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REMARKABLE SPIDERS OF ARTIFICIAL SANDY GRASSLAND NEAR TOWN HODONÍN (CZECH REPUBLIC)

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Abstract

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Air blown sands areas and its habitats are very rare in Europe as well as many spider species, which occure there. Research was focused on spiders of sandy grassland and its ecotones near the town of Hodonín. Three lines of pitfall traps were used (one in grassland and two in its ecotones). Research took place in growing seasons of the years 2008, 2009, 2010 and 2011. Total number of collected adult spider specimens was 11743, they belong to 160 species and 21 families. It was found out, that 15 following species are included in the Red List of threatened species in the Czech Republic: Critically Endangered – *Haplodrassus bohemicus* Miller & Buchar, 1977, *Sitticus zimmermanni* (Simon, 1877), *Titanoeca psammophila* Wunderlich, 1993, *Uloborus walckenaerius* Latreille, 1806; Endangered – *Euryopis laeta* (Westring, 1861), *Haplodrassus minor* (O. P.-Cambridge, 1879), *Micaria dives* (Lucas, 1846); Vulnerable – *Agroeca lusatica* (L. Koch, 1875), *Arctosa perita* (Latreille, 1799), *Haplodrassus dalmatensis* (L. Koch, 1866), *Myrmarachne formicaria* (De Geer, 1778), *Pellenes nigrociliatus* (Simon, 1875), *Scotina celans* (Blackwall, 1841), *Taranucnus setosus* (O. P.-Cambridge, 1863), *Titanoeca schineri* L. Koch, 1872. Another 19 remarkable species were also found. The finding of one new species for the fauna of the Czech Republic [*Sintula spiniger* (Balogh, 1935)] and two new for the territory of Moravia [*Mermessus trilobatus* (Emerton, 1882) and *Zelotes exiguus* (Müller & Schenkel, 1895)] are the most important.

Keywords: Araneae, faunistic, air-blow sands, South Moravia

INTRODUCTION

Continental air blown sands belong to the most threatened habitats in Europe (European Commission, 2007). Almost all natural habitats are protected by Natura 2000 in the Czech Republic (AOPK ČR & MŽP ČR, 2006). The majority of these regions are in the Polabí lowland and the Hodonín region. Several studies dealing with spiders exist from these regions, particularly Dolanský (2002), Holec (2009) and Růžička & Bezděčka (2000). Some data about psammophilous species can be also found in Bryja *et al.* (2005). The most important central European psammophilous species are *Uloborus walckenaerius*, *Alopecosa psammophila*, *Arctosa perita*, *Zora paralella* and *Titanoeca psammophila* (Buchar & Růžička 2002; Růžička & Bezděčka 2000; Bryja *et al.*, 2005), but these sandy areas host also many other thermophilous specialists.

From the publications mentioned above, the only two (Bryja *et al.*, 2005; Dolanský, 2002) are focused on fauna of unprotected localities too. We usually expect that rare species inhabit mainly natural habitats and nearly all of our faunistic works are focused on protected or rare habitats. On the other hand unprotected man-made land could host species, which prefer special habitats (e.g. quarries – Hula & Šťastná, 2010; vineyard terraces – Košulič & Hula, 2012a; Košulič & Hula, 2013). There are

several interesting faunistic records also from fields (Miller, 1974, Hula *at al.*, 2012).

In this work we show important faunistic data from former crop field on sand and its ecotones, transferred to the grassland in the Hodonín region. Check lists of ground beetles and grasshoppers and crickets has already been published from the same plots (Šefrová & Laštůvka, 2011; Laštůvka *et al.*, 2010).

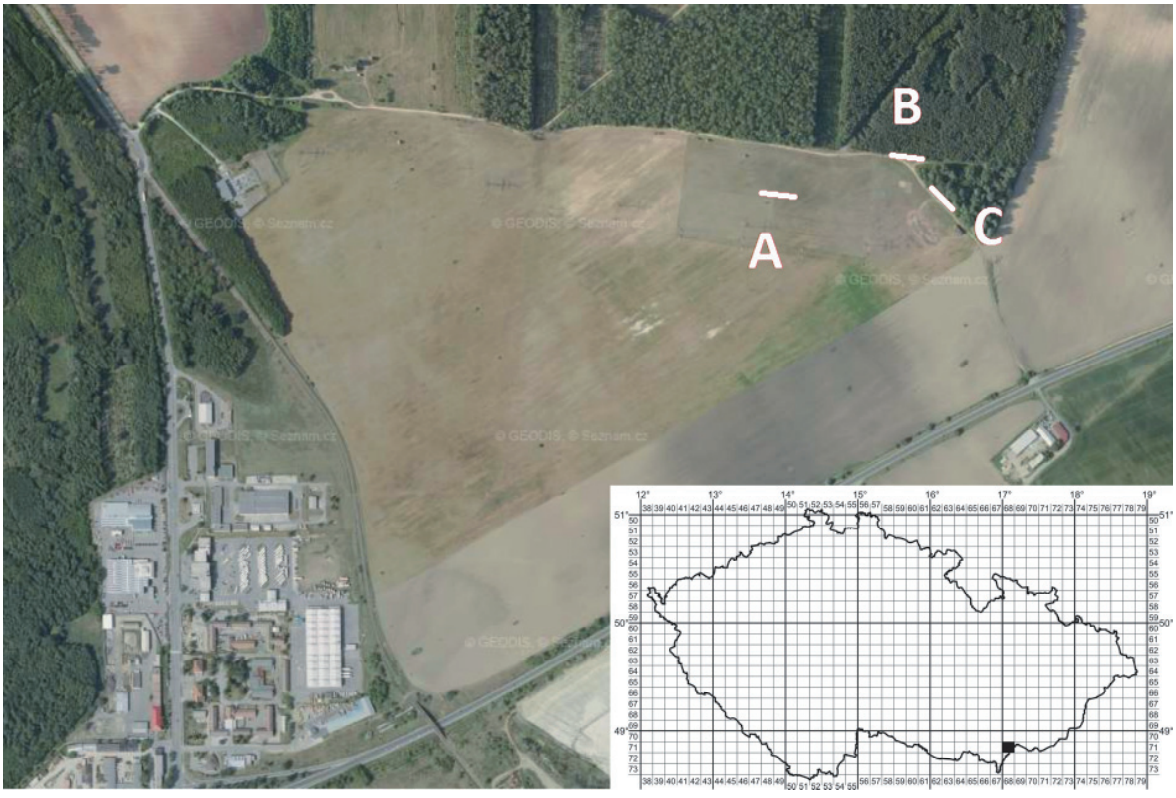
MATERIALS AND METHODS

Study site

The locality consists of a former arable field and its ecotones close to the town of Hodnonín. The faunistic grid is 7168. The area of Hodonín belongs to the Panonian province from biogeographical point of view and province of Panonian continental sands from geological point of view. The locality was selected at the beginning of the project of re-cultivation of soil and climatic-extreme habitat under conditions of changing climate within the next 50 years (Straková *et al.*, 2009). Three plots for pitfall traps were selected (Fig. 1). In each plot, five traps were arranged in a line. The first line of traps – plot A (48°52'39"N, 17°7'49"E) was placed at the experimental site of permanent grassland transformed from arable field. This locality is covered by different species of grasses and with several small linden and oak trees. The second line of traps – plot B (48°52'41"N, 17°7'60"E) was placed in ecotone of Scots pine forest with several small oaks, open vegetation turf and barren sand. The third part – plot C (48°52'39"N, 17°8'2"E) is ecotone of Poplar-Willow growth.

Collecting method and determination

Pitfall traps were used as a primary collecting technique. The traps were filled with 4% formaldehyde solution as a fixative fluid. Traps were always arranged in lines in W–E direction. In the year 2008, all traps were placed 4th July and collected in 25th August and 18th September. In the year 2009, traps were installed on 10th April, and collected on 28th April, 19th May, 3rd June, 2nd July, 31th July, 28th August and 30th September. In the year 2010 the traps were installed on 15th April, and collected in 11th May, 4th June, 19th June, 3rd August, 6th September and 8th October. In the year 2011 the traps were installed on 11th May, and collected in 3rd June, 8th July, 5th August, 30th August and 10th October. After collection, the obtained material was preserved in 70% ethanol. All material was collected by H. Šefrová and Z. Laštůvka (lgt.), determined by J. Niedobová and V. Hula (det.), only specimens of *Sintula spiniger* and *Mermessus trilobatus* were determined by V. Růžička (Entomological department, Academy of Science, České Budějovice) and one male of *Taranucnus setosus* was revised by M. Řezáč (Crop Research Institute Ruzyně). Nomenclature and arrangement of families, genera and species follow the most recent version of the World Spider Catalog 14.0 (Platnick, 2013) with



1: *General view of whole locality (source: www.mapy.cz)*

exception of family Agelenidae (according Bolzer *et al.*, 2013). Basic comments to the species and species characteristics are according to Buchar & Růžička (2002), Růžička & Buchar (2008), and Růžička (2005). For creating of grid square maps we used map application of BioLib (2013).

RESULTS

Altogether 11743 adult specimens of spiders were collected, belonging to 160 species from 21 families within 4 years (Tab. I). The total numbers of caught specimens differed between the plots. There were 2758, 3451 and 5534 adult specimens collected at the plots A, B and C, respectively. The total numbers of specimens (for years with full collecting season 2009–2011) significantly differ also between the years (plot A – 2009: 832 specimens, 2010: 1311 ex., 2011: 355 specimens; plot B – 2009: 959 specimens, 2010: 1875 specimens, 2011: 545 specimens; plot C – 2009: 1785 specimens, 2010: 2071 specimens, 2011: 1573 specimens). From the abundance point of view, the dominant species of spiders differed between the plots too. On the plot A, *Pardosa agrestis* (Westring, 1861), typically agricultural species, was the most abundant (1784 specimens); on the plot B, *Pardosa lugubris* (Walckenaer, 1802) was such species (805 specimens); on the plot C, *P. lugubris* and *P. alacris* (C. L. Koch, 1833) were the most abundant species (2259 and 889 specimens, respectively).

Altogether there were collected 160 species belonging to 5 categories: very rare (6%), rare (18%), scarce (22%), abundand (22%) and very abundand (32%) species (according to Buchar & Růžička, 2002). Concerning the Red List of threatened species in the Czech Republic (Růžička, 2005), 15 species belonging to the categories CR (Critically Endangered), EN (Endangered) and VU (Vulnerable) were found. These species included the following (alphabetically sorted): CR – *Haplodrassus bohemicus* Miller & Buchar, 1977, *Sitticus zimmermanni* (Simon, 1877), *Titanoeca psammophila* Wunderlich, 1993, *Uloborus walckenaerius* Latreille, 1806; EN – *Euryopis laeta* (Westring, 1861), *Haplodrassus minor* (O. P.-Cambridge, 1879), *Micaria dives* (Lucas, 1846); VU – *Agroeca lusatica* (L. Koch, 1875), *Arctosa perita* (Latreille, 1799), *Haplodrassus dalmatensis* (L. Koch, 1866), *Myrmarachne formicaria* (De Geer, 1778), *Pellenes nigrociliatus* (Simon, 1875), *Scotina*

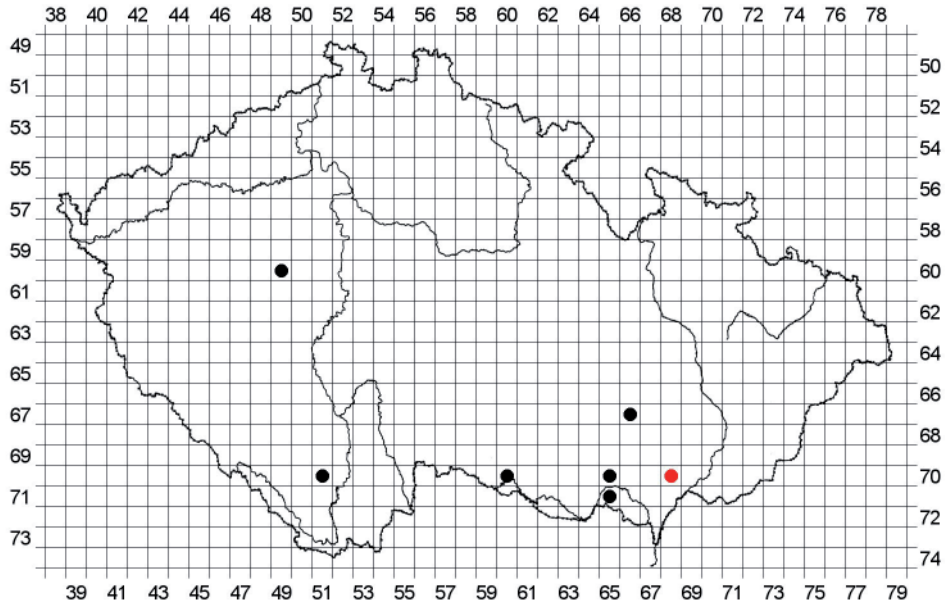
I: *List of all collected spiders from sandy grassland near Hodonín city. Occurrence means the occurrence status according Buchar and Růžička (2002): VA – very abundant; A – abundant; S – scarce; R – rare; VR – very rare. Red list means classication of species according Růžička (2005): VU – vulnerable; EN – endangered; CR – critically endangered.*

