

## A contribution to the Slovenian spider fauna – II

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**Abstract.** The present study reports on and discusses new records for the Slovenian spider fauna, namely: *Asthenargus bracianus*, *Clubiona leucaspis*, *Euryopsis laeta*, *Lasaeola prona*, *Lathys stigmatisata*, *Meioneta innotabilis*, *Oecobius maculatus*, *Porrhomma microphthalmum*, *Trichoncus saxicola* and *Zodarion pusio*. According to their areas of distribution and confirmed presence in the neighbouring countries, the presence of newly recorded species in Slovenia can be considered as expected, indicating still incomplete knowledge of Slovenian spider fauna.

Key words: new records, spiders, Slovenia, faunistics

**Izveček. Prispevek k favni pajkov Slovenije – II** – Prispevek obravnava deset vrst pajkov, ki doslej v Sloveniji še niso bile najdene, in sicer: *Asthenargus bracianus*, *Clubiona leucaspis*, *Euryopsis laeta*, *Lasaeola prona*, *Lathys stigmatisata*, *Meioneta innotabilis*, *Oecobius maculatus*, *Porrhomma microphthalmum*, *Trichoncus saxicola* in *Zodarion pusio*. Glede na areale razširjenosti in njihovo pojavljanje v sosednjih državah je pojavljanje večine prispevku obravnavanih vrst v Sloveniji pričakovano, kar kaže na še vedno pomanjkljivo poznavanje favne pajkov v Sloveniji.

Ključne besede: nove najdbe, pajki, Slovenija, favnistika

## Introduction

Slovenian arachnology has a long history. The first records of spider fauna in Slovenia reach back to the mid-18<sup>th</sup> century (Scopoli 1763), while an impressive opus of the most prominent Slovenian arachnologist, the late Dr Anton Polenec, from the second half of the 20<sup>th</sup> century includes more than 70 scientific publications (reviewed in Kuntner & Šereg 2002). Nevertheless, our knowledge of Slovenian spider fauna is still incomplete. Regarding the number of spider species in some countries in the region that are of comparable surface (Blick et al. 2004, Kuntner & Šereg 2002), the biogeographic properties of Slovenia and the fact that the number of species listed in so far the only checklist of the Slovenian spider fauna (Nikolić & Polenec 1981) has been almost doubled in recent decades, the initial estimation that another fifty to hundred spider species can be expected to be found in Slovenia (Kostanjšek 2010) might be even underestimated.

In order to contribute to a much needed comprehensive overview of the Slovenian spider fauna, the present study reports on and discusses new records of the Slovenian spider fauna retrieved during a whole-year survey of ground spiders near Nova Gorica in Western Slovenia, and material gathered at the Biology Students Research Camp (RTŠB) in 2011 at Sv. Jurij ob Ščavnici in northeastern Slovenia.

## Material and methods

During the survey performed in western Slovenia, the spiders were sampled using 96 pitfall traps set on the slopes of Sabotin and Sv. Katarina near Solkan between March 2008 and March 2009. The traps were filled with ethylene glycol as fixative. During the sampling in north-eastern Slovenia, selective samplings by hand and forceps, catcher net or sampling by sifting of leaf litter were applied at several locations near Sv. Jurij ob Ščavnici between 22. and 29. 7. 2011. Sampled specimens were commonly fixed in 70% ethanol. Absolute ethanol was used as fixative when samples were preserved for further DNA analysis. In most cases, soft tissues were removed from sclerotised parts of genitalia by overnight soaking in 15% KOH.

Specimens were identified according to various determination keys and published descriptions (Roberts 1993a, b, 1995, Heimer & Nentwig 1991, Nentwig et al. 2013). The systematics and nomenclature of the determined spiders follow Platnick (2013).

For each species, data of the collected material include description of the collecting site, geographic latitude and longitude in the Gauss-Krüger coordinates according to on-line application Atlas okolja (ARSO, 2013), altitude in meters above sea level (a.s.l.), date of collection, sampling method, followed by data on the material provider (leg.) and species determinator (det.). Descriptions of the collected material are followed by data on distribution of the species in other countries in the region and comments on the findings.

The specimens are deposited in zoological collection of the Department of Biology, Biotechnical Faculty, University of Ljubljana.

