Pseudoscorpions (Arachnida: Pseudoscorpiones) of the Burda Mountains in Slovakia

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Abstract. In the territory of the Burda Mountains and its surroundings, 1489 individuals of pseudoscorpions belonging to 24 taxa and five families were recorded. The material was collected using standard sampling methods and from as many habitat types as possible in 77 study plots. Zoogeographically, Palaearctic species and species with European distribution were the most abundant. Pseudoscorpions of the families Chthoniidae and Neobisiidae mainly represented epigeic and edaphic forms. Synanthropic species belonged to the families Atemnidae and Cheliferidae. Representatives of the Chernetidae family were mostly dendrophilic, or they occurred in decaying organic material. In the Burda Mts., eurytopic species and stenoecious, thermophilic species associated with xerothermic habitats, occurred. From a faunistic point of view, the record of *Chthonius orthodactylus* (Leach, 1817), sensu Beier (1963) documented in Slovakia after more than 40 years again, was the most important. The study area represents its second known locality in Slovakia, and its habitat preference has been specified for the first time. The second locality of occurrence in Slovakia was also discovered for the distribution of *Allochernes solarii* (Simon, 1898). *Diplotemnus balcanicus* (Redikorzev, 1928) has only been found in the Burda Mts. in Slovakia. Despite the small size of the Burda Mts., this mountain range represents one of the most important areas in Slovakia in terms of pseudoscorpion species diversity; almost 40% of the known pseudoscorpion species live here. When assessing habitat types, xerothermic steppe and forest steppe sites appeared to be the most valuable. This is also documented by the occurrence of rare and, due to their close ecological valence, potentially endangered species such as *Ephippiochthonius tuberculatus* (Hadži, 1937), *Microbisium suecicum* Lohmander, 1945, *Atemnus politus* (Simon, 1878) or *Allochernes solarii*.

Keywords: Central Europe, distribution, diversity, faunistics, thermophilic species

Zusammenfassung. Pseudoskorpione (Arachnida: Pseudoscorpiones) aus dem Burda-Gebirge in der Slowakei. Im Gebiet des Burda-Gebirges und seiner Umgebung wurden 1489 Individuen an Pseudoskorpionen aus 24 Taxa und fünf Familien erfasst. Das Material wurde unter Verwendung standardisierter Sammelmethoden und aus möglichst vielen Lebensraumtypen auf 77 Untersuchungsflächen zusammengetragen. Aus zoogeografischer Sicht waren paläarktische Arten und Arten mit europäischer Verbreitung am häufigsten vertreten. Pseudoskorpione der Familien Chthoniidae und Neobisiidae repräsentierten hauptsächlich die epigäischen und edaphischen Formen. Die synanthrope Arten gehörten zu den Familien Atemnidae und Cheliferidae. Vertreter der Familie Chernetidae waren meist dendrophil oder kamen in verrottendem organischem Material vor. Im Burda-Gebirge kamen eurytope Arten und stenöke, thermophile Arten vor, die mit xerothermen Lebensräumen assoziiert sind. Aus faunistischer Sicht war der Nachweis von *Chthonius orthodactylus* (Leach, 1817), sensu Beier (1963), der in der Slowakei nach mehr als 40 Jahren wieder dokumentiert wurde, am wichtigsten. Das Untersuchungsgebiet stellt für diese Art den zweiten bekannten Fundort in der Slowakei dar, und es werden die Lebensraumpräferenzen zum ersten Mal dargestellt. Für die Art *Allochernes solarii* (Simon, 1898) wurde ebenfalls der zweite Fundort in der Slowakei entdeckt. Für *Diplotemnus balcanicus* (Redikorzev, 1928) stellt das Burda-Gebirge den bislang einzigen Fundort in der Slowakei dar. Trotz seiner geringen Größe ist das Burda-Gebirge eines der wichtigsten Gebiete hinsichtlich der Artenvielfalt für Pseudoskorpione in der Slowakei; fast 40 % der bekannten Pseudoskorpionsarten kommen hier vor. Bei der Bewertung der Lebensraumtypen erwiesen sich xerotherme Steppen- und Waldsteppenstandorte als die wertvollsten. Die Vorkommen seltener und aufgrund ihrer engen ökologischen Valenz potenziell gefährdeter Arten wie *Ephippiochthonius tuberculatus* (Hadži, 1937), *Microbisium suecicum* Lohmander, 1945, *Atemnus politus* (Simon, 1878) oder *Allochernes solarii* belegen dies.

The Burda Mountains in Slovakia have attracted attention in faunistic research, with several studies focusing on the diversity of pseudoscorpions. The earliest mention of pseudoscorpions from the study area is an important record of *Diplotemnus balcanicus* (Redikorzev, 1928). A male and an immature female were found in the guano of the bats *Myotis myotis* (Borkhausen, 1797) and *Myotis blythii* Tomes, 1857 in the church attic in Chľaba (Verner 1959). Verner (1959) also recorded the synanthropic species *Chelifer cancroides* (Linnaeus, 1758) in the same guano sample; all developmental stages of this species were represented. A year later, Verner (1960) discovered the pseudoscorpion *Beierochelifer quadrimaculatus* (Tömösváry, 1882) under the bark of an oak in the Burda locality. Krumpálová & Krumpál (1993) published the first record of *Atemnus politus* (Simon, 1878) for the Slovak fauna; a female was sampled from oak leaves in the Burda. Christophoryová et al. (2011a) studied the associations of pseudoscorpions with other animals and in bird nests. They published records of two species, *Dactylochelifer latreillii* (Leach, 1817) and *Pselaphochernes scorpioides* (Hermann, 1804), from Štúrovo locality. Later, Šťáhlavský and co-authors studied the karyotypes of *Atemnus politus* (Šťáhlavský et al. 2012) and of the species of the genus *Roncus* L. Koch, 1873 (Šťáhlavský et al. 2013), the material of both taxa coming from the Burda Mountains.

Christophoryová et al. (2014) enriched the knowledge of the pseudoscorpion fauna based on material from several habitat types. A total of 459 individuals belonging to 13 species and five families were identified. Most of the species belonged to the families Chernetidae and Neobisiidae. The thermophilic species *A. politus*, rare in Slovakia, was also recorded (Christophoryová et al. 2014). Kaňuchová et al. (2015) studied pseudoscorpions from the composts of Slovakia, including a garden in a family house in Kamenica nad Hronom. They collected more than 50 individuals belonging to the genus *Lamprochernes* Tömösváry, 1883.

Further faunistic data were provided by Červená et al. (2020a) on the species *Dactylochelifer latreillii* from the Leľa locality and *Chernes vicinus* (Beier, 1932) from the Leliansky les NNR. One male of *Diplotemnus balcanicus* was doc-

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umented 65 years after the first record in the corridor of a family house in Kamenica nad Hronom (Krajčovičová et al. 2021). Krajčovičová et al. (2021) revised the older specimens and, together with the new male, redescribed the species. The original specimen mentioned as an immature female of *D. balcanicus* (Verner 1959) was identified as a tritonymph (Krajčovičová et al. 2021).

Results of the current research bring new insights into the diversity of the fauna of the studied area and complete our knowledge of the distribution and habitat preference of pseudoscorpions in Slovakia.

Material and methods

Study area

The Burda Mountains (old name Kováčovské kopce Hills) are located in southwestern Slovakia, on the border with Hungary (Fig. 1). The maximum length of the mountain range is 7.5 km, while its maximum width is only 3.5 km. The highest peak of the mountain range is Plešivec (395.4 m a.s.l.) in the central part, with relative elevation differences ranging from 180 to 310 meters. In the west, it borders the Danube Hills, while the Danube riverbed forms the southern boundary, the Ipeľ riverbed forms the eastern boundary. The northwestern part of the mountain range is bordered by the Bajtava Gate, which separates the Burda from the Ipeľ Hills. It is a volcanic mountain classified as Neogene volcanics; volcanic activity occurred in an aquatic environment. It is an area with a rich representation of thermophilic species of Pannonian flora and fauna, and for many species, it represents the northern limit of their distribution. Most of the area is covered by oak and beech-oak forest communities. There are stands of downy oak with manna ash, and oak-hornbeam stands with *Quercus cerris* L., which give way to black locusts in the north. The area outside the forest is characterized by xerothermic steppe vegetation.

In 1966, two national nature reserves (NNR) were declared in the area, namely Burdov (formerly Kováčovské kopce – juh) and Leliansky les (formerly Kováčovské kopce – sever). The Burdov NNR protects xerothermic oak forests alternating with woodland and rock steppe enclaves. It includes an andesite upland with the richest thermophilic biocenosis in Slovakia, including rare xerothermic animals. Leliansky les NNR protects beech-oak forests, with the lowest locality of beech in Slovakia.

Other sites of pseudoscorpion collection were: the village Kamenica nad Hronom located on the southwestern edge of the Burda, the recreational settlement Kováčov and the village Chľaba located southeast of this mountain range. The villages Bajtava and Leľa lie on the northern side of the mountain. Štúrovo, located southwest of the mountains, is also mentioned.

Sampling and identification

The studied material was obtained from several researchers and was supplemented with specimens from our collections and previously published data. For published data, geographical coordinates were refined in consultation with researchers, and locality names were updated to the current National Nature Reserve designations. The published material has been revised, and changes are given for specific species in the list of taxa.

