

Arachnofaunistical studies in Csákányospuszta and surroundings (Tatabánya, Komárom-Esztergom county, Hungary)

SZITA ÉVA¹, KOVÁCS PÉTER² & SZINETÁR CSABA³

¹Plant Protection Institute, Centre for Agricultural Research, Eötvös Loránd Reserch Network,
1022 Budapest Herman Ottó út 15., e-mail: szita.eva@atk.hu

²Szombathelyi Arachnológiai Műhely, 9700 Szombathely Károlyi Gáspár tér 4., e-mail: kovacs@locart.hu

³ELTE SEK Biológia Tanszék, 9700 Szombathely Károlyi Gáspár tér 4., e-mail: szcsaba.bdtf@gmail.com

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Abstract: Faunistical investigations of the 17th Biodiversity Days revealed the occurrence of 129 spider (Araneae) species in Csákányospuszta, northernmost part of Vértes Mountains, Hungary. Among the collected species there was 1 protected species (*Atypus piceus* (Sulzer, 1776)) and were several rare ones to the Hungarian fauna (*Collinsia inerrans* (O. P.-Cambridge, 1885), *Entelecara flavipes* (Blackwall, 1834), *Metopobactrus prominulus* (O. P.-Cambridge, 1872), *Zora parallela* Simon, 1878, *Lasaeola prona* (Menge, 1868), *Tmarus stellio* Simon, 1875).

Keywords: biodiversity days, spiders, Vértes Mountains, Duna-Ipoly National Park

Introduction

The 17th Biodiversity Days (BD17), a two-day intensive faunistic and floristic survey was conducted in Csákányospuszta, at the northernmost part of Vértes Mountains (Duna-Ipoly National Park, Hungary) in 2017.

Arachno-faunistical research has a long tradition in Hungary. At the end of the 19th century, Kornél Chyzer and Ladislaw Kulczynski performed a large-scale collecting from the pre-World War I territory of Hungary. Based on their study, the presence of 32 spider species was detected from Komárom-Esztergom county (CHYZER & KULCZYNSKI 1891, 1894, 1897). This list was updated by CHYZER (1909) with one species (*Eresus kollari* Rossi, 1846) and then by MIKHAILOV & SZINETÁR (1997) with two more species. So far, 35 species have been known from Komárom-Esztergom county from the following places: Esztergom (18 species), Felsőgalla (cave) (7 species), Hajagos-Turul-hegy, Gerecse (2 species), Peskő, Gerecse (1 species), Pilismarót (14 species), Tata (14 species). Two of these collecting places, Hajagos-Turul-hegy and Felsőgalla (cave), belong to the administrative territory of Tatabánya. These data were not added to the results of the BD17 spider checklist, but species overlapping with the previous county species list were marked in the current BD17 checklist.

Arachnological research has recently been carried out in two areas close to the southern border of Komárom-Esztergom county (EICHARDT et al. 2018, EICHARDT et al. 2020). In the future, it is worth considering these studies for the distribution of the species. Natural geographical boundaries are inherently more important than administrative (county) boundaries.

Material and methods

The 17th Biodiversity Days were held on June 9-11, 2017 in Csákányospuszta (Tatabánya), organised by the Hungarian Biodiversity Research Society. The designated core area comprises a variety of habitat types (Fig. 1, Table 1), and further extensions were also added to the study area, as a south-western dolomite rock grassland, Hosszú Hill near Szárliget, and two wetlands near Síkvölgypuszta (Tatabánya) and Vértessomló, as well as the northern part of Tatabánya with the Selim Cave belonging to Gerece (the latter is not shown in Fig. 1).

Several methods were used to explore the spider fauna: individual spider collecting, sweep net, limb beating, hand-held suction sampling (D-vac), and pitfall trap. The following colleagues took part in collecting of spiders: Előd Kondorósy, Csaba Kutasi, Péter Kovács, Tibor Kovács, János Novák, Csaba Szinetár, Éva Szita. The collecting methods and collector names used at each sampling area are shown in Table 1. Spiders were conserved in 70% ethanol, and adult individuals were identified by NENTWIG et al. (2021). The nomenclature of species and families follows the current version of the World Spider Catalog (2021).

