

Published records of limno-terrestrial tardigrades (Tardigrada: Heterotardigrada, Eutardigrada) from Vrachanski Balkan Nature Park

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Abstract. The following 6 species were reported for the area by Iharos (1961): *Echiniscus testudo*, *Ramazzottius oberhaeuseri*, *Hypsibius convergens*, *Macrobotus hufelandi*, *Minibiotus intermedius*, *Paramacrobotus richtersi*. Specimens from the *Macrobotus hufelandi* species group were recorded and during present study from one locality.

Key words: limno-terrestrial, water bears, Bulgaria.

Introduction

Tardigrades or water bears are microscopic aquatic invertebrates usually 100-300 µm long (largest species seldom exceed 1000 µm). Some species called “limno-terrestrial” have evolved adaptations for draught and cold and use to live among mosses, lichen and detritus in terrestrial habitats. They are active only when thin water film exists on the substrate surface and can withstand periods of extreme dehydration forming cysts (cryptobiosis) (Horning *et al.* 1978; Northcote-Smith 2012).

So far only about 40 water bear species have been recorded from Bulgaria (McInnes 1994), reported by Iharos (1961; 1973; 1982) and Kaczmarek *et al.* (2011).

There were only a few tardigrade species recorded from Vrachanska Planina Mts. all reported by Iharos (1961) for the karstic region of Lakatnik. Specimens from the *Macrobotus hufelandi* species group were recorded during present study from one locality.

Material and Methods

Literature survey was made considering all published data on tardigrades for Bulgaria.

A moss sample was collected by Prof. Dimitar Bechev from a limestone rock at Vratsata area on 28.02.2015. The sample was put into a paper bag and dried. In the laboratory the sample was further soaked in water for about 24 hours. After this time, water containing tardigrades, was decanted and examined under a stereomicroscope and a light microscope.

The taxonomy follows Degma *et al.* (2015).

Results

Phylum TARDIGRADA Doyère, 1840

Class HETEROTARDIGRADA Marcus, 1927

Order ECHINISCOIDEA Richters, 1926

Family Echiniscoididae Kristensen & Hallas, 1980

Echiniscus testudo (Doyère, 1840)

Class EUTARDIGRADA Richters, 1926

Order PARACHELA Schuster, Nelson, Grigarick & Christenberry, 1980

Family Macrobiotidae Thulin, 1928

Ramazzottius oberhaeuseri (Doyère, 1840)

Remark: reported as *Hypsibius*.

Hypsibius convergens (Urbanowicz, 1925)

Macrobiotus hufelandi Schultze, 1833

Remark: 5 specimens of the *hufelandi* group were collected from Vratsata area (near Vratsa) during present study.

Minibiotus intermedius (Plate, 1888)

Remark: reported as *Macrobiotus*.

Paramacrobiotus richtersi Murray, 1911

Remark: reported as *Macrobiotus*.

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References

- Degma, P., Bertolani, R. & Guidetti, R. (2015) Actual checklist of Tardigrada species. <http://www.tardigrada.modena.unimo.it/miscellanea/Actual%20checklist%20of%20Tardigrada.pdf>, pp. 40. Accessed on 25.02.2015.
- Horning, D., Schuster, R. & Grigarick A. (1978) Tardigrada of New Zealand. *New Zealand Journal of Zoology*, 5: 185-280.
- Iharos, G. (1961) Grundlage der tardigradenfauna Bulgariens. *Acta Zoologica Academiae*

Scientiarum Hungaricae, 7: 111-118.

Iharos, G. (1973) Angaben zur geographischen Verbreitung der Tardigraden. *Opuscula Zoologica*, Budapest, 12: 73-86.

Iharos, G. (1982) Tardigradologische Notizen. I. *Miscellanea Zoologica Hungarica*, 1: 85-90.

Kaczmarek, L., Goldyn, B., Prokop, Z. & Michalczyk, Ł. (2011) New records of Tardigrada from Bulgaria with the description of *Macrobiotus binieki* sp. nov. (Eutardigrada: Macrobiotidae) and a key to the species of the harmsworthi group. *Zootaxa*, 2781: 29-39.

McInnes, S. (1994) Zoogeographic distribution of terrestrial/freshwater tardigrades from current literature. *Journal of Natural History*, 28: 257-352.

Northcote-Smith E. (2012) The ecology of tardigrades. *The Plymouth Student Scientist*, 5(2): 569-580.

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**Публикувани данни за сухоземни тардигради
(Tardigrada: Heterotardigrada, Eutardigrada) от
Природен парк Врачански Балкан**

ДИЛЯН ГЕОРГИЕВ

(Резюме)

Шест вида сухоземни тардигради са съобщени от териорията на парка от Iharos (1961): *Echiniscus testudo*, *Ramazzottius oberhaeuseri*, *Hypsibius convergens*, *Macrobiotus hufelandi*, *Minibiotus intermedius* и *Paramacrobiotus richtersi*. Индивиди от групата видове „*hufelandi*” бяха събрани и по време на настоящото проучване от мъх по скали в района на Вратцата.