

## A first record of two dragonfly species (Odonata) from Kamchatka Peninsula, Russia

### Первая регистрация двух видов стрекоз (Odonata) для российского полуострова Камчатка

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**Ключевые слова:** *Sympecta paedisca*, *Coenagrion glaciale*, фаунистические находки, полуостров Камчатка.

**Abstract.** Two dragonfly species, *Sympecta paedisca* (Brauer, 1877) and *Coenagrion glaciale* (Selys, 1872) are newly recorded for Kamchatka Peninsula, Russia, in July 2023 at the vicinity of the city of Petropavlovsk-Kamchatsky.

**Резюме.** В июле 2023 года в окрестностях города Петропавловск-Камчатский зарегистрированы два ранее не известных для фауны полуострова Камчатка вида стрекоз: *Sympecta paedisca* (Brauer, 1877) и *Coenagrion glaciale* (Selys, 1872).

## Introduction

A general work on the dragonfly fauna of the Kamchatka Peninsula lists 27 species [Dumont et al., 2005]. The poverty of the fauna is explained by the isolated position of the peninsula and its relatively recent recolonization by dragonflies after the end of the Ice Age, approximately 13 thousand years ago [Dumont et al., 2005]. Since then, no special odonatological studies have been carried out in Kamchatka, and in the book «Dragonflies of Russia» the same 27 species are indicated for this territory [Onishko, Kosterin, 2021]. The rapid development of the iNaturalist Internet platform and the emergence of new faunal data on this basis have significantly expanded information about the distribution of individual dragonfly species in Kamchatka. To date, 26 observers have provided 131 observations of 17 dragonfly species for this territory [iNaturalist, 2023], but all these species on the peninsula have been reported previously.

In the summer of 2023, the authors discovered two previously unknown species for Kamchatka in the vicinity of Petropavlovsk-Kamchatsky, which is of undoubted interest from a faunal point of view.

## Material and methods

From June 26 to July 25, 2023, the authors collected imagoes and larvae of dragonflies in reservoirs

in 14 localities, mainly in the vicinity of the city of Petropavlovsk-Kamchatsky. A total of 13 species of dragonflies have been recorded, two of which were found for the first time in Kamchatka.

The material is stored in the Siberian Zoological Museum collection of the Institute of Systematics and Ecology of Animals SB RAS, Novosibirsk.

The present work is registered in ZooBank (www.zoobank.org) under LSID urn:lsid:zoobank.org:pub:F912EDF6-A07F-4235-BFB4-3496B7384236.

## Results

### *Sympecta paedisca* (Brauer, 1877)

Figs 1, 2.

**Material.** 1♀ — City of Petropavlovsk-Kamchatsky, Lake Medvezh'e, 53°04'18" N, 158°37'37" E, h~171 m a.s.l., 7.V.2023, overwintered individual, A.S. Borisov leg.

**Habitat.** The Lake Medvezh'e is located within the city of Petropavlovsk-Kamchatsky along Lunacharsky Street on the territory of the eco-park «Medvezh'e Ozero». This is a small (150 x 250 m) eutrophic reservoir with developed aquatic vegetation and a maximum depth of 1.5–2 m. The Lake is a subject of strong recreational pressure (Figs 1, 2).

**Notes.** The only female *S.paedisca* was caught on July 5th. Intensive searches for dragonflies of this species here in the following days did not bring any results. It should be mentioned that the species of the genus *Sympecta* Burmeister, 1839 are clearly distinguishable in external appearance from the other representatives of Zygoptera and may be easily identified distantly.

### *Coenagrion glaciale* (Selys, 1872)

Figs 3, 4.

**Material.** 1♀ — 4 km north of Petropavlovsk-Kamchatsky city limits, Lake Svetloe, 53°07'33" N, 158°31'53" E, h~282 m a.s.l., 17.VII.2023, S.N. Borisov leg.

**Habitat.** A single female *C. glaciale* was captured in a small isolated area of the lake (Fig. 3). Lake Svetloe is a small (350 x 450 m) eutrophic reservoir with developed aquatic vegetation (Fig. 4).

**Notes.** The only female *C. glaciale* was among 32 specimens of Zygoptera caught on Lake Svetloe. Females of this species are well distinguished from females of other representatives of the genus *Coenagrion* Kirby, 1890. The posterior edge of the pronotum has a characteristic shape, round, without lateral lobes, with a small central projection directed backwards [Onishko, Kosterin, 2021].

