

New records of terrestrial tardigrades (Tardigrada) from Ceahlău National Park with zoogeographical and taxonomical remarks on Romanian water bears

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Received: 22. September 2013 / Accepted: 18. December 2013 / Available online: 23. February 2014 / Printed: December 2014

Abstract. Fourteen tardigrade species have been found in moss and lichen samples collected at 14 sampling sites in the Ceahlău National Park in Romania. The study was carried out during the summers of 2009 and 2011, and 613 tardigrade specimens and 11 eggs were found in total. Among them, both *Milnesium asiaticum* Tumanov, 2006 and *Milnesium granulatum* (Ramazzotti, 1962) are new records for Romania. *M. granulatum* was originally described from Chile, later reported from Italy, and this is the second report of this species from Europe. In this paper, we also provide a comprehensive list of the tardigrades known from Romania altogether with zoogeographical and taxonomical remarks on all known Romanian water bears.

Key words: checklist, Ceahlău National Park, *Milnesium asiaticum*, *Milnesium granulatum*, new records, Romania, Tardigrada.

Introduction

Tardigrades, known also as water bears, are minute (ca. 0.05 to 2 mm) metazoans with a bilateral symmetry of the body and five indistinct body segments. In most species the four pairs of legs terminate with claws. The cuticle is thickened („armoured” tardigrades – Class Heterotardigrada) or smooth („unarmoured” tardigrades – Class Eutardigrada). Tardigrade taxonomy is based mostly on morphology of the claws, buccal-pharyngeal apparatus, cuticle and eggs. They inhabit a wide range of habitats, but all active individuals require water-film around the body (Ramazzotti & Maucci 1983, Nelson & Marley 2000, Guil 2008). Up to now, about 1,200 tardigrade species were reported throughout the world (Degma et al. 2013, Vincente & Bertolani 2013).

In Romania studies on tardigrades were rather fragmentary. The only large monograph of Romanian tardigrades has been published by Ludovic Rudescu in 1964 (Rudescu 1964). Since then, for 44 years, water bear studies in this region have been completely neglected. In 2008, Kaczmarek and Michalczyk recorded three new tardigrades for Romanian fauna, and later in 2012, Ciobanu and Kaczmarek (2012) recorded a new genus and another two new species for this region.

Although Rudescu (1964), in his monograph, mentioned more than 150 tardigrades spe-

cies/varieties, many of them were synonymised or require confirmation (see Discussion and Table 1).

Concerning tardigrades from Ceahlău National Park, only two species were reported from this area up to now: *Echiniscus spinulosus* (Doyère, 1840) and *Astatumen trinacriae* (Arcidiacono, 1962) (Rudescu 1964; Ciobanu and Kaczmarek 2012). In this paper we are reporting 14 species, including two new records for Romania and 14 records new for Ceahlău National Park.

Material and methods

In August 2009 and May 2011, 18 moss and lichen samples were collected in Ceahlău National Park (Neamț County) by the first author. All samples were put into small paper bags and allowed to dry slowly. In the laboratory each sample was further soaked in water for six hours. After this time, water containing tardigrades, their eggs and detritic particles, was decanted and examined under a stereomicroscope. We followed extraction methodology used by Dastych (1980, 1985). All specimens were mounted on microscope slides in Faure's medium. Observations, measurements and photomicrographs were taken using the Phase Contrast Microscopy (Olympus BX41 associated with digital camera ARTCAM-300Mi).

Species were determined using a key to the world fauna of Tardigrada (Ramazzotti & Maucci, 1983), original papers and modern keys (Tumanov 2006, Kaczmarek & Michalczyk 2009a, Pilato & Binda 2010, Michalczyk et al. 2012a,b, Fontuora & Pilato 2007, Bertolani & Rebecchi 1993, Claxton 1998). Information about the world distri-

bution of species is given according to McInnes (1994) and other original papers (e.g. Dastyh 1988, 1991, Bertolani et al. 1999, Kaczmarek et al. 2012a,b).

All specimens are deposited in the Natural History Museum - Iași (Bd. Independenței, No 16, 700101, Iași, România).

Sampling sites:

1.) 46°58'39"N, 25°57'00"E, 1,904 m asl: open space, moss and lichen from rocks, August 2009 (2 samples); 2.) 46°57'43"N, 25°56'37"E, 1,831 m asl: open space, moss from rock, August 2009 (1 sample); 3.) 46°57'46"N, 25°56'53"E, 1,760 m asl: open space, moss from rock, August 2009 (1 sample); 4.) 46°59'48"N, 25°55'38"E, 833 m asl: coniferous forest, moss from tree, May 2011 (1 sample); 5.) 46°59'29"N, 25°55'34"E, 900 m asl: coniferous forest, moss from tree, May 2011 (1 sample); 6.) 46°58'33"N, 25°55'59"E, 1,180 m asl: coniferous forest, mosses from rocks, May 2011 (2 samples); 7.) 46°58'23"N, 25°56'7"E 1,266 m: coniferous forest, moss from rock, May 2011 (1 sample); 8.) 46°58'14"N, 25°56'15"E 1,343 m asl: coniferous forest, moss from tree, May 2011 (1 sample); 9.) 46°59'15"N, 25°56'19"E, 1,184 m asl: coniferous forest, moss from rock, May 2011 (1 sample); 10.) 46°59'07"N, 25°56'14"E, 1,233 m asl: coniferous forest, lichens from dead wood, May 2011 (2 samples); 11.) 46°57'54"N, 25°58'53"E, 1,028 m asl: coniferous forest, mosses from tree and dead wood August 2011 (2 samples); 12.) 47°00'03"N, 25°56'37"E, 1,065 m asl: coniferous forest, from dead wood, August 2011 (1 sample); 13.) 46°59'09"N, 25°57'26"E, 1,584 m asl: open space, moss from rock, August 2011 (1 sample); 14.) 46°59'01"N, 25°57'34"E, 1,562 m asl: coniferous forest, moss from rock, August 2011 (1 sample).

Results

In 18 positive samples we found 449 tardigrades and 11 eggs which were identified to species level. Additionally, in examined material, 164 specimens belonging to the genera *Macrobiotus* and *Isohypsiobius* were found. Species-level identification of these specimens was not possible, due to the absence of eggs or poorly preserved specimens. To avoid potential misinterpretations, we decided not to report these incomplete identifications here.

Taxonomic accounts:

Phylum Tardigrada (Spallanzani, 1777)

Class Heterotardigrada Marcus, 1927

Family Echiniscidae Thulin, 1928

Genus Echiniscus Schultz, 1840

1. Echiniscus granulatus (Doyère, 1840)

Sampling sites and number of specimens: 8 (2 specimens)

Remarks: In Romania, the species was reported also in Coșna, Poiana Stampii, Rarău and

Giurnalău Mts (Suceava County), Mărișel field, Răcățău River (Cluj County) (Rudescu 1964).

Genus Testechiniscus Kristensen, 1987

2. Testechiniscus spitsbergensis (Scourfield, 1897)

Sampling sites and number of specimens: 2, 3 (143 specimens)

Remarks: In Romania, the species was reported only from Retezat National Park (Hunedoara County) (Rudescu 1964).

Class Eutardigrada Richters, 1926

Order Apochela Schuster, Nelson, Grigarick & Christenberry, 1980

Family Milnesiidae Ramazzotti, 1962

Genus Milnesium Doyère, 1840

3. Milnesium asiaticum Tumanov, 2006 (Fig. 1)

Sampling sites and number of specimens: 8, 9, 10, 11, 14 (29 specimens and 1 simplex stage)

Remarks: Our specimens correspond perfectly to the original description. *Milnesium asiaticum* was originally described from Kyrgyzstan and then found in Svalbard Archipelago (Kaczmarek et al. 2012b). It belongs to the *tardigradum* group of species with smooth cuticle and claw configuration [3-3]-[3-3] (Michalczyk et al. 2012a, b). It is a new record for Romania (see also Remarks in Appendix 1).

