Records of some rare and interesting spider (Araneae) species from anthropogenic habitats in Debrecen, Hungary

Ritka és érdekes pókfaj (Araneae) adatok debreceni antropogén élőhelyekről

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Abstract: spider species were occasionally collected by the author accross parks and buildings in the city of Debrecen (Eastern Hungary) and several faunistically interesting and/or protected species were recorded. A short survey of the tropical greenhouse of the Botanic Garden of the University of Debrecen yielded 3 exotic neozoon species (*Coleosoma floridanum*, *Nesticella mogera*, *Triaeris stenaspis*) that have never before been recorded from Hungary.

Key words: Araneae, faunistics, neozoon, rare species, Hungary.

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Összefoglalás: A szerző Debrecen területén, alkalmanként, parkokban és épületekben különböző pókfajokat gyűtött. A tanulmányban több faunisztikailag érdekes és/vagy védett faj adata kerül bemutatásra. A Debreceni Egyetem Botanikus Kertjének trópusi üvegházából pedig 3 olyan egzotikus neozoon faj (*Coleosoma floridanum*, *Nesticella mogera*, *Triaeris stenaspis*) került elő egy előzetes felmérés során, melyeknek még nem volt adata korábban Magyarországról.

Introduction

The checklist of the Hungarian spider fauna was published in 1999 (Samu & Szinetár) followed by an updated checklist of the salticid spiders of Hungary with biogeographical notes (Szűts et al. 2003). These publications greatly extended knowledge about the spider fauna of the country since the last comprehensive works (2 volumes out of the originally planned 3 of the series Fauna Hungariae) were published decades earlier (Loksa 1969; 1972). Since then, several new species have been described from Hungary, new additions to the fauna have been reported in various publications and some records were revised (partially in conference presentations, theses

and in environmental monitoring reports). Some (but far from all) of the new records were summarized by Pfliegler et al. (2012), who also recorded 4 species of previously unknown spiders from the country. The many interesting faunistic records that would expand knowledge about the Hungarian spider fauna and the distribution of the species still remain to be published in a revised Hungarian spider checklist.

The distribution of many spider species inside the country can be inferred from various faunistic publications of the last decades. These have mostly dealt with some particular national parks and other protected areas, but the faunistic records are comprehensive enough that the rareness of a good number of species in Hungary can be estimated. A test version of a digital map database of the spider occurrences in the westernmost region in Hungary has also been made online recently (Kovács et al. 2013).

In this article, data of the occurrence of 16 spider species (10 native and 6 neozoon) from the city of Debrecen is presented. All of them were hand -collected from parks (mainly of the University of Debrecen), disturbed public areas and from inside buildings. Out of the 10 native species, 7 are rare ones that have very few records throughout Hungary. Two species of large Lycosids, *Geolycosa vultuosa* and *Lycosa singoriensis* are more commonly found and have received more attention recently, due to their impressive size and protected status in Hungary. The non-native species recorded mostly represent small-sized exotic neozoons, while the species *Zodarion rubidum* originates from the Mediterranean.

Materials and Methods: Spider specimens were collected by hand in various places in Debrecen (elevation above sea level approx. 120 m), photographed, then stored in 75% ethanol for further studies. A subadult male specimen of *L. thorelli* was kept alive and fed with flies until its final moult (for 3 months long). The protected species were released in or near their collecting sites. Identification was made under binocular stereo microscope. Genitalia were dissected from the specimens and studied and photographed with a light microscope (transmitted light in case of epigynes, Olympus BX40 microscope equipped with a digital camera and with Olympus 20x Ach lens; or with illumination from above in case of pedipalps and big epigynes, with a Pentax k7 DSLR camera equipped with Nikon 10x BD Plan lens and using focus stacking with the software ZereneStacker and post-processing with Adobe Photoshop CS6). Epigynes and the scuta of one *Triaeris* specimen were cleared with lactic acid. Specimens are maintained in the collection of the author. Identification followed Nentwig et al. (2013) and the references therein. Name combinations reflect current nomenclature and synonymies in accordance with Platnick (2013).

Results

Araneidae

Leviellus thorelli (Ausserer, 1871) (Figure 1i-j, 4b.)

Material. Debrecen, main campus of the University of Debrecen, (N47° 33'19" E21°37'18"), on old oak tree, 12.08.2011. - 1 nymph. 04.07.2012. - 1 subadult female 1 subadult male (final moulting reached: approx. 20.10.2012.). Several further specimens sighted.

