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1 **New Records for Tardigrada from Cyprus**

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7 **Abstract.** In this study examined 4 moss samples from rock and soil collected in Northern
8 Cyprus: Kyrenia, Nicosia and Famagusta. A total of 97 specimens and 15 eggs were isolated,
9 and 6 species were identified from them. Among them, three are new species: *Hypsibius*
10 *dujardini*, *Macrobiotus persimilis* and *Isohypsibius macrodactylus*. With the recently
11 identified species, the number of tardigrade species known in Cyprus has reached to twelve.

12 **Key words:** Tardigrada, Eutardigrada, fauna, Cyprus.

13 Until recently, more than 1.200 species belonging to the Tardigrada Phylum had been
14 identified (Degma et al. 2009-2016). But the tardigrade fauna of Cyprus have rarely been
15 examined. The first study of the tardigrades from Cyprus was carried out by Bertolani (1975)
16 and until now only 5 papers have been published (Bertolani 1975, Michalczyk & Kaczmarek
17 2003, Kaczmarek & Michalczyk 2004, Pilato & Bertolani 2004, Michalczyk et al. 2006); in
18 total 9 species belonging to 5 genera were reported (Table 1).

19 In this paper the Turkish part of northern Cyprus was studied for the first time, and three new
20 tardigrade species were recorded for the country. In addition, a list of all Cyprus tardigrades is
21 presented with some zoogeographical and taxonomical remarks (Table 1).

22 The four moss samples were collected from rocks and soils in Northern Cyprus: Kyrenia,
23 Nicosia and Famagusta in October 2015.

24 All specimens were mounted on microscopic slides in Hoyer's medium according to
25 Ramazzotti and Maucci (1983). Identification of specimens was carried out using a phase-

26 contrast light microscope (Zeiss Axio Imager M1) and based on the keys in Ramazzotti &
27 Maucci (1983) and Dastych (1988), as well as on the original species descriptions (Bertolani
28 & Rebecchi 1993).

29 In this study, 97 specimens and 15 eggs of tardigrades were found. In total, six species were
30 identified: *Macrobiotus hufelandi hufelandi* (C.A.S. Schultze, 1834), *Ramazzottius* cf.
31 *oberhaeuseri* (Doyère, 1840), *Paramacrobiotus* cf. *richtersi* (Murray, 1911), *Hypsibius*
32 *dujardini* (Doyère, 1840), *Macrobiotus persimilis* Binda & Pilato, 1972 and *Isohypsibius*
33 *macrodactylus* (Maucci, 1978). The last three species are reported from Cyprus for the first
34 time and increases the number of species known in the country to 12. The biogeographical
35 and taxonomic data about the identified species are presented in Table 1.

36 These newly recorded tardigrade species from Cyprus are presented below. All specimens are
37 deposited in the Aquatic Animals Research Laboratory at Ankara University.

38 **1. *Hypsibius dujardini*** (Doyère, 1840)

39 **Material examined:** 7 specimens collected from two soil mosses in Kyrenia (35°20'6.87"N
40 33°17'51.17"E and 39 meters above sea level [a.s.l.]).

41 **Remarks:** This species belongs to the widely distributed *convergens-dujardini* complex of
42 species (Kaczmarek et al. 2014). The specimens obtained correspond perfectly to the
43 characterization of this species by Ramazzotti & Maucci (1983) Dastych (1988) and (Miller et
44 al. 2005).

45 **2. *Macrobiotus persimilis*** Binda & Pilato, 1972

46 **Material examined:** 6 specimens and 3 eggs collected from two rock moss samples in Nicosia
47 (35°13'9.05"N 33°19'48.49"E and 142 m a.s.l.).

48 **Remarks:** They are from the Palearctic region, but also found in Australia (Kaczmarek et al.
49 2011).

50 **3. *Isohypsibius macrodactylus*** (Maucci, 1978)

51 **Material examined:** 4 specimens collected from one rock and one soil moss in Famagusta
52 (35° 7'29.68"N 33°56'30.22"E and 35° 7'30.38"N 33°56'33.83"E and 13 m a.s.l).