	Occurence	Red-list	PLOT – A				PLOT – B				PLOT – C		
			2008	2009	2008	2009	2010	2011	2010	2011	2008	2009	2010
***A**bacoproeces saltuum* (L. Koch, 1872)	S		0	0	0	1	0	0	0	0	0	0	0
Agelena gracilens (C. L. Koch, 1841)	A		0	0	1	12	0	0	0	0	1	0	0
Agelena labyrinthica (Clerck, 1757)	A		0	0	1	1	2	2	0	0	0	0	0
Agroeca brunnea (Blackwall, 1833)	VA		0	0	1	7	10	1	0	0	0	6	14
Agroeca cuprea Menge, 1873	S		0	0	4	11	8	7	0	0	1	3	6
Agroeca lusatica (L. Koch, 1875)	R	VU	0	0	0	1	0	0	0	0	0	0	0
Agroeca proxima (O. P.-Cambridge, 1871)	S		0	0	0	2	0	0	0	0	0	0	0
Alopecosa accentuata (Latreille, 1817)	A		0	1	0	0	0	0	6	0	0	0	0
Alopecosa aculeata (Clerck, 1757)	S		0	0	0	25	0	0	0	0	0	6	1
Alopecosa cuneata (Clerck, 1757)	VA		0	1	0	0	0	0	0	0	0	11	0
Alopecosa pulverulenta (Clerck, 1757)	VA		0	0	0	27	43	3	1	1	0	22	187
Alopecosa sulzeri (Pavesi, 1873)	R		0	0	0	6	1	1	0	0	0	0	0
Alopecosa trabalis (Clerck, 1757)	S		0	1	0	12	1	0	0	0	0	2	9
Arctosa lutetiana (Simon, 1876)	R		0	0	0	46	74	31	0	0	0	5	5
Araeoncus humilis (Blackwall, 1841)	VA		0	2	0	0	0	0	1	0	0	0	0
Arctosa perita (Latreille, 1799)	R	VU	0	1	0	0	0	0	0	0	0	0	0
Argenna subnigra (O. P.-Cambridge, 1861)	S		0	1	0	0	0	0	0	0	0	2	1
Asagena phalerata (Panzer, 1801)	A		0	5	1	2	0	1	19	2	0	0	1
Atypus piceus (Sulzer, 1776)	S		0	0	0	0	0	0	0	0	0	0	1
Aulonia albimana (Walckenaer, 1805)	A		0	2	3	36	44	47	2	0	3	19	118
***C**entromerus incilium* (L. Koch, 1881)	S		0	0	0	0	1	0	0	0	0	0	1
Centromerus sylvaticus (Blackwall, 1841)	VA		0	0	1	5	8	3	0	0	0	1	2
Ceratinella brevipes (Westring, 1851)	S		0	0	0	0	1	0	0	0	0	0	1

	Occurence	Red-list	PLOT – A				PLOT – B				PLOT – C		
			2008	2009	2008	2009	2010	2011	2010	2011	2008	2009	2010
Ceratinella brevis (Wider, 1834)	VA		0	0	0	0	2	1	0	0	0	0	0
Ceratinella scabrosa (O. P.-Cambridge, 1871)	S		0	0	0	0	2	0	0	0	0	0	0
Cercidia prominens (Westring, 1851)	S		0	0	0	3	2	0	0	0	0	0	0
Clubiona lutescens Westring, 1851	A		0	0	0	1	1	0	0	0	0	0	0
Clubiona terrestris Westring, 1851	VA		0	0	0	0	1	0	0	0	0	0	0
Crustulina guttata (Wider, 1834)	A		0	0	1	1	0	0	0	0	0	0	0
***D**iplostyla concolor* (Wider, 1834)	VA		0	0	2	4	13	24	0	0	0	1	14
Dipoena melanogaster (C. L. Koch, 1837)	S		0	0	0	0	0	0	0	0	0	0	0
Drassodes cupreus (Blackwall, 1834)	S		0	0	0	7	0	0	0	0	0	11	0
Drassodes lapidosus (Walckenaer, 1802)	VA		0	0	0	13	1	0	0	0	0	18	1
Drassodes pubescens (Thorell, 1856)	VA		0	2	2	28	12	6	1	0	0	8	9
Drassyllus lutetianus (L. Koch, 1866)	A		0	0	0	1	0	0	0	0	0	0	0
Drassyllus praeficus (L. Koch, 1866)	A		0	4	0	14	9	3	9	3	2	39	100
Drassyllus pumilus (C. L. Koch, 1839)	R		0	0	0	0	0	0	0	0	0	0	2
Drassyllus pusillus (C. L. Koch, 1833)	A		0	0	0	0	1	0	4	0	0	1	17
***E**noplognatha ovata* (Clerck, 1757)	A		0	0	0	0	1	0	0	0	0	0	0
Enoplognatha thoracica (Hahn, 1833)	A		0	0	0	1	0	1	0	0	0	1	0
Erigone atra Blackwall, 1833	VA		2	1	0	0	0	0	0	2	0	0	1
Erigone dentipalpis (Wider, 1834)	VA		4	39	1	0	3	1	82	0	0	0	1
Ero furcata (Willers, 1789)	VA		0	0	0	0	0	2	0	0	0	0	0
Ero aphana (Walckenaer, 1802)	R		0	0	0	0	0	0	1	0	0	0	0
Euryopis flavomaculata (C. L. Koch, 1836)	A		0	0	0	6	3	4	0	0	0	3	4
Euryopis laeta (Westring, 1861)	R	EN	0	3	0	0	0	0	1	0	0	0	0
Euophrys frontalis (Walckenaer, 1802)	A		0	0	0	0	3	2	0	0	0	4	4
Evarcha falcata (Clerck, 1757)	VA		0	0	0	0	0	2	0	0	0	0	0
***G**ibbaranea bituberculata* (Walckenaer, 1802)	S		0	0	0	0	0	0	0	0	0	0	1
Gnaphosa alpica Simon, 1878	VR		0	0	0	44	12	8	0	0	0	29	35
Gnaphosa bicolor (Hahn, 1833)	S		0	0	0	0	0	0	0	2	0	0	0
***H**ahnia nava* (Blackwall, 1841)	S		0	0	0	2	1	0	0	0	0	0	1
Haplodrassus dalmatensis (L. Koch, 1866)	R	VU	0	2	0	0	1	0	4	1	0	1	0
Haplodrassus bohemicus Miller & Buchar, 1977	VA	CR	0	0	0	0	0	0	0	0	0	0	0
Haplodrassus minor (O. P. Cambridge, 1879)	VR	EN	0	1	0	1	0	0	0	0	0	0	1
Haplodrassus signifer (C. L. Koch, 1839)	VA		0	0	0	13	2	5	4	0	0	39	61
Haplodrassus silvestris (Blackwall, 1833)	A		0	0	1	20	30	23	0	0	0	2	11
Haplodrassus umbratilis (L. Koch, 1866)	A		0	0	0	0	0	0	0	0	0	6	3
Harpactea rubicunda (C. L. Koch, 1838)	VA		0	0	0	15	15	2	0	0	0	9	6
Heliophanus cupreus (Walckenaer, 1802)	A		0	0	0	1	1	1	0	0	0	0	3
Heliophanus dubius C. L. Koch, 1835	A		0	0	0	1	0	0	0	0	0	0	0
***Ch**eiracanthium campestre* Lohmander, 1944	VR		0	0	0	0	0	0	0	0	0	2	0
***L**inyphia triangularis* (Clerck, 1757)	VA		0	0	0	0	2	1	0	0	0	0	0
Liocranoeca striata (Kulczyński, 1882)	R		0	1	0	13	38	21	0	0	0	0	1
***M**althonica campestris* (C. L. Koch, 1834)	S		0	0	0	0	4	2	0	0	0	0	2
Malthonica silvestris (L. Koch, 1872)	A		0	0	0	1	0	0	0	0	0	2	0
Maso sundevalli (Westring, 1851)	VA		0	0	0	0	0	0	1	0	0	0	0
Meioneta affinis (Kulczyński, 1898)	A		0	2	0	0	0	0	0	0	0	0	0
Meioneta mollis (O. P.-Cambridge, 1871)	S		0	0	0	1	0	0	7	0	0	4	0

	Occurence	Red-list	PLOT – A				PLOT – B				PLOT – C		
			2008	2009	2008	2009	2010	2011	2010	2011	2008	2009	2010
Meioneta rurestris (C. L. Koch, 1836)	VA		1	2	0	0	0	0	5	0	0	1	0
Meioneta saxatilis (Blackwall, 1844)	VA		0	0	0	0	0	0	0	2	0	0	0
Mermessus trilobatus (Emerton, 1882)	VR		0	0	0	0	0	1	0	1	0	0	0
Micaria dives (Lucas, 1846)	VR	EN	0	0	0	0	0	0	0	0	0	0	1
Micaria formicaria (Sundevall, 1831)	R		0	1	0	1	3	1	0	0	0	4	4
Micaria fulgens (Walckenaer, 1802)	A		0	0	0	7	0	0	0	0	0	0	0
Micaria pulicaria (Sundevall, 1831)	VA		0	0	0	2	0	1	0	0	0	3	0
Micrargus herbigradus (Blackwall, 1854)	VA		0	0	0	0	1	1	0	0	0	1	2
Microlinyphia pusilla (Sundevall, 1830)	VA		0	0	0	0	0	0	0	0	0	0	0
Microneta viaria (Blackwall, 1841)	VA		0	1	0	1	0	0	0	0	0	0	0
Myrmarachne formicaria (De Geer, 1778)	R	VU	0	0	1	2	1	0	0	0	0	1	0
***N**eriene clathrata* (Sundevall, 1830)	VA		0	0	0	2	2	2	0	0	0	1	0
Neottiura bimaculata (Linnaeus, 1767)	VA		0	0	0	0	1	0	0	0	0	0	0
Neon reticulatus (Blackwall, 1853)	VA		0	0	0	0	0	0	0	0	0	1	0
***O**edothorax apicatus* (Blackwall, 1850)	VA		6	8	0	0	1	0	4	0	0	0	0
Ozyptila atomaria (Panzer, 1801)	S		0	0	0	2	0	0	0	0	0	1	0
Ozyptila praticola (C. L. Koch, 1837)	S		0	1	0	67	72	43	0	0	0	1	0
***P**achygnatha degeeri* Sundevall, 1830	VA		0	4	0	2	0	2	7	0	0	1	0
Pachygnatha clerckki Sundevall, 1823	VA		0	0	0	0	0	1	0	0	0	0	0
Pachygnatha listeri Sundevall, 1830	VA		0	0	0	0	11	25	0	1	0	0	0
Palliduphantes alutacius (Simon, 1884)	R		0	0	0	1	1	0	0	0	0	0	0
Palliduphantes pallidus (O. P.-Cambridge, 1871)	VA		0	0	0	2	0	0	0	0	1	0	2
Pardosa agrestis (Westring, 1861)	VA		239	503	1	6	26	6	898	144	1	10	9
Pardosa alacris (C. L. Koch, 1833)	S		0	1	57	628	104	100	0	0	24	230	34
Pardosa bifasciata (C. L. Koch, 1834)	S		0	7	0	2	1	0	31	29	0	3	3
Pardosa lugubris (Walckenaer, 1802)	VA		0	1	0	303	1087	869	0	0	0	12	666
Pardosa monticola (Clerck, 1757)	A		0	15	0	0	0	0	12	1	0	0	0
Pardosa paludicola (Clerck, 1757)	S		0	0	0	0	1	0	0	0	0	0	0
Pardosa palustris (Linnaeus, 1758)	VA		0	1	0	1	1	0	10	66	0	0	0
Pardosa prativaga (L. Koch, 1870)	VA		0	0	0	0	0	0	1	0	0	0	0
Pellenes nigrociliatus (Simon, 1875)	R	VU	0	0	0	0	0	0	0	0	0	1	0
Phlegra fasciata (Hahn, 1826)	A		0	0	2	3	0	0	0	0	1	4	3
Phlegra festiva (C. L. Koch, 1834)	R		0	0	0	1	0	0	0	0	0	0	0
Philodromus fuscomarginatus (De Geer, 1778)	S		0	0	0	0	0	0	0	0	0	1	0
Pholcus opilionoides (Schrank, 1781)	VA		0	0	0	0	0	0	0	0	0	0	1
Phrurolithus festivus (C. L. Koch, 1835)	VA		0	0	7	16	9	7	1	0	4	10	7
Phrurolithus mininus C. L. Koch, 1839	R		0	0	2	6	8	11	0	0	3	2	4
Phrurolithus pullatus Kulczyński, 1897	R		0	0	0	0	0	1	0	0	0	0	0
Piratula hygrophila (Thorell, 1872)	VA		0	0	0	6	12	51	0	0	0	0	4
Pisaura mirabilis (Clerck, 1757)	VA		0	0	0	12	1	0	0	0	0	8	0
Porrhomma microphthalmum (O. P.-Cambridge, 1871)	VA		2	0	0	1	0	0	0	0	0	0	0
Porrhomma pygmaeum (Blackwall, 1834)	A		0	4	0	1	0	0	0	0	0	0	0
***R**obertus arundineti* (O. P.-Cambridge, 1871)	A		0	1	0	1	0	1	0	0	0	0	0
Robertus lividus (Blackwall, 1836)	VA		0	0	0	0	2	2	0	0	1	0	0
***S**aloca diceros* (O. P.-Cambridge, 1871)	A		0	0	0	0	1	0	0	0	0	0	0
Scotina celans (Blackwall, 1841)	R	VU	0	1	0	1	32	31	0	0	0	6	11