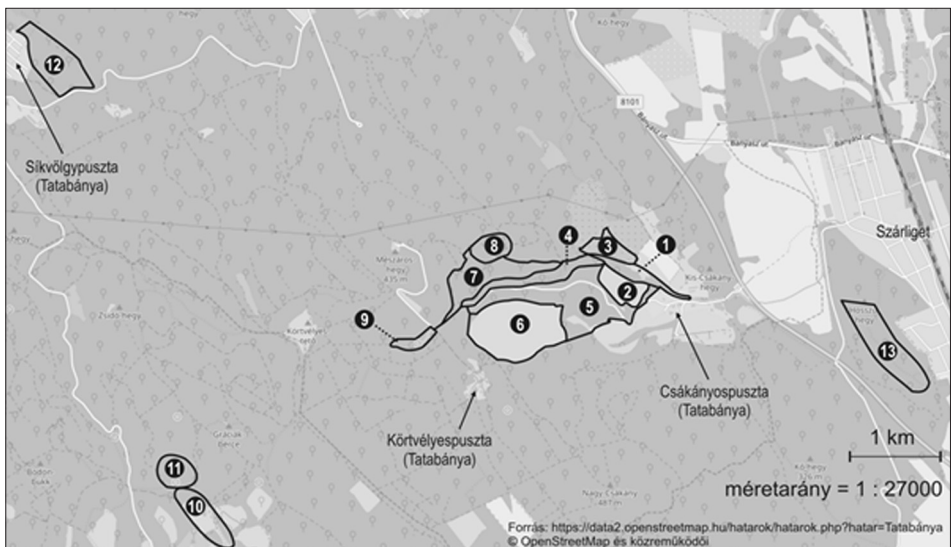


Fig. 1: Sampling sites in and around Csákányospuszta in the 17th Biodiversity Days
See the meaning of the numbers in Table 1.

Table 1: Data of sampling sites

Abbreviation of collector names: KE – Kondorosy, Előd; KCs – Kutasi, Csaba; KP – Kovács, Péter; KT – Kovács, Tibor; NJ – Novák, János; SzCs – Szinetár, Csaba; SzÉ – Szita, Éva

Nr.	Name of sampling site	Settlement	Habitat	Collecting methods	Collectors
1	Csákányospuszta walley	Tatabánya	Fresh meadow and willow-poplar forests	D-vac	SzÉ
2	Dry pasture	Tatabánya	Dry grassland	D-vac, sweep net, pitfall trap	KE, KCs, SzÉ
3	Orchard	Tatabánya	Abandoned orchard, with unmown grass layer	D-vac, sweep net, pitfall trap	KE, KCs, SzÉ
4	Mária canyon	Tatabánya	beech forest	individual collecting, pitfall trap	KCs, NJ, KP&SzCs
5	Lower fores	Tatabánya	Deciduous forest (<i>Quercus, Carpinus</i>)	D-vac	SzÉ
6	Upper pasture	Tatabánya	Shrubby grassland	D-vac, sweep net, pitfall trap	KE, KCs, SzÉ
7	Upper forest	Tatabánya	Deciduous forest (<i>Quercus, Carpinus, Fagus</i>)	individual collecting, pitfall trap	KT, KCs, SzÉ
8	Körtvélyes-hill	Tatabánya	Deciduous forest (<i>Quercus, Carpinus, Fagus</i>)	individual collecting, sweep net	KE, KP&SzCs, SzÉ
9	Béla-spring	Tatabánya	<i>Salix</i> grove	D-vac, limb beating, pitfall trap	KE, KT, KCs, SzÉ
10	Alder marsh	Vértessomló	<i>Alnus</i> swamp	D-vac	KE
11	Szép Ilonka well	Vértessomló	swamp meadow	pitfall trap	KCs
12	Síkvölgypuszta spring marsh	Tatabánya	<i>Alnus</i> swamp	pitfall trap	KCs
13	Hosszú-hill	Szárliget	dolomitic stone-steppe	sweep net	KE
14	Szelim-cave	Tatabánya	cave	individual collecting	KCs

Results and discussion

A total of 672 spider specimens (552 adult) were collected during the two collecting days of the BD17, belonging to 129 species of 26 spider families (Table 2). The most species-rich spider families proved to be: Linyphiidae (24 species), Theridiidae (17 species), Lycosidae (12 species), Thomisidae (12 species), Gnaphosidae (9 species). Information on the frequency of a species in Hungary and the naturalness of its habitat is provided for all species in Table 2.

