

Four spider species (Araneae: Atypidae, Theridiidae, Linyphiidae) new for the Bohemian Forest, Czech Republic

Ivana Hradská¹, Kryštof Růckl², Antonín Kůrka³ & Petr Dolejš^{4,*}

¹ Zoological Department, Museum of West Bohemia in Pilsen, Kopeckého sady 2, CZ-301 00 Plzeň, Czech Republic

² Department of Infectious Disease, Hospital Polyclinic Mělník, Pražská 528, CZ-276 01 Mělník, Czech Republic

³ 17. listopadu 1173, CZ-293 01 Mladá Boleslav, Czech Republic

⁴ Department of Zoology, National Museum – Natural History Museum, Cirkusová 1740, CZ-193 00 Praha 9 – Horní Počernice, Czech Republic

* petr.dolejs@nm.cz

Abstract

During an araneological survey in the Šumava Protected Landscape Area and National Park in 2020, four spider species were discovered for the first time in the Bohemian Forest: *Atypus affinis* (Atypidae), *Achaeridion conigerum* and *Phycosoma inornatum* (Theridiidae), and *Gongylidiellum edentatum* (Linyphiidae). All species were collected at the vicinity of Rejštejn and are considered least concern (LC), critically endangered (CR) and vulnerable (VU), respectively. Along with the four species, lists of accompanying species from respective localities are provided.

Key words: faunistics, *Atypus affinis*, *Achaeridion conigerum*, *Phycosoma inornatum*, *Gongylidiellum edentatum*, Rejštejn

INTRODUCTION

The spider fauna of the Czech part of Bohemian Forest (Šumava Mts.) is relatively well known, thanks mainly to research of Dr. Antonín Kůrka from the National Museum (Prague) and his collaborators (e.g. KŮRKA 1982, 1990, 1992, 1995a, b, 1996, 1997). Currently, 425 spider species are known from the Bohemian Forest (DOLEJŠ & RŮCKL 2017), seven of them (*Carorita limnaea* (Crosby & Bishop, 1927), *Clubiona norvegica* Strand, 1900, *Dictyna major* Menge, 1869, *Gnaphosa badia* (L. Koch, 1866), *G. microps* Holm, 1939, *Pardosa ferruginea* (L. Koch, 1870) and *P. hyperborea* (Thorell, 1872)) live only in the Šumava Mts. within the Czech Republic (KŮRKA & HRADSKÁ 2010, RŮCKL 2020). However, many areas with specific microhabitats have not been investigated yet. We thus provide here information on spiders from yet unexplored areas from the vicinity of Rejštejn.

MATERIAL AND METHODS

Study area

The initial stimulus for this research was an information from Zuzana Mašková who photographed a purseweb spider (*Atypidae*) in her house running on stairs near an entrance door (Fig. 1) on 22. 6. 2019. The female was probably disturbed during cutting the grass by a brushcutter. We therefore searched for the spider around her house as well as at another one potential place of its occurrence. The number of mapping grid square of the places follows BUCHAR (1982) and PRUNER & MÍKA (1996).

- 1) Rejštejn, former Václavíkova pila Mill, west-oriented clearance in a slope grown by spruces and pines, 49.135683N, 13.536917E (mapping grid square 6847), 625 m a.s.l., 3. 6. 2020, Fig. 2.
- 2) Rejštejn, former 1. zone “Rejštejnské stráně” of the Šumava National Park, south-east-exposed rocky slope, 49.139375N, 13.507722E (mapping grid square 6847), 580 m a.s.l., 4. 6. 2020 and 21. 9. 2020, Fig. 3.

Collecting methods and specimens maintenance

Along with searching for the atypid, other spiders from both localities were collected in order to investigate the entire spider assemblage. Spiders were collected according to protocol in AGHOVÁ et al. (2019) using hand collecting (in), sieving (si), sweeping (sw) and beating (be). All individuals were fixed in 80% ethanol and identified according to MILLER (1971), ROBERTS (1995), RŮŽIČKA & BRYJA (2000), NENTWIG et al. (2021), STÄUBLI (2021) and OGER (2021).



Fig. 1. The place of first finding of *Atypus affinis* (photo: J. Walter).



Fig. 2. Former Václavíkova pila Mill, locality of *Atypus affinis*, *Achaeridion conigerum* and *Phycosoma inornatum* (photo: J. Walter).



Fig. 3. Rejštejnské stráně former 1. zone, locality of *Gongylidiellum edentatum* (photo: P. Dolejš).

