Biuletyn Sekcji Dipterologicznej Polskiego Towarzystwa Entomologicznego
DIPTERON
Bulletin of the Dipterological Section of the Polish Entomological Society

ISSN 1895–4464
Tom 34: 45-51
Akceptacja: 15.12.2018
Wrocław 18 XII 2018

Orbellia cuniculorum Robineau-Desvoidy, 1830 (Diptera, Heleomyzidae) – a species newly recorded for the fauna of Russia (Chuvash Republic)

Orbellia cuniculorum Robineau-Desvoidy,1830 (Diptera, Heleomyzidae) - gatunek nowo wykazany dla fauny Rosji (Republika Czuwaska)

DOI: 10.5281/zenodo.2372579

ANDRZEJ J.WOŹNICA[1], NATALIA V. BORISOVA[2]

[1] Institute of Biology, Wrocław University of Environmental & Life Sciences
Kożuchowska 5b, 51-631 Wrocław, Poland
e-mail: andrzej.woznica@upwr.edu.pl

[2] Nature Reserve "Prisursky", Lesnoi Settlement 9, Cheboksary, Chuvashia, 428034 Russia
e-mail: natborisova18@yandex.ru

ABSTRACT. A heleomyzid fly, *Orbellia cuniculorum* ROBINEAU-DESVOIDY, 1830, is recorded from Russia for the first time, based on male specimens collected in the vicinity of Cheboksary, the Chuvash Republic. The males were observed on snow in a pine forest during December 2017. A detailed/short, illustrated diagnosis of *O. cuniculorum* and a key to males of other species of the genus known from the European part of Russia are given.

KEY WORDS: Heleomyzid fly, *Orbellia cuniculorum*, systematics, new record, Russia

INTRODUCTION

Heleomyzidae are cold adapted flies, mostly distributed in the Northern Hemisphere. Adults are often found in forested areas and they can be collected using various types of traps, such as funnel or pitfall traps (HACKMAN 1963), designed for collecting ground- and underground active invertebrates or those living under snow cover. During studies on snow-active flies (Diptera) of the Chuvash Republic in Russia conducted from November 2017 to January 2018, some heleomyzid flies were found. Among them two species of the genus

Orbellia ROBINEAU-DESVOIDY, 1830 were collected (BORISOVA *et* AL. 2018). The representatives of this genus belong to the –winter-active group of flies often recorded in late autumn and during winter, and they are often collected on snow (SOSZYŃSKA-MAJ *et* WOŹNICA 2016). Among the collected species, *Orbellia cuniculorum* ROBINEAU-DESVOIDY. 1830, is a very rare European heleomyzid fly taxon, hitherto not recorded from Russia (WOŹNICA 2018). Although the life-cycle of this species remains still unknown, CZERNY (1924) mentioned that some specimens of *Orbellia cuniculorum* were collected from rabbit warrens. Another record, from Spain, where a single female specimen had been collected in March, suggests that it can be regarded as a coprophagous species (CARLES-TOLRÁ 2011). Besides the present record in Russia, *Orbellia cuniculorum* is known from France, Germany, Hungary, Lithuania, Poland, Slovakia, and Spain (WOŹNICA 2018).

MATERIAL AND METHODS

This study is based on the materials collected by the junior author in the vicinity of Cheboksary, the Chuvash Republic (Southern Russia). Habitat: edge of young pines plantation, near a ditch filled with water (beavers activity visible); flies were found on snow; +1°C, 93% humidity, overcast and rainy weather. All specimens are stored in 75% ethanol and kept in plastic vials (specimens deposited in Museum of Natural History of the University of Lodz, and in the senior author's collection). Specimens were examined under a Nikon SMZ 800 stereomicroscope. Photographs were taken using a Canon 600D camera attached to the Nikon SMZ 800 stereomicroscope. Image stacks were processed using Combine ZP (HADLEY, 2010) and edited with Corel Photo-Paint X6. Metric indexes and abbreviations of various body parts are standards used by WOŹNICA (1993, 2006, 2015).

RESULTS

Family: Heleomyzidae WESTWOOD, 1840
Subfamily: Heleomyzinae WESTWOOD, 1840
Tribe: *Orbellini* GORODKOV, 1972
Genus: *Orbellia* ROBINEAU-DESVOIDY,1830

Orbellia cuniculorum ROBINEAU-DESVOIDY, 1830 (FIG. 1-3).

Material examined: 4♂♂, Zavolzhye, 56°10'14.2''N 47°19'10.33''E, pine forest and its edges, 4.XII.2017, leg. N.V BORISOVA.

