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SHORT COMMUNICATIONS

New Amphibiotic Species of Net-Winged Insect Order Found in Fauna of Belarus (Insecta: Neuroptera)

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Abstract—Information on the findings of two amphibiotic species new to Belarusian fauna, *Osmylus fulvicephalus* (Scopoli, 1763) and *Sisyra terminalis* Curtis, 1854 of the net-winged insect order Neuroptera, is reported. Data on the location, distribution, and ecological and biological characteristics of each species are provided.

Keywords: Hemerobiiformia, *Osmylus fulvicephalus*, *Sisyra terminalis*, new species, Belarusian fauna

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One of the priorities of modern biology is studying and preserving biodiversity (Koptyug, 1993; Mordkovich, 2005; Pavlov, 2011). The net-winged insect order (Insecta: Neuroptera) is of special interest. Studying insects of this group is relevant due to the insufficient ecological and faunistic data on these insects in a range of regions around the world and their economic importance as entomophages of major pests of agriculture (generally including aphises, mealybugs, and herbivorous mites). Some species of net-winged insects are quite rarely found or are unique specimens of their families, which can be the basis for including them into Red Books at different levels (Kaverzina, 2011). The fauna currently includes approximately 6000 species of the net-winged insects ascertained to 18 families in 3 suborders (Kral and Devetak, 2016). Various literature sources provide data on 15 to 20 species found in Belarus (Borodin, 2013; Burko and Lopatin, 2001). New species are regularly added to the list classifying their periodical occurrence (Ostrovsky, 2016, 2017).

Two new amphibiotic species found in Belarus were identified by studying the materials of Prof. Dr. Hab. Oleg Aleksandrovich (Institute of Biology and Earth Sciences, Pomeranian University in Slupsk, Poland) and analyzing the materials from field surveys carried out by the author. The species are assigned to the suborder Hemerobiiformia of the net-winged insect order Neuroptera.

Order Neuroptera Linnaeus, 1758

Family Osmylidae Leach, 1815

Osmylus fulvicephalus (Scopoli, 1763)

Material. Republic of Belarus, environs of the city of Grodno, bank of the Zarechanka River at its confluence with the principal Neman River, swarming, July 15, 1998, 3♂♂, 2♀♀, O.R. Aleksandrowicz leg., A.M. Ostrovsky det., 2018.

Description. Central European species. The species range covers Central and Southern Europe and Asia Minor. It is known to occur in Albania, Austria, Belgium, Bosnia and Herzegovina, Great Britain, Bulgaria, Croatia, Czechia, Denmark, Estonia, Turkey, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg and Liechtenstein, Macedonia, Poland, Romania, Slovenia, Spain, Sweden, Switzerland, and the Netherlands (Letardi et al., 2003). The species inhabits Ukraine and Crimea (Zakharenko, 1994). The species is recorded in Leningradskaya, Voronezh, Samara, and Saratov oblasts in Russia. It is included in the regional Red Books (excluding Voronezh oblast). However, it is thought that this species is probably extinct from Leningradskaya oblast at present, since the last date of its collection in that area was 1924 (Anikin, 2006; Kovrigina, 2009; Krivokhatskii, 2002; Makarkin and Ruchin, 2015). This species is a single representative of the family Osmylidae in the fauna of Belarus. It can be found in local populations on the banks of the fast-flowing rivers and streams. Larvae are predators; their life cycle is semiaquatic (Pavlovsky and Lepneva, 1948).

Family Sisyridae Handlirsch, 1906

Sisyra terminalis Curtis, 1854

Material. Republic of Belarus, Grodno raion, village of Pogorany, bank of the Neman River, June 25, 2012, 2♂♂, 4♀♀, O.R. Aleksandrowicz leg., A.M. Ostrovsky det., 2018; city of Gomel, Lunacharsky Central Park of Culture and Recreation, embankment

of the Sozh River, May 20, 2019, 4♂♂, 4♀♀, A.M. Ostrovsky leg. et det., 2019.

Description. The species is distributed in Europe and the Russian Far East (Khabarovsk krai and Primorskii krai) (Makarkin and Ruchin, 2019). It inhabits Austria, Belgium, Great Britain, Bulgaria, Croatia, Czechia, Finland, France, Germany, Hungary, Ireland, Italy, Poland, Romania, Slovenia, Sweden, Switzerland, Netherlands and Ukraine (Letardi et al., 2003). In the adjacent regions of Russia, it has been previously known in Bryansk, Belgorod, and Saratov oblasts, Perm krai, and the Northern Caucasus (Zakharenko, 1988; Zakharenko and Krivokhatsky, 1993; Krivokhatsky and Rokhletsova, 2004; Pankov and Novokshonov, 1995; Abrahám, 2000). The species is recently found in Mordovia (Makarkin and Ruchin, 2019). The lack of data on it in Southern Siberia is probably associated with insufficient knowledge of this species. The second representative of the family Sisyridae in the Belarus fauna is different from *S. nigra* (Retzius, 1783) in the light color of ¼ antenna upper portions. Images inhabit vegetation in the coastal areas close to the water reservoirs and streams. Larvae are predators; they are known as parasites of freshwater sponges (Pavlovsky and Lepneva, 1948).

CONCLUSIONS

Two new species ascertained to two families have been added to the species composition of net-winged insects in Belarus. One of these families (Osmylidae) was indicated for the first time to the fauna of Belarus. The data are of great importance, since they extend our understanding of the current distribution of *Osmylus fulvicephalus* and *Sisyra terminalis* in Eastern Europe. Further research surveys are required in order to find out new habitats of the species in the Republic of Belarus. It can generally provide the probability to justify the subsequent inclusion of these species in the Red Book of the Republic of Belarus.

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COMPLIANCE WITH ETHICAL STANDARDS

Conflict of interest. The author declares that he has no conflict of interest.

Statement of welfare of animals. All applicable international, national, and/or institutional guidelines for the care and use of animals were followed.

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