

NEW RECORDS AND RARE SPECIES OF COLLEMBOLA FOR THE ROMANIAN FAUNA (LEAOTA MASSIF, SOUTHERN CARPATHIANS)

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Abstract. The authors present two Collembola species collected from the Leaota Massif, Southern Carpathians (*Deuteraphorura cebennaria* (Gisin, 1956) and *Pygmarrhopalites cochlearifer* (Gisin, 1947)), which are reported as new for the Romanian fauna. Also, other two species (*Isotomurus fucicolus* (Reuter, 1891) and *Desoria tigrina* Nicolet, 1842) are considered rare, being recorded for the second time in the collembolan fauna of Romania.

Key words: Collembola, Leaota Massif, Romania, new records.

1. INTRODUCTION

In the Southern Carpathians of Romania, the Leaota massif lies between the Bucegi and Piatra Craiului massifs. This area represents a corridor between the the Bucegi and Piatra Craiului National Parks and the corresponding Natura 2000 sites. The collembolan fauna from the Piatra Craiului National Park is rather fairly known, thanks to the recent studies conducted by GRUIA AND POPA (2005), NAE *et al.* (2005), POPA AND GRUIA (2006) and POPA (2009, 2010). As a result of these studies, a total of 87 species of Collembola were identified from different types of habitats: caves, mesovoid shallow substratum (MSS) and soil (edaphic).

Until now, there were no studies concerning the collembolan fauna from the Leaota Massif. Our study on the MSS and soil habitats revealed two new species of Collembola for the Romanian fauna and other two species recorded for the second time. Therefore, this study indicates that other interesting results might be expected from this area.

2. MATERIAL AND METHODS

Between July 2014 and April 2015, in the Leaota massif we conducted a study concerning the arthropod fauna from the soil (edaphic) and the mesovoid shallow substratum (MSS). The faunal samples from mesovoid shallow substratum were collected using drillings of 0.50 m, 0.75 m and 1 m in depth. On the bottom of each drilling, a Barber trap with olfactory attractant and ethylene glycol was placed. The traps were verified and replaced monthly and the specimens were

transferred and preserved in 70% ethyl alcohol. The traps replaced in December 2014 were left over the winter, and they were collected in April 2015.

For sampling the soil fauna, we used Barber traps with olfactory attractant and ethyl alcohol. The traps were placed monthly and were emptied after 8-9 days. The specimens were transferred and preserved in 70% ethyl alcohol.

The sampling stations are:

● **Station I**

Habitat type: mixed forest of beech and coniferous trees, on crystalline schists substratum.

– Five pitfall traps (Barber) were placed in this sector: B1 - B5, coordinates 45°22'18,1" N, 25°15'57,2"E, altitude 1060 m.

● **Station II**

Three drillings (in MSS) were placed in this sector, as follows:

– S1 at 1 m in depth, coordinates 45°22'43.0"N, 25°13'49.4"E, altitude 879 m. The habitat is characterised by semi-mobile calcareous scree, partially covered by vegetation.

– S2 at 0.75 m in depth, coordinates 45°22'43.1"N, 25°13'49.2"E, altitude 883 m. The habitat is characterised by mobile calcareous scree, nude.

– S3 at 0.5 m in depth, coordinates 45°22'42.7"N, 25°13'49.3"E, altitude 860 m. The investigated habitat is fixed calcareous scree situated in a mixed forest (deciduous and coniferous trees).

● **Station III**

Habitat type: mixed forest of beech and coniferous trees, on a fixed calcareous scree substratum.

– Five pitfall traps (Barber) were placed in this sector: B1 - B5, coordinates 45°24'29.4"N, 25°15'50.2"E, altitude 985 m.

3. RESULTS AND DISCUSSIONS

Taking into consideration that the faunistic material of Collembola of the Leaota massif was not entirely identified as the studies still continues, we present here two new records of Collembola for the Romanian fauna and other two species which are considered rare.

Deuteraphorura cebennaria (Gisin, 1956) (Figs. 1–3)

Material examined. A total of 20 adult specimens were collected, as follows: 7 specimens, Station II S3, 04.08.-04.09.2014, leg. L. Dorobăț; 6 specimens, Station II S3, 05.12.2014-09.04.2015, leg. L. Dorobăț; 5 specimens, Station II S1, 05.11.2014-02.12.2015, leg. L. Dorobăț; 2 specimens, Station II S2, 05.12.2014-09.04.2015, leg. L. Dorobăț.

The length of the identified specimens (without antennae) varies between 2.16 – 2.40 mm. Colour: white (Fig. 1). Length of antennae: head diagonal = 0.94. Pseudocelli dorsal: 32/133/33354, ventral: 3/011/3212. Claw without teeth on inner edge and with strong, distinct lateral teeth (Fig. 2). In the description given by GREENSLADE *et al.*, 2012, the lateral teeth on the claw vary (weak at some specimens, conspicuous at others). Empodial appendage with no basal lamella, as long as the inner edge of the claw (Fig. 3). Other morphological characters present in our specimens fit well to the descriptions and illustrations given by POMORSKI, 1998 and FJELLBERG, 1998.

This is the first record of *Deuteraphorura cebennaria* (Gisin, 1956) for the Romanian fauna. According to POMORSKI, 1998, this bisexual species lives chiefly in caves, being collected, also, from gravel in river gorge. FJELLBERG, 1998 reported the species from deep, rich soil in deciduous forests. We have found twenty adult specimens in MSS drillings, at 0.5 – 1 m in depth.

General distribution: Palaearctic.

