Russian Entomol. J. 32(3): 297–304

Review of the Aphidiinae (Hymenoptera: Braconidae) fauna of the European North of Russia

Обзор фауны Aphidiinae (Hymenoptera: Braconidae) европейского Севера России

Elena M. Davidian[1], Andrei E. Humala[2#]
Е.М. Давидьян[1], А.Э. Хумала[2#]

[1] All-Russian Institute of Plant Protection, Pushkin, St. Petersburg, 196608, Russia. E-mail: gdavidian@yandex.ru
[2] Forest Research Institute, Russian Academy of Sciences, Pushkinskaya St. 11, Petrozavodsk, 185910, Russia. E-mail: humala@krc.karelia.ru
[1] Всероссийский научно-исследовательский институт защиты растений, шоссе Подбельского, 3, С.-Петербург – Пушкин, 196608, Россия.
[2] Институт леса Карельского научного центра Российской академии наук, ул. Пушкинская 11, Петрозаводск, 185910, Россия.
– Corresponding author

KEY WORDS: Aphidiinae, parasitoid wasps, fauna, Russian Fennoscandia, list of species, new records.
КЛЮЧЕВЫЕ СЛОВА: Aphidiinae, наездники, фауна, Российская Фенноскандия, список видов, новые находки.

ABSTRACT. This faunistic survey presents the records of 70 species of Aphidiinae (Hymenoptera, Braconidae) from the European North of Russia, mainly from the Republic Karelia, as well as from Murmansk and Arkhangelsk Provinces and Komi Republic. Three species are reported as a new to Russia, 23 species are new to the fauna of Karelia, seven species are new to Murmansk Province, three species are new to Arkhangelsk Province and one species is new to Komi Republic. Among the species new to Karelia, two species are also found in the Murmansk Province, and two more species were recorded for the first time for the European part of Russia.

РЕЗЮМЕ. В предлагаемом фаунистическом обзоре приведены находки 70 видов наездников-афидиин (Hymenoptera: Braconidae: Aphidiinae) на Европейском Севере России, большей частью из Республики Карелия, а также из Мурманской и Архангельской областей и Республики Коми. Три вида впервые указываются для фауны России, 23 вида являются новыми для Карелии, 7 видов — для Мурманской области, 3 вида — для Архангельской области и 1 вид — для Республики Коми. Среди новых для Карелии видов 2 найдены также в Мурманской области и еще 2 впервые отмечены на территории европейской части России.

Introduction

Aphidiines are a relatively small group of specialized koinobiont aphid parasitoids (Hemiptera: Aphidoidea: Aphididae) distributed worldwide. According to the vast majority of modern researchers, we accept their concept here and consider aphidiines as a subfamily within the family Braconidae (Hymenoptera, Ichneumonoidea) [Yu *et al*., 2016; Chen, van Achterberg, 2019]. However, there is another point of view, according to which this group is considered as a separate family within the superfamily Ichneumonoidea closely related to Braconidae [Starý, 1970; Tobias, Kiriac, 1986; Davidian, 2007, 2016, 2018b, 2019a, b]. According to various estimates, between 500 and over 650 species from 54 genera are known in the recent world fauna, more than half of which are distributed in the Palaearctic region [Yu *et al*., 2016; Žikić *et al*., 2017]. The Aphidiinae of Russia includes 201 species of 31 genera [Davidian, 2019b, 2020; Davidian, Belokobylskij, 2021, 2022].

These parasitoid wasps play an important role in the biological control of crop aphid pests [DeBach, 1964; Starý P., 1970, 1988; Hågvar, Hofsvang, 1991; Boivin *et al*., J. 2012; Žikić *et al*., 2017].

