Fauna of Biting Midges (Diptera: Simuliidae) in Russia

Olga Alexandrovna Fiodorova

1All-Russian Scientific Research Institute of Veterinary Entomology and Arachnology- Branch of Federal State Institution Federal Research Centre Tyumen Scientific Centre of Siberian Branch of the Russian Academy of Sciences, Tyumen, Russian Federation.

ABSTRACT

Blood-sucking midges of the family Simuliidae are small two-winged insects from the suborder of long-whiskers (Diptera: Nematocera). They are widely distributed in all landscape-geographical zones of the Russian Federation and have important medical and epidemiological significance as hematophagy and vectors of human and animal diseases. The hydrological regime of the watercourse and biotic factors determine the species composition and number of midges developing in the watercourse, as well as the blood-sucking activity of the flown females. The paper presents data on the species diversity of blood-sucking midges, by region, currently about 1600 species of midges belonging to 81 genera are known in the world fauna, and the question of the ecological properties of insects depending on the climatic features of habitats is raised. Presently, systematic studies of the areas and population density of the main vectors of infection on the territory of the Russian Federation are not carried out or are carried out only in some individual regions, which makes it much more difficult to assess the risk of introduction and spread of infections. Due to global warming, there is a possibility of penetration of the most plastic species of blood-sucking arthropods into the northern regions, which will have a direct impact on the epidemiology and epizootology of vector-borne diseases. This includes regular study of biota diversity, identification of changes, comparing them with shifts in environmental parameters, analysis of changes, conclusions on necessary measures to preserve biodiversity, and identifying the impacts of global changes on biota.

Keywords: Biting midges, Release, Fauna, Affinity of species composition.

INTRODUCTION

Midges are one of the components of insects of the "gnus" complex. Simuliids are widespread in all landscape-geographical zones of the Russian Federation and are of great medical and epidemiological significance as hematophagy and vectors of human and animal diseases. Currently, systematic studies of the ranges and population density of the main carriers of infection in the Russian Federation, unfortunately, are not carried out or are carried out only in some individual regions, which greatly complicates the assessment of the risk of introduction and spread of infections. In connection with the ongoing processes of global warming on the planet, there is a possibility of the penetration of the most plastic species of blood-sucking arthropods into the northern regions, which will have a direct impact on the epidemiology and epizootology of vector-borne diseases [1, 2]. The International Convention on Biological Diversity, adopted at a special conference of the UN General Assembly in 1992 in Rio de Janeiro, includes a requirement to ensure the monitoring of biodiversity at the national and international levels. The article summarizes the available materials of publications on blood-sucking midges, common in Russia, their role as carriers of pathogens. Biting midges of the family Simuliidae are small two-winged insects from the Nematocera suborder. The preimaginal stages develop under conditions of favorable oxygen and hydrological...
conditions in fast-flowing rivers and streams, using aquatic macrophytes, leaf litter, stones, and artificial substrates as attachment substrates. The hydrological regime of the watercourse and biotopic factors determine the species composition and number of midges developing in the watercourse, as well as the blood-sucking activity of emerging females [3].

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The International Convention on Biological Diversity, adopted at a special conference of the UN General Assembly in 1992 in Rio de Janeiro, includes a requirement to ensure the monitoring of biodiversity at the national and international levels. These include the regular study of biota diversity, identification of changes, their comparison with shifts in the values of environmental parameters, analysis of changes, conclusions about the necessary measures to conserve biodiversity, and identification of the impacts of global changes on biota [4]. In connection with all of the above, we have attempted to summarize the currently available publications on biting midges common in Russia and their role as carriers of pathogens. Currently, about 1600 species of midges belonging to 81 genera are known in the world’s fauna [5]. Most of the studies on the fauna of biting midges in Russia were carried out in the second half of the 20th century; since then, there have been significant changes in the taxonomy of the family Simuliidae [5], therefore, in the table, which presents the species composition of biting midges according to the literature data, we give modern names of species and genera, and in brackets - used earlier.

**MATERIALS AND METHODS**

In this paper, an analysis of our data, as well as literary data, is carried out, which speaks about the spread of blood-sucking midges and the medical and epidemiological significance of hematophages and vectors of human and animal diseases in the territory of Russia.