Pseudoscorpions were sampled from various types of (micro) habitats: in tree hollows, under tree bark, in dead wood, bat guano, birds' nests, compost, substrate (leaf litter, soil, grass clumps), under stones and in synanthropic environments. A standard sampling method was chosen for each habitat type, such as individual sampling, sifting, sample extraction (Tullgren apparatus), Malaise trap, or qualitative sampling. Pseudoscorpions were fixed mainly in 75% ethanol, but some specimens were stored in 96% ethanol for possible future molecular analyses. Some specimens were immersed in lactic acid for clearing and studied on temporary slide mounts. After the study, they were rinsed in water and returned to ethanol.

Pseudoscorpions were identified using the key in Krajčovičová et al. (2022), and data from Christophoryová et al. (2023) were applied to the genus *Lamprochernes*. Digital photographs of whole specimens were taken using a Canon EOS 5D Mark II camera attached to a Zeiss Axio Zoom V16 stereoscopic microscope. Image stacks were produced manually, combined using Zerene Stacker software, and edited in Adobe Photoshop CC.

The specimens are deposited in the zoological collection at the Department of Zoology, Comenius University in Bratislava. All spatial data used in the map were converted from their original coordinates and displayed in the GIS software QGIS ver. 3.36.2. A single point on the map represented each study plot.

List of study plots (Fig. 1)

1 Bajtava (47.84955, 18.75487; 255 m a.s.l.), edge of the forest (old black locust trees and maples between them) above the cemetery, leaf litter extraction, leg. P. Fenďa

2 Burda (47.83000, 18.76000; 331 m a.s.l.), oak-hornbeam forest, leaf litter sifting, leg. F. Šťáhlavský

3 Burda (47.83047, 18.73912; 170 m a.s.l.), sparse oak woodland, mould extraction from *Quercus* tree hollow and leaf litter sifting or extraction, leg. J. Christophoryová, K. Krajčovičová, O. Majzlan

4 Burda (47.83118, 18.74106; 205 m a.s.l.), oak-ash forest mixed with maples and black locusts, leaf litter sifting, leg. A. Mock

5 Burda (47.83157, 18.74535; 286 m a.s.l.), oak forest with black locust, soil extraction, leg. P. Fenďa

6 Burda (47.83234, 18.74084; 233 m a.s.l.), xerothermic meadow, leaf litter, clump of grass and soil extraction, leg. P. Fenďa

7 Burda (47.83272, 18.73708; 190 m a.s.l.), xerothermic meadow, individual sampling under stones, leg. F. Šťáhlavský

8 Burda (47.83305, 18.79256; 230 m a.s.l.), oak forest, leaf litter sifting, leg. P. Ľuptáčik

9 Burda (47.83550, 18.74579; 198 m a.s.l.), oak-hornbeam forest, leaf litter sifting, leg. F. Šťáhlavský

10 Burda (47.83555, 18.76083; 290 m a.s.l.), oak-hornbeam forest with beech trees and black locust stand, leaf litter extraction, leg. M. Holecová

11 Burda (47.83771, 18.81628; 213 m a.s.l.), oak-hornbeam forest, mould extraction from dendrotelm, leg. P. Ľuptáčik

12 Burda (47.84408, 18.77173; 305 m a.s.l.), oak-hornbeam forest, unspecified method and habitat or oak leaves and individual sampling under *Quercus* bark, leg. J. Svatoň and P. H. Verner

13 Burda (47.85037, 18.77387; 290 m a.s.l.), *Quercus cerris* forest with a rich undergrowth of grasses (*Melica* sp.), clump of grass extraction, leg. P. Fenďa
14 Burda (47.85083, 18.77388; 286 m a.s.l.), *Quercus cerris* forest, leaf litter extraction, leg. L. Švecová
15 Burda, hunting cabin Ipeľ (47.84800, 18.80225; 288 m a.s.l.), *Quercus cerris* forest, soil extraction, leg. P. Fenďa
16 Burda, hunting cabin Ipeľ (47.84883, 18.80037; 295 m a.s.l.), campfire, wood mould extraction, leg. P. Ľuptáčik, A. Mock
17 Burda, Veľká dolina (47.83318, 18.81205; 150 m a.s.l.), stand of field maple and willows along the stream Dolná, leaf litter extraction and sifting, leg. P. Ľuptáčik and A. Mock
18 Burda, Veľká dolina (47.83370, 18.81040; 180 m a.s.l.), oak-hornbeam forest, leaf litter extraction and sifting, leg. P. Ľuptáčik and A. Mock
19 Burda, Veľká dolina (47.84373, 18.79788; 219 m a.s.l.), bank vegetation along the stream Dolná, leaf litter sifting, leg. A. Mock
20 Burda, Veľká dolina (47.84440, 18.78441; 260 m a.s.l.), oak-beech forest with oak, leaf litter sifting, leg. A. Mock
21 Burda, Veľká dolina (47.84503, 18.78693; 240 m a.s.l.), *Robinia pseudoacacia* stand, leaf litter extraction, leg. P. Ľuptáčik
22 Burdov, NNR (47.82500, 18.76500; 198 m a.s.l.), oak-hornbeam forest, clump of grass extraction, leg. L. Švecová
23 Burdov, NNR (47.82577, 18.74811; 150 m a.s.l.), oak-forest steppe, pitfall trap, leg. O. Majzlan
24 Burdov, NNR (47.82579, 18.77744; 155 m a.s.l.), oak-hornbeam forest, leaf litter extraction, leg. P. Fenďa
25 Burdov, NNR (47.82587, 18.74868; 152 m a.s.l.), forest steppe, pitfall trap, leg. O. Majzlan
26 Burdov, NNR (47.82588, 18.74900; 150 m a.s.l.), meadow in the old quarry, soil extraction, leg. P. Fenďa
27 Burdov, NNR (47.82593, 18.77743; 153 m a.s.l.), in the vicinity of old mine tunnels above Kováčov, oak-hornbeam forest, leaf litter sifting, leg. P. Ľuptáčik
28 Burdov, NNR (47.82598, 18.74635; 145 m a.s.l.), stand of *Quercus cerris* mixed with *Cornus mas*, leaf litter sifting, leg. A. Mock
29 Burdov, NNR (47.82600, 18.74762; 158 m a.s.l.), *Quercus cerris* forest, leaf litter extraction, leg. P. Fenďa
30 Burdov, NNR (47.82606, 18.74900; 157 m a.s.l.), oak-ash forest in the old quarry, soil extraction, leg. P. Fenďa
31 Burdov, NNR (47.82627, 18.77623; 163 m a.s.l.), in the vicinity of old mine tunnels above Kováčov, unspecified biotope or oak forest mixed with ash; habitat, and method unspecified or sifting and individual sampling under stones, leg. F. Šťáhlavský and P. H. Verner
32 Burdov, NNR (47.82655, 18.74652; 180 m a.s.l.), xerothermic slope, clump of grass or soil extraction, leg. P. Fenďa
33 Burdov, NNR (47.82658, 18.77559; 170 m a.s.l.), in the vicinity of old mine tunnels above Kováčov, oak-hornbeam forest, leaf litter and soil extraction, qualitative sample and sifting, leg. P. Fenďa, P. Ľuptáčik and K. Tajovský
34 Burdov, NNR (47.82825, 18.75046; 288 m a.s.l.), oak-hornbeam forest, individual sampling under stones, leg. J. Christophoryová, M. Jurgová, K. Krajčovičová
35 Burdov, NNR (47.82888, 18.76083; 341 m a.s.l.), *Quercus cerris* forest, leaf litter extraction, leg. L. Švecová
36 Burdov, NNR (47.82912, 18.74923; 294 m a.s.l.), oak-hornbeam forest, individual sampling in dead wood and leaf litter sifting, leg. J. Christophoryová, M. Jurgová, K. Krajčovičová
37 Burdov, NNR (47.82924, 18.75314; 320 m a.s.l.), deciduous forest, mould extraction from *Fraxinus* tree hollow, leg. F. Šťáhlavský
38 Burdov, NNR (47.82978, 18.76300; 350 m a.s.l.), oak-hornbeam forest, individual sampling in dead wood and sifting of mould of *Quercus* tree hollow, leg. J. Christophoryová, M. Jurgová, K. Krajčovičová
39 Burdov, NNR (47.83070, 18.76274; 353 m a.s.l.), oak forest, mould extraction from *Quercus* tree hollow and leaf litter sifting, leg. F. Šťáhlavský
40 Burdov, NNR (47.83123, 18.76960; 240 m a.s.l.), oak-hornbeam forest with beech trees and black locust stand, mould extraction from *Fagus* tree hollow and individual sampling in rotting wood, leg. M. Jurgová, D. Selnekovič
41 Burdov, NNR (47.83147, 18.74524; 290 m a.s.l.), oak-hornbeam forest, individual sampling in dead wood and under *Quercus pubescens* bark or mould sifting from *Quercus* tree hollow, leg. J. Christophoryová, M. Jurgová, K. Krajčovičová
42 Burdov, NNR (47.83213, 18.76350; 332 m a.s.l.), oak-maple forest, leaf litter extraction, leg. P. Ľuptáčik
43 Burdov, NNR (47.83353, 18.76461; 312 m a.s.l.), oak-hornbeam forest, under a game feeding rack, compost extraction and leaf litter sifting, leg. L. Bouzek and F. Šťáhlavský
44 Burdov, NNR (47.83651, 18.76868; 360 m a.s.l.), oak-hornbeam forest, sifting mould from a fallen tree, leg. A. Mock
45 Burdov, NNR, Skaly viewpoint (47.82701, 18.75836; 301 m a.s.l.), oak-hornbeam forest, leaf litter extraction, leg. P. Fenďa
46 Burdov, NNR, Skaly viewpoint (47.82815, 18.75963; 321 m a.s.l.), oak-ash stand, leaf litter extraction and sifting, leg. P. Ľuptáčik and A. Mock
47 Burdov, NNR, Skaly viewpoint (47.82824, 18.75998; 322 m a.s.l.), oak-ash stand, individual sampling under stones or oak-ash leaf litter sifting, leg. F. Šťáhlavský
48 Burdov, NNR, Skaly viewpoint (47.82870, 18.76005; 338 m a.s.l.), oak-ash forest, mould extraction from *Quercus* tree hollow and individual sampling under *Quercus* bark, leg. F. Šťáhlavský
49 Chľaba (47.81831, 18.84752; 104 m a.s.l.), the confluence of the Ipeľ and the Danube, a group of alder and poplar trees, soil extraction, leg. P. Fenďa
50 Chľaba (47.82343, 18.85199; 107 m a.s.l.), in the vicinity of the riverbank Ipeľ, willow-poplar floodplain forest, soil extraction, leg. P. Fenďa
51 Chľaba (47.83168, 18.82869; 113 m a.s.l.), church attic, bat guano, method not specified, leg. K. Hůrka and P. H. Verner
52 Chľaba, Nové vinice (47.83127, 18.81612; 200 m a.s.l.), xerothermic forest steppe, soil extraction, leg. P. Fenďa
53 Ipeľ River bank (47.84058, 18.82311; 106 m a.s.l.), terrain gutter flowing into the river Ipeľ, leaf litter sifting, leg. A. Mock
54 Ipeľ River bank (47.84440, 18.82136; 117 m a.s.l.), debris slope, leaf litter sifting, leg. A. Mock

