

## Spiders (Araneae) of Chernivtsi City (Ukraine)

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**Abstract:** The spider fauna of buildings and other urban habitats (city parks, green areas of industrial enterprises, and housing estates) of Chernivtsi city was surveyed. In the period 2002–2011, 212 species belonging to 26 families were recorded. Previous studies found a total of 173 species of spiders belonging to 26 families from the territories which are now included in the city limits of Chernivtsi. Currently, the total spider species list for Chernivtsi includes 260 species of 30 families, of which 125 species (21 families) were recorded both by earlier researchers and by ourselves. The most important reasons for changes in urban spider assemblages are as follows: species habitat change, introduction of alien species, and description of new species unknown in the late 19th – early 20th centuries.

**Key words:** retrospective analysis, species composition, urban ecosystems

Urban habitats are becoming increasingly dominated by human-related factors and processes (GRIMM et al. 2000); yet most ecological studies focus on more natural and less human-altered ecosystems (SHOCHAT et al. 2004). Recent studies of the effect of urbanization on species composition show that urbanization can increase or decrease species richness, depending on the taxonomic group, the spatial scale of analysis, and the intensity of urbanization (MCKINNEY 2008). Certain studies focusing on changes in spider assemblages in urban habitats were undertaken during the last decades (KRZYŻANOWSKA et al. 1981, ANTOV et al. 2004, SHOCHAT et al. 2004, HORVÁTH et al. 2010, VARET et al. 2010). Yet, we do not know enough about the causes of changes in spider assemblages in urban environments. Some of them are due to alien spider species introduced to Europe (KOBELT & NENTWIG 2008). Habitat structure and productivity were shown to influence spider diversity and abundance in urban environments (SHOCHAT et al. 2004), as well as fragmentation of natural habitats due to urbanization (GIBBS & STANTON 2001, GIBB & HOCHULI 2002). However, changes in spider assemblages over time and under increasing urbanization are still poorly understood.

The aim of the present study is to conduct a retrospective analysis of the changes in spider assemblages

in Chernivtsi by a comparison of the results of our 10-year research (2002–2011) with the literature-derived data for the period 1874–1986.

### Material and methods

The material treated in this paper was collected in 2002–2011 within Chernivtsi city. Chernivtsi is the administrative centre of the Chernivtsi Region in western Ukraine; its population is 240,000 people. The city's area is 153 km<sup>2</sup> (the range of longitude is N 48°14'44.56"–48°23'53.55"; the range of latitude is E 25°49'59.96"–26°2'5.46"; the range of altitude is 151–510 m a.s.l.). The city is situated on the river Prut. According to the physiographic subdivision by MARYNYCH et al. (2003), this area belongs to the Ukrainian Carpathians Mountain Region. We collected the material using different methods (hand collecting, pitfall traps, sweeping with a net, and beating) in various urban habitats such as forests and open patches at the city's edge, city parks, green areas of industrial enterprises and housing estates, and buildings. The largest fraction of spider specimens from semi-natural habitats in Chernivtsi was collected by pitfall traps. The traps, with a diameter of 7 cm, were placed in a line, about 6 meters apart from each other and contained ethylene glycol as a preservative; traps were opened during the schedules shown below, and were emptied twice a month.

### The study localities were as follows:

**Tsetsyno Landscape Conservation Area, located at the city's edge:** This is a forest dominated by *Fagus sylvatica* L. partly mixed with *Quercus petraea* Liebl. and *Quercus robur* L. and open patches dominated by Poaceae. The trapping periods were, in both habitats,

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24.04.-04.05.2008 (15 traps) and 02.04.-29.05.2009 (30 traps).

**Four city parks:** Zhovtnevyi Park, Shevchenko Park, Fedkovych Park and Schiller Park are characterized mostly by artificially planted trees: *Acer*, *Carpinus*, *Tilia*, *Fraxinus*, *Picea*, *Betula*, *Robinia pseudoacacia* L., *Aesculus hippocastanum* L. The trapping periods were 04.-10.07.2006 (15 traps in Schiller Park) and 02.05.-02.12.2007 (15 traps in each of the four aforementioned parks).

**Green areas of seven industrial enterprises:** Chemical Plant, Mechanical Repair Plant, Brickyard # 1, Industria Factory, Bus-trolley Company, Electron-mash Plant, Quartz Plant. The trapping periods were 28.04.-28.05.2008 (15 traps in the area of each enterprise).

**Other urban habitats such as public gardens in Cathedral Square, Korduby str., Toliati str., Pidkovy str.; green areas on the grounds of the Biological Faculty of Chernivtsi University and College # 15; the Botanic Garden of Chernivtsi University:** The trapping periods were 09.07.-27.07.2007 and 07.05.-05.06.2008 (15 traps in each locality).

**Orchards containing fruit trees and beds of strawberries:** The trapping periods were 08.04.-10.06.2002 (30 traps).

A description of the city parks was given by FEDORIAK et al. (2010a); the green areas of industrial enterprises and other urban habitats were analyzed by FEDORIAK et al. (2010b). A total of 2496 adults and 499 juveniles (of which 155 were identifiable to species level) were captured by pitfall traps from the 21 localities.

We also collected 499 adults and 1191 juveniles (231 identifiable to species level) inhabiting the trees *Aesculus hippocastanum* L., *Tilia cordata* Mill., *Picea abies* (L.) Karst, *Thuja occidentalis* L., and *Acer negundo* L. during the periods May to October 2006-2008 from the aforementioned city parks and from planted trees on both sides of the streets J. Hlavka, Golovna, Chervonoarmiyska, Kyivska, Komarova, Korduby, L. Ukrainka, and Y. Fedkovych. Spiders from tree trunks included 197 adults and 576 juveniles (100 identifiable to species level) captured by hand collecting. A total of 302 adults and 615 juveniles (131 identifiable to species level) were collected from lower branches of trees by beating. Other spider specimens from different trees – 171 adults and 534 juveniles (79 identifiable to species level) – were collected in localities such as Tsetsyno Landscape Conservation

Area, the Botanic Garden of Chernivtsi University, and public gardens in Cathedral Square and Chervonoarmiyska str.

A total of 43 adults and 647 juveniles (159 identifiable to species level) were obtained from birds' nests collected from trees in different parts of the city. Additionally we used collecting methods such as hand-sorting litter samples and sweeping from nearly all the mentioned localities at different time periods as well as from the bank sediments of the river Prut; using these methods we caught a total of 476 adult specimens.