4. Milnesium granulatum (Ramazzotti, 1962)

(Fig. 2)

Sampling sites and number of specimens: 10 (14 specimens)

Remarks: *Milnesium granulatum* was originally described by Ramazzotti (1962) as a variety of *Milnesium tardigradum* Doyère, 1840, but was later elevated to species level by Michalczyk et al. (2012a,b). Our specimens correspond perfectly to the original description and later re-description. It belongs to the *granulatum* group of species with sculptured cuticle and claw configuration [3-3]-[3-3] (Michalczyk et al. 2012a,b). It is a new record for Romania (see also Remarks in Appendix 1).

Order Parachela Schuster, Nelson, Grigarick & Christenberry, 1980

Family Hysibiidae Pilato, 1969

Subfamily Hysibiinae Pilato, 1969

Genus Hysibius Ehrenberg, 1848

5. Hysibius dujardini (Doyère, 1840)

Sampling sites and number of specimens: 11 (1 specimen)

Remarks: The original description is inadequate and unsatisfactory therefore the examined

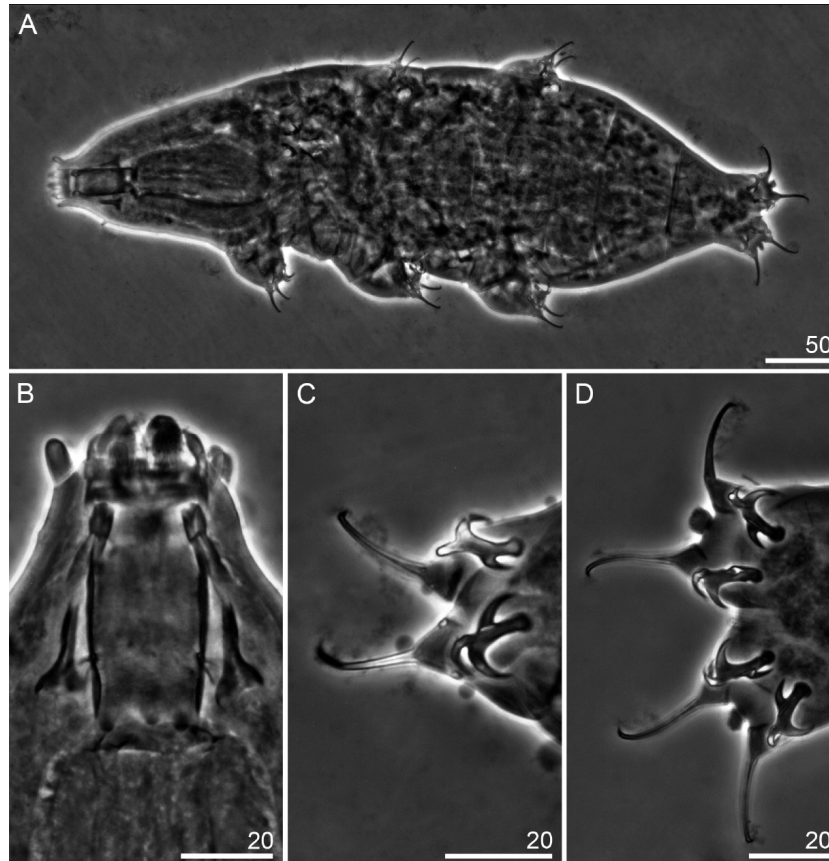


Figure 1. *Milnesium asiaticum* Tumanov, 2006: A - habitus (ventral view); B - buccal apparatus (ventral view); C - claws III; D - claws IV. [scales in micrometers].

specimens were compared with later descriptions (e.g. Ramazzotti & Maucci 1983, Dastyh 1988 and Miller et al. 2005). This species has also been reported in Bălea Lake (Sibiu County), Poiana Stampii, Pietrosul Mountain (Suceava County) (Rudescu 1964).

6. *Hypsibius pallidus* Thulin, 1911

Sampling sites and number of specimens: 1, 4, 7 (39 specimens)

Remarks: Our specimens correspond perfectly to the re-description (Kaczmarek & Michalczyk 2009a). *Hypsibius pallidus* was earlier reported from Romania in Pietrosul Mountain (Bistrița and Maramureș Counties), Inău (Maramureș County), Sovata (Mureș County), Tușnad (Harghita County), Retezat National Park (Hunedoara County) (Rudescu 1964).

7. *Hypsibius* cf. *scabropygus* Cuénot, 1929

Sampling sites and number of specimens: 10, 11,

12, 14 (12 specimens)

Remarks: Our specimens correspond to the original description in most of the characters, but in Romanian specimens we found small cuticular bars between claws on IV pair of legs. These small bars were not mentioned in original description, probably due to their small size. They could have been missed, but a re-description of this species is necessary. *Hypsibius scabropygus* was earlier reported from Romania on Pietrosul Mountain (Bistrița and Maramureș Counties) (Rudescu 1964).

Genus *Isohypsibius* Thulin, 1928

8. *Isohypsibius prosostomus prosostomus* Thulin, 1928

Sampling sites and number of specimens: 1, 12 (52 specimens)

Remarks: This species has been reported also in Maramureș Mts, Vișeu de Sus, the Mihoia Valley (Maramureș County), Cluj (Cluj County), Si-

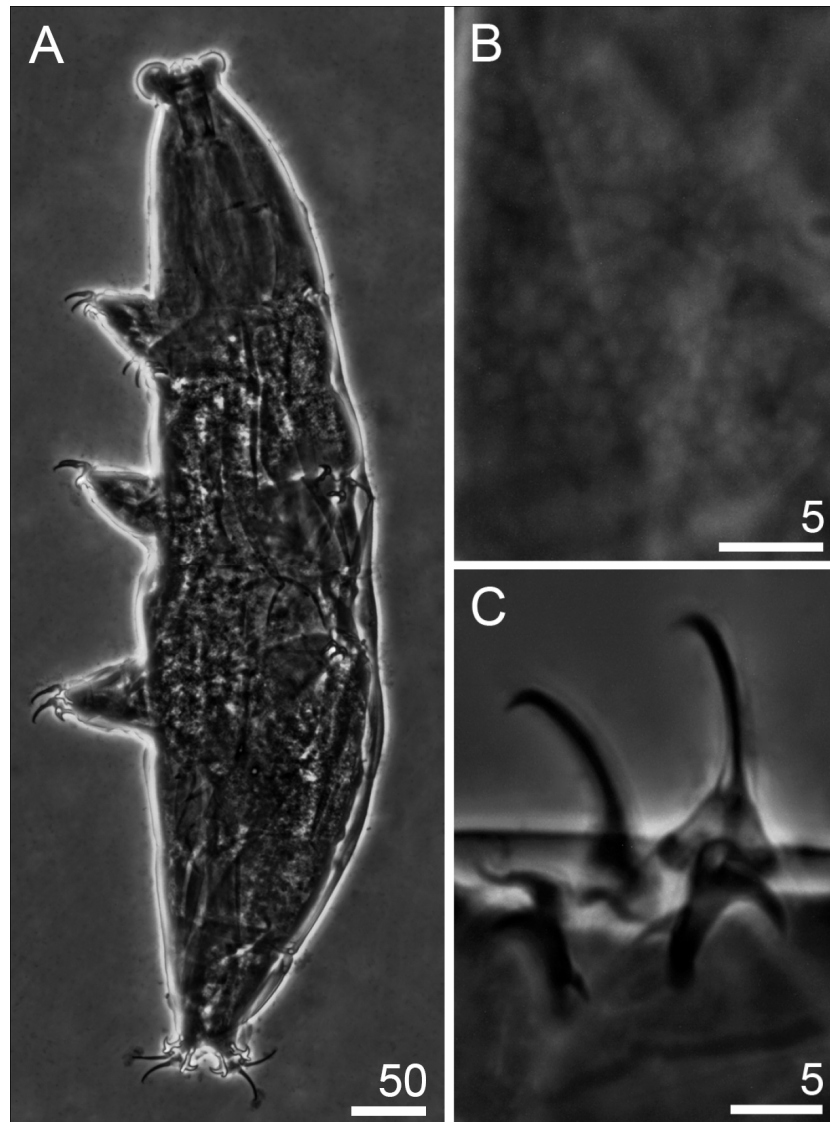


Figure 2. *Milnesium granulatum* (Ramazzotti, 1962): **A** – habitus (ventro-lateral view); **B** – sculpture on dorsal cuticle; **C** – claws III. [scales in micrometers].

naia (Prahova County), Predeal (Braşov County) (Rudescu 1964).

