TWO NEW RECORDS OF SPRINGTAILS (HEXAPODA: COLLEMBOLA) FOR THE ROMANIAN FAUNA – MARAMUREŞ COUNTY

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Abstract. The author presents data about the collembolan species collected from the Maramureş County. Forty-three species of springtails were identified. Among them, *Caprainea bremondi* Dallai, 1972 and *Sminthurinus reticulatus* Cassagnau, 1964 are recorded for the first time for the Romanian fauna.

Key words: Collembola, Maramureş County, Romania, new records.

1. INTRODUCTION

The studies concerning the Collembola from the Maramureş County are recent (DANYI *et al*., 2006; DANYI and TRASER, 2008). The first paper on the fauna of springtails of Maramureş (DANYI *et al*., 2006) records of 67 species. The second one (DANYI and TRASER, 2008) added further 10 species to this list. Among these 77 species of Collembola, 9 species are new for the Romanian fauna and 3 species are new to the science.

Our study resulted in several new faunistic records to the area and two new records for the fauna of Romania. The first Romanian records of *Caprainea bremondi* Dallai, 1972 and *Sminthurinus reticulatus* Cassagnau, 1964 are presented here.

The collembolan fauna from the Maramureş County is represented by a relatively low number of species (77). Therefore, our aim was to better evaluate the collembolan fauna in this area. Finding the two new species for the Romanian fauna indicated that other interesting results might be expected from further studies in this area.

2. MATERIAL AND METHODS

Our study was carried out in May 2009. The specimens were captured using Barber traps (9 pitfall traps with olfactory attractant and ethyl alcohol). The traps were emptied after 4 days (27–30.05.2009) and the specimens were transferred in 70% ethyl alcohol.

The faunistic material was collected by a research team consists of dr. E. Nitzu, dr. I. Popa and dr. A. Nae ("Emil Racovita" Institute of Speleology of Romanian Academy).

The sampling sites are:

● Station 1 – Solovan Hill

The Solovan Hill is situated close to the south part of the Sighetu Marmației town. Phytogeographically, it is framed in Central-European province, Oriental Carpathians sub province, Oaş-Gutâi-Văratec Mountains circumscription, which includes the hillock level. It represents a connection area between the volcanic mountains and the Maramureş Depression. It is aligned on a SE-NV direction for approximately 10 km. The relief energy is 352 m (between 264 and 616 m). The Solovan Hill is formed by sedimentary rocks (grit stones, clay, conglomerates), generally with a horizontal orientation (http://www.marasilva.ro/AP22.php).

Six pitfall traps were placed in this sector, as follows:

- 47º 54' 7'' N, 23º 52' 6'' E, 414 m elevation, two pitfall traps;
- 47º 54' 4'' N, 23º 52' 8'' E, 565 m elevation, one pitfall trap;
- 47º 55' 0.4'' N, 23º 52' 53'' E, 328 m elevation, three pitfall traps.

● Station 2 – Gutin Forest

A *Fagus sylvatica* and *Picea abies* mixed forest situated in Sighetu Marmatiei town (47º 41' 59'' N, 23º 46' 57'' E, 888 m elevation). Three pitfall traps were placed in this sector.

3. RESULTS AND DISCUSSIONS

In this paper we used the systematics and taxonomy according to BELLINGER *et al.* (1996-2012). We identified 43 species of Collembola, belonging to 12 families and 28 genera. Among them, 25 species were collected from the Solovan Hill (St. I) and 24 species from the Gutin Forest (St. II). Only 6 species are common to both stations. (*Table 1*).

