Spiders (Arachnida: Araneae) in dry grasslands of South Ukraine: a case study of Yelanetskyi Steppe Natural Reserve

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Abstract. Dry grassland areas of Ukraine are highly fragmented due to human activity. All of them require protection and thorough study of their biota. Arachnological research in the Yelanetskyi Steppe Natural Reserve has been conducted for the first time. An annotated list of spiders includes 113 species in 23 families. Salticidae (20 species, 17.7% of the species list) and Gnaphosidae (18 species, 15.9%) are the most species rich. The studied reserve is the westernmost locality of *Ero koreana* Paik, 1967 and *Zelotes eugenei* Kovblyuk, 2009. Richest were the ecotone habitats on the edges of forest plantations and shrub thickets (43–45 species), while the poorest were the most disturbed open grassland habitats like grazed steppe, secondary steppe and meadows (25–26 species). Spider assemblages of the undisturbed forb-fescue-feather grass and petrophytic steppe habitats accounted for 33–37 species. A comparison of the dry grassland spider faunas of 11 protected areas in the steppe and forest-steppe zones of Ukraine showed that the araneofauna of the Yelanetskyi Steppe is most similar to those of both forb-fescue-feather grass steppes of Southeast Ukraine and fescue-feather grass steppes of South Ukraine. Moreover, the spider fauna of the Yelanetskyi Steppe contains the least specific elements. 33% of the species are widespread and only 3.8% are recorded from one or only two close sites. Similarity of the spider faunas depends on the geographical location of the study area and on the types of the grasslands.

Keywords: European fauna, conservation areas, steppe ecosystems

Zusammenfassung. Spinnen (Arachnida: Araneae) auf Trockenrasen in der südlichen Ukraine: eine Untersuchung im Naturschutzgebiet Yelanetskyi Steppe. Die Trockenrasen der Ukraine sind aufgrund menschlicher Einflüsse stark fragmentiert. Alle sind schützenswert und sollten gründlich untersucht werden. Im Naturschutzgebiet Yelanetskyi Steppe wurden erstmals arachnologische Erfassungen durchgeführt. Die kommentierte Artenliste der Spinnen umfasst 113 Arten aus 23 Familien. Die Salticidae (20 Arten, 17,7 % der Artensumme) und die Gnaphosidae (18 Arten, 15,9 %) waren am artenreichsten. Im Reservat sind die westlichsten bekannten Vorkommen von *Ero koreana* Paik, 1967 und *Zelotes eugenei* Kovblyuk, 2009. Die artenreichsten Lebensräume sind Ökotone am Rand von Forsten und Gebüschen (43–45 Arten), hingegen waren stark gestörte offene Grünlandlebensräume wie Weidesteppen, Sekundärsteppen und Wiesen am artenärmsten (25–26 Arten). Die Spinnenfauna ungestörter Federgras- und Felssteppen enthielt 33–37 Arten. Ein Vergleich der Spinnenfauna der Trockenrasen von 11 Schutzgebieten in den Steppen- und Waldsteppengebieten der Ukraine ergab, dass die Spinnenfauna der Yelanetskyi-Steppe den Federgrassteppentypen der Südost- und Südukraine am ähnlichsten ist. Zudem enthält die Spinnenfauna der Yelanetskyi Steppe die wenigsten typischen Elemente. 33 % der Arten sind weit verbreitet und nur 3,8 % wurden an einem oder zwei benachbarten Standorten erfasst. Das Maß der Ähnlichkeiten der Spinnenfaunen ist abhängig von der geografischen Lage des Untersuchungsgebiets und von den Graslandtypen.

Dry grasslands are among the most endangered biomes in the world. They have declined dramatically in Europe, but remain better preserved in Asia (Werger & Staalduinen 2012). Nevertheless, the threats and conservation challenges are similar throughout the continent: total ploughing, overgrazing or abandonment, partial afforestation and agricultural intensification (Werger & Staalduinen 2012, Zhang et al. 2017, Török et al. 2018). All preserved steppe areas have outstanding conservation importance. In Ukraine, the steppes are protected in two Biosphere Reserves, 11 Natural Reserves, 15 National Parks and over 20 Regional Parks. However, this is a very small area since the Ukrainian grasslands have been converted into arable lands and, based on different estimates, only 1% to 3% of the prehistoric natural steppes have been preserved until the present day (Vasyliuk & Skorobogatov 2019).

Botanical research in Ukrainian dry grasslands has a long history of investigations and surveys (Bilyk 1973, Tkachenko 2004, Korotchenko & Perygrym 2012, Vynokurov & Kuzemko 2018) while numerous arthropod studies are mostly scattered (Shtirts & Yaroshenko 2003, Martynov 2008, Pushkar 2009, Putchkov & Nitochko 2016, Demyanenko et al. 2018). Spiders have also been studied unevenly. In Left-Bank Ukraine (a territory stretching from the left bank of the Dnieper River to the state border), all the Nature Reserves and most of the National Parks have been investigated and the results have been summarized (Polchaninova & Prokopenko 2013, 2017). Presently, an updated list of the dry grassland spiders includes over 370 species (Polchaninova et al. 2021). The Crimean protected areas are also well studied, but spiders of steppe habitats have not been surveyed (Kovblyuk et al. 2015). In the steppes of Right-Bank Ukraine, only one National Park has been thoroughly investigated (Polchaninova et al. 2017).

The present article is part of a series of works on the spiders of Ukrainian steppe reserves, which form a database for the further analysis of the spider distribution and assemblage structure in the dry grasslands of Ukraine. The paper presents the first arachnological research in the Yelanetskyi Steppe Natural Reserve and aims at compiling an annotated species list of spiders and comparing it with those of other well-studied protected areas within the steppe zone of Ukraine.

Material and methods

Study site

The Yelanetskyi Steppe is located on the southwest margin of the Ukrainian Crystalline Shield in the south of the forb-fescue-feather grass belt of the Pontic Steppe Province (terminology after Barbarych 1977: Fig. 1). The reserve encompasses a large deep, branched gully with granite outcrops at the bottom and limestone outcrops on the slopes. Previously, this territory was used for intensive sheep grazing. The flat interfluve was ploughed; two plots of 100 m^2 were planted with shrubs (*Crataegus laevigata* (Poir.) DC., *Ribes aureum* Pursh,

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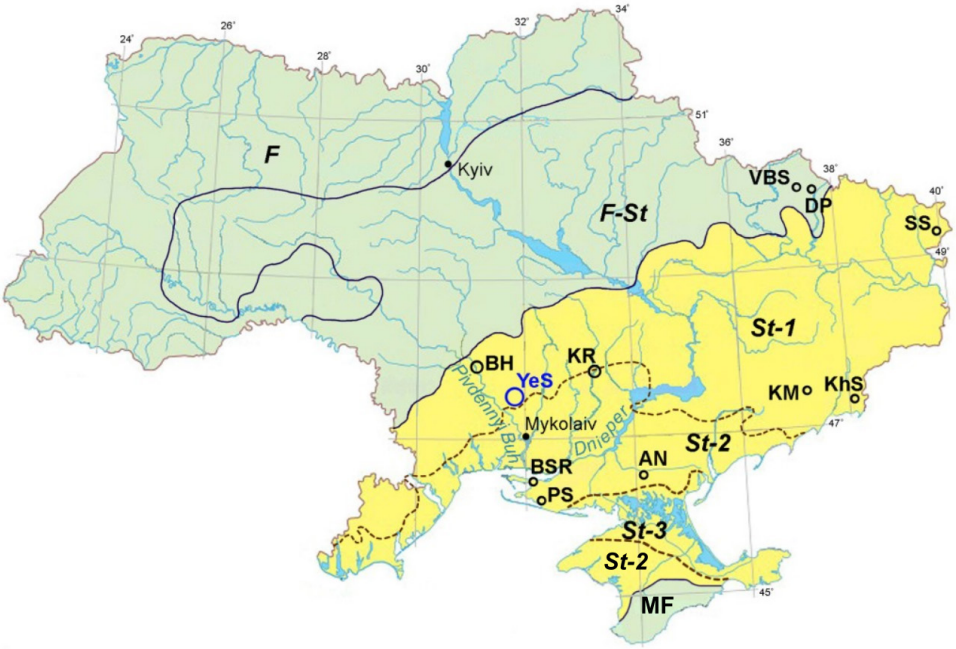

Fig. 1: Location of the Yelanetskyi Steppe Natural Reserve and compared protected areas in the forest-steppe and steppe regions of Ukraine; AN – Askania-Nova, BH – Buzkyi Hard, BSR – Black Sea Reserve, DP – Dvorichanskyi Park, KhS – Khomutivskyi Steppe, KM – Kamyani Mohyly, KR – Kryvyi Rih, PS – Potiivskyi segment of the Black Sea Reserve, SS – Striltsivskyi Steppe, VBS – Velykoburlutskyi Steppe, YeS – Yelanetskyi Steppe. Solid line – borders of the geobotanical regions: F – broadleaved forests, MF – Mediterranean forests, F-St – forest-steppe, St – steppe; dash line – borders of the steppe belts: St-1 – forb-fescue-feather grass steppes, St-2 – fescue-feather grass steppes, St-3 – sagebrush-grasses steppes. After Barbarych (1977)

Rosa spp.), pine trees (*Pinus nigra* subsp. *pallasiana* (Lamb.) Homboe) and black locust (*Robinia pseudoacacia* L.).

A strict conservation regime was established in 1996 across an area of 1657.7 ha. The main goal of creating the reserve was to monitor natural recovery of the steppe biota and to maintain biodiversity of the South Ukrainian steppes. Presently, forb-fescue-feather grass steppes cover gentle slopes, a specific petrophytic vegetation is patchily spread on the limestone outcrops, and meadow steppes occupy the gully bottoms (Fig. 2). The plots on the flat interfluves are recovering after ploughing; they form fallows at different stages of succession, partly overgrown with shrubs (Konaikova 2019). A pond and the pine and black locust plantations are also parts of the reserve.

In 2016, the reserve was enlarged to 3010.65 ha due to the adjoining of a new steppe gully, named the Mykhailivskyi Steppe. This had long been used for cattle grazing. There are two small forest plantations and scattered shrubs of *Crataegus laevigata*, *Rosa* spp., *Cotinus coggygria* Scop. and *Elaeagnus commutata* Bernh. ex Rydb. on the slopes. The latter forms hedges along old ditches (Fig. 3). The main vegetation cover is also a forb-fescue-feather grass steppe on the slopes with patches of petrophytic steppes on limestone soils. Moderate cattle grazing is maintained in an area of 300 ha. A dirt road and more intensive grazing destroyed meadow vegetation at the gully bottom.

Both segments of the reserve are located in the Mykolaiv Region, in Yelanets and Nova Odesa districts. Coordinates of the centre of the Yelanetskyi segment are 47.5578°N, 32.0269°E, 57 m a.s.l. and of the Mykhailivskyi segment 47.4094°N, 31.6186°E, 26 m a.s.l.