This paper contains an updated check-list of Aphidiinae occurring in the European North of Russia (N – in the "Annotated catalogue of the Hymenoptera of Russia" [Davidian, 2019b]). The western part of this territory belongs to Fennoscandia, including the Kola Peninsula, the Republic Karelia and adjacent areas of Leningrad Region (the Karelian Isthmus and the right bank of the Svir' River). The Aphidiinae fauna of Fennoscandia remains poorly studied, although its regular study began as early as the 1960s and are still ongoing [Mackauer, 1968; Gärdenfors, 1986; Hofsvang, Hågvar, 1983; Tobias, Kiriac, 1986; Davidian, Humala, 2017; Davidian, 2016, 2019a, b]. Prior to our studies,

How to cite this article: Davidian E.M., Humala A.E. 2023. Review of the Aphidiinae (Hymenoptera: Braconidae) fauna of the European North of Russia // Russian Entomol. J. Vol.32. No.3. P.297–304. doi: 10.15298/rusentj.32.3.04

only 23 species of Aphidiinae had been recorded in Russian Fennoscandia [Mackauer, 1968]. The recent catalogue [Davidian, 2019b] based on available publications [Davidian, 2016, 2017, 2018a, b, 2019a, etc.] includes 45 species of Aphidiinae occurring in the European North of Russia (N). The present paper provides a new data on the species composition of Aphidiinae of this region, including information on the distribution of these parasitoids species in the European North of Russia missing in the catalogue [Davidian, 2019b].

Materials and methods

An updated annotated check-list of parasitoid wasps of subfamily Aphidiinae occurring in the European North of Russia (N – according to the last catalogue [Davidian, 2019b]) is presented. In addition to information from this Catalogue, the paper includes new data based on the study of materials collected recently in the Republic Karelia, Murmansk and Arkhangelsk Provinces. This material was collected using an entomological net, Malaise traps (MT) and yellow pan traps (YPT). Almost all the mentioned material (unless otherwise stated) was collected by the second author, A.E. Humala. Species identification was carried out by the first author, E.M. Davidian. Some specimens were excluded from the work due to the impossibility of their precise identification: among them heavily damaged specimens or only males. The studied material is stored predominantly in the Zoological Institute of the Russian Academy of Sciences (St Petersburg) and in the collection of the Forest Research Institute, KRC RAS (Petrozavodsk).

The coordinates of collection localities are given according to the WGS84 coordinate reference system (EPSG: 4326). The abbreviations of the names of biogeographical provinces of East Fennoscandia are used in the text according to Heikinheimo & Raatikainen [1971] with additions by Kravchenko & Kuznetsov [2001] and Ahti & Boychuk [2006]: Kl — *Karelia ladogensis*, Kol — *Karelia olonetsensis*, Kon — *Karelia onegensis*, Kton – *Karelia transonegensis*, Kp — *Karelia pudogensis*, Kpoc — *Karelia pomorica occidentalis*, Kk — *Karelia keretica*, Lim — *Lapponia imandrae*, Lps — *Lapponia petsamoensis,* Lp — *Lapponia ponoensis.*

Another abbreviations used in the text: NP — National park; NR — Nature Reserve; Prov. — Province; Distr. — District; I. — Island; L. — Lake; R. — River; surr. — surroundings.

Genera and species are given in the text in alphabetical order according to the recent catalogue [Davidian, 2019b]. Species that are missed in the Catalogue for the European North of Russia (N) [Davidian, 2019b] are marked with an asterisk (*); species firstly noted for Karelia, Murmansk, Arkhangelsk Provinces or Komi Republic are marked with two asterisks (**); species firstly noted for Russia are marked with three asterisks (***).

List of species

Tribe Aphidiini

****Aphidius (Aphidius) avenae** Haliday, 1834

MATERIAL. **Karelia,** *Kol*: Olonets Distr., 1.5 km E of Vidlitsa, 61.179°N, 32.429°E, 4.IX.2018, 1♂; **Murmansk Prov.**, *Lps*: Pechenga Distr., Pasvik NR, Menikkayoki R., 69.3737°N, 29.8824°E, 5.VI.2007, 1♀; same label, MT, 5.VI–6.VII.2007, 1♀.

DISTRIBUTION: Palaearctic region, reported from Karelia [Davidian, 2017]. New for Murmansk Prov.

**Aphidius* (*Aphidius*) *eadyi* Starý, Gonzales et Hall, 1980

MATERIAL. See Davidian, 2017.

