

ZOOSYSTEMATICA ROSSICA

Zoological Institute, Russian Academy of Sciences, St Petersburg • https://www.zin.ru/journals/zsr/ Vol. 34(1): 3–8 • Published online 5 January 2025 • DOI 10.31610/zsr/2025.34.1.3

RESEARCH ARTICLE

A new ant-parasitising species of the genus *Microselia* (Diptera: Phoridae) from southern Russia

Новый вид рода *Microselia* (Diptera: Phoridae) с юга России, паразитирующий на муравьях

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Abstract. A new scuttle fly species, *Microselia rossica* **sp. nov.** (Diptera: Phoridae), a parasitoid of the ant species *Camponotus vagus* (Scopoli, 1763), is described from the floodplain habitats of the Rostov Province in southern European Russia. This is the first confirmed case of parasitisation by scuttle flies of worker ants in Russia. The behaviour of the females of the new species attacking the ants is described.

Резюме. В статье описан новый вид мух-горбаток *Microselia rossica* **sp. nov.** (Diptera: Phoridae) – паразитоид муравьев *Camponotus vagus* (Scopoli, 1763), обнаруженный в пойменных биотопах Ростовской области (Россия). Это первый подтвержденный случай паразитирования мух-горбаток на рабочих муравьях в России. Описано поведение самок нового вида при нападении на муравьев.

Key words: ants, scuttle flies, parasitoid, parasitisation, floodplain habitats, Phoridae, Formicidae, *Camponotus, Microselia*, new species

Ключевые слова: муравьи, мухи-горбатки, паразитоид, паразитизм, пойменные биотопы, Phoridae, Formicidae, *Camponotus*, *Microselia*, новый вид

ZooBank Article LSID: 9A329891-BB46-4C4E-8A49-5911D07521A4

Introduction

Scuttle flies (Diptera: Phoridae) occupy a significant place among parasitoids of ants (Hymenoptera: Formicidae) (Quevillon, 2018; Shevchenko et al., 2024). The Palaearctic members of the genus *Microselia* Schmitz, 1934 are associated with the ant genus *Camponotus* Mayr, 1861, ovipositing in the abdomen of worker ants (Schmitz, 1934; Della Santa, 1993; Disney & Shaw, 1994; Carles-Tolra, 2006; Carles-Tolra & Rivera, 2008). Up to now, five species of the genus were known in Europe (Disney, 1988; Gori, 1999; Disney, 2006). One species, *M. southwoodi* Disney, 1988, is known to be a parasitoid of *C. vagus* (Disney & Shaw, 1994). Most of the records of members of the genus have been made in Southern Europe. In Russia, only one species was known, *M. forsiusi* (Schmitz, 1927), recorded from the Kola Peninsula (Disney, 2013). This species is also known from Finland (Schmitz, 1927), but without knowledge about its host.

The paper presents the first observations of members of the genus *Microselia* from southern European Russia (Rostov Province), attacking the worker ants of *C. vagus*, with the description of a new species.

Materials and methods

The flies were collected in two localities: (1) the floodplain of the Chir River near the Oblivskaya Village (Oblivskiy District, Rostov Province of Russia), from 21 to 23 July 2024, and the floodplain of the Don River near the Bagaevskaya Village (Bagaevskiy District, same province), on 31 August 2024. The flies were caught with an aspirator and preserved in 70% ethanol. In both localities, observations on the behaviour of the flies were made.

Two specimens were pinned and eight (including the holotype) were mounted on slides in Canada balsam according to Disney (2001). The photos were taken via a Motic BA210 microscope in transmitted and reflected light using a Panasonic Lumix G7 digital camera and via a Keyence VK-9700 laser scanning microscope. The final images were processed with Adobe Photoshop CS5.

Morphological terms were used and morphometric analysis (length ratio of the wing veins and legs tarsomeres) was performed according to Disney (1994). The type specimens of flies are kept at the Zoological Institute of the Russian Academy of Sciences (ZISP).

