

## WATER BEARS (TARDIGRADA) OF OKUP MAŁY (GRABIA VALLEY, CENTRAL POLAND)

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**Abstract:** Eleven species of eutardigrades (Tardigrada) were found in 25 samples collected from Okup Mały (Grabia Valley, Central Poland) in November and December 2009. Eight of these species were recorded for the first time in this area: *Paramacrobiotus richtersi*, *Macrobiotus pallarii*, *Isohypsibius dastychi*, *I. prosostomus prosostomus*, *Hypsibius convergens*, *H. dujardini*, *Ramazzottius oberhaeuseri* and *Thulinus ruffoi*.

**Keywords:** Tardigrada, Eutardigrada, new records, Okup Mały, Grabia Valley, Poland

### INTRODUCTION

Up to now more than 1000 species (and *ca.* 100 from Poland) from two orders (Heterotardigra and Eutardigrada) have been described around the world (Degma et al. 2011). Previous studies in Grabia Valley were rather fragmentary and only Dastych (1988) reported seven tardigrade species from this region: *Minibiotus intermedius* Plate, 1888; *Macrobiotus hufelandi hufelandi* C.A.S. Schultze, 1833; *Macrobiotus harmsworthi harmsworthi* Murray, 1907; *Hypsibius pallidus* Thulin, 1911; *Diphascon prorsirostre* Thulin, 1928; *Diphascon scoticum scoticum* Murray, 1905; *Diphascon pingue pingue* Marcus, 1936. In this studies, mosses, lichens and freshwater samples were examined and 11 species of eutardigrades were found. Eight of these species is new for this region. Additionally, a full list of species found in Grabia Valley with zoogeographical remarks are given.

### MATERIALS AND METHODS

Grabia is a typical, lowland, medium size river and the Grabia Valley is located in the southern part of the Wielkopolska Lowland and Mazowieckie Slopes. Okup Mały is a small village located in the centre of Grabia Valley (51°36' N; 19°03' E).

The material studied contained 25 samples of mosses, lichens, freshwater mud and aquatic plants (Tab. 1). All samples were collected in November and December 2009 in Okup Mały (Grabia Valley). Samples were put into small paper bags and allowed to dry slowly. Each sample was then soaked in water for 6 hours. This water, containing tardigrades and detritus particles, was decanted

Table. List of collected samples (p/n–positive/negative sample, m–moss, l–lichen, fd–freshwater debris, ap–aquatic plants)

Locality	p/n	m	l	fd	ap
1. The tree ( <i>Alnus</i> sp.), near the road to the old bridge on the Grabia river (Okup Mały)	+	+			
2. Grabia River near the road to the old bridge (Okup Mały)					+
3. Grabia River near the road to the old bridge (Okup Mały)				+	
4. The iron base of the old bridge on the Grabia River (Okup Mały)	+	+			
5. The iron base of the old bridge on the Grabia River (Okup Mały)	+	+			
6. The wooden handrail of the old bridge on the Grabia River (Okup Mały)			+		
7. Grabia River near the old bridge (Okup Mały)				+	
8. Grabia River near the old bridge (Okup Mały)				+	
9. The tree ( <i>Alnus</i> sp.), about 30 m. from the river (Okup Mały)	+	+			
10. The tree ( <i>Salix</i> sp.) 2 m. above-the ground, about 30 m. from the river (Okup Mały)	+	+			
11. The small ponds near the river (Okup Mały)				+	
12. The tree ( <i>Salix</i> sp.) near Grabia river, between the ponds, the old bridge and the road to Zielęcice	+	+			
13. The Grabia River between the ponds, the old bridge and the road to Zielęcice				+	
14. The soil on the meadow, between the pond and the farm, near the road to Zielęcice	+	+			
15. The tree ( <i>Sambucus</i> sp.) near the road to Zielęcice	+		+		
16. The Grabia River near the road to Zielęcice					+
17. The Grabia River, near the road to Zielęcice, opposite the farm	+				+
18. The tree ( <i>Alnus</i> sp.), near the road to Zielęcice, opposite the farm			+		
19. The soil, near the road to Zielęcice, opposite the farm		+			
20. The stone near the Grabia River (Okup Mały)	+	+			
21. The tree ( <i>Alnus</i> sp.), near the road to Zielęcice	+	+			
22. The tree ( <i>Populus</i> sp.), near the road to Zielęcice	+	+			
23. The soil on the meadow, near the road to Zielęcice	+	+			
24. The pavement from Okup Mały to Zielęcice bridge	+	+			
25. The leaves of <i>Nymphaea alba</i> from a small pond	+				+

and examined under a stereo-microscope. Tardigrades were extracted and mounted on microscopic slides in Hoyer's medium, and examined under Phase Contrast Microscopy (PCM). The species were determined according to a key from the Tardigrada of Poland (Dastych 1988) and other original papers (Bertolani & Rebecchi 1993; Kaczmarek & Michalczyk 2009; Guidetti et al. 2008). All specimens have been deposited in the Department of Animal Taxonomy and Ecology (Adam Mickiewicz University, Poznań, Poland).