Measurements:

Body length: 3.80–4.50 mm. Head ratio: 1.1–1.2x**;** cheek–eye ratio: 0.53–0.65x; Aor/Por: 0.7–0.80. Wing: length: 3.5–4.35 mm; width: 1.23–1.61 mm; Mv ratio: 1.185–1.241.

FIG./RYC. 1. *Orbellia cuniculorum* ROBINEAU-DESVOIDY 1830, male on snow (Chuvack Republic). PHOTO N.V. BORISOVA.

SPECIES DIAGNOSIS

The smallest European *Orbellia* species, with body length less than 4.5 mm, and generally blackish-brown in colour (FIG. 1), with relatively small eyes, very broad and yellowish-brown gena, yellowish palpus slightly darkened apically, cheek-eye ratio more than one-half to two-thirds of eye diameter (FIG. 2A). Arista blackish, shorter than head height, and minutely pubescent. Frons regularly covered by small black setulae. Anterior orbital bristle ca. 0.8 times shorter than the second orbital and both directed outwardly. Mesonotum with typical chaetotaxy, as for other European *Orbellia* species (GORODKOV 1972), with numerous and various-in-length dorsocentral bristles, with two presutural and three to four postsutural bristles. Dorsal part of scutellum bare, with four scutellar bristles only. Pleuron with one small proepimeral bristle and two large but unequal in length bristles and few smaller bristles situated anteriorly in the katepisternal area. Legs normally developed, brownish in colour, femora not dilated. Fore leg with yellowish-brown tibia and hook-like bristle at the end of first tarsomere. Mid tibia with two preapical bristles (generic character, see CZERNY 1924; WOŹNICA 2006). Hind femur shortly setulose and without anterodorsal bristles. Wing with few short costal spines, especially distal to the subcostal break, membrane rather transparent, subcostal cell slightly dusted and ending distinctly beyond anterior crossvein (FIG. 2B). Abdomen with six well developed segments, brownish-black and sparsely setulose. Male with large brown epandrium bearing wide yellowish cercus and triangular yellow gonostylus (FIG. 3 A-B). Aedeagal-complex of very complicated structure, with 6-7 black thorns in the middle part, and with distal part left-twisted (Fig. 3A). **Species new to the Russian fauna**.

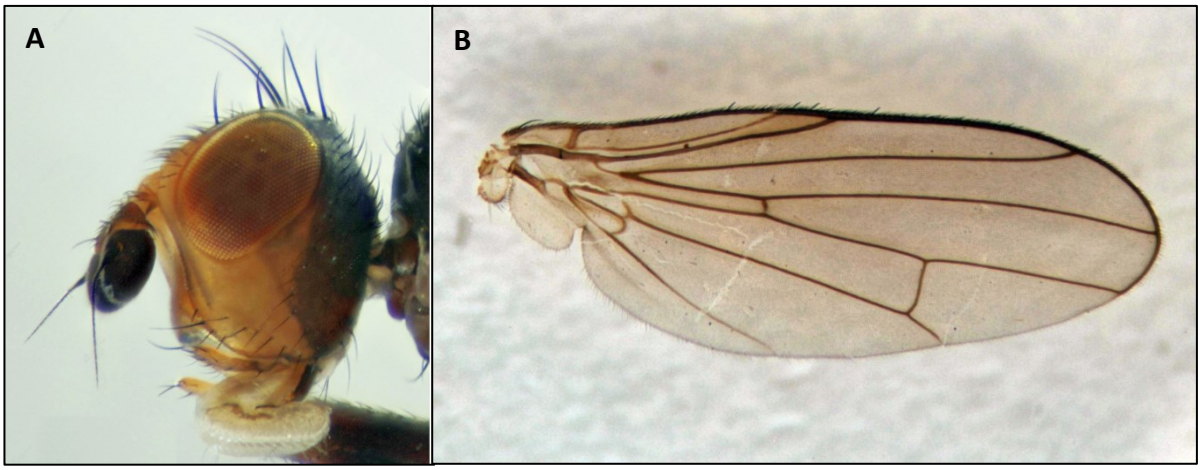

FIG./RYC. 2. *Orbellia cuniculorum* R.-D. 1830. **A**. head in lateral view, **B**. right wing.

