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 km² (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°2'25.46"; the range of altitude is 151-510 m a.s.l.). The city is situated on the river Prut. According 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,
Four city parks: Zhovtneviy 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, Rosha, 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 & ZHUHOVETS 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) (ROSCA 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. ROSCA (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. PROKOPENKO (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, 28 % – 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 %), Tegenaria domestica (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 Diplodysta 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 %), Lepthyphantes 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 zebranus, 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 aliticeps (2.8 %), Ph. ponticus (2.6 %), Steatoda grossa (2.5 %), Ph. opilionoides (2.4 %), Spermophora senoculata (2.3 %), and Lepthyphantes lopesus (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                              | Eudominant                      | Dominant                       | Subdominant                      |
|---------------------------------------|---------------------------------|--------------------------------|----------------------------------|
| Locality                              | Dominance classes               |                                |                                  |
| Tsetsyno                              |                                 | Epigeal fauna                  |                                  |
| Landscape                             |                                 | Pachygnatha degeneri (25.2)    | Pardosa paludicola (9.1)          |
| Conservation                         |                                 |                                | Trochosa terricola (8.5)          |
| Area                                  |                                 |                                | Alopecosa pulvurienta (5.7)       |
| City parks                            |                                 | Pardosa lugubris (19.2)        | Pardosa alacris (5.3)             |
|                                        |                                 | Pardosa palustris (5.0)        | Trochosa ruricola (4.9)           |
|                                        |                                 | Diplostyla concolor (16.0)     | Xysticus cristatus (4.1)          |
|                                        |                                 |                                | Inermacoelotes inermis (3.8)      |
|                                        |                                 |                                | Inermacoelotes faleiger (3.4)     |
| Green areas                           |                                 | Pardosa lugubris (49.1)        | Alopecosa pulvurienta (7.2)       |
| of industrial                         |                                 | Pardosa lugubris (18.0)        | Pardosa amentata (5.0)            |
| enterprises                            |                                 | Pardosa pratovaga (13.5)       |                                  |
| Other urban                           |                                 | Pachygnatha degeneri (22.4)    | Trochosa ruricola (4.0)           |
| habitats                               |                                 | Pardosa lugubris (16.8)        | Tenatiiphanes flavipes (3.2)      |
| Orchards                               |                                 | Xerolyssus miniata (14.6)      | Pardosa palustris (9.5)           |
|                                        |                                 |                                | Alopecosa pulvurienta (6.0)       |
|                                        |                                 |                                | Trochosa ruricola (6.5)           |
|                                        |                                 |                                | Xysticus cristatus (6.0)          |
| Trees                                 |                                 |                                |                                  |
| City parks                            | Enoplognatha ovata (41.1)       | Platnickina tinca (4.9)        |                                 |
|                                        |                                 | Steatoda bipunctata (4.9)      |                                 |
|                                        |                                 | Entelecra acuminata (4.6)      |                                 |
| Sides of streets                      | Enoplognatha ovata (39.9)       | Micaria subopaca (7.5)         |                                 |
|                                        |                                 | Steatoda bipunctata (6.4)      |                                 |
|                                        |                                 | Platnickina tinca (4.6)        |                                 |
|                                        |                                 | Entelecra acuminata (3.5)      |                                 |
| Buildings                             |                                 |                                |                                  |
| Greenhouses                           | Pholcus phalangioides (34.1)    | Parasteatoda tepidarium (5.0)  |                                 |
|                                        | Pholcus opilionoides (16.3)     |                                |                                 |
|                                        | Pholcus ponticus (7.8)          |                                |                                 |
|                                        | Tegenaria domestica (7.2)       |                                |                                 |
|                                        | Steatoda triangulosa (4.0)      |                                |                                 |
|                                        | Pholcus aliepus (3.8)           |                                |                                 |
|                                        | Megalephylphantes nebulosus (3.4)|                                |                                 |
|                                        | Steatoda castanea (3.2)         |                                |                                 |
| Buildings of the Industrial           | Pholcus phalangioides (46.9)    | Parasteatoda tepidarium (12.9) |                                 |
| enterprises                           |                                |                                |                                 |
|                                        | Pholcus ponticus (7.8)          |                                |                                 |
|                                        | Tegenaria domestica (7.2)       |                                |                                 |
|                                        | Steatoda triangulosa (4.0)      |                                |                                 |
|                                        | Pholcus aliepus (3.8)           |                                |                                 |
|                                        | Megalephylphantes nebulosus (3.4)|                                |                                 |
|                                        | Steatoda castanea (3.2)         |                                |                                 |
| Apartment buildings                   | Pholcus phalangioides (55.4)    | Steatoda castanea (8.7)        |                                 |
|                                        |                                | Parasteatoda tepidarium (6.6)  |                                 |
|                                        |                                | Steatoda grossa (4.3)          |                                 |
|                                        |                                | Spermophsora sensculata (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 our 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), Ageilenidae (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

R0ŠCA (1936) singled out synanthropic species (‘domicole’) as a separate ecological group of spiders. Overall, he mentioned seven species as synanthropic. Of these, following Rosca’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, R0ŠCA (1936) regarded Parasteatoda tepidariorum as a species living in trees (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

