

## RECORDS OF THE PSEUDOSCORPION *NEOBISIUM (BLOTHRUS) SLOVACUM* (NEOBISIIDAE) IN CAVES AND CHASMS OF THE SLOVAK KARST

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Eutroglobiont pseudoscorpions (i.e. pseudoscorpions with highly-evolved troglomorphism: absence of eyes, elongated extremities, depigmentation and desclerotization of the body) of the subgenus *Blothrus* (genus *Neobisium*) are typical members of European invertebrate cave fauna.

The most species are known from caves of the Iberian, Apennine and Balkan peninsulas (e. g. Heurtault, 1994). Seven taxa (6 species and 1 subspecies) have been reported from Carpathian caves (Harvey, 1990; Juberthie et Decu, 1994). Of these, *Neobisium (Blothrus) slovacum*, described by Gulička (1977) from Brzotín cave in the Slovak Karst, Slovakia, was the first eutroglobiont pseudoscorpion found in the Western Carpathians. Because this is also the northernmost eutroglobiont pseudoscorpion found in Europe (Gulička, 1977; Ducháč, 1966), this species can be regarded as very important from the zoogeographical, as well as the biospeleological, point of view.

Recently, additional material was obtained not only from the Brzotín cave (locus typicus of the *N. slovacum* species), but also from other caves and chasms of the Slovak Karst (Fig. 1).

Although resembling *Neobisium slovacum* closely, the individuals from the various sites display a certain variability in the size and proportions of their extremities, as well as in their chaetotaxy.

This paper gives an overview of sites where these pseudoscorpion have been found so far, along with characteristics of the biotopes. Except for the Brzotín cave, all of the sites have been newly established and have not been described in the literature. A brief record has only been presented by one of us within the context of the history of discovery of the beetle genus *Duvalius* (Mlejnek, 1997).

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## Material and Method

The majority of the study material was collected by one of us (R. M.) during 1988 – 1996. Collecting was mainly carried out by hand, but in one case a specimen was found in a pitfall trap laid from 21 February 1988 to 13 March 1988 in the Csik Lyuk chasm.

A minor part of the material, with 4 individuals from the Diviačia chasm, collected in 1966 (by Lysenko), was discovered by one of us (V. D.) in Dr. Verner's collection in Prague. This material is interesting in that it was included in the collection more than 10 years before the species *Neobisium slovacum* was first described. Although a note on this finding was published (Lysenko, 1972), it failed to attract attention.

The material studied also documents the occurrence of *Blothrus* at places other than the Brzotín cave. It comprises 26 individuals: 13 males, 11 females and 2 tritonymphs (in some cases the condition of the material did not allow the sex to be identified with absolute certainty). All specimens are deposited in V. D.'s collection.

## Overview of Sites and Findings

The Slovak Kars region (referred to as South-Slovak Kars in older sources) can be divided into several areas, separated by rivers. The western part is the Koniar plateau; the central part includes the Plešivec plateau, which stretches northwards; and to the east lie the Silica plateau, Horný Vrch plateau Zadiel-Turňa plateau and the Jasov plateau. The southeastern part is formed by the Dolný Vrch plateau, extending into Hungary.

The eutroglabiont pseudoscorpions *Neobisium slovacum* and *Neobisium rom. slovacum* have so far been found in caves and chasms of the Plešivec plateau and Dolný plateau (Fig. 2).

### Localities in the Plešivec plateau

1. Šngliarova chasm-type cave (mápe grid 7388)  
12 May 1988, 3 ♂♂, 3 ♀♀, in the dome in front of the closing shaft, under sunken stones in wet, clayey soil.
2. Zvonivá Diera chasm (map grid 7388)  
3 November 1996, 1 ♂, in the northern gallery (- 70 m), under a stone in wet, clayey soil.
3. Zombor chasm (map grid 7388)  
11 June 1988, 1 ♂, in front of the closing shaft (- 42 m), specimen climbing over a stone.
4. Brzotín cave (mápe grid 7388)  
This is the locus typicus of *Neobisium slovacum* Gulička, 1977. The type series (1 adult and 2 nymphs) was collected on 26 September 1974 and 10 October (Gulička, 1977). Another collection from this cave described by Ducháč (1996), paying attention to the character of the biotope and the morphology of the specimen.
5. Diviačia chasm (map grid 7488)  
1966, 1 ♂, 3 ♀♀, in recesses of the sinter layers of walls (- 70 m).
6. Csik Lyuk cave (map grid 7488)  
21 February 1988, 1 ♂, in an ascending corridor with clayey soil, under a stone.

