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Spiders (Araneae) from Deep Screees in the Northern Alps (Tyrol, Austria)

by

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Spinnen (Araneae) aus dem Innern von Schutthalden der Nordalpen (Nordtirol, Österreich)

Synopsis: At three sites in Tyrol (Austria), in Central Alps around Obergurgl ca. 2000 m, and in N. Calcareous Alps around Innsbruck, at ca. 1100-1200 m a.s.l., 25 spider species have been trapped from deep scree, belonging to Mimetidae (1 sp.), Theridiidae (2), Linyphiidae (12), Lycosidae (1), Agelenidae (2), Hahniidae (1), Dictynidae (1), Amaurobiidae (1), Liocranidae (2), Gnaphosidae (1), Thomisidae (1). There are some stenotopic inhabitants of the scree system, esp. *Rugathodes bellicosus* (Theridiidae), *Micrargus apertus*, *Lepthyphantes notabilis*, *Porrhomma myops* (Linyphiidae), present also in Czech Republic, and some regular invaders from the surface layers. Another two stenotopic inhabitants of the scree system of Central Europe were not encountered at the sites investigated, i.e. *Bathypantes simillimus buchari* and *Wubanooides uralensis* (Linyphiidae).

1. Introduction:

The interior of scree represents a system of narrow subterranean spaces, which has been called a "milieu souterrain superficiel" (JUBERTHIE et al. 1980). The main ecological factors governing this system are permanent darkness and the narrow range of fluctuations of daily temperature and other environmental factors. These spaces, which are hardly accessible to man, have an important role in the subterranean evolution of invertebrates (RUZICKA 1998, 1999b). They are inhabited by a special assemblage of invertebrate species, which can be obtained by the use of modified pitfall traps. Data about spiders and other invertebrates inhabiting deep scree layers are now available from Central Europe (MÖSELER & MOLENDEN 1999), especially from the Czech Republic (RUZICKA 1994, 1999a; RUZICKA & HAJER 1996, RUZICKA & ZACHARDA 1994, RUZICKA et al. 1995) and from Germany (MOLENDEN 1996). We now present information about spider assemblages inhabiting the interior of screees in the Austrian Alps.

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2. Sites and Methods:

Sites investigated in Tyrol were in the Central Alps around Obergurgl and in the Northern Calcareous Alps around Innsbruck:

Obergurgl 2000 m a.s.l.: Four traps situated on the left, sunny slope of Gurgler Ache river, in scree consisting of stones about 20-30 cm in size on average, at a depth of 60-130 cm, another three traps on the right, shaded slope of the valley, in scree consisting of stones of about 20-30 cm in size, at a depth of 40-70 cm.

Innsbruck, Kranebitter Klamm, 1200 m a.s.l. Six traps, placed on a sunny slope facing south, scree consisting of fine gravel about 2-5 cm in size on average, at a depth of 40-60 cm.

Hall / Tirol, Halltal, near Bettelwurfeck 1100 m a.s.l.: Six traps, situated in scree consisting of stones about 5-20 cm on average, at a depth of 50-80 cm.

Invertebrates were trapped in modified pitfall traps made of rigid plastic, 13 cm high and 10.5 cm in diameter. Traps contained a mixture of 7% formaldehyde and 10% glycerol, with a few drops of detergent (RUZICKA 1982, 1988) and were exposed for one year: in Obergurgl from July 4, 1991 to July 26, 1992; in Halltal from July 5, 1991 to July 25, 1992; and in Kranebitter Klamm from July 6, 1991 to July 24, 1992.

3. Results and Discussion:

A total of 113 spider specimens from 25 species were found. In addition to some surface species, scree inhabitants were collected, some of them exhibiting adaptations to subterranean life. *Rugathodes bellicosus* and *Lepthyphantes notabilis* are typical inhabitants of sun-exposed scree slopes in Central Europe. Specimens of *R. bellicosus* from the space system of scree show depigmentation and small body size (RUZICKA 1990).

Three species of the genus *Micrargus* closely related to *M. herbigradus* (BLACKWALL, 1854) were overlooked for a long time (MILLIDGE 1976; RELYS & WEISS 1997), i.e. *M. apertus*, *M. georgescuae* MILLIDGE, 1976, and *M. alpinus* RELYS & WEISS, 1997. *Micrargus apertus* is now known from more than 20 localities in the Czech Republic at 200-1500 m a.s.l., all records coming from deep scree layers (BUCHAR & RUZICKA 2002). We found six specimens in Obergurgl. This species has often escaped notice because it lives hidden in the subterranean system, at a depth of more than 50 cm (RUZICKA et al. 1995). Clearly *M. apertus* is one of the most common species in scree slopes, with legs elongated when compared with its congeners in the litter layer (RELYS & WEISS 1997).