## Results and discussion

### *Clubiona leucaspis* Simon, 1932 - Clubionidae

- forest edge, SW slope of Sv. Katarina, NE of Nova Gorica; Y=396480; X=92180, 185 m a.s.l.; 1♀: 28. 6. - 5. 7. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.
- meadow, E slope of Sabotin, N of Nova Gorica; Y=396010, X=93890, 120 m a.s.l.; 1♀: 5. - 12. 4. 2008, 1♂: 22. - 29. 3. 2008, 2♂: 29. 3. - 5. 4. 2008, 1♂: 26. 4. - 3. 5. 2008; pitfall traps; leg.: Alenka Gorjan, det.: Kostanjšek R.

Distribution and comment: the species is distributed in western and central Europe (Blick et al. 2004, van Helsdingen 2010) and reaches as far as Bulgaria in the east (van Helsdingen 2010) and Algeria in the south (Platnick 2013). Due to its presence in northern Italy (Stoch 2003) and Austria (Blick et al. 2004), the occurrence of *C. leucaspis* in western Slovenia is not surprising.

### *Lathys stigmatisata* (Menge, 1869) - Dictynidae

- meadow, E slope of Sabotin, N of Nova Gorica; Y=396010, X=93890, 120 m a.s.l.; 3♂: 12. - 19. 4. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.

Distribution and comment: in several identification keys commonly used in determination of European spiders (Roberts 1993a, 1995, Heimer & Nentwig 1991), the species is misidentified as *L. puta* (Platnick 2013). The distribution of the species is Palearctic (Platnick, 2013), although its presence has not been confirmed in Scandinavia, former Yugoslavia, Romania and Moldova (van Helsdingen 2010). Since the species is present in all neighbouring countries except Croatia, as already mentioned, the presence of this relatively rare ground species (Heimer & Nentwig 1991) preferring dry land with sparse vegetation (Roberts 1995) in Slovenia has been expected.

### *Asthenargus braclanus* Miller, 1938 - Linyphiidae

- forest, SE slope of Sabotin, N of Nova Gorica; Y=395770, X=93550; 95 m a.s.l.; 1♂: 13. - 21. 12. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.
- forest edge, SE slope of Sabotin, N of Nova Gorica; Y=395960, X=93835; 120 m a.s.l.; 1♂: 7. - 13. 12. 2008, 2♂: 13. - 21. 12. 2008, 2♂: 21. - 28. 12. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.

Distribution and comment: the distribution of the species is central and eastern European according to Platnick (2013), although the species has been recorded only from Austria (Blick et al. 2004), northern Italy (Stoch 2003), Romania (Weiss & Petrisor 1999) and Croatia (Nikolić & Polenec 1981). The species prefers xerothermic habitats like dry forests or deeper layers of soils including microcavernicolous environments, which are all common in the karst base of Sabotin, where the species was found. Despite all year long sampling in our area of interest in western Slovenia, all specimens of *A. braclanus* were retrieved in winter months, which is in congruity with previously reported winter activity of the species (Nentwig et al. 2013). Although the distribution of *A. braclanus* appears local and has been even referred to as endemic to the Croatian island of Brač (Nikolić & Polenec 1981), it cannot be excluded that this sheet-web spinning species has been often overlooked in the region due to its size, cryptic habitat and phenology.

***Meioneta innotabilis*** (O. P.-Cambridge, 1863) - Linyphiidae

- forest, 2 km SW from Apače, W of Gornja Radgona; Y=569037, X=171103; 220 m a.s.l.; 1♀: 26. 7. 2011; sifting of leaf litter; Leg. RTŠB '11, det.: Kostanjšek R.

Distribution and comment: although not confirmed in Croatia and Hungary (van Helsdingen 2010), the species is widespread throughout Europe and Russia (Platnick 2013) and was therefore expected in Slovenia. This species inhabits tree trunks or the litter in the base of trees (Roberts 1993b), where it was found in our case. While the species is fairly frequently found in Britain (Roberts 1993b), it is considered rare in central Europe (Heimer & Nentwig 1991).