In this paper, we also include material collected from different indoor habitats such as the aforementioned industrial enterprises, multi-storey apartment buildings, and greenhouses. The characteristics of buildings and study methods have been already published by FEDORIAK et al. (2010c). A total of 7959 specimens of spiders from buildings were collected: 2995 adults and 4964 juveniles (4464 identifiable to species level).

We also assembled data on urban spiders inhabiting Chernivtsi on the basis of all available literature records for the period of 1874-1986 (NOWICKI 1874, ROȘCA 1930, 1935, 1936a, 1936b, 1937, 1938, LEGOTAI 1964, CHUMAK & PICHKA 1982, CHUMAK 1986). We included the species recorded by earlier researchers both from Chernivtsi and from settlements such as Tsetsyno, Hot Urban, Klokuchka, Roshia, and Zhuchka, which later became parts of Chernivtsi.

NOWICKI (1874) recorded 26 species without mentioning details of collecting methods and habitats. ROȘCA (1930-1938) recorded 159 species from Chernivtsi, as the area of the city is currently defined. A description of habitats and collecting methods was not provided, but the author mentioned such habitats as the beech forest on Mt. Tsetsyno, banks of the river Prut, the Botanical Garden, and buildings. ROȘCA (1936) provided each species with information on the 'ecological group' to which it belonged, depending on its habitat preferences and other peculiarities: terrestrial forms, plant forms, domestic forms, and hydrophilic forms. Recently, we discussed the distribution of spiders in Chernivtsi according to Roșca's publications (FEDORIAK & ZHUKOVETS 2011). LEGOTAI (1964) mentioned two species from Chernivtsi without any details of collecting methods and habitats. CHUMAK & PICHKA (1982) and CHUMAK (1986) recorded three spider species collected in greenhouses of the Botanic Garden of Chernivtsi

from plants, walls, and the soil surface.

The scientific nomenclature follows PLATNICK (2012). Invalid species names in the literature-derived data are omitted from the analysis (appendix 1). *Lepthyphantes collinus* (L. Koch, 1872) (ROŞCA 1936) is considered to be *Megaleptyphantes pseudocollinus* Saaristo, 1997 (see SAARISTO 1997). According to the division by KLAUSNITZER (1987), all urban habitats are subdivided into two large groups (buildings and other terrestrial habitats). Thus we analyzed spiders inhabiting buildings (indoor habitats) separately from those inhabiting other (outdoor) habitats.

No publications of earlier researchers contained precise numerical data on abundances of the recorded species. ROŞCA (1936, 1937) provided almost every species with information on how often it was observed in Bukovyna: 'very often', 'often', 'not often' or 'rarely'. Therefore we applied only a presence/absence comparison. When discussing our own material, in order to separate the most abundant species in each of the treated spider assemblages, we followed STÖCKER & BERGMANN (1977) with dominance classes such as: 31.7-100 % – eudominant; 10.1-31.6 % – dominant; 3.2-10.0 % – subdominant; 1.1-3.1 % – recedent; less than 1 % – subrecedent. All calculations in this paper relate to adult specimens.

## Results

During the period 2002–2011, we collected a total of 14878 specimens representing 212 species belonging to 114 genera and 26 families. The commonest families were: Linyphiidae (25.9 %), Theridiidae (11.3 %), Lycosidae (10.4 %), Thomisidae (6.1 %), Araneidae (6.1 %), Agelenidae (6.1 %), and Salticidae (5.7 %). In Table 1 the most abundant spider species from the soil surface (epigeal fauna), trees, and buildings of Chernivtsi are sorted in descending abundance according to their localities.

In total, 107 **epigeal** species were captured using pitfall traps from different green areas of Chernivtsi. *Pardosa lugubris* sensu stricto is the most abundant species of the epigeal spider fauna (19.6 % of adults) dominating in city parks, public gardens and other green territories; yet, it is the eudominant species in the industrial enterprises areas sampled. PROKO-PENKO (2000) mentioned *P. lugubris* as a dominant species in five parks of Donetsk (Ukraine). However, it was not abundant in other localities we surveyed – only three specimens were trapped from the Tsetsyno Landscape Conservation Area and from the orchards. The cumulative percentage of *Pachygnatha degeeri*

(Tetragnathidae) was nearly the same as for *P. lugubris* (19.5 %). *P. degeeri* is the only species that dominates the epigeal spider faunas of all the sampled localities, apart from the orchards. *Alopecosa pulverulenta* (5.1 %) is the subdominant species of the Tsetsyno Landscape Conservation Area (5.7 %), green areas of industrial enterprises (7.2 %), and the orchards (6.0 %). *Pardosa agrestis* (4.6 %) is distributed very unevenly in the investigated sites: 42.2 % of the adults were trapped from the orchards, 2.8 % – from the Tsetsyno Landscape Conservation Area, and 0.3 % – from the city parks. Some other Lycosidae species were also abundant in the epigeal fauna of Chernivtsi city (in descending cumulative percentage): *Pardosa prativaga* (4.7 %), *P. paludicola* (3.7 %), *Trochosa terricola* (3.5 %), *T. ruricola* (3.3 %). The cumulative percentages of the other species did not reach 3 % of the adult spider specimens captured by pitfall traps in the sampled localities. Of the representatives of other families some linyphiids, such as *Diplostyla concolor* (2.6 %) and *Diplocephalus picinus* (1.8 %), and thomisids, *Xysticus cristatus* (2.2 %), were also abundant in the epigeal spider fauna of Chernivtsi.

*Enoplognatha ovata* (42.5 %) is the most abundant species inhabiting **trees** of Chernivtsi, followed by *Steatoda bipunctata* (5.8 %), *Leptyphantes minutus* (4.6 %), *Platnickina tincta* (3.6 %), and *Entelecara acuminata* (3.1 %). We collected these species both from tree crowns and trunks. *Enoplognatha ovata* prefers crowns, while *S. bipunctata*, *L. minutus*, *P. tincta*, and *E. acuminata* were found mainly on tree trunks. Some other species were abundant (>3 %) on tree trunks: *Moebelia penicillata*, *Clubiona lutescens*, *Erigone dentipalpis*, *Hylyphantes graminicola*, and *Hypomma cornutum* – in the city parks, while *Micaria subopaca*, *Clubiona brevipes*, *Linyphia triangularis*, *Parasteatoda tepidariorum*, *Salticus zebraneus*, *Neottiura bimaculata*, and *Dictyna uncinata* – in the trees planted on the street margins.