Results

Order Diptera

Family Phoridae

Subfamily Metopininae

Tribe Metopinini

Genus Microselia Schmitz, 1934

Microselia rossica sp. nov. (Figs 1, 2)

Holotype. Female, **Russia**, Rostov Prov., Oblivskiy Distr., Oblivskaya Vill., floodplain of Chir River, 48°35′21.01″N 42°19′24.04″E, ca. 55 m a.s.l., on willow trunk, attacking *Camponotus vagus* worker ants, 21.VII.2024, D.M. Shevchenko leg. (ZISP).

Paratypes. **Russia**, *Rostov Prov.*: 2 females, with same data as for holotype (ZISP); 2 females, with same data but 23.VII.2024 (ZISP); 5 females, Bagaevskiy Distr., Bagaevskaya Vill., floodplain of Don River, 47°20′50.02″N 40°22′24.08″E, ca. 10 m a.s.l., on cherry plum trunk, attacking *Camponotus vagus* worker ants, 31.VIII.2024, D.M. Shevchenko leg. (ZISP).

Description. *Female*. Body length 1.0–1.1 mm (Fig. 1A).

Frons dark brown, with 80–85 setulae. A single pair of supra-antennal setae. Frontal setae three times as long as adjacent setulae and 2.0– 2.5 times as long as postocular setae. Genal setae as long as frontal setae (Fig. 2B). Flagellomere 1 brown, on inside clearly curved, on outside slightly concave and tapering anteriorly. Arista very short (Fig. 2A). Palpus yellowish brown, with four setae. Labrum yellowish brown.

Thorax dark brown. Notopleuron with two setae. Scutum with two setae. Scutellum with posterior pair of setae and anterior pair of hairs (Fig. 2A). Mesopleuron bare. Femur and tibia brown. Legs brownish yellow. Last tarsal segment of fore and mid legs elongated and tapered (Fig. 2F). Ratios of lengths of fore legs tarsomeres as 0.97:0.73:0.52:0.51:1; ratios of lengths of mid tarsomeres as 1.53:0.73:0.61:0.45:1. Setae on ventrobasal half of hind femur twice as long and twice as thick as those on dorsal part. Last tarsal segment of hind leg more rounded than respective segments of fore and mid legs. Ratios of lengths of hind tarsomeres as 2.03:0.96:1.01:0.88:1.

Wing length 0.95–0.99 mm (Fig. 1C). Costal index 0.354. Costal ratios 2.55 : 1. Basal seta 0.069 mm. Costal cilia 0.034–0.037 mm long. Veins brown, membrane brownish grey. Vein 2 absent in all specimens. Halteres dark brown.

Abdominal tergites dark brown with white border. Sternite 6 desclerotised in middle, with 6–7 hairs on each side (Fig. 2D). Ovipositor sheath distinctly divergent posteriorly, its posterior margin slightly angular (Fig. 1B). Ovipositor with parallel sides, sharpened towards end.

Male unknown.

Comparison. In a key to the European species of *Microselia* provided by Carles-Tolra (2006), the new species runs to *M. rivierae* Schmitz, 1934 (and is most similar to this species), but it differs



Fig. 1. *Microselia rossica* **sp. nov.**, female, paratype. **A**, body without wings, lateral view; **B**, ovipositor, posterodorsal view; **C**, wing. Scale bars: 0.5 mm (A), 0.1 mm (B), 0.3 mm (C).

from the latter in the different shape of the ovipositor and the ovipositor sheath. The ovipositor of M. rossica **sp. nov.** has a sharper narrowing at the end, while the ovipositors of other species taper more smoothly towards the end. The posterior margin of the ovipositor sheath of M. rossica **sp. nov.** is more convex and rounded, while the shields of other species, except M. forsiusi, taper to the posterior margin, forming almost a 90° angle. In addition, M. rossica **sp. nov.** differs from the other species in the wing morphometry: it has a different costal index (0.29–0.38 in M. rivierae), costal ratios (2.02 : 1 in M. rivierae) and wing length

were found trying to oviposit in the worker ants of *C. vagus* defending the aphid colonies on a trunk of a cherry plum (*Prunus cerasifera* Ehrh.) one metre above the ground.

The females of *M. rossica* **sp. nov.** were following the running workers of *C. vagus* and those sitting near the aphid colony. Phorids were flying 1-2 cm above the ant's abdomen trying to sit on it (see Addenda: Fig. 3B). When the fly landed on the ant, the worker was trying to shake it off with its hind legs. The attack of the fly was about 5-8 seconds long. After 3-4 unsuccessful attempts, the phorid flew away and tried to oviposit in the

(1.06–1.14 mm in *M*. *rivierae*).