Fig. 2: Landscape view of the Yelanetskyi segment of the Yelanetskyi Steppe Reserve. July 2016

Fig. 3: Landscape view of the Mykhailivskyi segment of the Yelanetskyi Steppe Reserve. July 2016

Spider collection

Arachnological research in the Yelanetskyi Steppe was conducted in May–July 2016 and May–June, August and September 2017. The Yelanetskyi segment (further in the text YeS) was investigated in both years, the Mykhailivskyi segment (MyS) only in 2017. Habitat classification was adopted from Kuzemko et al. (2018). Within the main habitats, I chose several plots depending on the topography and vegetation characteristics. Plant associations, if available, are given after Konaikova (2019).

Spiders were collected by hand, by pitfall trapping and sweep netting. In each study plot, I set up eight traps (plastic caps of 6.5 cm diameter) at a 10 m distance; 4% formalin was used for preservation. In total, 1239 individuals of adult spiders were collected.

The sampled habitats and plots were as follows:

True forb-fescue-feather grass and fescue-feather grass steppes of the steppe zone

St1 = virgin steppe on the tops of slopes, ass. Stipo lessingianae-Salvietum nutantis Vynokurov 2014, both YeS 47.5631°N, 32.0261°E and MyS 47.3897°N, 31.6311°E; in MyS, the plot is periodically grazed.

St2 = secondary steppe on an abandoned field on the flat interfluves, ass. Potentillo arenariae-Stipetum capillatae (Hueck 1931) Krausch 1961, YeS, 47.5500°N, 32.0303°E

St3 = virgin steppe on the middle of a north-facing slope, ass. Salvio nemorosae-Festucetum valesiacae Korotchenko & Didukh 1997 var. Botriochloetum ischaemii, YeS, 47.5633°N, 32.0261°E

St4 = virgin steppe on the middle of a south-facing slope, ass. Vinco herbaceae-Caraganetum fruticis Korotchenko & Didukh 1997, YeS, 47.5625°N, 32.0225°E

Petrophytic steppes on carbonate substrata in the Pontic Region

Lst1 = top and middle parts of limestone slopes, ass. Lino tenuifolii-Jurineetum brachycephalae Krasova & Smetana 1999, YeS, 47.5669°N 32.0194°E

Lst2 = bottom parts of limestone slopes, same association, both YeS, 47.5528°N, 32.03°E and MyS, 47.3978°N, 31.6244°E

Meadow steppes on chernozem

Mt1 = annually mowed meadow steppe at the gully bottom, YeS, 47.5439°N, 32.0322°E

Mesic hay meadows

Md2 = annually mowed secondary mesic meadow at the gully bottom previously transformed by earthworks, YeS, 47.5625°N, 32.0214°E

Anthropogenic forests

FPl = forest plantation: rows of pines and shrubs with steppe vegetation between them, YeS, 47.5667°N, 32.0203°E

Riparian habitats

BP = bank of a pond with arboreal and herbaceous riparian vegetation, YeS, 47.5661°N, 32.0142°E

Ecotone habitats

Sl = edges of high shrub thickets/natural tree groves bordering the steppe on the lower parts of various slopes. Both YeS, 47.5447°N, 32.0153°E and MyS, 47.3903°N, 31.6267°E

Synanthropic habitats

OB = outbuildings, YeS, 47.5675°N, 32.0119°E.

Data analysis

Spiders were identified using Nentwig et al. (2021); for the identification of some rare species I used Kovblyuk & Tuneva (2009), Ponomarev et al. (2017) and Zamani et al. (2019). Spider taxonomy follows the WSC (2021). The material is arranged in a table that sums up the number of males/females collected in each reserve segment (Tab. 1). An annotated checklist is given in the Appendix. This is provided with a segment name (**MyS** – Mykhailivskyi, **YeS** – Yelanetskyi), habitat code (see above), number of males/females, and collecting date(s). I mention several juvenile individuals, if adults from a certain reserve segment/habitat were absent in the samples.

A comparison of the dominance structure of spider assemblages of the two reserve's segments was made based on the May–Jun. 2017 pitfall trapping, when the material was collected simultaneously in the same types of habitats (forb-fescue-feather grass and petrophytic steppes, edges of shrub thickets and natural tree groves). Species accounting for 5–10% of the total number of adult individuals were regarded as subdominant, 10.1–20% as dominant, and more than 20% as eudominant. They formed a dominant complex.

The spider fauna of the Yelanetskyi Steppe was compared to the faunas of ten other protected areas in the Steppe and Forest-Steppe Provinces of Ukraine (Fig. 1): National Park Buzkyi Hard (BH, Mykolaiv Region); vicinity of the Town of Kryvyi Rih (KR, Dnipropetrovska Region); Black Sea State Biosphere Reserve (BSR, the segments Ivano-Rybalchanskyi and Solenoozernyi, Kherson Region); the Potiivskyi segment of the same Reserve (PS, Kherson Region); Biosphere Reserve Askania-Nova (AN, Kherson Region); the Kamyani Mohyly (KM) and the Khomutivskyi Steppe (KhS) departments of the Ukrainian Steppe Natural Reserve (Donetsk Region); Regional Landscape Park Velykoburlutskyi Steppe (VBS, Kharkiv Region); National Park Dvorichanskyi (DP, Kharkiv Region), and the Striltsivskyi Steppe (SS) department of the Luhansk Natural Reserve (Luhansk Region). The data on spider faunas of the aforementioned protected areas were compiled in Polchaninova & Prokopenko (2013, 2017), Polchaninova et al. (2017, 2021) and Polchaninova (2012, 2019). The investigations were conducted during two or three years at each site by the standard collecting methods (pitfall trapping, sweep netting and hand sampling) that provide comparable material for faunistic analysis.

Only dry grassland habitats of these protected areas were analysed. Their classification is traditionally based on both climatic and edaphic factors (Vynokurov & Kuzemko 2018). The zonal habitats that are predominately shaped by climate occupy flat interfluves and slopes of different landforms in the appropriate zone/subzone: meadow steppes in the forest-steppe zone, true forb-fescue-feather grass, fescue-feather grass and desert steppes in the steppe subzones of the same names. In the neighbouring zones and subzones, these habitats are located on slopes/elevations or in depressions and form an extrarazonal group of habitats. The azonal edaphic-derived habitats are divided into two main groups – psammophytic and petrophytic; the latter is formed on siliceous (granite, slate) and/or calcareous (chalk, limestone) substrata under microclimatic conditions of insufficient humidity. In the particular areas, the studied dry grassland habitats are distributed as follows:

- meadow steppes – BH, DP, KhS, KM, KR, SS, VBS, YeS
- forb-fescue-feather grass steppes – DP, SS, VBS (mesic, rich in forbs), BH, KhS, KM, KR, YeS (dry, poor in forbs)
- fescue-feather grass steppe – AN
- psammophytic steppes – BSR (typical, not saline), PT (coastal with low salinity)
- petrophytic steppes – BH, KM (granite); KR (slate); DP, SS (chalky); KhS, KR, YeS (limestone)
- Steppe shrub habitats are imbedded in the grasslands of various types. They were investigated in BH, DP, KhS, KM, KR, SS, VBS and YeS.

Comparison of the spider faunas was performed in the program PAST (Hammer et al. 2001) by means of non-metric Multidimensional Scaling (NMDS) based on the Jaccard similarity index. A 2-dimentional model was used due to the low stress value (0.16). Then I chose the sites closest to the Yelanetskyi Steppe in terms of spider species composition and types of habitats – Kryvyi Rih and the Khomutivskyi Steppe – and compared the araneofaunas of the forb-fescue-feather grass and petrophytic (limestone) steppes, which are the main steppe types in this study.

Tab. 1: Spider species composition and the number of individuals collected in Yelanetskyi Steppe Natural Reserve in 2016/2017. YeS = Yelanetskyi segment, MyS = Mykhailivskyi segment

Family/species	Reserve segment	
	YeS (♂♂/♀♀)	MyS (♂♂/♀♀)
Agelenidae		
Allagelena gracilens C. L. Koch, 1841	0/2	0/2
Eratigena agrestis (Walckenaer, 1802)	0/3	
Araneidae		
Aculepeira armida (Audouin, 1826)	0/1	
Agalenatea redii (Scopoli, 1763)	0/4	0/4
Araneus diadematus Clerck, 1757	0/1	
Araneus quadratus Clerck, 1757	0/2	
Argiope bruennichi (Scopoli, 1772)	1/12	3/5
Argiope lobata (Pallas, 1772)	0/1	0/1
Cyclosa oculata (Walckenaer, 1802)	6/8	0/3
Mangora acalypha (Walckenaer, 1802)	9/41	0/11
Neoscona adianta (Walckenaer, 1802)	7/30	2/6
Atypidae		
Atypus muralis Bertkau, 1890	4/0	
Cheiracanthiidae		
Cheiracanthium pennyi O. Pickard-Cambridge, 1873	12/11	1/2
Cheiracanthium. punctorium (Villers, 1789)	1/4	0/1
Cheiracanthium virescens (Sundevall, 1833)		0/1
Clubionidae		
Clubiona pseudoneglecta Wunderlich, 1994		1/0
Dictynidae		
Altella hungarica Loksa, 1981	0/1	
Argenna subnigra (O. Pickard-Cambridge, 1861)		1/0
Briggitea latens (Fabricus, 1775)	1/3	0/2
Lathys stigmatisata (Menge, 1869)		1/0
Eresidae		
Eresus kollari Rossi, 1846	4/0	
Gnaphosidae		
Aphanthaulax trifasciata (O. Pickard-Cambridge, 1872)		0/1
Berlandina cinerea (Menge, 1872)	8/3	1/0
Civizelotes caucasius (L. Koch, 1866)	5/1	1/0
Drassodes lapidosus (Walckenaer, 1802)	4/3	2/3
Drassyllus praeficus (L. Koch, 1866)	5/6	3/2
Drassyllus pumilus (C. L. Koch, 1839)	4/2	
Gnaphosa lucifuga (Walckenaer, 1802)	0/1	0/3
Gnaphosa opaca Herman, 1879	79/26	
Haplodrassus bohemicus Miller & Buchar, 1977	2/2	16/9
Haplodrassus dalmatensis (L. Koch, 1866)	1/2	1/0
Haplodrassus kulczynskii Lohmander, 1942	5/8	
Haplodrassus signifer (C. L. Koch, 1839)	14/3	
Marinarozelotes malkini Platnick & Murphy, 1984	1/1	
Nomisia aussereri (L. Koch, 1872)	0/2	0/1
Zelotes electus (C. L. Koch, 1839)	4/2	1/0
Zelotes eugenei Kovblyuk, 2009	0/1	
Zelotes longipes (L. Koch, 1866)	0/2	0/2
Zelotes segrex (Simon, 1878)	3/1	1/0
Linyphiidae		
Agyneta rurestris (C. L. Koch, 1836)	2/1	
Linyphia tenuipalpis Simon, 1884	0/7	0/5
Linyphia triangularis (Clerck, 1757)	0/3	
Microlinyphia pusilla (Sundevall, 1830)		0/1
Stemonyphantes lineatus (Linnaeus, 1758)	1/0	
Liocranidae		
Agroeca cuprea Menge, 1873	0/7	
Lycosidae		
Alopecosa cursor (Hahn, 1831)	71/17	7/3
Alopecosa farinosa (Herman, 1879)	0/29	0/24
Alopecosa kovblyuki Nadolny & Ponomarev, 2012	0/5	0/1
Alopecosa pulverulenta (Clerck, 1757)	20/14	2/2
Alopecosa schmidti (Hahn, 1835)	0/2	0/1
Alopecosa solitaria (Herman, 1879)	0/1	
Alopecosa sulzeri (Pavesi, 1873)	1/0	
Alopecosa taeniopus (Kulczyński, 1895)	0/1	
Geolycosa vultuosa (C. L. Koch, 1838)	0/1	
Pardosa lugubris (Walckenaer, 1802)		1/1
Trochosa robusta (Simon, 1876)	16/7	1/1
Xerolycosa miniata (C. L. Koch, 1834)	1/0	1/0
Mimetidae		
Ero koreana Paik, 1967	0/1	
Miturgidae		
Zora pardalis Simon, 1878	1/1	
Oxyopidae		
Oxyopes heterophthalmus (Latreille, 1804)	17/17	5/7
Oxyopes lineatus Latreille, 1806	12/21	7/8
Philodromidae		
Philodromus cespitum (Walckenaer, 1802)	2/3	0/1
Rhysodromus histrio (Latreille, 1819)		0/1
Thanatus arenarius L. Koch, 1872	25/0	25/0
Tibellus macellus Simon, 1875	0/5	0/2
Tibellus oblongus (Walckenaer, 1802)	4/12	1/1
Pholcidae		
Pholcus ponticus Thorell, 1875	0/1	

