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FIRST RECORD OF THE GREEN LACEWING *CHRYSOPERLA NIGROCAPITATA* (NEUROPTERA: CHRYSOPIDAE) FROM RUSSIA

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Summary. The green lacewing *Chrysoperla nigrocapitata* Henry, Brooks, Johnson, Haruyama, Duelli et Mochizuki, 2015 (Neuroptera: Chrysopidae) is recorded for the first time from Russia (Primorskiy Krai: Kaimanovka). The feeding of full-grown larvae of this species on young, weakly chitinized larvae of *Molipteryx fuliginosa* (Uhler) (Heteroptera: Coreidae) is noted.

Key words: Chrysopidae, fauna, new record, biology, feeding, Heteroptera, Coreidae, Russian Far East.

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Резюме. Златоглазка *Chrysoperla nigrocapitata* Henry, Brooks, Johnson, Haruyama, Duelli et Mochizuki, 2015 (Neuroptera: Chrysopidae) впервые указывается для России (Приморский край: Каймановка). Отмечено питание взрослых личинок златоглазки личинками клопов *Molipteryx fuliginosa* (Uhler) (Heteroptera: Coreidae) младших возрастов со слабо хитинизированными покровами.

INTRODUCTION

Currently, 17 species of Chrysopidae are known from Primorskiy Krai (Makarkin, 1985a, 1985b, 1995, 2000; Tsukaguchi & Tago, 2018; Dobosz *et al.*, 2019): *Chrysopa formosa* Brauer, 1851, *Ch. gibeauxi* (Leraut, 1989) (= *Ch. septemmaculata* Tsukaguchi, 1995), *Ch. pallens* (Rambur, 1838) (= *Ch. cognata* McLachlan, 1867), *Ch. intima* McLachlan, 1893, *Ch. commata* Kis et Újhelyi, 1965, *Ch. perplexa* McLachlan, 1887, *Chrysoperla carnea* (Stephens, 1836), *Ch. nipponensis* (Okamoto, 1914), *Chrysotropia ciliata* (Wesmael, 1841), *Cunctochrysa albolineata* (Killington, 1935), *Kuwayamachrysa kichijoi* (Kuwayama, 1936), *Nineta alpicola* Kuwayama, 1956 (= *N. carinthiaca* (Hölzel, 1965)), *N. vittata* (Wesmael, 1841), *Pseudomallada cognatellus* (Okamoto, 1914), *P. parabolus* (Okamoto, 1919) (= *Anisochrysa laurae* Makarkin, 1985), *P. prasinus* (Burmeister, 1839), and *P. ussuriensis* (Makarkin, 1985).

Larvae of *Chrysoperla nipponensis* have been reported in Japan in two forms ('A' and 'B'), which strongly differ in color pattern (see Tsukaguchi, 1995, figs. 62a, b). Recently, these larval forms were interpreted as belonging to two closely related species, *Chrysoperla*

nipponensis and *Ch. nigrocapitata* Henry *et al.* 2015. The latter species was recorded from Japan (Honshu) and South Korea. Although imagoes of these sympatric species do not differ, their differences in the substrate-borne vibrational courtship songs support the premating reproductive isolation between the two species (Henry *et al.*, 2015).

In this note, we report *Chrysoperla nigrocapitata* in Russia for the first time.

NEW RECORD

Subfamily Chrysopinae Schneider, 1851

Tribe Chrysopini Schneider, 1851

Genus *Chrysoperla* Steinmann, 1964

***Chrysoperla nigrocapitata* Henry, Brooks, Johnson, Haruyama, Duelli et Mochizuki, 2015**
Figs 1–4

MATERIAL. **Russia:** Primorskii Krai, Kaimanovka village (43°37'49" N, 132°13'49" E), 10 full-grown larvae found in a household plot: (1) two on a raspberry bush (*Rubus idaeus* L.) beneath the netting covering it with larvae of *Molipteryx fuliginosa*, 11.VII 2016 (Figs 1–3); (2) eight on raspberry bushes, including one larva on a berry (Fig. 4), 19–26.VII 2019, 19–26.VII 2020 (T. Markova, M. Maslov).

DISTRIBUTION. Russia (Primorskii Krai, new record), Japan (Honshu), South Korea.

REMARKS. Adults of this species are not distinguished from those of *Chrysoperla nipponensis* (Henry *et al.*, 2015). Their larvae however differ markedly: the dorsal part of the head of *Ch. nigrocapitata* is often completely dark-brown (as in Fig. 2), whereas that of *Ch. nipponensis* is usually mostly pale, bearing a pair of relatively narrow, longitudinal brown stripes tapering anteriorly (Henry *et al.*, 2015, figs 3e–g). The head of darker larvae of *Ch. nipponensis* is never dorsally completely dark brown, it remains pale at least anteriorly (Henry *et al.*, 2015, fig. 3h). The larval body color pattern of these species also differs: the meso- and metathorax of *Ch. nigrocapitata* are expansively brown, while those of *Ch. nipponensis* have smaller spots (see Tsukaguchi, 1995, figs. 62a, b; Henry *et al.*, 2015, fig. 1a, b). The larval color pattern shown in Fig. 2 is typical for *Ch. nigrocapitata*.