| Family            | Our data | Historical data | Exclusive species |
|-------------------|----------|-----------------|-------------------|
|                   |          |                 |                   |
| Agelenidae        | 13       | 8               | 6                 |
| Amaurobiidae      | 2        | 2               | 0                 |
| Anyphaenidae      | 1        | 1               | 0                 |
| Araneidae         | 13       | 12              | 3                 |
| Clubionidae       | 7        | 6               | 2                 |
| Corinnidae        | 1        | 1               | 0                 |
| Cybaeidae         | 0        | 1               | 0                 |
| Dictynidae        | 6        | 3               | 3                 |
| Dysderidae        | 3        | 1               | 2                 |
| Gnaphosidae       | 9        | 2               | 7                 |
| Hahniidae         | 1        | 0               | 1                 |
| Linyphiidae       | 55       | 42              | 28                |
| Liocranidae       | 1        | 1               | 0                 |
| Lycosidae         | 22       | 24              | 7                 |
| Mimetidae         | 2        | 2               | 0                 |
| Miturgidae        | 1        | 2               | 1                 |
| Nesticidae        | 1        | 0               | 1                 |
| Philodromidae     | 6        | 6               | 2                 |
| Pholcididae       | 5        | 2               | 3                 |
| Pissauridae       | 1        | 1               | 0                 |
| Salticidae        | 12       | 11              | 3                 |
| Sicytidae         | 1        | 0               | 1                 |
| Segestriidae      | 1        | 1               | 0                 |
| Sparassidae       | 0        | 1               | 0                 |
| Tetragnathidae    | 10       | 8               | 3                 |
| Theridiidae       | 24       | 16              | 10                |
| Thomisidae        | 13       | 17              | 3                 |
| Uloboridae        | 0        | 1               | 0                 |
| Zodariidae        | 1        | 0               | 1                 |
| Zoridae           | 0        | 1               | 0                 |
| **Totals**        | **212**  | **173**         | **87**            | **48**              |
abundant in synanthropic habitats (inside buildings; see Tab. 1). Regarding other synanthropic species that are now abundant indoors, ROŠCA (1936) considered Leptothyphantes lepraus to occur under stones (‘lapidicole’); Pholcus aliceps, Ph. ponticus, and Steatoda triangulosa were not reported by earlier researchers.

Among ‘arboricole’ species, seven were collected ‘very often’ (ROŠCA 1936): viz., Metellina segmentata, Parasteatoda simulans, Parasteatoda tepidariorum, Philodromus dispers, 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’ (ROŠCA 1936): viz., Ero aphana, Ero furcata, Cryptachaea riparia, Neottiura bimaculata, Paidiscura pallens, Parasteatoda lunata, Philodromus poecilus, Platnickina tincta, Sitticus 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, Latbys humilis, Leptothyphantes poecilus, Platnickina tincta, Salticus 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.

In general, ROŠCA (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 ROŠCA (1936) from the ‘very often’ and ‘often’ categories we failed to locate 15 species: Coelotes atropos, Clubiona caerulescens, Centrocerus ludoavi, Hypomna bitubercolatum, Erigone atra, Mansuphantes mansuetus, Frontinellina frutetorum, Neriena peltata, Alopecosa trabalis, Pirata piraticus, Thanatus arenarius, Évarcha laetabunda, Zora pardalis, Xysticus lactuusus 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 Araneus hami-
lis, Erigone atra, and Arctosa stigmata 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 faileiger, Histoposa torpida, Drassyllus pusillus) from Chernivtsi, whereas earlier researchers recorded them from a number of localities outside the city (ROŠCA 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 & KOPPONEN 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 aliceps Spassky, 1932; Saloca kuleczynski Miller & Katochvil, 1939; Parasteatoda tabulata (Levi, 1980); Enoplognatha latimana Hippa & Oksala, 1997. Obviously, these species could be recognised neither by Nowicki nor by Rošca, 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.
Spiders of Chernivtsi City

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 epigean 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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References
ANTOV A., S. LAZAROV, C. DELTSHEV & G. BLAGOEV (2004): Spiders from the Sofia Region. A faunistic and zoogeographical analysis. In: PENEV L., J. NIEMELA, D.J. KOTZE & N. CHIPEV (Eds.): Ecology of the City of Sofia. Species and communities in an urban environment. Pensoft Publishers, Sofia–Moscow. pp. 355-363
BICK T. (2011): Abundant and rare spiders on tree trunks in German forests (Arachnida, Araneae). – Arachnologische Mitteilungen 40; 5-14 – doi: 10.5431/armit4002
CHAMBERLIN R.V. & W. IVIE (1941): North American Agelenidae of the Genera Agelenopsis, Galilena & Ritalena. – Annals of the entomological society of America 34: 585-628
CHUMAK P.Y. & V.E. PICHKA (1982): Species composition and trophic relations of representatives of the order Aranei in the greenhouses of Ukraine. – Ochrana, izuchenie i obogashchenie rastitelnogo mira 9: 112-114 [in Russian]
CHUMAK P.Y. (1986): Species composition and trophic relations of arthropods that live in greenhouses of Chernivtsi. – Ochrana, izuchenie i obogashchenie rastitelnogo mira 13: 108-112 [in Russian]

