

# REPORT OF *CYCLODONTA BIPARTITA* (CILIOPHORA) FROM A SEAWATER INFLUENCED BOULDER BEACH AT THE FALKLAND ISLANDS (SOUTH ATLANTIC OCEAN) \*

Chatterjee T.<sup>1</sup>, Dovgal I. V.<sup>2</sup>, Marshall D. J.<sup>3</sup>

<sup>1</sup>Independent researcher, Near Harimadir Road, Hirapur, Dhanbad, Jharkhand, India,

<sup>2</sup>A. O. Kovalevsky Institute of Biology of the Southern Seas of RAS, Sevastopol, Russian Federation,

<sup>3</sup>Universiti Brunei Darussalam, Gadong, Brunei Darussalam,

e-mail: [dovgal-1954@mail.ru](mailto:dovgal-1954@mail.ru)

**Abstract:** The peritrich ciliate *Cyclodonta bipartita* (Stokes, 1885) is reported as an epibiont on a harpacticoid copepod from the splash zone of a boulder beach at the Falkland Islands (South Atlantic Ocean). The host basibiont is recorded from interstitial freshwater at the boulder-sediment interface, in a habitat influenced by seawater intrusion, and is the first record of this ciliate from the Falkland Islands. The habitat at these islands suggests this species tolerate brackish water. The species taxonomy and distribution are also discussed.

**Keywords:** Ciliate, epibiosis, copepod host, basibiont, Falkland Islands

## Introduction

Ciliates are commonly epibionts on marine and freshwater meiofauna such as copepods, nematodes, ostracods, halacarid and hydrachnid mites [e.g. Dovgal et al., 2008; Ingole et al., 2010; Chatterjee et al., 2012, 2013, 2014a, b, 2018, 2019, 2020, 2023, 2024; Durucan and Dovgal, 2022; Fernandez-Leborans et al., 2012]. Some ciliates were reported earlier as epibionts from the Falkland Islands. *Thecacinetia calix* was reported (as *Thecacinetia subantarctica*) on *Desmodora campbelli* (Allgén, 1932) (at present taxon inquirendum) from the Falkland Islands [Allgén, 1949, 1955]. Allgén [1955] also reported *T. calix* (as *Thecacinetia paradesmodorae* Allgén, 1949) on the nematode, *Croconema stateni* Allgén, 1928 (= *Desmodora stateni*), at the islands. *Trematosoma rotunda* (Allgén, 1952) (as *Acinetia rotunda*) was described by Allgén [1955] from the nematode, *Croconema stateni* Allgén, 1928 (= *Desmodora stateni* Allgén, 1928), from the Falkland Islands. In the present communication we report the peritrich ciliate *Cyclodonta bipartita* (Stokes, 1885) as an epibiont on a harpacticoid copepod collected from the splash zone of a boulder beach, at the Falkland Islands (South Atlantic Ocean). The copepod inhabited the interstitial freshwater in the boulder-sediment interface that is influenced by seawater intrusion.

## Materials and Methods

The collection was made from the supratidal (not intertidal) zone of a boulder beach at Christina Bay (51°42' S; 57°44' W), Cape Pembroke, the Falkland Islands (Fig. 1). The habitat comprised the interface water between the sediment and a boulder. The sediment was collected and the harpacticoid copepod with the ciliate epibiont was separated during sorting. We assume that the sediment water is mainly freshwater, due to the regular and heavy rainfall at these islands, but there is also likely to be saltwater intrusion into this interstitial habitat during high seas. The copepod was collected by Alex Jones (UK) in 2002 and sent to DJM (Brunei). The systematic position of the found ciliate followed that of Lynn [2008].

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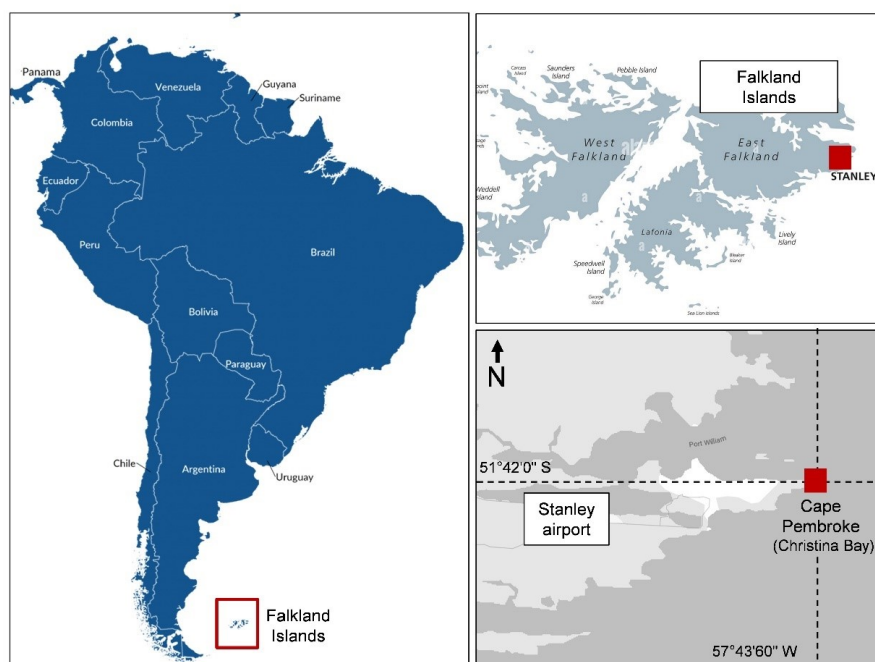