Subfamily Diphasconinae Dastych, 1992

Genus *Diphascon* Plate, 1889

Subgenus *Diphascon (Adropion)* Pilato, 1987

9. *Diphascon (Adropion) prorsirostre* Thulin, 1928

Sampling sites and number of specimens: 11, 12 (9 specimens)

Remarks: This species has been reported only in Pietrosul Mountain until now (Bistriţa and

Maramureş Counties) (Rudescu 1964). This is a second report of this species from Romania.

Subgenus *Diphascon (Diphascon)* Plate, 1889

10. *Diphascon (Diphascon) pingue pingue* (Marcus, 1936)

Sampling sites and number of specimens: 5, 11 (4 specimens)

Remarks: This species belongs to the *pingue* group, a complex of very similar species and should be examined and determined very care-

fully based on modern literature (Pilato & Binda 1998, 1999; see also Fontoura & Pilato (2007) for the diagnostic key to the group). This species has been reported in Romania from Bistrița, Ilva Mare (Bistrița Năsăud County) and Buduș (Cluj County) (Rudescu 1964).

Family Ramazzottidae Marley, McInnes & Sands, 2011

Genus Ramazzottius Binda & Pilato, 1986

11. Ramazzottius cf. oberhauseri (Doyère, 1840)

Sampling sites and number of specimens: 1, 11 (55 specimens)

Remarks: The species is considered as cosmopolitan (McInnes 1994), but recently many new species of *Ramazzottius* have been described (e.g. Dastych 2006, 2011, Kaczmarek et al. 2006, Bartels et al. 2011 and Pilato et al. 2013). All specimens from the genus *Ramazzottius* should be examined and determined very carefully (based on eggs and adults) and according to the modern literature (see Biserov 1998 for a diagnostic key to the genus). In the present study, eggs were not found, and final identification was not possible. Species are known from many localities in Romania (Rudescu 1964), but most require confirmation according to the modern literature.

Superfamily Macrobitoidea Thulin, 1928
in Marley et al. 2011

Family Macrobiotidae Thulin, 1928

Genus Macrobiotus Schultze, 1834

12. Macrobiotus hufelandi hufelandi C.A.S.
Schultze, 1834

Sampling sites and number of specimens: 2 (11 specimens and 1 egg)

Remarks: *Macrobiotus h. hufelandi* is a nominal species for a cosmopolitan group of species (McInnes 1994). Species from this group require a very careful taxonomic analysis, including egg morphology. Additionally, in the last few years many new species were described in this group (e.g. Pilato et al. 2003b, Kaczmarek & Michalczyk 2004, Dastych 2002, 2005, Fontoura et al. 2008, Bartels et al. 2009, Kaczmarek & Michalczyk 2009b, Pilato & Lisi 2009, Bertolani et al. 2011, Biserov et al. 2011, Pilato et al. 2012, Guidetti et al. 2013; see also Bertolani & Rebecchi 1993 for the diagnostic key to the group). Species are known from many localities in Romania (Rudescu 1964), but most of them require confirmation according to the modern literature.

13. Macrobiotus harmsworthi harmsworthi

Murray, 1907

Sampling sites and number of specimens: 6 (22 specimens and 10 eggs)

Remarks: *Macrobiotus h. harmsworthi* is a nominal species for a cosmopolitan group of species (McInnes 1994). Species from this group need a very careful taxonomic analysis, including egg morphology. In the last few years many new species were described in this group, also from Europe (e.g. Michalczyk & Kaczmarek 2003a, Pilato et al. 2004, Tumanov 2005, Pilato & Lisi 2006a, b, Pilato et al. 2006, Kaczmarek et al. 2007, Kaczmarek & Michalczyk 2009b, Pilato & Lisi 2009, Rossi et al. 2009; see also Kaczmarek et al. 2011 for the diagnostic key to the group). Species known from many localities in Romania (Rudescu 1964), but most of them require confirmation according to the modern literature.

Genus Minibiotus Schuster, 1980

(amended by Claxton, 1998)

14. Minibiotus intermedius (Plate, 1888)

Sampling sites and number of specimens: 4, 5, 9, 11, 13 (55 specimens)

Remarks: For many years *Minibiotus intermedius* had been considered as cosmopolitan (McInnes 1994), but according to more modern taxonomy it is a species complex (Claxton 1998). All species from this genus should be examined very carefully based on adults and (most often) eggs, especially that in the last years many of the new species were described from all over the world (e.g. Michalczyk & Kaczmarek 2003b, 2004, Pilato et al. 2003a, Guil & Guidetti 2005, Michalczyk et al. 2005, Pilato & Lisi 2006b, Li et al. 2008, Fontoura et al. 2009a, b, Meyer & Hinton 2009, Rossi et al. 2009, Meyer & Domingue 2011, Meyer et al. 2011, Meyer 2012). Species of the *Minibiotus intermedius* complex are known from many localities in Romania (Rudescu 1964), but most of them require confirmation according to the modern literature.

Discussion

Up to now only 17 papers on Romanian tardigrades were published (Margo 1879, Daday 1897, Botezat 1903, Richters 1910, Iharos 1936, 1937, 1938, 1940, 1961, 1962, Rodewald 1936, 1939, Péterfi 1956, Botoșăneanu & Negrea 1961, Rudescu 1964, Kaczmarek & Michalczyk 2008, Ciobanu & Kaczmarek 2012). In all of these papers, 154 taxa

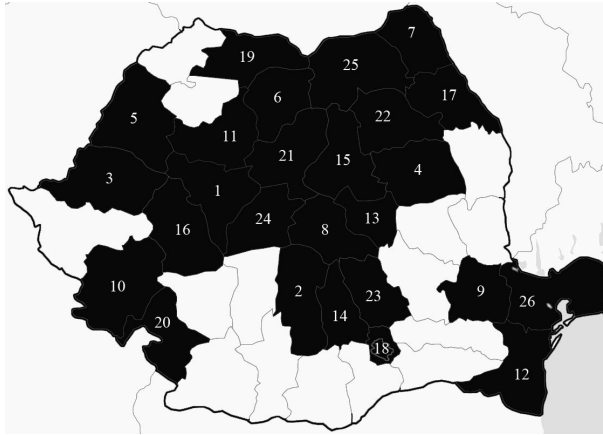


Figure 3. The administrative map of Romania with 26 blackened counties in which tardigrades were found (for the legend see the Table 1). Map outline according to Wikipedia: http://ro.wikipedia.org/wiki/Fi%C8%99ier:Romania_counties_blank_big.png

(species and subspecies) were reported. In spite of this fact, some of them are non-valid taxa or synonyms, or were only suggested to be present in Romania, based on findings of these species in neighbouring countries. As non-valid taxa in the light of modern taxonomy, the following are considered:

1.) *Echiniscus granulatus* forma *quadrifilis* Mihelčič, 1938, *E. g. f. trifilis* Mihelčič, 1938, *E. g. f. trifilis brachyspinosa*, *E. g. f. trifilis laterosetosa* Mihelčič, 1938, *E. g. f. bifilis laterosetosa* Mihelčič, 1938 were often found in samples in mixed populations and are probably different development stages of the nominal species *Echiniscus granulatus* (Doyère, 1840), *E. blumi blumi* Richters, 1903 or *E. trisetosus* Cuénot, 1932 (Rudescu 1964).

2.) *E. muscicola* Plate, 1988 is considered as an invalid taxon by Ramazzotti and Maucci (1983). Authors suggested that the description of this taxon is contradictory and probably refers to more than one species.

3.) *Macrobiotus dubius* Murray, 1907 and *M. ferdinandi* Reukauf, 1912 are invalid because their identification according to original descriptions is not possible (Ramazzotti & Maucci 1983).

As synonyms, the following are considered:

1.) *Calohypsibius ornatus carpaticus* Bartoš, 1931 is a synonym of nominal taxon *Calohypsibius ornatus* (Richters, 1900) (Ramazzotti & Maucci 1983).

2.) *Echiniscus iharosi* Rudescu, 1964 was described as a new species, but according to Ramazzotti & Maucci (1983) it is a synonym of *E. merokensis merokensis* Richters, 1904.