EVTSUHENKO K.V. & M.M. FEDORIAK (2003): Species composition and distribution of spiders (Aranei), living in the stone deposits on the banks of six mountain streams in Chernivtsi Region. – Vestnik Zoologii 16: 25-28 [in Russian]
FEDORIAK M.M., S.S. RUDENKO, Y.M. MARUSIK & L.V. BRUSHIVSKVA (2010a): Spiders-herpetobiontes of Chernivtsi city parks. – Zapovidna sprava v Ukraini 16 (1): 64-71 [in Ukrainian]
FEDORIAK M.M., L.V. BRUSHIVSKVA & S.S. RUDENKO (2010b): Transformation of spiders-herpetobionts communities as an indicator of technogenic pollution of urboccosystems (on the example of Chernivtsi city). – Dopovidi Natsionalnoyi akademiyi nauk Ukraïny 4: 198-204 [in Ukrainian]
FEDORIAK M.M., L.V. BRUSHIVSKVA & S.S. RUDENKO (2010c): Spider assemblages of premises of industrial enterprises in the biomonitoring researchers of urbocoeosystems state (on the example of Chernivtsi city). – Ekologiya ta noosferologiya 21: 27-37 [in Ukrainian]
FEDORIAK M. & E. ZHU VO VETS (2011): Spiders of Chernivtsi city (Ukraine): a comparison actual species composition and species recorded by A. Roșca (1930-1938). – Volumul de lucrări al simpozionului „Biodiversitatea șii și restructurarea insectelor din România”, Suceava, 2010: 157-169
GIBB H. & D.F. HOCHULI (2002): Habitat fragmentation in an urban environment: large and small fragments support different arthropod assemblages. – Biological Conservation 106: 91-100 – doi: 10.1016/S0006-3207(01)00232-4
GIBBS J.P. & E.J. STANTON (2001): Habitat fragmentation and arthropod community change: carrion beetles, phoretic mites, and flies. – Ecological Applications 11: 79-85 – doi: 10.1890/1051-0761(2001)011(0079:HF AACC)2.0.CO;2
GRIMM N.B., M. GROVE, S.T.A. PICKETT & C. REDMAN (2000): Integrated approaches to long-term studies of urban ecological systems. – BioScience 50: 571-584
HORVÁTH R., C. SZINETÁR, T. MAGURA & B. TÓTH-MÉRESZ (2010): Effects of urbanization on ground-dwelling spiders along a rural-suburban-urban lowland forest gradient in Hungary. – Book of Abstracts, 18th International Congress of Arachnology, Siedlce, Poland: 193
KL AUSNITZER B. (1987): Ökologie der Großstadtauna. Gustav Fischer Verlag, Stuttgart, New York. 225 pp.
KOBE LT M. & W. NENTWIG (2008): Alien spider introductions to Europe supported by global trade. – Diversity and Distributions 14: 273-280 – doi: 10.1111/j.1472-4642.2007.00426.x
KRZYŻAŃOWSKA E., A. DZIABASZEWSKI, B. JACKOWSKA & W. STARĘGA (1981): Spiders (Arachnoidea, Aranei) of Warsaw and Mazovia. – Memorabilia Zoologica 34: 165-180
LEGOTAI M.V. (1964): Spiders in cultural biocenoses of Transcarpathia. – Ekologia nasekomyh i drugih bespozvonochnyh Sovetskikh Karpat: materialy mezhvuzovskoi konferenci, Uzhgorod 1964: 52-59 [in Russian]

MARUSIK Y.M. & S. KOPONEN (2000): New data on spiders (Aranei) from the Maritime Province, Russian Far East. – Arthropoda Selecta 9: 55-68

MARUSIK Y.M., A.V. TANASEVITCH, D.K. KURENCHIKOV & D.V. LOGUNOV (2007): A check-list of the spiders (Araneae) of the Bolshekehkhtsyrski Nature Reserve, Khabarovsk Province, the Russian Far East. – Acta Arachnologica Sinica 16: 37-64

MARYNYCH O.M., G.O. PARKHOMENKO, O.M. PETRENKO & P.G. SHYSHCHENKO (2003): Improved scheme of physical and geographical zoning of Ukraine. – Ukrainskiyi heohrafichnyi Zhurnal 1: 16-20 [in Ukrainian]

McKINNEY M.L. (2008): Effects of urbanization on species richness: a review of plants and animals. – Urban ecosystems 11: 161-176 – doi: 10.1007/s11252-007-0045-4

NOWICKI M. (1874): Dodatek do fauny paj^cz^kow Galicyi. Sprawozdanie komisyi fizyjograficznej, Krakow 8: 1-11

PEKÅ R.S. (2002): Zodarion rubidum Simon, 1914: Railroad Riders? – Newsletter of the British Arachnological Society 95: 11-12

PLATNICK N.I. (2012): The world spider catalog, version 12.5. American Museum of Natural History. – Internet: http://research.amnh.org/iz/spiders/catalog/ [accessed 18.III.2012]

PROKOPENKO E.V. (2000): Peculiarities of araneofauna (Aranei) distribution in urban landscapes. – Izvestia Har’kovskogo entomologicheskogo obschestva 7: 191-193 [in Russian]

PROKOPENKO E.V. & I.A. HOIDYK (2006): The spread of Agelenopsis potteri (Blackwall, 1846) - alien Northamerican species in Left-bank Ukraine. – Visnyk Donetskoho Universytetu. Ser. A: Pryrodnych nauk 2: 257-260 [in Russian]

ROÅÇCA A. (1930): ContribuÅþiunî la cunoaÅþterea Arachnoidelor din Bucovina. – Buletinul Facultăţii de Ştiinţe din Cernăuţi 4: 201-219

ROÅÇCA A. (1935): Neue Spinnenarten aus der Bukowina (Rumänien). – Zoologerischer Anzeiger 111: 241-254

ROÅÇCA A. (1936a): Eine neue Spinnenart der Gattung Tarentula Sund. 1833 aus der Bukowina (Rumänien). – Festschrift Strand 1: 261-263

ROÅÇCA A. (1936b): Fauna Araneelor din Bucovina (Sistemática, ecología y ràspandirea geografica). – Buletinul Facultăţii de Ştiinţe din Cernăuţi 10: 123-216

ROÅÇCA A. (1937): Eine weitere neue Spinnenart der Gattung Tarentula Sund. 1833 aus der Bukowina (Rumänien). – Zoologerischer Anzeiger 117: 329-331

ROÅÇCA A. (1938): Supplement la fauna Araneelor din Bucovina. – Buletinul Facultăţii de Ştiinţe din Cernăuţi 11 (1937): 225-236

SAARISTO M.I. (1997): Description of Megalepythaphantes pseudocollinus n. sp. (Araneae: Linyphiidae: Micronetinae). – Bulletin of the British arachnological Society 10: 257-259

SHOCHAT E., W.L. STEFANOW, M.E.A. WHITEHOUSE & S.H. FAETH (2004): Urbanization and spider diversity: influences of human modification of habitat structure and productivity. – Ecological Applications 14: 268-280 – doi: 10.1890/02-5341

STÖCKER G. & A. BERGMANN (1977): Ein Modell der Dominanzstruktur und seine Anwendung. – Archiv für Naturschutz und Landschaftsforschung 17: 1-26

VARET M., J. PETILLON & F. BUREL (2010): Spider assemblages in urban habitats from Rennes (Brittany, France). Book of Abstracts, 18th International Congress of Arachnology. Siedlce, Poland. pp. 459-461

