First record of Embolemus tauricus (Hymenoptera: Embolemidae) at continental Ukraine

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Embolemidae is a small family of chrysidoid wasps (Hymenoptera: Chrysidoidea) understudied in Ukraine. The cosmopolitan genus Embolemus is shown comprising only 32 extant and 2 fossil species in the world fauna: the actual check-list for the genus is given. Only two species had been previously registered in Ukraine. Embolemus ruddii was recorded at Western Ukraine and Crimea, and E. tauricus was described from Crimea based on a single specimen collected at 1910. In present contribution E. tauricus is recorded for continental Ukraine for the first time from the Zaporizhia Region. The specimen collected almost fully correspond to the original description of the species, differing only in the small features of coloration. The habitat of E. tauricus is briefly described.

Key words: Embolemidae, Embolemus, Ukraine, new record, fauna, check-list.

Introduction

Embolemidae are a small family of chrysidoid wasps (Hymenoptera: Chrysidoidea) that parasitize nymphs of planthoppers (Hemiptera: Auchenorrhyncha) (Olmi, 1996; Varrone and Olmi, 2012; Guglielmino and Bückle, 2013; Olmi et al., 2014a, 2014b). The world fauna comprises only about 50 extant species of embolemid wasps within three genera, Ampulicomorpha Ashmead, 1893,
Embolemus Westwood, 1833 and Trogloembolemus Olmi, Mita et Guglielmino, 2014. The genus Trogloembolemus contains a single species from Japan, while Embolemus and Ampulicomorpha are distributed in all zoogeographical realms (Olmi et al., 2016). Faunas of tropical and subtropical regions reveal higher abundance of embolemid wasps, than other regions of the planet (Achterberg and Kats, 2000).

Fossil representatives of embolemid wasps are eleven described species: six of them belong to extinct genera †Baissobius Rasnitsyn 1975, †Cretembolemus Olmi et al. 2014 and †Embolemopsis Olmi, Rasnitsyn et Guglielmino, 2010; five more species are assigned to extant genera Embolemus and Ampulicomorpha. The palaeontological chronicle records Embolemidae starting from Lower Cretaceous (Aptian) and includes imprints from Orapa, Bon-Tsagaan and Baissa and specimens fossilized in Burmese, Alava, Rovno and Dominican ambers (Martynova et al., 2019).

Genera Embolemus and Ampulicomorpha are rather close in morphology, but they differ most evidently in sex dimorphism: females of Embolemus are micropterous and females of Ampulicomorpha are macropterous, while males of both genera are fully winged (Olmi, 1996; Olmi et al., 2014a, 2014b, 2016). Thus, van Achterberg and Kats (2000) proposed to synonymize these genera. Nevertheless, the biological criteria (host range) suggests the validity of both taxa: wasps of the genus Embolemus are known as parasites of nymphs of Cixiidae (Hemiptera, Fulgoromorpha) living in the soil and feeding on roots, and species of Ampulicomorpha parasitize nymphs of Achilidae living in rotten logs and feeding on hyphal sheets of shelf fungi (Bridwell, 1958; Wharton, 1989; Guglielmino and Bückle, 2013). Here, we follow Olmi (1996, 1997, 2016; Olmi et al., 2014a, 2014b) and consider Embolemus and Ampulicomorpha as a separate valid genera.

Previously only two species of the genus Embolemus s. str. were registered in Ukraine: widespread E. ruddii Westwood, 1833 was recorded for the European part of the former USSR (Trjapitzin, 1978) and E. tauricus Olmi, Belokobylskij et Guglielmino, 2014 was described from the Crimea. In the present contribution we give the second record of E. tauricus, which is the first record of this species for continental Ukraine.

Material and methods
A single female specimen of embolemid wasp E. tauricus was collected by the Barber pitfall trap (dry method, without fixing liquid) at the vicinities of Davydivka village, Akimov District, Zaporizhzhya Region, 46.517526, 35.186215, on August, 20, 2019. The specimen was preserved with 96% ethanol and is deposited in the collections of I.I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine (Kyiv, Ukraine).