Current nomenclature follows the WORLD SPIDER CATALOG (2021), Red List categories that of ŘEZÁČ et al. (2015). The locality was photographed by Sony CyberShot DSC-RX 10 III, the atypid by Olympus C-7070 Wide Zoom, and the theridiid and linyphiid by Olympus SZX12 stereomicroscope equipped with an Olympus E-510 camera. All specimens are deposited either in the National Museum in Prague (NMP: P6d-1/2021) or in the West Bohemian Museum in Pilsen (ZCM).

RESULTS

Atypidae

Atypus affinis Eichwald, 1830 (Fig. 4)

Rejštejn, former Václavíkova pila Mill: 22. 6. 2019, 1 ♀ in a house, observ. Z. Mašková (photo from a mobile phone only); 3. 6. 2020, 1 ♀, I. Hradská leg. (in) and det., coll. ZCM, four observed pursewebs; other species from the locality in Tab. 1.

Theridiidae

Achaeridion conigerum (Simon, 1914) (Fig. 5)

Rejštejn, former Václavíkova pila Mill: 3. 6. 2020, 1 ♀, K. Rückl leg. (in), P. Dolejš det., coll. NMP; other species from the locality in Tab. 1.

Phycosoma inornatum (O. Pickard-Cambridge, 1861) (Fig. 6)

Rejštejn, former Václavíkova pila Mill: 3. 6. 2020, 1 ♀, K. Rückl leg. (in), P. Dolejš det., coll. NMP; other species from the locality in Tab. 1.

Linyphiidae

Gonyldiellum edentatum Miller, 1951 (Fig. 7)

Rejštejn, former I. Zone Rejštejnské stráně, 4. 6. 2020, 1 ♀, P. Dolejš leg. (si) and det., coll. NMP; other species from the locality in Tab. 1.

DISCUSSION

In 2020, four species were recorded in the Šumava Mts. for the first time, increasing thus the number of spider species known from the Šumava Mts. to 429.

The most surprising was the discovery of an *Atypus affinis* colony. Occurrence of such a thermophilic species in the Šumava Mts. was unexpected. Three atypid species occur in the Czech Republic (ŘEZÁČ et al. 2007) of which *A. affinis* is the most common; ŘEZÁČ et al. (2015) consider it least concern. The occurrence of this species is quite rare in West Bohemia (ŘEZÁČ 2009). The nearest known colony of the species is in the Čepičná Nature Reserve near the Sušice town. The reserve is a xerotherm forest steppe on limestone bedrock. During the research from 2009 to 2010, eight males were caught by pitfall traps there (HRADSKÁ & TĚTÁL 2011). The atypid colony still occur there, confirmed last time in July 2021. We can speculate only, where was the origin of the colony in Rejštejn or whether there were more suitable places for this species in the past. However, we did not confirm *A. affinis* at similarly-looking locality Rejštejnské stráně.

At the same locality where *A. affinis* was found, two theridiids, *Achaeridion conigerum* and *Phycosoma inornatum* were discovered. The former is distributed from the Pyrenean Peninsula, through central Europe to Scandinavia in Europe (WORLD SPIDER CATALOG 2021)



Fig. 4. *Atypus affinis*, a – purseweb, b – female (photo: P. Dolejš).

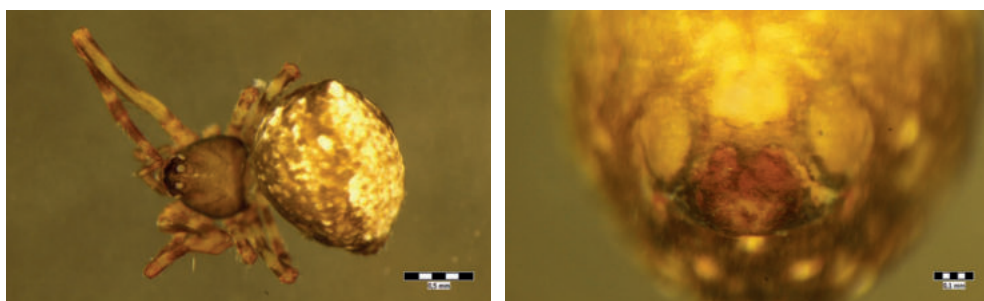


Fig. 5. *Achaeridion conigerum*, a – female habitus, b – epigyne (photo: P. Dolejš).

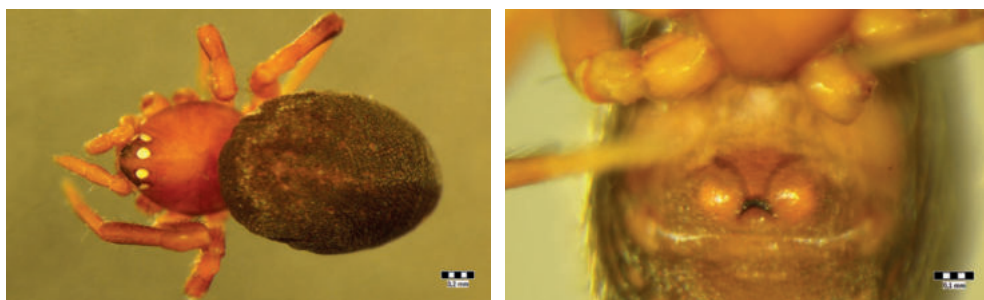


Fig. 6. *Phycosoma inornatum*, a – female habitus, b – epigyne (photo: P. Dolejš).