***Porrhomma microphthalmum*** (O. P.-Cambridge, 1871) - Linyphiidae

- meadow, 1.2 km NNE from village Biš, SE of Lenart; Y=568927, X=155230; 225 m a.s.l.; 1♀: 27. 7. 2011; Leg. RTŠB '11, det.: Kostanjšek R.

Distribution and comment: the species has Palearctic distribution (Platnick 2013) and has been recorded in most countries in the region (van Helsdingen 2010), including all countries neighbouring Slovenia. This species prefers plains and is, as in our case, commonly found in agrarian areas (Nentwig 2013, Heimer & Nentwig 1991), or under stones and in undergrowth (Roberts 1993b).

***Trichoncus saxicola*** (O. P.-Cambridge, 1861) - Linyphiidae

- forest, SE slope of Sabotin, N of Nova Gorica; Y=395770, X=93550; 95 m a.s.l.; 1♀: 31. 5 - 7. 6. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.

Distribution and comment: the species is distributed throughout Europe and Russia (Platnick 2013), including all Slovenia's neighbouring countries except Hungary (van Helsdingen 2010). This species is usually found in moss or on grass (Roberts 1993b). Although it is rarely found in some parts of Europe (Roberts 1993b), this sheet-web spider species might have been overlooked due its small size.

***Oecobius maculatus*** Simon, 1870 - Oecobiidae

- meadow, E slope of Sabotin, N of Nova Gorica; Y=396010, X=93890, 120 m a.s.l.; 1♂: 31. 5. - 7. 6. 2008, 1♂: 14. - 21. 6. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.

Distribution and comment: although the two only central European *Oecobius* species are cosmopolitan (Platnick 2013) and often synanthropic (Roberts 1995), and therefore likely present in Slovenia, the first record of the genus *Oecobius* in the area of the former Yugoslav republics belongs to our finding of *O. maculatus*. The species ranges from the Iberian Peninsula throughout the Mediterranean to Azerbaijan (Platnick 2013). Among the countries neighbouring Slovenia, the species has been recorded in Italy, Austria and Hungary (van Helsdingen 2010).

***Euryopsis laeta*** (Westring, 1861) - Theridiidae

- forest, SE slope of Sabotin, N of Nova Gorica; Y=395770, X=93550; 95 m a.s.l.; 4♀: 28. 6. - 5. 7. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.
- forest edge, SE slope of Sabotin, N of Nova Gorica; Y=395955, X=93835; 120 m a.s.l.; 2♂: 5. - 15. 7. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.
- rocks, SE slope of Sabotin, N of Nova Gorica; Y=395655, X=93525; 115 m a.s.l.; 1♂: 17. - 24. 5. 2008, 2♂, 2♀: 24. - 31. 5. 2008, 2♂, 1♀: 31. 5. - 7. 6. 2008, 1♀: 7. - 14. 6. 2008, 4♂, 1♀: 14. - 21. 6. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.
- meadow, E slope of Sabotin, N of Nova Gorica; Y=396010, X=93890, 120 m a.s.l.; 1♂: 24. - 31. 5. 2008, 1♂: 31. 5. - 7. 6. 2008, 1♂: 7. - 14. 6. 2008, 2♀: 5. - 15. 7. 2008, 1♀: 15. - 20. 7. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.

Distribution and comment: globally, the species is distributed from Europe to Tajikistan, including Tunisia (Platnick 2013). In central Europe, the species is associated to very warm microhabitats (Heimer & Nentwig 1991, Nentwig 2013), and from this aspect it is surprising that the species has not been recorded on the Iberian and Balkan Peninsulas (except Bulgaria) (van Helsdingen 2010). During our survey of the ground spider fauna in western Slovenia, the species was frequently found at the southern slope of Sabotin, which corresponds to the above mentioned preference of warm habitats by *E. laeta* in central Europe.

***Lasaеola prona*** (Menge, 1868) - Theridiidae

- lawn, Pod vinogradi 31, Solkan, Nova Gorica, Y=395933; X=92311; 113 m a.s.l.; 1♂: 23. - 30. 8. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.