During our research we collected a total of 83 species (7959 spiders) from **indoor habitats** of Chernivtsi, of which *Pholcus phalangioides* (50.2 %) was the most abundant species in buildings of different types. Cumulative percentages of *Parasteatoda tepidariorum* (11.7 %), *Steatoda castanea* (5.9 %), *Tegenaria domestica* (2.9 %), *Steatoda triangulosa* (2.8 %), *Pholcus alticeps* (2.8 %), *Ph. ponticus* (2.6 %), *Steatoda grossa* (2.5 %), *Ph. opilionoides* (2.4 %), *Spermophora senoculata* (2.3 %), and *Leptyphantes leprosus* (2.1 %) were higher than those of the other species in the buildings of Chernivtsi.

**Tab. 1:** The most abundant spider species from Chernivtsi. Numbers in brackets show relative abundance (% of adults).

Locality	Dominance classes		
	Eudominant	Dominant	Subdominant
Epigeal fauna			
Tsetsyno Landscape Conservation Area		<i>Pachygnatha degeeri</i> (25.2)	<i>Pardosa paludicola</i> (9.1) <i>Trochosa terricola</i> (8.5) <i>Alopecosa pulverulenta</i> (5.7) <i>Pardosa alacris</i> (5.3) <i>Pardosa palustris</i> (5.0) <i>Trochosa ruricola</i> (4.9) <i>Xysticus cristatus</i> (4.1) <i>Inermocoelotes inermis</i> (3.8) <i>Inermocoelotes falciger</i> (3.4)
City parks		<i>Pachygnatha degeeri</i> (19.2) <i>Pardosa lugubris</i> (18.7) <i>Diplostyla concolor</i> (16.0)	<i>Erigone dentipalpis</i> (6.2) <i>Ozyptila praticola</i> (4.9) <i>Diplocephalus cristatus</i> (4.3) <i>Centromerus sylvaticus</i> (3.5)
Green areas of industrial enterprises	<i>Pardosa lugubris</i> (49.1)	<i>Pachygnatha degeeri</i> (18.0) <i>Pardosa prativaga</i> (13.5)	<i>Alopecosa pulverulenta</i> (7.2) <i>Pardosa amentata</i> (5.0)
Other urban habitats	<i>Diplocephalus picinus</i> (32.0)	<i>Pachygnatha degeeri</i> (22.4) <i>Pardosa lugubris</i> (16.8)	<i>Trochosa ruricola</i> (4.0) <i>Tenuiphantes flavipes</i> (3.2)
Orchards	<i>Pardosa agrestis</i> (42.2)	<i>Xerolycosa miniata</i> (14.6)	<i>Pardosa palustris</i> (9.5) <i>Alopecosa pulverulenta</i> (6.0) <i>Trochosa ruricola</i> (6.5) <i>Xysticus cristatus</i> (6.0)
Trees			
City parks	<i>Enoplognatha ovata</i> (41.1)		<i>Platnickina tinctoria</i> (4.9) <i>Steatoda bipunctata</i> (4.9) <i>Entelecara acuminata</i> (4.6)
Sides of streets	<i>Enoplognatha ovata</i> (39.9)		<i>Micaria subopaca</i> (7.5) <i>Steatoda bipunctata</i> (6.4) <i>Platnickina tinctoria</i> (4.6) <i>Entelecara acuminata</i> (3.5)
Buildings			
Greenhouses	<i>Pbolcus phalangioides</i> (34.1) <i>Parasteatoda tepidariorum</i> (32.1)	<i>Pbolcus opilionoides</i> (16.3)	<i>Parasteatoda tabulata</i> (5.0)
Buildings of the Industrial enterprises	<i>Pbolcus phalangioides</i> (46.9)	<i>Parasteatoda tepidariorum</i> (12.9)	<i>Pbolcus ponticus</i> (7.8) <i>Tegenaria domestica</i> (7.2) <i>Steatoda triangulosa</i> (4.0) <i>Pbolcus alticeps</i> (3.8) <i>Megalepthyphantes nebulosus</i> (3.4) <i>Steatoda castanea</i> (3.2)
Apartment buildings	<i>Pbolcus phalangioides</i> (55.4)		<i>Steatoda castanea</i> (8.7) <i>Parasteatoda tepidariorum</i> (6.6) <i>Steatoda grossa</i> (4.3) <i>Spermophora senoculata</i> (4.0)

Spiders recorded from Chernivtsi during 1874–1986 were represented by 173 species, belonging to 96 genera and 26 families (Tab. 2, appendix 2). The commonest families were as follows: Linyphiidae (24.3 %), Lycosidae (13.9 %), Thomisidae (9.8 %), Theridiidae (9.2 %), Araneidae (6.9 %), and Salticidae (6.6 %). Nine species were recorded from buildings and 166 from other urban habitats.

Taking into account the information provided by earlier researchers and that resulting from own work, the total spider fauna of Chernivtsi city consists of 260 species from 131 genera and 30 families (appendix 2). Of these, 125 species were mentioned in the literature and occurred in our data. We found 87 species that were not previously reported from Chernivtsi, whereas 48 species of those reported earlier were not found during our survey. Obviously, there were ‘exclusive species’ that were mentioned only in the literature or occurred only in our data. The share of ‘exclusive species’ is higher at present (Tab. 2); the majority of them belong to Linyphiidae, Lycosidae, Theridiidae, Thomisidae, Gnaphosidae, and Agelenidae.

Differences between the historical records and our data were found in species numbers of various families (Tab. 2). In 15 families the number of species increased by 50 %. We noticed the greatest increase in species numbers for Gnaphosidae (4.5-fold), Dictynidae (2-fold), Agelenidae (1.6-fold), and Theridiidae (1.5-fold). Species numbers remained the same in eight families. In comparison with the historical data, we found a smaller number of species of the following three families: Thomisidae, Lycosidae, and Miturgidae. We found no species of Cybaeidae, Sparassidae, Uloboridae, and Zoridae in the area of Chernivtsi, whereas earlier researchers recorded one species from each of these families.

## Discussion

ROŞCA (1936) singled out synanthropic species (‘domicole’) as a separate ecological group of spiders. Overall, he mentioned seven species as synanthropic. Of these, following Roşca’s terminology, four species were collected ‘very often’: viz., *Pholcus opilionoides*, *Ph. phalangioides*, *Steatoda bipunctata*, and *S. castanea*; three were collected ‘often’: viz., *Tegenaria atrica*, *T. domestica*, and *Steatoda grossa*. We collected all these species in buildings in Chernivtsi. Percentages of all of them, except *S. bipunctata*, are higher indoors than in any of the semi-natural habitats such as city parks, lawns. At the same time, ROŞCA (1936) regarded *Parasteatoda tepidariorum* as a species living in trees

**Tab. 2:** Total numbers of species of different families collected during 2002–2011 (our data) and recorded during 1874–1986 (historical, literature-derived data) from Chernivtsi.