	Occurence	Red-list	PLOT – A				PLOT – B				PLOT – C		
			2008	2009	2008	2009	2010	2011	2010	2011	2008	2009	2010
Silometopus reussi (Thorell, 1871)	S		0	0	0	0	0	0	0	0	0	0	1
Sintula spiniger (Balogh, 1935)	VR		0	0	1	0	1	0	0	0	5	1	6
Sitticus zimmermanni (Simon, 1877)	VR	CR	0	0	0	2	0	0	0	0	0	2	3
Steatoda albomaculata (De Geer, 1778)	R		0	6	0	0	0	0	0	0	0	0	0
***T**alavera aequipes* (O. P.-Cambridge, 1871)	A		0	0	0	0	0	0	0	0	0	1	1
Tallusia experta (O. P.-Cambridge, 1871)	A		0	0	0	0	0	0	1	0	0	0	0
Tapinocyba biscissa (O. P.-Cambridge, 1872)	R		0	0	0	0	0	1	0	0	0	0	1
Tapinocyba insecta (L. Koch, 1869)	A		0	0	0	0	12	0	0	0	0	1	1
Taranucnus setosus (O. P.-Cambridge, 1872)	R	VU	0	0	0	0	0	0	0	0	0	0	1
Tapinopa longidens (Wider, 1834)	A		0	0	0	1	0	0	0	0	0	0	0
Tegenaria agrestis (Walckenaer, 1802)	S		0	0	2	0	0	0	0	0	1	0	0
Tenuiphantes flavipes (Blackwall, 1854)	VA		0	0	0	0	6	4	0	0	1	0	3
Thanatus arenarius L. Koch, 1872	R		0	4	0	0	0	0	14	7	0	0	0
Thanatus formicinus (Clerck, 1757)	A		0	0	0	1	1	0	0	0	0	1	0
Tibellus oblongus (Walckenaer, 1802)	S		0	0	0	0	0	0	2	1	0	0	0
Titanoeca psammophila Wunderlich, 1993	VR	CR	0	1	0	0	0	0	17	7	0	12	5
Titanoeca schineri L. Koch, 1872	R	VU	0	0	3	37	24	1	5	1	6	52	35
Trachyzelotes pedestris (C. L. Koch, 1837)	S		0	0	0	24	43	32	2	0	0	26	63
Trichoncus affinis Kulczyński, 1894	R		0	0	0	1	0	1	0	0	0	0	0
Trochosa ruricola (De Geer, 1778)	VA		0	0	1	8	0	2	1	2	0	0	0
Trochosa terricola Thorell, 1856	VA		0	0	2	116	110	75	5	0	4	123	167
***U**loborus walckenaerius* Latreille, 1806	VR	CR	0	0	0	0	0	0	0	0	0	0	1
***W**alckenaeria alticeps* (Denis, 1952)	A		0	0	0	0	0	0	0	0	0	1	0
Walckenaeria antica (Wider, 1834)	VA		0	0	0	0	1	0	0	0	0	0	0
Walckenaeria atrotibialis (O. P.-Cambridge, 1878)	VA		0	0	0	1	1	0	0	0	0	0	0
Walckenaeria dysderoides (Wider, 1834)	VA		0	0	0	0	0	3	0	0	0	0	0
Walckenaeria nudipalpis (Westring, 1851)	A		0	0	0	1	0	0	1	0	0	0	0
Walckenaeria vigilax (Blackwall, 1853)	S		0	0	0	0	0	0	1	0	0	0	0
***X**erolycosa miniata* (C. L. Koch, 1834)	S		0	11	0	0	0	0	53	0	0	3	3
Xerolycosa nemoralis (Westring, 1861)	VA		0	3	0	0	0	0	0	18	1	0	0
Xysticus cristatus (Clerck, 1757)	VA		0	0	0	0	0	0	0	1	0	0	0
Xysticus kochi Thorell, 1872	A		0	137	0	6	5	0	62	28	0	35	15
Xysticus luctator L. Koch, 1870	S		0	0	0	13	34	15	0	1	0	0	0
Xysticus ninnii Thorell, 1872	R		0	0	0	0	0	0	0	1	0	0	0
***Z**elotes apricorum* (L. Koch, 1876)	S		0	1	3	43	42	22	0	0	0	17	29
Zelotes electus (C. L. Koch, 1839)	S		0	0	1	7	5	0	1	0	1	19	30
Zelotes erebeus (Thorell, 1871)	S		0	0	1	7	4	7	0	0	0	6	6
Zelotes exiguus (Müller & Schenkel, 1895)	R		0	0	0	0	0	0	1	0	0	0	0
Zelotes latreillei (Simon, 1878)	VA		0	0	0	4	0	0	0	0	1	8	6
Zelotes longipes (L. Koch, 1866)	R		5	42	0	0	0	6	31	31	0	1	5
Zelotes petrensis (C. L. Koch, 1839)	A		1	6	3	14	11	6	1	2	10	50	101
Zodarion germanicum (C. L. Koch, 1837)	S		0	0	0	2	0	1	0	0	1	1	0
Zodarion rubidum Simon, 1914	R		0	0	0	4	0	0	0	0	0	24	8
Zora nemoralis (Blackwall, 1861)	A		0	0	0	2	4	1	0	0	0	0	0
Zora parallela Simon, 1878	VR		0	0	0	0	0	0	0	0	0	2	0
Zora spinimana (Sundevall, 1833)	VA		0	1	2	27	36	34	1	0	0	13	8



2: *Map of all known records of distribution of Euryopis laeta (Westring, 1861)*

celans (Blackwall, 1841), *Taranucnus setosus* (O. P.-Cambridge, 1863), *Titanoeca schineri* L. Koch, 1872. Except Red List species, there was found also one new species for the fauna of the Czech Republic: *Sintula spiniger* (Balogh, 1935). The commented list of mentioned species and other important records (new for fauna of the Czech Republic, new to the territory of Southern Moravia, interesting record from unexpected habitat) follows in the following chapter.

Commented list of some remarkable species

Family Atypidae

Atypus piceus (Sulzer, 1776)

A scarce species collected mainly on *Bromion erecti* grasslands (cf. Řezáč *et al.*, 2007), not reported from sandy soils until now. 1♂, 11. 5.–4. 6. 2010, plot B.

Family Uloboridae

Uloborus walckenaerius Latreille, 1806

A very rare species known only from Moravian sandy localities in the Czech Republic (Buchar & Ružička, 2002; Bryja *et al.*, 2005). From central Europe it is also known from other sandy areas in Baden-Württenberg (Nährig & Harms, 2003) and Hungary (Loksa, 1969). 1♀, 3. 8.–6. 9. 2010, plot B.

Family Theridiidae

Euryopis laeta (Westring, 1861) (Fig. 2)

A rare spider recorded from south Moravia (Miller, 1963; Kůrka, 2003; Bryja *et al.*, 2005; Košulič & Hula, 2013) and from two places in Bohemia (Buchar & Růžička, 2002). Although was not found by Růžička & Bezděčka (2000), it seems to be common on sandy areas in surrounding areas (Hula, pers. obs.). 3♂, 2. 7.–31. 7. 2009, plot A; 1♂, 11. 5.–19. 6. 2010, plot A.

Steatoda albomaculata (De Geer, 1778)

A rare species known mainly from different sandy and loess habitats, recently confirmed from periodically drained ponds bottom (Tropek, 2012). 1♂, 28. 4.–19. 5. 2009, plot A; 1♂, 3. 6.–2. 7. 2009, plot A; 3♂, 2. 7.–31. 7. 2009, plot A.

Family Linyphiidae

Mermessus trilobatus (Emerton, 1882) (Fig. 3)

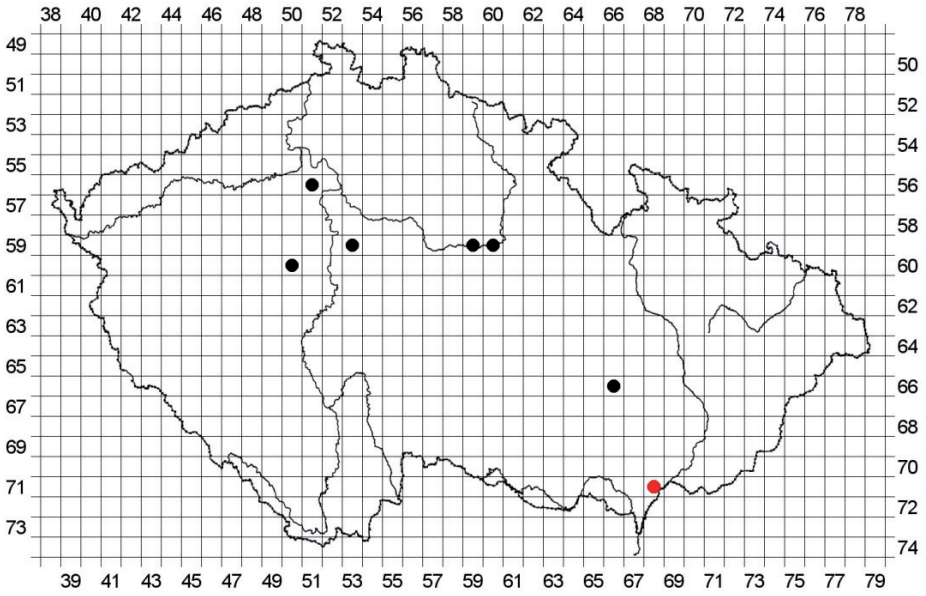
A spreading invasive American species, this is a first record from Moravia, all previous records were later (cf. Hula *et al.*, 2012). The species is spreading across Europe, the first records came from Germany from the 1980´s and the species was probably introduced by the American Army (Blick *et al.*, 2005). It is recorded from nearly whole Western Europe as a common species (Nentwig *et al.*, 2013). In the map all published data from Bohemia (Dolanský *et al.*, 2009, Holec *et al.*, 2012) until May, 2013 are presented. 1♀, 3. 6.–8. 7. 2011, plot A; 1♂, 8. 7.–5. 8. 2011, plot C.