#### COMPOSITION OF THE ODONATE COMPLEX

Dragonflies were collected on Lake Medvezh'e on 5, 7, 9, 20.VII.2023. A total of 10 species, *Sympetma paedisca*, *Coenagrion armatum* (Charpentier, 1840), *C. johanssoni* (Wallenger, 1894), *C. lunulatum* (Charpentier, 1840), *Enallagma cyathigerum cyathigerum* (Charpentier, 1840), *Aeshna juncea* (Linnaeus, 1758), *Cordulia aenea amurensis* Selys, 1887, *Libellula quadrimaculata* Linnaeus, 1758, *Leucorrhinia orientalis* Selys, 1887 and *Sympetrum flaveolum* (Linnaeus, 1758), have been recorded. In addition, according to iNaturalist [2023, <https://www.inaturalist.org/observations/127615637>], another species, *Sympetrum danae* (Sulzer, 1776), was registered on July 24, 2022.

From the Lake Svetloe dragonflies were collected on July 17, 2023. A total of 6 species, *Coenagrion glaciale*, *C. johanssoni*, *Enallagma cyathigerum cyathigerum*, *Cordulia aenea amurensis*, *Libellula quadrimaculata* and *Leucorrhinia orientalis*, have been recorded.

## Discussion

### *SYMPECMA PAEDISCA*

The extensive range of *S. paedisca* extends from Central Europe (where it is highly fragmented) to Japan [Borisov, 2010; Kalkman, Mauersberger, 2015; Onishko, Kosterin, 2021]. In Europe, this species penetrates north to the southern part of Finland, to approximately 62° N [Kalkman, Mauersberger, 2015; iNaturalist, 2023, <https://www.inaturalist.org/observations/91319549>]. In Asia, *S. paedisca* has been recorded even north



Figs 1–2. The Lake Medvezh'e in the city of Petropavlovsk-Kamchatsky, the habitat of *Sympetma paedisca*. 1 — general view of the lake; 2 — collection locality of *S. paedisca*.

Рис. 1–2. Озеро Медвежье в черте города Петропавловск-Камчатский — местообитание *Sympetma paedisca*. 1 — общий вид озера; 2 — место обнаружения *S. paedisca*.

of 62° N — near Yakutsk [Kosterin, Sivtseva, 2009; iNaturalist, 2023, <https://www.inaturalist.org/observations/57430177>]. Thus, the discovery of this species in Kamchatka is quite expected. Here it is recorded noticeably further south (more than 9° latitude) than in the mainland part of the range.

It should be noted that species of the genus *Sympetma* are remarkable for their unique annual life cycle. They overwinter in the adult phase. Reproductive activities (mating and oviposition) in overwintered individuals occur in spring, the development of pre-imaginal phases lasts approximately 2–3 months, after which a new generation of adults hatches [Jödicke, 1997; Corbet et al., 2006; Borisov, 2010]. Thus, in mid-summer, adult individuals in populations of *S. paedisca* may be completely absent or very rare, since the oviposition of these



Figs 3–4. Lake Svetloye is the habitat of *Coenagrion glaciale*: 3 — place of discovery of *Coenagrion glaciale*, 4 — general view of the lake.

Figs 3–4. Озеро Светлое — местообитание *Coenagrion glaciale*: 3 — место обнаружения *Coenagrion glaciale*, 4 — общий вид озера.

dragonflies has already ended and they are dying off, and individuals of the new generation have not yet hatched. Perhaps it is for this reason that *S. paedisca* was not previously found in Kamchatka, since the main collections of dragonflies were made here in mid-summer (July), as evidenced by the dates of collections of dragonflies [Dumont et al., 2005].

### COENAGRION GLACIALE

The main range of this species lies in the Russian Far East, Eastern Siberia and the mountainous regions of Southern Siberia. Outside Russia, *C. glaciale* lives only in Northeast China [Onishko, Kosterin, 2021]. To the west, it penetrates to Arkhangel'skaya Oblast [Bernard, Daraž, 2010; Boudot, Bernard, 2015; Onishko, Kosterin, 2021], where it is known up to 64°39'N [iNaturalist, 2023, <https://www.inaturalist.org/observations/173282054>]. In Eastern Siberia, the species is known in the Lena River valley up to 67° N [Onishko, Kosterin, 2021], in Chukotka (Markovo village), up to 64°39' N [Borisov et al., 2014]. Such northern locations of *C. glaciale* in Eastern Siberia suggest that the finding of this species on the Kamchatka Peninsula is quite natural. The Kamchatka location of *C. glaciale* lies at 11–14° latitude to the south of the known Siberian finds of this species.

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