## RESULTS

List of species recorded from Grabia Valley:

\*- new record for Grabia Valley

### 1. *Diphascon pingue pingue* (Marcus, 1936)

**Sample:** 9

**Distribution:** Cosmopolitan species, known from many localities throughout the world (McInnes 1994). In Poland reported within the whole territory (Dastych 1988) however in Okup Mały it was found only in one sample.

### 2. *Diphascon (Adropion) prorsirostre* Thulin, 1928

**Distribution:** Cosmopolitan species, known from many localities throughout the world (including Poland, Grabia Valley) (Dastych 1988; McInnes 1994) but was not found in the present studies.

### 3. *Diphascon scoticum scoticum* Murray, 1905

**Sample:** 21

**Distribution:** Cosmopolitan species, known from many localities throughout the world (McInnes 1994). In Poland reported within the whole territory (Dastych 1988) but in Okup Mały it was found only in one sample.

### 4. *Hypsibius convergens* (Urbanowicz, 1925)\*

**Samples:** 4, 12, 15, 23, 24

**Distribution:** Cosmopolitan species, known from many localities throughout the world (McInnes 1994). In Poland reported within the whole territory (Dastych 1988). Common species in Okup Mały.

5. *Hypsibius dujardini* (Doyère, 1840)\*

**Samples:** 15, 17

**Distribution:** Cosmopolitan species, known from many localities throughout the world (McInnes 1994). In Poland reported within the whole territory (Dastych 1988).

6. *Isohypsibius dastychi* Pilato, Bertolani & Binda, 1982\*

**Sample:** 24

**Distribution:** Rare species, known only from Spitsbergen, Poland and Italy (McInnes 1994). In Poland known only from 8 localities (Dastych 1988). Okup Mały (Grabia Valley) is the ninth localities of this species in Poland.

7. *Isohypsibius prosostomus prosostomus* Thulin, 1928\*

**Samples:** 4, 5, 20

**Distribution:** Cosmopolitan species, known from many localities throughout the world (McInnes 1994). In Poland reported within the whole territory (Dastych 1988).

8. *Macrobiotus harmsworthi harmsworthi* Murray, 1907

**Distribution:** Cosmopolitan species, known from many localities throughout the world (including Poland, Grabia Valley) (Dastych 1988; McInnes 1994) but was not found in the present study.

9. *Macrobiotus hufelandi hufelandi* C.A.S. Schultze, 1833

**Samples:** 1, 4, 9, 10, 12, 23

**Distribution:** Cosmopolitan species, known from many localities throughout the world (McInnes 1994) but some records may belongs to other species from the 'hufelandi group' (Bertolani & Rebecchi 1993). In Poland reported within the whole territory (Dastych 1988). The most common species in Okup Mały.

10. *Macrobiotus pallarii* Maucci, 1954\*

**Sample:** 20

**Distribution:** Species only known from a few localities in Europe, Asia and North America (McInnes 1994). In Poland known only from two localities: Radziejowa Range (Dastych 1988) and Wielkopolski National Park

(Kaczmarek & Michalczyk 2003). Okup Mały (Grabia Valley) is the third localities of the species in Poland.

11. *Minibiotus intermedius* (Plate, 1888)

**Distribution:** Cosmopolitan species, known from many localities throughout the world (including Poland, Grabia Valley) (Dastyk 1988; McInnes 1994) but some records may belong to other very similar species (Claxton 1998).

12. *Paramacrobotus richtersi* (Murray, 1911)\*

**Samples:** 1, 14, 22, 23

**Distribution:** Cosmopolitan species, known from many localities throughout the world (McInnes 1994) but some records may belong to other species from the '*richtersi* group' (Guidetti et al.2008). In Poland reported within the whole territory (Dastyk 1988). Common species in Okup Mały.

13. *Ramazzottius oberhaeuseri* (Doyère, 1840)\*

**Samples:** 10, 12

**Distribution:** Cosmopolitan species, known from many localities throughout the world (McInnes 1994). In Poland reported within the whole territory (Dastyk 1988).

14. *Thulinus ruffoi* (R. Bertolani, 1982)\*

**Sample:** 25

**Distribution:** Freshwater species, up to now known only from a few localities in: Italy, Greece, Poland, Russia, Sweden and USA (Kaczmarek & Michalczyk 2005; Kaczmarek et al. 2010). This is the second report of this species in Poland.

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