**RESULTS AND DISCUSSION**

The most complete faunistic list of biting midges in Western Siberia and the Ural is presented in the monographs of I.A. Rubtsova [6], V.D. Patrusheva [7], and V.A. Yankovsky [5]. For Western Siberia, I.A. Rubtsov [6] notes 18 species, according to V.D. Patrusheva [7] there are at least 40 species inhabiting the region. According to the research of V.D. Patrusheva [7] a typical form of *Simulium morsitans* Edw., noted by I.A. Rubtsov, does not occur in Siberia, and therefore information on this species refers either to *Sim. longipalpe* Belt., or to any of the close forms, while the species is indicated as *Simulium sp. aff. Morsitans* Edw.

The first information on the fauna of midges in the Tyumen region is presented in the monograph by I.A. Rubtsov [3] and their systematic study began in 1959 by employees of the Biological Institute of the Siberian Branch of the USSR Academy of Sciences (now the Institute of Animal Systematics and Ecology of the Siberian Branch of the Russian Academy of Sciences). During this period, fauna of the Tyumen region included all finds on the territory of the modern Yamalo-Nenets and Khanty-Mansi Autonomous Okrugs, and the south of the region.

In this article, we divided the literature data on the species composition of midges according to the place of their discovery into these three independent regions.

The species composition of biting midges in the south of the Tyumen region was studied by V.D. Patrusheva, V.I. Bukhstynov, V.U. Mitrokhin, and Yu.V. Gultyaev.

longipalpe Edw., Simulium rostratum Lund., of which B. maculatus was the absolute dominant. In the Tyumen region, V.I. Bukshtynov [9] discovered 5 species of midges: B. maculatus, Schoenbaueria nigra Mg., Boophthora erythrocephala D.G., Argentisimulium noelleri Fried., Sim. sp. aff. morsitans Edw. V.U. Mitrokhin as a result of research carried out in various natural and climatic zones of the south of the Tyumen region [10-12] discovered 11 species of midges, adding two species to the existing list - Parabyssodon transiens Rubz. and Simulium reptans L.

In 1982 V.D. Patrusheva [7] added Sim longipalpe Edw., Simulium venustum Say. to the list of known species. In 2003-2010, cases of detection entomology and dissection at the All-Russian Research Institute of Veterinary Entomology and Arachnology were revealed. As a result of the research, the faunistic list was filled with 1 species - Schoenbaueria subpusilla Rub. [13]. Thus, the fauna of midges of the family Simuliidae in the south of the Tyumen region includes 14 localities of 10 genera.

In the Khanty-Mansiysk Autonomous Okrug, the study of the fauna of biting midges was carried out only in the 60s-80s of the last century. V.D. Patrusheva [7, 14] discovered 8 species in the suburbs of the village Oktyabrske: Cnetha silvestris Rubz., Cnetha pugetensis Dyar. et Schan., C. verna, B. maculatus, Sch. pusilla, Argentisimulium (Simulium) palustre Rubz., Sim. (morsitans) longipalpe, Sim. rostratum, of which B. maculatus and Sch. pusilla. I.N. Ishmuratov [15] registered 7 species of midges in the district, adding two species to the known list: B. erythrocephala and Sim. sp. aff. venustum. In the Surgut district of S.A. Novitskaya [16] discovered 6 species of midges previously discovered.


In 1982 V.D. Patrusheva [7] added one more species to the list of midges living in the area - Gnus malyschevi Dorog., Rubz. et Vlas. According to the literature materials, the fauna of the biting midges of the Khanty-Mansiysk Autonomous Okrug is represented by 15 species belonging to 8 genera.

The study of blood-sucking dipterous insects, including midges, on the territory of the Yamalo-Nenets Autonomous Okrug was mainly carried out during the exploration of new oil and gas fields in the second half of the 20th century. In the area of \u200bthe village of Labytnangi, V.D. Patrusheva and P.E. Polyakova [20] established the habitation of 8 species: B. maculatus, Schoenbaueria rangiferina Rubz., Sch. pusilla, Gnus corbis Tw., O. ornata, Archesimulium vulgare Dorog., Rubz. et Vlas., Sim. (morsitans) longipalpe, Sim. rostratum.