Family/species	Reserve segment	
	YeS (♂♂/♀♀)	MyS (♂♂/♀♀)
Pisauridae		
Pisaura mirabilis (Clerck, 1757)	0/1	0/2
Pisaura novicia (L. Koch, 1878)	0/3	
Salticidae		
Aelurillus laniger Logunov & Marusik, 2000	1/3	
Aelurillus v-insignitus (Clerck, 1757)	2/3	
Attulus penicillatus (Simon, 1875)	4/2	0/3
Euophrys frontalis (Walckenaer, 1802)	3/1	
Evarcha arcuata (Clerck, 1757)	0/1	
Evarcha michailovi Logunov, 1992		0/1
Heliophanus auratus C. L. Koch, 1835	0/2	
Heliophanus cupreus (Walckenaer, 1802)	0/9	0/1
Heliophanus flavipes (Hahn, 1832)	8/26	2/2
Macaroeris flavicomis (Simon, 1884)	2/0	
Pellenes nigrociliatus (Simon, 1875)	0/2	
Philaeus chrysops (Poda, 1761)	0/2	0/3
Phlegra fasciata (Hahn, 1826)	0/1	
Pseudomogrus vittatus (Thorell, 1875)	1/0	
Pseudeuophrys erratica (Walckenaer, 1826)		0/1
Synageles hilarulus (C. L. Koch, 1846)	0/2	
Synageles subcingulatus (Simon, 1878)	0/1	
Synageles venator (Lucas, 1836)	0/1	
Talavera aequipes (O. Pickard-Cambridge, 1871)	1/0	
Talavera aperta (Miller, 1971)	0/1	
Tetragnathidae		
Tetragnatha montana Simon, 1874	0/2	
Theridiidae		
Enoplognatha thoracica (Hahn, 1833)	1/0	
Euryopis saukea Levi, 1951	2/0	
Heteroteridion nigrovariegatum (Simon, 1873)	1/0	
Phylloneta impressa (L. Koch, 1881)	1/3	1/2
Simitidion simile (C. L. Koch, 1836)	4/8	0/2
Thomisidae		
Ebrechtella tricuspidata (Fabricius, 1775)	1/3	
Heriaeus oblongus Simon, 1918	14/3	1/0
Misumena vatia (Clerck, 1757)	0/3	0/3
Ozyptila atomaria (Panzer, 1801)	0/2	
Ozyptila pullata (Thorell, 1875)	2/2	
Ozyptila scabricula (Westring, 1851)	2/3	
Runcinia grammica (Westring, 1851)	12/15	4/6
Spiracme striatipes (L. Koch, 1870)	2/15	1/8
Thomisus onustus Walckenaer, 1805	16/30	4/5
Xysticus acerbus Thorell, 1872	0/3	
Xysticus cristatus (Clerck, 1757)	0/5	
Xysticus kochi Thorell, 1872	6/10	1/3
Xysticus laetus Thorell, 1875	0/3	
Xysticus marmoratus Thorell, 1875	0/3	
Titanoecidae		
Titanoeca schineri L. Koch, 1872	3/0	3/1
Titanoeca veteranica Herman, 1879	6/0	
Uloboridae		
Uloborus walckenaerius Latreille, 1806	0/2	0/4
Zodariidae		
Zodarion thoni Nosek, 1905	9/1	0/1
Total number of species	**102**	**62**
Total number of individuals	**979**	**269**

Results

A total of 113 spider species in 23 families was collected in the two reserve's segments: 102 species in YeS and 62 species in MyS. The most species-rich families are ranged as follows: Salticidae (20 species, 17.7% of the total number of species), Gnaphosidae (18 species, 15.9%), Thomisidae (14 species, 12.4%), Lycosidae (11 species, 9.7%) and Araneidae (9 species, 8.0%). Of these, only the Lycosidae is represented almost equally in both segments (YeS – 10 species and MyS – 9), while the Salticidae shows the highest difference (19 and 7 species in YeS and MyS, respectively).

Some species were collected from one segment only. *Gnaphosa opaca,* the most numerous ground-dwelling spider in YeS, was absent from MyS. Five common species (*Haplodrassus kulczynskii, H. signifer, Agroeca cuprea, Aelurillus v-insignitus* and *Titanoeca veteranica*) occurred only in YeS while no species inhabited MyS solely. Other species recorded from one segment were found as singletons, which makes it impossible to draw further conclusions on their distribution within the reserve's segments.

Dominance structure of the ground-dwelling spider assemblages in the same habitat types (forb-fescue-feather grass and petrophytic steppes, edges of shrub thickets/groves) differed considerably between YeS and MyS; no species had the same dominant rank in both segments (Tab. 2). The only species that was similarly represented was *Alopecosa pulverulenta*. In MyS, there were three eudominants with almost equal ratio (20–21%) and one subdominant. In YeS, the dominant complex consisted of one eudominant (32.4%), one dominant (18.6%) and two subdominants (5.5%).

The spider assemblages of the ecotone habitats (edges of shrub thickets, tree grooves and plantations) were the richest (72 species in total); they accounted for 43–45 species in YeS (FPl) and MyS (Sl), but were poorer on the slopes in YeS (35 species). In the open grasslands of YeS, the number of species varied from 25–26 in the secondary steppe (St2) and meadow (Md2) to 36–37 in the petrophytic steppe on the top of the slope (Lst1), forb-fescue-feather grass steppe on the northern slope (St3) and meadow steppe at the gully bottom (Md1). In MyS, it was higher on the bottom of the limestone slope (33 species) but lower in the periodically grazed steppe on the top of the slope (25 species). In total, the forb-fescue-feather grass and petrophytic steppes hosted 63 spider species each.

A total of 353 spider species were recorded from the dry grasslands of eleven compared protected areas. Of these, 34 species (9.6%) occurred at all the sites or were absent from one of them. On the contrary, 151 species (42.8%) inhabited one or two sites only. The araneofauna of the Yelanetskyi Steppe was least specific – four local species, 3.8% of the reserve's fauna. The most specific in terms of spider species composition were the areas with granitic rocks: Kamyani Mohyly (47 local species, 23.8%) and Buzkyi Hard (32 species, 20.1%).

The species richness in the forb-fescue-feather grass and petrophytic steppes was equal in the Yelanetskyi Steppe (63 species in both), but increased in favour of the former habitat in Kryvyi Rih (69/50) and the Khomutivskyi Steppe (87/61). At the compared sites, only *Nomisia aussereri* showed stable preference to the petrophytic steppe and *Heliophanus cupreus*, *Misumena vatia* and *Ozyptila scabricula* to the forb-fescue-feather grass one.

Tab. 2: Dominance (%) of the ground-dwelling spiders in the Yelanetskyi Steppe (May/Jun. 2017), the seven most abundant species

Species	Reserve segment	
	Yelanetskyi	Mykhailivskyi
Gnaphosa opaca	18.6	0
Haplodrassus bohemicus	0	21.0
Alopecosa cursor	32.4	8.4
A. pulverulenta	5.5	3.4
A. farinosa	0	20.2
Thanatus arenarius	2.1	21.0
Zodarion thoni	5.5	0.9
Others	38.0	29.4
Total number of individuals	**145**	**140**
Total number of species	**32**	**27**

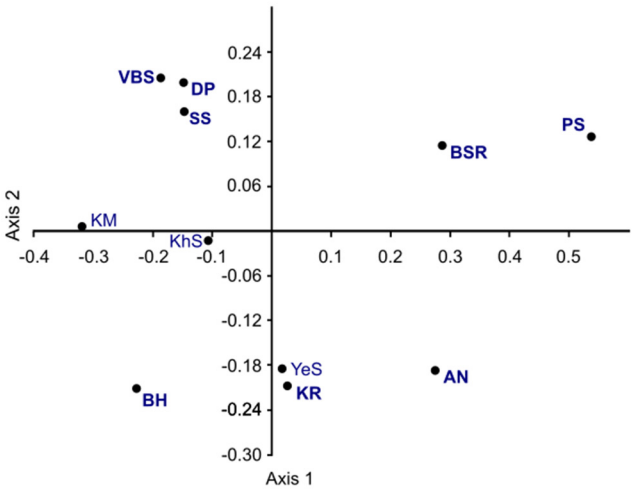

Fig. 4: Comparison of the spider species composition of dry grassland habitats of eleven protected areas of Ukraine. Jaccard similarity index, non-metric multidimensional scaling (NMDS), stress = 0.16. For abbreviations, see Fig. 1

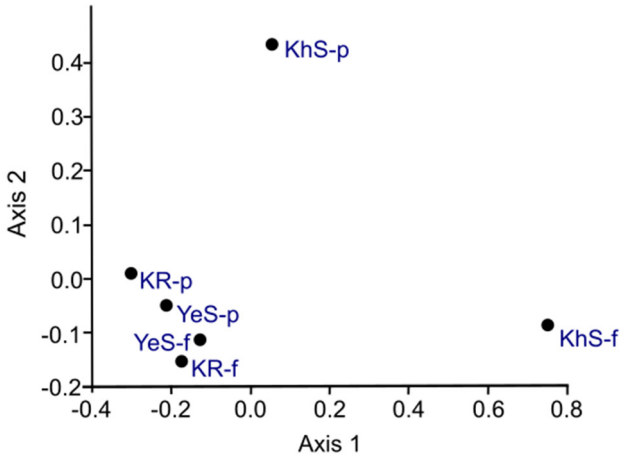

Fig. 5: Comparison of the spider species composition of the forb-fescue-feather grass (f) and petrophytic (p) steppes of the Yelanetskyi Steppe, Khomutivskyi Steppe and Kryvyi Rih vicinity. Jaccard similarity index, non-metric multidimensional scaling (NMDS), stress = 0.028. For abbreviations, see Fig. 1

At the MDS ordination of compared steppe areas, the Yelanetskyi Steppe and Kryvyi Rih occupy a central position located between the Khomutivskyi Steppe and Askania-Nova on Axis 1, and share the same projection with Askania-Nova on Axis 2 (Fig. 4). Three north-eastern sites (see Fig. 1) form a distant group by Axis 2 being closer to the Khomutivskyi Steppe and Kamyani Mohyly on Axis 1. The Potiivskyi segment of the Black Sea Reserve is isolated on Axis 1. A more detailed comparison of the spider species compositions of the forb-fescue-feather grass and petrophytic steppes in the Yelanetskyi Steppe, Kryvyi Rih and Khomutivskyi Steppe showed a close grouping of the spider faunas of the former two sites and a high distance of the latter (Fig. 5).