Family	Our data	Historical data	Exclusive species	
			Our data	Historical data
Agelenidae	13	8	6	1
Amaurobiidae	2	2	0	0
Anypheidae	1	1	0	0
Araneidae	13	12	3	2
Clubionidae	7	6	2	1
Corinnidae	1	1	0	0
Cybaeidae	0	1	0	1
Dictynidae	6	3	3	0
Dysderidae	3	1	2	0
Gnaphosidae	9	2	7	0
Hahniidae	1	0	1	0
Linyphiidae	55	42	28	15
Liocranidae	1	1	0	0
Lycosidae	22	24	7	9
Mimetidae	2	2	0	0
Miturgidae	1	2	1	2
Nesticidae	1	0	1	0
Philodromidae	6	6	2	2
Pholcidae	5	2	3	0
Pisauridae	1	1	0	0
Salticidae	12	11	3	2
Scytodidae	1	0	1	0
Segestriidae	1	1	0	0
Sparassidae	0	1	0	1
Tetragnathidae	10	8	3	1
Theridiidae	24	16	10	2
Thomisidae	13	17	3	7
Uloboridae	0	1	0	1
Zodariidae	1	0	1	0
Zoridae	0	1	0	1
<b>Totals</b>	<b>212</b>	<b>173</b>	<b>87</b>	<b>48</b>

(his ecological group – ‘arboricole’) and noted that it was very common in bushes and trees. In our samples, only 0.5 % of the specimens collected from parks and other semi-natural habitats of Chernivtsi belong to *P. tepidariorum*, with the species being much more



abundant in synanthropic habitats (inside buildings; see Tab. 1). Regarding other synanthropic species that are now abundant indoors, ROŞCA (1936) considered *Lepthyphantes leprosus* to occur under stones ('lapidicole'); *Pholcus alticeps*, *Ph. ponticus*, and *Steatoda triangulosa* were not reported by earlier researchers.

Among 'arboricole' species, seven were collected 'very often' (ROŞCA 1936): viz., *Metellina segmentata*, *Parasteatoda simulans*, *Parasteatoda tepidariorum*, *Philodromus dispar*, *Tetragnatha obtusa*, *Theridion pictum*, and *Theridion pinastri*. We collected all of them except *P. tepidariorum* (see above) and *Metellina segmentata* more often from trees than from other habitats in Chernivtsi. Thirteen 'arboricole' species were collected 'often' (ROŞCA 1936): viz., *Ero aphanis*, *Ero furcata*, *Cryptachaea riparia*, *Neottiura bimaculata*, *Paidiscura pallens*, *Parasteatoda lunata*, *Philodromus poecilus*, *Platnickina tinctoria*, *Salpicus scenicus*, *Sitticus pubescens*, *Tetragnatha nigrita*, *Thanatus arenarius*, *Theridion varians*. Of these, four species (*P. poecilus*, *T. arenarius*, *T. nigrita*, and *P. lunata*) were not found during our survey; the others with two exceptions (*S. scenicus* and *P. pallens*) were found mainly in trees.

BLICK (2011) recently published a list of the 20 most abundant spider species on tree trunks in German forests; we captured ten of the mentioned species from trees in Chernivtsi: *Anyphaena accentuata*, *Diplocephalus cristatus*, *Drapetisca socialis*, *Enoplognatha ovata*, *Lathys humilis*, *Lepthyphantes minutus*, *Meioneta innotabilis*, *Moebelia penicillata*, *Philodromus collinus*, and *Xysticus audax*.

In general, ROŞCA (1936, 1937) recorded 152 species from outdoor habitats in the present area of Chernivtsi. Of these, he specified that 22 species were collected 'very often', 112 – 'often', 12 – 'not often', and two – 'rarely'; for four species such information was not provided. According to our data, 183 species inhabit semi-natural habitats in Chernivtsi. However, of the species mentioned by ROŞCA (1936) from the 'very often' and 'often' categories we failed to locate 15 species: *Coelotes atropos*, *Clubiona caerulea*, *Centromerus ludovici*, *Hypomma bituberculatum*, *Erigone atra*, *Mansuphantes mansuetus*, *Frontinellina frutetorum*, *Neriene peltata*, *Alopecosa trabalis*, *Pirata piraticus*, *Thanatus arenarius*, *Evarcha laetabunda*, *Zora pardalis*, *Xysticus luctuosus* and, *Xysticus lanio*.

Thus, it seems fair to conclude that the spider assemblages of these areas have undergone some changes. Several reasons are likely to be responsible for such changes:

**1. Species habitat change.** The spider fauna of urban green areas differs from that of natural and even suburban habitats (KRZYŻANOWSKA et al. 1981, SHOCHAT et al. 2004). Regarding our study area, some species were recorded by earlier researchers from the city, whereas we found them only outside the city. For example, we collected *Araeoncus humilis*, *Erigone atra*, and *Arctosa stigmosa* only on the banks of mountain rivers in the Chernivtsi Region (EVTUSHENKO & FEDORIAK 2003) and never from Chernivtsi itself. On the other hand, we collected certain species (e.g., *Inermocoelotes falciger*, *Histoipona torpida*, *Drassyllus pusillus*) from Chernivtsi, whereas earlier researchers recorded them from a number of localities outside the city (ROŞCA 1930, 1936).

**2. Introduction of alien species.** Europe received at least 2000 small alien invertebrate species, including spiders, and most of them were introduced within the last 100 years (KOBELT & NENTWIG 2008). We collected five adults of *Agelenopsis potteri* in buildings within Chernivtsi and seven more in other habitats of the city. *A. potteri* is a Nearctic species (CHAMBERLIN & IVIE 1941) which was recorded from Kyrgyzstan, Russia, and Ukraine (MARUSIK & KOPONEN 2000, MARUSIK et al. 2007, PROKOPENKO & HOYDYK 2006). We also trapped five adults of *Zodarion rubidum* on the grounds of Chernivtsi enterprises and one more in the city park (FEDORIAK et al. 2010b, 2010c). *Z. rubidum* is spreading throughout Europe along railroads (PEKÁR 2002).

**3. Descriptions of new species unknown in the late 19th – early 20th centuries.** Of the 212 species we collected from Chernivtsi, five were described after 1930: *Pholcus alticeps* Spassky, 1932; *Saloca kulczyński* Miller & Kratochvíl, 1939; *Parasteatoda tabulata* (Levi, 1980); *Enoplognatha latimana* Hippa & Oksala, 1982, and *Megaleptyphantes pseudocollinus* Saaristo, 1997. Obviously, these species could be recognised neither by Nowicki nor by Roşca, the researchers who undertook the most profound earlier inventories of the spider fauna.

