

**First record of *Chlaenius (Agostenus) quadrisulcatus* (Paykull, 1790)
(Coleoptera, Carabidae) from Moskovskaya Oblast of Russia**

**Первая находка *Chlaenius (Agostenus) quadrisulcatus* (Paykull, 1790)
(Coleoptera, Carabidae) в Московской области**

**N.Yu. Troshkov
Н.Ю. Трошков**

General Biology and Bioecology of Federal State University of Education, Very Voloshinoy Str. 24, Moskovskaya Oblast, Mytishchi 141014 Russia. E-mail: nicktroshkov@mail.ru.

Государственный университет просвещения, ул. Веры Волошиной 24, Московская область, Мытищи 141014 Россия.

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Ключевые слова: жужелицы, *Chlaenius (Agostenus) quadrisulcatus*, новая находка, Московская область.

Abstract. A rare ground beetle species *Chlaenius (Agostenus) quadrisulcatus* (Paykull, 1790) is registered for the Moskovskaya Oblast for the first time. The species was found in May 2019 in the east of the region at the Orekhovo-Zuevsky district, on *Sphagnum* raft, in a lake-marsh biotope of coniferous-broadleaf forest. Considering the rarity of this species, it is proposed to include it in the Red Book of the Moskovskaya Oblast.

Резюме. Для фауны Московской области впервые приводится редкий вид жужелиц *Chlaenius (Agostenus) quadrisulcatus* (Paykull, 1790). Вид был найден в мае 2019 г. на востоке области, в Орехово-Зуевском районе на сфагновой сплаvine, в озёрно-болотном биотопе хвойно-широколиственного леса. Учитывая редкость данного вида, предлагается включение его в красную книгу Московской области.

The hairy ground beetle «slug eater» four-banded *Chlaenius (Agostenus) quadrisulcatus* (Paykull, 1790) (Coleoptera, Carabidae), has a Transeurasian (Transpalearctic) temperate type of distribution [Gorodkov, 1984], confined to swamp-forest biotopes, distributed in France, Belgium, Denmark, Sweden, Finland, Poland, Belarus, Estonia, the European and Asian parts of Kazakhstan, Kyrgyzstan, Japan; in Russia it is distributed in the northern and central regions, in western and eastern Siberia, and in the Far East [Kryzhanovskiy, 1965, 1983; Wallin et al., 1999; Catalogue..., 2017 a,b; Çınar, 2023; SLU Artdatabanken, 2024]. This species has not been recorded in the Moskovskaya Oblast.

Field studies were conducted from April 14 to October 27, 2019, in a lake-swamp-forest biotope on the shore of Lake Gorbatoye in the Orekhovo-Zuevsky district of the Moskovskaya Oblast of Russia. To catch beetles, 45 pcs. 0.2-liter soil traps were used, which were installed on *Sphagnum* raft among the reeds. The following dichotomous keys were used to identify species [Kryzhanovskiy, 1965; Freude, 1976; Isayev, 2002; Muller-Motzfeld, 2004; Lompe, website 2018–2024].

The material is stored in the author's personal collection.

The present work is registered in ZooBank (www.zoobank.org) under urn:lsid:zoobank.org:pub:7AAF8947-F719-4A47-BA7E-7EB41468F14E

Chlaenius (Agostenus) quadrisulcatus (Paykull, 1790)

Figs 1–3.

Material. *Russia, Moskovskaya Oblast:* Orekhovo-Zuevsky district, Gorbatoe Lake, on *Sphagnum* raft, 55°50'07" N, 39°06'18" E, h~115 m a.s.l., 1–12.V.2019, soil trap, Troshkov N.Yu. leg. — 1♂.

Despite its wide range, this species is more or less rare and sporadic everywhere, mainly confined to its characteristic biotopes. Diurnal predator. Found on swampy shores of forest lakes in the reed and sedge zone,



Fig. 1. External appearance of *Chlaenius (Agostenus) quadrisulcatus* (Paykull) from Moskovskaya Oblast.

Рис. 1. Внешний вид *Chlaenius (Agostenus) quadrisulcatus* (Paykull) из Московской области.



Figs 2–3. Locality map and habitat of *Chlaenius (Agostenus) quadrisulcatus* (Paykull) in Moskovskaya Oblast. 2 — locality map; 3 — habitat.
Рис. 2–3. *Chlaenius (Agostenus) quadrisulcatus* (Paykull) в Московской области. 2 — локалитет на карте; 3 — местообитание.

on sphagnum floats, on damp open soil of swamps and on shallow freshwater beaches. In search of food, it actively gnaws *Sphagnum* hummocks and swamp soil. Thanks to the velvety hairs that hold a layer of air, it is able to dive and obtain food under the surface of the water [SLU Artdatabanken, 2024]. Fragments of springtails, aphids, beetle larvae, small beetles, including ground beetles and leaf beetles, ants, spiders, as well as unidentified soft remains of invertebrates were found in the intestines of beetles. Earthworms, slugs and snails may be part of the diet. Analysis of mandible wear suggests at least a two-year lifespan. Adult beetles are encountered during the breeding season in early summer, as well as in late summer and autumn, when they seek a drier place for wintering. Larval development occurs in the summer. The wings are developed, it flies and runs well, and has been observed flying during the day. In Sweden, where the most numerous populations of this species have been found (24 specimens were caught), the peak of activity was noted in June [Wallin et al., 1999]. In this case, the researchers used traps with catching channels, which greatly increased the catch rate. In the biotope we studied, the observed abundance of this species was extremely low (1 specimen was caught), but we used a gentle method of catching, without using catching channels.

The main limiting factor for the distribution of this species is the reduction in the number of large or the disruption of small marshy biotopes. The recommended conservation measure is the creation of specially protected natural areas and reserves, as well as fencing of individual coastal areas, to limit peoples access and preserve the natural habitat of this species.

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