3.) *E. lapponicus carpaticus*, which could be a synonym of nominal taxon *Echiniscus lapponicus* Thulin, 1911. Ramazzotti & Maucci (1983) in their

monograph mentioned that this subspecies was found together with a typical form. The taxonomic status of this subspecies needs verification.

4.) *E. marinellae* Bartoš, 1935, *E. melanophthalmus* Bartoš, 1939, *E. menzeli* Heinis, 1917, *E. rosaliae* Mihelčič, 1951 and *E. spinuloides* Murray, 1907 are all synonyms of *Testechiniscus spitsbergensis* (Scourfield, 1897) (Maucci 1985).

5.) *Echiniscus scrofa* Richters, 1902 is a synonym of *E. quadrispinosus quadrispinosus* Richters, 1902 (Ramazzotti & Maucci 1983).

6.) *Macrobiotus morulatus* Bartoš, 1936 is a synonym of *M. montanus* Murray, 1910 (Ramazzotti & Maucci 1983).

7.) *Pseudechiniscus tridentifer* Bartoš, 1935 is a synonym of *P. victor* (Ehrenberg, 1853) (Dastyč 1980).

The species supposed to be present in Romania by Rudescu (1964) are as follows:

1.) *Bryochoreus intermedius intermedius* (Murray, 1910) was suggested based on the presence of other subspecies *B. intermedius laevis* (Marcus, 1936) in Hunedoara and Suceava counties.

2.) *Echiniscus batramiae* Iharos, 1936 was suggested based on the presence of this species in Hungary and former Czechoslovakia).

3.) *E. columinis* was suggested based on the presence of this species in Poland (but according to Dastyč 1980, 1988, the specimens of *E. columinis* reported by Węglarska (1959) from Poland belongs to *E. e. merokensis*).

4.) *Dactylobiotus ampullaceus* (Thulin, 1911) and *Macrobiotus komareki* Bartoš, 1939 were suggested based on the presence of these species in the neighbouring countries, Hungary and Ukraine.

5.) *Diphascion (Adropion) belgicæ* Richters, 1911

was suggested based on the presence of this species in Bulgaria and former Czechoslovakia.

6.) *Macrobiotus rollei* Heinis, 1920 was suggested based on the presence of this species in Hungary.

7.) *Oreella mollis* and *O. vilucensis* were suggested based on presence of the genus *Itaquascon* in Poland (originally described from Brasil) and suggestions that genus *Oreella* is present in Europe. Additionally, *O. vilucensis* is considered as species *inquirenda* now (Degma et al. 2013).

One further problem with the list of Romanian tardigrades is that some of the species reported from this country are considered as species groups now (e.g. *Paramacrobiotus areolatus*, *Hypsibius convergens*, *Macrobiotus hufelandi*, *Diphascoscon pingue*, *Paramacrobiotus richtersi*, etc.), and their presence/distribution in Romania requires verification. In conclusion, at present, 127 valid taxa are present in Romania (from 26 of 41 Romanian counties), but the presence of some of them should be confirmed in further studies (Appendix 1).

Acknowledgments. The authors want to thank Mrs Mihaela Manole for help in improving of the English in the manuscript. We are also grateful to an anonymous reviewer for valuable remarks.

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Appendix 1. An alphabetic list of Romanian tardigrade species with their localities and taxonomical or/ and zoogeographical remarks. [Numbers in brackets means counties where the tardigrades were reported: (1) Alba, (2) Argeş, (3) Arad (4) Bacău, (5) Bihor, (6) Bistriţa-Năsăud, (7) Botoşani, (8) Braşov, (9) Brăila, (10) Caraş-Severin, (11) Cluj, (12) Constanţa, (13) Covasna, (14) Dâmboviţa, (15) Harghita, (16) Hunedoara, (17) Iaşi, (18) Ilfov County and Bucharest City, (19) Maramureş, (20) Mehedinţi, (21) Mureş, (22) Neamţ, (23) Prahova, (24) Sibiu, (25) Suceava, (26) Tulcea [see also on the map (Fig. 3)]. Source codes mean the authors who reported different species of tardigrades in Romania: 1. Margo 1879; 2. Daday 1897; 3. Botezat 1903; 4. Richters 1910; 5. Iharos 1936; 6. Rodewald 1936; 7. Iharos 1937; 8. Iharos 1938; 9. Rodewald 1939; 10. Iharos 1940; 11. Péterfi 1956; 12. Botoşăneanu 1961; 13. Iharos 1961; 14. Iharos 1962; 15. Rudescu 1964; 16. Kaczmarek & Michalczyk 2008; 17. Ciobanu & Kaczmarek 2012; 18. Present study. Source codes marked with asterisk (*) were reported according to Rudescu (1964)].

| No. Species/subspecies | Source | Localities | Remarks |
|--|---------------|--|--|
| 1. <i>Acutuncus antarcticus</i> (Richters, 1904) | 15 | Poiana Stampii (25) | Known only from Antarctic region. All reports of <i>A. antarcticus</i> from the Northern hemisphere are probably misidentifications (Dastyeh 1991). |
| 2. <i>Astatumen bartosi</i> (Weglarska, 1959) | 17 | Bârnova Forest(17) | Known from few localities in Europe and a single from Africa, Asia and South America (McInnes 1994). |
| 3. <i>A. trinacriae</i> (Arcidiacono, 1962) | 17 | Bârnova Forest (17); Ceahlău Mountain (22) | Holarctic species with a few localities in other zoogeographical realms (McInnes 1994). |
| 4. <i>Batillipes mirus</i> Richters, 1909 | 15 | Agişea, Mangalia and Constanţa (12) | Marine species known from Europe, USA, Madagascar and Malaysia (Kristensen and Mackness 2000). |
| 5. <i>Borealibius zelandicus</i> (Murray 1907) | 10 | Pietrosul Mt (19, 6) | Palaearctic species (McInnes 1994). |
| 6. <i>Bryodolichus intermedius laevis</i> (Marcus, 1936) | 15 | Retezat Mts.(16); Rarău-Giumalău Mts., Câmpulung Moldovenesc(25) | Dubious genus very similar to genus <i>Bryodolichus</i> (for more details see Kristensen 1987). Known only from Europe (McInnes 1994). |
| 7. <i>Bryodolichus parvulus</i> Thulin, 1928 | 15 | Retezat Mts., Deva (16); Orşova (20); Sinaia(23); Predaal (8); Câmpulung Moldovenesc and Vatra Dornei (25) | Known mainly from the Palearctic, but there are also single reports from other zoogeographic zones (McInnes 1994). |
| 8. <i>B. tatrensis</i> (Weglarska, 1959) | 15 | Retezat Mts. (16); Giumalău-Rarău Mts. Câmpulung Moldovenesc (25); Fântânele, Inău Mts., Pietrosul Mt. (6, 19); Retezat Mts. (16); Sinaia Mts. (23); Vatra Dornei, Poiana Stampii (25) | Species known mainly from Palearctic and with a single locality on Sumatra (McInnes 1994). |
| 9. <i>Calolypsiobius ornatus</i> (Richters, 1900) | 9, 10, 11, 15 | Retezat Mts. (16); Sinaia Mts. (23); Vatra Dornei, Poiana Stampii (25) | Cosmopolitan species (McInnes 1994) with high intraspecific variability (Bartoş, 1940, Ramazzotti & Maucci 1983). Michalczyk and Kaczmarek (2005) suggested that it is probably a more than one species grouped under this name. |
| 10. <i>C. verrucosus</i> (Richters, 1900) | 15 | Retezat Mts. (16); Inău (19) | Species with disjunct distribution, known from Europe, Asia and South America (McInnes 1994). |
| 11. <i>Comechiniscus cornutus</i> (Richters, 1907) | 15 | Poiana Stampii, Rarău-Giumalău Mts. (25) | Species known mainly from Palearctic and with a single locality in Canada (McInnes 1994). |
| 12. <i>Comechiniscus lobatus</i> (Ramazzotti 1943) | 15 | Giumalău-Rarău Mts. (25) | Holarctic species with some localities from other zoogeographical realms (McInnes 1994). |
| 13. <i>Dactylobiotus ambiguus</i> (Murray, 1907) | 4, 6, 15 | Bălea Lake (24); Vatra Dornei and Poiana Stampii (25); Razim Lake (26) | Cosmopolitan species (McInnes 1994). |
| 14. <i>Dactylobiotus dispar</i> (Murray, 1907) | 6, 15 | Cefa, Inand (5); Insula Brăila(9); Sturghiol | Known mainly from Palearctic and a few localities in other zoogeographic |

