FIRST RECORD OF *MERMESSUS TRILOBATUS* (EMERTON, 1882) (ARANEAE, LINYPHIIDAE) IN LITHUANIA

MARIJA BITENIEKYTĖ, JONAS JORIS VALIULIS, GRITA SKUJIENĖ

Department of Zoology of the Institute of Biosciences, Life Sciences Center, Vilnius University, Saulėtekio av. 7, LT-10223 Vilnius, Lithuania
E-mails of corresponding authors: marija.biteniekyte@gf.vu.lt, jonas.valiulis@gmc.stud.vu.lt

Introduction

Currently there are 459 species of spiders recorded in Lithuania (Biteniekytė & Rėlys, 2012; Machač *et al.*, 2016). Among these species, a great part is taken up by the Linyphiidae family, which contains 33,3% of registered diversity. Additionally, one new species from this family (Linyphiidae) – *Mermessus trilobatus* (Emerton, 1882) – was identified and this note adds one more species to the local fauna.

Material and Methods

The study was carried out in 2020, at the perennial grass field in Bugailiškis village, Kupiškis district, Lithuania. The field was selected during the search for floristically diverse agricultural areas with the task in future to create new areas promoting higher biodiversity according to the Chemical Company BASF and Vilnius University R&D-Service Agreement (No. (1.57)15600-INS-43). Flowering plant species were sown at the beginning of May with the aim of improving the nutritional base for bees. A total of 44 plant species were counted in this field. The most attractive and covering the largest area were: *Melilotus albus* Medik., *Melilotus officinalis* (L.) Lam., *Phacelia tanacetifolia* Benth., *Sonchus arvensis* L., *Campanula patula* L., *Daucus carota* L., *Erodium cicuta*rium (L.) L'Hér., *Leucanthemum vulgare* Lam., *Vicia cracca* L., *Tripleurospermum inodorum* (L.) Sch.Bip. and others.

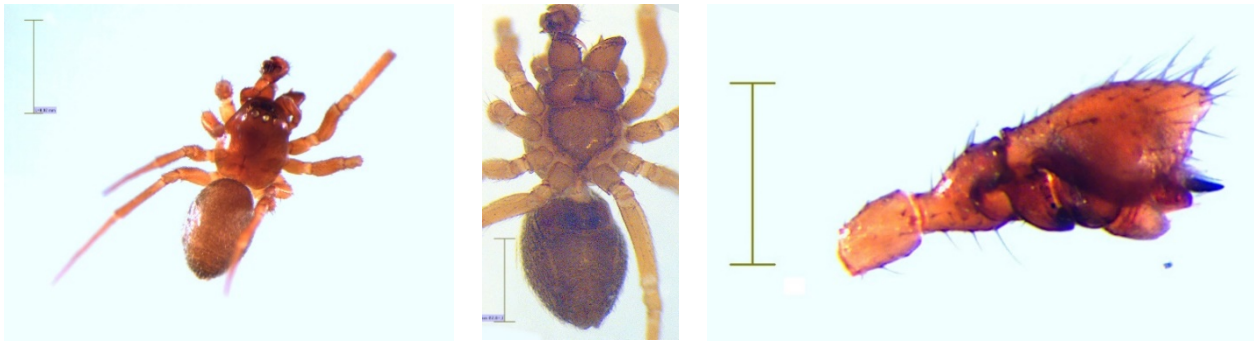
Ten plastic pitfall traps (9 cm in diameter, and 14 cm height) were placed in the central part of the field (coordinates: 55.75379, 25.243629 WGS 1984; approximation – 50 m) to collect the epigeal arthropods. Traps were dug into the soil with the opening at the soil surface. They were filled with 50:50 propylene glycol used as a preservative. To prevent rain from filling up the cups and to keep flying insects and small vertebrates from getting caught into the traps, a cover made of a canning cap was installed over each cup. The traps were emptied once every two weeks from 29 07 2020 until 03 10 2020.

