

New records of *Praethecacineteta halacari* (Schulz) (Suctorea: Ciliophora) from Taiwan, Tanzania and Canada

IGOR DOVGAL¹, TAPAS CHATTERJEE², D.V. SUBBA RAO^{3,4}, BENNY K.K. CHAN⁵ AND MARLEEN DE TROCH⁶

¹Schmalhausen Institute of Zoology, B. Khmelnytsky str, 15, 01601, Kiev, Ukraine, ²Indian School of Learning, ISM Annexe, PO—ISM, Dhanbad 826004, Jharkhand, India, ³Marine Environmental Sciences Division, Bedford Institute of Oceanography, PO Box 1006, Dartmouth, Nova Scotia B2Y 4A2, Canada, ⁴Present address: 12 The Horseshoe, Manor Park, Dartmouth, Nova Scotia B2Y 4E5, Canada, ⁵Research Centre for Biodiversity, Academia Sinica, Taipei 115, Taiwan, ⁶Marine Biology Section, Department of Zoology, Ghent University, Krijgslaan 281—S8, B-9000 Ghent, Belgium

The present study reports on a range extension of the suctorian species Praethecacineteta halacari to the region of He-Ping-Dao, north-east of Taiwan (West Pacific Ocean), Matemwe, the east coast of Unguja, Zanzibar, Tanzania (West Indian Ocean) and Nova Scotia, Canada (West Atlantic Ocean). Praethecacineteta halacari is reported here for the first time from Taiwan, Tanzania and Canada. Earlier records include the Caspian Sea, Western Australia, Brazil, India, and various coastal sites in Europe.

Keywords: epibionts, suctorians, *Praethecacineteta halacari*, range extension, Taiwan, Zanzibar, Canada

Submitted 4 May 2009; accepted 1 June 2009

INTRODUCTION

Several species of suctorian ciliates are common epibionts of benthic marine and interstitial invertebrates (Precht, 1935; Jankowski, 1981, 2007; Dovgal, 1996, 2002; Dovgal *et al.*, 2008a, b; Ingole *et al.*, 2009). A number of suctorian ciliates have been observed as epibionts on various halacarid mites (Dovgal *et al.*, 2008a). In this paper, we report *Praethecacineteta halacari* (Schulz, 1933) as an epibiont on halacarid mites from Taiwan, Tanzania and Canada. This ciliate species is reported here for the first time from these coastal waters.

MATERIALS AND METHODS

Halacarid mites were collected from He-Ping-Dao, north-east of Taiwan (West Pacific Ocean), Matemwe, the east coast of Unguja, Zanzibar, Tanzania (West Indian Ocean) and Nova Scotia, Canada (West Atlantic Ocean) (Figure 1). Standardized measurements were made using the computer program ScopePhoto 2.0 for processing digital images. All specimens are deposited in the collections of the Department of Fauna and Systematics of invertebrate animals of Schmalhausen Institute of Zoology, National Academy of Sciences, Ukraine.

RESULTS AND DISCUSSION

SYSTEMATICS

Class SUCTOREA Claparède & Lachmann, 1859

Corresponding author:

I. Dovgal
Email: dovgal@izan.kiev.ua

Subclass EXOGENIA Collin, 1912
Order METACINETIDA Jankowski, 1978
Family PRAETHECACINETIDAE Dovgal, 1996
Praethecacineteta halacari (Schulz, 1933) (Figures 2–4)

MATERIAL EXAMINED

Taiwan: 2 individuals were attached to *Copidognathus* sp. from He-Ping-Dao, north-east of Taiwan, 25°09'45"N 121°45'46"E, West Pacific Ocean, among intertidal coralline algae in exposed rocky shores, 6 March 2007, Col. B.K.K. Chan.

Tanzania: 2 individuals were attached to *Copidognathus ungujaensis* Chatterjee, De Troch & Chang from Matemwe, the east coast of Unguja, 05°52'S 39°21'E, Zanzibar, Tanzania (West Indian Ocean) among coral rubble of *Fungia*, 17 August 2004, Col. M. Raes and H. Gheerardyn.

Canada: 8 individuals were attached to one halacarid mite from Nova Scotia, 44°38'15"N 63°55'13"W, St Margaret's Bay, Canada (north-western Atlantic) in intertidal algae of the genus *Enteromorpha* on a rocky coast, September 2007, Col. DV Subba Rao.

DIAGNOSIS

Marine suctorians with stylothecca. Cell body weakly laterally flattened, entirely filling the lorica and attached to its posterior margin. Apical part of the body narrowed. Tentacles placed at upper cell surface. Macronucleus spherical posteriorly located; single contractile vacuole. Stylothecca smooth, without ribbing. Reproduction by semi-circumvaginate exogemmatic budding with formation of laterally placed ciliate swarms.