Clubionidae

Clubiona leucaspis Simon, 1932 (Figure 1a.)

Material. Debrecen, Botanic Garden of the University of Debrecen, (N47° 33'27" E21°37'18"), under pine bark, 27.02.2008. - 1 male.

Gnaphosidae

Micaria sociabilis (Kulczyński, 1897) (Figure 1l-m, 3e, 4c.)

Material. Debrecen, main campus of the University of Debrecen, (N47° 33'19" E21°37'18"), on old oak tree, 06.07.2012. - 1 female. 21.06.2013 - 2 females 2 males.

Micaria subopaca Westring, 1861 (Figure 1n, 3f.)

Material. Debrecen, Nagyerdő, (N47°33'11" E21°37'26"), under plane tree bark, 24.02.2010. - 1 female. Debrecen, main campus of the University of Debrecen, (N47°33'19" E21°37'18"), under plane tree bark, 17.06.2013. - 1 female.

Hahniidae

Hahnia picta Kulczyński, 1897 (Figure 1g-h, 3d, 4a.)

Material. Debrecen, Nagyerdő, (N47°32'54" E21°37'54"), under plane tree bark, 30.03.2009 - 1 female 1 male. Debrecen, agricultural campus of the University of Debrecen, (N47°33'0" E21°36'17"), under pine tree bark, 09.05.2010. - 1 male.

Linyphiidae

Ostearius melanopygius (O. P.-Cambridge, 1879) (Figure 1p.)

Material. Debrecen, "Flower Market", (N47°31'54" E21°37'42"), pot of an orchid, 04.09.2013. - 1 subadult female.

Lycosidae

Geolycosa vultuosa (C. L. Koch, 1838) (Figure 1e-f.)

Material. Debrecen, Kassai street campus of the University of Debrecen,

(N47°32'42" E21°38'26"), on wall, 11.09.2009. - 1 male. Debrecen, Sestakert, (N47°33' E21°36'), small field between buildings, 29.10.2013. - 1 female; several burrows sighted.

Lycosa singoriensis (Laxmann, 1770) (Figure 1k.)
Material. Debrecen, clinical campus of the University of Debrecen, (N47° 33'23" E21°37'26"), inside building, 08.10.2013. - 1 male.

Nesticidae

Nesticella mogera (Yaginuma, 1972) (Figure 1o, 2b, 3b.)
Material. Debrecen, Botanic Garden of the University of Debrecen, (N47° 33'36" E21°37'18"), tropical house, under leaf litter, 11.11.2013. - 2 females with cocoons.

Oonopidae

Triaeris stenaspis Simon, 1891 (Figure 1r, 2c, 3c.)
Material. Debrecen, Botanic Garden of the University of Debrecen, (N47° 33'36" E21°37'18"), tropical house, under leaf litter, 11.11.2013. - 3 females.

Philodromidae

Philodromus longipalpis Simon, 1870 (Figure 1q.)
Material. Debrecen, Vénkert, (N47°32'27" E21°37'14"), on plane tree, 03.07.2012. - 1 female.

Theridiidae

Coleosoma floridanum Banks, 1900 (Figure 1b, 2a, 3a.)
Material. Debrecen, Botanic Garden of the University of Debrecen, (N47° 33'36"' E21°37'18"), tropical house, under leaf litter, 11.11.2013. - 2 females.

Cryptachaea riparia (Blackwall, 1834) (Figure 1c.)
Material. Debrecen, Vénkert, (N47°32'27" E21°37'14"), in apartment, 20.07.2012. - 1 male.

Dipoena torva (Thorell, 1875) (Figure 1d.)
Material. Debrecen, main campus of the University of Debrecen, (N47° 33'19" E21°37'18"), on wall near old oak trees, 02.08.2012. - 1 male.