In the forest-tundra zone, V.D. Patrusheva [8] also notes 8 blood-sucking species of midges, while she believes that another 2 species registered by I.A. Rubtsov [3] for the north of Western Siberia: Prosimulium hirtipes Fries and Schoenbaueria gigantean Rubz. should be included, which she did not find.

Predominant species, according to V.D. Patrusheva [8], are Sch. pusilla and Sim. longipalpe. S.A. Novitskaya [21], after conducting research in the forest tundra of the Purovsky district, added 2 species to the faunistic list of blood-sucking midges in the district: B. erythrocephala and Sim. venustum. In 1972, V.D. Patrusheva (1972a) discovered one species of midges in the Polar Urals - Schoenbaueria tshernovskii Rub. Later V.A. Shchepekin [22] registered the habitation of 1 more species in the area - Simulium truncatum Lund., in addition, the author found larvae of 4 more species in watercourses: Cnephia pallipes Fr., Metacnephia tredecimata Edw., Cnetha bicornis Dor. et Rubz. and C. verna. In the suburbs of the village, Shchuchye V.D. Patrusheva [23] registered 2 previously registered species of midges, C. pallipes and Sim. truncatum.

Two years later, V.D. Patrusheva et al. [24] added three more species to the list of midges: Metacnephia trigoniformis Yank., Metacnephia pectinata Patr., Metacnephia korsacovi Rubz. In

In 1987 L.V. Petrozhitskaya [26] in the northern forest-tundra of Yamal confirmed the presence of one species indicated by I.A. Rubtsov [3] Sch. gigantea. As a result of the analysis of literature data, it was found that the fauna of the biting midges of the Yamalo-Nenets Autonomous Okrug is represented by 40 species belonging to 16 genera.

In the Taimyr Autonomous Okrug, the midges' fauna is poorly studied. The most studied part of the district was the right bank of the Yenisei. As a result of studies carried out in 1965-1968 [27] 23 species of biting midges were identified: Gymnopaiss tristifutilatus Rubz., Prosimulium alpestris Dor. et Rubz., P. hirtipes Fries, P. arcticum Rubz. et Carls., Helodon irkutensis Rubz., Stegopterina trigoni End., S. duodecimata Rubz., S sp., Cnephia pallipes Fried (Cnephia lapponica End.), B. maculatus., Cnetha verna Macquart (Eusimulium latipes Mgeigen), Schonbaueria pusilla Rubz., Sch.subpusilla Rubz., Sch.rangiferina Rubz., Gnus choldkovskii Rubz., G.rostratumLundstr, Simuliumvulgarerubz.,Sim. Rostratum Lundstrom (Simulium argyreatum Meigen), Sim.morsitans longipalpe Belt., Sim.sp. from the group venustum Say, Sim.verecondum St. etjamb., while some of the captured individuals were identified only to the genus - Cnephia sp.


The entomofauna of the southeast of Karelia remained a blank spot for a long time, despite the undoubted interest in the easternmost region of Fennoscandia, this region occupies a border position at the junction of the Baltic Shield and the Andoma Upland. Research conducted by Humala A.E. and Polevoy A.V. (2009) identified the following species: Gnus corbis Twin, Simulium rostratum Lund., Cnetha bicorne Dorogostajsky, Rubzov et Vlasenko, C. verna Macquart, Sim.morsitans Edw., Sim. reptans L., Archesimulium tuberosum Lund.

In Primorsky Krai, where the first information on the fauna and ecology of midges was published in the works of A.V. Gutevytsya [33], Z.A. Radzivilovskaya [34-36], K.Ya. Grunina [37], I.A. Rubtsova [3]. In subsequent years, no one was engaged in the study of midges in the Primorsky Territory. 24 species belonging to 9 genera were registered: Gymnopaissp.n, Helodon rubicundus Rubz., H. Alpestris Dorogostajsky, Rubzov et

On the territory of the Volgograd region of the Lower Volga zone, biting midges are an insufficiently studied group of insects, according to Denisov A.A., Ivantsov E.A. [39] identified five species of midges belonging to five genera: Byssodon maculatus Mg. (Titanopteryx maculatus Meigen), Schoenbaueria nigra Mg. (Schoenbaueria behningi End., Schoenbaueria matthiessenii Enderlein), Odagmia ornate Mg., Boophthora erythrocephala D. G., Simulium morsitans Edw.