Discussion

The higher species richness of the Yelanetskyi segment can be attributed to its habitat variety and a longer period of studies. Moreover, it should be noted, that this segment has been under protection for over 20 years, while the Mykhailivskyi segment has been used as pasture or partly burnt.

Some rare species were found in the reserve. For *Altella hungarica*, it is the fourth record from Ukraine (Polchaninova 2019). The species is distributed in Europe being known from Hungary, Ukraine (Kharkiv and the Donetsk regions) and Russia (Rostov-on-Don Region) (Loksa 1981, Ponomarev 2017, Ponomarev et al. 2017b, Polchaninova 2019). A record of *Zelotes eugenei* expands its known range to the north-west. The species was previously recorded between the south of the Kherson Region of Ukraine and the east of Stavropol Krai of Russia, and in some localities in Greece (Kovblyuk & Kastrygina 2015, Ponomarev et al. 2017a, Polchaninova & Prokopenko 2019, Nentwig et al. 2021). For *Ero koreana*, it is the westernmost known locality; the species range stretches from south Ukraine to Korea and Japan (Polchaninova & Prokopenko 2019, WSC 2021). *Gnaphosa opaca* inhabited all biotopes in the Yelanetskyi segment, except the mesic meadow and the pond bank. Nevertheless, it was absent from the nearest Mykhailivskyi segment and Buzkyi Hard National Park, but present at four localities in the Dnipropetrovsk Region (Prokopenko & Zhukov 2018a, 2018b, Polchaninova & Prokopenko 2019, Polchaninova et al. 2021). Based on present knowledge, these localities are the eastern limit of its range. According to Ovtcharenko et al. (1992), further to the east *G. opaca* is substituted by other close species. Its records from the Caucasus (Spassky 1937) have not been confirmed by subsequent studies (see Otto 2020). Recent records of *G. opaca* from the Republic of Tatarstan and from the Orenburg Region of the Russian Federation (Dedyukhin et al. 2015) indicate isolated populations not linked with the main geographic range.

All the rare species were found in the Yelanetskyi segment only in natural (petrophytic steppe) and transformed (abandoned field and forest plantation) habitats. Presumably, strict protection contributed to habitat conservation favourable for these species.

A comparison of the araneofaunas of eleven conservation steppe areas in Ukraine (Figs 1, 4) showed that their similarity is based on both the geographical position of the study site and the type of inhabited grasslands. The spider faunas of the Velykoburlutskyi Steppe, Striltsivskyi Steppe and Dvorichanskyi Park group together, since these areas are lo-

cated in the north-east of Ukraine and include plots of the mesic rich forb-fescue-feather grass steppes, meadow steppes and, in two areas, calcareous chalky steppes. Spiders of the Yelanetskyi Steppe and Kryvyi Rih are closer to those of the Khomutivskyi Steppe despite the high distance between the study sites (Fig.1). The three areas are situated at the southern boundary of the forb-fescue-feather grass steppe belt and host a dry poor-forbs variant of the zonal steppes and gullies with limestone outcrops. Each of them has a nearest protected area of the petrophytic steppes on granite bedrocks (Kamyani Mohyly and Buzkyi Hard). A pairwise comparison showed a high difference between the spider faunas of these sites (Fig. 4).

Although the steppe type drives the difference in the areneofaunas' compositions (Polchaninova 2012), we see a high resemblance of the spider faunas of Yelanetskyi Steppe and Kryvyi Rih located in Right-Bank Ukraine (Figs 1, 5). Within the two sites, spider faunas of zonal forb-fescue-feather grass steppes are very similar in species composition, while those of azonal petrophytic steppes are more specific. In the Khomutivskyi Steppe in Left-Bank Ukraine, the difference between the spider faunas of the two compared steppe habitats is pronounced and the araneofauna of the petrophytic steppe is closer to those of both habitats in the Yelanetskyi Steppe and Kryvyi Rih.

Additionally there are some common characteristics in the araneofaunas of the Yelanetskyi Steppe, Askania-Nova and Black Sea Reserve, although the latter two are located in a different steppe belt and preserve fescue-feather grass and/or sandy steppes. The similarity manifests itself in the high abundance of *Oxyopes heterophthalmus, O. lineatus* and *Runcinia grammica*, the presence of *Argiope lobata*, low abundances and/or absence of *Agalenatea redii, Dictyna arundinacea* and *Tibellus oblongs. Oxyopes heterophthalmus* is an abundant species in sandy grasslands and, especially, in the fescue-feather grass steppes of Askania-Nova. It has never been found in dense forb-grasses vegetation in Left-Bank Ukraine (Polchaninova 2012), but occurs in the same vegetation in the Right-Bank part. *Oxyopes lineatus* and *Runcinia grammica* have not been registered north of the fescue-feather grass steppe belt in Left-Bank Ukraine.

A habitat preference of *Linyphia triangularis* and *L. tenuipalpis* also gives a good example of the differences in species distribution in the forb-fescue-feather grass steppes of Right- and Left-Bank Ukraine. Both species colonize shrub thickets (*Caragana frutex* (L.) K. Koch + *Amygdalus nana* L. + forbs) in Khomutivskyi Steppe. In Yelanetskyi Steppe, *Linyphia tenuipalpis* aggregates on the shrubs of *Caragana frutex* around single trees, being absent in the thickets of *Caragana schythica* (Com.) Pojark. + forbs on the slopes. Arboreal and/or shrub vegetation at the dry gully bottoms is also inhabited by *L. tenuipalpis* while *L. triangularis* appears only in wet biotopes near the water.

Gnaphosidae is the most species-rich family in all the study areas (14.5–22.5% of the faunas) except in Buzkyi Hard and Kamyani Mohyly (Tab. 3). Both sites preserve granitic rocks of the Ukrainian Crystalline Shield and the Donetskyi Ridge and promote Linyphiidae diversity (17.6–18.5%). The second rank is shared between Salticidae, Thomisidae and Lycosidae depending on the area. The araneofauna of the Yelanetskyi Steppe was distinguished by the lowest proportion of Linyphiidae and the highest of Salticidae and Thomisidae. Interestingly, there were no Dysderidae species recorded from Yelanetskyi Steppe, while five species of this family were found in other steppe sites of South Ukraine (Polchaninova et al. 2017, Polchaninova & Prokopenko 2019).

In general, the local spider faunas of the study areas are richer in the forest-steppe and the forb-fescue-feather grass steppe belt of Left-Bank Ukraine (Fig. 1, Tab. 3). Three compared protected areas (Black Sea Biosphere Reserve, Kamyani Mohyly and Buzkyi Hard) can be regarded as biodiversity hotspots of South Ukraine. Their spider faunas account for 286, 266 and 250 species, respectively, but the grassland spiders are the most diverse in Kamyani Mohyly (196 species) and the poorest is the Black Sea Reserve (124 species in the five reserve's segments together) (Polchaninova & Prokopenko 2013, 2017, Polchaninova et al. 2017). However, the araneofaunas of these protected areas are less diverse than that of the Karadag Nature Reserve in the Mountain Crimea (344 species, Kovblyuk et al. 2015). The reserve is located in three landscape zones (nemoral, steppe and submediterranean) which promotes faunistic diversity. The steppe fauna of the Karadag includes 149 species that is less than in Kamyani Mohyly and Buzkyi Hard.

The variability of the spider species composition of each protected area confirms their value in biodiversity promotion in the highly transformed agricultural landscape of Ukraine.

The obtained data can serve as a starting point for future studies of the impact of conservation practices on the local steppe biota.

Tab. 3: Species richness of main spider families in the dry grassland habitats of eleven protected areas in Ukraine. Number of species (%). For the site abbreviation, see Fig. 1

Families	Sites										
	BH	**YeS**	**KR**	**BSR**	**PS**	**AN**	**KM**	**KhS**	**VBS**	**DP**	**SS**
Gnaphosidae	23 (14.5)	19 (18.3)	20 (21.1)	21 (14.9)	15 (17.4)	16 (16.8)	33 (16.8)	20 (15.6)	27 (22.1)	20 (16.3)	32 (20.1)
Salticidae	22 (13.8)	15 (144)	11 (11.6)	14 (13.0)	8 (9.3)	10 (10.5)	21 (10.7)	18 (14.3)	14 (11.5)	15 (12.2)	21 (13.2)
Thomisidae	16 (10.1)	15 (14.4)	10 (10.5)	12 (11.1)	7 (8.1)	11 (11.6)	16 (8.2)	12 (9.5)	7 (5.7)	11 (8.9)	17 (10.7)
Lycosidae	11 (6.9)	11 (11.5)	11 (11.6)	12 (11.1)	6 (7.0)	8 (8,4)	18 (9.2)	12 (9.5)	14 (11.5)	17 (13.8)	19 (11.9)
Araneidae	14 (8.8)	7 (6.7)	9 (9.5)	8 (7.4)	8. (9.3)	9 (9.5)	10 (5.1)	13 (10.3)	8 (6.6)	10 (8.1)	11 (6.9)
Theridiidae	11 (6.9)	5 (4.8)	6 (6.3)	7 (6.5)	9 (10.5)	7 (7.4)	13 (6.6)	10 (7.9)	8 (6.6)	10 (8.1)	13 (8.2)
Linyphiidae	28 (17.6)	4 (3.8)	4 (4.2)	10 (9.3)	8 (9.3)	5 (5.3)	36 (18.4)	15 (11.9)	15 (12.3)	11 (8.9)	13 (8.2)
Others	34 (21.4)	27 (26.0)	24 (25.3)	24 (22.2)	25 (29.1)	29 (30.5)	49 (25.0)	26 (20.6)	29 (23.8)	29 (23.6)	33 (20.8)
Total	159 (100)	104 (100)	95 (100)	108 (100)	86 (100)	95 (100)	196 (100)	126 (100)	122 (100)	123 (100)	159 (100)

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Electronic supplement

Appendix. An annotated list of spiders collected in the Yelanetskyi Steppe Natural Reserve (Mykolaiv Region, Ukraine) in 2016–2017

Appendix.
An annotated list of spiders collected in the Yelanetskyi Steppe Natural Reserve (Mykolaiv Region, Ukraine) in 2016–2017
Abbreviations: **YeS** – Yealnetskyi segment, **MyS** – Mykhailivskyi segment.
St1 = virgin steppe on the tops of slopes; St2 = secondary steppe on an abandoned field on the flat interfluves; St3 = virgin steppe on the middle of a north-facing slope; St4 = virgin steppe on the middle of a south-facing slope; Lst1 = top and middle parts of limestone slopes; Lst2 = bottom parts of limestone slopes; Mt1 = annually hayed meadow steppe at the undisturbed gully bottom; Md2 = annually hayed secondary mesic meadow at the gully bottom previously transformed by earthworks; FPl = forest plantation: rows of pines and shrubs with steppe vegetation between them; BP = bank of a pond with arboreal and herbaceous riparian vegetation; Sl = edges of high shrub thickets/natural tree groves bordering the steppe on the lower parts of various slopes. OB = outbuildings.
Number in brackets – total number of species in the family.