55 Kamenica nad Hronom (47.82289, 18.76465; 110 m a.s.l.), railway underpass, extracted from samples collected from the walls, leg. P. Ľuptáčik, A. Mock
56 Kamenica nad Hronom (47.82524, 18.74859; 134 m a.s.l.), oak forest near a house, Malaise trap, leg. O. Majzlan
57 Kamenica nad Hronom (47.82558, 18.74819; 137 m a.s.l.), family house and its garden, individual collection in the house corridor, compost extraction or pitfall traps, leg. P. Gajdoš, V. Hošek, O. Majzlan and P. Purgat
58 Kamenica nad Hronom (47.82591, 18.74402; 114 m a.s.l.), family house garden, Malaise trap, leg. O. Majzlan, Ľ. Vidlička
59 Kamenica nad Hronom (47.82870, 18.73423; 108 m a.s.l.), family house garden, compost extraction, leg. J. Christophoryová, K. Krajčovičová
60 Kováčov (47.82284, 18.77819; 113 m a.s.l.), poplar bank vegetation along the Danube River, mould of fallen tree sifting, leg. A. Mock
61 Kováčov (47.82293, 18.77918; 104 m a.s.l.), poplar bank vegetation along the Danube River, mould of fallen poplar and horse chestnut trees extraction, leg. A. Mock
62 Leľa (47.85485, 18.76825; 160 m a.s.l.), stand of *Robinia pseudoacacia* at the spring on the outskirts of the village, compost extraction, leg. P. Fenďa
63 Leľa (47.86472, 18.76361; 108 m a.s.l.), dead arm of the Ipeľ River, willows growing along the water, leaf litter extraction, leg. M. Holecová
64 Leliansky les, NNR (47.85596, 18.80661; 120 m a.s.l.), along riverbank of Ipeľ, leaf litter sifting, leg. A. Mock
65 Leliansky les, NNR (47.85629, 18.79293; 223 m a.s.l.), oak-ash forest, leaf litter extraction, leg. P. Ľuptáčik
66 Leliansky les, NNR (47.85694, 18.79388; 197 m a.s.l.), oak-hornbeam forest, leaf litter extraction, leg. L. Švecová
67 Leliansky les, NNR (47.85718, 18.79228; 190 m a.s.l.), oak-hornbeam forest, soil and leaf litter extraction, leg. P. Fenďa
68 Leliansky les, NNR (47.85773, 18.79423; 151 m a.s.l.), group of ash trees near the hunting cabin, leaf litter extraction, leg. P. Ľuptáčik
69 Leliansky les, NNR (47.85777, 18.79166; 170 m a.s.l.), beech forest, individual sampling beneath dead wood bark, leg. A. Purkart
70 Leliansky les, NNR (47.85785, 18.79478; 135 m a.s.l.), oak-hornbeam forest, soil extraction, leg. P. Fenďa
71 Leliansky les, NNR (47.85799, 18.79029; 170 m a.s.l.), oak-hornbeam forest, leaf litter extraction, leg. P. Fenďa
72 Leliansky les, NNR (47.85804, 18.79379; 143 m a.s.l.), oak-hornbeam forest with maple, soil extraction, leg. P. Fenďa
73 Leliansky les, NNR (47.85808, 18.79381; 143 m a.s.l.), oak-hornbeam forest with maple, mould extraction from *Quercus* tree hollow and leaf litter or leaf litter sifting, leg. P. Ľuptáčik and A. Mock
74 Štúrovo (47.79864, 18.72222; 110 m a.s.l.), plane tree alley on the square, individual sampling from beneath *Platanus* bark, leg. J. Christophoryová, M. Jurgová, K. Krajčovičová
75 Štúrovo (47.81666, 18.73333; 103 m a.s.l.), garden of a family house near the forest, nests extraction of *Phoenicurus ochruros* (Gmelin, 1774) and *Upupa epops* Linnaeus, 1758, leg. J. Krištofík
76 Veľký Kamenický ostrov (47.81836, 18.74255; 102 m a.s.l.), an island between the Danube River and its branch, willow stands, extraction of a sample from a decaying *Salix* trunk, leg. P. Ľuptáčik
77 Veľký Kamenický ostrov (47.82005, 18.75037; 104 m a.s.l.), an island between the Danube River and its branch, floodplain forest, leaf litter sifting in the entrance to the beaver burrow, leg. A. Mock

Results

The list of pseudoscorpions (unpublished and published data) includes 24 taxa belonging to five families. A total of 1489 individuals were recorded, although the published record for *Chelifer cancroides* does not specify an exact number of individuals in the original paper (Verner 1959). The species of the genus *Roncus* were only identified at the genus level. Individuals from the genus *Lamprochernes* published in Kaňuchová et al. (2015) were re-determined at the species level.

The list of pseudoscorpion taxa follows the system and nomenclature of Benavides et al. (2019) and the current version of the World Pseudoscorpiones Catalog (WPC 2025). Species are listed in alphabetical order within families. The faunistic record for each species includes the following data: study plot number code with details of the biotope, habitat, method and collector (see: List of study plots), date of collection, number of specimens according to developmental stages (♀ – female, ♂ – male, A – an adult, for which sex could not be determined, T – tritonymph, D – deutonymph, P – protonymph). For published papers, the same data are used if available, and the citation of the specific paper is included. Some study plots include more than one type of biotope, habitat, or collector under the same numerical code; in such cases, the specific data are provided for each species.

Pseudoscorpiones de Geer, 1778

Chthoniidae Daday, 1889

Chthonius carinthiacus Beier, 1951
Published data: 31: 18.4.1958, 1 ♂, unspecified biotope, habitat, and method; 16.5.1958, 1 ♂, unspecified biotope and habitat, sifting; 12.3.1959, 1 ♀, 1 ♂, unspecified biotope, habitat, and method; all samples leg. P. H. Verner (Christophoryová et al. 2014).

Chthonius carinthiacus has only been identified in the study area from the collections of P. H. Verner. No biotope or habitat type information was provided with the samples (Christophoryová et al. 2014).

Chthonius orthodactylus (Leach, 1817), *sensu* Beier (1963)
New data: 20: 5.10.2017, 1 ♀; **21:** 5.10.2017, 5 ♀♀, 2 ♂♂; **24:** 13.5.2018, 1 ♀, 1 ♂, 1 P; **27:** 13.5.2018, 1 ♂; **33:** 16.6.2017, 1 ♂, leaf litter and soil extraction, leg. P. Fenďa; 6.10.2017, 2 ♀♀, 1 D, leaf litter and soil extraction, leg. P. Ľuptáčik; 6.10.2017, 3 ♀♀, qualitative sample of leaf litter and soil, leg. K. Tajovský; 13.5.2018, 1 ♂, leaf litter and soil sifting, leg. P. Ľuptáčik.

The species *Chthonius orthodactylus* was recorded for the first time in the study area. A total of 20 specimens were collected from the leaf litter and soil in oak-hornbeam forest or black locust stand.