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

| Species | Citation | Notes |
|---------|----------|-------|
| Porrhomma calypso (Bertkau, in Förster & Bertkau, 1883) | (RoÅÇca 1930), (RoÅÇca 1936) | Nomen dubium (PLATNICK 2012), we omitted it from the analysis |
| Aranea rayi var. betulae Sulz., Aranea Rayi Scop. | (RoÅÇca 1936) | Both species are considered to be Araneus marmoreus Clerck, 1757 |
| Aranea rayi var. betulae Sulz., Aranea Rayi Scop. | (RoÅÇca 1936) | Both species are considered to be Araneus marmoreus Clerck, 1757 |
| Lycosa chelata O. F. Muller. | (RoÅÇca 1930) | Both species are considered to be Lycosa chelata O. F. Muller. |
| Lycosa chelata O. F. Muller. | (RoÅÇca 1930) | Both species are considered to be Lycosa chelata O. F. Muller. |
| Tarentula andrenivora Walck. | (RoÅÇca 1930) | Both species are considered to be Tarentula andrenivora Walck. |
| Tarentula andrenivora Walck. | (RoÅÇca 1930) | Both species are considered to be Tarentula andrenivora Walck. |
| Xysticus cristatus L. Koch. | (RoÅÇca 1930) | Both species are considered to be Xysticus cristatus L. Koch. |
| Xysticus viaticus Linne. | (RoÅÇca 1930) | Both species are considered to be Xysticus viaticus Linne. |
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 – Roșca, L – Legotai, Ch & P – Chumak & Pichka, Ch – Chumak.