Fam. Agelenidae (2)
Allagelena gracilens C. L. Koch, 1841
YeS. 1 ♀, Sl, 1 ♀, FPl, 20. Aug. 2017. **MyS.** 1 ♀, Lst2, 1 ♀, Sl, 18. Aug. 2017.
Eratigena agrestis (Walckenaer, 1802)
YeS. 2 ♀, Lst1, 20. Aug. 2017, 1 ♀, Lst1, 4. Sep. 2019.

Fam. Araneidae (9)
Aculepeira armida (Audouin, 1826)
YeS. 1 ♀, St3, 6. Jul. 2016.
Agalenatea redii (Scopoli, 1763)
YeS. 1 ♀, St3, 5. May 2016; 1 ♀, Md2, 8. May 2017; 2 ♀♀, Sl, 5. May 2016; **MyS.** 1 ♀, St1, 16. Jun. 2017; 1 ♀, Lst2, 2 ♀♀, Sl, 10. May 2017.
Araneus diadematus Clerck, 1757
YeS. 1 ♀, BP, 20. Aug. 2017.
Araneus quadratus Clerck, 1757
YeS. 1 ♀, Md2, 1 ♀, BP, 20. Aug. 2017.
Argiope bruennichi (Scopoli, 1772)
YeS. 1 ♀, St3, 3 ♀♀, Md1, 1 ♂, 3 ♀♀, Md2, 2 ♀♀, Sl, 1 ♀, FPl, 2 ♀♀, BP, 20. Aug. 2017. **MyS.** 1 ♂, 1 ♀, Lst2, 2 ♂♂, 4 ♀♀, Sl, 18. Aug. 2017.
Argiope lobata (Pallas, 1772)
YeS. 1 ♀, Lst2, 20. Aug. 2017. **MyS.** 1 ♀, Lst2, 18. Aug. 2017.
Cyclosa oculata (Walckenaer, 1802)
YeS. 1 ♂, St1, 9. Jun. 2016, 1 ♂, St1, 14. Jun. 2017; 1 ♂, St2, 14. Jun. 2017; 1 ♂ 1 ♀, St3, 14. Jun. 2017; 1 ♀, St4, 14. Jun. 2017; 1 ♀, Md1, 9. Jun. 2016; 2 ♂♂, 1 ♀, Md2, 9. Jun. 2016; 2 ♀♀, Sl, 14. Jun. 2017; 1 ♀, FPl, 9. Jun. 2016, 1 ♀, FPl, 14. Jun. 2017. **MyS.** 2 ♀♀, Lst2, 1 ♀, Sl, 16. Jun. 2017.
Mangora acalypha (Walckenaer, 1802)
YeS. 2 ♀♀, St1, 9. Jun. 2016, 1 ♂, 1 ♀, St1, 14. Jun. 2017; 2 ♀♀, St2, 9. Jun. 2016; 1 ♂, 4 ♀♀, St3, 9. Jun. 2016, 2 ♀♀, St4, 14. Jun. 2017; 4 ♀♀, Lst1, 9. Jun. 2016, 2 ♀♀, Lst1, 14. Jun. 2017; 2 ♂♂, 2 ♀♀, Lst2, 14. Jun. 2017; 4 ♀♀, Md1, 9. Jun. 2016; 3 ♀♀, Md1, 14. Jun. 2017; 2 ♀♀, Md2, 14. Jun. 2017; 3 ♂♂, 2 ♀♀, Sl, 14. Jun. 2017; 1 ♂, 4 ♀♀, FPl, 9. Jun. 2016; 5 ♀♀, FPl, 14. Jun. 2017; 1 ♂ 1 ♀, BP, 9. Jun. 2016, 1 ♀, BP, 14. Jun. 2017. **MyS.** 3 ♀♀, Lst2, 8 ♀♀, Sl, 16. Jun. 2017.
Neoscona adianta (Walckenaer, 1802)
YeS. 1 ♂, 1 ♀, St1, 6. Jul. 2016, 3 ♀♀, St1, 20. Aug. 2017; 1 ♂, 3 ♀♀, St2, 6. Jul. 2016; 1 ♀, St3, 6. Jul. 2016, 2 ♀♀, St3, 20. Aug. 2017; 1 ♂, St4, 20. Aug. 2017; 1 ♂, 3 ♀♀, Lst1 6. Jul. 2016, 2 ♀♀, Lst1, 20. Aug. 2017; 1 ♀, Lst2, 5 ♀♀, Md1, 1 ♂, 3 ♀♀, Sl, 20. Aug. 2017; 2 ♂♂, 3 ♀♀, FPl, 6. Jul. 2016, 4 ♀♀, FPl, 20. Aug. 2017. **MyS.** 1 ♂, St1, 7. Jul. 2016; 1 ♂, St1, 16. Jun. 2017, 1 ♀, St1, 18. Aug. 2017; 2 ♀♀, Lst2, 3 ♀♀, Sl, 18. Aug. 2017.

Fam. Atypidae (1)
Atypus muralis Bertkau, 1890
YeS. 2 ♂♂, St1, 1 ♂, St3, 9. Jun. – 6. Jul. 2016; 1 ♂, St4, 8. May – 14. Jun. 2017.

Fam. Cheiracanthiidae (3)
Cheiracanthium pennyi O. Pickard-Cambridge, 1873
YeS. 1 ♂, St1, 9. Jun. 2016; 2 ♂♂, 2 ♀♀, St3, 9. Jun. 2016; 2 ♀♀, St3, 14. Jul. 2017; 1 ♀, Lst1, 3 ♂♂, 2 ♀♀, Md1, 2 ♂♂, 2 ♀♀, Sl, 9. Jun. 2016; 3 ♂♂, 1 ♀, Md2, 1 ♂, 1 ♀, FPl, 14. Jun. 2017. **MyS.** 1 ♀ St1, 18. Aug. 2017; 1 ♂, Lst2, 16. Jun. 2017; 1♀, Sl, 18. Aug. 2017.
Cheiracanthium punctorium (Villers, 1789)
YeS. 2 ♀♀, Md1, 1♀, Sl, 1 ♂, 1♀, BP, 20. Aug. 2017. **MyS.** 1 ♀, Sl, 18. Aug. 2017.
Cheiracanthium virescens (Sundevall, 1833)
MyS. 1♀, Sl, 10. May – 16. Jun. 2017.

Fam. Clubionidae (1)
Clubiona pseudoneglecta Wunderlich, 1994
MyS. 1 ♂, Sl, 7. Jul. 2016.

Fam. Dictynidae (4)
Altella hungarica Loksa, 1981
YeS. 1 ♀, Lst1, 7. Jul. 2016.
Argenna subnigra (O. Pickard-Cambridge, 1861)
MyS. 1 ♂, Sl, 10. May – 16. Jun. 2017.
Brigittea latens (Fabricus, 1775)
YeS. 1 ♀, St2, 6. Jul. 2016, 1 ♀, St4, 1 ♂, 1 ♀, Lms1, 9. Jun. 2016. **MyS.** 1 ♀, St1, 1 ♀, Sl, 16. Jun. 2017.
Lathys stigmatisata (Menge, 1869)
MyS. 1 ♂, St1, 10. May – 16. Jun. 2017.

Fam. Eresidae (1)
Eresus kollari Rossi, 1846
YeS. 1 ♀, St4, 1 ♀, Lst1, 8. May – 14. Jun. 2017; 1 ♀, Lst2, 5. May – 9. Jun. 2016; 1 ♀, FPl, 8. May – 14. Jun. 2017.

Fam. Gnaphosidae (18)
Aphanthaulax trifasciata (O. Pickard-Cambridge, 1872)
MyS. 1 ♀, Sl, on a tree branch, 18. Aug. 2017.
Berlandina cinerea (Menge, 1872)
YeS. 3 ♂♂, St1, 5. May – 9. Jun. 2016, 2 ♂♂, St1, 8. May – 14. Jun. 2017; 1 ♂, 1 ♀, St3, 1 ♀, Lst1, 5. May – 9. Jun. 2016; 1 ♀, St4, 2 ♂♂, FPl, 8. May – 14. Jun. 2017. **MyS.** 1 ♂, Sl, 10. May – 16. Jun. 2017.
Civizelotes caucasius (L. Koch, 1866)
YeS. 1 ♂, St2, 1 ♂, St3, 2 ♂♂, Lst1, 1 ♂, 1 ♀, Lst2, 9. Jun. – 6. Jul. 2016. **MyS.** 1 ♂, St1, 10. May – 16. Jun. 2017.
Drassodes lapidosus (Walckenaer, 1802**)**
YeS. 1 ♂, St2, 1 ♀, St3, 9. Jun. – 6. Jul. 2016; 2 ♂♂, St4, 8. May – 14. Jun. 2017; 1 ♀, Lst1, 9. Jun. – 6. Jul. 2016, 1 ♂, Lst1, 8.