Uloboridae

Uloborus plumipes Lucas, 1846 (Figure 1s.)
Material. Debrecen, Botanic Garden of the University of Debrecen, (N47° 33'36"' E21°37'18"), tropical house, under leaf litter, 16.01.2010. - 1 female

Figure 1. Spider specimens in their habitats: a) *Clubiona leucaspis* male b) *Coleosoma floridanum* female c) *Cryptachaea riparia* male d) *Dipoena torva* male e) *Geolycosa vultuosa* female f) male g) *Hahnia picta* female h) male i) *Leviellus thorelli* female j) male k) *Lycosa singoriensis* male l) *Micaria sociabilis* female m) male n) *Micaria subopaca* female o) *Nesticella mogera* female p) *Ostearius melanopygius* female q) *Philodromus longipalpis* female r) *Triaeris stenaspis* female s) *Uloborus plumipes* female nymph t) *Zodarion rubidum* female.

Figure 2. Habitus photos of the females of the 3 newly recorded neozoons (with same scale): a) *Coleosoma floridanum* b) *Nesticella mogera* c) *Triaeris stenaspis*.

2 female nymphs. 11.11.2013. - 2 female nymphs.

Zodariidae

Zodarion rubidum Simon, 1914 (Figure 1t.)

Material. Debrecen, Sestakert, (N47°32'49" E21°37'17"), on tree bark, 07.09.2012. - 1 subadult female. Debrecen, Sestakert, (N47°33'01" E21° 36'56"), in apartment, 06.08.2013. - 1 female.

Discussion

16 faunistically interesting spider species from 12 families were recorded. A high number of peculiar species were recorded from the park of the main campus of the University of Debrecen - these were often exclusively found on the old oak (*Quercus robur*) trees that also host colonies of *Liometopum microcephalum* ants and many other arthropods as well [2 of them proved to be new species in the Hungarian fauna published by László et Pfliegler (2011). Unpublished observations are shown at the web address of the author naturephoto-walter.blogspot.hu].

Rare species recorded. The relatively big sized araneid *Leviellus thorelli* has few Hungarian records (Loksa 1972; Samu & Szinetár al. 1999 and references therein) and is mostly known as a species that inhabits rocky habitats and walls (e.g. Gregorič et al. 2010; Nentwig et al. 2013). At the main campus of the university of Debrecen, a high number of specimens were sighted - almost every old oak tree hosted several spiders. Their webs are relatively easily spotted but the specimens usually hide in crevices of the bark. They were observed to prey upon *L. microcephalum* ants. The rarely recorded sac spider *Clubiona leucaspis* was already found in Debrecen by Horváth et al. (2005) from *Pinus nigra* bark. It is probably a rather common

species, but it was omitted from the Check List because its misidentification to *C. genevensis* (Kovács et al. 2012). *Hahnia picta* is one of the rarest members of its family (Hahniidae) in Hungary (Chyzer & Kulczynski 1918; Loksa 1969) and also in Central Europe (Kielhorn & Blick 2007) found exclusively under the bark of old decidous trees. In Debrecen, it was found under the relatively loose old bark pieces of plane trees (*Platanus* x *hybrida*) and interestingly also under pine bark. The two gnaphosids recorded here are both small species in the (sub) genus *Arboricaria* (Bosmans & Blick 2000). *Micaria sociabilis* is a rare ant-mimic species supposed to be a specialized hunter of *L. microcephalum* ants (Dietrich & Busch 2004) with an interesting sexual cannibalistic behaviour (Sentenská & Pekár 2013). It has only one record from the country (Chyzer & Kulczynski 1918a). A similar, but somewhat smaller species, *Micaria subopaca* is more widely known in the country (Balogh & Loksa 1946; Chyzer & Kulczynski 1918b; Horváth & Szinetár 1998; Szinetár 2001, Szita et al. 2002) - it may actually be common. In Debrecen, it was always found under plane tree bark, but never on oaks, where the previous species lives. *Philodromus longipalpis* is a member of the *P. aureolus* species group and due to its doubtful earlier identifications it was omitted from the check list of Samu & Szinetár (1999). Later an indubious record of this philodromid was published from the Fertő-Hanság National Park (Western Hungary) (Szita et al. 2002). The species has not been recorded from Eastern Hungary before. Detailed keys and illustrations of this species group are provided in Muster & Thaler (2004). The species is relatively variable in colour; the specimen recorded from Debrecen is almost completely white. The rare theridiid *Dipoena torva*, specialized on preying on ants (Simon 1997) has no records from this part of the country and only very few from other regions (Samu & Szinetár 1999 and references therein). The other theridiid, *Cryptachaea riparia* is has equally few data from the country (Samu & Szinetár 1999 and references therein).