DISTRIBUTION: Palaearctic region, reported from Karelia [Davidian, 2017]. The species was missed in the Catalogue for N [Davidian, 2019b].

Aphidius (*Aphidius*) *ervi* Haliday, 1834

MATERIAL. **Karelia,** *Kton*: Pudozh Distr., Besov Nos, Kladovets Cape, 61.667°N, 36.046°E, windfall area, YPT, 3–6. VII.2018, 1♀, 1♂; *Kp*: 3 km SSW of Prirechnyi, 61.772°N, 37.583°E, mixed forest, MT, 24.VI–13.VIII.2009, 2♀; *Kk*: Loukhi Distr., NP Paanayarvi, Siltayoki R., 66.2835°N, 30.4622°E, MT2, 27.VI–28.VII.2021, 1♀.

DISTRIBUTION: Palaearctic region, known from Karelia and Murmansk Prov. [Davidian, 2017].

****Aphidius** (*Aphidius*) *microlophii* Penacchio et Tremblay, 1988

MATERIAL. **Karelia**, *Kpor*: Belomorsk Distr., Kondostrov I. 64.21°N 36.64°E, 20VIII.2002, 1♀; **Murmansk Prov.**, *Lps*: Pechenga Distr., Pasvik NR, 1 km SE of Varlam I., 69.1376°N, 29.2616°E, MT, 16.VII–3.VIII.2007, 2♂, 4♀; Kalkupya Mt., 69.2870°N, 29.3554°E, MT, 4–30.VII.2007, 5♂, 2♀; Menikkayoki R., 69.3737°N, 29.8824°E, MT, 5.VI–6.VII.2007, 1♂; 6.VII–14.VIII.2007, 1♂; *Lp*: Lovozero Distr., Ponoy, Orlovka Bay, 67.208°N, 41.188°E, YPT, 7–8.VII.2022, 1♂.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2017, 2018a]. New for Karelia.

**Aphidius* (*Aphidius*) *rhopalosiphi* de Stefani-Perez, 1902

MATERIAL. **Karelia**, *Kk*: Loukhi Distr., Chupa Bay, Kartesh biol. station, supralittoral, 16.IX.1989, 3♀ (E.S. Sugonyaev); NP Paanayarvi, Verkhniy Neris L., MT, 66.3055°N, 30.4399°E, 3–27.VI.2021, 1♀; *Kpor*: Belomorsk Distr., Ladozero, blueberry spruce, MT, 63°35’15”N, 35°50’40”E, 27.VI–13.VIII.2010, 1♀; *Kon*: Medvezh’egorsk Distr., Pod’elniki, 62°06'23"N, 35°10'27"E, 21.VII.2011, 2♀; Lyudskoy I., 61.96°N, 35.17°E, meadow, 24.VI.2003, 1♀; **Murmansk Prov.,** *Lim*: Khibiny, upper reaches of the Poachyok R., 10.VI.1975, 2♀ (A.G. Zinov’ev); Laplandsky NR, spruce forest, MT, 67.65381°N, 32.63703°E, 23.VII–02. VIII.2013, 1♀.

DISTRIBUTION: Palaearctic region [Davidian, 2019b]. New for Karelia and Murmansk Prov.

**Aphidius* (*Aphidius*) *rosae* Haliday, 1834

MATERIAL. See Litvinova & Rak, 2021.

DISTRIBUTION: Palaearctic region, reported from Murmansk Prov. [Litvinova, Rak, 2021]. The species is not listed in the Catalogue for N [Davidian, 2019b].

Aphidius (*Aphidius*) *sonchi* Marshall, 1896

MATERIAL. See Davidian, 2018a.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2018a].

Aphidius (*Aphidius*) *tanacetarius* Mackauer, 1962

MATERIAL. See Davidian, 2017.
DISTRIBUTION: Palaearctic region, known from Arkhangelsk Prov. [Davidian, 2017].