Body dimensions: body dimensions of *P. halacari* collected from Taiwan, Tanzania, Canada and India are given in Table 1.

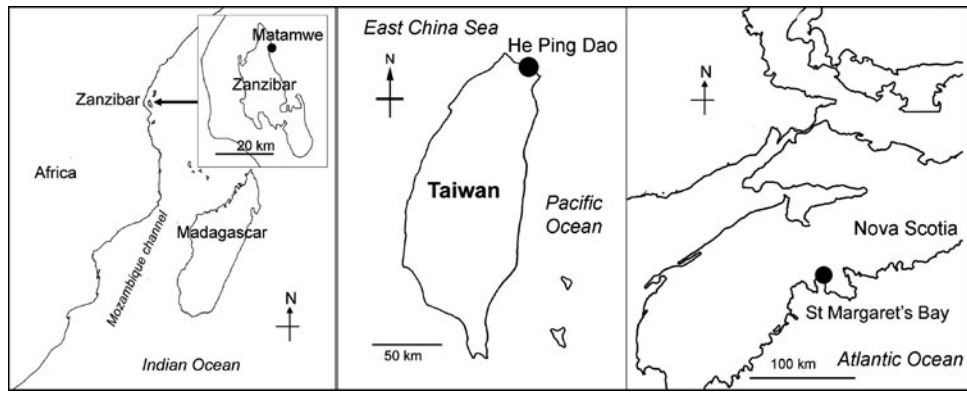


Fig. 1. Map showing the collection sites of *Praethecacineta halacari* reported in the present study.



Fig. 2. *Praethecacineta halacari* attached to *Copidognathus* sp. from Taiwan. Scale bar 20 μ m.



Fig. 3. *Praethecacineta halacari* attached to *Copidognathus ungujaensis* Chatterjee, De Troch & Chang from Zanzibar, Tanzania. Scale bar 20 μ m.

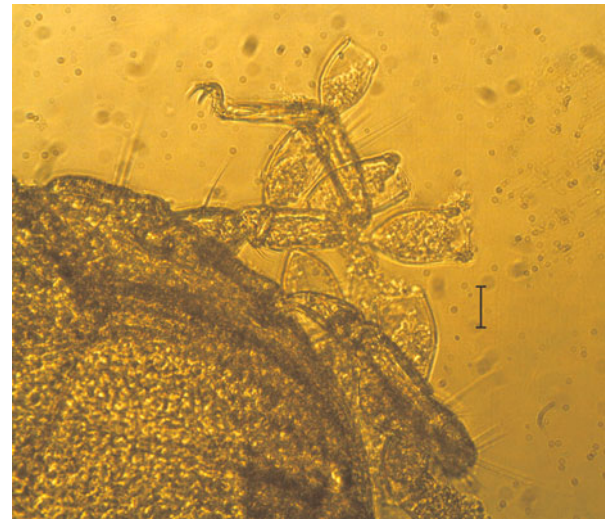


Fig. 4. *Praethecacineta halacari* attached to halacarid mite from Canada. Scale bar 20 μ m.

DISTRIBUTION

Bulgaria and Ukraine (Black Sea); Norway, Kiel Bay of North Sea, Caspian Sea, Western Australia, Atlantic coast of Brazil, west coast of India (Schulz, 1933; Detcheva, 1992; Boshko & Dovgal, 2004; Gelmboldt & Dovgal, 2005; Pepato & Tiago, 2005; Dovgal *et al.*, 2008a). Taiwan, Tanzania and Canada (present report).

HOST SPECIFICITY

Praethecacineta halacari has been found attached to a variety of halacarid mites; viz. *Copidognathus arabicus* Chatterjee & Chang, *C. brifacius* Bartsch, *C. brachystomus* Viets, *C. magnipalpus* (Police), *C. meridianus* Bartsch, *C. tupinamborum* Pepato & Tiago, *Copidognathus* spp., *Caspihalacarus hyrcanus* Viets, and many unidentified species (Schulz, 1933; Detcheva, 1992; Boshko & Dovgal, 2004; Gelmboldt & Dovgal, 2005; Dovgal *et al.*, 2008a). *Copidognathus ungujaensis* Chatterjee, De Troch & Chang is also reported here for the first time as a host of *P. halacari*. Chatterjee *et al.* (2006) noted that many specimens of *C. ungujaensis* were infested by suctorians, which have been identified here as *P. halacari*.

Table 1. Body dimensions of *Praethecacineta halacari*, measurements in μm .