Table 1

The list of collembolan species

Species	St. I. Solovan Hill	St. II. Gutin Forest	General Distribution
Ord. Poduromorpha **Fam. Neanuridae** 1. *Pseudachorutes dubius* Krausbauer, 1898		+	Palaearctic
2. *Pseudachorutes palmiensis* Borner, 1903	+		Europe
3. *Pseudachorutes subcrassus* Tullberg, 1871	+		Europe

Species	St. I. Solovan Hill	St. II. Gutin Forest	General Distribution
4. *Thaumanura carolii* (Stach, 1920)	+		Europe
Fam. Brachystomellidae 5. *Brachystomella parvula* (Schaffer, 1896)	+		Cosmopolitan
Fam. Odontellidae 6. *Superodontella empodialis* (Stach, 1934)		+	Europe
7. *Xenyllodes armatus* Axelson, 1903		+	Holarctic
Fam. Hypogastruridae 8. *Ceratophysella granulata* Stach, 1949	+		Palaearctic
9. *Ceratophysella luteospina* (Stach, 1919)	+		Central and Eastern Europe
10. *Ceratophysella silvatica* Rusek, 1964		+	Europe, Carpathian Mts.
11. *Hypogastrura tullbergi* (Schaffer, 1900)	+		Holarctic
Fam. Onychiuridae 12. *Archaphorura serratotuberculata* (Stach, 1933)		+	Europe
13. *Protaphorura quadriocellata* (Gisin, 1947)		+	Europe
14. *Tetrodontophora bielanensis* (Waga, 1842)	+	+	Central Europe, Balkan Peninsula
Ord. Entomobryomorpha **Fam. Tomoceridae** 15.*Pogonognathellus flavescens* (Tullberg, 1871)	+	+	Holarctic
16. *Pogonognathellus longicornis* (Muller, 1776)	+		Palaearctic
17. *Tomocerus minor* (Lubbock, 1862)	+	+	Holarctic
18. *Tomocerus vulgaris* (Tullberg, 1871)	+		Holarctic
Fam. Isotomidae 19. *Desoria nivea* Schaffer, 1896		+	Europe
20. *Desoria olivacea* (Tullberg, 1871)		+	Europe
21. *Desoria violacea* (Tullberg, 1876)	+	+	Europe, Asia
22. *Folsomia penicula* Bagnall, 1939	+		Palaearctic
23. *Folsomia quadrioculata* (Tullberg, 1871)		+	Holarctic

Species	St. I. Solovan Hill	St. II. Gutin Forest	General Distribution
24. *Isotomurus palustris* (Muller, 1776)	+		Holarctic
25. *Tetracanthella pilosa* (Schott, 1891)		+	Eastern Europe
26. *Vertagopus cinereus* (Nicolet, 1842)		+	Europe
Fam. Entomobryidae 27. *Entomobrya marginata* (Tullberg, 1871)	+		Palaearctic
28. *Heteromurus nitidus* (Templeton, 1835)	+		Holarctic
29. *Lepidocyrtus lignorum* (Fabricius, 1775)	+	+	Holarctic
30. *Lepidocyrtus paradoxus* Uzel, 1891	+		Holarctic
31. *Orchesella bifasciata* Nicolet, 1842	+		Europe
32. *Orchesella pontica* Ionescu, 1915	+	+	Central and Eastern Europe
33. *Orchesella xerothermica* Stach, 1960	+		Central Europe
Ord. Symphypleona **Fam. Katiannidae** 34. *Sminthurinus bimaculatus* Axelson, 1902		+	Palaearctic
35. *Sminthurinus niger* (Lubbock, 1867)		+	Palaearctic
36. *Sminthurinus reticulatus* Cassagnau, 1964*		+	Europe
Fam. Sminthuridae 37. *Allacma fusca* (Linnaeus, 1758)		+	Holarctic
38. *Allacma gallica* (Carl, 1899)		+	Europe, North Africa
39. *Caprainea bremondi* Dallai, 1972*	+		Central and Southern Europe
40. *Lipothrix lubbocki* (Tullberg, 1872)		+	Europe, North Africa
Fam. Bourletiellidae 41. *Deuterosminthurus bicinctus* (Koch in Herrich-Schäffer, 1840)		+	Palaearctic, Australia
Fam. Dicyrtomidae 42. *Dicyrtomina ornata* (Nicolet, 1842)	+		West Palaearctic
43. *Ptenothrix atra* (Linnaeus, 1758)	+		Europe

