

PRELIMINARY REPORT ON SPIDER ASSEMBLAGE FROM THE PASTURES AND FIELD CROPS OF THE MUREŞ RIVER FLOODPLAIN

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Introduction.

Spiders (Araneae) are the most diverse group of predators in the world with 111 Families, 3879 Genera and 43244 described species (Platnick 2012). In spite of the rapid advance in spider taxonomy in the case of many species our knowledge is limited to their description. Very little is known about their biology, ecology, distribution.

The present study is aiming to identify spider assemblages present in different types of habitats found along the Mureş River floodplain and to assess if human activities, especially those from the agricultural fields are affecting the spider fauna composition at local level. It is known that spiders are effective predators contributing in the control of many insect species, so their importance to the ecosystem is high (Nyffeler and Benz 1987). However many studies show that they may be susceptible to different chemicals used in the agriculture (Huusela-Veistola 1998) while spider associations are sensible to the changes made in their habitat (Lubin *et al.* 2011).

Material and Methods.

The flood plain of Mureş River is situated in western Romania close to the border with Hungary. The region has a temperate climate with an average yearly rainfall of about 700 mm and average yearly temperatures of 11.5 °C (Atlasul Climatologic al Republicii Socialiste România).

From the biogeographic point of view the study area fits into two regions: Pannonic (between Szeged and around Arad) and continental (the area that is close to Lipova town and Mureş River Gorge).

Along the most of its length, the habitats along the studied section of the Mureş River are deeply affected by agriculture practices of all kinds: from cattle rising, to field crops and invasive new plant species.

The spiders were collected with the most common method: pitfall traps. These were put in soil and filled with Ethylene glycol. The pitfalls were set in batteries of 5, placed five meters apart. They were covered with a plastic lid and verified once a month from April to August 2012. The material was then collected and stored in 70% alcohol.

The pitfall traps were set in the following types of habitat: 1) Not grazed pasture (semi natural pasture); 2) Grazed pasture; 3) Wheat field; 4) Marsh.

For identification of the specimens we used the online spider identification key provided so kindly by Wolfgang Nentwig, Theo Blick, Daniel Gloor, Ambros Hänggi & Christian Kropf.

Results

We have found 122 species belonging to 19 families (table 1). That is almost 12% of the total number of spider species recorded so far from Romania.

From the zoogeographical point of view the spider assemblages found within the study site fit well into the Panonian and Continental bioregions. The great majority of the species collected are Palearctic (83), these are followed by Holarctic species (16), European to Central Asia species (12) and European ones (10).

The natural pasture was so far the richest habitat with 69 species. The grazed pasture had 43 species, the marsh 39 species, and the most affected by the human activity was the arable land with only 12 species.

Table 1. The enumeration of spider species found at the floodplain of the Mureş river, their known distribution and habitats in which each species was found.

<i>Taxon</i>	<i>Distribution</i>	<i>Natural Pasture</i>	<i>Grazed Pasture</i>	<i>Wheat field</i>	<i>Marsh</i>
Atypidae					
1. <i>Atypus muralis</i> Bertkau, 1890	Central Europe to Central Asia	×			
Mimetidae					
1. <i>Ero aphana</i> (Walckenaer, 1802)	Palearctic	×	×		
2. <i>Ero tuberculata</i> (De Geer, 1778)	Palearctic	×			
Uloboridae					
* 1. <i>Uloborus plumipes</i> Lucas, 1846	Old World	×			
2. <i>Uloborus walckenaerius</i> (Latreille, 1806)	Palearctic	×	×		
Theridiidae					
1. <i>Anelosimus vittatus</i> (C.L.Koch, 1836)	Palearctic	×			
2. <i>Crustulina guttata</i> (Wider, 1834)	Palearctic	×			
3. <i>Cryptachaea riparia</i> (Blackwall, 1834)	Palearctic				×