Characters	Taiwan specimens (present study)	Tanzanian specimens (present study)	Canadian specimens (present study)	Indian specimens after Dovgal <i>et al.</i> , 2008a	Schulz, 1933
Lorica length	24–38	30–35	16–55	31–38	85–110
Lorica width	12–21	19–21	24–49	18–21	35–55
Cell body length	24–26	22–29	16–48		
Cell body width	12–25	12–18	15–47		
Macronucleus diameter	7–9	5–10	6–10		
Stalk length	17–18	7–16	8–29	3–26	50–110
Tentacle length	3–6	1–14	3–10		

ACKNOWLEDGEMENTS

Thanks are due to Dr M. Raes and Dr H. Gheerardyn, Ghent University, Belgium for collecting samples in Zanzibar. Thanks are also due to anonymous referees for their critical reading of the manuscript and useful comments.

REFERENCES

- Boshko E.G. and Dovgal I.V.** (2004) Sessile ciliates (Ciliophora). In *Karadag. Hydrobiological observations (scientific works dedicated to 90th anniversary of T.I. Vyazemsky Karadag Scientific Station and 25th anniversary of Karadag Natural Reserve of Ukrainian National Academy of Sciences)*. Book 2. Simferopol: Sonat, pp. 313–316. [In Russian.]
- Chatterjee T., De Troch M. and Chang C.Y.** (2006) Three halacarid mites of the genus *Copidognathus* (Acari, Halacaridae) from Zanzibar, Tanzania. *Cahiers de Biologie Marine* 47, 177–187.
- Detcheva R.** (1992) Catalogi faunae Bulgaricae. 1. Protozoa, Ciliophora. In *Aedibus Academiae Scientiarum Bulgaricae*. Sofia, 134 pp.
- Dovgal I.V.** (1996) Keys for identification of tentaculous infusoria (Ciliophora, Suctorina) of the Ukrainian fauna. *Vestnik Zoologii Supplement N2*, 1–42. [In Russian.]
- Dovgal I.V.** (2002) Evolution, phylogeny and classification of Suctorea Claparède et Lachmann, 1858. *Protistology* 2, 194–270.
- Dovgal I., Chatterjee T. and Ingole B.** (2008a) Suctorian ciliates (Ciliophora, Suctorea) as epibionts of halacarid mites (Acari: Halacaridae): an overview. *Zootaxa* 1810, 60–68.
- Dovgal I., Chatterjee T., Ingole B. and Nanajkar M.** (2008b) First report of *Limnoricus ponticus* Dovgal and Lozowskiy (Ciliophora, Suctorea) as epibionts on *Pycnophyes* (Kinorhyncha) from Indian Ocean with key to species of the genus *Limnoricus*. *Cahiers de Biologie Marine* 49, 381–385.
- Gelmboldt M.V. and Dovgal I.V.** (2005) The new finds of suctorian ciliates (Ciliophora, Suctorea) at the halacarid mites (Acari, Halacaridae) from the Ukrainian coast of the Black Sea. *Vestnik Zoologii Supplement N19*, 85–86. [In Russian.]
- Ingole B., Singh R., Sautya S., Dovgal I. and Chatterjee T.** (2009) Report of epibiont *Thecacineta calix* (Ciliophora, Suctorea) on deep sea *Desmodora* (Nematoda) from the Andaman Sea, Indian Ocean. *JMBA 2 Biodiversity Records*, Ref No. 6447, 1–4: Published online, January, 2009.
- Jankowski A.V.** (1981) New species, genera and families of tentacle infusoria (class Suctorina). *Proceedings of the Zoological Institute of Russia* 107, 80–115.
- Jankowski A.V.** (2007) Review of taxa Phylum Ciliophora Doflein, 1901. In Alimov A.F. (ed.) *Protista: Handbook on zoology*. Part 2. St Petersburg: Nauka, pp. 415–993.
- Pepato A.R. and Tiago C.G.** (2005) New species and new occurrences of *Copidognathus* (Acari, Halacaridae) from the northern littoral zone of São Paulo State (Brasil). *Zootaxa* 1083, 1–35.
- Precht H.** (1935) Epizoen der Kieler Bucht. *Nova Acta Leopoldina Halle, NF* 3, 405–474.
- and
- Schulz E.** (1933) Beiträge zur Kenntnis marinen Suctorien. *V. Zoologischer Anzeiger* 103, 327–329.

Correspondence should be addressed to:

I. Dovgal
Schmalhausen Institute of Zoology
B. Khmel'nitsky str, 15, 01601
Kiev, Ukraine
email: dovgal@izan.kiev.ua