| No. Species/subspecies | Source | Localities | Remarks |
|--|------------------|--|---|
| | | <p>12) Snagov Lake (18); Gorgova Lake, Fortuna Lake and Zagan Lake (25 - Danube Delta)</p> | <p>Known mainly from Europe and a single localities in Africa, Asia, North and South America (McInnes 1994). Despite the fact that the species is nominal for the genus, it is considered <i>nomen dubium</i> because of its poor original description and the lack of the type series (Binda & Pilato 1999; Kaczmarek et al. 2012a).</p> |
| 15 <i>Dactylobiotus macronyx</i> (Dujardin, 1851) | 2*, 6, 9, 15 | Zănoaga Lake (16); Snagov Lake (18); Bălea Lake (24); Poiana Stampii (25); Dorohoi (7); Razim Lake, Zagan Lake, Siutghiol-Tabacarie (26) | Known mainly from Europe and a single localities in Africa, Asia, North and South America (McInnes 1994). Despite the fact that the species is nominal for the genus, it is considered <i>nomen dubium</i> because of its poor original description and the lack of the type series (Binda & Pilato 1999; Kaczmarek et al. 2012a). |
| 16 <i>Dipluscon (Adropion) clavatum</i> (Bartos, 1935) | 15 | Sinaia Mt.(23); Muntele Mare-Cluj (11) | Known only from Europe (McInnes 1994). |
| 17 <i>D. (A.) prorsirostre</i> Thulin, 1928 | 10,14*, 18 | Pietrosul Mt. (6, 19); Zagon (13); Ceahlău Mt. (22) | The <i>Dipluscon (Adropion) prorsirostre</i> can be a complex of species. It is cosmopolitan (McInnes 1994), but the majority of records needs to be verified. |
| 18 <i>D. (A.) scoticum ornithophorum</i> (Thulin 1911) | 9, 15 | Retezat Mts. (16); Poiana Stampii (25) | Subspecies with rather disjunct distribution (McInnes 1994). |
| 19 <i>D. (A.) s. scoticum</i> Murray, 1905 | 6, 9, 10, 11, 15 | Pietrosul Mt. (6, 19); Orșova (20); Muntele Mare (11); Zagon (13); Harghita and Sântdominic (15); Sovata (21); Sinaia(23); Predeal(8); Coșna, Giumalău-Rarău , Poiana Stampii (25) | <i>Dipluscon (Adropion) scoticum scoticum</i> can be a complex of species. It is cosmopolitan (McInnes 1994), but the majority of records needs to be verified. |
| 20 <i>Dipluscon (Dipluscon) alpinum</i> Murray, 1906 | 10, 11, 14*, 15 | Fântânele (6); Calimani Mts. (6, 15, 21, 25); Pietrosul Mt. (6, 19); Muntele Mare-Cluj (11); Sândomic (15); Tr.-Severin (20); Sinaia(23); Predeal (8); Vatra Domei (25). | Species reported from many localities throughout the world. However, Pilato & Binda (1998) suggested that it is rather a very rare species with only few confirmed localities in Scotland, Siberia and probably also in Austria, where the species was reported by Mihelčić (1951) as <i>Dipluscon</i> spec. 5. |
| 21 <i>D. (D.) brevipennis</i> (Marcus, 1936) | 15 | Înău (19) | Holarctic with a single locality in Neotropic (Argentina) (McInnes 1994). |
| 22 <i>D. (D.) bullatum</i> Murray, 1905 | 10, 15 | Ilva Mare (6); Snagov Lake (18); Sinaia (23) | Holarctic, with several localities in other zoogeographic realms (McInnes 1994). |
| 23 <i>D. (D.) chilensis</i> Plate, 1888 | 15 | Retezat Mts. (16) | Cosmopolitan (McInnes 1994), but the revision of the geographic distribution of the species is probably needed. |
| 24 <i>D. (D.) oculatum</i> Murray, 1906 | 10, 14*, 15, 16 | Negoiu (2); Pietrosul Mt. (6, 19); Vișeu de Sus, Harghita (15); the Mihoasia Valley and Maramureș Mts. (19); Sovata (21); Rarău-Giumalău (25) | Holarctic (McInnes 1994). |
| 25 <i>D. (D.) pingue</i> Marcus, 1936 | 10, 18 | Bistrița and Ilva Mare (6); Buduș (11); Ceahlău Mt. (22) | The <i>pingue</i> group of species is cosmopolitan (McInnes 1994, Fontoura and Pilato 2007), but the majority of records needs to be verified. |
| 26 <i>D. (D.) recanieri</i> Richters, 1911 | 14* | Peștera Vadului (11); Sovata (21) | Holarctic species, recorded from sparse localities in Europe, Asia, North America and a single non-Holarctic locality in Argentina (McInnes 1994). |
| 27 <i>D. (D.) rugosum</i> (Bartos, 1935) | 15 | Sinaia(23); Predeal(8); Giumalău-Rarău (25) | Holarctic (McInnes 1994). |
| 28 <i>D. (D.) stappersi</i> Richters, 1911 | 15 | Becaș and Tușnad (15); Retezat Mts. (16); Sântgeorgiu (21) | Species with rather disjunct distribution (McInnes 1994). |

| No. Species/subspecies | Source | Localities | Remarks |
|--|-------------------|---|--|
| 29 <i>D.(D.) tenue</i> Thulin 1928 | 10, 15 | Bistrița, Ilva Mare (6); Sinaia (23); Giuamalau (25) | Holarctic species recorded from sparse localities in Europe and North America (McInnes 1994). |
| 30 <i>D.(D.) trachydorsatum</i> (Bartoș, 1937) | 15 | Snagov (18); Sinaia(23); Predeal(8) | European species (McInnes 1994). |
| 31 <i>Diploechinusus altonnae</i> (Richters, 1903) | 15 | Călimani and Suhard Mts. (6, 13, 19, 25); Coșna, Poiana Stampii (25) | Holarctic with a single non-Holarctic locality in Australia (McInnes 1994). |
| 32 <i>Doriphoribius evelinae</i> (Marcus, 1928) | 15 | Sinaia (23); Predeal (8) | Species with disjunct distribution (McInnes 1994). |
| 33 <i>Echiniscoides sigismundi sigismundi</i> (M. Schulze, 1865) | 15 | Constanța, Agigea and Mangalia (12) | Marine species. Up to now considered as a cosmopolitan species, but new molecular data have questioned cosmopolitanism in the genus <i>Echiniscoides</i> (Faurby et al. 2012). |
| 34 <i>Echiniscus arctomyx</i> Ehrenberg, 1853 | 15 | Retezat Mts. (16); Inău Mts. (19) | Cosmopolitan (McInnes 1994), but authors think that majority of records needs to be verified, as it is believed to be a species complex. |
| 35 <i>E. bisetosus</i> Hämis, 1908 | 15 | Inău-Cărlibaba (19); Rarău-Giuamalau and Câmpulung Moldovenesc (25) | Holarctic (McInnes 1994). |
| 36 <i>E. blumi</i> blumi Richters, 1903 | 9, 10, 15 | Vatra Dornei (25); Fântânele (6); Pietrosul Mt. (6, 19); Retezat Mts. (16) | Cosmopolitan (McInnes 1994). |
| 37 <i>E. canadensis</i> Murray, 1910 | 10, 15 | Blaj (1); Călimani Mts. (6, 15, 21, 25); Pietrosul Mt.(6, 19); Retezat Mts. (16), Giuamalau-Rarău Mts. (25) | Holarctic, with several localities in other zoogeographic realms (McInnes 1994). |
| 38 <i>E. glaber</i> Bartoș, 1937 | 15 | Doljoman and Jurilofca, near to Razim Lake (26) | Known only from Bulgaria and Romania (McInnes 1994). |
| 39 <i>E. granulatus</i> (Doyère, 1840) | 9, 10, 11, 15, 18 | Coșna and Poiana Stampii (25); Cluj (11); Rarău-Giuamalau Mts. (25); Ceahlău Mt. (22) | Palaearctic, with a few localities in other zoogeographic realms (McInnes 1994). |
| 40 <i>E. lapponicus</i> Thulin, 1911 | 10, 15 | Călimani Mts. (6, 15, 21, 25); Pietrosul Mt., Inău Mts (19); Rarău-Giuamalau (25) | Probably Palaearctic. Known mainly from Europe and a single locality in Japan (McInnes 1994). |
| 41 <i>E. laterospinosus</i> Rudescu, 1964 | 15 | Retezat Mts. (16) | Known only from Romania and Scotland (McInnes 1994). |
| 42 <i>E. loxophthalmus</i> Richters, 1911 | 15 | Retezat Mts. (16); Giuamalau Mt. (25) | Species with disjunct distribution. Known only from Europe and South America (McInnes 1994). |
| 43 <i>E. mediantus</i> Marcus, 1930 | 15 | Retezat Mts. (16) | Palaearctic with a single non-Palaearctic locality on Greenland (McInnes 1994). |
| 44 <i>E. merokensis merokensis</i> Richters, 1904 | 6, 10, 15 | Rodnei (6, 19); Retezat Mts. (16); Pietrosul Mt. (19); Sinaia (23); Vatra Dornei(25) | Holarctic with a single non-Holarctic locality in South America (McInnes 1994). |
| 45 <i>E. merokensis suecicus</i> Thulin, 1911 | 11 | Negoitu Peak- Făgăraș Mts. (2) | Palaearctic with a single non-Palaearctic locality on Greenland (McInnes 1994). |
| 46 <i>E. quadrispinosus quadrispinosus</i> Richters, 1902 | 10, 11 | Pietrosul Mt. (6, 19); Lomb Forest, Valea Popii (11); Retezat Mts. (16); Rarău-Giuamalau (25) | Probably cosmopolitan (McInnes 1994). |
| 47 <i>E. q. brachyspinosus</i> Bartoș, 1934 | 15 | Retezat Mts (16) | Subspecies with disjunct distribution, known from few localities throughout the world (McInnes 1994). |
| 48 <i>E. q. cribrosus</i> Murray, 1907 | 15 | Retezat Mts. (16); Rarău-Giuamalau Mts. (25) | Holarctic (McInnes 1994). |