Fig. 1. Map of collection area

Рис. 1. Станция отбора проб

## Results and Discussions

### Subclass Peritrichia Stein, 1859

#### Order Sessilida Kahl, 1933

#### Family Vaginicolidae de Fromentel, 1874

#### Genus *Cyclodonta* Matthes, 1958

#### *Cyclodonta bipartita* (Stokes, 1885) (Fig. 2, 3)

= *Cothurnia bipartita* Stokes, 1885

= *Cothurniopsis longipes* Voigt, 1902

= *Cothurniopsis rheotypica* Stiller, 1931

= *Cothurnia voighti* Kahl, 1935

= *Cothurnia affinis* Kahl, 1935

= *Cothurnia trilobata* Sramek-Husek, 1957

**Investigated material:** Single individual of *Cyclodonta bipartita* was found on the last thoracical segment of harpacticoid copepod.

**Description of found ciliate:** The peritrich ciliate was visible from lateral view, have a slightly curved lorica with gutter-like aperture. Eexternal stalk, short and wide with fine longitudinal striae, mesostyle and endostyle absent. Only a single contracted zooid was presented in the lorica, attached to the single membrane at posterior end of lorica. Macronucleus, not visible.

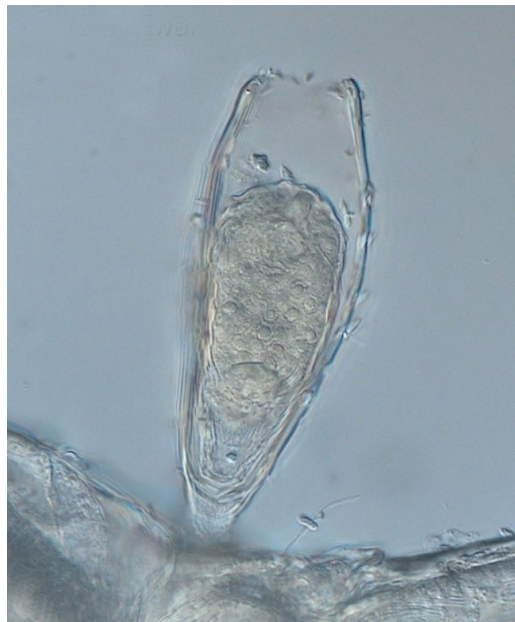
**Measurements (in  $\mu\text{m}$ , based on one individual):** Lorica length 83, width of lateral side 28; width of lorica aperture from lateral view 14; contracted zooid length 60, width 24; stalk length 15, diameter in the central part 9.

**Remarks:** *Cyclodonta bipartita* was described by Stokes [1885] as *Cothurnia bipartita*, an epibiont of the harpacticoid copepod *Bryocamptus minutus* (Claus, 1863) from USA freshwaters. Matthes [1958] believed that *Cothurnia bipartita* has the unique mode of attaching the zooid to the bottom of the lorica via a series of membranes, and erected the new genus *Cyclodonta* Matthes, 1958 for the family Vaginicolidae, for which *Cothurnia bipartita* Stokes, 1885 is the type species.



**Fig. 2.** Localization of *Cyclodonta bipartita* (Stokes, 1885) on harpacticoid host

**Рис. 2.** Локализация *Cyclodonta bipartita* (Stokes, 1885) на гарпактикоиде



**Fig. 3.** *Cyclodonta bipartita* (Stokes, 1885)

**Рис. 3.** *Cyclodonta bipartita* (Stokes, 1885)

Clamp [1991] transferred the genus *Cyclodonta* into the family Usconophryidae Clamp, 1991, based on the presence the *Opercularia*-like peristome in the type species. However, Jankowski [2007] believed that this was a mistake. Lynn [2008] also keep the genus *Cyclodonta* in Vaginicolidae. In Jankowski's [2007] opinion the type species of *Cothurnia* Ehrenberg, 1831 (*C. imberbis* Ehrenberg, 1831) and the type species of *Cyclodonta* (*Cothurnia bipartita*) are identical. Hence, the genus *Cyclodonta* is a junior synonym of *Cothurnia*. However, this view was not supported by other specialists.