Our results revealed the presence of one protected species (*Atypus piceus* (Sulzer, 1776)) and several rare species (*Collinsia inerrans* (OP-Cambridge, 1885), *Entelecara flavipes* (Blackwall, 1834), *Metopobactrus prominulus* (OP-Cambridge, 1872), *Zora parallela* Simon, 1878, *Lasaeola prona* (Menge, 1868), *Tmarus stellio* Simon, 1875). The species that are discussed separately below due to their rarity or protection were marked as underlined. Table 2 provides information on abundance of species and originality of their habitat, adapted to Hungary based on BUCAR & RŮŽIČKA (2002).

Csákányospuszta and its surroundings, chosen as the location for the 17th Biodiversity Days, have a fairly large habitat heterogeneity. This fact is well reflected in the number of spider species caught (129), which is the second most species-rich collection compared to previous years of Biodiversity Days (SZINETÁR et al. 2016). The vast majority of the species were detected in natural and semi-natural habitats. Species associated with artificial habitats were found in the guest house of Csákányospuszta (*Parasteatoda tepidariorum*) and in the Szelim Cave (*Tegenaria domestica*). 20 species of the species on our list overlap with the species previously detected from Komárom-Esztergom county, thus the occurrence of 155 spider species have been confirmed from the county currently.

Rare and protected species worth for attention

Atypus piceus (Sulzer, 1776)

This is the only protected species among the spiders detected. *A. piceus* occurs in a wide range of natural and semi-natural woody areas. Adult males switch to a vagabond lifestyle, thus these specimens are most in sight, or trapped in pitfall traps. Two male specimens were caught in pitfall traps at sampling site Nr. 2 (Dry pasture)

Collinsia inerrans (O. P.-Cambridge, 1885)

Palearctic species, typical for open grassy habitats. Expansion of its distribution area has been observed in the recent decades (NENTWIG et al. 2021), and its current data also supports this. Two female specimens were found at sampling site Nr. 2 (Dry pasture).

Entelecara flavipes (Blackwall, 1834)

Rare linyphiid spider with palaeartic distribution. Predominantly occurs in forests with low vegetation (NENTWIG et al. 2021).

Metopobactrus prominulus (O. P.-Cambridge, 1872)

A rare linyphiid spider with Holarctic distribution, living on the ground level. It was first reported in Hungary from the wetlands of Upper Tisza Region (LOKSA 1981). Further occurrence data are from Gyűrűfű, Transdanubia (KOVÁCS et al. 2009) and sand steppe of Kisalföld (SZINETÁR et al. 2015). In Csákányospuszta, four females were found at sampling site Nr. 3 (Orchard).

Zora parallela Simon, 1878

This extremely rare spider species is known from Europe and some parts of Asia. We have only one published data from Hungary so far. It was collected in Gyűrűfű (1st Hungarian Biodiversity Days) by motorised hand-held suction sampling (D-vac) in 2007 (KOVÁCS et al. 2009). In this study, 3 specimens were recorded in grassland habitats at sampling sites Nr. 2 (Dry pasture) and Nr. 6 (Upper pasture), respectively.

Lasaeola prona (Menge, 1868)

Rarely collected theridiid spiders with holarctic distribution. Species associated with sunny forest edges. It was first recorded in Hungary from Őrség (SZINETÁR 1995). It was recently collected in apple orchards in the Trans-Tisza region (MEZŐFI & MARKÓ 2018). In Csákányospuszta, a male specimen was found in shrubby grassland.

Tmarus stellio Simon, 1875

This crab spider species was recorded from Southern Europe to Japan. It is much rarer, than *Tmarus piger*, which is common in Hungary. Although it was already included in the monograph published at the beginning of the last century (CHYZER & KULCZYNSKI 1891), from Tokaj and Sátoraljaújhely, our knowledge is quite limited about this species. Like its relative, it lives on the branches of trees. A male specimen was collected at sampling site Nr 3 (Orchard).

Table 2. List of spiders collected in Csákányospuszta and surroundings

*Occurrence of a species in Komárom-Esztergom county was reported in previous literatures. Underlined species names are discussed separately in the text. Codes of study sites see in Table 1. Abbreviations. Abundance: R – rare, MF – moderately frequent, F – frequent; Originality of habitat: N – natural, SN – semi-natural, D – disturbed, A – artificial