Etymology. The specific epithet is an adjective referring to Russia, the country where the material of the new species was collected.

Hosts. *Camponotus vagus* is known as the only host of this species.

Notes on habitat and behaviour. In the type locality (floodplain of the Chir River), the females of M. rossica sp. nov. were detected trying to attack the worker ants of C. vagus on the branches and a tree trunk of willow (Salix alba L.) 2-5 metres above the ground (see Addenda: Fig. 3A). Three females of M. rossica sp. nov. were caught and four more were observed on 21 July, and two females were collected two days later. In the second locality (floodplain of the Don River), they



Fig. 2. *Microselia rossica* **sp. nov.**, female, paratype. **A**, head, scutum and scutellum, dorsal view; **B**, head, frontal view; **C**, abdomen, dorsal view; **D**, sternite 6, dorsal view (arrow indicates hairs of sternite 6); **E**, ovipositor, lateral view (laser microscopy); **F**, mid leg (laser microscopy). Scale bars: 0.3 mm (A–C), 0.1 mm (D), 0.05 mm (E, F).

next worker ant (see Addenda: video file). Sometimes the flies were sitting on bark for 1-2 minutes waiting for the ant to pass by. The flies did not choose the biggest or the smallest workers, as well as the wounded ones. They were active till 8 p.m. and disappeared after sunset. On July 22, no scuttle flies were observed, as it was raining all day. On July 23, two females were found in the same place. Since the weather was cloudy when there was no direct sunlight, the flies immediately stopped attacking the ants.

A key to species of *Microselia* known from Russia

- 1. Ovipositor sheath with a pair of posterodorsal subcircular swellings in its widest part. Wing length 1.30 mm; costal ratios 2.11 : 1 **M. forsiusi**

Discussion

The diurnal patterns of activity of scuttle flies are poorly known (Disney, 1994). However, Hussey's data (Hussey, 1965) on the diurnal flight activity of another scuttle fly, Megaselia halterata (Wood, 1910), are highly correlated with our data on Microselia rossica sp. nov. In both of our localities, the individuals of *M. rossica* **sp. nov.** were active only in sunny, windless weather. Carles-Tolra (2006) reported that M. rivierae have no preferences in attacking a running or a standing ant. Our observations on *M. rossica* sp. nov. suggest that phorids prefer to attack the groups of ants maintaining aphid colonies, since they are often static and do not pay much attention to the attacks of the flies. Phorids were not found to have preferences in choosing the size of the host. It is also unclear if the members of the genus Microselia are species-specific to different species of ants, as there are very few observations of their behaviour in nature. The way the M. rossica oviposit in the ant's abdomen is different from those of M. southwoodi in the experiments of Duran (2012). He reported that the flies can both attack an ant from above by injecting an ovipositor between the tergites, and fly up to an ant from below, holding onto a petiole and injecting an ovipositor between sternites 1 and 2. We did not observe the latter way. Perhaps this method of parasitising is available to the fly only when the ant is fixed and cannot scare it away or shake it off, as in the Duran's experiment.

Addenda

Electronic supplementary material 1.

Fig. 3. The habitat of *Microselia rossica* sp. nov. in its type locality (floodplain of the Chir River, Rostov Province of Russia). A, willow (*Salix alba* L.), the habitat of *M. rossica* sp. nov.; B, worker ants of *Camponotus vagus* on the willow trunk, maintaining aphid colony (the white circle highlights the female of *M. rossica* sp. nov. attacking the worker ant). File format: JPG.

Electronic supplementary material 2.

Video file. The female of *Microselia rossica* sp. nov. trying to oviposit in the worker ant of *Camponotus vagus* maintaining on aphids colony. File format: MP4.

These materials are available from: https://doi.org/10.31610/zsr/2025.34.1.3

Acknowledgements

The work was performed using equipment at the shared resource centre of Federal Research Centre the Southern Scientific Centre of the Russian Academy of Sciences (501994).

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Editorial responsibility: A.A. Przhiboro