Studies on the zoobenthos of the rivers of the Kaliningrad region Gusev A.A., Guseva D.O. and Rudinskaya L.V. [40], 3 species of midges were identified: Wilhelmia eduina Linnaeus, W. lineata Mg., Simulium spp. Studies of midges in the territory of St. Petersburg and the Leningrad region were carried out at different times by I.A. Rubtsov, Z.V. Usova, and S.V. Aibulatov. Thus, to date, 63 species of midges belonging to 17 genera have been recorded in the region, including such large ones as Cnetha, Eusimulium, Odagmia, Prosimulium, Schoenbaueria, and Simulium [8].


Argentisimulium noelleri Fried (Simulium noelleri Fried), Arg. palustre Rubz., and Sim. truncatum Lundström.

According to Budaeva I.A. and Ruchina A.B. [43] information about the fauna of midges in the article is given for the first time as a result of research in 2009-2013 in Mordovia, 11 species of midges belonging to 8 genera were registered: Stegopterina trigoni Lundström, Wilhelmia balcanica End., W. equina Lannaeus, Boreosimulium annulus Lundström, Byssodon maculatus Mg., Schoenbaueria nigra Mg., Boophthora erythrocephala D. G., Odagmia ornate Mg., O. pratora Fried., Argentisimulium noelleri Fried, and Sim. Paramorositans Rubz.

The fauna of biting midges of the central Non-Black-Soil Zone region is represented by 15 species from 10 genera: Stegoptera trigoni Lundström (richteri Enderlein), Byssodon maculates Mg., Eusimulium aureum Fries, Schoenbaueria nigra Mg., Sch. Dendrofila Patrusheva, Wilhelmia equina Lannaeus, Boophthora erythrocephala D. G., Odagmia ornate Mg., Simulium morsitans Edw., Argentisimulium noelleri Fried (Simuliurnoelleri Fried), Sim. Paramorositans Rubz., Sim. Sp. Aff. Venustum Say (Simulium verecundum St. et Jambh), Cnetha verna Macq.(Cnetha latipes Mg.), C. silvestris Rubz., Nevermannia angustitarsis Lundström (Chelocnetha angustitarse End.) [44].

The studies carried out by the authors Potapov A.A., Bogdanova E.N. and Vladimirova V.V. [45] in the Udora region of the Komi ASSR in the administrative district of the Komi Republic found 14 species belonging to 9 genera: Boophthora erythrocephala D. G., Parabyssodon transiens Rubzov (Byssodon transiens Rubz.), Cnetha verna Macquart (Eusimulium latipes Meigen), Gnus rostratum Lundstr., Odagmia frigid Rubz., O.ornata Mg., Schoenbaueria sp., Simulium rostratum Lundström (Simulium argyreatum Meigen), Sim. Reptans Linnaeus (Simulium galericatum Edwards), Sim.morsitans Edw., Sim. Venustum Say, Sim.vulgar Rubz., Cnephia sp., Wilhelmia equina Lannaeus.


In the southwestern Altai, in the maral breeding farms of OAO Aksu (Aksu, JSC) and TOO Yongu-Abzal (Yongu-Abzal, LLP), on maral pastures, they are located on meadow-steppe and forest-meadow belts of mountains, which are characterized by harsh conditions. The study of midges was carried out in 2004-2007. Isimbekov Zh.M. and Modiev K.M. [48] identified 7 species: Archesimulium vulgare Dorogostajsky, Rubzov et Vlasenko, Argentisimulium noelleri Fried, Odagmia ornata Mg., Boophthora ery throcephala D. G., Cnetha verna Macquart, Sim. reptans Linnaeus, and Wilhelmia veltististshevi Rubz.