Aphidius (*Aphidius*) *urticae* Haliday, 1834

MATERIAL. **Karelia,** *Kk*: Loukhi Distr., NP Paanayarvi, 66.3055°N, 30.4399°E, Verkhniy Neris L., MT, 28.VII–28.IX.2021, 1♀; *Kp*: Pudozh Distr., 3 km SSW of Prirechnyi, 61.772°N, 37.583°E, mixed forest, MT, 24.VI–13.VIII.2009, 1♂, 3♀.
DISTRIBUTION: Palaearctic region, known from Karelia and Murmansk Prov. [Davidian, 2017].

**Aphidius* (*Aphidius*) *uzbekistanicus* Luzhetzki, 1960

MATERIAL. **Karelia**, *Kon*: Medvezh'egorsk Distr., Povenets, north of Onega Lake, meadow and small woodlands with Alnus and Salix, 5.VII.1981, 1♀ (V.I. Tobias).
DISTRIBUTION: Palaearctic region [Davidian, 2019b]. New for Karelia.

***Aphidius* (*Euaphidius*) *cingulatus* (Ruthe, 1859)

MATERIAL. **Karelia**, *Kon*: Medvezh'egorsk Distr., Malyi Lelikovsky I., meadow, 26.VI.2003, 1♀; Zaonezhye, 4 km NW of Tambitsa, square 132, 62°14'40"N, 35°29'30"E, 28.VIII.2013, 1♂, 1♀; Prionezhsky Distr., 13 km NNE of Petrozavodsk, Yalgora, 61.90°N, 34.47°E, 15.VI.2023, 1♂; **Murmansk Prov.**, *Lim*: Khibiny, upper reaches of the Poachyok R, 10.VI.1975, 2♀ (A.G. Zinov'ev); **Arkhangelsk Prov.**, NP "Onezhskoe Pomor'e", Malaya Palova R., 64.58°N, 36.87°E, 28.VII.2020, 1♀; 25 km SE of Arkhangelsk, Vatozero, 3.VIII.1977, 1♂ (D.R. Kasparyan).
DISTRIBUTION: Palaearctic region, known from Karelia (Sortavala) and Murmansk Prov. (Ponoy, Kuolayarvi) [Mackauer, 1968; Davidian, 2017]. New for Arkhangelsk region.

Aphidius (*Euaphidius*) *plocamaphidis* (Starý, 1973)

MATERIAL. See Davidian, 2017, 2018a.
DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2017, 2018a].

Betuloxys compressicornis (Ruthe, 1859)

MATERIAL. See Davidian, 2016.
DISTRIBUTION: Palaearctic region, known from Karelia [Davidian, 2016].

**Betuloxys kostyukovi* Davidian, 2005

MATERIAL. **Murmansk Prov.**, *Lp*: Lovozero Distr., Ponoy, Orlovka Bay, 67.208°N, 41.188°E, YPT, 7–8.VII.2022, 1♀.
DISTRIBUTION: Palaearctic region, missed in the Catalogue for N [Davidian, 2019b]. New for Murmansk region.

***Binodoxys brevicornis* (Haliday, 1833)

MATERIAL. **Karelia,** *Kon*: Medvezh'egorsk Distr., Bolshoy Klimenetskiy I., Gryznavolok Headland, 62.02°N, 35.22° E, meadow, 4.VII.2019, 1♀.
DISTRIBUTION: Palaearctic region, known from N [Davidian, 2016, 2019b]. New for Karelia.

**Binodoxys centaureae* (Haliday, 1833)

MATERIAL. Not available for study.
DISTRIBUTION: Palaearctic region, known from Karelia (Shun'ga) [Mackauer, 1968]. The species was missed in the Catalogue for N [Davidian, 2019b].

Binodoxys heraclei (Haliday, 1833)

MATERIAL. See Davidian, 2016.
DISTRIBUTION: Palaearctic region, known from Karelia [Davidian, 2016].

**Diaeretellus ephippium* (Haliday, 1833)

MATERIAL. **Karelia,** *Kon*: Kondopoga Distr., Kivach NR, 62.2851°N, 33.9705°E, mixed forest, trunk emergence trap on aspen log, 19.VIII–28.IX.2016, 1♀ (A.V. Polevoi).
DISTRIBUTION: Palaearctic region [Davidian, 2019b]. The species was missed in the Catalogue for N, new for Karelia.

