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NEW AND REMARKABLE FINDINGS OF SPIDERS (ARANEIDA) IN PSEUDOKARST CAVES OF THE 'POHANSKÝ HRAD' NATURE RESERVATION

Introduction and Methods

The phenomenon of pseudokarst caves had been almost overlooked by speleologists for many decades. Pseudokarst caves were not investigated also from zoological point of view. Only Růžička recently dealt with spider communities of stony debris including pseudokarst caves. He published several papers (Růžička, 1993a, 1993b, 1995) which prove that thick layers of stones and pseudokarst caves are valuable biotopes for a lot of rare and remarkable spiders.

In this paper we would like to sum up the results of our arachnological research especially in underground biotopes of the 'Pohanský hrad'nature reservation (the grid mapping code 7785). This research was carried out during the year 1995. We applied current methods of collecting, mainly sifting of detritus from pseudokarst caves and also individual collecting. The material was determined according to the key by Miller (1971) and by Helmer & Nentwig (1991). All findings listed were ours, except where the different collector is given in brackets. Literary data and further findings in Slovakia are added only in the case of rare and faunistically significant species.

Results (Systematic Review of Species)

Nesticidae

Nesticus cellulanus (Clerck, 1757) - 1 male and 4 females were found in summer 1992 by Růžička (Růžička, 1995). It is a typical species for dark biotopes of caves and also of mines, cellars, etc. It occurs locally.

Theridiidae

Pholcomma gibbum (Westring, 1851) - 21 April: 2 males and 5 females, and 29 May: 3 males and 7 females. It occurs sporadically in thick layers of litter and stony debris. In the Red List of Slovakia it is listed among "R" (rare) species (Gajdoš, Svatoň, 1993).

Linyphiidae

Centromerus albidus Simon, 1929 (= *quercicola* Miller, 1958) - 21 April: 2 females, and 29 May: 7 females (one of them in coll. Růžička). Known only from two records: Kováčovské kopce (8178d) (Miller, 1971) and Zobor (7674), 13 April 1978, 1 female (Gajdoš, 1985). It occurs very locally and rarely in warm deciduous forests, but it obviously lives under deeply located stones, in hollows, pseudokarst caves, etc. In the Red List of Great Britain it is listed among "V" (vulnerable) species (Merrett, 1991); in Slovakia it is considered to be a rare ("R") species (Gajdoš, Svatoň, 1993). Its pale, light yellow colouration confirms that it is a typical subterraneous species.

Ceratinella major Kulczynski, 1894 - 17 August: 1 male. A rare species, recently known from a few records: Malý Rozsutec (6780) (Svatoň, Miller, 1979); Zobor, 12 June 1978, 1 female (Gajdoš, 1985); Velčice (7575d) (Gajdoš, 1986); Štiavnické vrchy - Sitno (7679a) and Kašivárová (7578b) (Gajdoš, 1987a); the 'Ostrov Kopáč' Nature Reservation (7968) (Gajdoš, 1987b); Rohožník (7569) (Gajdoš, 1992) and prielom Hornádu (7088) (Žiťňanská, 1987). Its occurrence in pseudokarst caves is remarkable and accidental (?)

Lepthyphantes angulipalpis (Westring, 1851) - 21 April: 1 male and 4 females. It occurs sporadically in thicker layers of litter and also in hollows, pseudokarst caves, etc. In the red list of Slovakia it is listed among "R" (rare) species.

Lepthyphantes leprosus (Ohlert, 1865) - 29 May: 1 female. It occurs frequently in hollow trees, cellars, underground cavities, etc.

Lepthyphantes notabilis Kulczynski, 1887 - 29 May: 6 females. Svatoň (1989) considered that it is a very rare species and he referred several records from mountain and also from lowland altitudes. Brothers Růžička (1990) list it among dealpine species and they mention that it had been found very rarely due to its hidden bionomy. They suppose that it occurs almost in every sunny stony debris biotope. In the Red List of Slovakia it is listed among "R" (rare) species.