<i>Taxon</i>	<i>Distribution</i>	<i>Natural Pasture</i>	<i>Grazed Pasture</i>	<i>Wheat field</i>	<i>Marsh</i>
4. <i>Diploena melanogaster</i> (C.L.Koch, 1837)	Europe-north Africa- Azerbaijan	×			×
5. <i>Enoplognatha ovata</i> (Clerck, 1757)	Holarctic	×	×		
6. <i>Enoplognatha thoracica</i> (Hahn, 1833)	Holarctic	×			
7. <i>Episinus truncatus</i> Latreille, 1809	Palaearctic	×			
8. <i>Heterotheridion nigrovariegatum</i> (Simon, 1873)	Palaearctic	×			
9. <i>Neottiura bimaculata</i> (Linnaeus, 1767)	Holarctic	×	×		×
10. <i>Neottiura suaveolens</i> (Simon, 1879)	Europe, Russia	×	×		
11. <i>Simitidion simile</i> (C.L.Koch, 1836)	Holarctic	×	×		
12. <i>Theridion pictum</i> (Walckenaer, 1802)	Holarctic	×			
13. <i>Theridion pinastri</i> L.Koch, 1872	Palaearctic	×	×		
14. <i>Theridion uhligi</i> (Martin 1974)	Europe		×		
*Theridiosomadidae					
* <i>Theridiosoma gemmosum</i> (L. Koch, 1877)	Holarctic				×
Linyphiidae					
1. <i>Acartauchenius scurrilis</i> (O.P.-Cambridge, 1872)	Palaearctic	×			
2. <i>Agyneta subtilis</i> (O.P.-Cambridge, 1863)	Palaearctic	×	×	×	×
3. <i>Bathyphantes approximatus</i> (O.P.-Cambridge, 1871)	Palaearctic	×			
4. <i>Bathyphantes setiger</i> O.P.-Cambridge, 1894	Palaearctic	×			
5. <i>Centromerus sylvaticus</i> (Blackwall, 1841)	Holarctic	×			×
6. <i>Ceratinella brevis</i> (Wider, 1834)	Palaearctic	×			×

<i>Taxon</i>	<i>Distribution</i>	<i>Natural Pasture</i>	<i>Grazed Pasture</i>	<i>Wheat field</i>	<i>Marsh</i>
7. <i>Dicymbium nigrum</i> (Blackwall, 1834)	Paelearctic		×		
8. <i>Diplostyla concolor</i> (Wider, 1834)	Holarctic		×		
9. <i>Erigone dentipalpis</i> (Wider, 1834)	Holarctic	×	×	×	
10. <i>Gnathonarium dentatum</i> (Wider, 1834)	Paelearctic	×			
11. <i>Gongylidium rufipes</i> (Linnaeus, 1758) Paelearctic	Paelearctic	×			
12. <i>Labulla thoracica</i> (Wider, 1834)	Europe, Russia		×		×
13. <i>Linyphia hortensis</i> Sundevall, 1830	Paelearctic				×
14. <i>Linyphia triangularis</i> (Clerck, 1757)	Paelearctic				×
15. <i>Macrargus rufus</i> (Wider, 1834)	Paelearctic		×		
16. <i>Mansuphantes arciger</i> (Kulczynski, 1882)	Europe	×			
17. <i>Mansuphantes mansuetus</i> (Thorell, 1875)	Paelearctic		×		
18. <i>Maso sundevalli</i> (Westring, 1851)	Holarctic		×		
19. <i>Meioneta rurestris</i> (C.L.Koch, 1836)	Paelearctic	×	×		×
20. <i>Micrargus apertus</i> (O.P.-Cambridge, 1871)	Paelearctic			×	
21. <i>Nematogmus sanguinolentus</i> (Walckenaer, 1842)	Paelearctic		×		
22. <i>Neriene clathrata</i> (Sundevall, 1830)	Holarctic	×			
23. <i>Neriene peltata</i> (Wider, 1834)	Paelearctic, Greenland	×			
24. <i>Oedothorax agrestis</i> (Blackwall, 1853)	Paelearctic	×	×		
25. <i>Oedothorax apicatus</i> (Blackwall, 1850)	Paelearctic		×	×	×
26. <i>Pelecopsis elongata</i> (Wider, 1834)	Europe, Russia		×		