Further typical inhabitants of subterranean spaces are the microphthalmous species of the genus *Porrhomma* (see FAGE 1931, THALER 1968). The habitat niche of *P. egeria* is comparatively broad, but *P. myops* occurs exclusively in stone accumulations (RUZICKA 2000, results from Czech Republic) and in caves. Further species invade the scree system regularly from the surface layers. The liocranid *Agracina striata*, which is known from wetlands and lowland forest (MAURER & HÄNGGI 1990), also occurs on scree slopes in the Czech Republic (RUZICKA 1999a).

If we compare our results from Tyrol with the data for scree spiders from the Czech Republic, some species stand as typical inhabitants of scree in both countries: *Pholcomma gibbum*, *Lepthyphantes notabilis*, *Micrargus apertus*, *Tegenaria silvestris*, *Agracina striata*.

Table 1: Spiders from deep screes in North Tyrol: Survey of material collected in 1991/92, ♂/♀. System and names according to PLATNICK (1998).

Species/Localities	Halltal	Kranebitter Klamm	Obergurgl
Mimetidae			
<i>Ero furcata</i> (VILLERS, 1789)	-	-	1/-
Theridiidae			
<i>Pholcomma gibbum</i> (WESTRING, 1851)	4/1	1/1	-
<i>Rugathodes bellicosus</i> (SIMON, 1873)	-/1	-	3/6
Linyphiidae			
<i>Asthenargus helveticus</i> SCHENKEL, 1936	-/1	-	-
<i>Micrargus apertus</i> (O.P.-CAMBRIDGE, 1871)	-	-	5/1
<i>Centromerus sellarius</i> (SIMON, 1884)	-	1/-	-
<i>C. subalpinus</i> LESSERT, 1907	-	-	2/-
<i>Lepthyphantes monticola</i> (KULCZYNSKI, 1881)	-	-/1	4/-
<i>L. notabilis</i> KULCZYNSKI, 1887	4/1	-/1	-
<i>L. pallidus</i> (O.P.-CAMBRIDGE, 1871)	-	-/1	-
<i>L. tenebricola</i> (WIDER, 1834)	-	-/1	-
<i>Oreonetides vaginatus</i> (THORELL, 1872)	-	-	3/-
<i>Porrhomma egeria</i> SIMON, 1884	-	-	3/-
<i>Porrhomma myops</i> SIMON, 1884	-	-/1	-
<i>Sintula corniger</i> (BLACKWALL, 1856)	1/-	-	-
Lycosidae			
<i>Pardosa saturator</i> SIMON, 1937	2/-	-	-
Agelenidae			
<i>Tegenaria silvestris</i> L. KOCH, 1872	2/-	2/7	-
<i>T. tridentina</i> L. KOCH, 1872	2/-	-	-
Hahniidae			
<i>Hahnina montana</i> (BLACKWALL, 1841)	-	1/-	-
Dictynidae			
<i>Cicurina cicur</i> (FABRICIUS, 1793)	-/1	5/11	-
Amaurobiidae			
<i>Coelotes inermis</i> (L. KOCH, 1855)	-	1/-	-
Liocranidae			
<i>Agraecina striata</i> (KULCZYNSKI, 1882)	-/1	-	-
<i>Apostenus fuscus</i> WESTRING, 1851	2/4	13/8	-
Gnaphosidae			
<i>Drassodes lapidosus</i> (WALCKENAER, 1802)	-	-/1	-
Thomisidae			
<i>Ozyptila trux</i> (BLACKWALL, 1846)	-	1/-	-

ta. The linyphiid *Lepthyphantes monticola* is replaced in the Czech Republic by *L. tripartitus* MILLER & SVATON, 1978 (see THALER & BUCHAR 1993). In Central Europe another two stenotopic linyphiid species exist in boulder accumulations, which have not been found in the three localities hitherto investigated in the Northern Alps. These are *Bathypantes simillimus buchari* RUZICKA, 1988, also known from Low Tatra, Bohemian

Forest, Schwarzwald Mts., and Vosges Mts. (RUZICKA 1994), and *Wubanooides uralensis* (PAKHORUKOV, 1981), occurring also in Harz Mts. (SCHIKORA 2001, for further records see RUZICKA & ZACHARDA 1994, RUZICKA & HAJER 1996).

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