Other reasons for the changes in the species assemblages of Chernivtsi spider fauna cannot be excluded: e.g., possible differences in the collection methods used by earlier researchers and by ourselves, or collections that were not taken from comparable sites.

## Conclusions

Spiders are shown to be a species-rich group in urban habitats of Chernivtsi city (212 spider species belonging to 114 genera and 26 families were found during 2002–2011). This suggests the necessity of surveying urban habitats while estimating spider biodiversity of different regions.

*Pardosa lugubris* and *Pachygnatha degeeri* were the most abundant species of the epigeal spider fauna, *Enoplognatha ovata* of trees, and *Pholcus phalangioides* of the synanthropic spider fauna.

Differences in spider species composition between the data recorded in 1874–1986 and our own (2002–2011) may reflect changes in the spider fauna of Chernivtsi city as a result of the combination of several processes, namely: species habitat change, introduction of alien species and description of new species unknown in the late 19th – early 20th centuries.

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**Appendix 1:** List of invalid species names recorded during 1874-1986 from Chernivtsi.

Species	Citation	Notes
<i>Porrhomma calypso</i> (Bertkau, in Förster & Bertkau, 1883)	(Roșca 1930), (Roșca 1936)	Nomen dubium (PLATNICK 2012), we omitted it from the analysis
<i>Aranea rayi</i> var. <i>betulae</i> Sulz., <i>Aranea Rayi</i> Scop.	(Roșca 1936) (Roșca 1936)	Both species are considered to be <i>Araneus marmoreus</i> Clerck, 1757
<i>Lycosa chelata</i> O. F. Muller. <i>Lycosa lugubris</i> Walck.	(Roșca 1930) (Roșca 1930)	Both species are considered to be <i>Pardosa lugubris</i> (Walckenaer, 1802)
<i>Tarentula andrenivora</i> Walck. <i>Tarentula pulverulenta</i> Cl.	(Roșca 1930) (Roșca 1930)	Both species are considered to be <i>Alopecosa pulverulenta</i> (Clerck, 1757)
<i>Xysticus cristatus</i> L. Koch. <i>Xysticus viaticus</i> Linne.	(Roșca 1930) (Roșca 1930)	Both species are considered to be <i>Xysticus cristatus</i> (Clerck, 1757)



**Appendix 2:** List of spider species collected during 2002-2011 (our data) and recorded during 1874-1986 (historical, literature-derived data) from Chernivtsi. Names of the earlier researchers: N – Nowicki, R – Roşca, L – Legotai, Ch & P – Chumak & Pichka, Ch – Chumak.

Taxa	Our data, adults (ind.)		Historical data	
	Build-ings	Other habitats	Buildings	Other habitats
<b>Agelenidae</b>				
<i>Agelena labyrinthica</i> (Clerck, 1757)	2	4		R 1936
<i>Agelenopsis potteri</i> (Blackwall, 1846)	5	7		
<i>Allagelena gracilens</i> (C.L. Koch, 1841)	1			R 1936
<i>Coelotes atropos</i> (Walckenaer, 1830)				R 1936
<i>Histopona torpida</i> (C.L. Koch, 1837)		10		
<i>Inermocoelotes falciger</i> (Kulczyński, 1897)		34		
<i>Inermocoelotes inermis</i> (L. Koch, 1855)		43		R 1936
<i>Malthonica ferruginea</i> (Panzer, 1804)	10	3		R 1936
<i>Malthonica pagana</i> (C.L. Koch, 1840)	1			
<i>Malthonica picta</i> (Simon, 1870)	1			
<i>Tegenaria agrestis</i> (Walckenaer, 1802)	4	3		
<i>Tegenaria atrica</i> C.L. Koch, 1843	7		R 1936	
<i>Tegenaria domestica</i> (Clerck, 1757)	88	1	R 1936	
<i>Tegenaria parietina</i> (Fourcroy, 1785)	1	1		R 1936
<b>Amaurobiidae</b>				
<i>Amaurobius ferox</i> (Walckenaer, 1830)	8			R 1936
<i>Callobius claustrarius</i> (Hahn, 1833)		1		R 1936
<b>Anyphaenidae</b>				
<i>Anyphaena accentuata</i> (Walckenaer, 1802)	1	2		R 1936
<b>Araneidae</b>				
<i>Araneus diadematus</i> Clerck, 1757	8	4		R 1936
<i>Araneus marmoreus</i> Clerck, 1757	1	1		N 1874
<i>Araneus quadratus</i> Clerck, 1757	1			N 1874
<i>Araneus saevus</i> (L. Koch, 1872)		1		
<i>Araneus sturmi</i> (Hahn, 1831)				N 1874
<i>Araneus triguttatus</i> (Fabricius, 1793)		1		
<i>Araniella cucurbitina</i> (Clerck, 1757)		7		R 1936, L 1964
<i>Araniella opisthographa</i> (Kulczyński, 1905)	1			R 1936
<i>Argiope bruennichi</i> (Scopoli, 1772)		1		R 1936
<i>Gibbaranea bituberculata</i> (Walckenaer, 1802)				N 1874
<i>Gibbaranea gibbosa</i> (Walckenaer, 1802)		1		R 1937
<i>Larinioides ixobolus</i> (Thorell, 1873)	4	1		
<i>Larinioides sclopetarius</i> (Clerck, 1757)	1			N 1874
<i>Mangora acalypha</i> (Walckenaer, 1802)		4		R 1936
<i>Singa nitidula</i> C.L. Koch, 1844		3		R 1936
<b>Clubionidae</b>				
<i>Clubiona brevipes</i> Blackwall, 1841		6		
<i>Clubiona caerulescens</i> L. Koch, 1867				N 1874, R 1936
<i>Clubiona comta</i> C.L. Koch, 1839		14		
<i>Clubiona germanica</i> Thorell, 1871		1		R 1936
<i>Clubiona lutescens</i> Westring, 1851		14		R 1936
<i>Clubiona marmorata</i> L. Koch, 1866		1		N 1874
<i>Clubiona neglecta</i> O. P.-Cambridge, 1862		1		R 1936
<i>Clubiona pallidula</i> (Clerck, 1757)	1	4		R 1936
<b>Corinnidae</b>				
<i>Phrurolithus festivus</i> (C.L. Koch, 1835)		5		R 1936

