



The first records of *Chrysopa walkeri* (McLachlan, 1893) and *Euroleon nostras* (Geoffroy in Fourcroy, 1785) (Insecta: Neuroptera) from Belarus

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Abstract The first records of *Chrysopa walkeri* (McLachlan, 1893) and *Euroleon nostras* (Geoffroy in Fourcroy, 1785) from the fauna of Belarus are provided. Brief information on distribution and ecology of these species is given.

Pierwsze stwierdzenie *Chrysopa walkeri* (McLachlan, 1893) i *Euroleon nostras* (Geoffroy in Fourcroy, 1785) (Owady: Neuroptera) z Białorusi

Słowa kluczowe Neuroptera, *Chrysopa walkeri*, *Euroleon nostras*, nowe stwierdzenie, SE Białoruś

Streszczenie Artykuł zawiera doniesienie dotyczące pierwszego stwierdzenia *Chrysopa walkeri* (McLachlan, 1893) i *Euroleon nostras* (Geoffroy in Fourcroy, 1785) z Białorusi. Ponadto opisano biologię i rozmieszczenie powyższych gatunków.

Introduction

One of the priorities of modern biology is studying and preserving biodiversity (Koptuyug, 1993; Mordkovich, 2005; Pavlov, 2011). The net-winged insect order (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 aphids, 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 6,000 species of the net-winged insects ascertained to 18 families in 3 suborders (Kral, Devetak, 2016). Various literature sources

provide data on 15 to 20 species found in Belarus (Borodin, 2013; Burko, Lopatin, 2001). New species are regularly added to the list classifying their periodical occurrence (Ostrovsky, 2016, 2017, 2020, 2021). Thus, we registered the *Chrysopa walkeri* (McLachlan, 1893) and *Euroleon nostras* (Geoffroy in Fourcroy, 1785) in Belarus territory that was the result of our continuous research.

Material and methods

Two new species found in Belarus were identified by analyzing the materials from field surveys carried out by the author. The species are assigned to the suborders Hemerobiiformia and Myrmeleontiformia of the net-winged insect order Neuroptera. The examined specimens are housed at the author's collection.

Results and discussion

Order Neuroptera Linnaeus, 1758

Suborder Hemerobiiformia Latreille, 1803

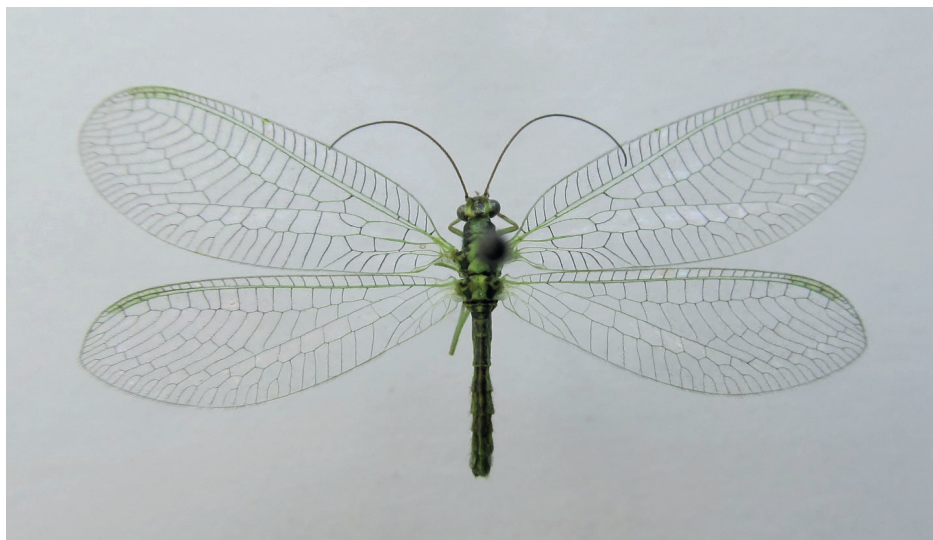
Family Chrysopidae Schneider, 1851

Chrysopa walkeri (McLachlan, 1893)

Material examined. 1♂, Republic of Belarus, Gomel area, Gomel district, W of the Rudnya Marimonova village, pine forest on the sands, 52°09'30"N 30°42'19"E, 121 a.s.l., 10.07.2021.

Distribution. West-Palaeartic species. Distributed to the east to the Baikal region and Kyrgyzstan. Recorded from the following countries: Belarus (new record); Austria, Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Hungary, Italy, Moldova, Montenegro, Romania, Russia, Serbia, Slovakia, Slovenia, Switzerland, Ukraine (Aspöck, Aspöck, Hölzel, 1980; Seredyuk, 2015). Also known from the Asian part of Turkey, Caucasus, Armenia, Lebanon, Kazakhstan, Kyrgyzstan, Uzbekistan (Makarkin, Shchurov, 2011; Daminova, 2015).