Sintula spiniger (Balogh, 1935)

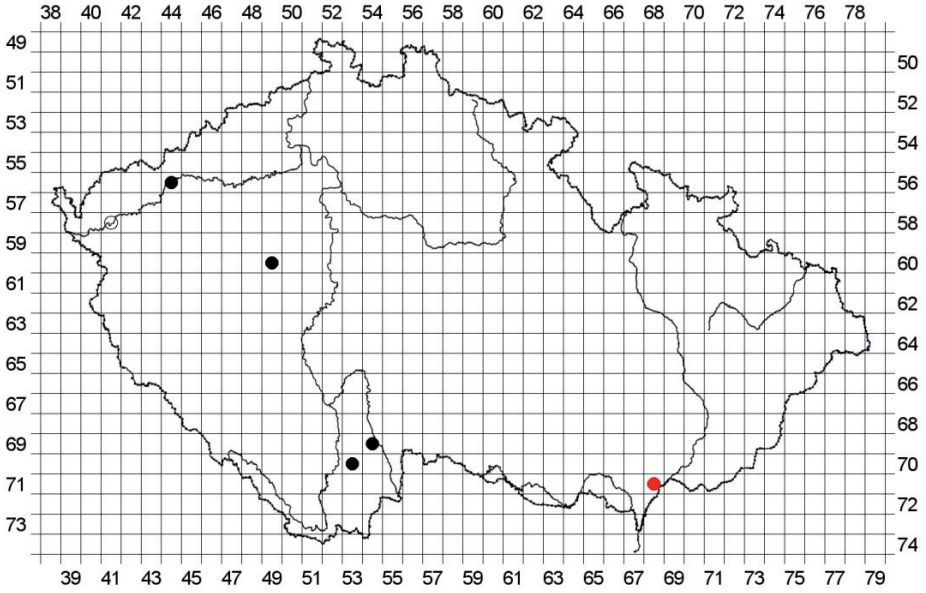
A new species for the Czech Republic. The species was known from Slovakia (Miller, 1968; Gajdoš, 2005), Hungary (Balogh & Loksa, 1947; Loksa, 1969), Romania (Weiss & Istvan, 2009), Bulgaria (Deltshev, 2006), Slovenia (Gregorič & Kuntner, 2009), Albania (Vrenozi & Deltshev, 2012) and Ukraine only (Polchaninova & Prokopenko, 2006). The species is in generally rarely collected. 1♀, 25. 8.–18. 9. 2008, plot C; 1♂, 6. 9.–8. 10. 2010, plot C; 5♀, 25. 8.–18. 9. 2008, plot B; 1♀, 28. 8.–30. 9. 2009, plot B; 6♀, 6. 9.–8. 10. 2010, plot B.

Tapinocyba biscissa (O. P.-Cambridge, 1872) (Fig. 4)

A rare species inhabiting different forests and their margins. The only Moravian record came from Lanžhot (Buchar & Růžička, 2002) and from



3: *Map of all known records of distribution of Mermessus trilobatus (Emerton, 1882)*



4: *Map of all known records of distribution of Tapinocyba biscissa (O. P.-Cambridge, 1872)*

Moravian Karst (Niedobová *et al.*, 2011). 1♂, 11. 5.–3. 6. 2011, plot C; 1♂, 15. 4.–11. 5. 2010, plot B.

Taranucnus setosus (O. P.-Cambridge, 1863) (Fig. 5)

A rare species characteristic for wetlands, pond margins and moors. The presence of this species on this locality is really unusual, even the specimen was found on driest part of locality. It is second record for Moravia, the first record comes from Stibůrkovská jezera Nature Reserve (Bryja *et al.*, 2005). 1♂, 11. 5.–4. 6. 2011, plot B.

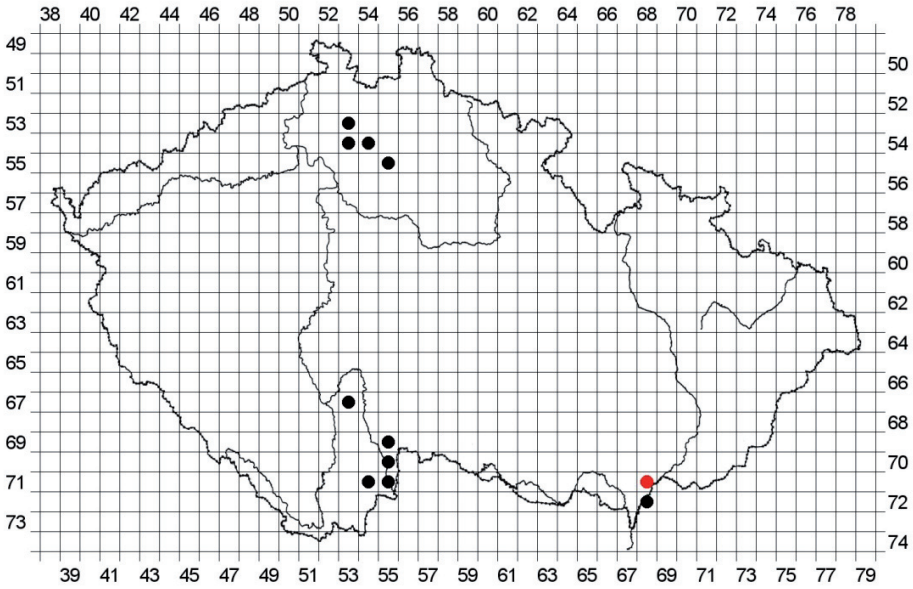
Trichoncus affinis Kulczyński, 1894 (Fig. 6)

A rare species of oak forests, among grass and leaf litter of oaks, on rocky slopes in oak forests (Buchar & Růžička, 2002). 1♂, 28. 4.–19. 5. 2009, plot C; 1♂, 11. 5.–4. 6. 2011, plot C.

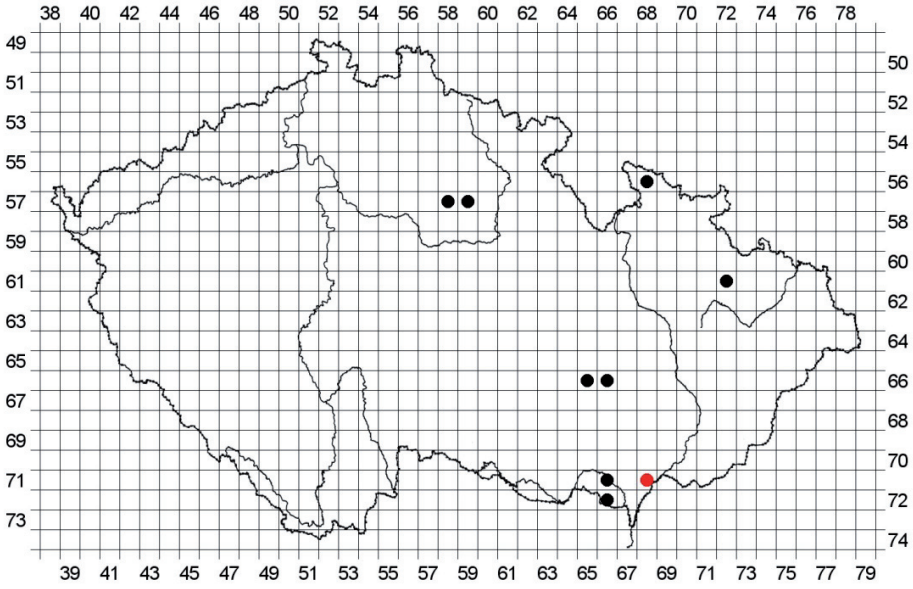
Family Lycosidae

Arctosa lutetiana (Simon, 1876)

A scarce species characteristic for different steppe habitats, on sun-exposed forest margins and rock steppes (Buchar & Růžička, 2002). From sandy habitats reported only few times (Krumpálová, 2000). Also reported from abandoned extracted peat bog in Bohemian forest (Kůrka, 1997). Once reported from periodically drained ponds bottom (Tropek, 2012). 5♂, 28. 4.–19. 5. 2009, plot C; 26♂, 19. 5.–3. 6. 2009, plot C; 12♂, 3♀ 3. 6.–2. 7. 2009, plot C; 3♂, 15. 4.–11. 5. 2010, plot C; 48♂, 1♀,



5: *Map of all known records of distribution of Taranucnus setosus (O. P.-Cambridge, 1863)*



6: *Map of all known records of distribution of Trichoncus affinis Kulczyński, 1894*

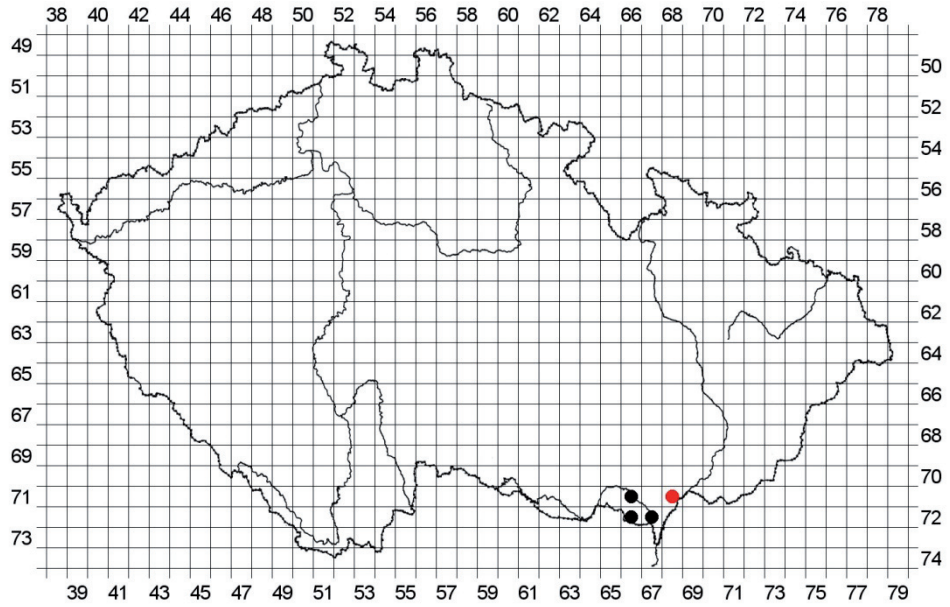
11. 5.–4. 6. 2010, plot C; 20♂, 1♀, 4. 6.–19. 6. 2010, plot C; 1♂, 6. 9.–8. 10. 2010, plot C; 29♂, 3. 6.–8. 7. 2011, plot C; 1♀, 8. 7.–5. 8.2011, plot C; 1♀, 5. 8.–30. 8. 2011, plot C; 5♂, 3. 6.–2. 7. 2009, plot B; 3♂, 11. 5.–4. 6. 2010, plot B; 2♂, 4. 6.–19. 6. 2010, plot B; 6♂, 11. 5.–3. 6. 2011, plot B; 4♂, 3. 6.–8. 7. 2011, plot B; 1♀, 5. 8.–30. 8. 2011, plot B.

Arctosa perita (Latreille, 1799)

A rare species connected to the sandy soils or ore-washery sedimentation basin (Dolanský, 2002; Řezáč, 2004). 1♀, 19. 5.–3. 6. 2009, plot A.

Pardosa bifasciata (C. L. Koch, 1834)

A scarce species typical for different xeric slopes, forest steppes etc. (Buchar & Růžička, 2002). The presence of sibling species, *P. schenkeli* Lessert, 1904, was expected, but not confirmed. Even the species *P. schenkeli*, is connected to the sandy soils from different sandy habitats across Europe (Kronestedt, 2006), only *P. bifasciata* was recorded. Almost all other Czech records are from non-sandy soils. 3♂, 3♀, 3. 6.–2. 7. 2009, plot A; 1♂, 28. 8.–30. 9. 2009, plot A; 1♂, 15. 4.–11. 5. 2010, plot A; 19♂, 2♀, 11. 5.–4. 6. 2010, plot A; 7♀, 4. 6.–19. 6. 2010, plot A; 2♀, 19. 6.–3. 8. 2010, plot A; 14♂, 11. 5.–3. 6. 2011, plot A; 10♂, ♀, 3. 6.–8. 7. 2011, plot A; 1♀, 19. 5.–3. 6. 2009, plot C; 1♂, 3. 6.–2. 7. 2009, plot C; 1♂, 4. 6.–3. 8. 2010, plot C; 1♂, 28. 4.–19. 5. 2009, plot B; 2♂, 19. 5.–3. 6. 2009, plot B; 2♂, 4. 6.–19. 6. 2010, plot B; 1♂, 19. 6.–3. 8. 2010, plot B; 5♂, 1♀, 3. 6.–8. 7. 2011, plot B; 6♂, 11. 5.–3. 6.2011, plot B.