Taxa	Our data, adults (ind.)		Historical data	
	Buildings	Other habitats	Buildings	Other habitats
<b>Cybaeidae</b>				
<i>Cybaeus angustiarum</i> L. Koch, 1868				R 1936
<b>Dictynidae</b>				
<i>Cicurina cicur</i> (Fabricius, 1793)		3		R 1936
<i>Dictyna arundinacea</i> (Linnaeus, 1758)		6		
<i>Dictyna civica</i> (Lucas, 1850)	1			
<i>Dictyna uncinata</i> Thorell, 1856	1	10		R 1936
<i>Lathys humilis</i> (Blackwall, 1855)		4		R 1936
<i>Nigma walckenaeri</i> (Roewer, 1951)	4	1		
<b>Dysderidae</b>				
<i>Dysdera crocata</i> C.L. Koch, 1838		1		R 1936
<i>Harpactea rubicunda</i> (C.L. Koch, 1838)	6	1		
<i>Harpactea saeva</i> (Herman, 1879)		4		
<b>Gnaphosidae</b>				
<i>Drassodes pubescens</i> (Thorell, 1856)		1		
<i>Drassyllus pusillus</i> (C.L. Koch, 1833)		10		
<i>Haplodrassus signifer</i> (C.L. Koch, 1839)		2		
<i>Haplodrassus silvestris</i> (Blackwall, 1833)		1		R 1936
<i>Micaria formicaria</i> (Sundevall, 1831)		1		
<i>Micaria nivosa</i> L. Koch, 1866		1		
<i>Micaria pulicaria</i> (Sundevall, 1831)		4		
<i>Micaria subopaca</i> Westring, 1861		13		
<i>Scotophaeus scutulatus</i> (L. Koch, 1866)	3			R 1936
<b>Hahniidae</b>				
<i>Hahnia nava</i> (Blackwall, 1841)		4		
<b>Linyphiidae</b>				
<i>Agyseta decora</i> (O. P.-Cambridge, 1871)		3		
<i>Aræoncus humilis</i> (Blackwall, 1841)				R 1936
<i>Bathypantes gracilis</i> (Blackwall, 1841)	3			
<i>Bathypantes nigrinus</i> (Westring, 1851)	1	4		R 1936
<i>Centromerita bicolor</i> (Blackwall, 1833)		2		
<i>Centromerus ludovici</i> Bösenberg, 1899				R 1936
<i>Centromerus sylvaticus</i> (Blackwall, 1841)		13		R 1936
<i>Ceratinella major</i> Kulczyński, 1894		1		
<i>Dicymbium nigrum</i> (Blackwall, 1834)		10		R 1936
<i>Dicymbium tibiale</i> (Blackwall, 1836)		2		R 1936
<i>Diplocephalus cristatus</i> (Blackwall, 1833)		24		R 1936
<i>Diplocephalus latifrons</i> (O. P.-Cambridge, 1863)		4		
<i>Diplocephalus picinus</i> (Blackwall, 1841)		45		
<i>Diplostyla concolor</i> (Wider, 1834)	2	70		R 1936
<i>Dismodicus bifrons</i> (Blackwall, 1841)		1		
<i>Drapetisca socialis</i> (Sundevall, 1833)		1		N 1874, R 1936
<i>Entelecara acuminata</i> (Wider, 1834)	1	23	Ch & P 1982, Ch 1986	R 1936
<i>Erigone atra</i> Blackwall, 1833				R 1936
<i>Erigone dentipalpis</i> (Wider, 1834)	5	35		R 1930, R 1937
<sup>1</sup> <i>Erigone remota</i> L. Koch, 1869				R 1936
<sup>2</sup> <i>Erigone tirolensis</i> L. Koch, 1872				R 1936
<i>Frontinellina frutetorum</i> (C.L. Koch, 1834)				N 1874, R 1936
<i>Helophora insignis</i> (Blackwall, 1841)		6		
<i>Hylyphantes graminicola</i> (Sundevall, 1830)		5		R 1937
<i>Hypomma bituberculatum</i> (Wider, 1834)				R 1936

Taxa	Our data, adults (ind.)		Historical data	
	Buildings	Other habitats	Buildings	Other habitats
<i>Hypomma cornutum</i> (Blackwall, 1833)		5		
<i>Lepthyphantes leprosus</i> (Ohlert, 1865)	64	1		R 1936
<i>Lepthyphantes minutus</i> (Blackwall, 1833)	1	36		
<i>Linyphia hortensis</i> Sundevall, 1830		6		R 1936
<i>Linyphia triangularis</i> (Clerck, 1757)	4	13		R 1936
<i>Macrargus rufus</i> (Wider, 1834)		1		
<i>Mansuphantes mansuetus</i> (Thorell, 1875)				R 1936
<i>Megalepthyphantes nebulosus</i> (Sundevall, 1830)	44	2		
<i>Megalepthyphantes pseudocollinus</i> Saaristo, 1997		2		R 1936
<i>Meioneta fuscipalpa</i> (C.L. Koch, 1836)		1		
<i>Meioneta innotabilis</i> (O. P.-Cambridge, 1863)		1		
<i>Meioneta mollis</i> (O. P.-Cambridge, 1871)		3		
<i>Meioneta rurestris</i> (C.L. Koch, 1836)	5	11		
<i>Micrargus herbigradus</i> (Blackwall, 1854)		1		
<i>Micrargus subaequalis</i> (Westring, 1851)		3		
<i>Microlinyphia pusilla</i> (Sundevall, 1830)		1		R 1936
<i>Microneta viaria</i> (Blackwall, 1841)		3		R 1936
<i>Moebelia penicillata</i> (Westring, 1851)	1	11		
<i>Nematogmus sanguinolentus</i> (Walckenaer, 1841)		2		
<i>Neriere clathrata</i> (Sundevall, 1830)	4	10		
<i>Neriere emphana</i> (Walckenaer, 1841)				R 1936
<i>Neriere montana</i> (Clerck, 1757)	7	9		R 1936
<i>Neriere peltata</i> (Wider, 1834)				R 1936
<i>Neriere radiata</i> (Walckenaer, 1841)				R 1936
<i>Oedothorax apicatus</i> (Blackwall, 1850)	1	1		R 1936
<i>Oedothorax fuscus</i> (Blackwall, 1834)				R 1936
<i>Oedothorax insignis</i> (Bösenberg, 1902)				R 1936
<i>Oedothorax retusus</i> (Westring, 1851)		1		
<i>Pityohyphantes phrygianus</i> (C.L. Koch, 1836)				N 1874
<i>Porrhomma pygmaeum</i> (Blackwall, 1834)		2		
<i>Saloca kulczynskii</i> Miller & Kratochvil, 1939		1		
<i>Stemonyphantes lineatus</i> (Linnaeus, 1758)		2		
<i>Tapinocyba pallens</i> (O. P.-Cambridge, 1872)		2		
<i>Tenuiphantes cristatus</i> (Menge, 1866)		1		R 1936
<i>Tenuiphantes flavipes</i> (Blackwall, 1854)		15		R 1936
<i>Tenuiphantes mengei</i> (Kulczyński, 1887)	1	7		R 1936
<i>Tenuiphantes tenebricola</i> (Wider, 1834)		3		R 1936
<i>Tenuiphantes tenuis</i> (Blackwall, 1852)	1	3		R 1936
<i>Tenuiphantes zimmermanni</i> (Bertkau, 1890)	3	1		R 1936
<i>Thyreostenius parasiticus</i> (Westring, 1851)	1	5		
<i>Trematocephalus cristatus</i> (Wider, 1834)		7		R 1936
<i>Walckenaeria cucullata</i> (C.L. Koch, 1836)		5		R 1936
<i>Walckenaeria fusca</i> Roşca, 1935				R 1936
<i>Walckenaeria mitrata</i> (Menge, 1868)		2		
<i>Walckenaeria obtusa</i> Blackwall, 1836		2		R 1936
<b>Liocranidae</b>				
<i>Agroeca brunnea</i> (Blackwall, 1833)		1		R 1936
<b>Lycosidae</b>				
<i>Alopecosa accentuata</i> (Latreille, 1817)		4		N 1874, R 1930
<i>Alopecosa barbipes</i> (Sundevall, 1833)				R 1936
<i>Alopecosa cuneata</i> (Clerck, 1757)		18		