*first records for the Romanian fauna

Caprainea bremondi Dallai, 1972 (3 specimens, 30.05.2009, Barber trap, Solovan Hill, leg. Nitzu, Nae, Popa) is recorded for the first time in the Romanian fauna. According to BRETFELD, 1999, total length of the body is up to 1.2 mm in females, 0.75 mm in males. We identified three females, with a body length between 0.95 mm and 1 mm.

Proportions: Length of antennae: head diagonal = 1.8; Dens: mucro = 2.9; Appendices anales: mucro = 1. Background color yellow, large abdomen with dark purple pigment in varying patches and stripes; antennae purple, small abdomen pale (Fig.1, A).

Large abdomen with long, straight, rough, and abruptly pointed spines and with normal setae. Distal part of Ant II with 4 short, dorsal setae; Ant III proximally with 4 long, thick setae. Ant IV with 15–17 subsegments. Claws with tunica, inner and basal outer tooth, and short, serrate pseudonychia; empodium with tooth, filaments thin and acuminate, length of empodium I and II > claw, III < claw. Ventral tube with 2+2, retinaculum with 2 setae. Setae 2 and 3 of furca base as thick, blunt spines (Fig.1, B) (BRETFELD, 1999). Both edges of mucro densely serrate; seta missing. Appendices anales long, thick, setalike, and smooth or rough (Fig.1, C) (SIMON, BACH & GAJU, 1986).

Occurrence: Portugal, Spain, former Yugoslavia and Albania.

Biology: *C. bremondi* lives in warm, humid habitats near the soil in litter and moss (BRETFELD, 1999).

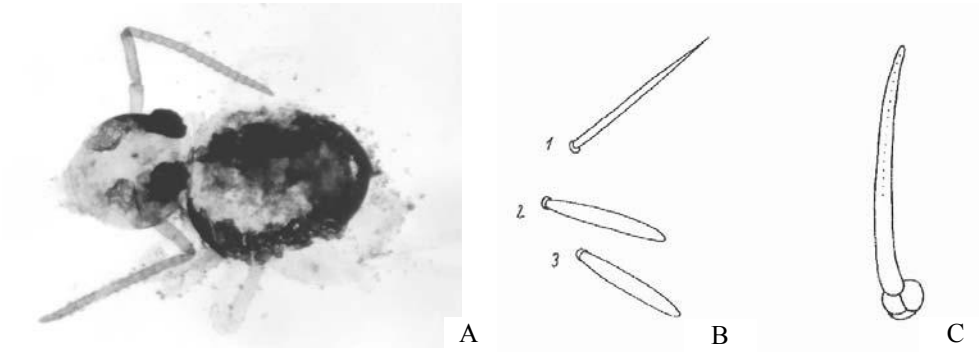

Fig. 1. A – C – *Caprainea bremondi* Dallai, 1972: A – Habitus (Photo by E. Nitzu); B – Setae 1–3 of furca base (after BRETFELD, 1999); C – Appendices anales (after SIMON, BACH & GAJU, 1986).

Sminthurinus reticulatus Cassagnau, 1964 (one specimen, 30.05.2009, Barber trap, Gutin Forest, leg. Nitzu, Nae, Popa) was recorded up to now only from France, Spain, Greece, Germany and Finland (BRETFELD, 1999). Total length 0.7 mm. In adults, abdominal segment V fused with large abdomen. Background color yellow, bluish green lateral and cross stripes on large abdomen, head with a dark band between eye-patches (Fig. 2). Other morphological characteristics as in *Sminthurinus aureus* Lubbock, 1862.

Biology: *S. reticulatus* usually lives in soil and moss, but also in fields and dry meadows (BRETFELD, 1999).

