



Eurylophella karelica Tiensuu, 1935 (Insecta: Ephemeroptera: Ephemerellidae) – an additional species to the mayfly fauna of Ukraine and notes on distribution of the family in the country

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Abstract: A rare European species, *Eurylophella karelica* Tiensuu, 1935 (Ephemeroptera: Ephemerellidae) is reported for the first time from Ukraine. The larvae of the species were found within Ukrainian Polissya region in the Pripjat' River basin. Species list of family Ephemerellidae of Ukraine with notes on species distribution within the country is given in the present contribution.

Keywords: Checklist, distribution, mayfly, Pannota, species, Ukrainian Polissya region.

Eurylophella Tiensuu, 1935 is a Holarctic genus encompassing 19 recent species. Most of these species inhabit the Neartic realm, and only three of them occur within the western Palearctic region—*Eurylophella karelica* Tiensuu, 1935, *E. iberica* Keffermüller & Da Terra, 1978, and *E. korneyevi* Martynov, Palatov & Godunko, 2015 (Martynov et al. 2015). *Eurylophella karelica* is the most common and widely distributed, the other two are rare with restricted distribution. Distribution of *E. karelica* extends from north to south, and falls within the north-west of the European part of Russia, Finland, Lithuania, Latvia, Estonia, Poland, Hungary, and Slovenia (Martynov et al. 2015; Ozoliņš et al. 2017). This species has not yet been recorded in Belarus (Moroz & Lipinskaya 2014), but it is likely to be found in the future.

MATERIALS AND METHODS

The material was collected with square hydrobiological hand net 25cm long on each side. The sample is stored in 90–95 % ethanol in the author's collection in the National Museum of Natural History, National Academy of Sciences of Ukraine (Kyiv, Ukraine); its inventory number (IN) is Riv19Eurkar. Toponyms and hydronyms are duplicated in Ukrainian in square brackets.

Habitus of *E. karelica* larva was photographed using a Leica Z16 APO stereomicroscope equipped with Leica DFC450 Digital Camera in the I.I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, and was subsequently processed with LAS Core 3.8 and Adobe® Photoshop™ CS5 software.

Material: Five larvae of *Eurylophella karelica*, Ukraine, Rivne region [Рівненська область], vicinity of Osnyts'k [Осницьк] Village, L'va [Льва] River, 51.284E, 27.145N and 51.284°E, 27.144°N (Image 1), about 145m, 22.xii.2018, leg. Martynov A.V. – IN Riv19Eurkar.

RESULTS AND DISCUSSION

In Ukraine, *E. karelica* was recorded at Polissya [Полісся] region in potamal zone of L'va [Льва] River

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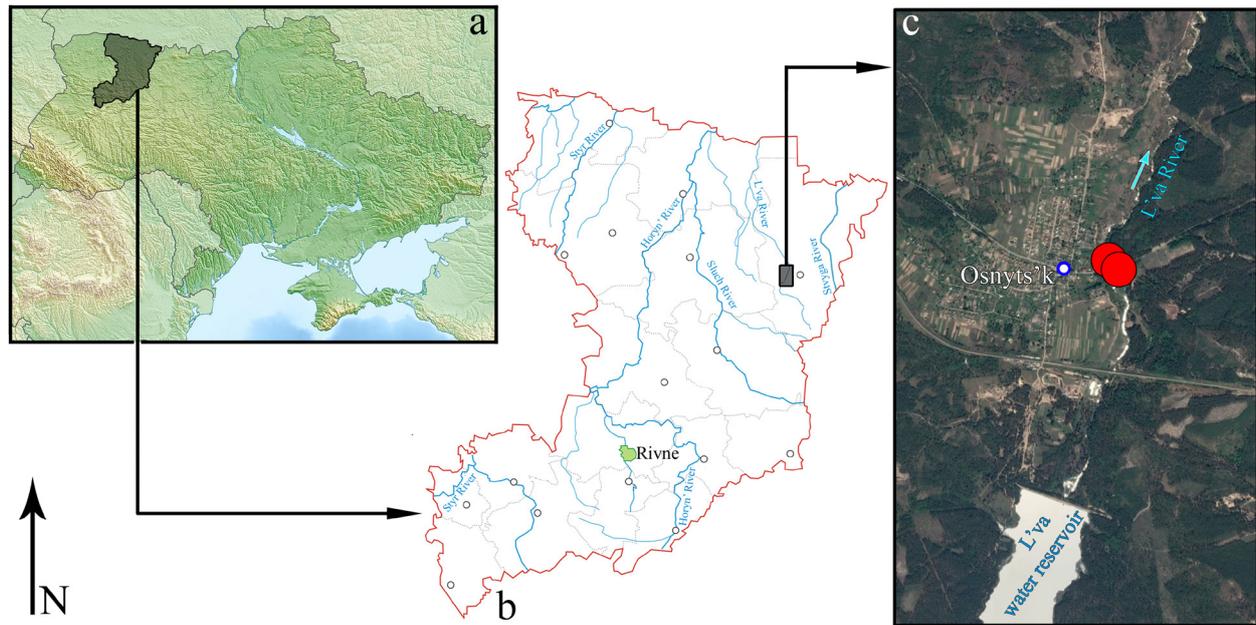


Image 1. Geographical location of *Eurylophella karelica* Tiensuu, 1935 collecting place: a—Rivne Region | b—vicinity of Osnyts'k Village on map of Rivne Region | c—total view of L'va River watercourse in vicinity of Osnyts'k Village.

(Image 2) that belongs to Pripjat' [Прип'ять] River basin. This finding is the first record of *E. karelica* from Ukraine. The Pripjat' River basin, where the species was found, differs in the presence of a relatively large number of waterbodies, with slightly impaired species compositions of aquatic insects, in comparison with vast parts of lowland Ukraine. Thus, during investigation of Ephemeroptera at the Pripjat' River basin in 2017–2018 several stenobiotic and rare species were registered (Martynov 2018); some of these species had not yet been recorded elsewhere in Ukraine.