Taxa	Our data, adults (ind.)		Historical data	
	Buildings	Other habitats	Buildings	Other habitats
<i>Alopecosa pulverulenta</i> (Clerck, 1757)		132		R 1936
<i>Alopecosa roeweri</i> (Roşca, 1937)				R 1937
<i>Alopecosa trabalis</i> (Clerck, 1757)				N 1874, R 1936
<i>Arctosa cinerea</i> (Fabricius, 1777)		2		N 1874
<i>Arctosa figurata</i> (Simon, 1876)				R 1936
<i>Arctosa lutetiana</i> (Simon, 1876)				R 1936
<i>Arctosa stigmata</i> (Thorell, 1875)				R 1936
<i>Aulonia albimana</i> (Walckenaer, 1805)		4		
<i>Lycosa singoriensis</i> (Laxmann, 1770)				N 1874, R 1936
<i>Pardosa agrestis</i> (Westring, 1861)	1	115		R 1936
<i>Pardosa agricola</i> (Thorell 1856)		1		
<i>Pardosa alacris</i> (C.L. Koch, 1833)		53		N 1874
<i>Pardosa amentata</i> (Clerck, 1757)	1	78		R 1936
<i>Pardosa fulvipes</i> (Collett, 1876)		8		
<i>Pardosa lugubris</i> (Walckenaer, 1802)		503		R 1936
<i>Pardosa monticola</i> (Clerck, 1757)		1		
<i>Pardosa nigriceps</i> (Thorell, 1856)		1		
<i>Pardosa paludicola</i> (Clerck, 1757)		93		R 1936
<i>Pardosa palustris</i> (Linnaeus, 1758)	1	74		R 1936
<i>Pardosa prativaga</i> (L. Koch, 1870)	1	122		R 1930
<i>Pardosa pullata</i> (Clerck, 1757)		32		R 1936
<i>Pardosa sphagnicola</i> (Dahl, 1908)		1		R 1936
<i>Pirata piraticus</i> (Clerck, 1757)		6		R 1936
<i>Piratula hygrophila</i> (Thorell, 1872)				R 1936
<i>Trochosa robusta</i> (Simon, 1876)				R 1936
<i>Trochosa ruricola</i> (De Geer, 1778)	3	88		R 1936
<i>Trochosa terricola</i> Thorell, 1856		89		R 1936
<i>Xerolycosa miniata</i> (C.L. Koch, 1834)		32		
<b>Mimetidae</b>				
<i>Ero aphana</i> (Walckenaer, 1802)		5		R 1936
<i>Ero furcata</i> (Villers, 1789)		1		R 1936
<b>Miturgidae</b>				
<i>Cheiracanthium erraticum</i> (Walckenaer, 1802)				R 1936
<i>Cheiracanthium mildei</i> L. Koch, 1864	12			
<i>Cheiracanthium oncognathum</i> Thorell, 1871				R 1936
<b>Nesticidae</b>				
<i>Nesticus cellulanus</i> (Clerck, 1757)	13			
<b>Philodromidae</b>				
<i>Philodromus albidus</i> Kulczyński, 1911	1	5		
<i>Philodromus aureolus</i> (Clerck, 1757)	1	1		R 1936
<i>Philodromus cespitum</i> (Walckenaer, 1802)	2	3		R 1936
<i>Philodromus collinus</i> C.L. Koch, 1835		2		
<i>Philodromus dispar</i> Walckenaer, 1826		3		R 1936
<i>Philodromus poecilus</i> (Thorell, 1872)				N 1874, R 1936
<i>Thanatus arenarius</i> L. Koch, 1872				R 1936
<i>Tibellus oblongus</i> (Walckenaer, 1802)		1		R 1936
<b>Pholcidae</b>				
<i>Pholcus alticeps</i> Spassky, 1932	85			
<i>Pholcus opilionoides</i> (Schrank, 1781)	72	3		R 1936
<i>Pholcus phalangioides</i> (Fuesslin, 1775)	1503	1		R 1936, Ch & P 1982