May – 14. Jun. 2017; 1 ♀, FPl, 9. Jun. – 6. Jul. 2016. **MyS.** 1 ♂, St1, 8. May – 14. Jun. 2017; 2 ♀♀, Lst2, 16. Jun. 2017; 1 ♂, Sl, 10. May – 16. Jun. 2017, 1 ♀, Sl, 18. Aug. 2017.
Drassyllus praeficus (L. Koch, 1866)
YeS. 1 ♀, St1, 9. Jun. 2016, 1 ♀, St1, 8. May – 14. Jun. 2017; 2 ♀♀, St3, 9. Jun. – 6. Jul. 2016; 1 ♂, Md1, 1 ♂, Md2, 8. May – 14. Jun. 2017, 1 ♂, 1 ♀, Sl, 8. May – 14. Jun. 2017, 1 ♂, 1 ♀, FPl, 9. Jun. – 6. Jul. 2016, 1 ♂, FPl, 8. May – 14. Jun. 2017. **MyS.** 1 ♂, 1 ♀, Lst2, 2 ♂♂, 1 ♀, Sl, 10. May – 16. Jun. 2017.
Drassyllus pumilus (C. L. Koch, 1839)
YeS. 1 ♀, Lst1, 9. Jun. – 6. Jul. 2016, 1 ♂, Lst1, 8. May – 14. Jun. 201; 1 ♀, Lst2, 9. Jun. – 6. Jul. 2016; 3 ♂♂, FPl, 8. May – 14. Jun. 2017.
Gnaphosa lucifuga (Walckenaer, 1802)
YeS. 1 ♀, FPl, 8. May – 14. Jun. 2017. **MyS.** 1 ♀, St1, 8. May – 14. Jun. 2017, 1 ♀, Lst2, 1 ♀, Sl, 18. Aug. 2017.
Gnaphosa opaca Herman, 1879
YeS. 2 ♂♂, St1, 5. May – 9. Jun. 2016, 2 ♂♂, 2 ♀♀, St1, 8. May – 14. Jun. 2017; 5 ♂♂, St2, 4 ♂♂, St3, 9. Jun. – 6. Jul. 2016; 3 ♂♂, St4, 8. May – 14. Jun. 2017; 13 ♂♂, 4 ♀♀, Lst1, 5. May – 9. Jun. 2016, 1 ♂, 1 ♀, Lst1, 9. Jun. – 6. Jul. 2016, 10 ♂♂, 5 ♀♀, Lst1, 8. May – 14. Jun. 2017; 11 ♂♂, 2 ♀♀, Lst2, 5. May – 9. Jun. 2016, 14 ♂♂, Lst2, 9. Jun. – 6. Jul. 2016, 1 ♂, Lst2, 8. May – 14. Jun. 2017; 1 ♂, 1 ♀, Md1, 8. May – 14. Jun. 2017; 1 ♂, Sl, 5. May – 9. Jun. 2016, 4 ♂♂, Sl, 8. May – 14. Jun. 2017; 1 ♂, 5 ♀♀, FPl, 5. May – 9. Jun. 2016, 6 ♂♂, 5 ♀♀, FPl, 8. May – 14. Jun. 2017.
Haplodrassus bohemicus Miller & Buchar, 1977
YeS. 2 ♀♀, St2, 5. May – 9. Jun. 2016, 1 ♂, Md1, 8. May – 14. Jun. 2017; 1 ♂, FPl, 9. Jun. – 6. Jul. 2016. **MyS.** 1 ♀, St1, 6 ♂♂, 3 ♀♀, Lst2, 10 ♂♂, 5 ♀♀, Sl, 10. May – 16. Jun. 2017.
Haplodrassus dalmatensis (L. Koch, 1866)
YeS. 1 ♀, Lst1, 5. May 2016, 1 ♂, Lst1, 5. May – 9. Jun. 2016, 1 ♀, Lst1, 9. Jun. – 6. Jul. 2016. **MyS.** 1 ♂, Lst2, 10. May – 16. Jun. 2017.
Haplodrassus kulczynskii Lohmander, 1942
YeS. 1 ♂, St2, 2 ♀♀, St3, 5. May – 9. Jun. 2016; 1 ♂, St4, 1 ♂, 1 ♀, Md1, 1♂, 3 ♀♀, Md2, 1 ♂, 1 ♀, Sl, 1 ♀, FPl, 8. May – 14. Jun. 2017.
Haplodrassus signifer (C. L. Koch, 1839)
YeS. 1 ♂, St1, 5. May – 9. Jun. 2016, 1 ♂, St1, 8. May – 14. Jun. 2017; 2 ♂♂, St2, 1 ♂, St3, 5. May – 9. Jun. 2016; 1 ♂, St4, 8. May – 14. Jun. 2017; 1 ♂, Lst1, 5. May – 9. Jun. 2016, 1 ♂, Lst1 8. May 2017; 1 ♂, Lst2, 5. May – 9. Jun. 2016; 1 ♂, Sl, 8. May – 14. Jun. 2017; 2 ♂♂, 1 ♀, FPl, 5. May – 9. Jun. 2016, 2 ♂♂, 2 ♀♀, FPl, 8. May – 14. Jun. 2017.
Marinarozelotes malkini (Platnick & Murphy, 1984)
YeS. 1 ♀, Lst1, 9. Jun. 2016; 1 ♂, Sl, 8. May – 14. Jun. 2017.
Nomisia aussereri (L. Koch, 1872)
YeS. 2 ♀♀, Lst2, 20. Aug. 2017. **MyS.** 1 ♀, Lst2, 18. Aug. 2017.
Zelotes electus (C. L. Koch, 1839)
YeS. 1 ♂, St1, 5. May 2016, 1 ♂, St1, 5. May – 9. Jun. 2016; 1 ♂, Md1, 1 ♂, FPl, 8. May – 14. Jun. 2017; 1♀, Sl, 9. Jun. 2016; 1 ♀, BP, 14. Jun. 2017. **MyS.** 1 ♂, St1, 10. May – 16. Jun. 2017.
Zelotes eugenei Kovblyuk, 2009
YeS. 1 ♀, St2, 5. May – 9. Jun. 2016.
Zelotes longipes (L. Koch, 1866)
YeS. 1 ♀, St1, 5. May – 9. Jun. 2016, 1 ♀, Lst2, 8. May – 14. Jun. 2017. **MyS.** 2 ♀♀, St1, 10. May – 16. Jun. 2017.
Zelotes segrex (Simon, 1878)
YeS. 1 ♂, St2, 5. May – 9. Jun. 2016; 2 ♂♂, Lst2, 9. Jun. – 6. Jul. 2016, 1 ♀, Lst2, 8. May – 14. Jun. 2017. **MyS.** 1 ♂, St1, 10. May – 16. Jun. 2017.

Fam. Linyphiidae (5)
Agyneta rurestris (C. L. Koch, 1836)
YeS. 1 ♂, St3, 1 ♀, Md2, 1 ♂, FPl, 7.–9. Jun. 2016.
Linyphia tenuipalpis Simon, 1884
YeS. 2 ♀♀, St3, on shrubs around a single tree, 3 ♀♀, Sl, 2 ♀♀, FPl, 3. Sep. 2017. **MyS.** 5 ♀♀, Sl, 4. Sep. 2017.
Linyphia triangularis (Clerck, 1757)
YeS. 3 ♀♀, BP, 3. Sep. 2017.
Microlinyphia pusilla (Sundevall, 1830)
MyS. 1 ♀, Sl, 7. Jul. 2016.
Stemonyphantes lineatus (Linnaeus, 1758)
YeS. 1 ♂, Md1, 8. May – 14. Jun. 2017.

Fam. Liocranidae (1)
Agroeca cuprea Menge, 1873
YeS. 1 ♀, St4, 8. May – 14. Jun. 2017; 1 ♀, Lst2, 9. Jun. – 6. Jul. 2016; 2 ♀♀, Sl, 8. May – 14. Jun. 2017; 1 ♀, FPl, 9. Jun. – 6. Jul. 2016, 2 ♀♀, FPl, 8. May – 14. Jun. 2017.

Fam. Lycosidae (12)
Alopecosa cursor (Hahn, 1831)
YeS. 9 ♂♂, 2 ♀, St1, 5. May – 9. Jun. 2016, 2 ♂♂, 2 ♀♀, St1, 8. May – 14. Jun. 2017; 3 ♂♂, St2, 5. May – 9. Jun. 2016; 4 ♂♂, St3, 5. May – 9. Jun. 2016; 3 ♂♂, St4, 8. May – 14. Jun. 2017; 6 ♂♂, 2 ♀♀, Lst1, 5. May – 9. Jun. 2016, 4 ♀♀, Lst1, 9. Jun. – 6. Jul. 2016; 34 ♂♂ 2 ♀♀, Lst1, 8. May – 14. Jun. 2017; 1 ♂, 2 ♀♀, Lst2, 5. May – 9. Jun. 2016, 1 ♀, Lst2, 9. Jun. – 6. Jul. 2016; 3 ♂♂, Sl, 8. May – 14. Jun. 2017; 1 ♂, 1 ♀, FPl, 9. Jun. – 6. Jul. 2016, 5 ♂♂, 1 ♀, FPl, 8. May – 14. Jun. 2017. **MyS.** 4 ♂♂, 3 ♀♀, St1, 1 ♂, Lst2, 2 ♂♂, Sl, 10. May – 16. Jun. 2017.
Alopecosa farinosa (Herman, 1879)
YeS. 1 ♀, St1, 5. May – 9. Jun. 2016, 1 ♀, St1, 9. Jun. – 6. Jul. 2016; 6 ♀♀, St3, 1 ♀, Lst2, 9. Jun. – 6. Jul. 2016; 7 ♀♀, Md1, 10 ♀♀, Md2, 8. May – 14. Jun. 2017; 2 ♀♀, FPl, 9. Jun. – 6. Jul. 2016, 1 ♀, FPl, 8. May – 14. Jun. 2017. **MyS.** 1 ♀, St1, 6 ♀♀, Lst2, 17 ♀♀, Sl, 10. May – 16. Jun. 2017.
Alopecosa kovblyuki Nadolny & Ponomarev, 2012
YeS. 1 ♀, Lst1, 5. May – 9. Jun. 2016; 3 ♀♀, Sl, 1 ♀, FPl, 8. May – 14. Jun. 2017. **MyS.** 1 ♀, Sl, 10. May – 16. Jun. 2017.
Alopecosa pulverulenta (Clerck, 1757)
YeS. 3 ♂♂, 1 ♀, St3, 5. May – 9. Jun. 2016, 1 ♂, Lst2, 8. May – 14. Jun. 2017; 1 ♀, Md1, 5. May – 9. Jun. 2016, 6 ♂♂, 4 ♀♀, Md1, 8. May – 14. Jun. 2017; 3 ♂♂, 3 ♀♀, Md2, 4 ♂♂, 3 ♀♀, Sl, 8. May – 14. Jun. 2017; 1 ♂, FPl, 5. May – 9. Jun. 2016, 1 ♀, FPl, 9. Jun. – 6. Jul. 2016, 2 ♂♂, FPl, 8. May – 14. Jun. 2017; 1 ♀, BP, 14. Jun. 2017. **MyS.** 2 ♂♂, 2 ♀♀, Sl, 10. May – 16. Jun. 2017.
Alopecosa schmidti (Hahn, 1835)
YeS. 1 ♀, Lst1, 5. May – 9. Jun. 2016; 1 ♀, Lst1, 8. May – 14. Jun. 2017. **MyS.** 1 ♀, Lst2, 10. May – 16. Jun. 2017.
Alopecosa solitaria (Herman, 1879)
YeS. 1 ♀, Lst1, 5. May – 9. Jun. 2016.
Alopecosa sulzeri (Pavesi, 1873)
YeS. 1 ♂, Md2, 8. May – 14. Jun. 2017.
Alopecosa taeniopus (Kulczyński, 1895)
YeS. 1 ♀, Md2, 8. May – 14. Jun. 2017.
Geolycosa vultuosa (C. L. Koch, 1838)
MyS. 1 ♀, grazed gully bottom, 7. Jul. 2016.
Pardosa lugubris (Walckenaer, 1802)

MyS. 1 ♀, Sl, 7. Jul. 2016, 1 ♂, Sl, 10. May – 16. Jun. 2017.
Trochosa robusta (Simon, 1876)
YeS. 1 ♀, St1, 9. Jun. – 6.09. Jun. 2016; 1 ♂, 2 ♀♀, 8. May – 14. Jun. 2017; 2 ♂♂, St3, 5. May – 9. Jun. 2016, 2 ♂♂, St3, 9. Jun. – 6.09. Jun. 2016; 1 ♂, Lst1, 9. Jun. – 6.09. Jun. 2016; 1 ♂, Lst2, 9. Jun. – 6.09. Jun. 2016; 1 ♂, Md1, 5. May – 9. Jun. 2016, 3 ♂♂, Md1, 8. May – 14. Jun. 2017; 3 ♂♂, 2 ♀♀, Md2, 2 ♂♂, 2 ♀♀, Sl, 8. May – 14. Jun. 2017. **MyS.** 1 ♀, Lst2, 1 ♂, Sl, 10. May – 16. Jun. 2017.
Xerolycosa miniata (C. L. Koch, 1834)
YeS. 1 ♂, Md2, 8. May – 14. Jun. 2017. **MyS.** 1 ♂, Sl, 10. May – 16. Jun. 2017.