**Diaeretellus heinzei* (Mackauer, 1959)

MATERIAL. **Murmansk Prov.**, *Lps*: Pechenga Distr., Pasvik NR, Kalkupya Mt., 69.2870°N, 29.3554°E, MT, 7.VI–4.VII.2007, 1♂; 4–30.VII.2007, 1♀; 30.VII–11.X.2007, 1♂.
DISTRIBUTION: Palaearctic region [Davidian, 2019b]. The species was missed in the Catalogue for N, new for Murmansk Prov.

Diaeretellus macrocarpus Mackauer, 1961

MATERIAL. **Murmansk Prov.**, *Lps*: Pechenga Distr., Pasvik NR, 1 km SE of Varlam I., 69.1376°N, 29.2616°E, MT, 16.VII–3.VIII.2007, 1♀.
DISTRIBUTION: Palaearctic region, known from Murmansk Prov. (Trifonovo) [Mackauer, 1968].

Diaeretiella rapae (McIntosh, 1855)

MATERIAL. See Davidian, 2017, 2018a.
DISTRIBUTION: Palaearctic region, known from Karelia and Murmansk Prov. [Davidian, 2017, 2018a].

Diaeretus leucopterus (Haliday, 1834)

MATERIAL. See Davidian, 2018a.
DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2018a].

Lipolexis gracilis Foerster, 1863

MATERIAL. **Karelia,** *Kon*: Medvezh'egorsk Distr., Turastamozero environs, 62.5603°N, 34.7163°E, pine forest, MT, 21.VII–22.VIII.2012, 1♂.
DISTRIBUTION: Palaearctic region, known from N [Davidian, 2016; 2019b].

***Lysiphlebus* (*Lysiphlebus*) *dissolutus* (Nees, 1834)

MATERIAL. **Karelia**, *Kton*: Pudozh Distr., Besov Nos, Cape Kladovets, 61.667°N, 36.046°E, 30.VI–06.VII.2018, 1♂.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. (Vuorikyulya) [Mackauer, 1968; Davidian, 2019b]. New for Karelia.

**Lysiphlebus* (*Phlebus*) *confusus* Tremblay et Eady, 1978

MATERIAL. **Karelia**, *Kk*: Loukhi Distr., Chupa Bay, Kartesh biol. station, supralittoral, 16.IX.1989, 1♀ (E.S. Sugonyaev).

DISTRIBUTION: Palaearctic region, the species is not listed in the Catalogue for N [Davidian, 2019b]. New for Karelia.

Metaphidius aterrimus (Fahringer, 1935)

MATERIAL. Not available for study.

DISTRIBUTION: Palaearctic region, known from Karelia (Petrozavodsk) [Mackauer, 1968].

Monoctonus caricis (Haliday, 1833)

MATERIAL. Not available for study.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. (Gavrilovo) [Mackauer, 1968]. The species was missed in the Catalogue for N [Davidian, 2019b].

Monoctonus nervosus (Haliday, 1833)

MATERIAL. **Murmansk Prov.,** *Lps*: Pechenga Distr., Pasvik NR, 1 km SE of Varlam I., 69.1376°N, 29.2616°E, MT, pine forest, 6.VI–10.VII and 3.VIII–10.X.2007, 2♀; Kalkupya Mt., 69.2870°N, 29.3554°E, MT, 4–30.VII.2007, 1♂, 1♀; Menikkayoki R., 69.3737°N, 29.8824°E, birch forest, MT, 6.VII–14.VIII.2007, 1♂; 14.VIII–25.IX.2007, 1♂; *Lp*: Lovozero Distr., Ponoy, Orlovka Bay, 67.208°N, 41.188°E, YPT, 7–8.VII.2022, 1♀.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. (Kandalaksha, Kuzomen, Ponoy, Luostari, Trifonovo, Gavrilovo), Arkhangelsk Prov. and Komi Republic [Mackauer, 1968; Davidian, 2016, 2019b].