7: *Map of all known records of distribution of Zora parallela Simon, 1878*

Family Zoridae

Zora parallela Simon, 1878 (Fig. 7)

A very rare spider recorded from the Czech Republic only from sandy and loess habitats in the Pálava PLA (Bryja *at al*., 2005; Růžička & Buchar, 2008). Presented record is the only record outside of this region. Not included in the Red List (Růžička, 2005), because it was found just before Růžička (2005) was published. Rarely reported from other European countries: France (Denis, 1966), Switzerland (Pozzi & Hänggi, 1998), Germany (Platen *et al*., 1995) and Russia (Mikhailov, 1997). 1♂, 28. 4.–19. 5. 2009, plot B; 1♂, 19. 5.–3. 6. 2009, plot B.

Family Titanoecidae

Titanoeca psammophila Wunderlich, 1993

A very rare species reported from air-blown sands of Hodonín vicinity in the Czech Republic (Růžička & Bezděčka, 2000). It has an interesting limited geographical distribution: Czech Republic, Germany, Poland, Slovakia, Sweden and Finland (Nentwig et. al 2013; Platnick, 2013). 1♂, 3. 6.–2. 7. 2009, plot A; 2♂, 11. 5.–4. 6. 2010, plot A; 13♂, 4. 6.–19. 9. 2010, plot A; 2♂, 19. 6.–3. 8. 2010, plot A; 4♂, 11. 5.–3. 6. 2011, plot A; 2♂, 3. 6.–8. 7.2011, plot A; 1♂, 8. 7.–5. 8. 2011, plot A; 1♂, 28. 4.–19. 5. 2009, plot B; 6♂, 19. 5.–3. 6. 2009, plot B; 5♂, 3. 6.–2. 7. 2009, plot B; 4♂, 4. 6.–19. 6. 2010, plot B; 1♂, 19. 6.–3. 8. 2010, plot B; 1♂, 3. 6.–8. 7. 2011, plot B.

Titanoeca schineri L. Koch, 1872

According to Buchar & Růžička (2002) a rare species, but the distribution seems to be underestimated (cf. with Bryja *et al*., 2005; Košulič & Hula, 2012a; Košulič & Hula, 2012b). 4♂, 15. 4.–11. 5.2010, plot A; 1♂, 19. 6.–3. 8. 2010, plot A; 1♀, 3. 6.–8. 7. 2011, plot A; 1♂, 14. 7.–5. 8. 2008, plot C; 2♀, 5. 8.–25. 8. 2008, plot C; 1♀ 28. 4.–19. 5. 2009, plot C; 12♀, 19. 5.–3. 6. 2009, plot C; 12♂, 3♀, 3. 6.–2. 7. 2009, plot C; 7♂, 1♀, 2. 7.–31. 7. 2009, plot C; 1♀, 31. 7.–28. 8. 2009, plot C; 21♂, 19. 6.–3. 8. 2010, plot C; 3♂, 6. 9.–19. 9. 2010, plot C; 1♂, 8. 7.–5. 8. 2011, plot C; 4♂, 14. 7.–5. 8. 2008, plot B; 2♀, 5. 8.–25. 8. 2008, plot B; 2♂, 1♀, 28. 4.–19. 5. 2009, plot B; 3♂, 6♀, 19. 5.–3. 6. 2009, plot B; 22♂, 13♀, 3. 6.–2. 7. 2009, plot B; 2♂, 3♀, 2. 7.–31. 7. 2009, plot B; 2♂, 15. 4.–11. 5. 2010, plot B; 11♂, 4♀, 4. 6.–19. 6. 2010, plot B; 15♂, 2♀, 19. 6.–3. 8. 2010, plot B; 1♂, 3. 8.–6. 9. 2010, plot B; 1♀, 11. 5.–3. 6. 2011, plot B; 5♂, 2♀, 3. 6.–8. 7. 2011, plot B; 9♂, 8. 7.–5. 8. 2011, plot B.

Family Miturgidae

Cheiracanthium campestre Lohmander, 1944

According to Buchar & Růžička (2002) a very rare species, but according to Dolanský (2011) it seems to be more common (rare or scarce). On sands of the area, it seems to be scarce (Hula, pers. obs.). 1♀, 10. 4.–28.4. 2009, plot B; 1♀, 3. 6.–2. 7. 2009, plot B.

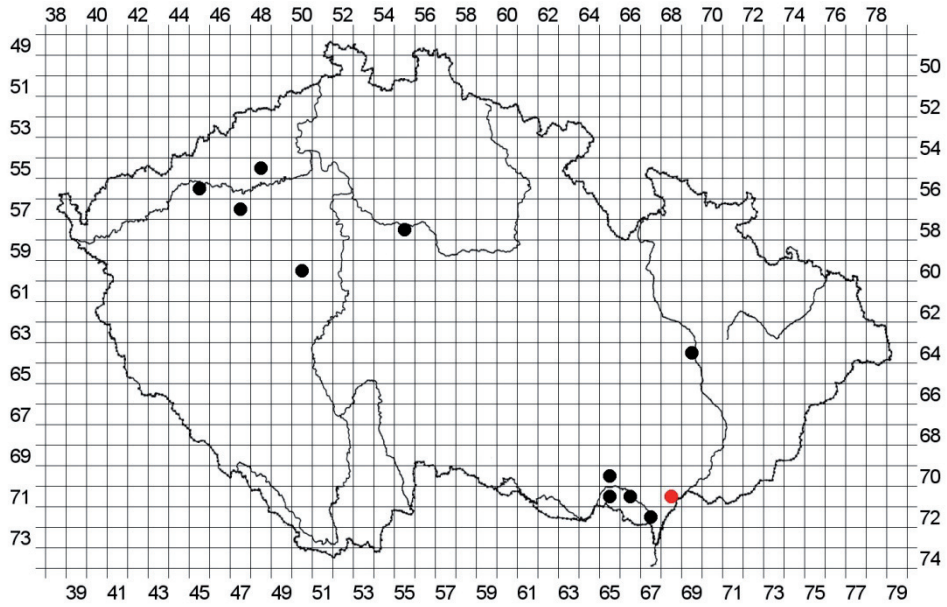
Family Liocranidae

Agroeca lusatica (L. Koch, 1875)

A rare species of rock steppes (Buchar & Růžička, 2002). It seems to be closely associated to sandy or loess habitats (Bryja *et al*., 2005) in Moravia. 1♀, 19. 5.–3. 6. 2009, plot C.

Liocranoeca striata (Kulczyński, 1882)

A rare species of different habitats (screes, spoil heaps, quarries, floodplain forests) (Buchar & Růžička, 2002). In the Pálava PLA, it is more common but always closely associated to the floodplain forests (Bryja *et al*., 2005). 1♂, 3. 6.–2. 7. 2009, plot A; 9♂, 28. 4.–19. 5. 2009, plot C; 4♂, 3. 6–2. 7. 2009, plot C; 3♂, 15. 4.–11. 5. 2010, plot C; 23♂, 1♀, 11. 5.–4. 6. 2010, plot C; 1♂, 19. 6.–3. 8. 2010, plot C; 10♂, 6. 9.–19. 9. 2010, plot C; 11♂,



8: *Map of all known records of distribution of Scotina celans (Blackwall, 1841)*

11. 5.–3. 6. 2011, plot C; 9♂, 3. 6.–8. 7. 2011, plot C; 1♂, 8. 7.–5. 8. 2011, plot C; 1♂, 11. 5.–4. 6. 2010, plot B; 4♂, 11. 5.–3. 6. 2011, plot B; 1♂, 3. 6.–8. 7. 2011, plot B.

Scotina celans (Blackwall, 1841) (Fig. 8)

A rare species of different light conditions and floodplain forests and steppe sites (Buchar & Růžička, 2002). It seems to be quite common in some type of forests in South Moravia (e.g. Děvín in Pálava PLA – Hula pers. obs.). 1♀, 10. 4.–28. 4. 2009, plot A; 1♂, 28. 8.–30. 9. 2009, plot C; 1♀, 11. 5.–4. 6. 2010, plot C; 2♂, 4. 6.–3. 8. 2010, plot C; 29♂, 19. 9.–8. 10. 2010, plot C; 1♀, 11. 5.–3. 6. 2011, plot C; 1♀, 3. 6.–8. 7. 2011, plot C; 28♂, 30. 8.–7. 10. 2011, plot C; 1♀, 31. 7.–28. 8. 2009, plot B; 5♂, 28. 8.–30. 9. 2009, plot B; 1♀, 11. 5.–4. 6. 2010, plot B; 1♂, 1♀, 4. 6.–19. 6. 2010, plot B; 1♂, 19. 6.–3. 8. 2010, plot B; 7♂, 6. 9.–8. 10. 2010, plot B; 41♂, 30. 8.–7. 10. 2011, plot B.

Family Corinnidae

Phrurolithus minimus C. L. Koch, 1839

A rare species of all xeric types of habitats in the Czech Republic (Buchar & Růžička, 2002). According to Bryja *et al.* (2005) very rare species collected twice only at Pálava PLA. 1♀, 14. 7.–5. 8. 2008, plot C; 1♀, 5. 8.–25. 5. 2008, plot C; 1♂, 10. 4.–28. 5. 2009, plot C; 1♂, 28. 4.–19. 5. 2009, plot C; 2♂, 2♀, 3. 6.–2. 7. 2009, plot C; 1♂, 15. 4.–11. 5. 2010, plot C; 1♂, 2♀, 11. 5.–4. 6. 2010, plot C; 2♂, 4. 6.–3. 8. 2010, plot C; 2♂, 6. 9.–19. 9. 2010, plot C; 3♂, 1♀, 11. 5.–3. 6. 2011, plot C; 2♂, 3. 6.–8. 7. 2011, plot C; 4♂, 8. 7.–5. 8. 2011, plot C; 1♀, 5. 8.–30. 8. 2011, plot C; 1♀, 14. 7.–5. 8. 2008, plot B; 2♀, 5. 8.–25. 8. 2008, plot B; 1♂, 3. 6.–2. 7. 2009, plot B; 1♀, 31. 7.–28. 8. 2009, plot B; 2♂, 4. 6.–19. 6. 2010, plot B; 2♂, 19. 6.–3. 8. 2010, plot B; 1♂, 11. 5.–3. 6. 2011, plot B; 1♂, 3. 6.–8. 7. 2011, plot B; 1♀, 8. 7.–5. 8. 2011, plot B; 1♀, 5. 8.–30. 8. 2011, plot B; 1♀, 30. 8.–7. 10. 2011.

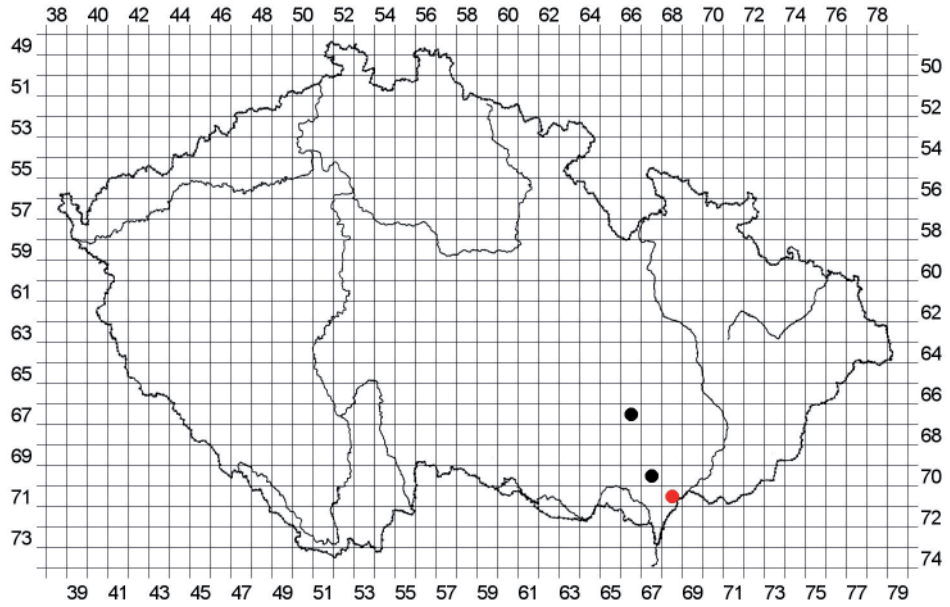
Phrurolithus pullatus Kulczyński, 1897

According to (Buchar & Růžička, 2002) rare species of different Moravian grass steppes, but Bryja *et al.* (2005) recorded species as relatively common in Pálava PLA. Species is known from more localities recently (Košulič & Hula, 2011). 1♂, 3. 6.–8. 7. 2011, plot C.