The photographs were taken using a Leica Z16 APO stereomicroscope equipped with Leica DFC 450 camera and processed by LAS Core and Adobe Photoshop software.

Results
The genus Embolemus s.str. (sensu Olmi, 1996, 1997; Olmi et al., 2014a, 2014b, 2016) comprises 32 extant species and 2 fossil species:

The check-list of the genus Embolemus Westwood, 1833 s. str. (sensu Olmi, 1996)

1. Embolemus africanus (Risbec, 1957): Afrotropical realm
2. Embolemus ambrensis Olmi, 2004: Afrotropical realm
3. Embolemus angustipennis (Kieffer, 1912): Neotropical realm
4. Embolemus apertus Azevedo et Amarante, 2005: Neotropical realm
5. Embolemus bestelmeyeri Olmi 1997: Neotropical realm
22. *Embolemus pecki* Olmi, 1997: East of Palaearctic realm and Indomalayan realm
23. *Embolemus ruddii* Westwood, 1833: North of Palaearctic realm (including Ukraine)
30. *Embolemus walkeri* Richards, 1951: Indomalayan realm
32. *Embolemus zealandicus* Olmi, 1966: Australian realm
33. †*Embolemus breviscapus* Brues, 1933 (Baltic amber)
34. †*Embolemus excitus* Perrichot et Engel, 2011

The fauna of Palaearctic realm is less abundant in embolemid wasps than other realms, and encompasses only 5 species (see the check-list above). Furthermore, only 3 species are recorded for Europe and only *E. ruddii* and *E. tauricus* are registered in Ukraine (Olmi, 1996, 1997; Achterberg and Kats, 2000; Olmi et al., 2014a).

*Embolemus tauricus* is recorded in continental part of Ukraine for the first time in this contribution (Zaporizhia Region). Previously, the species was known based only on a female holotype collected in 1910 at Inkerman town, Crimean Peninsula, Ukraine (Olmi et al., 2014a).

*Embolemus ruddii* was listed in the key to insects of European part of the former USSR with collection areas specified as Western Ukraine and Crimea within Ukraine (Trjapitzin, 1978). Nevertheless, this species is known as being widespread in the Western Palaearctic and also recorded at Eastern Palaearctic (Russian Siberia) (Olmi et al., 2014a). The second species, *E. antennalis* (Kieffer, 1906), given in the Key is now considered as junior synonym of *E. ruddii* (Achterberg and Kats, 2000).

**Notes on morphology.** The studied specimen of embolemid reveals the main distinguishing character of *E. tauricus* (Fig. 1): dorsal anterior surface of propodeum shiny, weakly granulate, without rugae (Olmi et al., 2014a). It also clearly differs in having the head much longer than high (lateral view) and body testaceous light brown in color. Other characters of studied specimen correspond to the original description of Olmi et al. (2014a), including the body length of about 3 mm.
The single character of *E. tauricus* that can be specified based on additional specimen is the features of the body coloration: in the newly collected female the legs, distal third of the metasoma and apical flagellomeres are lighter brown, than the rest of body (Fig. 1). Possibly, the original coloration of holotype had been changed due to a long time gap (more than 100 years) between the collection and description of the species.

**Habitat.** *Embolemus tauricus* was collected at the section of dry steppe with sparse vegetation at clay soil. *Artemisia* sp. (Asteraceae) was the dominant plant at the collection cite (Fig. 2). The area studied is a section of steppe of Pryazovia [Cis-Azov region]. Moreover, the collection cite was located close to the bank of Utlyukskyi estuary.

![Fig. 1](image-url)

*Fig. 1. Embolemus tauricus* Olmi, Belokobylskij et Guglielmino, 2014, female, imago: *a* — body, lateral view; *b* — body, dorsal view; *c* — mesosoma, dorsal view; *d* — head, ventral view; *e* — head, lateral view.
Fig. 2. Habitat of *Embolemus tauricus* Olmi, Belokobylskij et Guglielmino, 2014 with Barber pitfall trap. The traps are marked with white arrows.

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Отримано 16.11.2019

Підписано до друку 1.12.2019

Received 16.11.2019

Accepted 1.12.2019