***Pauesia* (*Paraphidius*) *abietis* (Marshall, 1896)

MATERIAL. **Karelia,** *Kon*: Medvezh'egorsk Distr., Bolshoy Klimenetskiy I., Vatnavolok Headland, 61.97°N, 35.34° E, meadow, 6.VII.2017, 1♀; *Kk*: Loukhi Distr., NP Paanayarvi, Siltayoki R., 66.2835°N, 30.4622°E, MT, 2–27.VI.2021, 1♀.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2017, 2018a]. New for Karelia.

****Pauesia* (*Paraphidius*) *juniperorum* (Starý, 1960)

MATERIAL. **Murmansk Prov.,** *Lps*: Pechenga Distr., Pasvik NR, Kalkupya Mt., 69.2870°N, 29.3554°E, MT, 7.VI–4.VII.2007, 1♀.

DISTRIBUTION: Palaearctic region [Davidian, 2017]. New for Russia.

Pauesia (*Paraphidius*) *infulata* (Haliday, 1834)

MATERIAL. **Karelia,** *Kon*: Kondopoga Distr., 1 km E of Malaya Gomsel'ga, 62.06°N, 33.99°E, 9.VIII.2018, 1♀; *Kton*: Pudozh Distr., Besov Nos, Kladovets Cape, 61.667°N, 36.046°E, windfall area, YPT, 3–6.VII.2018, 1♀, 1♂.

DISTRIBUTION: Palaearctic region, known from Karelia and Murmansk Prov. [Mackauer, 1968; Davidian, 2017].

****Pauesia* (*Paraphidius*) *maculolachni* (Starý, 1980)

MATERIAL. **Karelia,** *Kk*: Loukhi Distr., NP Paanayarvi, 60.27°N, 30.4°E, road along Olonga R., 1.VI.2021, 1♀.

DISTRIBUTION: Palaearctic region. New for Russia.

Pauesia (*Paraphidius*) *pini* (Haliday, 1834)

MATERIAL. See Davidian, 2017.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2017].

***Pauesia* (*Paraphidius*) *silana* Tremblay, 1969

MATERIAL. **Karelia,** *Kton*: Pudozh Distr., 61.75°N, 36.03°E, Chernyi Cape, 8.VII.2019; 1♂.

DISTRIBUTION: Palaearctic region, known from Arkhangelsk Prov. [Davidian, 2017]. New for Karelia.

**Pauesia* (*Paraphidius*) *silvestris* (Starý, 1960)

MATERIAL. **Murmansk Prov.**, *Lim*: Laplandsky NR, 2 km W of Chunozero, Lisiy brook, MT, 67.6513°N, 32.5985°E, 28.V–20.IX.2014, 1 ♀.

DISTRIBUTION: Palaearctic region, known from Russia, the species is not listed in the Catalogue for N [Davidian, 2019b]. New for Murmansk Region.

***Pauesia* (*Paraphidius*) *similis* Starý, 1966

MATERIAL. **Karelia,** *Kpoc*: Kalevala Distr., Nyuk L., 7 km W of Piz'maguba, 64.580°N, 31.639°E, 13.VIII.2016, 1♀; *Kk*: Loukhi Distr., NP Paanayarvi, 66.3055°N, 30.4399°E, Verkhniy Neris L., MT, 27.VI–28.VII.2021, 3♀; Siltayoki R., 66.2835°N, 30.4622°E, MT, 27.VI–28.VII.2021, 4♂, 7♀; MT, 28.VII–28.IX.2021, 1♀; Vartiolampi, 66.24636°N, 30.55560°E, MT; 27.VI–28.VII.2021, 1♀.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2018a]. New for Karelia.

**Pauesia* (*Pauesia*) *akamatsucola* Takada, 1968

MATERIAL. **Karelia,** *Kton*: Pudozh Distr., Besov Nos, Kladovets Cape, 61.667°N, 36.046°E, windfall area, YPT, 3–6.VII.2018, 1♀.