| Taxa                     | Our data, adults (ind.) | Historical data |
|--------------------------|-------------------------|-----------------|
|                          | Buildings | Other habitats | Buildings | Other habitats |
| **Agelenidae**           |           |               |           |               |
| *Agelenia labyrintha* (Clerck, 1757) | 2         | 4              | R         | 1936          |
| *Agelenopsis potteri* (Blackwall, 1846) | 5         | 7              | R         | 1936          |
| *Allageleina gracilens* (C.L. Koch, 1841) | 1         |                 | R         |                |
| *Coelotes atropos* (Walckenaer, 1830) |           |                 | R         | 1936          |
| *Histopona torpida* (C.L. Koch, 1837) | 10        |                 |           |               |
| *Inermocelotes falciger* (Kulczyński, 1897) | 34        |                 |           |               |
| *Inermocelotes inermis* (L. Koch, 1855) | 43        |                 | R         | 1936          |
| *Malthonica ferruginea* (Panzer, 1804) | 10        | 3              | R         | 1936          |
| *Malthonica pagana* (C.L. Koch, 1840) | 1         |                 | R         |                |
| *Malthonica picta* (Simon, 1870) | 1         |                 | R         |                |
| *Tegenaria agrestis* (Walckenaer, 1802) | 4         | 3              | R         | 1936          |
| *Tegenaria atria* C.L. Koch, 1843 | 7         |                 | R         | 1936          |
| *Tegenaria domestica* (Clerck, 1757) | 88        | 1              |           | R 1936        |
| *Tegenaria partitana* (Fourcroy, 1785) | 1         | 1              |           | R 1936        |
| **Amaurobiidae**         |           |               |           |               |
| *Amaurobius ferox* (Walckenaer, 1830) | 8         |                 | R         | 1936          |
| *Callobius clausuarius* (Hahn, 1833) | 1         |                 | R         | 1936          |
| **Anyphaenidae**         |           |               |           |               |
| *Anyphaena accentuata* (Walckenaer, 1802) | 1         | 2              | R         | 1936          |
| **Araneidae**            |           |               |           |               |
| *Araneus diadematus* Clerck, 1757 | 8         | 4              | R         | 1936          |
| *Araneus marmoreus* Clerck, 1757 | 1         | 1              | N         | 1874          |
| *Araneus quadratus* Clerck, 1757 | 1         |                 | N         | 1874          |
| *Araneus saevus* (L. Koch, 1872) |           | 1              |           |               |
| *Araneus sturti* (Hahn, 1831) |           |                 | N         | 1874          |
| *Araneus triguttatus* (Fabricius, 1793) |           | 1              |           |               |
| *Araniella cucurbitina* (Clerck, 1757) |           | 7              | R         | 1936, L 1964  |
| *Araniella opisthographa* (Kulczyński, 1905) | 1         |                 | R         | 1936          |
| *Argiope bruennichi* (Scopoli, 1772) |           | 1              | R         | 1936          |
| *Gibbaranea bituberculata* (Walckenaer, 1802) | 1         |                 | N         | 1874          |
| *Gibbaranea gibbosa* (Walckenaer, 1802) |           | 1              | R         | 1937          |
| *Larinioides ixobolus* (Thorell, 1873) | 4         | 1              |           |               |
| *Larinioides scleropetarius* (Clerck, 1757) | 1         |                 | N         | 1874          |
| *Mangora acalypha* (Walckenaer, 1802) |           | 4              | R         | 1936          |
| *Singa nitidula* C.L. Koch, 1844 |           | 3              | R         | 1936          |
| **Clubionidae**           |           |               |           |               |
| *Clubiona breviceps* Blackwall, 1841 |           | 6              |           |               |
| *Clubiona caeruleascens* L. Koch, 1867 |           |                 | N         | 1874, R 1936  |
| *Clubiona carnea* C.L. Koch, 1839 |           | 14             |           |               |
| *Clubiona germanica* Thorell, 1871 |           | 1              | R         | 1936          |
| *Clubiona lutescens* Westring, 1851 |           | 14             | R         | 1936          |
| *Clubiona marmorata* L. Koch, 1866 |           | 1              | N         | 1874          |
| *Clubiona neglecta* O. P.-Cambridge, 1862 |           | 1              | R         | 1936          |
| *Clubiona pallidula* (Clerck, 1757) | 1         | 4              | R         | 1936          |
| **Corinnidae**            |           |               |           |               |
| *Pherolitibus festivus* (C.L. Koch, 1835) |           | 5              | R         | 1936          |
| Taxa                                      | Our data, adults (ind.) | Historical data |
|-----------------------------------------|-------------------------|-----------------|
|                                         | Buildings | Other habitats | Buildings | Other habitats |
| **Cybaecidae**                           |           |                |           |                |
| *Cybaecus angustiarum* L. Koch, 1868     |           |                |           |                |
| **Dictynidae**                           |           |                |           |                |
| *Cicarina eicur* (Fabricius, 1793)       | 3         |                |           | R 1936         |
| *Dictyna arundinacea* (Linnaeus, 1758)   | 6         |                |           | R 1936         |
| *Dictyna civica* (Lucas, 1850)          | 1         |                |           | R 1936         |
| *Dictyna uncinata* Thorell, 1856        | 10        |                |           | R 1936         |
| *Laibis humilis* (Blackwall, 1855)      | 4         |                |           | R 1936         |
| *Nigmi walchenaei* (Roever, 1951)       | 1         |                |           | R 1936         |
| **Dysderidae**                           |           |                |           |                |
| *Dysdera crocata* C.L. Koch, 1838       | 1         |                |           | R 1936         |
| *Harpactea rubicunda* (C.L. Koch, 1838) | 6         |                |           | R 1936         |
| *Harpactea sace* (Herman, 1879)         | 4         |                |           |                |
| ** Gnaphosidae**                         |           |                |           |                |
| *Drasodes pubescens* (Thorell, 1856)    | 1         |                |           | R 1936         |
| *Drasysyllus pusillus* (C.L. Koch, 1833)| 10        |                |           | R 1936         |
| *Haplodrassus signifer* (C.L. Koch, 1839)| 2       |                |           | R 1936         |
| *Haplodrassus silvestris* (Blackwall, 1833)| 1     |                |           | R 1936         |
| *Micaria formicaria* (Sundevall, 1831)  | 1         |                |           | R 1936         |
| *Micaria nivosum* L. Koch, 1866          | 1         |                |           | R 1936         |
| *Micaria pulicaria* (Sundevall, 1831)   | 4         |                |           | R 1936         |
| *Micaria subpaca* Westring, 1861        | 13        |                |           | R 1936         |
| *Scotophaeus scutulatus* (L. Koch, 1866)| 3         |                |           | R 1936         |
| **Hahnidae**                             |           |                |           |                |
| *Habnia nova* (Blackwall, 1841)         | 4         |                |           |                |
| **Linyphiidae**                          |           |                |           |                |
| *Agyneta decora* (O. P.-Cambridge, 1871)| 3         |                |           | R 1936         |
| *Araonous humilis* (Blackwall, 1841)    |           |                |           | R 1936         |
| *Bathyphantes gracilis* (Blackwall, 1841)| 3       |                |           | R 1936         |
| *Bathyphantes nigrosum* (Westring, 1851)| 4        |                |           | R 1936         |
| *Centromerita bicolor* (Blackwall, 1833)| 2         |                |           | R 1936         |
| *Centromerus ludovici* Bosenberg, 1899  |           |                |           | R 1936         |
| *Centromerus cylindricalis* (Blackwall, 1841)| 13      |                |           | R 1936         |
| *Ceratinella major* Kulzyfski, 1894     | 1         |                |           | R 1936         |
| *Dicymbium nigrosum* (Blackwall, 1834)  | 10        |                |           | R 1936         |
| *Dicymbium tibiale* (Blackwall, 1836)   | 2         |                |           | R 1936         |
| *Diploecephalus cristatus* (Blackwall, 1833)| 24      |                |           | R 1936         |
| *Diploecephalus laterifrons* (O. P.-Cambridge, 1863)| 4      |                |           | R 1936         |
| *Diploecephalus picinus* (Blackwall, 1841)| 45      |                |           | R 1936         |
| *Diptolyta concolor* (Wider, 1834)      | 2         | 70             |           | R 1936         |
| *Dismodicus bifrons* (Blackwall, 1841)  | 1         |                |           | R 1936         |
| *Draperisca socialis* (Sundevall, 1833)| 1         |                |           | R 1936         |
| *Entelecara acuminata* (Wider, 1834)    | 1         | 23             |           | R 1936         |
|                                          |           |                | Ch & P 1982, Ch 1986 | R 1936 |
| *Erigone atra* Blackwall, 1833          |           |                |           | R 1936         |