The pictures (Fig. 1) of collected specimen were taken with Infinity-1 camera mounted on a Nikon SMZ800 stereomicroscope and then in specific cases adjusted by GIMP software (enhanced sharpness, brightness and contrast, in some cases separate regions were adjusted differently). The specimen itself is stored in the Zoological Museum of Vilnius University, preserved in 70% ethyl-alcohol. One of the palps of specimen was detached in order to get clearer view and is stored together with the rest of the body.

List of species

***Mermessus trilobatus* (Emerton, 1882)**

Bugailiškis (Kupiškis distr., 55.75379, 25.243629), 18 08 2020 - 01 09 2020, 1 ♂ (G. Skujienė)



A B C

Figure 1. A male of *Mermessus trilobatus* found in current study: A. dorsal view, B. ventral view of spider (chelicerae and sternum), C. male palp (Photographed by J. J. Valiulis).

Discussion

A single male (Fig. 1) was captured in one of the pitfall traps. Pitfall traps is the most commonly used method for capturing spiders, as the most efficient sampling technique for evaluating the relative abundance and species richness of epigeal invertebrates (Gist & Crossley Jr 1973; Work *et al.,* 2002; Ausden & Drake, 2006; Matevski *et al.*, 2020). However, despite the advantages of the method, only one spider was caught and its detection raised many questions: is it an accidental entry, if so, what is it related to; or perhaps the individual indicates that this is the end of their life cycle; maybe it's the beginning of the spread. More detailed research is needed to answer these questions.

M. trilobatus originated in North America and was introduced in the second half of the 20th century to Europe and now colonized most of the countries of Western and Central Europe, so it was considered as invasive species within Europe (Nentwig, 2015), in some cases locally reaching high densities (Nentwig, 2015; Řezáč *et al.*, 2021). Although the exact reasons and consequences of such successful invasion remains yet to be understood for this species (Narimanov *et al.*, 2021 a,b), the rapid spreading can be explained by ballooning strategy (Blandenier, 2009; Řezáč *et al.*, 2021).

This species tends to be found in various habitats: in meadows, in litter layer of forests, in humid areas and sandy beaches (Harvey *et al.*, 2002; Hirna, 2017). It is notable for occurring in a wide range of mostly agricultural habitats, while most other invasive spiders in Europe are associated with human buildings (Narinamov *et al.*, 2021 a). It was first detected in Europe in the late 1970s in the Upper Rhine valley near Karlsruhe in South-West Germany (Dumpert & Platen, 1985), later in Czech Republic (Řezáč *et al.*, 2021), Poland (Rozwałka *et al.*, 2013, 2016) where it is quite rarely found but already widespread. However, based on the fact that *M. trilobatus* was found in the northern part of Lithuania, we suggest that it already has a wide distribution there.

Acknowledgements

We thank the farmers, especially Mr. Zigmantas Aleksandravičius, for field work allowance. Authors are grateful to Dr. Yuri M. Marusik (Magadan, Russia) for the help with species identification, Mr. S. Juzėnas (Vilnius University, Lithuania) for identification of plants. Help of V. Kuznecova, M. Adomaitis, J. Skuja (all Vilnius university) with collection or sorting of the material is also greatly appreciated. Study is supported by the BASF SE (Germany) and Vilnius Uiversity (Lithuania) R&D-Service Agreement (supervised by dr. G. Skujienė).

References

Ausden A., Drake M. 2006. Invertebrates. In: Sutherland W. J. (ed) *Ecological census techniques* – a handbook, 2nd ed. Cambridge University Press, Cambridge: 214–249.

Biteniekytė M., Rėlys V. 2011. The checklist of Lithuanian spiders (Arachnida: Araneae). *Biologija* 57:148–158. DOI: 10.6001/biologija.v57i4.1926.

Blandenier G. 2009. Ballooning of spiders (Araneae) in Switzerland: General Results from an Eleven-Year Survey. *Arachnology* 14 (7): 308–316.

Dumpert K., Platen R. 1985. Zur Biologie eines Buchenwaldbodens. 4. *Die Spinnenfauna.* Carolinea, 42: 75–106.

