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Notes on two species of the cavernicolous subgenus *Neobisium* (*Blothrus*) Schiödte, 1847 (Arachnida: Pseudoscorpiones) from Transylvania (Romania), with a key to the species of the Carpathian Mountains

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Abstract

Redescriptions of *Neobisium* (*Blothrus*) *minutum* (Tömösváry, 1882) and *N. (B.) brevipes* (Frivaldszky, 1865) are given, accompanied by new illustrations. *Neobisium (B.) brevipes montanum* is elevated to full species rank as *N. (B.) montanum* Beier, 1939. New records of *N. (B.) minutum* and *N. (B.) brevipes* from Romania are presented. A key to the members of the subgenus *Blothrus* occurring in the Carpathian Mountains is provided.

Key words: pseudoscorpions, Central Europe, taxonomy

Introduction

Pseudoscorpions are small, predatory arachnids, comprising 3533 described species (Harvey 2013) and thus representing one of the four mesodiverse orders within the Arachnida (Harvey 2002). They can be found in almost every terrestrial habitat. Most species are litter-dwellers, but many are adapted to cavernicolous conditions.

The subgenus *Neobisium* (*Blothrus*) Schiödte, 1847 includes 93 species (Harvey 2011) and has a predominantly southern European distribution (Heurtault 1994). All species of the subgenus are adapted to cavernicolous habitats and, in accordance with this, their extremities are elongated and they lack eyes. The first summary work on the pseudoscorpion fauna of Hungary and the Carpathian Mountains was published more than a century ago (Tömösváry 1882), and the first data on the subgenus *Blothrus* were reported by Frivaldszky (1865), with the description of the species *Neobisium (Blothrus) brevipes* (Frivaldszky, 1865) from Transylvania. Almost twenty years later, Tömösváry (1882) described *Neobisium (Blothrus) minutum* (Tömösváry, 1882) from the southern part of Transylvania. In the first half of the 20th century, Beier (1939) reported two further taxa new for science from Transylvania (*Neobisium (Blothrus) leruthi* Beier, 1939 and *N. (B.) brevipes montanum* Beier, 1939) and provided new records of *N. (B.) brevipes brevipes* from the region (Beier 1928; 1939).

In the second half of the 20th century, three further *Blothrus* species were reported from cavernicolous habitats in the Carpathian Mts. *Neobisium (Blothrus) closanicum* Dumitresco & Orghidan, 1970 and *N. (B.) maxbeieri* Dumitresco & Orghidan, 1972 were found in the Southern Carpathians (Dumitresco & Orghidan 1970, 1972), and *N. (B.) slovacum* Gulička, 1977 in the Slovak Karst of Slovakia (Gulička 1977) and later also from the nearby Aggtelek Karst in Hungary (Ducháč & Mlejnek 2000).

The aim of this study is to update our knowledge regarding to *N. (B.) minutum* and *N. (B.) brevipes*, as well as to provide an identification key to the *Blothrus* species reported from the Carpathian Mts.

Material and methods

The specimens of *N. (B.) minutum* and *N. (B.) brevipes* studied belong to the collection of the Hungarian Natural History Museum (HNHM). Unfortunately, some of these, which are over a hundred years old, were not

Identification key to the *Blothrus* species of the Carpathian Mountains

- 1 Pedipalpal femur at most 6 times longer than wide 2.
- Pedipalpal femur more than 6.5 times longer than wide. 5.
- 2 Pedipalpal patella less than 4 times longer than wide. Chelal fingers at least one third longer than hand with pedicel 3.
- Pedipalpal patella more than 4 times longer than wide. Chelal fingers at most 1.25 times longer than hand with pedicel 4.
- 3 Pedipalpal femur 5.80–5.84 times longer than wide, distance between trichobothria *ib* and *ist* approximately twice that between *ist* and *it* *N. (B.) minutum*.
- Pedipalpal femur 6 times longer than wide, distance between trichobothria *ib* and *ist* approximately 3.8–4.0 times that between *ist* and *it* *N. (B.) montanum*.
- 4 Pedipalpal femur 4.3 times, chelal hand 2.8 times longer than wide. Chelal fingers approximately as long as hand with pedicel *N. (B.) closanicum*.
- Pedipalpal femur 5.5 times, chelal hand 2.0 times longer than wide. Chelal fingers 1.25 times longer than hand with pedicel *N. (B.) maxbeieri*.
- 5 Ocular protuberances present on carapace *N. (B.) brevipes*.
- No ocular protuberances on carapace 6.
- 6 Epistome present and well developed, teeth of fixed chelal finger of equal length *N. (B.) leruthi*.
- Epistome absent, teeth of fixed chelal finger of unequal length *N. (B.) slovacum*.

Discussion

The main taxonomic characters of the taxa studied here correspond well with the descriptions of Beier (1963). However, a greater variability was observed for *Neobisium (Blothrus) minutum* in body size, chelal finger length, length/width ratios of the pedipalp patella and chelal hand, and in the setation of the carapace and chelicerae, and for *Neobisium (Blothrus) brevipes* in body size, chelal finger and hand length, length/width ratios of the pedipalpal femur and the chelal hand. Similar intraspecific variation has been documented for *Neobisium (Blothrus) slovacum* (Ducháč, 1999).

Ducháč (1999) presented a key to the *Neobisium (Blothrus)* species occurring in the Carpathians, but it did not include *Neobisium (Blothrus) montanum* from Transylvania, and some characters are now known to show greater intraspecific variability, such as the number of setae at the posterior margin of the carapace in *N. (B.) minutum*, and the length of chelal finger compared to the length of the pedipalpal femur in *N. (B.) brevipes*.

Regarding the occurrence of the six *Blothrus* species in Transylvania, it should be noted that *N. (B.) montanum* and *N. (B.) leruthi* are known from caves of the Western Transylvanian Mts, while *N. (B.) minutum*, *N. (B.) maxbeieri* and *N. (B.) closanicum* come from a few caves of the Southern Carpathians (Beier 1939; Dumitresco & Orghidan 1970, 1972; Tömösváry 1882). In contrast, *N. (B.) brevipes* is known from numerous caves of the Western Transylvanian Mts and the Southern Carpathians (Beier 1928, 1939; Tömösváry 1882).

Further investigations of the cave fauna of the Carpathian Basin, especially in Transylvania, will be necessary to broaden our knowledge on the occurrence of these species. In particular, detailed taxonomic redescriptions of *N. (B.) montanum* and *N. (B.) leruthi* would also be useful in the future.

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