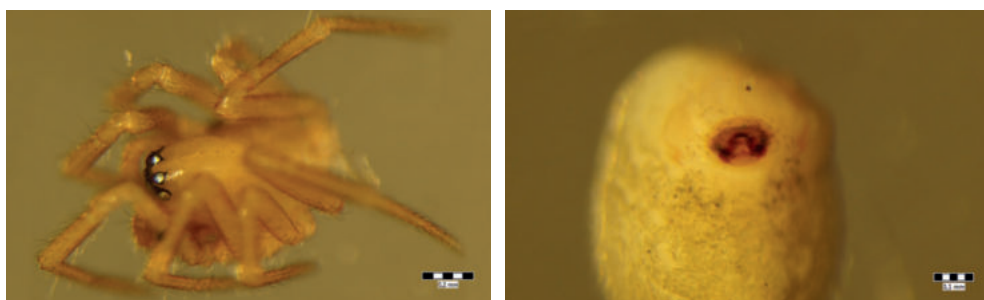


Fig. 7. *Gongylidiellum edentatum*, a – prosoma, b – opisthosoma with epigyne (photo: P. Dolejš).

Table 1. List of species collected in two localities near Rejštejn (species new for the Bohemian Forest are in bold): VP – Václavíkova pila, RS – Rejštejnské stráně. ♂/♀/juv. Red List (RL) categories: CR – critically endangered, VU – vulnerable, LC – least concern.

Species	VP	RS	RL
<i>Achaeridion conigerum</i> (Simon, 1914)	0/1		CR
<i>Alopecosa taeniata</i> (C. L. Koch, 1835)		0/0/1	
<i>Amaurobius fenestralis</i> (Ström, 1768)		0/0/1	
<i>Anyphaena accentuata</i> (Walckenaer, 1802)	1/0		
<i>Asthenargus helveticus</i> (Schenkel, 1936)		0/3	
<i>Atypus affinis</i> (Eichwald, 1830)	0/1/4 observed pursewebs		LC
<i>Centromerus silvicola</i> (Kulczyński, 1887)	0/1	2/2	
<i>Ceratinella brevis</i> (Westring, 1851)	1/0	4/2/1	
<i>Cercidia prominens</i> (Westring, 1851)	1/1/1		
<i>Coelotes terrestris</i> (Wider, 1834)		0/1	
<i>Crustulina guttata</i> (Wider, 1834)	0/1/1		
<i>Cyclosa conica</i> (Pallas, 1772)	1/0	0/0/1	
<i>Diaea dorsata</i> (Fabricius, 1777)	0/0/1		
<i>Dismodicus bifrons</i> (Blackwall, 1841)	2/3		
<i>Dismodicus elevatus</i> (C. L. Koch, 1838)	0/3		LC
<i>Dysdera erythrina</i> (Walckenaer, 1802)	0/1		
<i>Euophrys frontalis</i> (Walckenaer, 1802)	0/1		
<i>Evarcha falcata</i> (Clerck, 1757)	3/4/7		
<i>Gongyliidiellum edentatum</i> (Miller, 1951)		0/1	VU
<i>Hahnia pusilla</i> (C. L. Koch, 1841)	0/2	0/4	
<i>Haplodrassus soerenseni</i> (Strand, 1900)		2/0/1	LC
<i>Harpactea hombergi</i> (Scopoli, 1763)		2/1	
<i>Harpactea lepida</i> (C. L. Koch, 1838)	0/0/1	0/0/7	
<i>Harpactea rubicunda</i> (C. L. Koch, 1838)		0/0/1	
<i>Heliophanus cupreus</i> (Walckenaer, 1802)	1/1		
<i>Histopona torpida</i> (C. L. Koch, 1837)		0/0/1	
<i>Improphantes nitidus</i> (Thorell, 1875)		1/0	
<i>Labulla thoracica</i> (Wider, 1834)		0/0/2	
<i>Lathys humilis</i> (Blackwall, 1855)	1/0		
<i>Lepthyphantes nodifer</i> (Simon, 1884)		1/0	LC
<i>Linyphia triangularis</i> (Clerck, 1757)	0/1		
<i>Macrargus rufus</i> (Wider, 1834)		0/1	
<i>Mansuphantes mansuetus</i> (Thorell, 1875)		4/3	

Table 1. Continued.