Distribution and comment: the species has a Holarctic distribution (Platnick 2013); its biology is poorly known (Heimer & Nentwig 1991) and it is generally rare (Roberts 1995). The species is present in central Europe, including all countries in the region except the former Yugoslav republics (van Helsdingen 2010). From this aspect, the presence of the species in Slovenia was assumed, yet not proven, already by Nikolić & Polenec (1981) in their summarized work on the spider fauna of Yugoslavia, where the species still appears under its former name of *Dipoena prona* (Menge, 1868).

***Zodarion pusio*** Simon, 1914 - Zodariidae

- meadow, E slope of Sabotin, N of Nova Gorica; Y=396010, X=93890, 120 m a.s.l.; 1♂ 10. - 17. 5. 2008, 2♂, 1♀: 14. - 21. 6. 2008, 1♂: 28. 6. - 5. 7. 2008, 1♂: 5. - 15. 7. 2008; pitfall traps; leg.: Gorjan A., det.: Kostanjšek R.

Distribution and comment: the species has been recorded from France, Tunisia, Italy, Croatia and Bosnia-Herzegovina only (Platnick 2013). According to its presence in the region, the finding of *Z. pusio* near the Italian border was not surprising.

This contribution to the Slovenian spider fauna is the second in the series, established to encourage and promote new records to the spider fauna in Slovenia and to contribute to the new and up-to-date checklist of Slovenian spiders. The known number of spider species in the territory of Slovenia has increased from the initial 44 species listed in *Entomologia Carniolica* by Scopoli (1763), over 416 species cited in the first and so far the only checklist of the Slovenian spider fauna (Nikolić & Polenec 1981) to 529 in the last summarized work on the Slovenian spider fauna (Kuntner & Šereg 2002). With sporadic papers in between and several after the above mentioned works (e.g. Kuntner 1999, Kuntner & Kostanjšek 2000, Fišer & Kostanjšek 2001, Kostanjšek & Miller 2004, Kostanjšek 2004, Kostanjšek & Fišer 2005, Kostanjšek & Celestina 2008, Gregorič & Kuntner 2009, Kostanjšek 2010), the number of the spiders listed in the checklist of Slovenian spiders (Nikolić & Polenec 1981) has nearly doubled in recent years and currently consists of 739 species, including the species presented in this paper. Despite the fact that the Slovenian spider fauna is still far from being fully known, the above listed additions to our spider fauna as well as a number of changes in the spider nomenclature in recent decades (Platnick 2013) certainly justify the need for a contemporary check-list of Slovenian spiders, which would provide a solid base for further investigations.

## Povzetek

Prispevek je drugi v seriji prispevkov o favni pajkov Slovenije, vzpostavljeni z namenom spodbujanja objav novih zanimivih najdb pajkov na območju Slovenije in prispevati k novemu, dopoljenemu seznamu vrst pajkov Slovenije. Obravnava deset vrst pajkov, ki doslej v Sloveniji še niso bile najdene, in sicer: *Clubiona leucaspis* Simon, 1932, *Lathys stigmatisata* (Menge, 1869), *Asthenargus braccianus* Miller, 1938, *Meioneta innotabilis* (O. P.-Cambridge, 1863), *Porrhomma microphthalmum* (O. P.-Cambridge, 1871), *Trichoncus saxicola* (O. P.-Cambridge, 1861), *Oecobius maculatus* Simon, 1870, *Euryopsis laeta* (Westring, 1861), *Lasaola prona* (Menge, 1868) in *Zodarion pusio* Simon, 1914. Glede na razširjenost obravnavanih vrst v Evropi, je njihovo pojavljanje v Sloveniji pričakovano. Najdba desetih novih vrst na časovno in prostorsko omejenih območjih vzorčenja, predstavljenih v prispevku, kaže na še vedno pomanjkljivo raziskanost favne pajkov v Sloveniji. Ta trenutno obsega 739 vrst, glede na pestrost habitatov v Sloveniji in število poznanih vrst pajkov v primerljivo velikih državah v regiji pa lahko v Sloveniji realno pričakujemo vsaj še sto ali celo več vrst pajkov.

