingole et al., 2010; Fernandez-Leborans et al., 2012; Chatterjee et al., 2012, 2013 a, 2013b, 2013 c, 2014a, 2014b, 2018). Recently, individuals of the suctorian ciliate *Praethecacineteta*

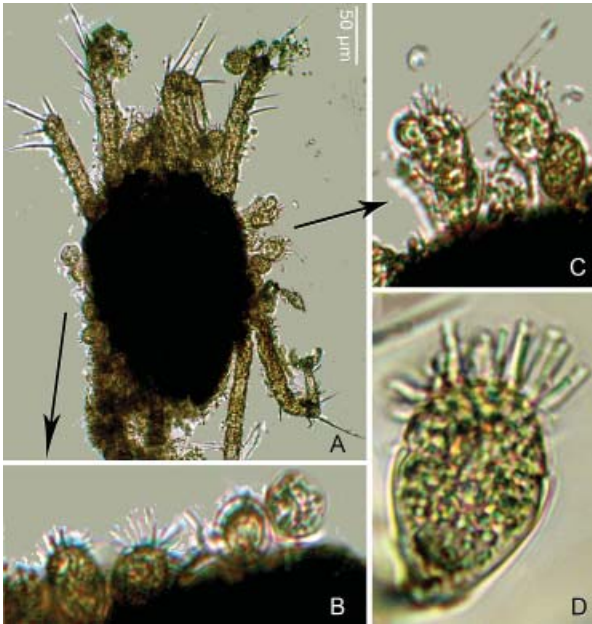


Fig. 2. *Paracineteta irregularis* Dons, 1928. A, B – Distribution of the ciliate on the host body; C – budding individual (marked by arrow); D – the species in the habitat. Scale bar: 50 µm.

halacari were observed on *Copidognathus venustus* Bartsch, 1977 and two different *Rhombognathus* sp. species from Turkish Mediterranean coast of Antalya, Turkey (Durucan and Boyaci, 2019).

In this context, our new finding of *Paracineteta irregularis* supplements the information on the diversity of epibiont ciliates on meiofauna. At the same time, the discovery of the species, which previously was observed only on polychaete worms (*Pherusa plumosa*), on a halacarid mite indicates that this species does not demonstrate strict host specificity.

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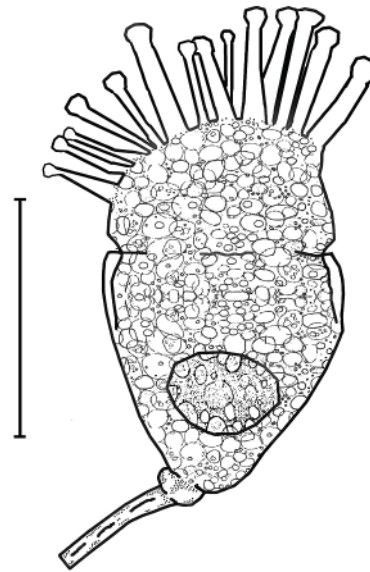


Fig. 3. Schematic drawing of *Paracineteta irregularis* Dons, 1928. Scale bar: 10 µm.

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