Family Gnaphosidae

Gnaphosa alpica Simon, 1878 (Fig. 9)

A very rare spider, its occurrence published for the second time from the Czech Republic (Košulič & Hula, 2012b). In general, within the Central Europe this species is usually reported under the name *G. modestior* Kulczynski, 1897 (e.g. Miller, 1971). Ovtsharenko *et al.* (1992) later pointed out some uncertainties in the taxonomy of *G. modestior* and in their revision they report the species of *G. modestior* only from the steppe regions of eastern Europe. The same authors report that all previous Central European records of *G. modestior* belong to the species of *G. alpica*. A tricking fact is that *G. alpica* was described by Simon (1878) from the high western Alps and Alpes-de-Haute-Provence and that the species, as it had been known by the time of Ovtsharenko's *et al.* (1992) review, was considered extremely rare (see Grimm, 1985) and only from the westernmost Alps (Dauphine, Savoyen, Wallis, Zermatt). On the contrary, the Central European population live in the lowlands at the hottest and driest sites (vineyard terraces of the Little Carpathians – Gajdoš & Dankaninová, 2010; near Lake Neusiedl – collection of Naturhistorisches Museum Wienn; Hungarian Lowlands – Szita *et al.*,



9: *Map of all known records of distribution of Gnaphosa alpica Simon, 1878*

2005). The Simons (1878) description of *G. alpica* is based on several females (localities Zermatt, Siron and Les Dourbes); consider fact of similarities of females of *Gnaphosa* sensu stricto. The situation is unclear and requires further taxonomic study with an examination of type specimens. 4♂, 10. 4.–28. 4. 2009, plot C; 9♂, 4 ♀, 28. 4.–19. 5. 2009, plot C; 11♂, 19. 5.–3. 6. 2009, plot C; 11♂, 4♀, 3. 6.–2. 7. 2009, plot C; 1♀, 28. 8.–30. 9. 2009, plot C; 9♂, 15. 4.–11. 5. 2010, plot C; 1♂, 11. 5.–4. 6. 2010, plot C; 1♀, 4. 6.–3. 8. 2010, plot C; 1♂, 6. 9.–19. 9. 2010, plot C; 3♂, 11. 5.–3. 6. 2011, plot C; 4♂, 3. 6.–8. 7. 2011, plot C; 1♀, 8. 7.–5. 8. 2011, plot C; 3♂, 10. 4.–28. 4. 2009, plot B; 17♂, 28. 4.–19. 5. 2009, plot B; 6♂, 1♀, 19. 5.–3. 6. 2009, plot B; 1♂, 3. 6.–2. 7. 2009, plot B; 1♀, 2. 7.–31. 7. 2009, plot B; 17♂, 3♀, 15. 4.–11. 5. 2010, plot B; 3♂, 1♀, 11. 5.–4. 6. 2010, plot B; 9♂, 1♀, 4. 6.–19. 6. 2010, plot B; 1♀, 3. 8.–6. 9. 2010, plot B; 17♂, 2♀, 11. 5.–3. 6. 2011, plot B; 1♀, 5. 8.–30. 8. 2011, plot B.

Gnaphosa bicolor (Hahn, 1833)

A scarce species characteristic of forest steppes, light oak forests, scree slopes and rocks (Buchar & Růžička, 2002). Rarely collected in Moravia, there are only few recent data about this species (Niedobová *et al*., 2011). It is similar to the previews species in general appearance (bi-colours legs). 2♂, 19.5.–3.6. 2011, plot A.

Haplodrassus bohemicus Miller & Buchar, 1977

A very rare species published from the Czech Republic from type locality only (Raná hill, České Středohoří PLA), from Bzenec military area (Růžička & Bezděčka, 2000); unpublished data came from Váté písky National Nature Monument. The species is reported also from Greece (Bosmans & Chatzaki, 2005), Macedonia (Stefanvska *et al*., 2008), Ukraine (Kovblyuk *et al*., 2012) and southern part of European Russia (Otto & Tramp, 2011). 8♂, 11. 5.–3. 6. 2011, plot B; 1♂, 8. 7.–5. 8. 2001, plot B.

Haplodrassus dalmatensis (L. Koch, 1866)

A rare spider inhabiting different steppe and rock steppe habitats (Buchar & Růžička, 2002). Often found in limestone quarries (Hula & Šťastná, 2010; Kůrka, 2000) and on vineyard terraces (Košulič & Hula, 2013). Quite common on Pálava PLA (Bryja *et al*., 2005). 1♀, 19. 5.–3. 6. 2009, plot A; 1♀, 2. 7.–31. 7. 2009, plot A; 4♂, 4. 6.–19. 6. 2010, plot A; 1♀, 3. 6.–8. 7. 2011; 1♂, 6. 9.–19. 9. 2010, plot C; 1♂, 10. 4.–28. 4. 2009, plot B.

Haplodrassus minor (O. P.-Cambridge, 1879)

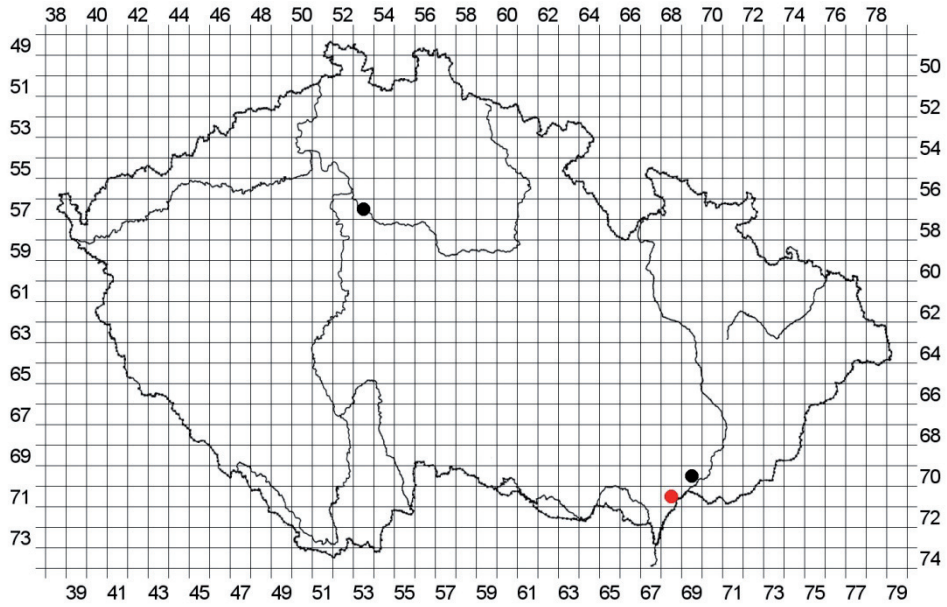
A very rare species found on a salt marsh, in limestone quarries (Kůrka, 2000; Hula & Šťastná, 2010), in a field or in steppe protected area (Nature Monument Terasy – Vinohradské near Draslavice, lgt. Majkus – Majkus, 2005). From the Pálava PLA, it is recorded also from wet meadows (Bryja *et al*., 2005) and from Slanisko u Nesytu National Nature Reserve salt marsh (Majkus & Svatoň, 2005). 1♂, 2. 7. 31. 7. 2009, plot A; 1♂, 3. 6.–2. 7. 2009, plot C; 1♂, 11. 5.–4. 6. 2010, plot B.

Micaria dives (Lucas, 1846)

A rare species known from different rock steppes (Buchar & Růžička, 2002). Aslo reported from sandy habitats (Dolanský, 2002) and from ash deposits (Řezáč, 2004) 1♂, 15. 4.–11. 5. 2010, plot B.

Micaria formicaria (Sundevall, 1831)

A rare species known from different xerothermic habitats (Buchar & Růžička, 2002), not reported from Pálava PLA before (Bryja *et al*., 2005). Species is probably closely associated to the empty snail-shells (Hula *et al*., 2009). 1♂, 3. 6.–2. 7. 2009, plot A; 1♂, 10. 4.–28. 4. 2009, plot C; 2♂, 15. 4.–11. 5. 2010, plot C; 1♂, 3. 6.–8. 7. 2011, plot C; 1♂, 10. 4.–28. 4. 2009, plot B; 2♂, 19. 5.–3. 6. 2009, plot B; 1♂, 15. 4.–



10: *Map of all known records of distribution of Sitticus zimmermanni (Simon, 1877)*

11. 5. 2010, plot B; 1♂, 2♀, 4. 6.–19. 6. 2010, plot B; 1♀, 3. 6.–8. 7. 2011, plot B.

Zelotes exiguus (Müller & Schenkel, 1895)

A rare species of different xerothermic habitats, including quarries (Buchar & Růžička, 2002). This is first published record from Moravia. 1♂, 4. 6.–19. 6. 2010, plot A.

Zelotes longipes (L. Koch, 1866)

A rare species recorded from different xerothermic habitats (Buchar & Růžička, 2002). Records came mainly from autumn months (Bryja *et al.*, 2005; Košulič & Hula, 2011, 2012, 2013; Niedobová *et al.*, 2011). 5♂, 31. 7.–28. 8. 2009, plot A; 30♂, 7♀, 28. 8.–30. 9. 2009, plot A; 2♂, 4. 6.–19. 6. 2010, plot A; 1♂, 1♀, 19. 6.–3. 8. 2010, plot A; 7♂, 3. 8.–6. 9. 2010, plot A; 19♂, 1♀, 6. 9.–8. 10. 2010, plot A; 2♀, 11. 5.–3. 6. 2011, plot A; 2♀, 3. 6.–8. 7. 2011, plot A; 8♂, 3♀, 5. 8.–30. 8. 2011, plot A; 16♂, 30. 8.–7. 10. 2011, plot A; 3♂, 5. 8.–30. 8. 2011, plot C; 3♂, 30. 8.–7. 10. 2011, plot C; 1♂, 31. 7.–28. 8. 2009, plot B; 1♂, 15. 4.–11. 5. 2010, plot B; 1♀, 4. 6.–19. 6. 2010, plot B; 2♂, 1♀, 3. 8.–6. 9. 2010, plot B; 4♂, 1♀, 5. 8.–30. 8. 2011, plot B; 15♂, 30. 8.–7. 10. 2011, plot B.

Family Philodromidae

Thanatus arenarius Thorell, 1872

Generally a rare species of sandy habitats, rock steppes and heathlands (Buchar & Růžička, 2002). It seems to be common in South Moravia (Bryja *et al.*, 2005; Košulič & Hula, 2013). 1♂, 10. 4.–28. 4. 2009, plot A; 1♂, 28. 4.–19. 5. 2009, plot A; 1♂, 19. 5.–3. 6. 2009, plot A; 1♀, 2. 7.–31. 7. 2009, plot A; 9♂, 1♀, 15. 4.–11. 5. 2010, plot A; 2♂, 11. 5.–4. 6. 2010, plot A; 2♂, 4. 6.–19. 6. 2010, plot A; 5♂, 1♀, 11. 5.–3. 6. 2011, plot A; 1♂, 8. 7.–5. 8. 2011, plot A; 1♂, 11. 5.–3. 6. 2011, plot B.