Taxon (family and species name)	Sampling site code	Abundance	Originality of habitat
Agelenidae			
<i>Histopona torpida</i> (C. L. Koch, 1837)	4, 5, 6, 7, 11	MF	N, SN
<i>Inermocoelotes inermis</i> (L. Koch, 1855)	4, 6	MF	N, SN
* <i>Tegenaria domestica</i> (Clerck, 1757)	14	F	A
<i>Tegenaria ferruginea</i> (Panzer, 1804)	4	F	N, SN, A
<i>Tegenaria silvestris</i> L. Koch, 1872	5	F	N, SN
Amaurobiiidae			
* <i>Amaurobius ferox</i> (Walckenaer, 1830)	8	F	SN, D, A
Anyphaenidae			
<i>Anyphaena accentuata</i> (Walckenaer, 1802)	8, 9	F	N, SN
Araneidae			
<i>Araniella opisthographa</i> (Kulczynski, 1905)	3, 4, 8, 9	F	N, SN
<i>Hyposyinga pygmaea</i> (Sundevall, 1832)	10	MF	N, SN
<i>Hyposyinga sanguinea</i> (C. L. Koch, 1844)	2	MF	N, SN
<i>Mangora acalypha</i> (Walckenaer, 1802)	2, 3, 6, 8, 13	F	N, SN, D
<i>Zilla dioida</i> (Walckenaer, 1802)	8	F	N, SN
Atypidae			
<i>Atypus piceus</i> (Sulzer, 1776)	2	MF	N
Cheiracanthidae			
<i>Cheiracanthium elegans</i> Thorell, 1875	8	MF	N
Clubionidae			
<i>Clubiona diversa</i> O. P.-Cambridge, 1862	6	MF	N
<i>Clubiona neglecta</i> O. P.-Cambridge, 1862	2, 6	MF?	N, SN
<i>Clubiona terrestris</i> Westring, 1851	9	MF	N, SN
<i>Clubiona trivialis</i> C. L. Koch, 1843	2	MF	N, SN
Dictynidae			
<i>Argenna subnigra</i> (O. P.-Cambridge, 1861)	2, 6	MF	N, SN
<i>Brigittea latens</i> (Fabricius, 1775)	4, 6	MF	N, SN
<i>Dictyna arundinacea</i> (Linnaeus, 1758)	3	F	N, SN, D
* <i>Dictyna uncinata</i> Thorell, 1856	4	MF	N, SN, D
<i>Lathys humilis</i> (Blackwall, 1855)	2	MF	N, SN
<i>Nigma flavescens</i> (Walckenaer, 1830)	4, 5	MF	N, SN
Dysderidae			
* <i>Harpactea hombergi</i> (Scopoli, 1763)	4	MF	N, SN
<i>Harpactea rubicunda</i> (C. L. Koch, 1838)	4	F	N, SN, A
Gnaphosidae			
<i>Drassodes lapidosus</i> (Walckenaer, 1802)	7	F	N, SN
<i>Drassyllus praeficus</i> (L. Koch, 1866)	3	MF	N, SN
<i>Drassyllus pumilus</i> (C. L. Koch, 1839)	2, 7	MF	N
<i>Drassyllus villicus</i> (Thorell, 1875)	2	F	N
<i>Haplodrassus silvestris</i> (Blackwall, 1833)	7, 12	F	N, SN
<i>Micaria dives</i> (Lucas, 1846)	3	MF	N, (SN)
<i>Micaria formicaria</i> (Sundevall, 1832)	3	MF	N, SN
<i>Trachyzelotes pedestris</i> (C. L. Koch, 1837)	7	F	N, SN, (D)
<i>Zelotes subterraneus</i> (C. L. Koch, 1833)	11	F	N, SN, D