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## References

- ARSO (2013): Atlas okolja. <http://gis.arso.gov.si/atlasokolja/> [accessed on 10.01.2013]
- Blick T., Bosmans R., Buchar J., Gajdoš P., Hänggi A., Van Helsdingen P., Ružicka V., Starega W., Thaler K. (2004): Checkliste der Spinnen Mitteleuropas. Checklist of the spiders of Central Europe. (Arachnida: Araneae). Version 1, December 2004  
[http://www.arages.de/checklist.html#2004\\_Araneae](http://www.arages.de/checklist.html#2004_Araneae). [accessed on 10.01.2013]
- Fišer C., Kostanjšek R. (2001): A contribution to the knowledge of the jumping spiders fauna in Slovenia (Araneae, Salticidae). *Nat. Slo.* 3(2):33-40.
- Gregorič M., Kuntner M. (2009): Epigeian spider diversity of the classical Karst. *Hacquetia* 8: 67-78.
- Heimer S., Nentwig W. (1991): *Spinnen Mitteleuropas*. Paul Parey, Berlin, 543 pp.
- Kostanjšek R. (2004): A contribution to the knowledge of the spider fauna of the wider Haloze region (northeast Slovenia). *Nat. Slo.* 6(2): 5-13.
- Kostanjšek R., Miller J. (2004): New records of sheet web spiders from Slovenia (Arachnida: Araneae: Linyphiidae). *Nat. Slo.* 6(1): 19-24.
- Kostanjšek R., Fišer C. (2005): New records of jumping spiders (Araneae: Salticidae) for Slovenia. *Nat. Slo.* 7(1): 5-11.
- Kostanjšek R., Celestina A. (2008): New records on synanthropic spider species (Arachnida: Araneae) in Slovenia. *Nat. Slo.* 10(1): 51-55.
- Kostanjšek R. (2010): A contribution to Slovenian spider fauna – I. *Nat. Slo.* 12(2): 23-33.
- Kuntner M., Šereg I. (2002): Additions to the spider fauna of Slovenia, with a comparison of spider species richness among European countries. *Bull. - Br. Arachnol. Soc.* 12(4): 185-195.
- Kuntner M., Kostanjšek R. (2000): Prispevek k poznavanju favne pajkov zahodne Slovenije (Arachnida: Araneae). *Nat. Slo.* 2: 13-28.
- Kuntner M. (1999): Prispevek k poznavanju favnistike in ekologije pajkov severovzhodne Slovenije (Arachnida: Araneae). *Nat. Slo.* 1(1): 29-44.
- Nentwig W., Blick T., Gloor D., Hänggi A., Kropf C. (2013): *Spiders of Europe*. <http://www.araneae.unibe.ch>. [accessed on March.2013]
- Nikolić F., Polenec A. (1981): *Aranea. Catalogus Faunae Jugoslaviae III/4.SAZU Ljubljana*, 135 pp.
- Platnick N.I. (2013): The world spider catalog, version 13.5. American Museum of Natural History. <http://research.amnh.org/entomology/spiders/catalog/index.html> [accessed on 10.01.2013]
- Roberts M.J. (1993a): *Spiders of Great Britain and Ireland (Part 1)*. Harley Books, Cholchester, 229 pp.
- Roberts M.J. (1993b): *Spiders of Great Britain and Ireland (Part 2)*. Harley Books, Cholchester, 204 pp.
- Roberts M.J. (1995): *Spiders of Britain and Northern Europe*. Collins field guide series. Harper Collins Publishers, London, 383 pp.

- Scopoli J.A. (1763): *Entomologia Carniolica exhibens Insecta Carniolia e indigena et distributa in ordines, genera, species, varietates - Methodo Linnaeana - Trattner, Vindobonae.* (IV), XXXII, 424 pp.
- Samu F., Szinetár C. (1999): Bibliographic check list of the Hungarian spider fauna. *Bull. Brit. Araneol. Soc.* 11(5): 161-184.
- Stoch F. (2003): Checklist of the Italian fauna. Version 03.12.2003.  
<http://www.faunaitalia.it/checklist/introduction.html> [accessed on 10.01.2013]
- van Helsdingen P.J. (2010): Araneae. In: *Fauna Europaea Database (Version 2010.1)*, online at <http://www.european-arachnology.org> [accessed on 10.01.2013]
- Weiss I., Petrisor A. (1999): List of the spiders from Romania. *Trav. Mus. natl. Hist. nat. »Grigore Antipa«* 41: 79-107.