

DIVERSITY OF SPRINGTAILS (COLLEMBOLA, INSECTA) IN THE OBEDSKA BARA SPECIAL NATURE RESERVE. L. R. Lučić. *Institute of Zoology, Faculty of Biology, University of Belgrade, 11000 Belgrade, Serbia.*

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According to a paper published by K o l e d i n and B o g o j e v - i ć in 1976, 228 collembolan species classified into 43 genera and five families were recorded in Serbia up to that time. Our research on diversity of the springtail fauna (primary cavernic-

olous forms) in Serbia resulted in a finding of 11 more species, 10 new to science and one new for the collembolan fauna of Serbia (for a review see L u ĉ i ć *et al.*, 2005). However, the springtail fauna in Serbia was not investigated in many terres-

Table 1. Preliminary list of collembolan species recorded in the Obedska Bara Special Nature Reserve

| Family | Genus | Species |
|-----------------|---|--|
| Hypogastruridae | <i>Hypogastrura</i> Bourlet, 1839 | <i>Hypogastrura manubrialis</i> Tullberg, 1869) <i>Hypogastrura viatica</i> (Tullberg, 1872) <i>Hypogastrura socialis</i> (Uzel, 1891) |
| Neanuridae | <i>Neanura</i> Mac Gilvray, 1893 | <i>Neanura caroli</i> (Stach, 1926) <i>Neanura muscorum</i> (Templeton, 1835) <i>Neanura conjuncta</i> (Stach, 1926) |
| Onychiuridae | <i>Onychiurus</i> Gervais, 1841 | <i>Onychiurus alticiola</i> Bagnall, 1935 <i>Onychiurus burmeisteri</i> (Lubbock, 1873) <i>Onychiurus armatus</i> (Tullberg, 1869) |
| Isotomidae | <i>Folsomia</i> Willem, 1902 <i>Isotoma</i> Bourlet, 1839 | <i>Folsomia similis</i> Bagnall 1939 <i>Isotoma notabilis</i> Schaffer, 1896 <i>Isotoma olivacea</i> Tullberg, 1871 |
| Entomobryidae | <i>Isotomiella</i> Bagnall, 1939 | <i>Isotomiella minor</i> (Schafer, 1896) |
| Entomobryinae | <i>Entomobrya</i> Rondani, 1861 | <i>Entomobrya muscorum</i> (Nicolet, 1841) <i>Entomobrya multifasciata</i> (Tullberg, 1871) <i>Entomobrya nivalis</i> (Linne, 1758) <i>Entomobrya spectabilis</i> Reuter, 1890 |
| | <i>Pseudosinella</i> Schaffer, 1897 | <i>Pseudosinella sexocullata</i> Schöt, 1902 <i>Pseudosinella alba</i> (Packard, 1873) <i>Pseudosinella duodecimpunctata</i> Denis, 1931 <i>Pseudosinella octopunctata</i> Börner, 1901 |
| | <i>Lepidocyrtus</i> Bourlet, 1839 | <i>Lepidocyrtus cyaneus</i> Tullberg, 1871 <i>Lepidocyrtus curvicolis</i> Bourlet 1839 <i>Lepidocyrtus lanuginosus</i> (Gmelin, 1788) <i>Lepidocyrtus lignorum</i> (Fabricius, 1783) |
| | <i>Sinella</i> Brook, 1882 <i>Willowsia</i> Shoebbotham, 1917 | <i>Sinella coeca</i> (Schött, 1896) <i>Willowsia planati</i> (Nicolet, 1841) |
| Orchesellinae | <i>Orchesella</i> Templeton, 1835 | <i>Orchesella multifasciata</i> Stacherbakow, 1899 <i>Orchesella flavescens</i> (Bourlet, 1839) <i>Orchesella villosa</i> (Geoffroy, 1764) |
| | <i>Heteromurus</i> Wankel, 1860 | <i>Heteromurus major</i> (Moniez, 1889) <i>Heteromurus nitidus</i> (Templeton, 1835) |
| Tomoceridae | <i>Tomocerus</i> Nicolet, 1842 | <i>Tomocerus terestralis</i> Stach, 1935 <i>Tomocerus minor</i> (Lubbock, 1862) <i>Tomocerus vulgaris</i> (Tullberg, 1871) |
| Sminthuridae | | |
| Katianninae | <i>Arrhopalites</i> Börner, 1906 | <i>Arrhopalites sericus</i> Gisin, 1947 <i>Arrhopalites acanthophthalmus</i> Gisin, 1958 <i>Arrhopalites principalis</i> Stach, 1945 |
| | <i>Sminthurinus</i> Börner, 1901 <i>Bourletiella</i> Banks, 1899 | <i>Sminthurinus aureus</i> (Lubbock, 1862) <i>Bourletiella spinata</i> Stach, 1920 <i>Bourletiella viridescens</i> Stach, 1920 |
| | <i>Dicyrtoma</i> Bourlet, 1842 | <i>Dicyrtoma minuta</i> (O. Fabricius, 1783) <i>Dicyrtoma setosa</i> (Krausbauer, 1898) |
| Sminthuridinae | <i>Sminthurus</i> Latreille, 1802 | <i>Sminthurus gallicus</i> Carl, 1899 |