<i>Taxon</i>	<i>Distribution</i>	<i>Natural Pasture</i>	<i>Grazed Pasture</i>	<i>Wheat field</i>	<i>Marsh</i>
1834)					
27. <i>Pelecopsis radicolata</i> (L.Koch, 1872)	Paelearctic	×			
28. <i>Porrhomma pallidum</i> Jackson, 1913	Paelearctic	×			
29. <i>Pelecopsis parallela</i> (Wider, 1834)	Paelearctic	×			
30. <i>Prinerigone vagans</i> (Audouin, 1826)	Old World	×	×		
31. <i>Tapinocyba affinis</i> Lessert, 1907	Paelearctic			×	
32. <i>Tapinocyba biscissa</i> (O.P.-Cambridge, 1872)	Paelearctic			×	
33. <i>Tenuiphantes alacris</i> (Blackwall, 1853)	Paelearctic	×			
34. <i>Trichoncus affinis</i> Kulczynski, 1894	Paelearctic		×		
35. <i>Walckenaeria acuminata</i> Blackwall, 1833	Paelearctic		×		
36. <i>Walckenaeria alticeps</i> (Denis, 1952)	Europe, Iran	×			
37. <i>Walckenaeria capito</i> (Westring, 1861)	Holarctic	×			
38. <i>Walckenaeria monoceros</i> (Wider, 1834)	Europe, Kyrgystan		×		
Tetragnathidae					
1. <i>Tetragnatha montana</i> Simon, 1874	Paelearctic				×
2. <i>Pachygnatha degeeri</i> Sundevall, 1830	Holarctic				×
Araneidae					
1. <i>Araneus angulatus</i> Clerck, 1757	Paelearctic			×	×
2. <i>Araneus quadratus</i> Clerck, 1757	Paelearctic	×	×	×	
3. <i>Araniella cucurbitina</i> (Clerck, 1757)	Paelearctic	×			×
4. <i>Argiope bruennichi</i> (Scopoli, 1772)	Paelearctic	×	×		

<i>Taxon</i>	<i>Distribution</i>	<i>Natural Pasture</i>	<i>Grazed Pasture</i>	<i>Wheat field</i>	<i>Marsh</i>
5. <i>Hypsosinga heri</i> (Hahn, 1831)	Palaearctic				×
6. <i>Hypsosinga sanguinea</i> (C.L.Koch, 1844)	Palaearctic				×
Lycosidae					
1. <i>Alopecosa trabalis</i> (Clerck, 1757)	Europe, Central Asia		×		
2. <i>Aulonia albimana</i> (Walckenaer, 1805)	Palaearctic	×			
3. <i>Hogna radiata</i> (Latreille, 1817)	Central Europe, Central Asia	×	×	×	
4. <i>Pardosa agrestis</i> (Westring, 1861)	Palaearctic			×	
5. <i>Pardosa alacris</i> (C.L.Koch, 1833)	Europe, Russia	×			
6. <i>Pardosa hortensis</i> (Thorell, 1872)	Palaearctic	×	×		
7. <i>Pardosa lugubris</i> (Walckenaer, 1802)	Palaearctic	×			
8. <i>Pirata knorri</i> (Scopoli, 1763)	Palaearctic				×
9. <i>Pirata latitans</i> (Blackwall, 1841)	Palaearctic				×
10. <i>Trochosa robusta</i> (Simon, 1876)	Palaearctic				×
Pisauridae					
1. <i>Dolomedes fimbriatus</i> (Clerck, 1757)	Palaearctic				×
2. <i>Pisaura mirabilis</i> (Clerck, 1757)	Palaearctic	×	×	×	
Oxyopidae					
1. <i>Oxyopes heterophthalmus</i> (Latreille, 1804)	Palaearctic	×			
Zoridae					
1. <i>Zora silvestris</i> Kulczynski, 1897	Europe, Central Asia		×		
2. <i>Zora spinimana</i> (Sundevall, 1833)	Palaearctic	×	×		
3. <i>Zora sp.</i>		×			
Agelenidae					

<i>Taxon</i>	<i>Distribution</i>	<i>Natural Pasture</i>	<i>Grazed Pasture</i>	<i>Wheat field</i>	<i>Marsh</i>
1. <i>Malthonica campestris</i> (C.L.Koch, 1834)	Europe, Azerbaijan	×	×		
2. <i>Malthonica ferruginea</i> (Panzer, 1804)	Europe, Azores	×			
3. <i>Tegenaria agrestis</i> (Walckenaer, 1802)	Europe, Central Asia, North America	×			
4. <i>Tegenaria silvestris</i> (L.Koch, 1872)	Europe, Russia	×			
Clubionidae					
1. <i>Clubiona genevensis</i> L.Koch, 1866	Paelearctic	×	×		
2. <i>Clubiona subsultans</i> Thorell, 1875	Paelearctic				×
Zodariidae					
1. <i>Zodarion rubidum</i> Simon, 1914	Europe				×
Gnaphosidae					
1. <i>Micaria dives</i> (Lucas, 1846)	Paelearctic				×
2. <i>Micaria formicaria</i> (Sundevall, 1831)	Paelearctic				×
3. <i>Micaria fulgens</i> (Walckenaer, 1802)	Paelearctic				×
4. <i>Zelotes latreillei</i> (Simon, 1878)	Paelearctic	×			
5. <i>Zelotes sp. 1</i>			×		
6. <i>Zelotes sp. 2</i>			×		
Philodromidae					
1. <i>Philodromus aureolus</i> (Clerck, 1757)	Paelearctic				×
2. <i>Philodromus cespitum</i> (Walckenaer, 1802)	Holarctic				×
3. <i>Philodromus poecilus</i> (Thorell, 1872)	Paelearctic	×			
4. <i>Thanatus pictus</i> L. Koch, 1881	Paelearctic	×			
5. <i>Tibellus maritimus</i> (Menge, 1875)	Paelearctic	×	×	×	×
Thomisidae					
1. <i>Misumena vatia</i> (Clerck, 1757)	Holarctic	×	×		
2. <i>Ozyptila praticola</i> (C.L.Koch, 1834)	Holarctic	×			×