| No. Species/subspecies | Source | Localities | Remarks |
|---|-------------------------|---|---|
| 49 <i>E. q. fissispinosa</i> Murray, 1907 | 15 | Retezat Mts. (16); Rarău-Giumalău Mts. (25) | Holarctic (McInnes 1994). |
| 50 <i>E. reticulatus</i> Murray, 1905 | 15 | Poiana Stampii (25) | Palaearctic, with a single localities in other zoogeographic realms (McInnes 1994). |
| 51 <i>E. simba</i> Marcus, 1928 | 15 | Sinaia (23); Câmpulung Moldovenesc (25) | Palaearctic (McInnes 1994). |
| 52 <i>E. spiniger</i> Richters, 1904 | 15 | Retezat Mts. (16); Rarău-Giumalău Mts., Câmpulung Moldovenesc (25) | Species with rather disjunct distribution (McInnes 1994). |
| 53 <i>E. spinulosus</i> (Doyère, 1840) | 15 | Retezat Mts. (16); Inău (19); Ceahlău (22); Sinaia (23); Rarău-Giumalău (25) | Palaearctic with a single localities in other zoogeographic realms (McInnes 1994). |
| 54 <i>E. storkani</i> Bartoš, 1940 | 15 | Rarău-Giumalău Mts. and Câmpulung Moldovenesc (25) | Known only from Europe (McInnes 1994). |
| 55 <i>E. testudo</i> (Doyère, 1840) | 1*, 14*, 15 | Cluj (11); Retezat Mts. (16); Sinaia (23); Predeal (8); Iurilofca (26); Băile Harghita, Vârghiș (13); Câmpulung Moldovenesc (25) | Holarctic (McInnes 1994, Jørgensen et al. 2007). |
| 56 <i>E. trisetosus</i> Cuénot, 1932 | 11, 14*, 15 | Blaj (1); Dealul Peana, Muntele Mare (11); Retezat-Giumalău Mts. (25) | Holarctic (McInnes 1994). |
| 57 <i>E. viridissimus</i> Péterfi, 1956 | 15 | Giălăului Mts. (11) | Species with rather disjunct distribution, known from Europe, North and South America and probably also from Asia (Plato et al. 2007). |
| 58 <i>E. wendli</i> Richters, 1903 | 11, 15 | Pietrosul Mt. (6, 19); Bălea Lake (24) | Cosmopolitan (McInnes 1994). |
| 59 <i>Halechinctus gutteli</i> Richters, 1908 | 15 | Constanța and Mangalia (12) | Marine species. |
| 60 <i>Halobiotus stenotomus</i> (Richters 1908) | 15 | Constanța, Mamaia and Chituc (12) | Marine species reported from Baltic and North Seas (McInnes 1994). |
| 61 <i>Hebesunctus conjungens</i> (Thulin, 1911) | 9, 10 | Pietrosul Mt. (6, 19); Poiana Stampii (25) | Holarctic with a few non-Holarctic localities throughout the world (McInnes 1994). |
| 62 <i>Hypsibius arcticus</i> (Murray, 1907) | 15 | Retezat Mts. (16) | Dastych (1991) suggested that the status of <i>H. arcticus</i> should be verified due to insufficient morphological information. |
| 63 <i>H. calcaratus</i> Bartoš, 1935 | 15 | Bucegi Mts. (8, 13, 22) | Holarctic (McInnes 1994). |
| 64 <i>H. convergens</i> (Urbanowicz, 1925) | 9, 11, 14*, 15 | Odothei, Tușnad and Miercurea Ciuc (15); Sinaia(23); Predeal(8); Vatra Dornei (25); Fântânele (6); Muntele Mare, Bălea Valley, Stâna de Vale(11); Orșova (20); Giumalău(25); Negoitu Peak (2); | The nominal species for a cosmopolitan species complex (McInnes 1994), but the majority of records of this species needs to be verified (Kaczmarek & Michalczuk 2009a). |
| 65 <i>H. diujardini</i> (Doyère, 1838) | 6, 10, 12*, 14*, 15, 18 | Peștera Dimbovicioara and Moldoveanu Peak (2); Pietrosul Mt. (6, 19); Muntele Mare (11); Onu Peak (14); Prundu Bărgăului (19); Bălea Lake (24); Poiana Stampii(25); Sinaia(23); Predeal(8); Corbii Ciungi (18); Zagon (13) Ceahlău Mt. (22) | This species belongs to the <i>convergens-dujardini</i> complex of species, which is cosmopolitan (McInnes 1994, Miller et al. 2005). |
| 66 <i>H. hypostomus</i> Bartoš, 1935 | 10, 14*, 15 | Ghimeș and Faget (4); Miercurea Ciuc (15); | Known only from few localities in Europe (McInnes 1994). |