Species	VP	RS	RL
<i>Minyriolus pusillus</i> (Wider, 1834)	1/0	0/1	
<i>Mughiphantes pulcher</i> (Kulczyński, 1881)		0/1	LC
<i>Neon reticulatus</i> (Blackwall, 1853)	1/3	0/3/2	
<i>Neottiura bimaculata</i> (Linnaeus, 1767)	0/0/2		
<i>Neriere clathrata</i> (Sundevall, 1830)	1/1		
<i>Neriere montana</i> (Clerck, 1757)	0/1		
<i>Neriere radiata</i> (Walckenaer, 1841)	1/3/1	0/0/2	
<i>Palliduphantes pallidus</i> (O. Pickard-Cambridge, 1871)		0/1	
<i>Pardosa lugubris</i> (Walckenaer, 1802)	1/2/1	0/0/2	
<i>Pelecopsis elongata</i> (Wider, 1834)		0/1	LC
<i>Pelecopsis radicolica</i> (L. Koch, 1872)	3/1		
<i>Phrurolithus festivus</i> (C. L. Koch, 1835)	0/0/1		
<i>Phycosoma inornatum</i> (O. Pickard-Cambridge, 1861)	0/1		CR
<i>Phylloneta sisyphia</i> (Clerck, 1757)	0/1		
<i>Pisaura mirabilis</i> (Clerck, 1757)		0/1	
<i>Pocadicnemis pumila</i> (Blackwall, 1841)	13/13	0/2	
<i>Saloca diceros</i> (O. Pickard-Cambridge, 1871)		0/1	
<i>Salticus zebraneus</i> (C. L. Koch, 1837)	0/1		
<i>Segestria senoculata</i> (Linnaeus, 1758)		0/0/1	
<i>Sintula corniger</i> (Blackwall, 1856)		1/0	LC
<i>Tapinocyba affinis</i> (Lessert, 1907)	0/3	1/1	
<i>Tenuiphantes flavipes</i> (Blackwall, 1854)		1/1	
<i>Tenuiphantes tenebricola</i> (Wider, 1834)		1/3	
<i>Tetragnatha pinicola</i> (L. Koch, 1870)	0/0/2		
<i>Titanoeca quadriguttata</i> (Hahn, 1833)	0/1		
<i>Trochosa terricola</i> (Thorell, 1856)		0/0/4	
<i>Walckenaeria mitrata</i> (Menge, 1868)		0/1	
<i>Xerolycosa nemoralis</i> (Westring, 1861)	0/0/2	0/1/1	
<i>Zora nemoralis</i> (Blackwall, 1861)		0/1	
<i>Zora spinimana</i> (Sundevall, 1833)	0/0/1	0/1/1	

but seems to be often overlooked (NENTWIG et al. 2021). In the Czech Republic, it was found only at five localities (KŮRKA 1994, ŠIMON 2010, ROUŠAR 2019, VANĚK 2020, DOLANSKÝ unpubl.) in western and northern parts of the country. Thus, ŘEZÁČ et al. (2015) classify it as critically endangered. Our record comes from a place outlying from the above-mentioned localities and represents therefore the southernmost occurrence of the species in the Czech Republic.

Phycosoma inornatum is distributed throughout Europe to Azerbaijan (WORLD SPIDER CATALOG 2021) but it is also rarely found (NENTWIG et al. 2021). It seems that it prefers dry, open forest habitats with pines and screes (e.g. BUCHAR & RŮŽIČKA 2002, NENTWIG et al. 2021). In the Czech Republic, it was found in 1993 for the first time (KŮRKA 1995c) and is known from few localities in Bohemia (western and central part of the Czech Republic) only. Therefore, ŘEZÁČ et al. (2015) classify it as critically endangered. The closest known locality is the Žďár Nature Reserve by the Rokycany town (FENCLOVÁ 1999). As in the case of the previous species, our record represents the southernmost occurrence in the Czech Republic.

The linyphiid *Gongylidiellum edentatum* was the other species new for the Šumava Mts. It represents an Atlantic species distributed in suitable habitats in western and central Europe (NENTWIG et al. 2021). The easternmost border of its distribution is in the Czech Republic. The species is considered vulnerable in the country (ŘEZÁČ et al. 2015) and is scattered rather in higher altitudes, missing in Moravia (eastern part of the Czech Republic) and western Bohemia (BUCHAR & RŮŽIČKA 2002). The closest known locality is in the Blanský les Protected Landscape Area (RŮŽIČKA 1994). Our record thus represents the westernmost occurrence of the species in the Czech Republic.

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