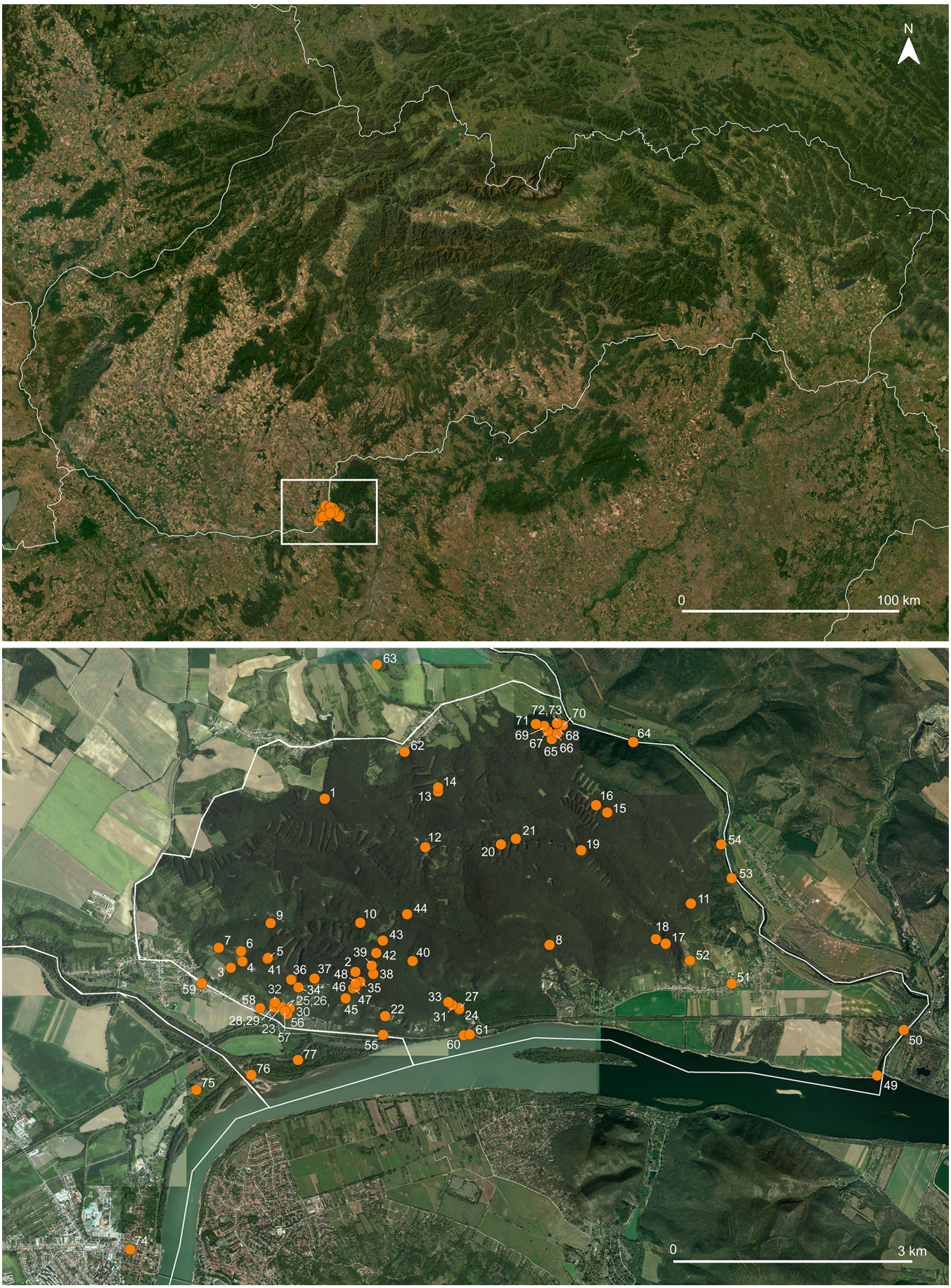

Fig. 1: Studied plots in the Burda Mountains. The numbers are explained in the List of study plots

Ephippiochthonius tetrachelatus (Preyssler, 1790)
Published data: 3: 24.10.2012, 1 ♀, 2 ♂♂, leaf litter and soil extraction, leg. O. Majzlan; 2.11.2012, 1 A, 1 ♀, 7 ♂♂, 2 T, leaf litter sifting, leg. J. Christophoryová, K. Krajčovičová; 2.11.2012, 1 ♀, leaf litter and soil extraction, leg. O. Majzlan (Christophoryová et al. 2014); **7:** 26.5.1999, 1 ♀ (Christophoryová et al. 2014); **37:** 26.5.1999, 3 ♀♀, 2 ♂♂, 1 T (Christophoryová et al. 2014); **39:** 26.5.1999, 1 ♀, 2 ♂♂, leaf litter sifting (Christophoryová et al. 2014); **47:** 26.5.1999, 1 ♀, 3 ♂♂; 6.7.2001, 1 ♀, 3 ♂♂; all samples leaf litter sifting (Christophoryová et al. 2014).
New data: 1: 4.6.2020, 1 ♀, 1 ♂; **4:** 17.3.2018, 1 ♀; **5:** 9.4.2019, 2 ♂♂, 1 T; **8:** 15.6.2017, 1 ♂, 1 D; **13:** 4.6.2020, 3 ♀♀, 1 T, 1 D; **14:** 4.7.2020, 1 ♀, 1 ♂; **15:** 22.10.2018, 1 ♂, 3 T, 1 P; **16:** 22.10.2018, 1 D; **17:** 5.10.2017, 1 D, leaf litter sifting, leg. A. Mock; **18:** 5.10.2017, 1 ♀, 2 T, 1 D, leaf litter sifting, leg. A. Mock; **21:** 5.10.2017, 2 ♀♀; **24:** 13.5.2018, 1 ♀, 6 ♂♂, 1 T; **27:** 13.5.2018, 1 ♂; **29:** 17.3.2018, 1 ♀, 1 ♂, 1 T; **30:** 18.4.2018, 1 ♀; **32:** 18.4.2018, 3 ♀♀, 2 ♂♂; 12.5.2018, 1 ♀; **33:** 16.6.2017, 1 T, leaf litter extraction, leg. P. Fenďa; 6.10.2017, 1 ♂, leaf litter extraction, leg. P. Ľuptáčik; 13.5.2018, 2 ♀♀, 1 ♂, 2 T, leaf litter and soil extraction, leg. P. Fenďa; 13.5.2018, 3 ♂♂, 1 T, leaf litter and soil sifting, leg. P. Ľuptáčik; **35:** 5.7.2020, 2 ♀♀, 1 ♂; **40:** 9.10.2017, 3 ♀♀, 1 ♂, 3 T, 3 D, mould extraction from *Fagus* tree hollow; **42:** 5.10.2017, 1 ♀, 2 ♂♂, 1 D; **44:** 5.10.2017, 1 D; **49:** 22.10.2018, 1 ♀; **54:** 16.6.2017, 1 ♀, 4 ♂♂; **55:** 16.6.2017, 1 ♂; **57:** 11.8.2019, 1 ♀, pitfall trap, leg. O. Majzlan; 1.7.2020, 3 ♀♀, 2 ♂♂, pitfall trap, leg. P. Gajdoš, P. Purgat; 17.9.2020, 2 ♀♀, 6 ♂♂, pitfall trap, leg. P. Gajdoš, P. Purgat; 20.8.2020, 2 ♀♀, 1 ♂, 1 T, 1 D, pitfall trap, leg. P. Gajdoš, P. Purgat; **61:** 16.6.2017, 1 ♀; **64:** 16.6.2017, 1 ♂; **66:** 4.7.2020, 3 ♀♀, 1 ♂; **67:** 22.10.2018, 5 ♀♀, 9 ♂♂, 3 T; **70:** 4.6.2020, 3 ♀♀, 1 D; **71:** 24.10.2018, 15 ♀♀, 17 ♂♂, 13 T, 6 D; **73:** 16.6.2017, 1 T, mould extraction from *Quercus* tree hollow, leg. A. Mock; 16.6.2017, 3 ♀♀, 12 ♂♂, 1 D, leaf litter sifting, leg. A. Mock; 7.10.2017, 3 D, leaf litter sifting, leg. A. Mock.

Ephippiochthonius tetrachelatus is the most numerous species of the family Chthoniidae recorded in the Burda Mountains, with 233 collected individuals. The species is epigeic and occurs sporadically in other habitat types. In the study area, individuals have also been recorded in soil and leaf litter, including pitfall traps, as well as in tree hollows and grass clumps. Previously published data were from deciduous forests, where the species occurred in soil, leaf litter, under stone, and in tree hollow (Christophoryová et al. 2014). In addition to deciduous forests, the species was found on debris and xerothermic slopes, as well as in the garden of a family house.

Ephippiochthonius tuberculatus (Hadži, 1937)
New data: 1: 4.6.2020, 1 ♀, 2 T, 1 D; **5:** 9.4.2019, 1 ♂; **11:** 22.10.2018, 1 T; **13:** 4.6.2020, 4 ♀♀, 3 ♂♂, 2 D, 4 P; **14:** 4.7.2020, 4 ♂♂; **24:** 13.5.2018, 1 ♂; **30:** 18.4.2018, 3 ♀♀, 2 ♂♂; **32:** 18.4.2018, 1 ♂; 12.5.2018, 2 ♂♂; **35:** 5.7.2020, 2 ♂♂; **40:** 9.10.2017, 1 ♂, mould extraction from *Fagus* tree hollow; **46:** 5.10.2017, 6 ♀♀, 10 ♂♂, 2 T, 1 D, leaf litter sifting, leg. A. Mock; **52:** 22.10.2018, 1 ♀; **65:** 4.7.2020, 1 ♂, 3 D, 2 P; **66:** 4.7.2020, 2 ♀♀, 3 ♂♂, 1 T; **68:** 4.7.2020, 1 T; **70:** 4.6.2020, 1 ♂, 1 P.

The occurrence of *Ephippiochthonius tuberculatus* was recorded for the first time in the Burda Mountains. A total of 70 specimens were collected from leaf litter, soil, grass clumps, and mould of deciduous forests, xerothermic slope, and forest steppe.

Neobisiidae Chamberlin, 1930

Microbisium suecicum Lohmander, 1945
New data: 46: 5.10.2017, 1 ♀, leaf litter extraction, leg. P. Ľuptáčik; 5.10.2017, 15 ♀♀, 1 D, leaf litter sifting, leg. A. Mock.