Metopobactrus rayi (Simon, 1881) - 29 May: 1 male (Svatoň det.). This rare species was described under invalid name *Trichopterna fatrensis* Miller, 1966. It is known only from several findings in mountain altitudes: Malý Kriváň (6879b) (Miller, 1971); Nízke Tatry: Vlašky (6983) and Veľká Fatra: Suchý Jasienok (7079) (Miller, Žiťňanská, 1976);

Slovenský Raj: Dedinky (7188) (Žitňanská, 1987) and Nízke Tatry: Ohnište (7084) (Svatoň, 1989). Its relict occurrence in the locality only about 500 m under the sea level is surprising and very remarkable from zoogeographical point of view! In the nature conditions of 'Pohanský hrad' we can consider it to be a glacial relict. In the Red List of Slovakia it is listed among "R" (rare) species.

Microneta viaria (Blackwall, 1841) - 29 May: 1 female. A frequent species that occurs in litter, under stones, etc. Its occurrence in pseudokarst caves is probably accidental.

Pelecopsis bicapitata (Miller, 1938) - 21 April: 3 males and 1 female, and 29 May: 5 females. It is one of the rarest spiders of Central Europe, mainly due to its hidden bionomy. Data concerning its occurrence in Slovakia are not available. A new species for Slovakia! It ranks among relict and highly vulnerable species at all events and its locality deserves very strict protection.

Porrhomma egeria Simon, 1884 - 29 May: 1 female. It was found in pseudokarst caves of 'Pohanský hrad' also by Růžička in a numerous series more than 40 specimens (Růžička, 1995). It occurs locally in underground biotopes. Very little eyes and light yellow colouration confirm that it is a typical subterraneous species.

Tapinocyba insecta (L. Koch, 1869) - 29 May: 1 female. It is a typical litter species occurring frequently. It was found in pseudokarst caves probably accidentally.

Metidae

Meta menardi (Latreille, 1804) - it is a typical spider of caves, mines and dark cellars. It was frequently observed in the deepest, dark parts of pseudokarst caves. In the cave 'Šurický úkryt' more than 100 specimens were observed.

Agelenidae

Tegenaria ferruginea (Panzer, 1801) - 29 May: 1 female. It ocassionally occurs in upper parts of pseudokarst (and also of karst) caves, but it does not occupy totally dark spaces. This frequent species lives also in hollow trees, cellars, etc.

Conclusions

Pseudokarst caves could be formed by a rock massif erosion or by slope movements. In both cases they are significant biotopes for a lot of rare and stenoecious spiders and other animals. The ocurrence of several species has clearly relict character; it is actual especially in the case of *Centromerus albidus* Sim., *Metopobactrus rayi* (Sim.), *Pelecopsis bicapitata* (Mill.) [which is a new species for Slovakia] and *Porrhomma egeria* Sim. Stenoecious inhabitants of pseudokarst caves are clearly psychrophilic species - the temperature of the lowest parts of pseudokarst caves never exceeds 9-10 °C and the air has a high humidity.

Underground communities of spiders highly contrast with the surface ones, because southern slopes of this locality are covered by xerothermic forests and rocky steppes. A lot of clearly thermophilic spider species live here, including *Eresus cinnabarinus* (Olivier, 1789), *Lepthyphantes keyserlingi* (Ausserer, 1867), *Cheiracanthium elegans* Thorell, 1875, *Zodarion germanicum* (C. L. Koch, 1837), *Callilepis nocturna* (Linnaeus, 1758), *Callilepis schusteri* (Herman, 1879), *Micaria fulgens* (Walckenaer, 1802), *Bianor aurocinctus* (Ohlert, 1865), etc. Some of them rank among rare and zoogeographically significant species: *Syedra gracilis* (Menge, 1866), *Ceto laticeps* (Canestrini, 1868), *Haplodrassus dalmatensis* (L. Koch, 1866), *Marpissa nivoyi* (Lucas, 1846) and *Sitticus distinguendus* (Simon, 1868).

Pseudokarst caves of 'Pohanský hrad' (but not only of this locality!) appear as the biotopes of remarkable and highly valuable communities of spiders and other animals. We ought to take into consideration that these biotopes are insular refugia which are highly vulnerable by anthropic activities. The most dangerous threats for these biotopes are:

- the stone extraction (basalt is often used as a building material);
- forceful deforestation of stony debris slopes is another kind of intervention that would completely alter ecological and microclimatic conditions of the locality;
- inappropriate movement of people that would damage or up to destroy microbiotopes of spiders and other animals (pillows of litter and detritus fallen down from the surface, etc.).

Therefore it seems to be suitable to close the most valuable pseudokarst caves (including the Labyrinth Cave, the Nyári' Cave and the 'Šurický úkryt' Cave) totally. These biotopes deserve the strictest protection.

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