

To the fauna of shore flies (Diptera: Ephydriidae) of the Republic of Tuva (Russia)

К фауне мух-береговушек (Diptera: Ephydriidae) республики Тува (Россия)

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КЛЮЧЕВЫЕ СЛОВА: Diptera, Ephydriidae, Республика Тува, фауна, новые регистрации.

ABSTRACT. The first faunistic list of shore flies of the Republic of Tuva is compiled. In total, it includes 13 species from 8 genera. One species, *Hyadina tuvensis* Krivosheina et Ozerov, 2022, is endemic to Tuva. *Pelina norvegica* Dahl, 1975, previously known only from Norway, Germany and Leningrad Oblast of Russia, is firstly recorded in Siberia (Tuva).

РЕЗЮМЕ. Впервые составлен фаунистический список мух-береговушек республики Тува. Он включает 13 видов из 8 родов. Один вид — *Hyadina tuvensis* Krivosheina et Ozerov, 2022 — является эндемичным. Вид *Pelina norvegica* Dahl, 1975, известный ранее только из Норвегии, Германии и Ленинградской области России, впервые регистрируется на территории Сибири (Тува).

Introduction

Shore flies or Ephydriidae is a large family uniting about 2000 species worldwide [Mathis, Zatwarnicki, 1995]. Shore flies got their name due to the fact that they were most often found near waterbodies of various types: fresh, salt, hot and hydrogen sulfide springs. Shore-flies are very diverse in habits. Immatures of the most species feed on detritus, microorganisms, algae and cyanobacteria; several species are predators of small invertebrates. The larvae of others are leaf miners, parasitoids in spider eggs, predators in clusters of frog eggs, being saprophagous on feces, decaying dead snails and carrion. Some species are specialized to live in environments in which competition is minimal, for example in hot springs, where they can survive temperatures over 50 °C. Many species live in salt pools with exceptionally high salt concentration. Larvae of so-called petro-

leum fly scavenge on insects trapped in the surface film of crude petroleum [Ferrar, 1987]. Such an unusual life habits attracted scientists to the study of this family of flies in many regions of the world.

The territory of the Tuva Republic is one of the territories where the fauna of shore flies has not been studied before. We received for study materials collected by N. Vikhrev during the expeditions to Tuva. The results given below are the first data on the fauna of shore flies of this republic.

Material and methods

Nomenclature follows the current version of the Ephydriidae section of Fauna Europaea [Zatwarnicki, 2013]. The subfamilies and the tribes are ordered systematically; genera within tribes and species within genera are listed alphabetically. This list is based on the materials collected during field trips to Tuva Republic in 2017–2018. Diptera were collected near a small stream flowing into the salt lake Dus-Khol and on the banks of the Uyk River (Fig. 1) as well as in poplar-birch forest near Kyzyl.

Fly trapping was carried out using an entomological net and an exhaustor. Flies were pinned and labelled. The specimens examined are deposited in the Zoological Museum of Moscow University, Russia (ZMUM).

The data on the distribution of Ephydriidae species in Russia and neighbouring countries are based on the collection of the Zoological Museum of the Moscow Lomonosov State University.

A list of Ephydriidae (Diptera) of the Republic of Tuva

Subfamily GYMNOZYGINAE Latreille, 1829
Tribe Gymnomyzini Latreille, 1829

1. *Athyroglossa glabra* (Meigen, 1830)

MATERIAL. 2 ♂♂, 1 ♀, Russia, Tuva region, Kyzyl, poplar-birch forest, 51.70°N, 94.70°E, 17–25.05.2018, N. Vikhrev.

DISTRIBUTION. Nearctic: United States (Washington). Palearctic: Algeria, Austria, Belgium, Bosnia & Herzegovina, Bulgaria, Czech Republic, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Israel, Italy, Korea (North), Macedonia, Morocco, Netherlands, Norway, Poland, Romania, Serbia, Slovenia, Spain, Sweden, Switzerland, Ukraine [Mathis, Zatwarnicki, 1995], Azerbaijan, Tadjikistan. Russia: Altai, Amur Oblast, Crimea, Krasnodar Krai, Primorsky Krai, Tuva, Volgograd Oblast.

Subfamily ILYTHEINAE Cresson, 1943
Tribe Hyadinini Philips *et al.* in Cresson, 1949

2. *Hyadina guttata* (Fallén, 1813)

MATERIAL. 1 ♂, Russia, Tuva region, Kyzyl, poplar-birch forest, 51.70°N, 94.70°E, 17–25.05.2018, N. Vikhrev.