Microbisium suecicum is a rare species associated with xerothermic biotopes, where it primarily prefers leaf litter, the roots of grass clumps, or was found in an anthill (summarized in Červená et al. 2020a). A total of 17 individuals were collected in Burdov, NNR (Skaly viewpoint) from the leaf litter of the xerotherm oak-ash stand, which agrees with the biotope and habitat preference of the species.

Neobisium* (*Neobisium*) *carcinoides (Hermann, 1804)
Published data: 3: 24.10.2012, 1 D, leaf litter and soil extraction, leg. O. Majzlan; 2.11.2012, 8 ♀♀, 11 ♂♂, 1 D, leaf litter sifting, leg. J. Christophoryová, K. Krajčovičová; 2.11.2012, 1 ♀; leaf litter and soil extraction, leg. O. Majzlan (Christophoryová et al. 2014); **31:** 18.4.1958, 1 ♂, unspecified biotope, habitat, and method; 16.5.1958, 1 ♂, unspecified biotope, and habitat, sifting; 12.3.1959, 2 ♀♀, 6 ♂♂, unspecified biotope, habitat, and method; 15.4.1959, 1 ♀, 2 ♂♂, unspecified biotope, habitat, and method; all samples leg. P. H. Verner (Christophoryová et al. 2014); **39:** 26.5.1999, 2 ♂♂; 27.5.1999, 1 ♂; all samples leaf litter sifting (Christophoryová et al. 2014); **43:** 5.7.2001, 1 T; 14.4.2002, 1 ♀, 1 ♂; 20.10.2002, 2 ♀♀; 4.5.2007, 2 ♂♂; all samples leaf litter sifting, leg. F. Šťáhlavský (Christophoryová et al. 2014); **47:** 6.7.2001, 1 ♀; 20.10.2002, 1 ♂, 1 T; 4.5.2007, 3 ♂♂; all samples leaf litter sifting (Christophoryová et al. 2014).
New data: 1: 4.6.2020, 6 D, 1 P; **4:** 17.3.2018, 1 ♀, 1 T, 1 D; **8:** 15.6.2017, 2 T, 2 D; **10:** 6.10.2017, 2 ♀♀; **15:** 22.10.2018, 1 ♀, 2 ♂♂; **17:** 5.10.2017, 1 ♀, 5 ♂♂, leaf litter extraction, leg. P. Ľuptáčik; 5.10.2017, 1 ♀, 3 ♂♂, leaf litter sifting, leg. A. Mock; **18:** 5.10.2017, 7 ♀♀, 4 ♂♂, 2 D, 1 P, leaf litter sifting, leg. A. Mock; **19:** 22.10.2018, 2 ♀♀, 4 ♂♂; **20:** 5.10.2017, 3 ♀♀, 1 ♂, 2 T, 2 D; **21:** 5.10.2017, 2 ♀♀, 1 ♂; **23:** 31.5.2018, 1 ♂; **24:** 13.5.2018, 1 ♂; **25:** 11.9.2011, 4 ♀♀, 2 ♂♂; **27:** 13.5.2018, 1 ♂, 2 D; **29:** 17.3.2018, 1 ♂; **30:** 18.4.2018, 1 ♂; **33:** 16.6.2017, 1 ♂, 1 T, 16 D, leaf litter and soil extraction, leg. P. Fenďa; 6.10.2017, 1 ♂, leaf litter and soil extraction, leg. P. Ľuptáčik; 6.10.2017, 15 ♀♀, 8 ♂♂, 3 T, 14 D, 6 P, qualitative sample of leaf litter and soil, leg. K. Tajovský; 13.5.2018, 1 ♀, leaf litter and soil sifting, leg. P. Ľuptáčik; **35:** 5.7.2020, 1 ♂; **36:** 9.4.2019, 1 ♀, leaf litter sifting; **38:** 9.4.2019, 1 ♀, mould sifting from *Quercus* tree hollow; **40:** 9.10.2017, 1 D, mould extraction from *Fagus* tree hollow; **42:** 5.10.2017, 1 ♀, 3 D, 1 P; **44:** 5.10.2017, 1 ♀; **53:** 17.6.2017, 1 ♀, 1 ♂, 1 T, 2 D; **54:** 16.6.2017, 3 ♀♀, 2 ♂♂, 1 D, 4 P; **57:** 9.1.2020, 1 ♀, compost extraction, leg. O. Majzlan; **60:** 17.3.2018, 1 ♂, 1 D; **64:** 16.6.2017, 1 ♀, 2 ♂♂, 1 D, 3 P; **67:** 22.10.2018, 5 ♀♀, 6 ♂♂, 1 T; **70:** 4.6.2020, 1 T; **71:** 24.10.2018, 4 ♂♂, 1 T; **72:** 17.6.2017, 1 ♂, 1 P; **73:** 16.6.2017, 1 ♀, 11 ♂♂, 1 D, 2 P, leaf litter sifting, leg. A. Mock; 7.10.2017, 1 ♂, 5 D, 2 P, leaf litter extraction, leg. P. Ľuptáčik; 7.10.2017, 1 ♂, mould extraction from *Quercus* tree hollow, leg. P. Ľuptáčik; 7.10.2017, 7 ♀♀, 6 ♂♂, 1 T, 8 D, leaf litter sift-

ing, leg. A. Mock; 22.10.2018, 17 ♀♀, 18 ♂♂, 4 D, 1 P, leaf litter sifting, leg. A. Mock; **76:** 23.10.2018, 1 ♀; **77:** 23.10.2018, 1 ♂.

Neobisium carcinoides is an eurypotent species with a wide ecological range, which belongs to one of the most common species of the family. It was also the most abundant neobisiid (333 individuals) during the present research. The species is mainly epigeic, which is consistent with published data from the study area; individuals occurred in soil and leaf litter (Christophoryová et al. 2014). The new data come from more than 30 study plots (including both reserves) and different habitat types such as compost, tree hollows, and dead wood.

The *Neobisium carcinoides* complex is currently considered to be a polymorphic species. Genetic data support the competing hypothesis that there are 10–20 cryptic species within this morphologically conserved complex, exemplifying cryptic diversity (Muster et al. 2021).

Neobisium* (*Neobisium*) *erythrodactylum (L. Koch, 1873)
Published data: 3: 24.10.2012, 1 D, leaf litter and soil extraction, leg. O. Majzlan; 2.11.2012, 1 T, 2 D, leaf litter sifting, leg. J. Christophoryová, K. Krajčovičová (Christophoryová et al. 2014); **31:** 18.4.1958, 1 ♂, 1 T, unspecified biotope, habitat, and method; 16.5.1958, 1 ♂, 1 T, unspecified biotope and habitat, sifting; 12.3.1959, 4 ♀♀, 5 ♂♂, 4 T, unspecified biotope, habitat, and method; 15.4.1959, 1 ♀, unspecified biotope, habitat, and method; all samples leg. P. H. Verner (Christophoryová et al. 2014); **43:** 26.5.1999, 1 ♂, 1 T; 5.7.2001, 1 ♂; 22.4.2006, 2 ♂♂; 4.5.2007, 2 ♀♀; all samples leaf litter sifting, leg. F. Šťáhlavský (Christophoryová et al. 2014); **47:** 4.5.2007, 2 ♂♂, leaf litter sifting (Christophoryová et al. 2014).
New data: 4: 17.3.2018, 2 ♂♂; **10:** 6.10.2017, 1 ♂; **15:** 22.10.2018, 1 ♀; **18:** 5.10.2017, 1 ♂, 1 T, 1 D, leaf litter extraction, leg. P. Ľuptáčik; 5.10.2017, 1 ♂, 1 T, 2 D, 1 P, leaf litter sifting, leg. A. Mock; **19:** 22.10.2018, 1 ♀, 1 D, 5 P; **20:** 5.10.2017, 1 ♀, 1 T, 1 D, 1 P; **25:** 11.9.2011, 1 ♀; **26:** 12.5.2018, 2 D; **28:** 17.3.2018, 1 ♀; **29:** 17.3.2018, 1 ♂; **33:** 6.10.2017, 1 ♂, 1 D, 1 P, qualitative sample of leaf litter and soil, leg. K. Tajovský; **52:** 22.10.2018, 2 T, 1 D; **54:** 16.6.2017, 1 ♀, 1 T; **57:** 11.8.2019, 1 ♀, pitfall trap, leg. O. Majzlan; **62:** 4.6.2020, 1 D; **64:** 16.6.2017, 1 ♀, 1 ♂; **66:** 4.7.2020, 1 ♂, 1 T; **67:** 22.10.2018, 1 T, 13 D, 4 P; **71:** 24.10.2018, 1 ♀, 1 P; **73:** 16.6.2017, 2 ♀♀, 7 ♂♂, leaf litter sifting, leg. A. Mock; 7.10.2017, 1 T, 2 D, 1 P, leaf litter sifting, leg. A. Mock; 22.10.2018, 1 ♂, 1 T, 4 D, 1 P, leaf litter sifting, leg. A. Mock.

Neobisium erythrodactylum (113 individuals) represents a typical epigeic and edaphic species, which agrees with both published (Christophoryová et al. 2014) and newly obtained data. The species occurred mainly in the soil and leaf litter of deciduous and mixed forests, xerothermic forest steppe, or debris on a slope.

Neobisium* (*Neobisium*) *sylvaticum (C.L. Koch, 1835)
Published data: 31: 18.4.1958, 1 ♂, unspecified biotope, habitat, and method; 16.5.1958, 1 T, unspecified biotope, and habitat, sifting; 12.3.1959, 1 ♀, 2 ♂♂, 1 T, unspecified biotope, habitat, and method; all samples leg. P. H. Verner (Christophoryová et al. 2014); **39:** 4.5.2007, 1 ♂, leaf litter sifting (Christophoryová et al. 2014).
New data: 4: 17.3.2018, 1 ♂; **21:** 5.10.2017, 1 ♀; **32:** 12.5.2018, 1 ♀, 34 P; **44:** 5.10.2017, 1 T; **57:** 5.2.2019, 1 ♀, 1 ♂, pitfall trap, leg. O. Majzlan.