Table 2/2 continuation

Taxon (family and species name)	Sampling site code	Abundance	Originality of habitat
Hahniidae			
<i>Cicurina cicur</i> (Fabricius, 1793)	6	MF	N, SN, D
<i>Hahnia nava</i> (Blackwall, 1841)	2	F	N, SN
Linyphiidae			
<i>Agyneta affinis</i> (Kulczynski, 1898)	2, 6	R	N, SN
<i>Agyneta rurestris</i> (C. L. Koch, 1836)	6, 10	F	N, SN, D
<i>Agyneta simplicatarsis</i> (Simon, 1884)	2, 3	F	N, SN
<i>Bathyphantes nigrinus</i> (Westring, 1851)	9	F	N, SN
<i>Ceratinella brevipes</i> (Westring, 1851)	7	F	N, SN
<i>Collinsia inerrans</i> (O. P.-Cambridge, 1885)	2	R	N, SN (?)
<i>Diplostyla concolor</i> (Wider, 1834)	7, 8	F	N, SN, D
<i>Entelecara flavipes</i> (Blackwall, 1834)	6	R	N, SN
<i>Erigone dentipalpis</i> (Wider, 1834)	1, 3	F	N, SN, D
<i>Metopobactrus prominulus</i> (O. P.-Cambridge, 1872)	3	R	N, SN
<i>Micrargus herbigradus</i> (Blackwall, 1854)	2, 5	F	N, SN
<i>Minicia marginella</i> (Wider, 1834)	6	MF	N, SN
<i>Neriene clathrata</i> (Sundevall, 1830)	2, 3	F	N, SN
<i>Neriene furtiva</i> (O. P.-Cambridge, 1870)	3	R	N
<i>Neriene radiata</i> (Walckenaer, 1841)	4	F	N, SN
<i>Oedothorax agrestis</i> (Blackwall, 1853)	9	MF	N, SN
<i>Oedothorax apicatus</i> (Blackwall, 1850)	1, 3	F	N, SN, D
<i>Oedothorax fuscus</i> (Blackwall, 1834)	9	MF	N, SN, D
<i>Pocadicnemis pumila</i> (Blackwall, 1841)	6	F	N, SN
<i>Tenuiphantes flavipes</i> (Blackwall, 1854)	4, 5	F	N, SN
<i>Tenuiphantes tenuis</i> (Blackwall, 1852)	10	F	N, SN, D
<i>Trichoncus hackmani</i> Millidge, 1956	1, 2, 3, 13	R	N, SN
<i>Walckenaeri atrotibialis</i> (O. P.-Cambridge, 1878)	4, 11	MF	N, SN
Liocranidae			
<i>Agroeca brunnea</i> (Blackwall, 1833)	6, 9, 11	F	N, SN
Lycosidae			
<i>Alopecosa cuneata</i> (Clerck, 1757)	2	F	N, SN, D
<i>Alopecosa pulverulenta</i> (Clerck, 1757)	2	F	N, SN, D
<i>Alopecosa sulzeri</i> (Pavesi, 1873)	7	MF	N
<i>Aulonia albimana</i> (Walckenaer, 1805)	2, 6	F	N, SN, (D)
<i>Pardosa alacris</i> (C. L. Koch, 1833)	7, 9, 11, 12	F	N, SN
<i>Pardosa amentata</i> (Clerck, 1757)	9, 11	F	N, SN, D
<i>Pardosa bifasciata</i> (C. L. Koch, 1834)	3, 6	MF	N
* <i>Pardosa lugubris</i> (Walckenaer, 1802)	11	F	N, SN, D
<i>Pardosa riparia</i> (C. L. Koch, 1833)	2, 6, 7, 11	MF	N, SN
<i>Piratula hygrophila</i> (Thorell, 1872)	11, 12	F	N, SN
<i>Trochosa terricola</i> Thorell, 1856	1, 7, 11	F	N, SN, D
<i>Xerolycosa miniata</i> (C. L. Koch, 1834)	1	F	N, SN
Mimetidae			
* <i>Ero aphana</i> (Walckenaer, 1802)	2	F (MF)	N
Miturgidae			
<i>Zora parallela</i> Simon, 1878	2, 6	R	N, SN
<i>Zora pardalis</i> Simon, 1878	6	MF	(SN)
<i>Zora spinimana</i> Simon, 1878	2, 11	F	N, SN, D