According to the results of research by Petrozhitskaya L.V. [49, 50] and literature data, midge fauna of Southern Altai currently includes 33 species of the genus Simulium from 7 subgenera.

For the basins of the Greater and Lesser Yenisei, which form the catchment area of the Upper Yenisei on the territory of Eastern Tuva, midges of 31 species from 5 genera were identified [51-

Research carried out by Dariychuk Z.S. [54] on the territory of the Kachugsky district of the Irkutsk region in May - October 1965, marked the beginning of the study of midges in the upper Lena. In Lena, such malicious bloodsuckers hatched as Sim. Reptans Linnaeus (Simulium galeratum Edwards), Prosimulium jacticum Rubz., and Sim.morstan Edw., the following 12 species are also noted: Eusimulim species gr. Latipes Mg., Eusimulium species gr. Aureum Fries, C. Bicornis Dorogostajski, RubzovetVlasenko (Eusimulium bicornis Dorogostajski et Rubzov), Odagmia ornata Mg., Grostratum Lundstr, Archesimulium vulgar Dorogostajski, Rubzov et Vlasenko (Simulium vulgar Rubz.), Sim. Rostratum Lundstrom (Simulium argyreum Meigen), Argentisimulium noelleri Fried (Simulium noelleri Fried), Helodon alpestris Dorogostajski, Rubzov et Vlasenko, (Prosimulium alpestr Dorogostajski, Rubzov et Vlasenko), P. Candidans Rubz., Twinnia sedecimfistulata Rubz., Cnephia sp.

Gogolev V.B. [55] in the conditions of the Middle Volga region in the region of the Republic of Mari El revealed 11 species of biting midges of 5 genera: Byssodon maculatus Mg. (Titanopteryx maculates Meigen), Yrenieradorieli Ussova, Cnetha verna Macquart (Eusimulium latipesMeigen), C. silvestris Rubzov (Eusimulium silvestris Rubzov), C. Bicornis Dorogostajski, Rubzov et Vlasenko (Eusimulium bicornis Dorogostajsky et Rubzov), Eusimulium aureum Fries, Schonbaueria pusilla Fries, Odagmia ornata Mg., Simulium longipalpe Belt., Sim. rostratum Lundstrom (Simulium argyreatum Meigen), and Sim. reptans Linnaeus (Simulium galeratum Edwards).

According to Budaeva I.A. and Silina A.E. (2013) the fauna and ecology of midges have not been previously studied in the Belgorod region. Carried out field works in 2007-2012 showed that 9 species of midges were found: Wilhelmia balcanica End., W. lineate Mg., Cnetha verna Macquart, Nevermannia angustitarsis Lundstrom., N.latigonia Rubz., Eusimulium angustipes Edw., Boophthora erythrocephala D. G., Odagmia ornata Mg., Argentisimulium noelleri Fried.

On the territory of the Caucasus region, the fauna was studied unevenly: the main part of the research was carried out at different times in the second half of the 20th century in Transcaucasia [56-58]. Rubtsov I.A. published information on the fauna of midges of the North Caucasus in short reports and general faunistic reports [3]. Currently, 22 species of midges belonging to 9 genera are found on the territory of Adygea: Prosimulium petrosum Rubz., P. Pronevitishe Rubz., P.tomosvayi End., Wilhelmia balcanica End., W. Pseudoquina Seguy, Cnetha angustata Rubz., C. djafarovi Rubz., C. elata Rubz., C. fontia Rubz., C. geigelenais Djafarov, Cnetha verna Macquart, Nevermannia gomphocornis Rubz., Eusimulium aureum Fries, Obuchoviadornata Rubz., Paragnushukovskii Rubz., Odagmiabaracornis Smart, O. caucasia Rubz., O. fontana Tertelryan, O. Monticola Fried., O.monticoloides Rubz., O. ornata Mg., and Simulium tarnogradskii Rubz.