The species is epigeic and edaphic, and individuals can climb grasses and shrubs. A total of 47 individuals of *Neobisium sylvaticum* were collected. Published data mostly lacked specific information on biotopes and habitats (Christophoryová et al. 2014). Most individuals from the new samples were present in grass clumps on xerothermic slope, and up to 34 of them were protonymphs.

Roncus* cf. *lubricus L. Koch, 1873
Published data: 31: 18.4.1958, 4 ♀♀, 5 ♂♂, unspecified biotope, habitat, and method; 16.5.1958, 1 ♀, unspecified biotope, and habitat, sifting; 12.3.1959, 6 ♀♀, 26 ♂♂, unspecified biotope, habitat, and method; 15.4.1959, 8 ♀♀, 11 ♂♂, unspecified biotope, habitat, and method; all samples leg. P. H. Verner (Christophoryová et al. 2014); **43:** 26.5.1999, 1 ♀, 6 ♂♂, 2 T; 5.7.2001, 5 ♀♀, 7 ♂♂; 14.4.2002, 10 ♀♀, 8 ♂♂, 5 T; 20.10.2002, 14 ♀♀, 7 ♂♂; 24.6.2004, 8 ♂♂; 4.5.2005, 7 ♀♀, 28 ♂♂; 22.4.2006, 3 ♀♀, 18 ♂♂; all samples leaf litter sifting, leg. F. Šťáhlavský; 26.5.2006, 3 ♂♂, leaf litter sifting, leg. L. Bouzek; 4.5.2007, 3 ♀♀, 12 ♂♂, leaf litter sifting, leg. F. Šťáhlavský (Christophoryová et al. 2014).

The genus *Roncus* includes several species complexes without known morphological or morphometric characters. Cytogenetic studies have revealed the presence of cryptic species of the genus in Slovakia (Šťáhlavský et al. 2013). Therefore, the individuals were identified only as cf. or at the genus level (see below). Members of the genus are predominantly epigeic and live in forest leaf litter.

***Roncus* sp.** L. Koch, 1873
Published data: 2: 5.7.2001, 1 ♀, 6 ♂♂ (Šťáhlavský et al. 2013); **9:** 14.4.2002, 2 ♀♀, 4 ♂♂; 24.6.2004, 2 ♂♂; 4.5.2005, 2 ♂♂; 22.4.2006, 2 ♂♂ (Šťáhlavský et al. 2013).
New data: 13: 4.6.2020, 1 ♀; **14:** 4.7.2020, 1 ♀, 2 T; **18:** 5.10.2017, 1 ♀, leaf litter sifting, leg. A. Mock; **40:** 9.10.2017, 1 ♀, 1 D, mould extraction from *Fagus* tree hollow; **57:** 21.3.2019, 1 ♂, pitfall trap, leg. O. Majzlan; **73:** 16.6.2017, 1 ♂, 1 T, leaf litter sifting, leg. A. Mock; 7.10.2017, 1 ♀, leaf litter extraction, leg. P. Ľuptáčik; 7.10.2017, 1 ♀, 2 ♂♂, leaf litter sifting, leg. A. Mock.

See notes on *Roncus* cf. *lubricus*.

Atemnidae Kishida, 1929

Atemnus politus (Simon, 1878) (Fig. 2a)
Published data: 3: 5.6.2010, 1 ♀, 1 ♂, mould extraction from *Quercus* tree hollow; 24.10.2012, 3 ♀♀, 1 ♂, 3 D, leaf litter extraction; all samples leg. O. Majzlan; 2.11.2012, 1 ♀, 1 ♂, mould extraction from *Quercus* tree hollow; 2.11.2012, 4 D, leaf litter sifting; all samples leg. J. Christophoryová, K. Krajčovičová; 2.11.2012, 1 ♂, 1 D, leaf litter and soil extraction, leg. O. Majzlan (Christophoryová et al. 2014); **12:** 19.9.1974, 1 ♀, oak leaves, leg. J. Svatoň (Krumpálová & Krumpál 1993); **31:** 26.5.1999, 1 ♀, 1 T, oak woodland with ash, individual sampling under stones, leg. F. Šťáhlavský (Christophoryová et al. 2014); 5.7.2001, 1 ♀, 5 ♂♂, 1 T; 14.4.2002, 1 ♀, 6 ♂♂; 20.10.2002, 1 ♂; 24.6.2004, 2 ♂♂; all collections unspecified biotope, individual sampling under stones, leg. F. Šťáhlavský (Šťáhlavský et al. 2012); **47:** 26.5.1999, 2 ♀♀, individual sampling under stones; 26.5.1999, 1 ♀, 2 ♂♂, leaf litter sifting; 5.7.2001, 6 ♂♂, individual sampling under stones; 14.4.2002,

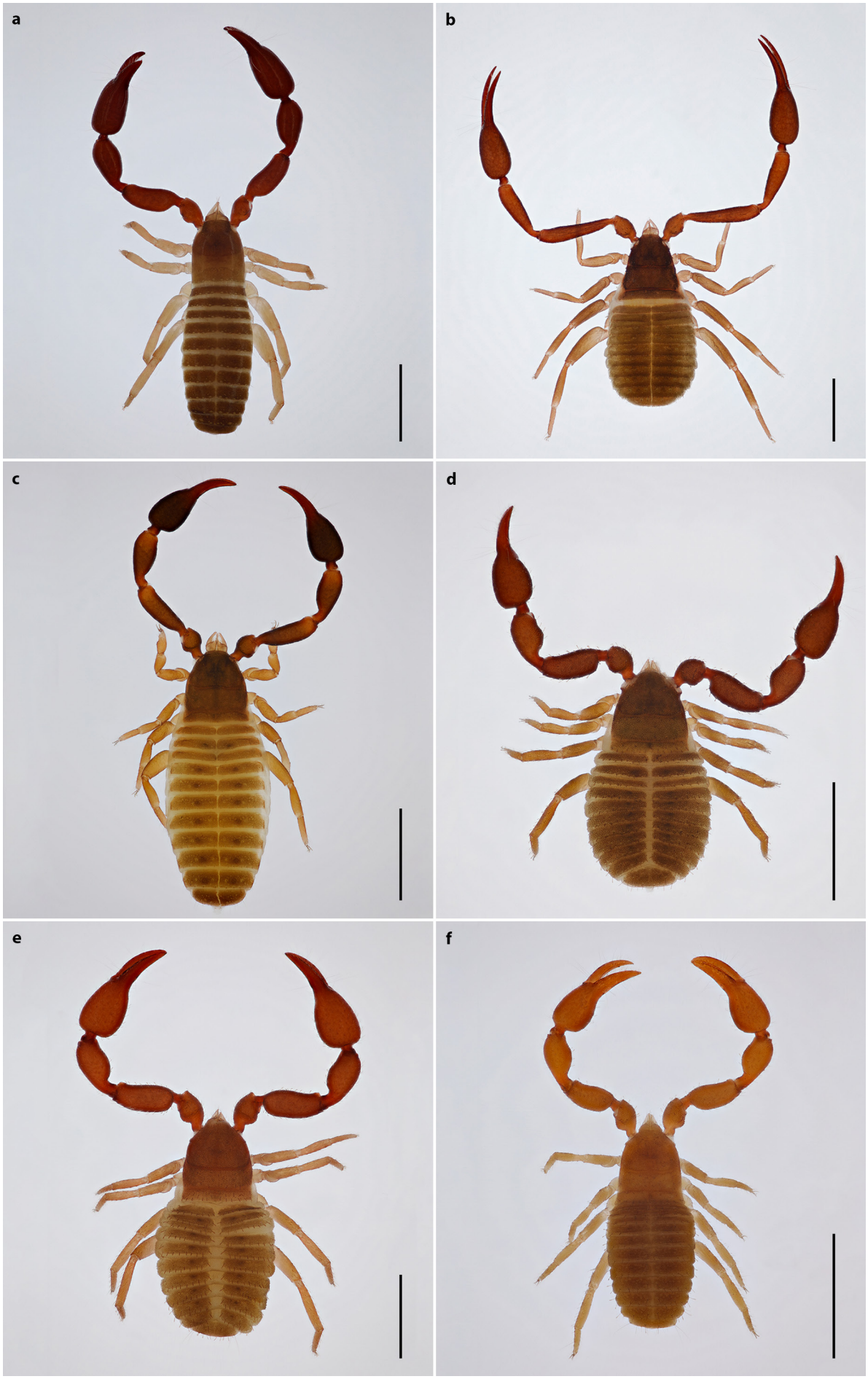

Fig. 2: Selected species of pseudoscorpions living in the Burda Mountains. **a.** *Atemnus politus*; **b.** *Chelifer cancroides*; **c.** *Dactylochelifer* sp.; **d.** *Chernes hahnii*; **e.** *Dinocheirus panzeri*; **f.** *Pselaphochernes scorpioides*. Scale bars: 1 mm

