

First record of the alien spider species *Mermessus trilobatus* (Araneae: Linyphiidae) in Ukraine

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Abstract. *Mermessus trilobatus* (Emerton, 1882) is recorded for the first time in Ukraine. Its presence represents the easternmost boundary of this species in Europe. One male was found in the glacial cirque of the mountain massif Svydivets' in the Ukrainian Carpathians at an altitude of 1495 m. The locality is a mountain stream, the banks of which have been moderately grazed by sheep. Information on the distribution of this species in Central and Eastern Europe is given.

Keywords: non-native species, Ukrainian Carpathians

Zusammenfassung. **Erstnachweis der neozoischen Spinnenart *Mermessus trilobatus* (Araneae: Linyphiidae) in der Ukraine.** *Mermessus trilobatus* (Emerton, 1882) wird erstmals für die Ukraine nachgewiesen. Es ist der östlichste Verbreitungspunkt der Art in Europa. Ein Männchen wurde in einem Kartal des Bergmassifs Svydivets in den Ukrainischen Karpaten in 1495 m Höhe gefangen. Der Fundort ist an einem Bergbach, dessen Uferbereiche extensiv mit Schafen beweidet wurden. Die Verbreitung der Art in Mittel- und Osteuropa wird diskutiert.

The European spider fauna comprises almost 4600 species, of which 184 (4 %) are allochthonous in Europe (Nentwig 2015, Helsdingen 2016). Among them, *Mermessus trilobatus* was introduced from North America relatively recently (in the 1980s) into south-western Germany (Karlsruhe; DumPERT & Platen 1985).

Since 1990, new records of this species have gradually appeared from other areas of Europe, namely Switzerland (Hänggi 1990), Italy (1995: cited by Helsdingen & IJland 2007), Austria (Breuss 1999), Belgium (Aminal 2000), France (Blick 2000), the Netherlands (Helsdingen & IJland 2007), Great Britain (Harvey 2008), the Czech Republic (Dolanský et al. 2009), Poland (Rozwałka 2010, Rozwałka et al. 2013, 2017), Slovenia (Čandek et al. 2013), Hungary (Szinetár et al. 2014), Croatia (Republic of Croatia 2014) and Slovakia (Šestáková et al. 2017). This expansion into the east started within Germany (Arachnologische Gesellschaft 2016), and has already reached the Czech Republic, Slovakia, Hungary, Poland and now Ukraine. The Ukrainian Carpathians represent the eastern boundary for the spread of *Mermessus trilobatus* on the Eurasian continent.

Material and methods

The collection locality of *Mermessus trilobatus* is Ukraine, Zakarpats'ka oblast', Rakhiv rayon (district), the Svydivets' mountain massif, f.n. Vorozheska (48°16'32"N, 24°11'32"E; 1495 m a.s.l.); at the bottom of the glacial cirque covered with subalpine green alder scrubs, *Juniper* thickets, *Vaccinium* heaths and meadows; a mountain stream (soft water bryophyte springs; after 200 m it flows into Lake Vorozheska), between stones and in moss, collected by hand, 9.VIII.2016, 1♂ (Fig. 1, 2). There is moderate grazing of sheep within the area and it is generally hard to reach by tourists because of the steep slopes of the glacial cirque.

Besides *Mermessus trilobatus*, a small number of other native species typical for this habitat were found: *Agyneta rurestris* (C.L. Koch, 1836) 1♀, *Diplocephalus helleri* (L. Koch, 1869) 1♀, *Kaestneria torrentum* (Kulczyński, 1882) 2♂♂, *Micrargus* sp. 2♀♀, *Oedothorax retusus* (Westring, 1851) 1♀,

Porrhomma convexum (Westring, 1851) 1♀ and *Sittiflor rupicola* (C. L. Koch, 1837) 2♀♀, 6 juv.

Fragmentary data about the fauna of the Svydivets' mountain massif has been known since the middle of the twentieth century (Baum 1934, Balogh 1940, Balogh & Loksa 1947a, 1947b). The present study was conducted in glacial cirques of the Svydivets' massif (once per month from V to VIII.2016) on the basis of standard collecting methods, such as Barber



Fig. 1: Locality of *Mermessus trilobatus*

pitfall traps, entomological sweep-netting, hand-collecting, and with the aid of pooter. The specimen of *Mermessus trilobatus* was found at only one locality.