<i>Taxon</i>	<i>Distribution</i>	<i>Natural Pasture</i>	<i>Grazed Pasture</i>	<i>Wheat field</i>	<i>Marsh</i>
1837)					
3. <i>Oxyptila scabricula</i> (Westring, 1851)	Palearctic	×			×
4. <i>Synema globosum</i> (Fabricius, 1775)	Palearctic				
5. <i>Tmarus piger</i> (Walckenaer, 1802)	Palearctic	×			×
6. <i>Xysticus audax</i> (Schrank, 1803)	Palearctic		×		
7. <i>Xysticus ferrugineus</i> Menge, 1876	Palearctic		×		
8. <i>Xysticus lanio</i> C.L.Koch, 1835	Palearctic	×			
9. <i>Xysticus ulmi</i> (Hahn, 1831)	Palearctic	×	×		
Salticidae					
1. <i>Ballus chalybeius</i> (Walckenaer, 1802)	Europe, North Africa, Central Asia				×
2. <i>Carrhotus xanthogramma</i> (Latreille, 1819)	Palearctic				×
3. <i>Evarcha falcata</i> (Clerck, 1757)	Palearctic	×			
4. <i>Heliophanus auratus</i> C.L.Koch, 1835	Palearctic		×		
5. <i>Heliophanus cupreus</i> (Walckenaer, 1802)	Palearctic	×	×		
6. <i>Leptorchestes berolinensis</i> (C.L.Koch, 1846)	Europe, Turkmenistan		×		
7. <i>Marpissa nivoyi</i> (Lucas, 1846)	Palearctic				×
8. <i>Myrmarachne formicaria</i> (De Geer, 1778)	Palearctic				×
9. <i>Pellenes nigrociliatus</i> (Simon, 1875)	Palearctic	×	×		
10. <i>Sitticus distinguendus</i> (Simon, 1868)	Palearctic				×
11. <i>Sitticus zimmermanni</i> (Simon, 1877)	Europe, Central Asia				×
12. <i>Sitticus saxicola</i> (C.L.Koch, 1846)	Palearctic				×
13. <i>Synageles hilarulus</i> (C.L.Koch, 1846)	Palearctic	×			

Discussion

The present study has revealed that human disturbances in habitats are seriously affecting the spider community and species richness. In present study it was found that the most affected type of habitat was the wheat field which had the most severe vegetation cover change. In contrast the semi natural pasture was found to be the richest with 69 spider species.

Although the study region was located in two very well studied bioregions: Pannonian and Continental, the faunistical list revealed some novelties at least for Romania. Among the novelties that the present study brings are one new family of spiders for Romania: Theridiosomatidae, with a very rare species: *Theridiosoma gemosum* and another, this time invasive species which seems to be spreading towards east: *Uloborus plumipes* Lucas, 1846.

Conclusions

The present study shows that human activities are disrupting the spider assemblages and richness and so are interfering with one of the most important group of invertebrate predators that serve as pest control (Maloney *et al.* 2003). By reducing the number of spider species and richness the agriculture is deprived of one of the most important factors that control the herbivorous insect populations and so makes it more dependent on chemical alternatives.

The present study reveals that Romanian spider fauna has a new Spider Family: Theridiosomatidae with a new species: *Theridiosoma gemosum*. Also the Family Uloboridae with only two species (Weiss and Urak 2000) gets a third one: *Uloborus plumipes* a species that seems to spread eastwards. With this new record Romania is the eastern limit of the species in Europe.

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