2 ♀♀, 3 ♂♂, individual sampling under stones; 14.4.2002, 1 ♀, leaf litter sifting; 20.10.2002, 1 ♂, individual sampling under stones; 24.6.2004, 1 ♂, individual sampling under stones; 4.5.2005, 1 ♂, individual sampling under stones; 22.4.2006, 1 ♀, 2 ♂♂, individual sampling under stones; 4.5.2007, 1 ♀, 1 ♂, leaf litter sifting (Christophoryová et al. 2014); **59:** 2.11.2012, 1 T, 2 D (Christophoryová et al. 2014).
New data: 6: 17.3.2018, 3 ♀♀, 1 ♂, 3 D, clump of grass extraction; 18.4.2018, 1 ♀, 1 ♂, 4 D, soil extraction; 12.5.2018, 1 ♀, leaf litter extraction; 12.5.2018, 2 ♀♀, 1 T, 2 D, 1 P, clump of grass extraction; **22:** 5.7.2020, 1 T; **23:** 31.5.2018, 1 ♀, 1 ♂; 26.6.2018, 1 ♀; **34:** 9.4.2019, 2 ♂♂; **36:** 9.4.2019, 1 ♂, leaf litter sifting; **45:** 17.3.2018, 2 ♀♀, 2 ♂♂, 10 D; **46:** 5.10.2017, 1 ♀, 1 D, 1 P, leaf litter extraction, leg. P. Ľuptáčik; 5.10.2017, 3 ♀♀, 2 ♂♂, 2 T, 24 D, 2 P, leaf litter sifting, leg. A. Mock; **57:** 5.2.2019, 1 ♂, pitfall trap, leg. O. Majzlan; 9.1.2020, 2 ♀♀, compost extraction, leg. O. Majzlan; 19.11.2020, 2 ♀♀, pitfall trap, leg. P. Gajdoš, P. Purgat.

Atemnus politus is a thermophilic species associated with xerothermic biotopes. The records, mainly from the study plots of the Burdov NNR, confirmed this affinity. A total of 147 individuals were recorded in different habitat types, namely in leaf litter, soil, grass clumps, compost, under stones, and in the mould of ground tree hollows.

Diplotemnus balcanicus (Redikorzev, 1928)
Published data: 51: 3.7.1955, 1 ♂, 1 T, guano of the bats *Myotis myotis* and *M. blythii*, leg. K. Hůrka (Verner 1959, Krajčovičová et al. 2021); **57:** 28.10.2019, 1 ♂, leg. P. Gajdoš, V. Hošek (Krajčovičová et al. 2021).

The presence of *Diplotemnus balcanicus* has only been documented twice in Slovakia, both in synanthropic habitats in the Burda Mountains. The species was recorded for the first time in the area in 1955, when two individuals were found in bat guano in the attic of a church in Chľaba (Verner 1959). After 65 years, the species was rediscovered 8 km away in Kamenica nad Hronom, in the corridor of a family house (Krajčovičová et al. 2021).

Cheliferidae Risso, 1827

Chelifer cancroides (Linnaeus, 1758) (Fig. 2b)
Published data: 51: 3.7.1955, all developmental stages (numbers not given), guano of the bats *Myotis myotis* and *M. blythii*, leg. K. Hůrka (Verner 1959); 18.4.1956, 8 ♀♀, 5 ♂♂, 1 T, bat guano, leg. P. H. Verner (Christophoryová et al. 2014).
New data: 56: 4.5.2018, 1 ♀.

Chelifer cancroides is a cosmopolitan and synanthropic species, as evidenced by its finding in bat guano in the attic of a church in Chľaba (Verner 1959, Christophoryová et al. 2014). It is worth noting that a female was captured in a Malaise trap in the oak forest of Kamenica nad Hronom. Verner (1959) did not specify the number of individuals.

Beierochelifer quadrimaculatus (Tömösváry, 1882)
Published data: 12: 20.3.1958, 1 ♂, individual sampling under *Quercus* bark, leg. P. H. Verner (Verner 1960).

Verner (1960) published a record of *Beierochelifer quadrimaculatus*, a male specimen found under the bark of an oak tree in the locality of Burda. The presence of this species was not confirmed in the present study.

***Dactylochelifer* sp.** Beier, 1932 (Fig. 2c)
Published data: 63: 7.10.2017, 1 ♂ (Červená et al. 2020a); **75:** 9.10.1992, 1 P, nests of *Phoenicurus ochruros* extraction (Christophoryová et al. 2011a).
New data: 18: 5.10.2017, 1 D, leaf litter sifting, leg. A. Mock.

Only three individuals of *Dactylochelifer* were documented in the study area, in leaf litter and a nest of *Phoenicurus ochruros* (Christophoryová et al. 2011a, Červená et al. 2020a).

The species *D. degeerii* (C.L. Koch, 1835) and *D. ninnii* (Canestrini, 1876) have recently been reinstated to species status after previously being treated as junior synonyms of *D. latreillii*. Both were reported from Slovakia by Muster et al. (2024). Female specimens would be necessary to revise the material previously attributed to *D. latreillii* (Christophoryová et al. 2011a, Červená et al. 2020a). For this reason, the specimens are currently identified only to the genus level.

Chernetidae Menge, 1855

Allochernes solarii (Simon, 1898)
New data: 5: 9.4.2019, 1 ♂.

The occurrence of the species in Slovakia has been recorded only recently from anthills of *Formica gagates* Latreille, 1798 at the locality Vajnorská Hora in the Malé Karpaty Mts. (Červená et al. 2018, 2020c). The new record represents the second known locality of the species in Slovakia. One male was extracted from soil in an oak forest with black locusts in Burda.

Allochernes wideri (C.L. Koch, 1843)
Published data: 3: 5.6.2010, 1 ♀, mould extraction from *Quercus* tree hollow, leg. O. Majzlan (Christophoryová et al. 2014); **43:** 20.10.2002, 1 ♂, leaf litter sifting, leg. F. Šťáhlavský (Christophoryová et al. 2014).
New data: 40: 9.10.2017, 1 ♀, 1 ♂, 1 T, 3 D, mould extraction from *Fagus* tree hollow; **73:** 16.6.2017, 1 ♀, 1 T, mould extraction from *Quercus* tree hollow, leg. A. Mock.

Allochernes wideri lives mainly in tree hollows, bird nests, or anthills (Červená et al. 2020a). It is less common in leaf litter or composts. Both published data and new material are consistent with its known ecological preferences. A total of 10 specimens were collected, mainly from the hollows of beech and oak trees.

Chernes cimicoides (Fabricius, 1793)
New data: 40: 9.10.2017, 2 ♀♀, mould extraction from *Fagus* tree hollow; **71:** 24.10.2018, 3 ♀♀, 3 D, 5 P.

Chernes cimicoides is a predominantly dendrophilous species living under tree bark and in tree hollows, more rarely in leaf litter or bird nests (Červená et al. 2020a). This is the first time the species has been recorded in the study area. It was recorded in both reserves from the mould of beech trees and leaf litter (13 specimens in total).

Chernes hahnii (C.L. Koch, 1839) (Fig. 2d)
Published data: 48: 14.4.2002, 1 ♂; 20.10.2002, 1 ♂; all collections individual sampling under *Quercus* bark (Christophoryová et al. 2014).
New data: 36: 9.4.2019, 2 ♂♂, individual sampling in dead wood; **41:** 9.4.2019, 1 ♀, 1 ♂, 4 T, 1 P, individual sampling in dead wood; 9.4.2019, 1 ♀, individual sampling under *Quercus pubescens* bark; **74:** 10.4.2019, 1 ♀.

Chernes hahnii is a typical dendrophilous species; 13 individuals were collected under tree bark and in dead wood.

Chernes vicinus (Beier, 1932)
Published data: 69: 25.10.2018, 1 ♀, 1 ♂ (Červená et al. 2020a).
New data: 40: 9.10.2017, 1 T, mould extraction from *Fagus* tree hollow.

The presence of three individuals of *Chernes vicinus* was recorded in both reserves under tree bark and in tree hollows. It is a dendrophilous species, or it inhabits bird nests and anthills (Červená et al. 2020a).

Dinocheirus panzeri (C.L. Koch, 1836) (Fig. 2e)
Published data: 39: 27.5.1999, 6 ♀♀, 1 ♂, 1 T, 1 D, mould extraction from *Quercus* tree hollow (Christophoryová et al. 2014); **48:** 27.5.1999, 4 ♀♀, 3 ♂♂, 5 T, 9 D, mould extraction from *Quercus* tree hollow (Christophoryová et al. 2014).
New data: 11: 22.10.2018, 1 T, 4 D, 1 P; **38:** 9.4.2019, 2 ♀♀, 1 ♂, sifting of mould of *Quercus* tree hollow; **40:** 9.10.2017, 1 ♀, 1 ♂, 4 T, 7 D, 5 P, mould extraction from *Fagus* tree hollow; **41:** 9.4.2019, 1 ♂, sifting of mould of *Quercus* tree hollow; **70:** 4.6.2020, 1 D; **73:** 16.6.2017, 3 ♀♀, 1 T, 8 D, 1 P, mould extraction from *Quercus* tree hollow, leg. A. Mock.

Like other species of the family Chernetidae, *Dinocheirus panzeri* prefers tree hollows. It was recorded in both reserves, mainly in tree hollows in deciduous and mixed forests. Out of 72 individuals, only one was found in soil.

Lamprochernes chyzeri (Tömösváry, 1883)
Published data: 59: 2.11.2012, 5 ♀♀, 24 ♂♂, 13 T, 12 D (Kaňuchová et al. 2015).
New data: 36: 9.4.2019, 1 ♀, 3 ♂♂, 1 D, individual sampling in dead wood; **38:** 9.4.2019, 2 ♀♀, individual sampling in dead wood; **40:** 9.10.2017, 2 ♀♀, 1 ♂, individual sampling in rotting wood.