Fam. Mimetidae (1)
Ero koreana Paik, 1967
YeS. 1 ♀, FPl, 9. Jun. – 6. Jul. 2016.

Fam. Miturgidae (1)
Zora pardalis Simon, 1878
YeS. 1 ♂, Md1, 1 ♀, FPl, 8. May – 14. Jun. 2017.

Fam. Oxyopidae (2)
Oxyopes heterophthalmus (Latreille, 1804)
YeS. 2 ♂♂, St1, 9. Jun. 2016; 1 ♂ 2 ♀♀, St1, 14. Jun. 2017; 2 ♂♂, 1 ♀, St2, 1 ♂, St3, 9. Jun. 2016; 1 ♂, 1 ♀, St4, 14. Jun. 2017; 2 ♂♂, 2 ♀♀, Lst1, 9. Jun. 2016, 2 ♂♂, 4 ♀♀, Lst1, 14. Jun. 2016; 1 ♂, Lst2, 9. Jun. 2016; 2 ♂♂ Md1, 14. Jun. 2017; 1 ♂, Sl, 9. Jun. 2016; 3 ♂♂, 3 ♀♀, FPl, 9. Jun. 2016, 1 ♀, FPl, 6. Jul. 2016; 3 ♀♀, FPl, 14. Jun. 2017. **MyS.** 2 ♂♂ 3 ♀♀, St1, 1 ♂, 1 ♀, Lst2, 2 ♂♂, 3 ♀♀, Sl, 16. Jun. 2017.
Oxyopes lineatus Latreille, 1806
YeS. 2 ♂♂, 2 ♀♀, St1, 9. Jun. 2016, 1 ♀, 14. Jun. 2017; 1 ♂, St2, 9. Jun. 2016; 1 ♀, St3, 14. Jun. 2017; 2 ♂♂ St4, 14. Jun. 2017; 4 ♂♂, 2 ♀♀, Lst1, 9. Jun. 2016, 2 ♀♀, Lst1, 6. Jul. 2016, 2 ♂♂, 4 ♀♀, Lst1, 14. Jun. 2017; 1 ♀, Lst2, 14. Jun. 2017; 1 ♂, Md1, 9. Jun. 2016, 2 ♀♀, Md1, 14. Jun. 2016; 1 ♀, Sl, 14. Jun. 2017; 3 ♀♀, FPl, 6. Jul. 2016, 2 ♀♀, FPl, 14. Jun. 2017. **MyS.** 2 ♂♂, 2 ♀♀, St1, 3 ♂♂, 1 ♀, Lst2, 2 ♂♂, 5 ♀♀, Sl, 16. Jun. 2017.

Fam. Philodromidae (5)
Philodromus cespitum (Walckenaer, 1802)
YeS. 1 ♀, Md1, 6. Jul. 2016; 1♂, 1 ♀, FPl, 1♂, 1 ♀, BP, 14. Jun. 2017. **MyS.** 1 ♀, Sl, 16. Jun. 2017.
Rhysodromus histrio (Latreille, 1819)
MyS. 1 ♀, Lst1, 7. Jul. 2016.
Thanatus arenarius L. Koch, 1872
YeS. 1 ♂, St1, 5. May – 9. Jun. 2016, 1 ♂, St1, 8. May – 14. Jun. 2017; 1 ♂, St2, 2 ♂♂, St3, 5. May – 9. Jun. 2016; 1 ♂, St4, 1 ♂, Lst1, 8. May – 14. Jun. 2017; 1 ♂, Md1, 5. May – 9. Jun. 2016, 1 ♂, Md1, 8. May – 14. Jun. 2017; 10 ♂♂, Md2, 3 ♂♂, Sl, 8. May – 14. Jun. 2017; 1 ♂, FPl, 5. May – 9. Jun. 2016, 2 ♂♂, FPl, 8. May – 14. Jun. 2017. **MyS.** 7 ♂♂, St1, 2 ♂♂, Lst2, 16 ♂♂, Sl, 10. May – 16. Jun. 2017.
Tibellus macellus Simon, 1875
YeS. 2 ♀♀, St1, 14. Jun. 2017; 1 ♀, St2, 9. Jun. 2016; 1 ♀, St4, 14. Jun. 2017; 1 ♀, Lst1, 9. Jun. 2016. **MyS.** 1 ♀, St1, 1 ♀, Lst2, 16. Jun. 2017.
Tibellus oblongus (Walckenaer, 1802)
YeS. 1 ♀, St3, 1 ♀, Lst2, 9. Jun. 2016; 1 ♂, 1 ♀, Md1, 9. Jun. 2016, 2 ♀♀, Md1, 14. Jun. 2017; 1 ♂, 2 ♀, Md2, 14. Jun. 2017; 1 ♂, Sl, 14. Jun. 2017; 1 ♀, Sl, 19. Aug. 2017; 1 ♂, 1 ♀, FPl, 9. Jun. 2016, 1 ♀, FPl, 14. Jun. 2017; 2 ♀♀, BP, 14. Jun. 2017. **MyS.** 1 ♀, Sl, 16. Jun. 2017; 1 ♀, Sl, 18. Aug. 2017.

Fam. Pholcidae (1)
Pholcus ponticus Thorell, 1875
YeS. 1 ♀, OB, 6. Jul. 2016.

Fam. Pisauridae (2)
Pisaura mirabilis (Clerck, 1757)
YeS. 1 ♀, BP, 14. Jun. 2017. **MyS.** 2 ♀♀, Sl, 16. Jun. 2017.
Pisaura novicia (L. Koch, 1878)
YeS. 1 ♀, Md2, 2 ♀♀, BP, 14. Jun. 2017.

Fam. Salticidae (20)
Aelurillus laniger Logunov & Marusik, 2000
YeS. 2 ♀♀, Lst1, 14. Jun. 2017; 1 ♂, FPl, 8. May – 14. Jun. 2017, 1 ♀, 14. Jun. 2017.
Aelurillus v-insignitus (Clerck, 1757)
YeS. 1 ♀, St1, 5. May – 9. Jun. 2016, 1 ♀, St1, 9. Jun. – 6. Jul. 2016; 2 ♂♂, Lst1, 5. May – 9. Jun. 2016; 1 ♀, FPl, 9. Jun. – 6. Jul. 2016.
Attulus penicillatus (Simon, 1875)
YeS. 2 ♂♂, St1, 1 ♂, St2, 9. Jun. – 6. Jul. 2016; 1 ♀, Lst1, 9. Jun. – 6. Jul. 2016, 1 ♀, Lst1, 14. Jun. 2017; 1 ♂, Lst2, 8. May – 14. Jun. 2017. **MyS.** 3 ♀♀, Lst2, 16. Jun. 2017.
Euophrys frontalis (Walckenaer, 1802)
YeS. 1 ♀, St4, 9. Jun. 2016; 1 ♂, Lst1, 5. May – 9. Jun. 2016; 1 ♂, Lst2, 8. May – 14. Jun. 2017; 1 ♂, FPl, 8. May – 14. Jun. 2017.
Evarcha arcuata (Clerck, 1757)
YeS. 1 ♀, BP, 14. Jun. 2017.
Evarcha michailovi Logunov, 1992
MyS. 1 ♀, Sl, 16. Jun. 2017.
Heliophanus auratus C. L. Koch, 1835
YeS. 1 ♀, Md2, 1 ♀, BP, 14. Jun. 2017.
Heliophanus cupreus (Walckenaer, 1802)
YeS. 1 ♀, St1, 6. Jul. 2016; 1 ♀, St3, 6. Jul. 2016; 1 ♀, St4, 14. Jun. 2017; 1 ♀, Md1, 6. Jul. 2016; 1 ♀, Sl, 8. May – 14. Jun. 2017; 2 ♀♀, FPl, 9. Jun. 2016, 1 ♀, FPl, 9. Jun. – 6. Jul. 2016; 1 ♀, BP, 14. Jun. 2017. **MyS**. 1 ♀, Sl, 16. Jun. 2017.
Heliophanus flavipes (Hahn, 1832)
YeS. 2 ♀♀, St1, 5. May 2016, 1 ♂, 1 ♀, St1, 9. Jun. 2016, 1 ♂, St1, 8. May 2017; 1 ♀, St2, 9. Jun. 2016; 1 ♂, St3, 5. May 2016, 1 ♂, 3 ♀♀, St3, 9. Jun. 2016; 2 ♀♀, St4, 14. Jun. 2017; 7 ♀♀, Lst1, 9. Jun. 2016, 1 ♀, Lst1, 6. Jul. 2016, 2 ♀♀, Lst1, 14. Jun. 2017; 1 ♀, Lst2, 6. Jul. 2016; 1 ♀, Md1, 5. May 2016, 1 ♂, 1 ♀, Md1, 9. Jun. 2016, 1 ♀, Md1, 8. May – 14. Jun. 2017; 1 ♂, Md2, 5. May 2016, 1 ♀, Md2, 9. Jun. 2016; 1 ♂, Sl, 14. Jun. 2017; 1 ♂, FPl, 9. Jun. 2016, 1 ♀, FPl, 9. Jun. – 6. Jul. 2016, 1 ♀, FPl, 6. Jul. 2016. **MyS.** 1 ♂, St1, 2 ♀♀, Lst2, 1 ♂, Sl, 16. Jun. 2017.
Macaroeris flavicomis (Simon, 1884)
YeS. 1 ♂, St3, 9. Jun. 2016; 1 ♂, FPl, 6. Jul. 2016. On the branches of single trees.
Pellenes nigrociliatus (Simon, 1875)
YeS. 1 S, St1, 9. Jun. 2016; 1 S, St4, 8. May – 14. Jun. 2017.
Philaeus chrysops (Poda, 1761)
YeS. 1 ♀, FPl, 1 ♀, St1, 6. Jul. 2016. **MyS**. 1 ♀, St1, 2 ♀♀, Lst2, 16. Jun. 2017.
Phlegra fasciata (Hahn, 1826)
YeS. 1 S, Md1, 9. Jun. – 6. Jul. 2016.
Pseudeuophrys erratica (Walckenaer, 1826)

MyS. 1 ♀, St1, 7. Jul. 2016.
Pseudomogrus vittatus (Thorell, 1875)
YeS. 1 ♂, Md1, 8. May – 14. Jun. 2017.
Synageles hilarulus (C. L. Koch, 1846)
YeS. 1 ♀, St1, 1 ♀, Lst1, 9. Jun. 2016.
Synageles subcingulatus (Simon, 1878)
YeS. 1 ♀, St1, 14. Jun. 2017.
Synageles venator (Lucas, 1836)
YeS. 1 ♀, Lst1, 5. May 2016.
Talavera aequipes (O. Pickard-Cambridge, 1871)
YeS. 1 ♂, Lst2, 8. May – 14. Jun. 2017.
Talavera aperta (Miller, 1971)
YeS. 1 ♀, Lst1, 9. Jun. 2016.