Gist C.S., Crossley D.A.J. 1973. A method for quantifying pitfall trapping. *Environmental Entomology* 2 (5): 951–952. https://doi.org/10.1093/ee/2.5.951

Harvey P., Nellist D. 2002. *Provisional Atlas of British Spiders (Arachnida, Araneae), vol. 1-2*. Biological Records Centre, Abbots Ripton.

Harvey P., Nellist D., Telfer M. 2002. *Provisional Atlas of British Spiders (Arachnida, Araneae), vol 1–2*. Biological Records Centre, Abbots Ripton.

Helsdingen P. J. van, IJland S. 2007. *Mermessus* species in the Netherlands (Araneae, Linyphiidae). *Nieuwsbrief SPINED* 23: 27–29.

Hirna A. 2017. First record of the alien spider species *Mermessus trilobatus* (Araneae: Linyphiidae) in Ukraine. *Arachnologische Mitteilungen* 54 (54): 41–43.

Machač O., Ivinskis P., Rimšaitė J. 2016. Several new for the Lithuanian fauna species of spiders (Araneae). *New and Rare for Lithuania Insect Species* 28: 121–126.

Matevski D., Cvetkovska-Gjorgjievska A., Prelić D., Hristovski S., Naumova M., Delltshev C. 2020. Efficacy of trapping techniques (pitfall, ramp and arboreal traps) for capturing spiders. *Biologia* 75**:** 2315–2319. https://doi.org/10.2478/s11756-020-00475-1

Narimanov N., Hatamli K., Entling M. 2021. Prey naïveté rather than enemy release dominates the relation of an invasive spider toward a native predator. *Ecology and Evolution* 11 (191): 11200–11206. DOI: 10.1002/ece3.7905.

Narimanov N., Kempel A., van Kleunen M., Entling M. 2021. Unexpected sensitivity of the highly invasive spider *Mermessus trilobatus* to soil disturbance in grasslands. *Biological Invasions* 23: 1–6. DOI: 10.1007/s10530-020-02348-9.

Nentwig W. 2015. Introduction, establishment rate, pathways and impact of spiders alien to Europe. *Biological Invasions* 17 (9): 2757–2778. https://doi.org/10.1007/s10530-015-0912-5

Řezáč M., Růžička V., Hula V., Dolanský J., Machač O., Roušar A. 2021. Spiders newly observed in Czechia in recent years – overlooked or invasive species? *BioInvasions*

Records 10 (3): 555–566.
Rozwałka R., Rutkowski T., Bielak-Bielecki P. 2013. New data on introduced and rare synanthropic spider species (Arachnida: Araneae) in Poland. *Annales UMCS*, *sec. C*, 68: 127–150.
Rozwałka R., Rutkowski T., Bielak-Bielecki P. 2016. New data on introduced and rare synanthropic spider species (Arachnida: Araneae) in Poland (II). *Annales UMCS*, *Biologia* 71: 60–85. DOI: 10.17951/c.2016.71.1.59.
Work T.T., Buddle C.M., Korinus L.M., Spence J.R. 2002. Pitfall trap size and capture of three taxa of litter-dwelling arthropods: implications for biodiversity studies. *Environmental Entomology* 31 (3): 438–448. https://doi.org/10.1603/0046-225X-31.3.43833

Pirmas *Mermessus trilobatus* (Emerton, 1882) (Araneae, Linyphiidae) stebėjimas Lietuvoje

M. BITENIEKYTĖ, J. J. VALIULIS, G. SKUJIENĖ

Santrauka

Šiame straipsnyje pateikiami duomenys apie naujai Lietuvoje rastą vorų Linyphiidae šeimai priklausančią rūšį *Mermessus trilobatus* (Emerton, 1882). Vienas patinas buvo sugautas Bugailiškio kaimo daugiamečių žolių lauke, Kupiškio rajone, 2020 m. rugpjūčio antroje pusėje, taikant įkasamų gaudyklių metodą. Tai svetimžemė Europai rūšis, kilusi iš Šiaurės Amerikos, dabar randama keliose Europos valstybėse (Nentwig, 2015), tarp jų ir kaimyninėje Lenkijoje, kur paplitusi plačiai, bet nėra dažna (Rozwałka *et al.*, 2016).

Received: October 26, 2021