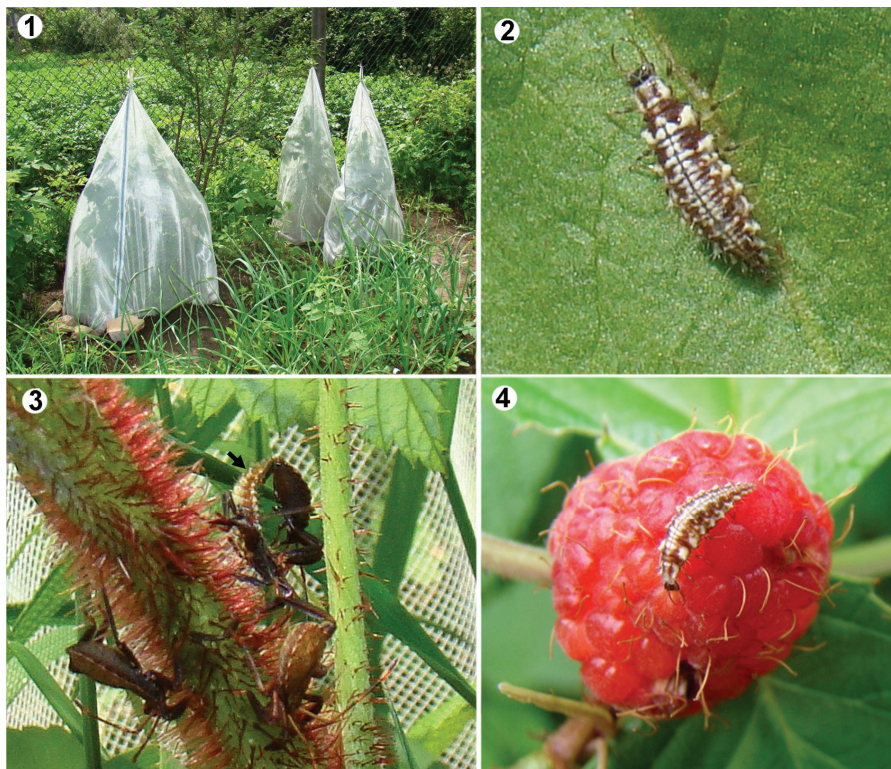
DISCUSSION

As mentioned above, the adults of *Chrysoperla nipponensis* and *Ch. nigrocapitata* do not differ; only their larvae may be easily distinguished. *Ch. nipponensis* is distributed in the Russian Far East (southern Khabarovskii Krai, Primorskii Krai, Sakhalin I., Kunashir I.), Japan (Hokkaido, Honshu, Sikoku, Kyushu), Korea, China (widely distributed), and Mongolia, while *Ch. nigrocapitata* is found so far only in some of these regions (see above). Therefore, we can expect that the range of *Ch. nigrocapitata* is much wider than is now known, as both species co-occur at some localities in Japan and Korea (Henry *et al.*, 2015).

The ecology of *Ch. nigrocapitata* is thought to not principally differ from that of *Ch. nipponensis*. In Japan, both species are associated with herbs, grasses, low shrubs growing in the open, or disturbed areas and in agricultural crop fields (Henry *et al.*, 2015). Adults of *Ch. nipponensis* in Japan and Primorskii Krai, however, occur also on various deciduous trees, like oaks and willows (Makarkin, 1985b; Tsukaguchi, 1995).

We found that the full-grown larvae of *Ch. nigrocapitata* live in Kaimanovka on raspberry bushes (*Rubus idaeus* L.) in July. We note that these larvae feed on the young, weakly chitinized larvae of *Molipteryx fuliginosa* (Uhler) (Heteroptera: Coreidae). These attacks were

observed in July of 2016. Simultaneous settlement of raspberry bushes by the predatory larvae of *Ch. nigrocapitata* and the phytophagous larvae of second-third stage of *Molipteryx fuliginosa* and *Coreus marginatus orientalis* (Kiritshenko) (Heteroptera: Coreidae) were noted in July 2019 and 2020. Probably, the high number of bug larvae attracted these green lacewings.



Figs 1–4. *Chrysoperla nigrocapitata* from Kaimanovka, Primorskii Krai: 1 – netting covering entire raspberry bushes (*Rubus idaeus* L.) with larvae of *Molipteryx fuliginosa*; 2 – larva of *Ch. nigrocapitata* from one of these (11 July 2016); 3 – larva of *Ch. nigrocapitata* (arrow) attacking a young larva of the bug *Molipteryx fuliginosa* (11 July 2016); 4 – larva of *Ch. nigrocapitata* on a berry of *Rubus idaeus* L. (25 July 2020) (photos: M.V. Maslov).

Although chrysopid larvae are mainly predatory, feeding on small arthropods with soft bodies, at least the larvae of *Chrysoperla* also consume non-prey foods such as pollen, and especially sugar-rich foods as honeydew and nectar (e.g., Downes, 1974; Limburg & Rosenheim, 2001; Hogervorst *et al.*, 2008). Moreover, a third of larvae of *Chrysoperla externa* (Hagen, 1861) in the laboratory was shown to develop to adults feeding exclusively on pollen of the grass *Pennisetum purpureum* (Schum) (de Oliveira *et al.*, 2010). Finding *Ch. nigrocapitata* larva on *Rubus idaeus* berry is then not accidental (Fig. 4). In the 1980s, VNM observed a similar larva in Arseniev (Primorskii Krai) whose head was inserted in a berry of *Rubus idaeus*, and in Vladivostok two larvae were seen on flowers, one of which was evidently feeding on nectar.

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