Fam. Tetragnathidae (1)
Tetragnatha montana Simon, 1874
YeS. 2 ♀♀, BP, 14. Jun. 2017.

Fam. Theridiidae (5)
Enoplognatha thoracica (Hahn, 1833)
YeS. 1 ♂, Sl, 8. May – 14. Jun. 2017.
Euryopis saukea Levi, 1951
YeS. 1 ♂, St2, 1 ♂, Lst1, 5. May 2016.
Heteroteridion nigrovariegatum (Simon, 1873)
YeS. 1 ♂, St4, 8. May 2017.
Phylloneta impressa (L. Koch, 1881)
YeS. 1 ♀, Lst2, 6. Jul. 2016; 1 ♂, Md1, 14. Jun. 2017; 2 ♀♀, FPl 20. Aug. 2017. **MyS.** 1 ♀, St1, 7. Jul. 2016; 1 ♂, Lst2, 16. Jun. 2017; 1 ♀, Sl, 18. Aug. 2017.
Simitidion simile (C. L. Koch, 1836)
YeS. 2 ♂♂, St3, 9. Jun. 2016, 1 ♂, 2 ♀♀, St3, 14. Jun. 2017; 1 ♀, Md1, 2 ♀♀, Md2, 3 ♀♀, Sl, 1 ♂, 1 ♀, FPl, 14. Jun. 2017. **MyS.** 1 ♀, Lst2, 1 ♀, Sl, 16. Jun. 2017.

Fam. Thomisidae (14)
Ebrechtella tricuspidata (Fabricius, 1775)
YeS. 1 ♀, St3, 9. Jun. 2016; 1 ♂, BP, 9. Jun. 2016, 2 ♀♀, BP, 14. Jun. 2017.
Heriaeus oblongus Simon, 1918
YeS. 1 ♂, St1, 1 ♂, St2, 9. Jun. 2016; 3 ♂♂, 1 ♀, St3, 9. Jun. 2016, 1 ♀, St3, 14. Jun. 2017; 1 ♂, St4, 14. Jun. 2017; 2 ♂♂, Lst1, 2 ♂♂, Md1, 1 ♂, Md2, 9. Jun. 2016; 1♂, Sl, 14. Jun. 2017; 2 ♂♂, FPl, 9. Jun. 2016, 1 ♀, FPl, 14. Jun. 2017. **MyS.** 1 ♂, Lst2, 16. Jun. 2017.
Misumena vatia (Clerck, 1757)
YeS. 1 ♀, St3, 14. Jun. 2017; 1 ♀, Md2, 5. May 2016, 1 ♀, Md2, 9. Jun. 2016. **MyS**. 3 ♀♀, Sl, 16. Jun. 2017.
Ozyptila atomaria (Panzer, 1801)
YeS. 2 ♀♀, St1, 8. May – 14. Jun. 2017.
Ozyptila pullata (Thorell, 1875)
YeS. 1 ♀, Lst2, 9. Jun. – 6. Jul. 2016; 2 ♂♂, Sl, 8. May – 14. Jun. 2017; 1 ♀, FPl, 9. Jun. – 6. Jul. 2016.
Ozyptila scabricula (Westring, 1851)
YeS. 1 ♂, St1, 1 ♂, St4, 8. May – 14.–6.2017; 1 ♀, Md1, 5. May – 9. Jun. 2016, 1 ♀, Md1, 9. Jun. – 6. Jul. 2016; 1 ♀, FPl, 9. Jun. – 6. Jul. 2016.
Runcinia grammica (C. L. Koch, 1837)
YeS. 1 ♂, St1, 9. Jun. 2016, 1 ♀, St1, 14. Jun. 2017; 1 ♂, St2, 1 ♂, 2 ♀♀, St3, 9. Jun. 2016; 2 ♀♀, St4, 14. Jun. 2017; 1 ♂, Lst1, 9. Jun. 2016, 1 ♀, Lst1, 9. Jun. – 6. Jul. 2016, 1 ♀, Lst1, 14. Jun. 2017; 1 ♂, Lst2, 9. Jun. 2016, 1 ♀, Lst2, 14. Jun. 2017; 2 ♂♂, Md1, 9. Jun. 2016, 1 ♂, Md1, 14. Jun. 2017; 1 ♂, FPl, 9. Jun. 2016, 1 ♂, 6 ♀♀, FPl, 6. Jul. 2016, 2 ♂♂, 1 ♀, FPl, 14. Jun. 2017. **MyS.** 2 ♂♂, 3 ♀♀, St1, 16. Jun. 2017; 2 ♂♂, 2 ♀♀, Lst2, 16. Jun. 2017, 1 ♀, Lst2, 18. Aug. 2017.
Spiracme striatipes (L. Koch, 1870)
YeS. 1 ♀, St1, 5. May 2016; 3 ♂♂ juv., St2 20. Aug. 2017; 2 ♀♀, St4, 3. Sep. 2017; 1 ♀, Lst1, 9. Jun. 2016; 1 ♀, Lst2, 14. Jun. 2017; 1 ♀, Md1, 9. Jun. 2016; 4 ♀♀, Sl, 3. Sep. 17; 1♂, 5 ♀♀ FPl, 3. Sep. 2017; **MyS.** 1 ♀, Lst2, 10. May 2017, 2 ♀♀, Lst2, 18. Aug. 2017, 1♂, 5 ♀♀, Sl, 4. Sep. 2017.
Thomisus onustus Walckenaer, 1805
YeS. 1 ♂, 4 ♀♀, St1, 9. Jun. 2016, 1 ♀, St1, 14. Jun. 2017; 3 ♀♀, St2, 1 ♂, 3 ♀♀, St3, 9. Jun. 2016; 2 ♀♀, St4, 14. Jun. 2017; 1 ♂, Lst1, 5. May 2016, 1 ♂, 3 ♀♀, Lst1, 9. Jun. 2016, 1 ♂, Lst1, 6. Jul. 2016; 2 ♀♀, Lst1, 14. Jun. 2017; 2 ♀♀, Lst2, 9. Jun. 2016, 1 ♂, Lst2, 16. Jun. 2017; 1 ♂, 3 ♀♀, Md1, 9. Jun. 2016; 1 ♂, 1 ♀, Sl, 14. May 2017; 6 ♂♂, 4 ♀♀ FPl, 9. Jun. 2016; 2 ♀♀, FPl, 6. Jul. 2016, 2 ♂♂, 4 ♀♀, FPl, 14. May 2017. **MyS.** 2 ♀♀, St1, 3 ♂♂, 1 ♀, Lst2, 1 ♂, 2 ♀♀, Sl, 16. Jun. 2017.
Xysticus acerbus Thorell, 1872
YeS. 1 ♀, Md1, 5. May 2016, 1 ♀, Md1, 9. Jun. 2016; 1 ♀, Md2, 14. Jun. 2017.
Xysticus cristatus (Clerck, 1757)
YeS. 1 ♀, St3, 9. Jun. 2016; 2 ♀♀, St4, 14. Jun. 2017; 1 ♀, Lst2, 9. Jun. 2016; 1 ♀, BP, 14. Jun. 2017.
Xysticus kochi Thorell, 1872
YeS. 1 ♂, 1 ♀, St1, 9. Jun. 2016, 2 ♂♂, St3, 5. May 2016, 1 ♀, St3, 9. Jun. 2016; 1 ♂, St4, 8. May 2017; 1 ♂, 2 ♀♀, Md1, 5. May 2016, 3 ♀♀, Md1, 9. Jun. 2016; 1 ♂, Md2, 5. May 2016, 1 ♀, Md2, 9. Jun. 2016; 1 ♀, Sl, 13. Jun. 2017; 1 ♀, FPl, 6. Jul. 2016. **MyS.** 2 ♀♀, Lst2, 16. Jun. 2017; 1 ♂, 1 ♀, Sl, 10. May – 16. Jun. 2017.
Xysticus laetus Thorell, 1875
YeS. 1 ♀, St1, 1 ♀, St3, 9. Jun. 2016; 1 ♀, St4, 14. Jun. 2017.
Xysticus marmoratus Thorell, 1875
YeS. 1 ♀, Lst1, 5. May 2016, 1 ♀, Lst1, 9. Jun. – 6. Jul. 2016; 1 ♀, Lst2, 5. May – 9. Jun. 2016.

Fam. Titanoecidae (2)
Titanoeca schineri L. Koch, 1872
YeS. 2 ♂♂, Md2, 1 ♂, Sl, 8. May – 14. Jun. 2017; 1 ♂ juv., FPl, 5. May – 9. Jun. 2016. **MyS.** 3 ♂♂, 1 ♀, Sl, 10. May – 16. Jun. 2017.
Titanoeca veteranica Herman, 1879
YeS. 1 ♂, Lst2, 5. May – 9. Jun. 2016, 1 ♂, Lst2, 9. Jun. – 6. Jul. 2016; 1 ♂, Md1, 2 ♂♂, Sl, 1 ♂, FPl, 8. May – 14. Jun. 2017.

Fam. Uloboridae (1)
Uloborus walckenaerius Latreille, 1806
YeS. 1 ♀, St3, 1 ♀, Lst1, 14. Jun. 2017. **MyS.** 1 ♀, St1, 18. Aug. 2017; 1 ♀, St1, 2 ♀♀, Lst2, 16. Apr. 2017.

Fam. Zodariidae (1)
Zodarion thoni Nosek, 1905
YeS. 1 ♀, Lst2, 2 ♂♂, Md1, 7 ♂♂, Sl, 8. May – 14. Jun. 2017. **MyS.** 1 ♀, Sl, 10. May – 16. Jun. 2017.