| No. Species/ subspecies | Source | Localities | Remarks |
|--|-----------------|--|--|
| | | Retezat Mts. (16); Pietrosul Mt. (6, 19) | |
| 67. <i>H. microps</i> Thulin, 1928 | 15 | Moldoveanu Peak (2); Omu Peak (14); Retezat Mts. (16) | Cosmopolitan (McInnes 1994), but see also the comments on <i>H. conrvergens</i> . |
| 68. <i>H. montanus</i> Iharos, 1940 | 10, 15 | Pietrosul Mt. (6, 19) | Known only from type locality in Carpathians as <i>H. ilharosi</i> (McInnes 1994). |
| 69. <i>H. pallidus</i> Thulin, 1911 | 10, 14*, 15, 18 | Pietrosul Mt. (6, 19); Tugnad, Sântdominic (15); Retezat Mts. (16); Inău Mt. (19); Sovata (21); Ceahlău Mt. (22) | Cosmopolitan (McInnes 1994), but see also the comments on <i>H. conrvergens</i> . |
| 70. <i>H. scabropygus</i> Cuénot, 1929 | 10, 18 | Pietrosul Mt. (6, 19); Ceahlău Mt. (22) | Palaearctic, with few non-Palaearctic localities (McInnes 1994). |
| 71. <i>Ischiopsibius</i> . <i>annulatus</i> (Murray, 1905) | 9 | Poiana Stampii (25) | Probably cosmopolitan (McInnes 1994). |
| 72. <i>I. a. minor</i> (Ramazzotti 1945) | 9, 15 | Retezat Mts. (16) | Known only from few localities in Europe (McInnes 1994). |
| 73. <i>I. arcuatus</i> (Bartoš, 1934) | 15 | Sinaia Mt. (23) | Rudescu (1964) found only one specimen (which was lost), and the presence of this species in Romania needs confirmation. Species known only from Hungary and from Slovakia (McInnes 1994, Degna 1997). |
| 74. <i>I. asper</i> (Murray, 1906) | 15 | Doniceasca Lambrinoasă (25) | Known from few disjunct localities (McInnes 1994). According to Dastych (1988) the presence of this species in Europe requires confirmation. |
| 75. <i>I. granulifer granulifer</i> Thulin, 1928 | 15 | Retezat Mts. (16); Vatra Dornei and Giumalău-Rarău (25) | Holarctic with a single non-Holarctic locality in Brazil (McInnes 1994). |
| 76. <i>I. hadzii</i> (Mihelčić, 1938) | 15 | Caraiman (14); Giumalău Mt. (25) | Known only from few localities in Europe (McInnes 1994). |
| 77. <i>I. montanus</i> Mihelčić, 1938 | 15 | Oșova and Turnu Severin (20); Moldoveanu Peak (2) | Known only from few localities in Europe (McInnes 1994). |
| 78. <i>I. nodosus</i> (Murray, 1907) | 10, 15 | Pietrosul Mt. (6, 19); Sinaia (23); Predeal (8); Giumalău-Rarău Mts. (23) | Known from many disjunct localities throughout the world (McInnes 1994). |
| 79. <i>I. papilifer papilifer</i> (Murray, 1905) | 10 | Pietrosul Mt. (6, 19); Giumalău Mt., Vatra Dornei (25) | Known from many disjunct localities throughout the world (McInnes 1994). |
| 80. <i>I. p. bulbosus</i> (Marcus 1928) | 9 | Poiana Stampii (25) | Known mainly from Europe and two localities in Asia and South America (McInnes 1994). |
| 81. <i>I. prosostomus prosostomus</i> | 11, 15, 16, 18 | Făget Forrest (11); Maramureș Mts, Vișeu de Sus and the Mihoia Valley (19); Sinaia (23); Predeal (8); Ceahlău Mt. (22) | Cosmopolitan (McInnes 1994), but authors think that it needs a redescription. |
| 82. <i>I. satleri</i> (Richters 1902) | 15 | Muntele Mare (11); Sinaia (23); Predeal (8), Rarău-Giumalău (25) | Cosmopolitan (McInnes 1994). |
| 83. <i>I. schaudinni</i> (Richters, 1909) | 10, 11, 14*, 15 | Bistrița (6); Mănăsturelului Forrest, Cluj (11); Miercurea Ciuc (15); Băjanii Mari (13); Valea Prahovei (23) | Holarctic, with few non-Holarctic localities (McInnes 1994). |
| 84. <i>I. tetradactyloides</i> (Richters, 1907) | 14*, 15 | Retezat Mts. (16); Sinaia Mt. (23); Giumalău- | Holarctic, with few non-Holarctic localities (McInnes 1994). |

| No. Species/subspecies | Source | Localities | Remarks |
|--|-----------------------|--|---|
| | | Rarău (25); Becaș (15) | |
| 85. <i>I. tuberculatus</i> (Plate, 1888) | 15 | Retezat Mts. (16); Sinaia (23); Predeal (8); Vatra Dornei (25) | Holarctic, with a few localities in other zoogeographic realms (McInnes 1994). According to Dastych (1988) species ought to be considered as species <i>duhin</i> et <i>inquirenda</i> . |
| 86. <i>I. vejidoskiji</i> (Bartos, 1939) | 14* | Sovata (21); Sinaia (23) | Known only from type locality in Carpathians (McInnes 1994). |
| 87. <i>I. verrucosus</i> (Della Valle, 1915) | 15 | Babadag (26) | Known from few disjunct localities as <i>I. gibbus</i> (Marcus, 1928; McInnes 1994). |
| 88. <i>Macrobrotius arthroparyngis</i> Iharos, 1940 | 15 | Bistrița (6); Retezat Mts. (16) | Known only from Hungary and Romania (McInnes 1994). According to Degma (2013) this species should be probably attributed to the genus <i>Miniobrotus</i> , but this statement needs verification, and we decided to cite it temporarily as <i>Macrobrotus</i> . |
| 89. <i>M. echinogenitus</i> Richters, 1903 | 11, 15 | Negoiu Peak (2); Omu Peak (14); Retezat Mts. (16); Sinaia, Predeal Mts. (23); Poiana Stampii and Vatra Dornei (25); | The presence of this species in Romania needs to be confirmed. For more details see Maucci (1986) and Binda (1988). |
| 90. <i>Macrobrotius fusciger</i> Murray, 1907 | 11, 15 | Făget, Călfan Lake (11); Rarău-Giumalău Mts. (25); Sinaia (23); Predeal (8) | Probably cosmopolitan species (Dastych 1984), but according to Binda et al. (2005) more than one species was attributed for this name in the past. The presence of this species in Romania requires confirmation. |
| 91. <i>M. grandis</i> Richters, 1911 | 9 | Poiana Stampii (25) | Palaearctic (McInnes 1994). |
| 92. <i>M. harmsworthii</i> Murray, 1907 | 4, 6, 10, 13*, 15, 18 | Bucegi Mts. (8, 13, 22); Băile Herculane (10); Sântdominic (15); Sovata (21); Bălea Lake (24); Vatra Dornei, Poiana Stampii (25); Ceahlău Mt. (22) | The nominal species for a cosmopolitan species complex (McInnes 1994), but the species' geographic range is unknown (see also Kaczmarek et al. 2011). |
| 93. <i>M. hufelandi hufelandi</i> C.A.S. Schultz, 1834 | 6, 11, 14*, 16, 18 | Negoiu Peak and Moldoveanu Peak (2); Marghita (5); Muntele Mare, Ceaba (11); Omu Peak and Caraiman (14); Tușnad, Miercurea Ciuc, Odorhei, Sântdominic, Baile Homorod, Baile Harghita, Becaș and Plăieși (15); the Mihoia Valley, Maramureș Mts., Vișeu de Sus Inău, Pietrosul Mt. (19); Orșova and Turnu-Severin (20); Stănceni and Sovata (21); Sinaia (23); Retezat Mts. (16) Rarău-Giumalău Mts. (25); Juriilca-Doljoman (26) | The nominal species for a cosmopolitan species complex (McInnes 1994), but the species' geographic range is unknown. |
| 94. <i>M. islandicus islandicus</i> Richters, 1904 | 9, 15 | Retezat Mts. (16); Poiana Stampii (25) | Holarctic (McInnes 1994), but authors think that all non-holarctic records have to be confirmed. |
| 95. <i>M. montanus</i> Murray, 1910 | 10, 14*, 15 | Hășmașu Mare (15); Deva, Simeria and Iliia (16); Pietrosul Mt. (6, 19); Sovata (21), Sinaia (23); Predeal (8) | Holarctic, with few non-Holarctic localities (McInnes 1994). |