| *Erigone dentipalpis* (Wider, 1834)     | 5         | 35             |           | R 1930, R 1937 |
| *E. remota* L. Koch, 1869               |           |                |           | R 1936         |
| *E. tirodennis* L. Koch, 1872           |           |                |           | R 1936         |
| *Frontinellia frutetorum* (C.L. Koch, 1834)| 1       |                |           | N 1874, R 1936 |
| *Helophora insignis* (Blackwall, 1841)  | 6         |                |           | R 1936         |
| *Hylyphantes graminicola* (Sundevall, 1830)| 5      |                |           | R 1937         |
| *Hypocoma bituberculatum* (Wider, 1834) |           |                |           | R 1936         |
| Taxa                                                | Our data, adults (ind.) | Historical data |
|-----------------------------------------------------|-------------------------|-----------------|
|                                                     | Buildings | Other habitats | Buildings | Other habitats |
| Hypomma cornutum (Blackwall, 1833)                  | 5         |                | R 1936    |                |
| Leptophantes leptopus (O. P.-Cambridge, 1865)       | 64        | 1              |           |                |
| Leptophantes minutus (Sundevall, 1830)              | 1         | 36             | R 1936    |                |
| Linyphia bortensis Sundevall, 1830                  |           |                | R 1936    |                |
| Linyphia triangularis (Clerck, 1757)                | 4         | 13             | R 1936    |                |
| Macargus rufus (Wider, 1834)                        |           |                | R 1936    |                |
| Mansuphanthes mansuetus (Thorell, 1875)             |           |                | R 1936    |                |
| Megaleptophantes nebulosus (Sundevall, 1830)        | 44        | 2              |           |                |
| Megaleptophantes pseudocollinus Saaristo, 1997      | 2         |                | R 1936    |                |
| Meioneta fascipalpa (C.L. Koch, 1836)               |           |                |           |                |
| Meioneta innotabilis (O. P.-Cambridge, 1863)        |           |                |           |                |
| Meioneta mollis (O. P.-Cambridge, 1871)             | 3         |                |           |                |
| Meioneta rarestris (C.L. Koch, 1836)               | 5         | 11             |           |                |
| Micargus berbigraudus (Blackwall, 1854)             |           |                |           |                |
| Micargus subaequalis (Westring, 1851)               |           |                |           |                |
| Microlynphia pusilla (Sundevall, 1830)              | 1         |                | R 1936    |                |
| Microneta viaria (Blackwall, 1841)                  |           |                | R 1936    |                |
| Moebelia penicillata (Westring, 1851)               | 1         | 11             |           |                |
| Nematognus sanguinolentus (Walckenaer, 1841)        |           |                |           |                |
| Neriene clathrata (Sundevall, 1830)                | 4         | 10             |           |                |
| Neriene emphana (Walckenaer, 1841)                  |           |                | R 1936    |                |
| Neriene montana (Clerck, 1757)                      | 7         | 9              | R 1936    |                |
| Neriene peltata (Wider, 1834)                       |           |                | R 1936    |                |
| Neriene radiata (Walckenaer, 1841)                  |           |                | R 1936    |                |
| Oedothorax apicatus (Blackwall, 1850)               | 1         | 1              | R 1936    |                |
| Oedothorax fuscus (Blackwall, 1834)                 |           |                | R 1936    |                |
| Oedothorax insignis (Bösenberg, 1902)               |           |                | R 1936    |                |
| Oedothorax retusus (Westring, 1851)                 |           |                | R 1936    |                |
| Pityohyphantes pfyrgianus (C.L. Koch, 1836)         |           |                | N 1874    |                |
| Porroboma pygmaeaum (Blackwall, 1834)               | 2         |                |           |                |
| Salaca krauzjynski Miller & Kratochvil, 1939        |           |                |           |                |
| Stenonyphantes lineatus (Linnaeus, 1758)            | 2         |                |           |                |
| Tapinocyba pallens (O. P.-Cambridge, 1872)          | 2         |                |           |                |
| Tenuiphantes cristatus (Menge, 1866)                | 1         |                | R 1936    |                |
| Tenuiphantes flavipes (Blackwall, 1854)             | 15        |                | R 1936    |                |
| Tenuiphantes mengei (Kulczyński, 1887)              | 1         | 7              | R 1936    |                |
| Tenuiphantes tenebrosa (Wider, 1834)                |           |                | R 1936    |                |
| Tenuiphantes tenuis (Blackwall, 1852)               | 1         | 3              | R 1936    |                |
| Tenuiphantes zimmermanni (Bertkau, 1890)            | 3         | 1              | R 1936    |                |
| Thyrostenius parasiticus (Westring, 1851)           | 1         | 5              | R 1936    |                |
| Tymatocephalus cristatus (Wider, 1834)              | 7         |                | R 1936    |                |
| Walckenaeria cucullata (C.L. Koch, 1836)            |           |                | R 1936    |                |
| Walckenaeria fusca Rosca, 1935                      |           |                | R 1936    |                |
| Walckenaeria mitrata (Menge, 1868)                  | 2         |                | R 1936    |                |
| Walckenaeria obtusa Blackwall, 1836                 | 2         |                | R 1936    |                |
| **Liocranidae**                                     |           |                |           |                |
| Agroeca brunnea (Blackwall, 1833)                   | 1         |                | R 1936    |                |
| **Lycosidae**                                       |           |                |           |                |
| Alopecosa accentuata (Latreille, 1817)              | 4         |                | N 1874, R 1930 |                |
| Alopecosa barbipes (Sundevall, 1833)                |           |                | R 1936    |                |
| Alopecosa cuneata (Clerck, 1757)                    |           |                | R 1936    |                |
| Taxa                                             | Our data, adults (incl.) | Historical data |
|-------------------------------------------------|--------------------------|-----------------|
| Alopeosa pulverulenta (Clerck, 1757)             | 132                      | R 1936          |
| Alopeosa roeweri (Roësca, 1937)                 |                          | R 1937          |
| Alopeosa trabalis (Clerck, 1757)                |                          | N 1874, R 1936  |
| Arctosa cinerea (Fabricius, 1777)               | 2                        | R 1936          |
| Arctosa figurata (Simon, 1876)                  |                          | R 1936          |
| Arctosa lutetiana (Simon, 1876)                 |                          | R 1936          |
| Arctosa stigmosa (Thorell, 1875)                |                          | R 1936          |
| Autopia albimana (Walckenaer, 1805)             | 4                        | N 1874, R 1936  |
| Lycosa singoriensis (Laxmann, 1770)             |                          |                 |
| Pardosa agrestis (Westring, 1861)               | 1 115                    | R 1936          |
| Pardosa agricola (Thorell 1856)                 | 1                        | R 1936          |
| Pardosa alacris (C.L. Koch, 1833)               | 53                       | N 1874          |
| Pardosa amentata (Clerck, 1757)                 | 1 78                     | R 1936          |
| Pardosa fulvipes (Collett, 1876)                | 8                        |                 |
| Pardosa lugubris (Walckenaer, 1802)             | 503                      | R 1936          |
| Pardosa monticola (Clerck, 1757)                | 1                        | R 1936          |
| Pardosa nigriceps (Thorell, 1856)               | 1                        | R 1936          |
| Pardosa paludicola (Clerck, 1757)               | 93                       | R 1936          |
| Pardosa palustris (Linnaeus, 1758)              | 1 74                     | R 1936          |
| Pardosa pratiroga (L. Koch, 1870)               | 1 122                    | R 1930          |
| Pardosa pullata (Clerck, 1757)                  | 32                       | R 1936          |
| Pardosa sphagnicola (Dahl, 1908)                | 1                        | R 1936          |
| Pirata piratica (Clerck, 1757)                  | 6                        | R 1936          |
| Piratula hygrophila (Thorell, 1872)             |                          | R 1936          |
| Trochosa robusta (Simon, 1876)                  |                          | R 1936          |
| Trochosa ruricola (De Geer, 1778)               | 3 88                     | R 1936          |
| Trochosa terricola (Thorell, 1856)              | 89                       | R 1936          |
| Xerolyosa miniata (C.L. Koch, 1834)             | 32                       |                 |