DISTRIBUTION. Palearctic: Austria, Azores, Belgium, Canary Islands, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Israel, Italy, Netherlands, Poland, Macedonia, Madeira Islands, Morocco, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland [Mathis, Zatwarnicki, 1995], Armenia, Belorussia, Kazakhstan, Ukraine. Russia: Amur Oblast, Crimea, Irkutsk Oblast, Jewish Autonomous Oblast, Kamchatka Krai, Leningrad Oblast, Primorsky Krai, Smolensk Oblast, Tuva, Tyumen Oblast, Yakutia.

3. *Hyadina tuvensis* Krivosheina et Ozerov, 2022

MATERIAL. 2 ♀♀, Russia, Tuva region, Dus-Khol salt lake, 700 m, 51.36°N, 94.45°E, 18.05.2018, N. Vikhrev.

DISTRIBUTION. Palearctic: Russia: Tuva.

4. *Pelina aenea* (Fallén, 1813)

MATERIAL. 1 ♂ Russia, Tuva region, Uyuk River, 800 m, 52.07°N, 94.04°E, 27.05.2018, N. Vikhrev.

DISTRIBUTION. Palearctic: Afghanistan, Austria, Belgium, China (NE Tibet), Czech Republic, Finland, France, Germany, Great Britain, Hungary, Italy, Japan (Hokkaido), Kazakhstan, Morocco, Netherlands, Norway, Poland, Romania, Slovakia, Spain, Sweden, Ukraine [Mathis, Zatwarnicki, 1995]. Russia: Leningrad Oblast, Moscow Oblast, Smolensk Oblast, Volgograd Oblast, Tuva, Primorsky Krai.

5. *Pelina aenescens* (Stenhammar, 1844)

MATERIAL. 1 ♂ Russia, Tuva region, Uyuk River, 800 m, 52.07°N, 94.04°E, 16.05.2018, N. Vikhrev.

DISTRIBUTION. Palearctic: Austria, Czech Republic, Finland, France, Great Britain, Hungary, Japan (Kyushu), Netherlands, Norway, Poland, Sweden [Mathis, Zatwarnicki, 1995]. Russia: Arkhangelsk Oblast, Baikal, Leningrad Oblast, Omsk Oblast, Tuva.

6. *Pelina canadensis* Cresson, 1934

MATERIAL. 2 ♂♂ Russia, Tuva region, Dus-Khol salt lake, 700 m, 51.36°N, 94.45°E, 18.05.2018, N. Vikhrev.

DISTRIBUTION. Nearctic: Canada (Alberta, British Columbia, Manitoba, Yukon); United States (Alaska, California, Iowa, Minnesota, Ohio, Utah, Wisconsin, Wyoming). Palearctic: Kazakhstan, Mongolia [Mathis, Zatwarnicki, 1995]. Russia: Yakutia [Krivosheina, 1992], Tuva.



Fig. 1. The bank of the Uyuk River — collection site for adults of Ephydriidae.
Рис. 1. Берег реки Уюк — место сбора имаго Ephydriidae.

7. *Pelina norvegica* Dahl, 1975

MATERIAL. 1 ♀, Russia, Tuva region, Uyuk River, 800 m, 51.36°N, 94.45°E, 27.05.2018, N. Vikhrev.

DISTRIBUTION. Palearctic: Germany, Norway [Mathis, Zatwarnicki, 1995; Stuke, 2010]. Russia: Leningrad Oblast [Krivosheina, 1992], Tuva.

Tribe Ilytheini Cresson, 1943

8. *Ilythea spilota* (Curtis, 1832)

MATERIAL. 1 ♀, Russia, Tuva region, Kyzyl, poplar-birch forest, 51.70°N, 94.70°E, 17–25.05.2018, N. Vikhrev.

DISTRIBUTION. Nearctic: Canada (British Columbia), United States (Alaska, California, Connecticut, Iowa, Illinois, Maine, Massachusetts, New Hampshire, New Jersey, Ohio, Oregon, Rhode Island, Virginia, VT). Palearctic: Austria, Belgium, Canary Islands, Czech Republic, Estonia, Faroe Islands, Finland, France, Germany, Great Britain, Hungary, Italy, Netherlands, Norway, Poland, Sweden [Mathis, Zatwarnicki, 1995], Tadjikistan. Russia: Leningrad Oblast, Kamchatka Krai, Primorsky Krai, Tuva.

Subfamily EPHYDRINAE Zetterstedt, 1837

Tribe Ephydrini Zetterstedt, 1837

9. *Ephydra glauca* Meigen, 1830

MATERIAL. 1 ♂, Russia, Tuva region, Dus-Khol salt lake, 700 m, 51.36°N, 94.45°E, 2–5.07.2017, N. Vikhrev.