*Cyclodonta bipartita* is a widely distributed species (USA, Germany, Switzerland, Hungary, Ukraine, Austria, Italy, Czech Republic) isolated as epibiont on freshwater harpacticoid copepods [Voigt, 1902; Penard, 1914, 1922; Kahl, 1935; Stiller, 1953; Matthes, 1958; Foissner, 1979; Warren and Paynter, 1991; Konstantynenko, 2014]. Jankowski [2007] has also mentioned that the species was observed as an epibiont of brackish water and marine harpacticoid copepods, but without any details of finds in the such conditions.

Krucinska & Simon [1968] isolated *Cothurnia bipartita* from the crayfish *Cambarus affinis* and *Astacus leptodactylus*. Warren and Paynter [1991] commented that *Cyclodonta* does not appear to be confined exclusively to harpacticoid copepod hosts, as suggested by Jankowski [1985], since it has also been isolated (as *Cothurnia bipartita*) from the crayfish. However, Schödel [2018] stated that the *Cothurnia* species found on crayfish gills by Krucinska and Simon [1968] is not *Cothurnia bipartita*.

This is the first find of *Cyclodonta bipartita* from the Falkland Islands. The habitat at these islands also suggests this species may tolerate some exposure of saltwater intrusion, or brackish water.

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**ОБНАРУЖЕНИЕ *CYCLODONTA BIPARTITA* (CILIOPHORA) НА ПОДВЕРЖЕННОМ ВОЗДЕЙСТВИЮ МОРСКОЙ ВОДЫ ГАЛЕЧНОМ ПЛЯЖЕ НА ФОЛКЛЕНДСКИХ ОСТРОВАХ (ЮЖНАЯ ЧАСТЬ АТЛАНТИЧЕСКОГО ОКЕАНА)**

**Чаттерджи Т.<sup>1</sup>, Довгаль И.<sup>2</sup>, Маршалл Д. Дж.<sup>3</sup>**

<sup>1</sup>Хирапур, Дханбад, Джаркханд, Индия,

e-mail: [drtchatterjee@yahoo.co.in](mailto:drtchatterjee@yahoo.co.in)

<sup>2</sup>ФГБУН ФИЦ «Институт биологии южных морей им. А. О Ковалевского РАН»,

г. Севастополь, Российская Федерация,

e-mail: [dovgal-1954@mail.ru](mailto:dovgal-1954@mail.ru)

<sup>3</sup>Университет Брунея-Даруссалама, Гадонг, Бруней-Даруссалам,

e-mail: [david.marshall@ubd.edu.bn](mailto:david.marshall@ubd.edu.bn)

**Аннотация:** Инфузория-перитриха *Cyclodonta bipartita* (Stokes, 1885) обнаружена как эпибионт гарпактикоиды из зоны заплеска на Фолклендских островах (Южная Атлантика). Гарпактикоида-базибионт отмечена в интерстициальной пресной воде на границе галечного пляжа, куда проникает морская вода. Это первая находка данного вида инфузорий на Фолклендских островах. Особенности местообитания свидетельствуют о том, что данный вид может обитать в солоноватой воде. Также обсуждаются таксономия и распространение вида.

**Ключевые слова:** инфузория, эпибиоз, копепода-хозяин, базибионт, Фолклендские острова

About the Authors

|                      |                                                                                                                                                                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chatterjee<br>Tapas  | Ph. D., D. Sc., Independent researcher, Near Hari Mandir Road, Hirapur, Dhanbad 826001, Jharkhand, India, e-mail: <a href="mailto:drtchatterjee@yahoo.co.in">drtchatterjee@yahoo.co.in</a>                                                           |
| Dovgal<br>Igor V.    | Dr. Sc. in Biology, Professor, Chief Researcher in A. O. Kovalevsky Institute of Biology of the Southern Seas of RAS, 2, Nakhimov ave., Sevastopol, 299011, Russian Federation, e-mail: <a href="mailto:dovgal-1954@mail.ru">dovgal-1954@mail.ru</a> |
| Marshall<br>David J. | Ph. D. and Professor of Marine Biology in Environmental and Life Sciences, Universiti Brunei Darussalam, Tungku Link, Gadong BE 1410, Brunei Darussalam, e-mail: <a href="mailto:david.marshall@ubd.edu.bn">david.marshall@ubd.edu.bn</a>            |

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