Research carried out by Dementiev M.S. [59] showed that in the period 1985-2012 in fish farms and water bodies of the Central Ciscaucasia, starting from the Elbrus region to the water bodies of the Kuma-Manych depression and including the territories of the Stavropol Territory, Karachay-Cherkessia, Kabardino-Balkaria, North Ossetia, Kalmykia, Ingushetia and Chechnya, 40 species of midges were noted: Prosimulium gigas Rubz., P. Petrosum Rubz., P.rachiliense Djafarov, Boophthora erythrocephala De Geer, Byssodon maculatus Mg., Eusimulium angustipes Edwards, E. aureum Rubzov, E. maritimum Rubzov, E. sivaticum
Rubzov, C. verna Macquart, Schoenbaueria nigra Mg., Montsimulium alizadei Djasarow, M. montium Rubzov, Wilhelmina angustifurca Rubzov, W. balcanicum Enderlein, W. daheestanicum Rubzov, W. euagia Linnaeus, W. lineatum Mg., Nevermannia angustitarsis Lundstrom, N. gompocorne Rubzov, N. lundstromi End., Cnetha coctata Friedrichs (Nevermannia coctata Friedrichs), C. cryophilum Rubzov, C. elata Rubzov, C. fontia Rubzov, C. verna Macquart, Obuchovia adarnata Rubzov, Odagmia baracornis Smart (Simulium baracornis Smart), O. fontana Terteryan (Simulium fontana Terteryan), O. monticola Friederichs (Simulium monticola Friederichs), O. monticoloides Rubzov, O. variegate Meigen, O. ornata Meigen, O. schamili Rubzov, Tetisimulium bezzi Corti, Simulium longipalpe Beltucivae, Sim. tarnogradskii Rubzov, Sim. morsitans Edwards, Sim. paramorsitans Rubzov, Sim. shevshenkovaize Rubzov, Sim. simulans Rubzov, and Argentisimulium noelleri Fried.

Alania National Park (NPA) is located on the northern slope of the Central Caucasus in the Uruk River basin; for the first time, information about its freshwater entomofauna is given by Khazeeva L.A. [60] — 2 species of midges were identified: Odagmia ornata Mg., O. caucasicum Rubzov.

In the Voronezh region, among the most active hematophagous species, we should mention: Byssodon maculatus Mg., Schoenbaueria nigra Mg., Simulium morsitans Edw., Sim. paramorsitans Rubzov.


Research was carried out in areas remote from large rivers (Ob and Irtysh): in 1960 — in the Zonovo village, in 1962 — in Kasuk, in 1964 near Novosibirsk, also in the Maslyansky and Ordynsky districts of the Novosibirsk region, in 1964 near Novosibirsk. The Novosibirsk region is represented by the following types: Cnetha meigeni Rubzov et Carlsson (Eusimulium pygmaeum Zitterstedt sensy Rubzov), Cnephia species, Byssodon maculatus Meigen (Titanopteryx macularus Meigen), Sch. pusilla Fries., Eusimulium aureum Rubzov, E. angustipes Edwards, E. silvaticum Rubzov, E. latipes Meigen, B. erythrocephala De Geer, Sim. morsitans Edwards, Sim. longipalpe Beltucivae, Sim. rostratum Lundstrom (Simulium argyreatum Meigen), Sim. reptans Linnaeus (Simulium galaratum Edwards), Sim. aemulium Rubzov, Odagmia ornata Meigen, O. frigida Rubzov, Parabyssodon transiens Rubzov (Byssodon transiens Rubzov.), Arg. noelleri Fried (Simulium noelleri Fried), Simulium vulgare Rubzov.