Family Thomisidae

Xysticus ninnii Thorell, 1872

A rare species of different xerothermic habitats (Buchar & Růžička, 2002). To date, there is the only one recent record from South Moravia (Bryja *et al.*, 2005). 1♂, 8. 7.–5. 8. 2011, plot A.

Family Salticidae

Myrmarachne formicaria (De Geer, 1778)

A rare species inhabiting two contrasting habitats – wet and dry habitats – in flood plain forest and forest steppes (Bryja *et al.*, 2005). Found in different empty land-snail shells (Hula *et al.*, 2009; Szinetár *et al.*, 1998). 1♂, 28. 8.–18. 9. 2008, plot C; 1♂, 28. 4.–19. 5. 2009, plot C; 1♂, 31. 7.–28. 8. 2009, plot C; 1♂, 15. 4.–11. 5. 2010, plot C; 1♂, 3. 6.–2. 7. 2009, plot B.

Pellenes nigrociliatus (Simon, 1875)

A rare species of different xerothermic habitats (Buchar & Růžička, 2002). Overlooked, closely associated to land-snail shells, where is sometimes commonly found (Hula *et al.*, 2009). 1♂, 28. 4.–19. 5. 2009, plot B.

Sitticus zimmermanni (Simon, 1877) (Fig. 10)

A very rare spider recorded few times from sandy habitats (Buchar & Růžička, 2002). The only recent records came from Váté písky NNR (Macek, 2013). 1♀, 10. 4.–28. 4. 2009, plot C; 1♀, 31. 7.–28. 8. 2009, plot C; 1♀, 3. 6.–2. 7. 2009, plot B; 1♀, 2. 7.–31. 7. 2009, plot B; 1♂, 4. 6.–19. 6. 2010, plot B, 1♂, 3. 8.–6. 9. 2010, plot B; 1♂, 6. 9.–8. 10. 2010, plot B.

DISCUSSION

There are not so many places with such spider diversity like on our experimental place and its ecotones. South Moravian preserve areas have usually rich species diversity (Bryja *et al.*, 2005;

Košulič & Hula, 2011, 2012b). On the other hand, really rare and endangered fauna can be found even on artificial habitats, e.g. on vineyard terraces (Košulič & Hula, 2013) or quarries (Hula & Šťastná, 2010; Kůrka, 2000). According to our results, it seems that abandoned field on sandy soil could host very interesting fauna as well. Generally, it is possible to say that sandy soils host rich spider fauna (Merkens, 2000; Růžička & Bezděčka, 2000; Bonte *et al*., 2002; Bonte *et al*., 2003; Dolanský, 2002). Habitat which we investigated hosts even sandy specialists (*Uloborus walckenaerius*, *Alopecosa psammophila*, *Arctosa perita*, *Zora paralella* and *Titanoeca psammophila*) and agrobiont (*Pardosa agrestis*, *Pardosa palustris*, *Oedothorax apicatus*) spiders together. Such co-occurrence increases the total number of species. One of species is recorded for the first time for the spider fauna of the Czech Republic (*Sintula spiniger*), two as a first record for Moravia (*Mermessus trilobatus*, *Zelotes exiguus*), one found species where not listed by Růžička & Buchar (2002) and Růžička & Buchar (2008) (*Gnaphosa alpica*). These records are also important because species were not found in legally protected areas. On the other hand species of open sandy habitats are usually considered to be very rare. Here, it seems that there are not so many conservation management activities necessary to do to establish suitable habitats for such fauna.

Founded spectrum has an interesting structure of rareness degree. There were found quite high number of very rare, rare and scarce species, which are usually more expectable in nature protected areas then in former arable land.

CONCLUSION

Research of spider species on sandy grassland and its ecotones near the town of Hodonín shows, that man-maid sandy habitat can be very valuable and rich on remarkable spider species. We collected altogether 11 743 spider specimen, which belong to 160 spider species and 21 families. We found 14 species which are listed under Red List of threatened species of the Czech Republic and another 18 remarkable species. One of them, namely *Sintula spiniger* (Balogh, 1935), is new species for the fauna of the Czech Republic.

SUMMARY

The main objective of this work was to investigate spider fauna on man-made habitat of sandy grassland and its ecotones near the town Hodonín. Collection was conducted by Z. Laštůvka and H. Šefrová within four years (2008–2011) as a part of project of re-cultivation of soil and climatic extreme habitat under conditions of changing climate within future 50 years. Three transects were established, one on experimental grassland and two on its ecotones (ecoton of Scots Pine forest and ecoton of Poplar-Willow growt). There were placed 5 pitfall traps with 4% formaldehyde solution as a fixative fluid. Spiders from pitfall traps were collected each month of growing season (from April to September). Pitfall traps collecting from the year 2008 was shorter (from July to September). Altogether were collected 11743 adult specimens of spiders belonging to 160 species from 21 families within four years. The total numbers of caught species differed between plots. There were 2758, 3451 and 5534 adult specimens collected at the plot A, B and C, respectively. We found, that 15 species are included in Red List of threatened species in the Czech Republic. In addition to that, another 18 remarkable species were also found. The most important finding is the new species for the fauna of the Czech Republic: *Sintula spiniger* (Balogh, 1935).

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REFERENCES

AOPK ČR & MŽP ČR, 2006: Natura 2000. Available online at: http://www.nature.cz/natura2000-design3/hp.php (cited on 25.iv.2013).

BALOGH, J., LOKSA, I., 1947: Faunistische Angaben über die Spinnen des Karpatenbeckens II. *Fragmenta Faunistica Hungarica*, 10: 61–68. ISSN 0200-9196.

BioLib, 2013: BioLib.cz – Nástroj na kreslení síťových map. [BioLib.cz – A tool for creating of grid map squares]. Available online at: http://www.biolib.cz/cz/tooltaxonmap/id1/ (cited on 4.vi.2013).

BLICK, T., HÄNGGI, A., WITTENBERG, R., 2005: Spider and allies – Arachnida, 213–224. In: WITTENBERG, R., KENIS, M., BLICK, T., HÄNGGI, A., GASMANN, A., WEBER, E.: *An inventory of alien species and their threat to biodiversity and economy in Switzerland.* CABI Bioscience Switzerland Centre, report to The Swiss Agency for Environment, Delémont, Switzerland: Forests and Landscape SAEFL, 416 pp. ISBN UW-0629-E.

BOLZERN, A., BURCKHARDT D., HÄNGGI, A., 2013: Phylogeny and taxonomy of European funnel web spiders of the *Tegenaria-Malthonica* complex (Araneae: Agelenidae) based upon morphological and molecular data. *Zoological Journal of the Linnean Society*, 168, 4: 723–848. ISSN 1096-3642.

BONTE, D., CRIEL, P., VAN THOURNOUT, I., MAELFAIT, J.–P., 2003: Regional and local variation of spider assemblages (Araneae) from coastal grey dunes along the North Sea. *Journal of Biogeography*, 30, 6: 901–911. ISSN 1365-2699.

BONTE, D., BAERT, L., MAELFAIT, J.–P., 2002: Spider assemblage structure and stability in a heterogenous coastal dune systém (Belgium). *Journal of Arachnology*, 30, 2: 331–343. ISSN 0160-8202.

BRYJA, V., SVATOŇ, J., CHYTIL, J., MAJKUS, Z., RŮŽIČKA, V., KASAL, P., DOLANSKÝ, J., BUCHAR, J., CHVÁTALOVÁ, I., ŘEZÁČ, M., KUBCOVÁ, L., ERHART, J., FENCLOVÁ, I., 2005: Spiders (Araneae) of the Lower Morava Biosphere Reserve and closely adjacent localities (Czech republic). *Acta Musei Moraviae, Scientiae biologicae (Brno)*, 90, 1: 13–184. ISSN 1211-8788.

BUCHAR, J., RŮŽICKA, V., 2002: *Catalogue of Spiders of the Czech Republic*. Praha: Peres, 351 pp. ISBN 80-86360-25-3.

DENIS J., 1966: Éléments d'une faune arachnologique de Vendée (4e note). *Bulletin de la société scientifique de Bretagne*, 40: 177–186. ISSN 0037-9581.

DELTSHEV, CH., 2003: A review of the family Linyphiidae (Araneae) in Bulgaria, faunistic and zoogeographical analyses, 53–66. Logunov, D. V., Penney, D. (Eds.): *Proceedings of the 21st European Colloquium of Arachnology, St. Peterburg, 4.–9. August 2003*, Arthropoda Selecta, Special Issue No. 1: 374 pp. ISSN 0136-006X.

DOLANSKÝ, J., 2002: Arachnofauna písčin a bílých strani východních Čech. (Spiders of Eastbohemian sandy habitats and sliding chalk slopes). *Východočeský sborník přírodovědný – Práce a studie*, 10: 285–310. ISSN 1212-1460.

DOLANSKÝ, J., 2011: Rozšíření a stanovištní nároky zápřednic rodu *Cheiracantium* (Araneae, Miturgidae) v Česku. (Distribution and habitat preferences of spiders of the genus *Cheiracanthium* (Araneae, Miturgidae) in Czechia). *Východočeský sborník přírodovědný – Práce a studie*, 18: 125–140. ISSN 1212-1460.

DOLANSKÝ, J., KŮRKA, A., ŘEZÁČ, M., 2009: *Mermessus trilobatus* (Emerton, 1882) (Araneae, Linyphiidae) – nový druh pavučenky v České republice. (*Mermessus trilobatus* (Emerton, 1882) – a new spider species in the Czech Republic). *Východočeský sborník přírodovědný – Práce a studie*, 16: 143–144. ISSN 1212-1460.

EUROPEAN COMMISSION, 2007: "Habitat directive" – Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Available online at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:01992L0043-20070101:EN:NOT (cited on: 25.iv.2013).

GAJDOŠ, P., 2006: Spiders of the Domica drainage area (Slovak Karst Mts.): community composition and habitat evaluation, 101–104. In: DELTSHEV, C., STOEV, P. (eds) 2006: European Arachnology 2005. *Acta Zoologica Bulgarica*, 58, Suppl. 1: 1–343. ISSN 0324-0770.

GAJDOŠ, P., DANKANINOVÁ, L., 2010: Epigeické pavúky ve vazbe na vinohradnické historické krajinné struktury (modelové území Svätý Jur) (The epigeic spiders communities in relation to vinery historical landscape structures (model area Svätý Jur)) In: *Medzinárodná vedecká konferencia doktorandov, mladých vedeckých a pedagogických pracovníkov.* Nitra: Faculty of Natural Sciences, Constantine the Philosopher University, 201–209. ISBN 978-80-558-0120-9.

GREGORIČ, M., KUNTNER, M., 2009: Epigean spider diversity in the classical karst. *Hacquetia*, 8, 1: 67–78. ISSN 1854-9829.

GRIMM, U., 1985: *Die Gnaphosidae Mitteleuropas (Arachnida, Araneae)*. Hamburg: Parey, 318 pp. ISBN 3490142969.

HOLEC, M., 2009: Příspěvek k poznání fauny EVL "Písčiny u Oleška" (Česká republika). (Contribution to the knowledge of spider fauna of locality "Písčiny u Oleška" (Czech Republic). *Studia Oecologica*, 2, 2: 39–51. ISSN 1802-212X.

HOLEC, M., SVOBODOVÁ, Z., HABUŠTOVÁ, O., MOHAMED HUSSIEN, H., SEHNAL, F., 2012: První nález pavouka *Mermessus trilobatus* (Araneae) v jižních Čechách. (First record of spider *Mermessus trilobatus* (Araneae) in south Bohemia. *Studia Oecologica*, 6, 1: 15–18. ISSN 1802-212X.

HULA, V., KOŠULIČ, O., ŠŤASTNÁ, P., 2012: Spiders (Araneae) of selected sinkholes of Moravský kras Protected Landscape Area (Czech Republic). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 60, 1: 57–70. ISSN 1211-8516.

HULA, V., NIEDOBOVÁ, J., KOŠULIČ, O., 2009: Overwintering of spiders in land-snail shells in South Moravia (Czech Republic). *Acta Musei Moraviae, Scientiae biologicae (Brno)*, 94: 1–12. ISSN 1211-8788.

HULA, V., ŠŤASTNÁ, P. 2010: Spiders (Araneida) from the Lesní lom Quarry (Brno–Hády). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 58, 5: 191–202. ISSN 1211-8516.

