

Short Communication

New Data on Digger Wasps, *Sceliphron curvatum* (F. Smith, 1870) and *Trypoxylon figulus* Linnaeus, 1758 (Hymenoptera: Sphecidae) as hosts of *Amobia oculata* Robineau-Desvoidy, 1830 (Diptera: Sarcophagidae) in Ukraine

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Received: May 31, 2021; Revised June 16, 2021; Accepted: July 3, 2021

Abstract: *Amobia oculata* was reared from the nests of sphecid wasps *Sceliphron curvatum* (F. Smith, 1870) and *Trypoxylon figulus* Linnaeus, 1758 in Kyiv and Poltava regions of Ukraine. *S. curvatum* is a new host for this fly.

Keywords: Solitary wasps, Miltogrammine flies, Inquilines, Kyiv, Poltava

Introduction

This work is a continuation of the previously initiated (Verves & Protsenko, 2019) study of inquilines of solitary wasps in Ukraine. Thread-waisted or digger wasps (Hymenoptera: Apoidea, Sphecidae) consist of nearly 7700 species of solitary or semisocial insects (Pulawski, 2019). The female (sometimes together with male) build underground burrows for nesting, or aerial nests on the stems of grasses and shrubs (so called “clay jugs”), or mud nests in attics, carports, etc (so called “mud-dauber wasps”). Each nest includes from one to 40 brood cells. The adult females capture prey that they paralyze with a sting or kill and place it in a cell along with an egg. Predatory larvae feed on cicadas, aphids, bugs, grasshoppers, caterpillars, larvae and adult beetles, hymenopterans and other insects, or spiders. Adults of all known species usually feed on the nectar and (rarely) pollen of flowering

plants (O'Neill, 2000).

Mud-dauber wasps, *Sceliphron curvatum* (F. Smith, 1870) build aerial nests using mud collected from humid-soil sources and carried to the nest in the form of spherical mud-balls (Chatenoud *et al.*, 2012). *Sceliphron curvatum* is an invasive species in Ukraine. The native area of *S. curvatum* include Iraq, East Kazakhstan, Kyrgyzstan, Tajikistan, Afghanistan, Pakistan, East India and Nepal (Hensen, 1987; Gülmez & Can, 2015). The expansion of this species has been noted in Europe since 1979 (Van der Vecht, 1984), and in Georgia and Turkey from the beginning of XXI century (Gülmez & Can, 2015). In Ukraine, *S. curvatum* reached Kharkiv region in 1999; Crimea in 2000; and Zakarpattia in 2001 (Shorenko, 2003, 2005). The modern analysis of museum collections and other materials suggests, that *S. curvatum* appears almost throughout the territory of Ukraine, except of the most of Polissia (Tymkiv *et al.*, 2015). Today this species is found at territories of following 25 European countries (Schmid-Egger, 2005; Bitsch & Barbier, 2006; Ertürk & Taş, 2021): Austria (since 1979), Belarus (2014), Belgium (2014), Bulgaria (2005), Croatia (1996), Czech Republic (2004), France: mainland and Corsica (2001), Germany (2001), Greece (2005), Hungary (1998), Italy: mainland and Sicily (1995), Lithuania (2016), Luxembourg (2014), Montenegro (2004), Netherlands (2004), Poland (2009),

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Portugal (2006), Romania (2014), Russia: European part (2010), Serbia (2004), Slovakia (2003), Slovenia (1995), Spain: mainland and Balearic Is. (2006), Switzerland (2001), Ukraine (1999). *Sceliphron curvatum* has also appeared in Neotropical region: Argentina (Compagnucci & Roig Alsina, 2008) and Chile (Barrera-Medina & Garcete-Barrett, 2008). Since 2017, this species has been registered in Utah State of USA. The analysis of expansion dynamics indicates a gradual settling of *S. curvatum* in Europe, but it is limited up to north by 53°N, what can be explained by thermophilicity of this species (Schmid-Egger, 2005). The preys are paralyzed spiders from 23 genera and 10 families, mainly Araneidae, Salticidae, and Philodromidae. Female places 2–40 spiders per cell (Fateryga & Kovblyuk, 2013; Gülmez & Can, 2015; etc).

Trypoxylon figulus (Linnaeus, 1758) is distributed throughout the Holarctic region (Bitsch et al., 2001). In Ukraine, this species is known from Cherkasy (Gorobchishin, 2006), Crimea (Shorenko, 2005), Kharkiv (Shorenko & Konovalov, 2010), Khmelnytskyi (Shorenko & Konovalov, 2010), Kyiv (Gorobchishin, 2006), Luhansk (Shorenko & Konovalov, 2010), Lviv (Shorenko & Konovalov, 2010), Sumy (Shorenko & Konovalov, 2010), Ternopil (Gorobchishin, 2006), Vinnytsia (Gorobchishin, 2006), Zhytomyr (Shorenko & Konovalov, 2010) regions and Kyiv City (Gorobchishin, 2006). This species nests in holes in dead wood, walls, stems etc, and abandoned earth nests of wasps, and boreholes of beetles; the preys are different paralyzed aphids or spiders of small sizes (Abraham, 1982).

Materials and Methods

The nests of the wasps *Sceliphron curvatum* and *Trypoxylon figulus* were selected as objects for the study. The field studies by second author took place in Kyiv region, Obukhiv district, Ukrainka town, 50°09'N, 30°44' E. The nests of *S. curvatum* were placed at a height of one meter on the wall

of the apartment on the 8th floor. Insects flew in and out freely through the open window. The pupae of *A. oculata* were collected from nests in November 2019; adult flies emerged in April 2020. The pupae of *A. oculata* were collected from nests of *T. figulus* in Poltava region, Pyriatyn district, outskirts of Leliaky village, 50°20'N, 32°30'E, in October 2018; adult flies emerged in April 2019. Laboratory investigations of the hymenopteran nests were performed by second author in the Biology and Medicine Institute Science Educational Center of Taras Shevchenko National University of Kyiv, and the determination of the flies was made by senior author at the Institute for Evolutionary Ecology, National Academy of Sciences of Ukraine, Kyiv.

Results.

AMOBIA OCULATA (Zetterstedt, 1844)

Material examined

2♀. Kyiv region, Obukhiv district, Ukrainka town, inside of building, 50°09'N, 30°44'E, pupae collected in November 2019 from nest of *Sceliphron curvatum*, emerged in April 2020.

3♀. Poltava region, Pyriatyn district, outskirts of Leliaky village, 50°20'02"N, 32°30' E, bottomland, forest instillation in April 2018, pupae collected in October 2018 from nest of *Trypoxylon figulus*, emerged in April 2019.

Distribution

Ukraine: Cherkasy, Chernigiv, Dnipro, Donetsk, Kyiv and Poltava regions; Kyiv City. The detailed review of general distribution (Holarctic and northern part of Oriental regions) and a list of hymenopteran hosts of this species were given in our previous publication (Verves & Protsenko, 2019).

Comment: This is the first record of *Sceliphron curvatum* as a host of *A. oculata*.

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