21 February – 13 March 1988, 1 ♀, in the upper segment of an ascending corridor with clayey soil, in a pitfall trap.

12 May 1988, 1 ♂, in the main dome of the cave, on the wall.

9 June 1989, 2 ♀♀, in stony debris on clayey soil.

7. Fialová cave (map grid 7488)

15 April 1989, 1 ♀, i tritonymph, under stones in wet clayey soil.

8 May 1989, 1 ♂, under a stone on clayey soil.

9 June 1989, 1 ♂, under a stone on clayey soil.

23 September 1989, 1 ♂, under a stone in wet clayey soil.

#### Localities in the Dolný Vrch plateau

8. Oriáš chasm (Obrovská chasm, map grid 7490)

8 May 1988, 1 ♂, in the centre of the cave dome (-75 m), in wet, stony debris.

17 August 1989, 1 tritonymph, clayey stony debris in the dome (- 75 m).

9. Márnica cave (map grid 7490)

8 May 1988, 1 ♀, in the centre of the dome (- 20 m), in wet, stony debris.

10. Meteor cave (map grid 7490)

9 May 1989, 1 ♂, in the Lábaztató-terem area (- 10 m), in wet, clayey soil by the wall (this site lies in Hungary).

#### Discussion and Conclusions

Gulička (1977) expressed a belief that the eutroglobiont pseudoscorpion subgenus *Blothrus* would be found not only in the Brzotín cave, but also in other caves of the Slovak Karst. Our work confirms its occurrence at 10 sites, of which 9 lie in Slovakia and one in Hungary. The map grids of the sites are 7388, 7488 and 7490 (Fig. 2).

The data show that the majority of the pseudoscorpions occurred under stones and in stony debris; few were observed on walls. Wet sites were invariably involved. Noteworthy are the wide ranges of cave or chasm depths, as well as the distances from the entrances. This is presumably due to the microclimatic circumstances, humidity in particular. The deepest lying site, at a depth of 75 m, was in the Oriáš chasm.

Blind ground-beetles of the genus *Duvalius* live together with the pseudoscorpions in some caves. Populations of *Duvalius bokori bokori* live in the Csík Lyuk and Fialová caves (Csiki, 1910), *Duvalius hungaricus brzotinensis* in the Brzotín cave (Janák, 1987), *Duvalius hungaricus* in the Šingliarova cave and *Duvalius hungaricus hungaricus* in the Meteor cave in Hungary (Hürka, Janák et Moravec, 1989; Mlejnek 1997).

The Slovak Karst is the northernmost region, not only in the Carpatians but within the whole Europe, where the occurrence of pseudoscorpions of the subgenus *Blothrus* has been demonstrated (Šingliarova chasm-type cave lies at 48° 40' N),

In the Carpatian system, the nearest sites to the Slovak Karst where the eutroglobiont pseudoscorpions of this subgenus live are Munti Apuseni and the Central Carpatians in Romania (Deucu et Rakovitza, 1994). The following species (or subspecies) are included: *Neobisium (Blothrus) minutum* (Tömösvary, 1882), *N. (B.) brevipes* (Frivaldszky, 1865), *N. (B.) brevipes montanum* (Beier, 1939), *N. (B.) leruthi* (Beier, 1939), *N. (B.) maxbeieri* (Dumitresco et Orghidan, 1970) and *N. (B.) clossanicum* (Dumitresco et Orghidan, 1970).

The occurrence of eutroglobiont pseudoscorpions in Hungary had not been reported until now (Zicsi, Hevesi et Decu 1994). Thus, our finding in the Meteor cave is the first record in the territory of today's Republic of Hungary. Where, for instance, Harvey (1990) reports occurrence of the species *N. brevipes* and *N. minutum* in „Hungary, Romania“, the data concerned have been taken over from older sources, published when the sites all lay within the Austrian-Hungarian Empire. Nowadays, however, they all belong to Romania.

In the Slovak Karst, eutroglobiont pseudoscorpions of the subgenus *Blothrus* have so far only been observed at two isolated sites, viz. the Plešivec plateau and the Dolný Vrch plateau, whereas no such observation has been made in the Silica or Horný Vrch plateau lying between them, or at any other site. Note that speleological examination of caves within the Silica plateau was as intense as within the Plešivec plateau. Despite this, we believe that it is only of matter of time before *Blothrus* is found within the remaining areas of Slovak Karst.