Representatives of the genus *Lamprochernes* Tömösváry, 1883 are typical inhabitants of decaying organic materials. They are particularly dominant in composts, where all their developmental stages are present. An interactive approach combining molecular DNA barcoding with cytogenetic and multivariate statistical analyses of the genus revealed the occurrence of the cryptic species *L. abditus* Christophoryová, Krajčovičová, Šťáhlavský, Španiel & Opatova, 2023, and other identification characters of the species *L. chyzeri* and *L. nodosus* (Christophoryová et al. 2023). Based on the new knowledge, the previously published material from Burda by Christophoryová et al. (2014) was redetermined. The specimens preserved in 75% ethanol and prepared as permanent slide mounts could not be molecularly analysed; therefore, the presence of the cryptic species *L. abditus* in the samples cannot be excluded.

A total of 64 specimens were identified and redetermined to be *L. chyzeri*. Individuals inhabited compost, dead, and rotting wood.

Lamprochernes nodosus (Schrank, 1803)
Published data: 3: 2.11.2012, 1 ♀, mould extraction from *Quercus* tree hollow, leg. J. Christophoryová, K. Krajčovičová (Christophoryová et al. 2014); **43:** 14.4.2002, 9 ♀♀, 11 ♂♂; 20.10.2002, 1 ♀, 5 ♂♂; all samples compost extraction, leg. F. Šťáhlavský (Christophoryová et al. 2014).

See notes for *L. chyzeri*.

A total of 27 individuals of *Lamprochernes nodosus* were present in straw and haystacks, with only one specimen inhabiting an oak tree hollow (Christophoryová et al. 2014). No new data on the distribution of the species were obtained during this research.

Pselaphochernes scorpioides (Hermann, 1804) (Fig. 2f)
Published data: 48: 27.5.1999, 2 ♀♀, 1 ♂, mould extraction from *Quercus* tree hollow (Christophoryová et al. 2014); **75:** 13.7.1995, 1 ♀, nest of *Upupa epops* extraction (Christophoryová et al. 2014).
New data: 16: 22.10.2018, 7 ♀♀, 3 ♂♂, 5 T, 10 D; **40:** 9.10.2017, 2 ♀♀, mould extraction from *Fagus* tree hollow; **50:** 4.6.2020, 1 ♀; **58:** 21.4.2019, 1 ♀; **61:** 16.6.2017, 3 T; **74:** 10.4.2019, 1 ♀, 1 T.

Pselaphochernes scorpioides is widespread in Slovakia, where it is known mainly from compost, leaf litter, bird nests and anthills. The same applies to records from the present study, during which it has been recorded in mould samples, under tree bark, in a hoopoe nest and in soil (38 individuals).

Discussion

In comparison to previously published data from the Burda Mts., five pseudoscorpion species were newly recorded in the area – *Chthonius orthodactylus*, *Ephippiochthonius tuberculatus*, *Microbisium suecicum*, *Allochernes solarii* and *Chernes cimicoides*. On the other hand, the species *Chthonius carinthiacus*, *Diplotemnus balcanicus*, *Beierochelifer quadrimaculatus* and *Lamprochernes nodosus* were not recorded for the second time during the current research. From a faunistic point of view, the record of *C. orthodactylus* is of special interest, because the only data published from Slovakia come from two localities in the Gaderská dolina Valley, without specifying ecological requirements of the species (Krumpál 1980, Krumpál & Kiefer 1981). We found the species to be epigeic and living in deciduous forest leaf litter and soil. Thus, the present findings represent new data on its distribution in Slovakia after more than 40 years. The species *E. tuberculatus* was found only twice in Slovakia, at the localities Hradová in the Čierna hora Mountains and Ladmovce in the Latorica Protected Landscape Area (Christophoryová et al. 2011b, Červená et al. 2021). It is a relatively rare species; individuals were collected in leaf litter and grass clumps in xerothermic biotopes. The newly obtained data show that the species also occurs in deciduous forests in addition to xerothermic biotopes. Moreover, a new habitat for the species was discovered (mould of ground tree hollows). *Microbisium suecicum* has been known from five localities in Slovakia so far: Sekule, Gajary, Zoborská lesostep NNR, Drňa, and Tajba (Christophoryová 2009, Christophoryová et al. 2011c, 2017; Červená et al. 2020a). The species prefers areas with a mosaic of sandy and ruderal vegetation. It inhabits most frequently clumps of grass and leaf litter but has also been present in the anthill of *Formica rufibarbis* Fabricius, 1793. Data from the Burda Mts. confirm the habitat preference of the species. The new record also adds the locality of its distribution in Slovakia. The discovery of the rare species *A. solarii* in the study area has expanded our knowledge of its distribution in Slovakia. So far, it has only been documented in the locality of Vajnorská Hora in the Malé Karpaty Mountains (Červená et al. 2018, 2020c).

Epigeic and edaphic forms were represented mainly by the pseudoscorpions of the families Chthoniidae and Neobisiidae, including the eurytopic species *E. tetrachelatus* and *N. carcinoides*. In the family Atemnidae, *A. politus* is epigeic and represents a typical thermophilic species associated with xerothermic habitats. *Diplotemnus balcanicus* has only been recorded twice in Slovakia from the Burda Mts. in a synanthropic environment (Verner 1959, Krajčovičová et al. 2021). The family Cheliferidae includes the cosmopolitan and synanthropic species *Chelifer cancroides*, the genus *Dactylochelifer* with its wider range of habitat preferences, and *B. quadrimaculatus*, which was present under tree bark. Most species of the family Chernetidae are dendrophilous, inhabiting the hollows of trees or spaces under the bark. In addition, members of the genus *Lamprochernes* and the species *P. scorpioides* are abundant in decaying organic material such as compost or haystacks (Kaňuchová et al. 2015, Červená et al. 2020a).

The recorded pseudoscorpions can be divided into four groups according to their biotope preferences. The pseudoscorpions of forest biotopes often include mesophilic species living in deciduous and mixed forests (e.g. *C. orthodactylus*, *E. tuberculatus*, *N. erythrodactylum*, *N. sylvaticum*, and species of the genus *Roncus*). Eurypotent species capable of colonizing forests, as well as non-forest sites, were also present (*E. tetrachelatus*, *N. carcinoides*). Alluvial biotopes were inhabited by species that prefer shady forest habitats, stream banks with higher humidity (e.g. *N. erythrodactylum*, *Dactylochelifer* sp., *P. scorpioides*), and the above-mentioned eurypotent species. The presence of pseudoscorpions in xerothermic biotopes depends on the composition and cover of the vegetation. As this also includes secondary habitats created after deforestation, the species must cope with direct sunlight, wind, and significant fluctuations in humidity and temperature. They are, therefore, often concentrated in the roots of grasses or even in a thin layer of leaf litter (e.g. *E. tuberculatus*, *M. suecicum*, *A. politus*). Pseudoscorpions that can live in anthropogenic habitats are species that live mainly in human settlements and their immediate surroundings, such as garden compost (e.g. *D. balcanicus*, *C. cancroides*, representatives of the genus *Lamprochernes*, *P. scorpioides*).

The pseudoscorpion fauna of the Burda Mts. is zoogeographically quite diverse, with Palaearctic species and species with a European distribution being the most abundant. Representatives of the genus *Lamprochernes* have a Palaearctic, Afrotropical and Indo-Malaysian distribution due to their ability to phoresy. *Chelifer cancroides* is a cosmopolitan species. The record of *A. solarii*, known – apart from Slovakia – only from France, Italy, and the Czech Republic, is especially significant (Červená et al. 2018, Šťáhlavský & Krejčí 2021).

Despite their small size, the Burda Mts. are one of the most important areas in Slovakia for pseudoscorpion diversity, with nearly 40% of the country's known pseudoscorpion species occurring here. Two national nature reserves have been declared in this area. Nineteen taxa of pseudoscorpions were recorded in Burdov NNR and nine taxa in Leliansky Les NNR. In both reserves, the rare species *E. tuberculatus* was recorded, and in Burdov, the thermophilic species *A. politus*. Areas outside the reserves proved to be equally important for pseudoscorpion biodiversity. In Kamenica nad Hronom, a little-known, rare species *A. solarii*, was documented, as well as the introduced *D. balcanicus*, which has its north-western limit of distribution in this area. The species *M. suecicum*, which prefers xerothermic habitats, was recorded at the Burdov, NNR (Skaly viewpoint). The above-mentioned species are rare, rarely occurring in Slovakia, or species associated with a certain type of biotope or habitat. Currently in validity is the Decree of the Ministry of the Environment of the Slovak Republic No. 170/2021 Coll., which implements the Act No. 543/2002 Coll. on Nature and Landscape Protection, as amended. Annex 5 of this decree lists the species *M. suecicum* and *A. politus* as protected animals.

When assessing biotope types, xerothermic steppe and forest steppe sites, with the sporadic occurrence of trees and shrubs and native or little disturbed forests, appear to be the most valuable. Pseudoscorpions are associated with a variety of environment types, so it is important to maintain a wide range of habitats through long-term sustainable land management. Management should aim to preserve remnants of native forests, xerothermic steppes and forest steppes, as well as alluvial biotopes. The occurrence of rare and thermophilic species in xerothermic habitats may be threatened by the loss and degradation of xerothermic grassland, steppe and forest steppe habitats, overgrowth of invasive woody plants, inappropriate forest management (e.g., planting of pine monocultures) or illegal sand mining. Conservation measures should include activities such as the removal of invasive woody plants and the general prevention of habitat overgrowth.

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