Protected Lycosids. The two large-bodied ground-dwelling wolf spiders recorded here are both protected species in Hungary. *Geolycosa vultuosa* has several records from accross the country (Kasper 1998; Samu & Szinetár 1999 and references therein). *Lycosa singoriensis*, the South Russian Tarantel is a characteristic steppe species known also from several locations (eg. Samu & Szinetár and references therein; Deli 2008), and also from localities close to the city of Debrecen (Szalkovszki et al. 2007). The protected status of both these Lycosids were thoroughly reviewed in Kovács (2003). The colony of *G. vultuosa* observed in Debrecen seems to be stabile with many small burrows of juvenile specimens. However, possible

harmful disturbances of the habitat (eg. enlarging of the local childrens' playground) are easily imaginable at this small field located between block houses.

Neozoon spiders. Alien species that are only or mostly known from greenhouses or tropical houses are generally regarded as interesting members of the fauna of a given country, even if their presence is restricted to small areas and their escape is very unlikely (due to their special habitat requirements, mostly warm and extremely humid climate). Such invertebrate species are occasionally recorded from Hungary (Kontschán 2004 and references therein; Boros & Dózsa-Farkas 2007) but no systematic survey has been conducted so far. Among spiders, general synanthropic neozoon species and typical greenhouse species (mostly associated with greenhouses, tropical houses, flower industry) are often hard to tell apart, but at least 3 members of the latter group have been recorded: *Uloborus plumipes* (Uloboridae) (Szinetár 1992), *Hasarius adansoni* (Salticidae) (Szűts et al. 2003), *Pandava laminata* (Titanoecidae) (Pfliegler et al. 2012). This latter species was collected in Debrecen, from the pot of a commercially obtained orchid. The neozoon species recorded in this article are all small ones probably also easily distributed with flower industry - the *O. melanopygius* specimen was actually also found in an orchid pot. Of the species recorded in this article, the theridiid *Coleosoma floridanum* is supposed to originate from the American tropics or the Oriental Region (Levi 1967). It has recently been found in Slovakia and the Czech Republic (Šestáková et al. 2013). The behaviour of the species was studied by Cutler (1972). *Nesticella mogera*, a minute Nesticid was first found in the Caucasus in 2003 (Marusik & Guseinov 2003) and in Europe in 2009 (Kielhorn 2009) and it is known from Germany and Poland (Bielak-Bielecki & Rozwałka 2011). Its record from the Botanic Garden of Debrecen may suggest that it is actually widely distributed in European tropical houses. *Ostearius melanopygius* (Linyphiidae) was first described from New Zealand and is known from USA and Europe also (Levi 1967). It has been recorded from a locality very close to the Hungarian border - the species is spreading towards East in Europe and it can thrive in natural habitats as well, not just in greenhouses (Růžička 1995). This species has never been published as a member of the Hungarian fauna yet, but it was mentioned in a table in a Hungarian language dissertation - as collected in an outdoor habitat (Samu 2007). *Triaeris stenaspis*, a characteristic little goblin spider with a large dorsal scutum and the small ventral scutum on the abdomen is known from North and South America and has been recorded from many European greenhouses since the middle of the 20th century (Kielhorn 2008). *Ulobo-*

rus plumipes (Uloboridae) is probably widespread in greenhouses in Hungary, but the species has few data so far from the country (Szinetár 1992; 2001). The species has been recently found in Romania, close to the Hungarian border, in an outdoor habitat as well (Duma 2012). Lastly, the small member of the family Zodariidae, *Zodarion rubidum*, originally described from France, is an invasive species not restricted to, but often found in buildings (Rozwałka & Zawal 2009). It has only very few records in Hungary, and none from Eastern Hungary (Szinetár et al. 1998) (Szinetár & Miltényi 2000). Other species of spiders that are regularly found in tropical and greenhouses accross Europe [e.g. Staudt (2003), Wunderlich & Hänggi (2005), Kielhorn (2008; 2009), Jäger (2009), Gabriel (2010), Wilson (2012), Rozwałka et al. (2013)] or species accidentally introduced to Europe by global trading [e.g. Tomasiewicz & Wesołowska (2006), Kobelt & Nentwig (2007)] are likely to be distributed in Hungary as well. Several species of large, colourful salticids (*Phidippus*, *Plexippus* spp) already recorded as neozoons in some parts of Europe are available for terrarists in Hungary nowadays (see www.arachnida.hu), meaning another possible source of introduction of neozoons. Systematic search could yield many more such new members of the Hungarian spider fauna. For further informaton about alien spider species in Europe, DAISIE (2009) and in particular, Hulme et al. (2009) and the DAISIE European Invasive Alien Species Gateway (DAISIE 2013) are referred.