Taxa	Our data, adults (ind.)		Historical data	
	Buildings	Other habitats	Buildings	Other habitats
<i>Pbolcus ponticus</i> Thorell, 1875	77			
<i>Spermophora senoculata</i> (Duges, 1836)	69			
<b>Pisauridae</b>				
<i>Pisaura mirabilis</i> (Clerck, 1757)	1	10		R 1936
<b>Salticidae</b>				
<i>Asianellus festivus</i> (C.L. Koch, 1834)		5		N 1874, R 1937
<i>Ballus chalybeius</i> (Walckenaer, 1802)		1		N 1874, R 1936
<i>Evarcha arcuata</i> (Clerck, 1757)		1		R 1936
<i>Evarcha falcata</i> (Clerck, 1757)		1		R 1936
<i>Evarcha laetabunda</i> (C.L. Koch, 1846)				R 1936
<i>Heliophanus auratus</i> C.L. Koch, 1835		2		R 1937
<i>Heliophanus cupreus</i> (Walckenaer, 1802)		2		R 1936
<i>Heliophanus flavipes</i> (Hahn, 1832)		2		
<i>Heliophanus tribulosus</i> Simon, 1868				R 1936
<i>Myrmarachne formicaria</i> (De Geer, 1778)	1			R 1936
<i>Salticus scenicus</i> (Clerck, 1757)	1	2		R 1936
<i>Salticus zebraneus</i> (C.L. Koch, 1837)		7		
<i>Sibianor aurocinctus</i> (Ohlert, 1865)		2		
<i>Sitticus pubescens</i> (Fabricius, 1775)	3	1		R 1936
<b>Scytodidae</b>				
<i>Scytodes thoracica</i> (Latreille, 1802)	18			
<b>Segestriidae</b>				
<i>Segestria senoculata</i> (Linnaeus, 1758)	1	1		R 1936
<b>Sparassidae</b>				
<i>Micrommata virescens ornata</i> (Walckenaer, 1802)				N 1874
<b>Tetragnathidae</b>				
<i>Metellina mendei</i> (Blackwall, 1870)	4	1		R 1936
<i>Metellina segmentata</i> (Clerck, 1757)	5	2		R 1936
<i>Pachygnatha clercki</i> Sundevall, 1823	1	3		R 1936
<i>Pachygnatha degeeri</i> Sundevall, 1830	3	517		R 1936
<i>Pachygnatha listeri</i> Sundevall, 1830		12		
<i>Tetragnatha dearmata</i> Thorell, 1873		2		
<i>Tetragnatha extensa</i> (Linnaeus, 1758)		1		R 1936
<i>Tetragnatha montana</i> Simon, 1874		6		R 1936
<i>Tetragnatha nigrata</i> Lendl, 1886				R 1936
<i>Tetragnatha obtusa</i> C.L. Koch, 1837	1	4		R 1936
<i>Tetragnatha pinicola</i> L. Koch, 1870	1			
<b>Theridiidae</b>				
<i>Asagena phalerata</i> (Panzer, 1801)		5		
<i>Cryptachaea riparia</i> (Blackwall, 1834)		1		R 1936
<i>Dipoena melanogaster</i> (C.L. Koch, 1837)		3		
<i>Enoplognatha latimana</i> Hippa & Oksala, 1982		5		
<i>Enoplognatha ovata</i> (Clerck, 1757)	2	590		R 1936, L 1958
<i>Enoplognatha thoracica</i> (Hahn, 1833)		1		
<i>Episinus angulatus</i> (Blackwall, 1836)	1			
<i>Neottiura bimaculata</i> (Linnaeus, 1767)		9		R 1936
<i>Oblertidion oblerti</i> (Thorell, 1870)				R 1936
<i>Paidiscura pallens</i> (Blackwall, 1834)		1		R 1936
<i>Parasteatoda lunata</i> (Clerck, 1757)				R 1936
<i>Parasteatoda simulans</i> (Thorell, 1875)	28	10		R 1936
<i>Parasteatoda tabulata</i> (Levi, 1980)	60	1		

Taxa	Our data, adults (ind.)		Historical data	
	Buildings	Other habitats	Buildings	Other habitats
<i>Parasteatoda tepidariorum</i> (C.L. Koch, 1841)	349	18	Ch & P 1982	R 1936
<i>Phylloneta impressa</i> (L. Koch, 1881)	3	1		R 1936
<i>Platnickina tinctoria</i> (Walckenaer, 1802)	3	28		N 1874, R 1936
<i>Robertus arundineti</i> (O. P.- Cambridge, 1871)		2		
<i>Steatoda albomaculata</i> (De Geer, 1778)		1		
<i>Steatoda bipunctata</i> (Linnaeus, 1758)	14	43	R 1936	
<i>Steatoda castanea</i> (Clerck, 1757)	178	1	R 1936	
<i>Steatoda grossa</i> (C.L. Koch, 1838)	76	1	R 1936	
<i>Steatoda triangulosa</i> (Walckenaer, 1802)	85	1		
<i>Theridion mystaceum</i> L. Koch, 1870		2		
<i>Theridion pictum</i> (Walckenaer, 1802)		1		R 1936
<i>Theridion pinastri</i> L. Koch, 1872	1	2		R 1936
<i>Theridion varians</i> Hahn, 1833	2	13		N 1874, R 1936
<b>Thomisidae</b>				
<i>Diaea dorsata</i> (Fabricius, 1777)		1		R 1936
<i>Ebrechtella tricuspidata</i> (Fabricius, 1775)		4		R 1936
<i>Misumena vatia</i> (Clerck, 1757)		2		R 1936
<i>Ozyptila atomaria</i> (Panzer, 1801)		3		
<i>Ozyptila praticola</i> (C.L. Koch, 1837)	1	36		R 1930
<i>Ozyptila pullata</i> (Thorell, 1875)				R 1936
<i>Ozyptila rauda</i> Simon, 1875		3		
<i>Pistius truncatus</i> (Pallas, 1772)				N 1874
<i>Runcinia grammica</i> (C.L. Koch, 1837)				R 1936
<i>Synema globosum</i> (Fabricius, 1775)				N 1874
<i>Tmarus piger</i> (Walckenaer, 1802)				N 1874
<i>Xysticus acerbus</i> Thorell, 1872		24		R 1936
<i>Xysticus audax</i> (Schrank, 1803)		6		R 1936
<i>Xysticus bifasciatus</i> C.L. Koch, 1837		7		R 1936
<i>Xysticus cristatus</i> (Clerck, 1757)		57		R 1936
<i>Xysticus erraticus</i> (Blackwall, 1834)		1		
<i>Xysticus kochi</i> Thorell, 1872		45		R 1936
<i>Xysticus lanio</i> C.L. Koch, 1835				N 1874, R 1936
<i>Xysticus luctuosus</i> (Blackwall, 1836)				R 1936
<i>Xysticus ulmi</i> (Hahn, 1831)		5		R 1936
<b>Uloboridae</b>				
<i>Hyptiotes paradoxus</i> (C.L. Koch, 1834)				N 1874
<b>Zodariidae</b>				
<i>Zodarion rubidum</i> Simon, 1914		6		
<b>Zoridae</b>				
<i>Zora pardalis</i> Simon, 1878				R 1936
<b>Number of species in each category</b>	<b>83</b>	<b>192</b>	<b>9</b>	<b>166</b>
<b>Totals (our data and historical data)</b>	<b>212</b>		<b>173</b>	
<b>Total</b>	<b>212</b>		<b>260</b>	

<sup>1</sup>*Erigone remota* and <sup>2</sup>*Erigone tirolensis* are recorded from Chernivtsi (Roşca 1936) with a note that they were found on the bank of the Prut river in a pile of rubbish and were probably transported from somewhere else.