Very little is known about the species composition of midges in the Tomsk region. In the studies of V.M. Popov [62] on the Tomsk region, 8 species of biting midges are given: T. maculata Mg., C. verna Macquart (Cnetha latipes Meigen), E. aureum Rubzov, Sim. venustum Say (Simulium verecundum St. et Jamb), Sim. reptans Linnaeus, Sim. Tuberosum Lund, Sim. morsitans Edwards, and Sch. pusilla Fries. In the Aleksandrovsky district of the Tomsk region, Darychuk Z.S. [63] notes 7 species including 3 species are listed for the first time: B. erythrocephala De Geer, C. verna Macquart, E. aureum Rubzov. V.D. Patrusheva [7], notes the following species for the Tomsk region: Byssodon maculatus Meigen (Titanopteryx macularus Meigen), Sim. morsitans Edwards, Sim. longipalpe Beltucivae, Sim. rostratum Lundstrom (Simulium argyreatum Meigen), Sch. Rangiferina Rubzov, N. angustitarsis Lundstrom (Eusimulium angustitarsis Lundstrom), O. ornata Meigen, Sim. reptans Linnaeus (Simulium galaratum Edwards).
In various areas of the basin of the Yana and Lena, according to the carried out research, Vorobets E.I. [43], 59 species of midges belonging to 18 genera were registered, of which 29 species are recorded for the first time in Yakutia: Gymnopais trifistulatus Rubzov, Prosimulium candidans Rubzov, Perythronotum Rubzov, P. hirtipes Rubzov (Prosimulium hirtipes diminutum Rubzov), P. macropygia Lundstrom, P. irkutense Rubzov, P. jacaticum Rubzov, Helodon rubicundus Rubzov, H. alpestris Dorogostajsky, Rubzov et Vlasenko (Prosimulium alpestris Dorogostajsky, Rubzov et Vlasenko), H. czeckanowskii Rubzov (Prosimulium czeckanowskii Rubzov), H. Rhizomorphus Rubzov (Prosimulium rhizomorphus Rubzov), Stegoopterina asema Rubzov, S.majalis Rubzov et Carlsson, S. dentata Rubzov et Carlsson, S. decalis Rubzov, Cnephia pallipes Fries (Cnephia pallipes Enderlein), Metacnephia salieri Stone (Metacnephia pallipes Fries), M. trigoniformis Yankovsky (Metacnephia trigonium Lunström), and M.taimyrica Patrusheva, Sulcicnephia tungus Rubzov, Byssodon macula males Meigen (Byssodon maculates lenae Rubzov), Eusimulium aureum Rubzov, Cnetha chomustachi Worobez (Gomphostilbia chomustachi Worobez), Schoenbaueria rangiferina Rubzov, Sch. pusilla Fries, Sch. subpusilla Rubzov, Sch. brachyarthra Rubzov, Sch. gigantea Rubzov (Hemicnetha gigantea Rubzov), Cnetha verna Macguart (Cnetha latipes Meigen), C.silvesris Rubzov, C.bicornis Dorogostajsky, Rubzov et Vlasenko, C.pugetensis Dyar et Shannon (Eusimulium longipile Rubzov), C. curvans Rubzov et Carlsson, Hellichiella baffinensis Twinn (Cnetha baffinensis Twinn), Archesimulium tuberosum Lunström (Simulium tuberosum Lunström), Arch. vulgare Dorogostajsky, Rubzov et Vlasenko (Simulium vulgare Rubzov), Simulium venustum Say, Sim. trucatum Lunstrom, Sim. posticatum Meigen (Simulium austeni Edwards), Sim. morsitans Edwards, Sim. paramorsitans Rubzov, Sim.longipalpe Beltucovae, Sim. aemulium Rubzov, Sim. rubzovii Smart, Sim. rostratum Lundström (Simulium argyreatum Meigen), Sim. venustum Say (Simulium verucundum St. et Jannb), Sim. sp., Boophthora erythrocephala De Geer, Gnus malyshchevi Rubzov, G. jacaticum Rubzov, G. decimarum Dorogostajsky, Rubzov et Vlasenko, G. cholodkovskii Rubzov, G. pavlovskii Rubzov, G. rostratum Lundstrom, G. subvariegareum Rubzov, G. nakojapi Smart, and Parabyssodon transiens Rubzov.


The diversity of the midge fauna on the territory of Kunashir, the southernmost of the islands of the Greater Kuril Ridge, is small — 3 species of midges of 3 genera were found here: Cnetha spp., Gomphostilbia makartshenkovi Bodrova, Odagmia nishijima Ono. [28].

CONCLUSION
To date, the topic is relevant and requires further research because these blood-sucking Diptera are carriers of several infectious and parasitic diseases in humans and animals.

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