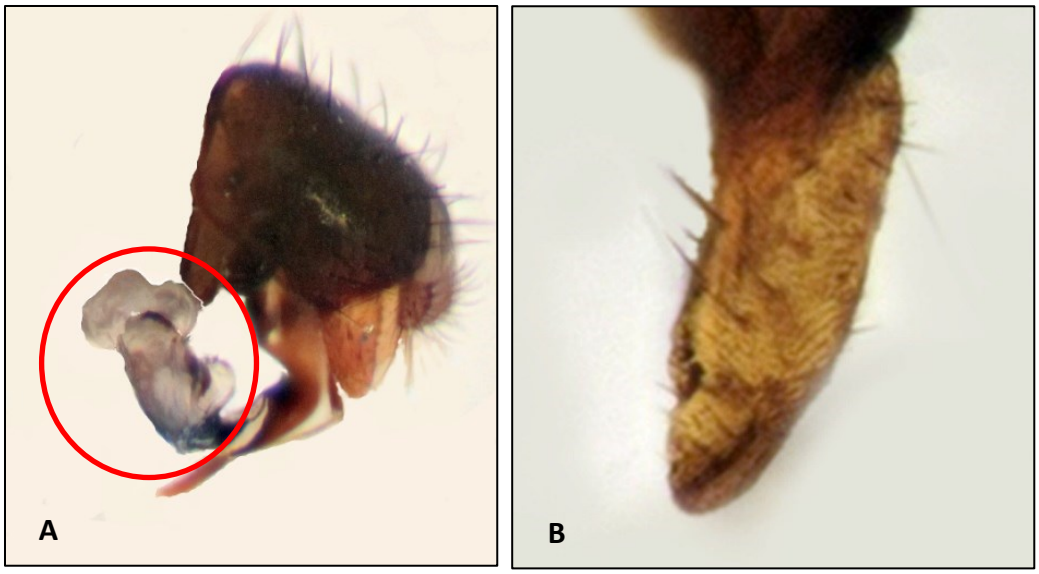

FIG./RYC. 3. *Orbellia cuniculorum* R.-D. 1830. **A**. Epandrial complex with apical part of distiphallus (red circled) at left side in lateral view. **C**. right gonostylus in ventral view.

DISCUSSION

Orbellia cuniculorum is a typical representative of the genus *Orbellia* (WOŹNICA 2006), which is represented by 14 nominative species, known only from the Holarctic Region (1 Holarctic, 2 Nearctic and 11 Palaearctic, see GILL 1962; GORODKOV 1984). It is worth noting that the recently described species, *Orbellia inflata* CARLES-TOLRÁ *et* PEREZ, 2016, is known from the type-locality only (western Spain). This very peculiar species, with a highly inflated mid femur (CARLES-TOLRÁ *et* PEREZ 2016), is not yet included the in *Fauna Europaea* database (WOŹNICA 2018). *Orbellia cuniculorum* resembles *O. hiemalis* (LOEW [1862]), but the latter species differs in the colour of the palpus and gena (see the key below). Adults of *Orbellia* species are collected/occurring mostly from/in rodents burrows or from/on snow (SOSZYŃSKA-MAJ *et* WOŹNICA 2016; BORISOVA *et* AL. 2018).

FIG./РУС. 4. Pine forest - habitat of *Orbellia cuniculorum* R.-D. 1830 in the vicinity of sanatorium „Chuvashia”.

Nine *Orbellia* species are known from Europe, and from these, five are recorded from the European part of Russia (GORODKOV 1984; CARLES-TOLRÁ 2016). The Volga region (Zavolzhye) where specimens of *O. cuniculorum* were collected, is a natural zone of the Chuvash Republic located on the right bank of the river Volga. The surface of the territory folded by the probe (near-glacial) sands is almost entirely covered with pine forests (FIG. 4 A-B). In this area there are many sphagnum bogs and lakes with marshy shores. Pine forests dominate the vegetation cover (lichen pine forest, sphagnum pine forests with cranberries, etc.). Flies were found on snow, at +1°C, 93% humidity in overcast rainy weather.

KEY TO *ORBELLIA* SPECIES RECORDED FROM THE EUROPEAN PART OF RUSSIA (MALES ONLY)

1. Palpus and gena blackish ..... ***hiemalis*** (LOEW, 1862)
-. Palpus yellowish to orange-brown; gena variable in colour, but not black ..... 2.
2. Two pairs of scutellar bristles ..... 3.
-. Three pairs of scutellar bristles ..... 4.
3. Katepisternum with one large bristle; abdomen yellowish-orange to yellowish-brown ..... ***tetrachaeta*** GORODKOV, 1972
-. Katepisternum with two bristles; abdomen blackish-brown ..... ***cuniculorum*** Robineau-Desvoidy, 1830
4. Frons totally yellowish-brown in colour; postpronotum brownish, contrasting with bluish-grey mesonotum ..... ***montana*** GORODKOV, 1972
-. Frons orange-brown in colour; postpronotum concolourous with mesonotum ..... ***nivicola*** (FREY, 1913)

REFERENCES

BORISOVA N.V., WOŹNICA A.J., SOSZYŃSKA-MAJ A. Some data about the winter active Diptera (Insecta) of the Chuvash Republic. Scientific works of the state natural reserve "Prisursky". Cheboksary. ED. L.V. EGOROV. CHEBOKSARY, 2018. VOL. **33**: 91-98.

