ACTA ZOOLOGICA BULGARICA

Short Communication

Acta Zool. Bulg., 75 (3), September 2023: 445-447

Published online 17 July 2023
DOI: https://doi.org/10.71424/azb75.3.002644

Distribution of *Boeckella poppei* (Mrázek, 1901) (Copepoda: Calanoida) on the Livingston Island, Maritime Antarctic

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Abstract: The available data on the localities (including new localities) of the calanoid copepod *Boeckella poppei* on the Livingston Island, Maritime Antarctic, are summarised. The results suggest a substantial expansion in the distribution of the species, likely owing to recent climate change and the resulting freeing from permanent ice or snow of additional territories during the austral summer.

Key words: *Boeckella*, new localities, Antarctic freshwaters, climate change

Introduction

Currently, there are 49 valid species of the genus *Boeckella* Guerne & Richard, 1889 (Walter & Boxshall 2021), with most species occurring in the Southern Hemisphere. *Boeckella poppei* (Mrázek, 1901) is the only species that is common in both Maritime and Continental Antarctic. This calanoid was firstly established from the Livingston Island on the Byers Peninsula during the Chilean Antarctic Expedition in 1971 (Pezzani-Hernández 1973). In the 1990s, the species was also recorded from the freshwater glacial Todorina Buza Lake, close to the Bulgarian Antarctic Base "St. Kliment Ohridski" (Pandourski & Chipev 1999). Later, Toro et al. (2007) confirmed the presence of *B. poppei* in freshwater ecosystems on the Byers Peninsula.

In this note, we present new data on the distribution of *B. poppei* from Hannah Point and from specific temporary pools situated on the permafrost (thermokarst) and formed after the retreat of the Perunika Glacier near the Bulgarian Antarctic Base.

Materials and Methods

The specimens of *B. poppei* (Fig. 1) were collected with a hand-held net (50 μm mesh) after intensive mixing of the water from two temporary ponds above the Bulgarian Antarctic Base, from the glacial Todorina Buza Lake and from a shallow coastal lake near Hannah Point. They were transported alive to the laboratory of the Bulgarian Antarctic Base, immobilised in highly-diluted ethanol and photographed. The taxonomic identification of the individuals was based on the morphological fea-

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Fig. 1. Specimens of *Boeckella poppei* (Mrázek, 1901) collected from a temporary pond, Livingston Island.

Fig. 2. Localities of *Boeckella poppei* (Mrázek, 1901) on the Livingston Island. **1** and **2**. Temporary ponds in front of Perunika Glacier. **3**, Todorina Buza Lake. **4.** Hannah Point, coastal lake.

tures typical for the species as described by Bayly (1992).

Basic physical and chemical characteristics of the water in two ponds situated on permafrost (Table 1) were measured using hand-held oximeter Oxi 300i with DurOx 325 electrode and conductometer Cond 330i with KLE 325 electrode (WTW, Germany). The water transparency of all studied shallow water bodies was very low due to colloidal inorganic particles originating from glacier activity. Their depths did not exceed 0.10–20 m. Contrariwise, the Todorina Buza Lake is an oligotrophic glacial lake with a maximum depth of c. 4 m and with high transparency (down to the bottom).

Table 1. Basic characteristics of the two studied ponds situated on permafrost.

Pond	Area	Water temperature	Salinity	Oxygen		Conductivity
	(m^2)	(°C)	(‰)	($mg.dm^{-3}$)	(%)	($\mu S.cm^{-1}$)
1	10 – 12	7.6	0.00	8.4	74	82
2	5 – 6	9.1	0.00	9.5	81	131

Results

During the 28th Bulgarian Antarctic Expedition in 2020, we confirmed the presence of *B. poppei* in the Todorina Buza Lake (62.642488 S, 60.363505 W) on 20.01.2020. In addition, we recorded this species at three new localities (Fig. 2):

Hurd Peninsula: two adjacent temporary ponds on permafrost if the front of Perunika Glacier, 07.02.2020, 62.63622 S, 60.35117 W;

Hannah Point: shallow coastal freshwater turbid lake, 04.02.2020, 62.642488 S, 60.363505 W.

Discussion

The accelerated retreat of permanent ice or snow cover observed on Livingston Island during the past decades is a premise for the formation of new water bodies (pools and ponds). Such newly-formed habitats are suitable for colonization by copepods adapted to the harsh environmental conditions in Antarctica. The calanoid copepod *B. poppei* was previously known from two localities on the Livingston Island. Here, we conform one of them and add three further localities. Our results suggest a considerable expansion in the distribution of *B. poppei* on the Livingston Island, likely owing to recent global environmental changes and the ecological plasticity of the species facilitating its survival in Antarctica.

Acknowledgements: The study was funded through the National Program for Polar Studies, Polar Research Funding, 2019: projects # 70.25-178/22.11.2019 and 70.25-177/22.11.2019. We are grateful to the National Centre of Polar Research, Bulgarian Antarctic Institute, the staff of the Bulgarian Antarctic Expedition for their help and to Prof. C. Pimpirev and D. Mateev for their support.

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Received: 27.05.2022
Accepted: 03.07.2023