Identification notes. In Figures 3. and 4., genital organs of some rarely illustrated species and all 3 newly recorded neozoons are shown. Pedipalp and/or epigyne photos of the rest of the species discussed in this article are available online at the Wiki of the Spinnen-Forum (Lemke 2013).

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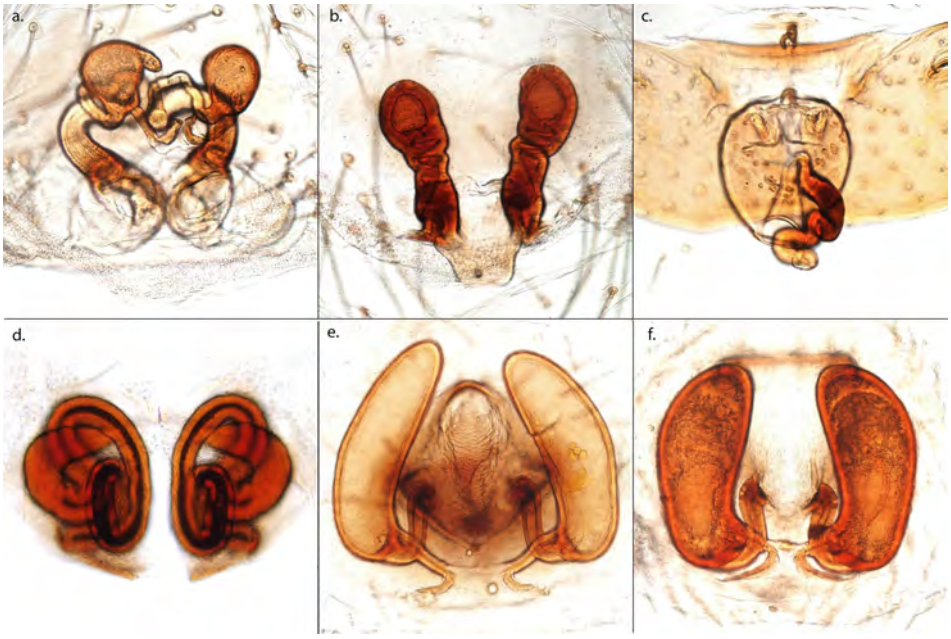

Figure 3. Epigyne/vulva preparates of female specimens: a) *Coleosoma floridanum* b) *Nesticella mogera* c) *Triaeris stenaspis* d) *Hahnia picta* e) *Micaria sociabilis* f) *Micaria subopaca*.

Figure 4. Pedipalps of male specimens: a) *Hahnia picta* b) *Leviellus thorelli* c) *Micaria sociabilis*.

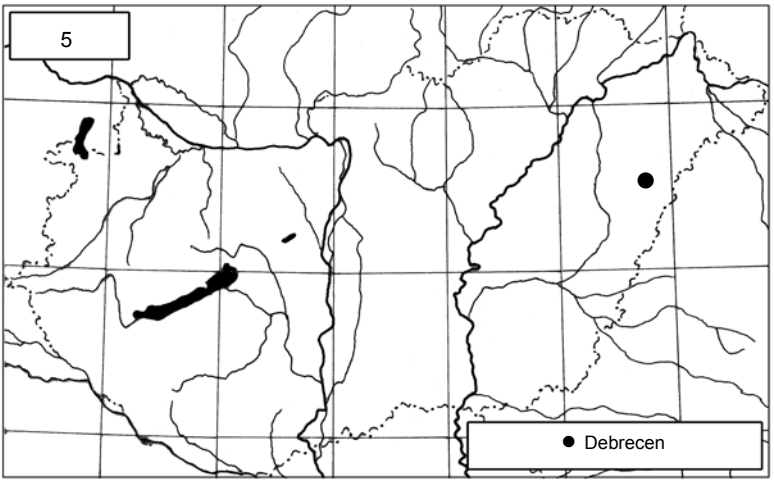

Figure 5. Town of Debrecen in Hungary

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