Habitat characteristics

The section of the L'va River, where *E. karelica* larvae were collected (Image 2, 3), is situated downstream of a dam. The river has moderate current velocity (up to 0.3m/s), but under the bridge and above the dam rapids with strong current are present (up to 1m/s). The bottom of the river is silty, sandy (in some places silted), and stony (under the bridge). All larvae of the species were collected from dead aquatic vegetation (leaves, stems etc.) in small bays with silted bottom and almost lacking flow (Image 2). The additional parameters of waterbody in collecting sites measured during the sampling (22. xii.2018) were: water temperature 6°C, water hardness 84ppm, pH 8.9.

The following mayflies were also collected within the investigated section of the L'va River in winter (22. xii.2018) and spring (22.iii.2019)—*Nigrobaetis digitatus*

(Bengtsson 1912), *Cloeon dipterum* (Linnaeus, 1761), *Heptagenia sulphurea* (O.F. Müller, 1776), *H. flava* Rostock, 1878, *Kageronia fuscogrisea* (Retzius, 1783), *Leptophlebia marginata* (Linnaeus, 1767), *L. vespertina* (Linnaeus, 1758), *Paraleptophlebia submarginata* (Stephens, 1835), *Ephemera vulgata* Linnaeus, 1758, and *Caenis* sp. The registration of 11 mayfly species in this section of the L'va River, makes me consider it as one of the hotspots of mayfly species diversity in Ukrainian Polissya region.

Ephemerellidae of Ukraine and their distribution within country

In the first checklist of mayflies of Ukraine, five species of subfamily Ephemerellinae were mentioned (Godunko & Kłonowska-Olejnik 2003). *Eurylophella karelica*, recorded for Ukraine for the first time herein, belongs to another subfamily – Timpanoginae. Thereby, now species list of Ephemerellidae of Ukraine consists of six species from five genera and two subfamilies, and *E. karelica* is the most rare species among them.

Ephemerellinae

- *Serratella ignita* (Poda, 1761)
- *Ephemerella notata* Eaton, 1887
- *Ephemerella mucronata* (Bengtsson, 1909)
- *Teloganopsis mesoleuca* (Brauer, 1857)
- *Torleya major* (Klapálek, 1905)



Image 2–3. Larva of *Eurylophella karelica* Tiensuu, 1935 and its habitat: 2—total view of the L'va River in collecting cite (area outlined with white color - microhabitat mostly preferred by *E. karelica*) | 3—larva of *E. karelica*, dorsal view. Scale bar 2mm. © Alexander V. Martynov.

Timpanoginae

· *Eurylophella karelica* Tiensuu, 1935 – first record for Ukraine

The Carpathian Mountains [Карпати], Transcarpathian [Закарпатська] Lowland, and eastern Carpathian Foothills [Передкарпаття] are the Ukrainian regions inhabited with the highest number of Ephemeroptera taxa; a total of five species are recorded here—*S. ignita*, *E. notata*, *E. mucronata*, *T. mesoleuca*, and *T. major* (Mikulski 1935; Godunko 2000; Godunko & Kłonowska-Olejnik 2003; Afanasyev 2006; Kovács & Godunko 2008). Such diversity is reasoned by abundance of waterbodies with unpolluted or moderately polluted rhithral and epipotamal zones preferred by a vast

number of mayfly species.

Except for *E. karelica*, also *S. ignita* inhabits some waterbodies of Ukrainian Polissya. Larvae of this last species were registered in Dnipro [Дніпро] River (Zimbalevskaya et al. 1989), Pripjat' River (Trylis et al. 2013), and Irsha [Ірша] River (50.759E & 29.411N) (original data). Such small numbers of species in the region may be due to the small number of flowing waterbodies preferred by Ephemeroptera, pollution and habitat modifications in main part of them.

Four species of Ephemeroptera, *Serratella ignita*, *Teloganopsis mesoleuca*, *Ephemeroptera notata*, and *E. mucronata* were recorded for Dniester [Дністер] River, natural border of Podolia [Подільська] Upland, and

eastern Carpathian Foothills (Telyuk 1982, 1992; Mikulski 1933).

Mayflies of Podolia and Volyn' [Волинська] Uplands, lowland, central, and southern regions of Ukraine are still poorly investigated. Most of the data are old and need confirmation due to significant changes and pollution levels in waterbodies, especially in central and southern regions.

The Crimean [Кримські] Mountains was investigated and summarized in detail (see overview in Prokopov & Godunko 2007). Only *Serratella ignita* was listed by Kiseleva & Yezernitskiy (1985) for this region, and there are no other mentions of the species for the Crimea [Крим]. According to Prokopov & Godunko (2007) the presence of this species in the fauna of the region needs confirmation.

Within physiographic regions of eastern Ukraine only one representative of Ephemerellidae—*Serratella ignita*—was registered. This species inhabits only rhithral and eupotamal zones of streams and headwaters of rivers within most elevated parts of Donetsk [Донецька] elevated areas, and the species is rare within it (Martynov 2014, 2016). The recorded population of *S. ignita* is geographically isolated and should be considered as glacial relicts in this territory.

It should be noted, that the diversity of Ephemerellidae in neighboring countries (Romania, Hungary, Slovakia, Poland, and European part of Russian Federation) does not exceed diversity of the family within Ukraine. The territory of Moldova is poorly investigated; two species of the family were recorded for Belarus only. Therefore, the Ephemerellidae species list given above should be considered as complete, and no other species of the family are expected to be registered in Ukraine in the near future.

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