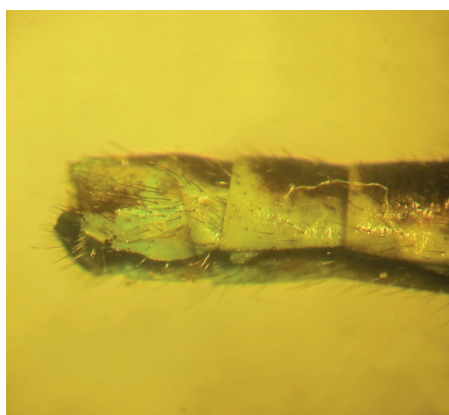
Remarks. It lives in the herbaceous layer in loose bush stands, forest clearings or cleared forests in heat-favored locations (Aspöck et al., 1980). Like the closely related species, *C. perla* (Linnaeus, 1758), which is widespread in Belarus, *C. walkeri* is diurnal, which is extremely rare in green lacewings (Duelli, 1986). *C. walkeri* therefore rarely comes to light at night and is accordingly rare in light traps even where the species is more common. Imago and larvae are predators (Duelli, Monnerat, Koch, 2016).



A



B



C

Figure 1. *Chrysopa walkeri*: A – general view, B – front view of the head and thorax, C – side view of the distal part of the male abdomen

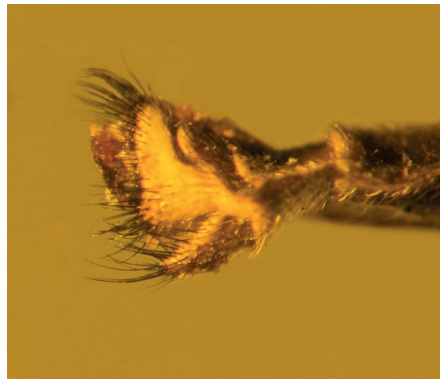
Suborder Myrmeleontiformia Latreille, 1802
Family Myrmeleontidae Latreille, 1802
Euroleon nostras (Geoffroy in Fourcroy, 1785)



A



B



C



D



E

Figure 2. *Euroleon nostras*: A – general view, B – front view of the head, C – side view of the distal part of the male abdomen, D – axillary plates of the male, E – cocoon

Material examined. During a fieldwork carried out in Loev district Gomel area a third instar of ant-lion living in sheltered habitat was collected in the Karpovka village (52°01'05"N 30°54'10"E) at 115 m a.s.l., on 12.06.2021. The microhabitat of the larva was protected from direct sunshine and wind under turfs overhangs, in a pine forest. The larva was put into a glass container which was previously filled with loose soil from their natural habitat and the larva was fed with ants. It always moved only backwards while building its pitfall. The larva was kept at 27–30°C with 60% RH and the photoperiod of 16L/8D. During pupation the larva spun spherical shaped cocoon, 1 cm in diameter, incorporated a dense coating of soil particles into external surface. The pupation took place within 1 month. During emergence the soft-bodied imago (♂) left the cocoon through a circular cup-like aperture but the exuvium remained at the bottom of the cocoon then it dragged itself up to the surface. This happened on 20.07.2021.

Distribution. West-Palaearctic species. Widespread species in most of Europe, recorded from the following countries: Belarus (new record); Albania, Austria, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine. In Asia, it is recorded from Armenia, Georgia and Azerbaijan, known also from Morocco in Africa (Jedlička, Ševčík, Vidlička, 2004; Canbulat, 2007; Krivokhatsky, 2011). Much more common in southern and central Europe than in the north. In Russia, it is found mainly in steppe lowland and mid-mountain areas in the south of the European part and the North Caucasus (Makarkin, Shchurov, 2010). It also penetrates through sands into more northern, forested regions (Krivokhatsky, 2011).

Remarks. *E. nostras* is widespread in all over the European countries therefore it is the well studied species from biological point of view (Gepp, Hölzel, 1989; Yasseri, Parzefall, 1996; Devetak, 2005; Canbulat, 2007; Krivokhatsky, 2011). It is polycentric Mediterranean-extramediterranean faunal element (Aspöck, Hölzel, Aspöck, 2001). The pits are built in sheltered conditions wherever a suitable loose substratum is present, thus the larvae are normally found under rock overhangs, near escarpments, at the entrance of caves and at the base of trees. Generally *E. nostras* prefers woody environments and in open sites, such as river banks and dunes, it is found in protected conditions. The requirement for sheltered corners predisposes this antlion to live in proximity of artificial structures such as buildings, rock walls and bridges (Badano, Pantaleoni, 2014). In Spain larvae of this species were found under bushes of *Juniperus oxycedrus* (Diaz-Aranda, Monserrat, 1988). In Central Europe it is known as the most common species found along the edge of houses living in rural areas (Gepp, Hölzel, 1989). Ábrahám (1998) even hatched its parasite, *Micomitra stupida* (Diptera, Bombyliidae) from cocoon of this species in Hungary. Interestingly the larvae of *E. nostras* are often found in unreachable corners for themselves such as tree holes, probably representing oviposition sites of females (Badano, Pantaleoni, 2014). Adults are found from June to September, during the day rest on vegetation, active at night and fly into the light. Development lasts for one year, the larva of the third instar overwinters (Krivokhatsky, 2011).

Conclusions

Two species ascertained to two families of net-winged insects are recorded for the first time to fauna of Belarus. The data are of great importance, since they extend our understanding of the current distribution of *Chrysopa walkeri* and *Euroleon nostras* in Eastern Europe. Further

research surveys are required in order to find out new habitats of the species in 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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