KOŠULIČ, O. & HULA, V., 2011: Arachnofauna přírodní rezervace Louky pod Kumstátem (Česká republika). (Arachnofauna of Louky pod Kumstátem Nature Reserve (Czech Republic)). *Klapalekiana*, 47, 3–4: 201–212. ISSN 1210-6100.

KOŠULIČ, O. & HULA, V., 2012a: Ecological evaluation of spiders of the vineyard terraces in the condition of South Moravia (Czech Republic), p. 73. In: KUNTNER, M. (eds): *27th European Congress of Arachnology, 2–7 September 2012*, Book of Abstracts. Ljubljana: EZ lab, Slovenia, 187 pp.

KOŠULIČ, O. & HULA, V., 2012b: Investigation of spiders (Araneae) of the Nature Monument

Jesličky (South Moravia, Czech Republic). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis,* 60, 5: 125–136. ISSN 1211-8516.

KOŠULIČ, O., HULA, V., 2013: Rare and remarkable spiders (Araneae) from vineyard terraces in Palava region (South Moravia, Czech Republic). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 61, 3: 663–676. ISSN 1211-8516.

KOVBLYUK, M. M., KASTRYGINA, Z. A., OMELKO, M. M., 2012: A review of the spider genus *Haplodrassus* Chamberlin, 1922 in Crimea (Ukraine) and adjacent areas (Araneae, Gnaphosidae). *ZooKeys*, 205: 59–89. ISSN 1313-2970.

KRONESTEDT, T., 2006: On *Pardosa schenkeli* (Araneae, Lycosidae) and its presence in Germany and Poland. *Arachnologische Mitteilungen*, 32: 31–37. ISSN 1018-4171.

KRUMPÁLOVÁ, Z., 2000: Pavúky (Araneae) zaplavovaného lužného lesa v meandri Horniancky včelín v inundačním pásme rieky Moravy. (Spiders (Araneae) of the inundation soft wood forest of the meander Horniacky včelín in the area of Morava River). *Sborník Přírodovědného klubu v Uh. Hradišti*, 5: 184–199. ISBN 80-902213-9-4.

KŮRKA, A., 1997: The spider fauna of Bohemian peatbogs. Check-list of spider species found in the peatbogs of the Šumava Mts region. *Acta Musei Nationalis Pragae*, 53: 11–35. ISSN 0036-5343.

KŮRKA, A., 2000: Sukcese arachnocenoz v povrchovych vapencovych lomech v Českem krasu (pavouci – Araneae). [The succession of the spider fauna in limestone quarries of the Bohemian Karst (spiders – Araneae)]. *Český kras*, 26: 22–27. ISSN 1211-1643.

KŮRKA, A., 2003: A survey of spider species (Araneida) in Prof. F. Miller's collection (Department of Zoology, Museum of Natural History – National Museum), Part VII: Theridiidae. *Časopis Národního Muzea*, Řada přírodovědná, 172, 1–4: 133–140. ISSN 0139-9497.

LAŠTŮVKA, Z., PURCHART, L., ŠEFROVÁ, H., 2010: Druhová diverzita střevlíkovitých (Carabidae) v extrémních podmínkách na experimentální ploše u Hodonína. (Species diversity of ground beetles (Carabidae) under extreme conditions at the experimental area near Hodnín). *Úroda – vědecká příloha*, 12: 127–132. ISSN 0139-6013.

LOKSA, I., 1969: Pókok I – Araneae I. [Spiders I - Araneae]. *Fauna Hungariae*, 97: 1–133.

MACEK, R., 2013: Pavouci – Araneae. Available online at: http://pavouci-cz.eu/Pavouci.php?celed=vse (cited on 26.vi.2013).

MAJKUS, Z. & SVATOŇ, J., 1995: Araneida. In: ROZKOŠNÝ, R. & VAŇHARA J. (eds), Terrestrial Invertebrates of the Pálava Biosphere Reserve of UNESCO I. *Folia Facultas Scientiarium Naturalium Universitatis Masarykianae Brunensis, Biologia* 92: 35–50. ISBN 80-210-1209-4.

MAJKUS, Z., 2005: *Závěrečná zpráva inventarizačního arachnologického výzkumu 3 chráněných území Přírodního parku Prakšická vrchovina: PP Terasy – Vinohradné, PR Vrchové-Chrástě, PR Rovná hora*. [*Final report from arachnological investigation of 3 protected areas of Natural Park Prakšická vrchovina: NM Terasy-Vinohradné, PR Vrchové-Chrástě, PR Rovná hora*]. Manuscript, depon. in KrÚ Zlínského kraje, 24 pp.

MERKENS, S., 2000: Epigeic spider communities in inland dunes in the lowlands of Northern Germany, pp. 215–222. In: Toft, S. & Sharff, N.: *Proceedings of the 19th European Colloquium of Arachnology*, Århus 17–22 July 2000. Aarhus: University Press Aarhus, 358 pp. ISBN 87-7934-001-6.

MIKHAILOV, K. G., 1997: *Catalogue of the spiders of the territories of the former Soviet Union (Arachnida, Aranei)*. Archives of the Zoological Museum of the Moscow State University 37. Moscow, 416 pp.

MILLER, F., 1963: Tschechoslowakische Spinnenarten aus der Gattung *Euryopis* Menge (Araneae, Theridiidae). *Časopis Československé společnosti entomologické*, 60, 4: 341–348. ISSN 0374-7204.

MILLER, F., 1968: *Sintula buchari* sp. n., eine neue Zwergspinne aus der Tschechoslowakei (Araneida, Micryphantidae). *Acta Entomologica Bohemoslovaca*, 65: 241–245. ISSN 0001-5601.

MILLER, F., 1974: Pavoučí fauna řepných polí v okolí Chválkovic a Nákla na Hané. (Spider fauna of sugar beet fields in the surroundings of Chválkovice and Náklo in Haná). *Acta Univerzity Palackého Olomouc*, Faculta rerum naturae Biologica, 15, Supplementum: 175–181. ISSN 0474-1110.

MILLER., F. 1971: Řád Pavouci – Araneida [Order Spiders – Araneida]. Pp. 51–306. In: DANIEL, M. & ČERNÝ, V. (eds.): *Klíč zvířeny ČSSR, díl IV.* [*Key to the fauna of Czechoslovakia IV*]. Praha: Československá akademie věd, 603 pp.

NÄHRIG D., HARMS K. H., (eds.), 2003: *Rote Listen und Checklisten der Spinnen in Baden-Württemberg.* Mannhaim: Landesanstalt für Umweltschutz Baden-Württemberg, 203 pp. ISBN 3-88251-281-4.

NENTWIG, W., BLICK, T., GLOOR, D., HÄNGGI, A., KROPF, CH., 2013: Spiders of Europe. Available online at: http://www.araneae.unibe.ch/ (cited on 4.vi.2013).

NIEDOBOVÁ, J., HULA, V., ŠŤASTNÁ, P., 2011: Spiders (Araneida) from the slopes of Macošská stráň and Vilémovická stráň (Moravský kras Protected Landscape Area, Czech Republic). *Acta Musei Moraviae, Scientiae biologicae (Brno)*, 96, 1: 1–27. ISSN 1211-8788.

OVTSHARENKO, V. I., PLATNICK, N. I., SONG, D. X., 1992: A review of the North Asian ground spiders of the genus *Gnaphosa* (Araneae, Gnaphosidae). *Bulletin of the American Museum of Natural History*, 212: 1–88. ISSN 0003-0090.

PLATEN, R., BLICK, T., BLISS, P., DROGLA, R., MALTEN, A., MARTENS, J., SACHER, P. & WUNDERLICH, J., 1995: Verzeichnis der Spinnentiere (excl. Acarida) Deutschlands (Arachnida: Araneida, Opilionida,

Pseudoscorpionida). *Arachnologische Mitteilungen*, Sonderband 1: 1–55.

PLATNICK, N. I., 2013: *The World Spider Catalog, Version 13.5*. American Museum of Natural History. Available online at: http://research.amnh.org/iz/spiders/catalog/INTRO1.html (cited on 30.v.2013).

POZZI, S. & HÄNGGI, A., 1998: Araignées nouvelle ou peu connues de la Suisse (Arachnida: Araneae). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 71: 33–47. ISSN 0036-7575.

RŮŽIČKA, V., 2005: Araneae (pavouci), p. 76–82. In: FARKAČ, J., KRÁL, D. & ŠKORPÍK, M. (eds.), 2005: *Červený seznam ohrožených druhů České republiky. Bezobratlí. (Red list of threatened species in the Czech Republic. Invertebrates)*. Praha: AOPK ČR, 760 pp. ISBN 80-86064-96-4.

RŮŽIČKA, V., BEZDĚČKA, P., 2000: Pavouci (Araneae) vátých písků u Bzence. (Spiders (Araneae) of sand dunes near Bzenec). *Sborník Přírodovědného klubu v Uherském Hradišti*. 2000(5): 208–213. ISBN 80-902213-9-4.

RŮŽIČKA, V., BUCHAR, J., 2008: Dodatek ke katalogu pavouků České republiky 2001–2007. (Supplement to the Catalogue of Spiders of the Czech Republic 2001–2007). *Sborník Oblastního muzea v Mostě, Řada přírodovědná* 29/30 (2007/2008): 3–32. ISSN 1214-2573.

ŘEZÁČ, M., 2004: Spiders and harvestmen (Arachnida: Araneae, Opiliones) on an abandoned ore-washery sedimentation basin near Chvaletice, pp. 311–323. In: Kovář P. (ed.), *Natural recovery of human-made deposits in landscape (biotic interactions and ore/ash-slag artificial ecosystems)*. Praha: Academia, 358 p. ISBN 8020012796.

ŘEZÁČ, M., ŘEZÁČOVÁ, V., PEKÁR, S., 2007: The distribution of purse-web *Atypus* spiders (Araneae: Mygalomorphae) in central Europe is constrained by microclimatic continentality and soil compactness. *Journal of Biogeography*, 34: 1016–1027. ISSN 1365-2699.

SIMON, E., 1878: *Les arachnides de France – IV: La familie des Drassidae*. Paris: Librairie encyclopédique de Roret, 334 pp.

STRAKOVÁ, M., SALAŠ, P., KOHUT, M., PEKAŘ, M., ŠEVČÍKOVÁ, M. & PELIKÁN, J., 2009: Modelový projekt zamezení biologické degradace půd v podmínkách aridního klimatu, s. 4–9. In: Salaš P. (ed.), *Trávníky 2009 – zeleň v suchých oblastech ČR*. Sborník semináře, Hodonín, 15.–16. 10. 2009, Hrdějovice: Agentura BONUS, 88 s. ISBN 978-80-86802-14-5.

SZITA, É., SAMU, F., SZINETÁR, C., DUDÁS, G., BOTOS, E., HORVÁTH, R., SZALKOVSZKI, O., 2006: New data on the occurrence of *Gnaphosa rufula* (L. Koch, 1866) and Gnaphosa mongolica Simon, 1895 in Hungary (Araneae: Gnaphosidae), 329–334. In: DELTSHEV, C., STOEV, P. (eds) 2006: *European Arachnology 2005*. *Acta Zoologica Bulgarica*, Suppl. 1: 1–343. ISSN 0324-0770.

SZINETÁR C., GÁL Z., EICHARDT J. 1998: Spiders in snail shells in different Hungarian habitats. *Miscellanea Zoologica Hungarica*, 12: 67–75. ISSN 0230-9017.

ŠEFROVÁ, H., LAŠTŮVKA, Z., 2011: Rovnokřídlí (Orthoptera) na experimentální ploše u Hodonína – bioindikace a rostlinolékařský význam. (Orthopetera of the experimental area near Hodnín – bioindication and plant protection importance). *Úroda – vědecká příloha*, 12: 37–42. ISSN 0139-6013.

TROPEK, R., 2012: Can periodically drained ponds have any potential for terrestrial arthropods conservation? A pilot survey of spiders. *Polish Journal of Ecology*, 60: 635–639. ISSN 1505-2249.

WEISS, I., ISTVAN, U., 2009: *Faunenliste der Spinnen Rumäniens – Checklist of the Romanian spiders (Arachnida: Araneae)*. Availabe online at: http://www.arachnologie.info/fauna.htm (cited on 26.ix.2013).

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