**Mimetidae**

| Taxa                               | Our data, adults (incl.) | Historical data |
|------------------------------------|--------------------------|-----------------|
| Ero aphana (Walckenaer, 1802)      | 5                        | R 1936          |
| Ero furcata (Villers, 1789)        | 1                        | R 1936          |

**Miturgidae**

| Taxa                               | Our data, adults (incl.) | Historical data |
|------------------------------------|--------------------------|-----------------|
| Cheiracanthium erraticum (Walckenaer, 1802) |                  | R 1936          |
| Cheiracanthium mildii L. Koch, 1864  | 12                       |                 |
| Cheiracanthium onognathum Thorell, 1871 |                        | R 1936          |

**Nesticidae**

| Taxa                               | Our data, adults (incl.) | Historical data |
|------------------------------------|--------------------------|-----------------|
| Nesticus cellulans (Clerck, 1757)  | 13                       |                 |

**Philodromidae**

| Taxa                               | Our data, adults (incl.) | Historical data |
|------------------------------------|--------------------------|-----------------|
| Philodromus albicus Kulczyński, 1911 | 1 5                      | R 1936          |
| Philodromus aureolus (Clerck, 1757) | 1 1                      | R 1936          |
| Philodromus cespitum (Walckenaer, 1802) | 2 3                     | R 1936          |
| Philodromus collinus C.L. Koch, 1835 | 2                        |                 |
| Philodromus dispar Walckenaer, 1826 | 3                        | R 1936          |
| Philodromus poecilus (Thorell, 1872) |                          | N 1874, R 1936  |
| Thunatus arenarius L. Koch, 1872    |                          | R 1936          |
| Tibellus oblongus (Walckenaer, 1802) | 1                        | R 1936          |

**Pholcidae**

| Taxa                               | Our data, adults (incl.) | Historical data |
|------------------------------------|--------------------------|-----------------|
| Pholcus alliceps Spassky, 1932     | 85                       |                 |
| Pholcus opilionoides (Schräfl, 1781) | 72 3                    | R 1936          |
| Pholcus phalangioides (Fuesslin, 1775) | 1503 1                 | R 1936, Ch & P 1982 |
| Taxa                                      | Our data, adults (ind.) | Historical data |
|-------------------------------------------|-------------------------|-----------------|
|                                           | Buildings   | Other habitats | Buildings | Other habitats |
| *Pholcus ponticus* Thorell, 1875          | 77                      |                |           |                |
| *Spermophora senoculata* (Duges, 1836)    | 69                      |                |           |                |
| **Pisauridae**                            |            |                |           |                |
| *Pisaura mirabilis* (Clerck, 1757)        | 1            | 10             |           | R 1936         |
| **Salticidae**                            |            |                |           |                |
| *Asianellus festivus* (C.L. Koch, 1834)   | 5            |                | N 1874, R 1937 |                |
| *Balliochalybeius* (Walckenaer, 1802)     | 1            |                | N 1874, R 1936 |                |
| *Evarcha arcuata* (Clerck, 1757)          | 1            |                | R 1936    |                |
| *Evarcha falcata* (Clerck, 1757)          | 1            |                | R 1936    |                |
| *Evarcha laetabunda* (C.L. Koch, 1846)    | 1            |                | R 1936    |                |
| *Heliophanus auratus* C.L. Koch, 1835     | 2            |                | R 1937    |                |
| *Heliophanus cupreus* (Walckenaer, 1802)  | 2            |                | R 1936    |                |
| *Heliophanus flavipes* (Hahn, 1832)       | 2            |                | R 1936    |                |
| *Heliophanus tribulosus* Simon, 1868      |              |                | R 1936    |                |
| *Myrmarchne formicaria* (De Geer, 1778)   | 1            |                | R 1936    |                |
| *Salticus scenicus* (Clerck, 1757)        | 1            | 2              | R 1936    |                |
| *Salticus zebranue* (C.L. Koch, 1837)     | 7            |                | R 1936    |                |
| *Sibianor aurocininctus* (Ohlert, 1865)   | 2            |                | R 1936    |                |
| *Sitticus pubeus* (Fabricius, 1775)       | 3            | 1              | R 1936    |                |
| **Scytodidae**                            |            |                |           |                |
| *Scytothrix thoracica* (Latreille, 1802)  | 18           |                |           |                |
| **Segestriidae**                          |            |                |           |                |
| *Segestria senoculata* (Linnaeus, 1758)   | 1            | 1              | R 1936    |                |
| **Sparassidae**                           |            |                |           |                |
| *Micrommata virescens ornata* (Walckenaer, 1802) |            |                | N 1874    |                |
| **Tetragnathidae**                        |            |                |           |                |
| *Metellina mengi* (Blackwall, 1870)       | 4            | 1              | R 1936    |                |
| *Metellina segmentata* (Clerck, 1757)     | 5            | 2              | R 1936    |                |
| *Pachygnatha clerki* Sundevall, 1823      | 1            | 3              | R 1936    |                |
| *Pachygnatha degener* Sundevall, 1830     | 3            | 517            | R 1936    |                |
| *Pachygnatha listeri* Sundevall, 1830     | 12           |                | R 1936    |                |
| *Tetragnatha dearmata* Thorell, 1873      | 2            |                | R 1936    |                |
| *Tetragnatha extensa* (Linnaeus, 1758)    | 1            |                | R 1936    |                |
| *Tetragnatha montana* Simon, 1874         | 6            |                | R 1936    |                |
| *Tetragnatha nigrata* Lendl, 1886         |              |                | R 1936    |                |
| *Tetragnatha obtusa* C.L. Koch, 1837      | 1            | 4              | R 1936    |                |
| *Tetragnatha pinicola* L. Koch, 1870      |              |                | R 1936    |                |
| **Theridiidae**                           |            |                |           |                |
| *Asagena phalerata* (Panzer, 1801)        | 5            |                | R 1936    |                |
| *Cryptachaea riparia* (Blackwall, 1834)   | 1            |                | R 1936    |                |
| *Dipoena melanogaster* (C.L. Koch, 1837)  | 3            |                | R 1936    |                |
| *Enoplognatha latimana* Hippa & Oksala, 1982 | 5          |                | R 1936, L 1958 |                |
| *Enoplognatha oculata* (Clerck, 1757)     | 2            | 590            | R 1936    |                |
| *Enoplognatha thoracica* (Hahn, 1833)     | 1            |                | R 1936    |                |
| *Episinus angulatus* (Blackwall, 1836)    | 1            |                | R 1936    |                |
| *Neottiura bimaculata* (Linnaeus, 1767)   | 9            |                | R 1936    |                |
| *Oblertidion obterri* (Thorell, 1870)     |              |                | R 1936    |                |
| *Paidiscera pallens* (Blackwall, 1834)    | 1            |                | R 1936    |                |
| *Parasteatoda funata* (Clerck, 1757)      |              |                | R 1936    |                |
| *Parasteatoda simulans* (Thorell, 1875)   | 28           | 10             | R 1936    |                |
| *Parasteatoda tabulata* (Levi, 1980)      | 60           | 1              | R 1936    |                |
| Taxa                                           | Our data, adults (ind.) | Historical data |
|-----------------------------------------------|-------------------------|-----------------|
| **Parasteatoda tepidariorum** (C.L. Koch, 1841) | 349 buildings, 18 other habitats | Buildings: Ch & P 1982, Other habitats: R 1936 |
| *Phylloneta impressa* (L. Koch, 1881)          | 3 buildings, 1 other habitat | R 1936 |
| *Plistnickina spinata* (Walckenaer, 1802)      | 3 buildings, 28 other habitats | N 1874, R 1936 |
| *Robertus arundinieti* (O. P. Cambridge, 1871) | 2 buildings            |                 |
| *Steatoda albomaculata* (De Geer, 1778)        | 1 building              |                 |
| *Steatoda bipunctata* (Linnaeus, 1758)         | 14 buildings, 43 other habitats | R 1936 |
| *Steatoda castanea* (Clerck, 1757)             | 178 buildings, 1 other habitat | R 1936 |
| *Steatoda grossa* (C.L. Koch, 1838)            | 76 buildings, 1 other habitat | R 1936 |
| *Steatoda triangulosa* (Walckenaer, 1802)      | 85 buildings, 1 other habitat |                 |
| *Theridion mystaceum* L. Koch, 1870            | 2 buildings              |                 |
| *Theridion pictum* (Walckenaer, 1802)          | 1 building               | R 1936 |
| *Theridion pinastri* L. Koch, 1872             | 1 buildings, 2 other habitats | R 1936 |
| *Theridion varians* Hahn, 1833                 | 2 buildings, 13 other habitats | N 1874, R 1936 |