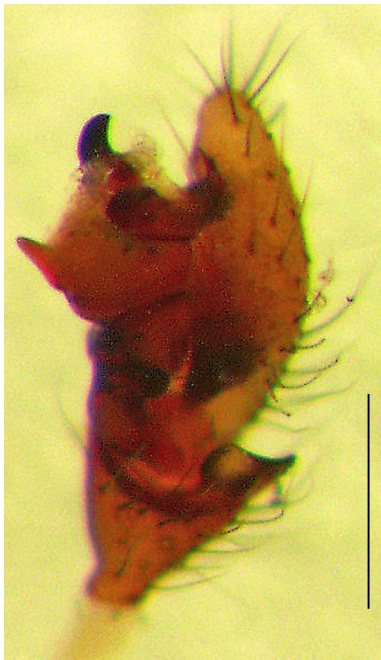


Fig. 2: *Mermessus trilobatus*, male palp, retrolateral view (from the Svydivets' mountain massif, Ukraine; Scale 0.1 mm)

The photograph of *Mermessus trilobatus* was taken using an Olympus DP72 camera connected to an Olympus SZX10 stereoscope (Center for collective use of the scientific equipment, National Museum of Natural History, NAS of Ukraine, Lviv).

Discussion

The range of *Mermessus trilobatus* is continually spreading out from Germany, where the species was introduced in the late twentieth century. However, this species has now been

found not only in Western Europe, but also in most of Central Europe (Poland, the Czech Republic, Slovakia, Hungary, Slovenia, Croatia) (Fig. 3; Dolanský et al. 2009, Kúrka et al. 2010, Rozwałka 2010, Košulič & Hula 2011, Holec et al. 2012, Čandek et al. 2013, Košulič et al. 2013, Rozwałka et al. 2013, 2017, Hula et al. 2014, Niedobová & Hula 2014, Republic of Croatia 2014, Dudić, 2015, Kovács & Szinetár 2015, Kovács et al. 2015, Szinetár et al. 2015; Šestáková et al. 2017; CAS 2017). There is a higher concentration in Western Europe (France, INPN 2017) and in Central Europe: i.e. Switzerland (CSCF 2017), Germany (Arachnologische Gesellschaft 2016), the Czech Republic and western Poland (Rozwałka et al. 2017).

In the Carpathian Mountains *Mermessus trilobatus* is known within Poland (Gajdoš et al. 2014) and Slovakia (Šestáková et al. 2017: heated greenhouses in the Botanical Garden in Košice). In Poland (Tatra National Park) one female has been found in the glacial cirque of the Gašienicowa Valley around the lake Litworowe Staw (ca 1700 m a.s.l.; Rozwałka et al. 2017). In other words, under conditions similar to the presently documented locality of this species in the Svydivets' mountain massif in Ukraine.

Mermessus trilobatus belongs to the smaller linyphiids, with an average body length of 1.6–2.1 mm. It is a eurytopic species, capable of successfully spreading in the air by ballooning (Dolanský et al. 2009, Rozwałka 2010, Blandenier et al. 2013). In North America the species inhabits both diverse natural habitats and heterogeneous habitats changed by human activities (Millidge 1987). The ability to live in a wide variety of ecosystems and to tolerate a wide range of environmental conditions, together with a strategy of aerial dispersal, allows *Mermessus trilobatus* not only to survive in the temperate climatic belt of Europe, but also to spread quickly and easily. Currently the species is found in nearly all types of more or less open habitats.

Our knowledge of the overall impact of an alien species on European spiders is low, in particular on the small number of alien species that can exist in natural habitats (Nentwig 2015). The influence of an invasion of *Mermessus trilobatus* on the structure of spider communities and the functioning of associated ecosystems remains an open question. It is not known whether it replaces native species, becoming part of the regional fauna. Therefore, at this time we can only accumulate data based on the initial country records of *Mermessus trilobatus*, and conduct long-term monitoring of spider communities at these localities.

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Fig. 3: Map of known records of *Mermessus trilobatus* in eastern Central and Eastern Europe (see text for references). In the shaded area, the species is widely distributed and found at many localities.

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