CARLES-TOLRÁ M. 2011. Some dipterans collected on winter cadavers in La Rioja (Spain) (Diptera: Phoridae, Heleomyzidae and Sphaeroceridae). Boletín de la Sociedad Entomológica Aragonesa (S.E.A.) **48**: 147-150.

CARLES TOLRÁ M., PÉREZ D.V. 2016. *Orbellia inflata* sp. n.: a new heleomyzid species from Spain (Diptera, Heleomyzidae). Boletín de la Sociedad Entomológica Aragonesa (S.E.A.) **59**: 43-45.

CZERNY L. 1924. Monographie der Helomyziden. Abhandlung der Zoologischen-Botanischen Gesellschaft in Wien 15(1): 1-166.

GILL G.D. 1962. The heleomyzid flies of America north of Mexico (Diptera: Heleomyzidae). Proceedings of the United States National Museum **113**(3465): 495-603.

GORODKOV K.B. 1972. A system of Holarctic Helomyzidae (Diptera, Acalyptrata). Doklady XXIII ezheg. chtenii pam. N.A. Kholodkovskogo, 2 April 1970: 50-92 (*In Russian*).

GORODKOV K.B. 1984. Family Heleomyzidae (Helomyzidae), pp.15-45. [In]: SOÓS Á. & PAPP L. (EDS). Catalogue of Palaearctic Diptera, vol.**10**, Budapest.

HACKMAN W. 1963. Studies on the dipterous fauna in burrows of voles (*Microtus*, *Clethrionomys*) in Finland. Acta Zoologica Fennica **102**: 1-64.
LOEW H. 1862. Über die europäischen Helomyzidae und die in Schlesien vorkommenden Arten derselben. Zeitschrift für Entomologie Breslau (1859) **13**: 1-80.
SOSZYŃSKA-MAJ A., WOŹNICA A.J. 2016. A case study of Heleomyzidae (Diptera) recorded on snow in Poland with a review of their winter activity in Europe. European Journal of Entomology **113**: 279-294.
WESTWOOD J.O. 1840. Order XIII. Diptera Aristotle. (Antiata FABRICIUS, Halteriptera CLAIRV.). Pp. 125–154. [In]: WESTWOOD, J.O. Synopsis of the genera of British Insects.
WOŹNICA A. 1993. A new genus of heleomyzid fly of the tribe Oecotheini from Afrotropical Region (Diptera: Heleomyzidae). Genus **4**(1): 59-65.
WOŹNICA A. 2006. *Protoorbellia hoffeinsorum* gen. and sp. nov., a new heleomyzid genus and species of the tribe Orbelliini GORODKOV from Baltic amber (Diptera: Heleomyzidae). Annales Zoologici vol. **56**(1): 147-151.
WOŹNICA A.J. 2015. Two new Palaearctic species of the genus *Schroederella* ENDERLEIN, 1920 (Diptera: Heleomyzidae). Polish Journal of Entomology **84**(4): 371-382.
WOŹNICA A.J. 2018. Fauna Europaea: Heleomyzidae. [In]: PAPE T. *et* P. BEUK (EDS). Fauna Europaea: Diptera: Brachycera. https://fauna-eu.org/cdm_dataportal/taxon/361a98c1-09e0-4ad7-84de-f66c17f1cac3.

PODSUMOWANIE

Rodzaj *Orbellia* ROBINEAU-DESVOIDY, 1830 (Diptera: Heleomyzidae) obejmuje ogółem 14 gatunków, z których aż 12 występuje w Palearktyce. Muchówki te są słabo zbadane, zarówno pod względem poznania ich biologii, jak i rozmieszczenia. Dotychczasowe dane pozwalają stwierdzić, że postaci dorosłe tych gatunków występują wyłącznie w okresie jesienno-zimowym oraz wczesną wiosną, stąd grupa ta stanowi bardzo ważny element fauny naśnieżnej (SOSZYŃSKA-MAJ *et* WOŹNICA 2016). W niniejszej pracy podano informacje na temat bardzo rzadko spotykanego gatunku, *Orbellia cuniculorum*, ROBINEAU-DESVOIDY 1830. Po raz pierwszy podana została jego diagnoza a także klucz do oznaczania europejskich gatunków z rodzaju *Orbellia* wykazanych w Rosji.

==========

* ***Editorial remarks:***

* This paper is dedicated to the late BOGUSŁAW SOSZYŃSKI.