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## Souhrn

V práci jsou popsány dosavadní nálezy eutroglobiontního štirka *Neobisium* (*Blothrus*) *slovacum*. Dosud byl nalezen v 9 jeskyních a propastech Slovenského krasu a v jednom případě také na území Maďarské republiky. Jsou popsány nálezové okolnosti jednotlivých sběrů a charakterizovány biotopy zjištěných populací.

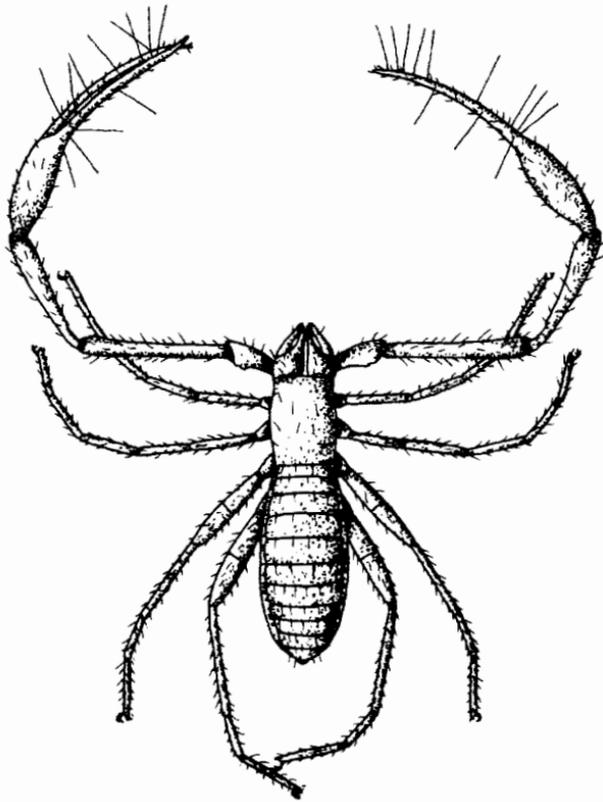


Fig. 1 *Neobisium slovacum*.  
Obr. 1 *N. (B.) slovacum*.

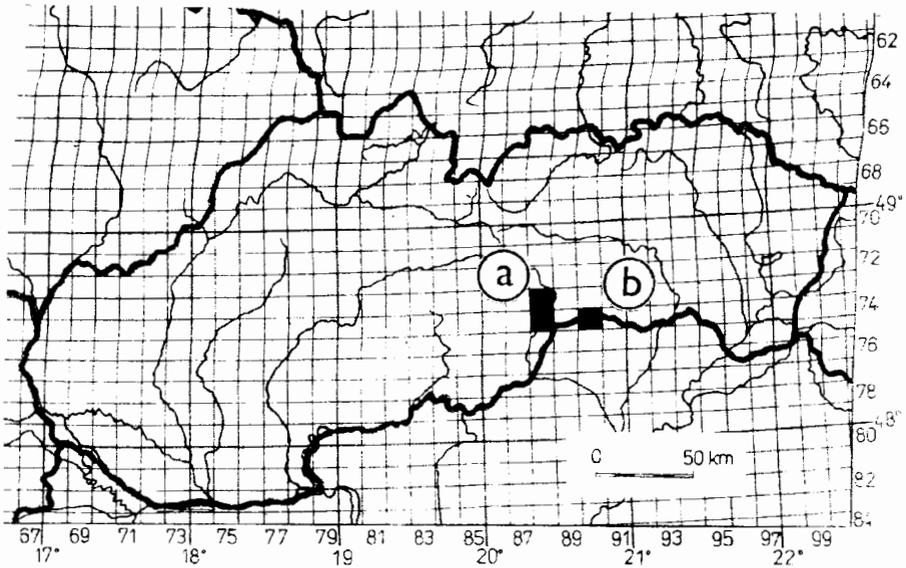


Fig. 2 Distribution of *N. (B.) slovacum*: a – Plešivec plateau, b – Dolný vrch plateau.  
 Obr. 2 Rozšíření *N. (B.) slovacum*: a – Plešivecká planina, b – Dolný vrch