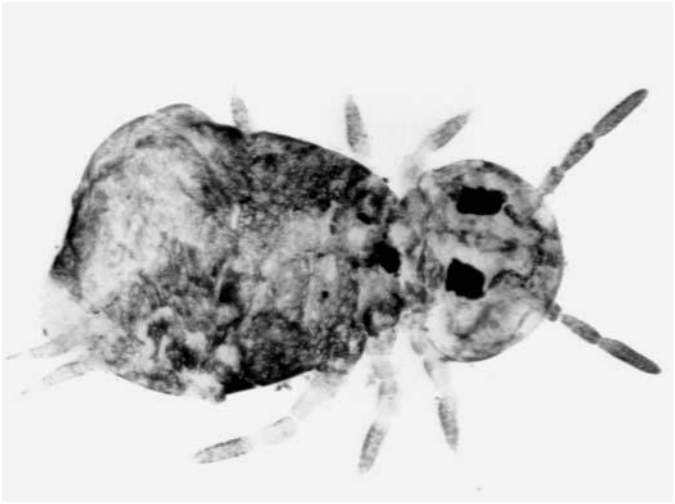

Fig. 2 – *Sminthurinus reticulatus* Cassagnau, 1964 (Photo by E. Nitzu).

Allacma gallica (Carl, 1899) (one specimen, 30.05.2009, Barber trap, Gutin Forest, leg. Nitzu, Nae, Popa) is reported for the second time in the Romanian fauna; until now the species was recorded only from Retezat Mountains (FALCĂ, 1984). This species prefers warm climates where it occurs near the soil in litter, on dead wood, and in low vegetation (BRETFELD, 1999). We collected it together with three individuals of *Allacma fusca* (Linnaeus, 1758), one individual of *Deuterosminthurus bicinctus* (Koch in Herrich-Schäffer, 1840) and 1 individual of *Sminthurinus niger* (Lubbock, 1867).

Sminthurinus bimaculatus Axelson, 1902 (two specimens, 30.05.2009, Barber trap, Gutin Forest, leg. Nitzu, Nae, Popa) was recently reported for the first time in Romania from Maramureş County (DANYI et al., 2006). This is the second record of this species. According to BRETFELD, 1999, *S. bimaculatus* lives in wet moss, but also in more or less dry soils and their low vegetation. We collected it together with one individual of *S. reticulatus,* one individual of *D. bicinctus* and one individual of *Lipothrix lubbocki* (Tullberg, 1872).

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REFERENCES

BELLINGER, P. F., CHRISTIANSEN, K. A., JANSSENS, F., Checklist of the Collembola of the world. -http://www.collembola.org/taxa/collembo.htm [Updated: 2012.08.31], 1996–2012.

BRETFELD, G., *Synopses on Palearctic Collembola: Symphypleona,* Abhandlungen und Berichte des Naturkundemuseums Gorlitz, **71** (1): 1–318, 1999.

DANYI, L., TRASER, G., *Contribution to the collembola fauna of Maramureş, Romania.* Studia Universitatis "Vasile Goldiş", Seria Ştiinţele Vieţii (Life Sciences Series), **18**: 211–219, 2008.

DANYI, L., TRASER, G., FIERA, C., RADWANSKI, M., *Preliminary data on the Collembola fauna of Maramureş County.* Studia Universitatis Vasile Goldiş, Seria Ştiinţele Vieţii, **17**: 47–51, 2006.

FALCĂ, M., *Studiu ecologic al unor artropode (Insecte inferioare) din sol şi litieră din Carpaţii Meridionali. Ph.D. Thesis.* Institutul de Ştiinţe Biologice, Bucureşti, 219 pp., 1984.

SIMON, J. C., BACH, C., GAJU, M., *Colembolos de la provincia de Cordoba (Espana).* EOS, Rev. Esp. Ent. **62**: 297–306, 1986.

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