DISTRIBUTION. Palearctic: Algeria, Bulgaria, France, Hungary, Italy, Kazakhstan, Mongolia, Poland, Romania, Turkey, Ukraine, Uzbekistan [Krivosheina, Ozerov, 2021]. Russia: Altai, Astrakhan' Oblast, Khakassia, Novosibirsk Oblast, Omsk Oblast, Orenburg Oblast, Stavropol' Krai, Tuva, Volgograd Oblast, Yakutia, Zabaikalsky Krai.

10. *Paracoenia fumosa* (Stenhammar, 1844)

MATERIAL. 1 ♀, Russia, Tuva region, Dus-Khol salt lake, 700 m, 51.36°N, 94.45°E, 18.05.2018, N. Vikhrev.

DISTRIBUTION. Palearctic: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Italy, Japan (Hokkaido), Jordan, Mallorca, Morocco, Netherlands, Norway, Poland, Romania, Slovakia, Sweden, Switzerland, Turkey [Mathis, Zatwarnicki, 1995], Tadjikistan, Turkmenistan, Uzbekistan. Russia: Amur Oblast, Chita Oblast, Kalmykia, Krasnodar Krai, Kursk Oblast, Leningrad Oblast, Mordovia, Moscow Oblast, North Ossetia-Alania, Primorsky Krai, Sakhalin Oblast (Kuril Islands), Tuva, Volgograd Oblast, Yakutia. One of the common species in Palearctic.

Tribe Parydrini Wirth and Stone, 1956

11. *Parydra aquila* (Fallén, 1813)

MATERIAL. 2 ♂♂, Russia, Tuva region, Uyuk River, 800 m, 51.36°N, 94.45°E, 27.05.2018, N. Vikhrev.

DISTRIBUTION. Nearctic: Canada (Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Quebec, Saskatchewan), United States (Arizona, California, Colorado, Connecticut, District of Columbia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyo-

ming). Palearctic: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Japan (Hokkaido, Honshu), Kazakhstan, Morocco, Netherlands, Norway, Poland, Romania, Serbia, Slovakia, Sweden, Switzerland, Ukraine [Mathis, Zatwarnicki, 1995]. One of the common Holarctic species. Russia: commonest species all over European part of Russia, Siberia, Far East, including Kamchatka [Krivosheina, 1989]. Now the species is also found in Tuva.

Tribe Scatellini Wirth and Stone, 1956

12. *Lamproscatella aklavik* Mathis, 1979

MATERIAL. 1 ♂, Russia, Tuva region, Kyzyl, poplar-birch forest, 51.70°N, 94.70°E, 17–25.05.2018, N. Vikhrev.

DISTRIBUTION. Nearctic: Canada (Northwest Territories) [Mathis, Zatwarnicki, 1995]. In Russia the species was registered by single specimens in Yakutia and Tuva [Krivosheina, 2004, 2022].

13. *Lamproscatella bimaculata* Hendel, 1933

MATERIAL. 2 ♂♂, 2 ♀♀, Russia, Tuva region, Dus-Khol salt lake, 700 m, 51.36°N, 94.45°E, 18.05.2018, N. Vikhrev.

DISTRIBUTION. Nearctic: Canada (Alberta), United States (Arizona, California, Colorado, Idaho, Nevada, Oregon, Utah, Washington, Wyoming). Palearctic: Austria, Bulgaria, Czech Republic, Hungary, Mongolia, Slovakia, Switzerland [Mathis, Zatwarnicki, 1995]. Russia: Yakutia [Krivosheina, 2004]. Now the species is found in Tuva.

Discussion

As a result of our research, we have compiled the first faunistic list of shore flies of the Republic of Tuva. In total, it includes 13 species. One species, *Hyadina tuvensis*, is endemic to Tuva. An interesting fact is the discovery of the species *Pelina norvegica* in Tuva, previously known from Norway and Germany only [Mathis, Zatwarnicki, 1995; Stuke, 2010] and the European part of Russia, Leningrad Oblast [Krivosheina, 1992].

The species *Pelina canadensis* and *Lamproscatella aklavik*, described from Canada, have long been considered Nearctic. Our research has shown that they are also distributed in Russia — in Yakutia and Tuva [Krivosheina 1992; Krivosheina, Ozerov, 2022]. The remaining species are widespread common species found throughout the Palearctic.

Only one of the discovered fly species, *Ephydra glauca*, is halobiont. The species *Paracoenia fumosa* is more often found in freshwater bodies of water, sometimes entering brackish and hydrogen sulfide waters [Krivosheina, 1987]. All other species are freshwater. Species of the genera *Pelina* and *Hyadina* are confined to standing ponds and lakes with clean fresh water.

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