| No. Species/ subspecies | Source | Localities | Remarks |
|--|--------------------------------|--|---|
| 96. <i>M. occidentalis occidentalis</i> Murray, 1910 | 15 | Retezat Mts. (16), Inău (19); Rarău-Giumalău Mts. (25) | Cosmopolitan (McInnes 1994). |
| 97. <i>M. ovidii</i> Bartoš, 1937 | 15 | Doljman-Jurilofca, Enisala and Razim Lake area (26) | Known only from Bulgaria and Romania (McInnes 1994). |
| 98. <i>M. recens</i> Cuénot 1932 | 15 | Jurilofca-Doljman and Măcinului Mts. (26) | Palaearctic, with a few localities in other zoogeographic realms (McInnes 1994). |
| 99. <i>M. virgatus</i> Murray, 1910 | 15 | Retezat Mts. (16) | Known from disjunct localities (McInnes 1994). |
| 100. <i>Mesochista marculsi</i> (Rudescu, 1964) | 15 | Sinaia (23); Predeal (8); Giumalău-Rarău (25) | Known from Austria, Poland and Romania (McInnes 1994). |
| 101. <i>M. spitsbergense</i> (Richters, 1903) | 10, 14*, 15 | Călimani Mts. (6, 13, 19, 25), Rodnei Mts., Pietrosul Mt. (6, 19); Retezat Mts (16); Caraiman (14); Sovata (21); Odorhei (15) Ceahlău Mt. (22) | Holarctic (McInnes 1994). |
| 102. <i>Milnesium asiaticum</i> Tumanov, 2006 | 18 | Ceahlău Mt. (22) | Previously known only from two localities in Kyrgyzstan (Tumanov, 2006) and Spitsbergen (Kaczmarek et al. 2012b). |
| 103. <i>Milnesium granulatum</i> (Ramazzotti, 1962) | 18 | Ceahlău Mt. (22) | Previously known only from two localities in Chile and Italy (McInnes 1994). All records of <i>M. granulatum</i> are based solely on morphological traits, but if molecular data reveal great and discontinuous genetic variance between different populations of this taxon (Chile, Italy, Romania), the current opinion that the same species inhabiting different zoogeographical realms may be refuted in favour of a species complex hypothesis (Michalczuk et al. 2012a). |
| 104. <i>Milnesium</i> sp. | 3*, 6, 7, 10, 11, 13*, 14*, 15 | Negoiu Peak and Moldoveanu Peak (2); Fântânele (6); Pietrosul Mt. (6, 19); Băile Herculeane (10); Muntele Mare and Gîlău (11); Omul Peak, Caraiman (14); Sântdominic and Tușnad (15); Băneasa (18); Orșova (20); Vatra Dornei, Poiana Stampii and Giumalău-Rarău Rarău (25); Măcin Mts. (26) | Cited as <i>Milnesium tardigradum</i> , but all records prior to its redescription (Michalczuk et al. 2012a,b) should be verified and cited as <i>Milnesium</i> sp. |
| 105. <i>Minibiothus aculeatus</i> (Murray, 1910) | 15 | Retezat Mts. (16) | Rudescu (1964) reported only an egg of this species which was found by him in 1948. In this situation the presence of this taxon in Romania needs confirmation. Species known from few disjunct localities (McInnes 1994). Known from many localities throughout the world (McInnes 1994). |
| 106. <i>M. furcatus</i> (Ehrenberg, 1859) | 15 | Retezat Mts. (16); Giumalău Mt. (25); Sinaia (23) | |
| 107. <i>M. intermedius</i> (Plate, 1888) | 6, 11, 14, 15, 18 | Poiana Stampii (25), Bălea Lake (24), Munții Giulaului (11), Răcățeau Valley (5), Ineu (3), Miercurea Ciuc (15), Sinaia (23), Predeal (8), Retezat Mts. (16); Ceahlău Mt. (22) | <i>Minibiothus intermedius</i> used to be considered cosmopolitan, but according to more modern taxonomy it is probably a species complex (Claxton 1998). |
| 108. <i>Murrayon hastatus</i> (Murray, 1907) | 6 | Poiana Stampii (25) | Palaearctic, with few non-Palaearctic localities (McInnes 1994). |
| 109. <i>M. hibernicus</i> (Murray, 1911) | 15 | Sinaia (23); Predeal (8); Gura Humorului and Câmpulung Moldovenesc (25) | Holarctic (McInnes 1994). |

| No. Species/subspecies | Source | Localities | Remarks |
|--|------------------------|---|--|
| 110 <i>M. pullari</i> (Murray, 1907) | 6, 15 | Retezat Mts. (16); Coșna, Poiana Stampii, Siret river (25) | Holarctic, with few non-Holarctic localities (McInnes 1994). |
| 111 <i>Paramacrobiotus areolatus</i> (Murray, 1907) | 15 | Inău Mts (19); Poiana Stampii, Rarău-Giumalău (25); Sinaia (23); Preddeal (8) | The nominal species for a cosmopolitan species complex (McInnes 1994), but the species' geographic range is unknown. |
| 112 <i>P. richtersi</i> (Murray, 1911) | 8, 14*, 15 | Cașin (4); Ilva Mare (6); Retezat Mts. (16); Sovata (21); Rarău-Giumalău (25); Cașin (13) Plăieși (15) | The nominal species for a cosmopolitan species complex (McInnes 1994), but the species' geographic range is unknown. |
| 113 <i>Parechiniscus chitonides</i> Cuénot, 1926 | 15 | Pietrosul Mt. (6, 19); Deva, Retezat Mts. (16); Sinaia Mts. (23); Câmpulung Moldovenesc and Gura Humorului (25); Măcin (26) | Palaearctic (McInnes 1994). |
| 114 <i>Platicristia angustata</i> (Murray, 1905) | 9 | Coșna (25) | Holarctic, with single non-Holarctic locality in Argentina (McInnes 1994). |
| 115 <i>Pseudochiniscus conifer</i> (Richters, 1904) | 15 | Giumalău Mt. (25) | Rudescu (1964) found only one specimen (which was lost), and the presence of this species in Romania needs confirmation. Species known only from a few European localities (McInnes 1994). |
| 116 <i>P. dicrani</i> Mihelčić, 1938 | 15 | Inău Mts. (19); Orșova (20) | Known only from a few localities in Europe (McInnes 1994). |
| 117 <i>P. islandicus</i> (Richters, 1904) | 15 | Retezat Mts. (16) | Rare, probably holarctic species (McInnes 1994). |
| 118 <i>P. novaezealandiae marinae</i> Bartoš, 1934 | 15 | Rarău-Giumalău Mts (25) | Known from few disjunct localities (McInnes 1994). |
| 119 <i>P. suillus</i> (Ehrenberg, 1853) | 6, 11, 13*, 14*, 15 | Pietrosul Mt. (6, 19); Harghita (15); Corbii Ciungi (18); Sovata (21); Sinaia (23); Preddeal (8); Vatra Dornei (25) | The nominal species for a cosmopolitan species complex (McInnes 1994), but the species' geographic range is unknown. |
| 120 <i>P. transsylvanicus</i> Iharos, 1936 | 5, 15 | Retezat Mts. (16) | Known only from type locality in Carpathians (McInnes 1994). |
| 121 <i>P. victor</i> (Ehrenberg, 1853) | 15 | Retezat Mts. (16) | Holarctic (McInnes 1994). |
| 122 <i>Pseudobiotus megalonyx</i> (Thulin, 1928) | 15 | Snağov Lake (18); Vatra Dornei (25); Danube Delta (26) | Probably cosmopolitan (McInnes 1994), but according to Bertolani et al. (1999) it is actually not possible to state which records refer to the true <i>P. megalonyx</i> . |
| 123 <i>Ramazotius novemcinctus</i> (Marcus, 1936) | 15 | Băneasa (18); Măcin Mts., Babadag Enisala (26) | Palaearctic (McInnes 1994). |
| 124 <i>R. oberhauseri</i> (Doyère, 1840) | 6, 10, 11, 14*, 15, 18 | Blaj (1); Peștera Dâmbovicioara (2); Ilva Mare (6); Cluj (11); Inău (19); Ceahlău Mt. (22) | Cosmopolitan, but the majority of older records need to be confirmed (McInnes 1994). |
| 125 <i>Richtersius coronifer</i> (Richters, 1903) | 9, 10, 11, 15 | Pietrosul Mt. (6, 19); Sinaia (23); Preddeal (8); Vatra Dornei (25); Fântânele, Bălea Valley (11) | Palaearctic, but known also from a few non-Palaearctic localities (McInnes 1994), but those need to be verified as this could be another species complex. |
| 126 <i>Testchiniscus spitsbergensis</i> (Scourfield, 1897) | 15, 18 | Retezat Mts. (16); Gutinului Mts. (19); Rarău-Giumalău Mts. (25); Ceahlău Mt. (22) | Holarctic (McInnes 1994). |
| 127 <i>Thuliniscus augusti</i> (Murray, 1907) | 6, 15 | Retezat Mts. (16); Poiana Stampii and Coșna (25) | Probably cosmopolitan (McInnes 1994), but according to Bertolani et al. (1999) it is actually not possible to state which records refer to the true <i>T. augusti</i> . |