Table 2/3 continuation

Taxon (family and species name)	Sampling site code	Abundance	Originality of habitat
Mysmenidae			
<i>Microdipoena jobi</i> (Kraus, 1967)	6	R, (MF)	N, SN
Oxyopidae			
<i>Oxyopes lineatus</i> Latreille, 1806	3	R, (MF)	N, SN
Philodromidae			
<i>Philodromus albidus</i> Kulczynski, 1911	9	(MF)?	N, SN, D
<i>Philodromus aureolus</i> (Clerck, 1757)	13	F	N, SN, D
<i>Thanatus arenarius</i> L. Koch, 1872	3	MF	N
<i>Tibellus oblongus</i> (Walckenaer, 1802)	6, 13	F	N, SN, D
Salticidae			
* <i>Ballus chalybeius</i> (Walckenaer, 1802)	6, 8, 9	MF	N, SN
<i>Euophrys frontalis</i> (Walckenaer, 1802)	6	F	N, SN
<i>Euophrys herbigrada</i> (Simon, 1871)	1	R	N
<i>Evarcha arcuata</i> (Clerck, 1757)	3, 6	F	N, SN
* <i>Evarcha falcata</i> (Clerck, 1757)	3, 13	F	N, SN
<i>Evarcha laetabunda</i> (C. L. Koch, 1846)	3, 8, 13	F	N
<i>Heliophanus auratus</i> C. L. Koch, 1835	2, 6	MF	N, SN
* <i>Heliophanus cupreus</i> (Walckenaer, 1802)	3, 8, 13	F	N, SN
<i>Heliophanus flavipes</i> (Hahn, 1832)	3, 13	F	N
* <i>Macaroeris nidicolens</i> (Walckenaer, 1802)	1, 8	MF	N, SN
* <i>Salticus zebraneus</i> (C. L. Koch, 1837)	13	MF	N, SN
Segestriidae			
<i>Segestria bavariaca</i> C. L. Koch, 1843	4	MF	N, SN
<i>Segestria senoculata</i> (Linnaeus, 1758)	4	MF	N, SN
Tetragnathidae			
<i>Metellina segmentata</i> (Clerck, 1757)	4	F	N, SN, D
* <i>Pachygnatha degeeri</i> Sundevall, 1830	2, 11, 12	F	N, SN, D
Theridiidae			
<i>Asagena phalerata</i> (Panzer, 1801)	7	F	N, SN
<i>Enoplognatha mordax</i> (Thorell, 1875)	6, 8	R	N
* <i>Enoplognatha ovata</i> (Clerck, 1757)	4, 9	F	N, SN, D
<i>Enoplognatha thoracica</i> (Hahn, 1833)	3	F	N, SN, D
<i>Episinus truncatus</i> Latreille, 1809	5	F	N, SN
<i>Heterotheridion nigrovariegatum</i> (Simon, 1873)	8	R	N, SN
<i>Lasaeola prona</i> (Menge, 1868)	6	R	N
<i>Laseola tristis</i> (Hahn, 1833)	4	R	N, SN
<i>Neottiura bimaculata</i> (Linnaeus, 1767)	3, 4, 6, 8, 13	F	N, SN, D
<i>Neottiura suaveolens</i> (Simon, 1879)	2, 6	MF	N, SN
* <i>Parasteatoda tepidariorum</i> (C. L. Koch, 1841)	7	F	A
<i>Phylloneta impressa</i> (L. Koch, 1881)	3, 6, 13	F	N, SN, D
* <i>Platnickina tincta</i> (Walckenaer, 1802)	2, 3, 6, 8, 13	F	N, SN
<i>Robertus arundineti</i> (O. P.-Cambridge, 1871)	5, 6, 8	F	N, SN, D
<i>Robertus lividus</i> (Blackwall, 1836)	4, 5, 8	F	N, SN
* <i>Steatoda bipunctata</i> (Linnaeus, 1758)	7	F	N, SN, A

Table 2/4 continuation

Taxon (family and species name)	Sampling site code	Abundance	Originality of habitat
<i>Theridion varians</i> Hahn, 1833	5	F	N, SN, A
Thomisiidae			
* <i>Ebrechtella tricuspadata</i> (Fabricius, 1775)	3, 4, 6, 13	F	N, SN
<i>Misumena vatia</i> (Clerck, 1757)	6, 9	F	N, SN
<i>Ozyptila claveata</i> (Walckenaer, 1837)	1	MF	N
* <i>Ozyptila praticola</i> (C. L. Koch, 1837)	4, 11	F	N, SN
<i>Ozyptila simplex</i> (O. P.-Cambridge, 1862)	13	MF	N, SN
* <i>Synema globosum</i> (Fabricius, 1775)	9	F	N, SN
<i>Synema ornatum</i> (Thorell, 1875)	6, 8		
* <i>Thomisus onustus</i> Walckenaer, 1806	2, 13	F	N, SN, D
<i>Tmarus stellio</i> Simon, 1875	3	R	N
<i>Xysticus erraticus</i> (Blackwall, 1834)	2	F	N, SN
<i>Xysticus kochi</i> Thorell, 1872	13	F	N, SN, D
<i>Xysticus luctator</i> L. Koch, 1870	7, 11	MF?	N, SN
Titanoecidae			
<i>Titanoeca schineri</i> L. Koch, 1872	3, 7	F	N, SN
Uloboridae			
<i>Uloborus walckenaerius</i> Latreille, 1806	3, 13	MF	N

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