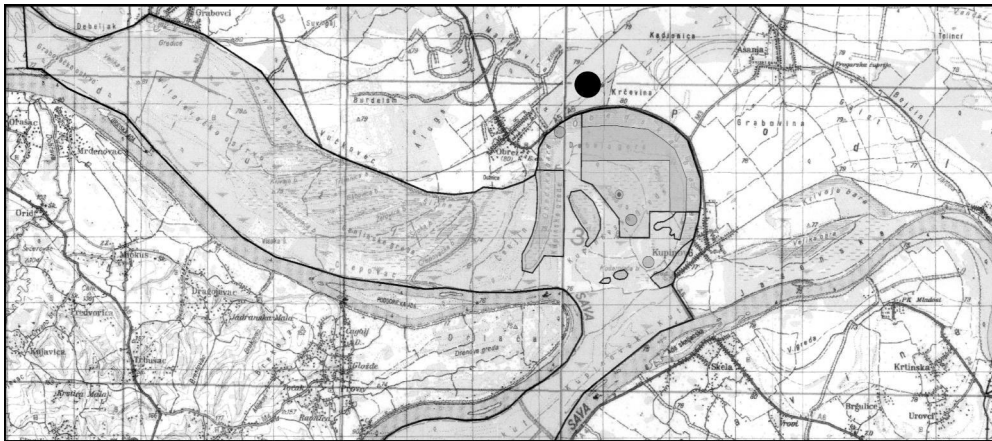


Fig. 1. The Obedska Bara Special Natural Reserve near Belgrade, with the locality studied.

trial habitats: the most complete faunistic data on the collembolan fauna are available for Vojvodina, the Iron gate region, and Western Serbia (B o g o j e v i ć, 1971, 1989).

Obedska Bara in Srem is a vast swamp-forest area, stretching along the Sava River in southern Srem (Vojvodina) between the villages of Obrež and Kupinovo. It is located about 50 km southeast of the city of Belgrade and covers an area of about 17,501 ha.

This paper gives a preliminary list of collembolan species recorded in this special natural reserve. Collembolans were collected during 2000 and 2001 four times each year (in April, May, June, and October) in order to monitor seasonal changes in the fauna (not discussed in this paper) in an oak-elm forest near the village of Obrež. We used the following sampling techniques: collection of leaf-litter (i.e., "bringing habitat" into the laboratory); extraction of springtails from it; and subsequent examination and species determination in laboratory conditions. The most common tool for extraction, a Tullgren funnel, was used. Specimens were preserved in 75% ethanol until identification. Species were examined and identified using Carl Zeiss (400x magnification) and Leica (1000x magnification) microscopes. They were determined using the key to collembolan species of G i s i n (1960). For higher taxonomic categories, we followed G r e e n s l a d e (1991, 1994), H o p k i n (1997), and the key to springtails given in the web site www.collembola.org.

A total of 44 species belonging to 19 genera and seven families (Hypogastruridae, Neanuridae, Onychiuridae, Isotomidae, Entomobryidae, Tomoceridae, and Sminthuridae) were collected and identified (Table 1). Following the usual qualitative and quantitative approach, we ascertained that the family Entomobryidae was the richest both qualitatively (i.e., in number of registered species - 19 species or 43.20 %) and quantitatively (i.e. in number or percentage of captured specimens (43.70%). In terms of abundance, the Entomobryidae were followed by Hypogastruridae (17.91%), Neanuridae (9.94%), On-

ychiuridae (9.72%), Sminthuridae (7.97%), Isotomidae (7.79%) and Tomoceridae (2.98%). Several species with very small abundance were also identified; they do not contribute significantly to seasonal fluctuations of the collembolan community, but they do contribute to qualitative composition of the springtail fauna.

During examination of the springtail fauna in the Obedska Bara Nature Reserve, three species new to the fauna of Serbia were identified. These are: *Entomobrya spectabilis* Reuter, 1890; *Bourletiella spinata* Stach, 1920; and *Dicyrtoma setosa* (Krausbauer, 1898). Together with one species new to our fauna collected during similar investigations conducted on Mt. Kosmaj (*Isotoma nivalis* Carl, 1910, L u č i ć, unpublished), we can conclude that the number of springtail species recorded until now in Serbia is 243 (L u č i ć *et al.*, 2005).

In recent years, there has been widespread interest in using Collembola as ecological indicators of the state of the environment (H o p k i n, 1997), i.e., using springtails as biological monitors of pollution. Monitoring the collembolan fauna in the Obedska Bara Nature Reserve over an extended period would be of great interest because UNESCO has listed it as an internationally significant marshy area.

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