53 **Remarks:** It was originally discovered for the first time in Turkey (Maucci 1978). This
54 species is not common in Italy, the Caucasus and Algeria (McInnes 1994).

55 Although the present study of the number of known tardigrades from Cyprus has now reached
56 twelve, the real number of Tardigrada species in Cyprus is apparently much greater than those
57 already known; thus, the study of island fauna is only just beginning.

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- 97 Ramazzotti, G., Maucci, W. (1983): II Phylum Tardigrada. *Memorie dell'Istituto Italiano di*
98 *Idrobiologia* 41: 1-1012.
- 99 Table 1. A list of Tardigrada species from Cyprus with their localities, and zoogeographical
100 and taxonomic remarks. The species originally described from Cyprus are indicated with an
101 asterisk (*). Source codes: 1-Bertolani (1975), 2-Michalczyk & Kaczmarek (2003), 3-
102 Kaczmarek & Michalczyk (2004), 4-Pilato & Bertolani (2004), 5- Michalczyk et al. (2006), 6-
103 McInnes (1994), 7- present study.

Taxa	Locality	Source	Remarks
<i>Echiniscus testudo</i> (Doyère, 1840)	Surroundings of the Kykko monastery and Mts. Troodos, a.s.l: 450 m and 700 m respectively.	3	Moss from rock, tree and soil; Holarctic (McInnes 1994, Jørgensen et al. 2007).
<i>Milnesium tardigradum</i> (Doyère, 1840)	Surroundings of the Kykko monastery, a.s.l: 450 m.	3	Moss from soil. A cosmopolitan.
<i>Hypsibius dujardini</i> (Doyère, 1840)	Kyrenia, a.s.l: 39 m.	7	Collected from soil mosses & studied habitats. A geopolitan species (Dastch 1988).
<i>Ramazottius cf. oberhaeuseri</i> (Doyère, 1840)	Kykko monastery, Mts. Olympus and Famagusta, a.s.l: 450 m. Present study: Nicosia, a.s.l: 13 m.	3,7	Moss from rock, tree and soil. In this study, it was found in rock mosses. A cosmopolitan (Dastch 1988).
<i>Isohypsibius macrodactylus</i> (Maucci, 1978)	Famagusta, a.s.l: 13 m.	7	Holarctic. Known only from a few localities (McInnes 1994). It was found in rock and soil mosses.
<i>Macrobotus dariae</i> Pilato & Bertolani, 2004*	Mts. Troodos, a.s.l: 1350 m.	4	It was extracted from a moss sample.
<i>Macrobotus hufelandi hufelandi</i> (C.A.S. Schultze, 1834)	Mts. Troodos and Kyrenia. Present study: Famagusta, a.s.l: 13 m.	1,7	In this study, it was collected from soil mosses. A geopolitan species (Dastch 1988).
<i>Macrobotus marlenae</i> (Kaczmarek & Michalczyk, 2004)*	Surroundings of the Kykko monastery, a.s.l: 1450 m.	3	Moss from rock. Known only from one locality in Cyprus.
<i>Macrobotus persimilis</i> Binda & Pilato, 1972	Nicosia, a.s.l: 142 m.	7	In this study, it was collected from two rock mosses.
<i>Macrobotus reinhardti</i> (Michalczyk & Kaczmarek 2003)*	Mts. Troodos, southern slope of Mts. Olympus.	2	Moss from rock, tree and soil.
<i>Paramacrobotus cf. richtersi</i> (Murray, 1911)	Kykko monastery, a.s.l: 450 m. Present study: Nicosia, a.s.l: 142 m.	3,6	A cosmopolitan, but the species' geographic range is unknown (Kaczmarek et al. 2012). In this study, it was collected in rock mosses.
<i>Paramacrobotus sklodowskae</i> (Michalczyk, Kaczmarek & Węglarska, 2006)	Surroundings of the Kykko monastery, a.s.l: 1450 m.	5	Moss. Known only from a few localities in Cyprus.