**Thomisidae**

| Taxa                                           | Our data, adults (ind.) | Historical data |
|-----------------------------------------------|-------------------------|-----------------|
| *Diaea dorsata* (Fabricius, 1777)             | 1 building              | R 1936 |
| *Ebrechtella tricuspidata* (Fabricius, 1775)   | 4 buildings, 2 other habitats | R 1936 |
| *Misumenia vatia* (Clerck, 1757)              | 2 buildings, 3 other habitats | R 1936 |
| *Ozyptila atomaria* (Panzer, 1801)            |                         |                 |
| *Ozyptila praticola* (C.L. Koch, 1837)        | 1 building, 36 other habitats | R 1930 |
| *Ozyptila pullata* (Thorell, 1875)            |                         | R 1936 |
| *Ozyptila rauda* Simon, 1875                  | 3 buildings             |                 |
| *Pittius truncatus* (Pallas, 1772)            |                         |                 |
| *Runcinia grammica* (C.L. Koch, 1837)         |                         | R 1936 |
| *Synema globum* (Fabricius, 1775)             |                         | N 1874 |
| *Tmarus piger* (Walckenaer, 1802)             |                         | N 1874 |
| *Xysticus acerbus* Thorell, 1872              | 24 buildings, 1 other habitat | R 1936 |
| *Xysticus audax* (Schrank, 1803)              | 6 buildings, 1 other habitat | R 1936 |
| *Xysticus bifasciatus* C.L. Koch, 1837        | 7 buildings, 1 other habitat | R 1936 |
| *Xysticus cristatus* (Clerck, 1757)           | 57 buildings, 1 other habitat | R 1936 |
| *Xysticus erraticus* (Blackwall, 1834)        | 1 building              |                 |
| *Xysticus kochi* Thorell, 1872                | 45 buildings, 1 other habitat | R 1936 |
| *Xysticus lanio* C.L. Koch, 1835              |                         | N 1874, R 1936 |
| *Xysticus lucuosus* (Blackwall, 1836)         |                         | R 1936 |
| *Xysticus ulmi* Hahn, 1831                    | 5 buildings, 1 other habitat | R 1936 |

**Uloboridae**

*Hyptiotes paradoxus* (C.L. Koch, 1834)  N 1874

**Zodariidae**

*Zodarion rubidum* Simon, 1914  6

**Zoridae**

*Zora pardalis* Simon, 1878  R 1936

Number of species in each category  83 192  9 166

Totals (our data and historical data)  212 173

Total  260

1 *Erigone remota* and 2 *Erigone tirolensis* are recorded from Chernivtsi (Roșca 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.