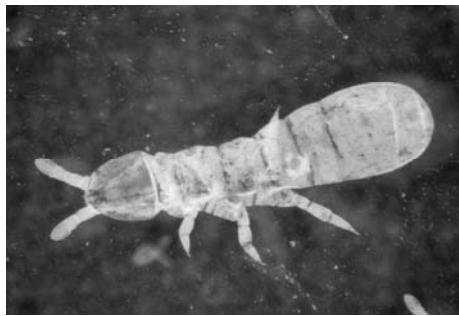


Fig. 1. *Deuteraphorura cebennaria* (Gisin, 1956): 1 – Habitus (Photo by E. Nitzu).

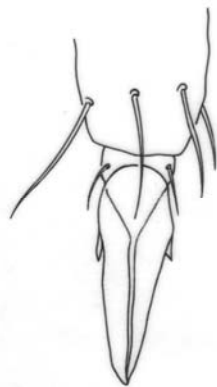


Fig. 2 *Deuteraphorura cebennaria* (Gisin, 1956): claw III dorsal (scale bar 0.08 mm).



Fig. 3 *Deuteraphorura cebennaria* (Gisin, 1956): claw II lateral (scale bar 0.08 mm).

Pygmarrhopalites cochlearifer (Gisin, 1947) (Figs. 4, 5)

Material examined. Three adult specimens were collected: Station I B1, 15–24.07.2014 (one specimen); Station I B3, 24.07.-04.08.2014 (one specimen); Station I B4, 04-16.08.2014 (one specimen), leg. L. Dorobăț.



Fig. 4. *Pygmarrhopalites cochlearifer* (Gisin, 1947): Head apex with 4 + 4 heavy spines. (scale bar 0.25 mm).

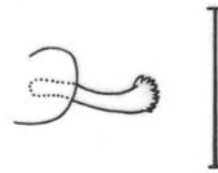


Fig. 5. *Pygmarrhopalites cochlearifer* (Gisin, 1947): subanal appendage. (scale bar 0.04 mm).

The specimens have a body length between 0.64 – 0.80 mm. One specimen is pale grey colored, the other two specimens are pale yellow. Length of antennae: head diagonal = 1.7. Dens : mucro = 1.4 – 1.6. Dens with 2 outer spines. 1 + 1 unpigmented ommatidia. Antenna IV with 6 subsegments. The species is very close to *Pygmarrhopalites principalis* Stach, 1945, on which differs in 4 + 4 heavy spines on the head apex (unlike 6 + 6 moderately thickened spines in *P. principalis*) (Fig. 4) and a straight, spoonlike subanal appendages (unlike a branched, feathered subanal appendages in *P. principalis*) (Fig. 5). Circumanal setae not winged.

This is the first record of *Pygmarrhopalites cochlearifer* (Gisin, 1947) for the Romanian fauna. According to BRETTFELD, 1999, the species lives in damp litter and bogs from the plains up to 2000 m. We have found three adult specimens, in a mixed forest of beech and coniferous (pitfall traps), at 1060 m altitude.

General distribution: Palaearctic.

Isotomurus fucicolus (Reuter, 1891) (Fig. 6)

Material examined. Four adult specimens were collected in Station III B1, 08 – 17.04.2015, leg. L. Dorobăț.

Isotomurus fucicolus (Reuter, 1891) was reported as *Isotomurus palustris* var. *fucicola* by J. STACH, 1929, from Hodod, Satu-Mare county. We have identified four specimens, with a body length between 1.8 – 2 mm. The antennae are slightly darker than rest of the body, as well as the neck region and a dark blue mid-dorsal stain is present between the eyes (Fig. 6).

According to FJELLBERG, 2007, the species apparently prefers wet habitats along the shores of lakes and rivers. We collected four specimens (pitfall trap) in a

mixed forest of beech and coniferous, at 985 m altitude. Therefore, we confirm here the presence of *Isotomurus fucicolus* (Reuter, 1891) in the Romanian fauna.

General distribution: Palaearctic.



Fig. 6. *Isotomurus fucicolus* (Reuter, 1891) (Photo by E. Nitzu).

Desoria tigrina Nicolet, 1842 (Fig. 7)

Material examined. Nine adult specimens were collected: one specimen, Station I B1, 15 – 24.07.2014, leg. L. Dorobăț; 5 specimens, Station III B2, 15 – 24.07.2014, leg. L. Dorobăț; 3 specimens, Station III B5, 15– 24.07.2014, leg. L. Dorobăț.

Desoria tigrina Nicolet, 1842 was reported for the first time in the Romanian fauna by BUȘMACHIU *et al.*, 2014, from Codrul Secular Giupalau, Eastern Carpathians.

This is the second record of this species for the Romanian fauna. The identified specimens have a body length between 1.6 – 2 mm, uniformly pale grey colored (Fig. 7).

According to FJELLBERG, 2007, *Desoria tigrina* is a common species in compost and other organic debris.

General distribution: Palaearctic.

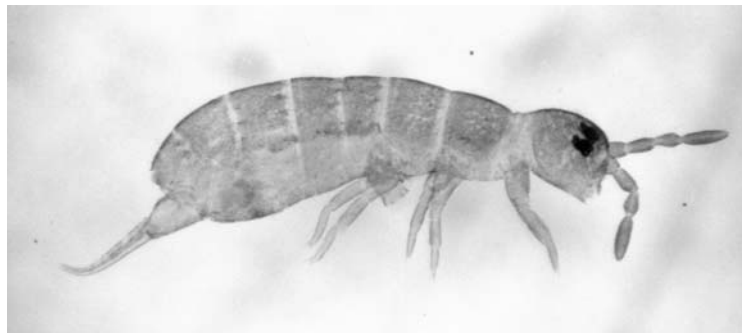


Fig. 7. *Desoria tigrina* Nicolet, 1842 (Photo by E. Nitzu).

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