DISTRIBUTION: Palaearctic region, known from Russia, the species is not listed in the Catalogue for N [Davidian, 2019b]. New for Karelia.

REMARK. This is first record of this species from the European part of Russia.

**Pauesia* (*Pauesia*) *goidanichi* Starý, 1966

MATERIAL. **Karelia,** *Kp*: Pudozh Distr., 3 km SSW of Prirechnyi, 61.772°N, 37.583°E, mixed forest, MT, 24.VI–13.VIII.2009, 8♀; *Kk*: Loukhi Distr., NP Paanayarvi, Verkhniy Neris L., 66.3055°N, 30.4399°E, MT, 27.VI–28.VII.2021, 1♀, 1♂; Vartiolampi, 66.24636°N, 30.55560°E, MT; 1–27.VI.2021, 3♂; 27.VI–28.VII.2021, 1♀; Siltayoki R., 66.2835°N, 30.4622°E, MT, 27.VI–28.VII.2021, 1♀.

DISTRIBUTION: Palaearctic region, known from Russia, the species is not listed in the Catalogue for N [Davidian, 2019b]. New for Karelia.

Pauesia (*Pauesia*) *jezoensis* (Watanabe, 1941)

MATERIAL. See Davidian, 2017.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2017].

Pauesia (*Pauesia*) *laricis* (Haliday, 1834)

MATERIAL. **Karelia,** *Kp*: Pudozh Distr., 3 km SSW of Prirechnyi, 61.772°N, 37.583°E, mixed forest, MT, 24.VI–13.VIII.2009, 4♂, 4♀.

DISTRIBUTION: Palaearctic region, known from Karelia [Davidian, 2017].

**Pauesia* (*Pauesia*) *picta* (Haliday, 1834)

MATERIAL. **Karelia,** *Kon*: Medvezh'egorsk Distr., Bolshoy Klimenetskiy I., Vatnavolok Headland, 61.97°N, 35.34° E, meadow, 6.VII.2017, 1♀.

DISTRIBUTION: Palaearctic region, the species is not listed in the Catalogue for N [Davidian, 2019b]. New for Karelia.

Pauesia (*Pauesia*) *pinicollis* Starý, 1960

MATERIAL. See Davidian, 2017.

DISTRIBUTION: Palaearctic region, known from Murmansk and Arkhangelsk Prov. [Davidian, 2017].

****Pauesia* (*Pauesia*) *soranumensis* Watanabe et Takada, 1965

MATERIAL. **Karelia**, *Kol*: Olonets Distr., Mayachino surr., spruce forest, 60°46'N, 32°49'E, MT, 23–28.VI.2012, 1♀.

DISTRIBUTION: Palaearctic region. New for Russia.

Pauesia (*Pauesia*) *unilachni* (Gahan, 1926)

MATERIAL. See Davidian, 2017.

DISTRIBUTION: Palaearctic region, known from Karelia and Murmansk Prov. [Davidian, 2017].

**Pauesia* (*Pauesiella*) *spatulata* Sedlag et Starý, 1980

MATERIAL. **Karelia,** *Kk*: Loukhi Distr., NP Paanayarvi, Siltayoki R., 66.2835°N, 30.4622°E, MT, 27.VI–28.VII.2021, 1♀.

DISTRIBUTION: Palaearctic region, known from Russia; the species is not listed in the Catalogue for N [Davidian, 2019b]. New for Karelia and the European part of Russia.

**Trioxys auctus* (Haliday, 1833)

MATERIAL. See Davidian, 2016.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. (Kandalaksha) [Mackauer, 1968] and Karelia [Davidian, 2016]. The species was missed in the Catalogue for N [Davidian, 2019b].

Trioxys betulae Marshall, 1896 (syn. *T. hincksi* Mackauer, 1960)

MATERIAL. **Murmansk Prov.**, *Lps*: Pechenga Distr., Pasvik NR, Kalkupya Mt., 69.2870°N, 29.3554°E, MT, 4–30.VII.2007, 1♀; *Lim*: Laplandsky NR, 4 km SE of Chunozero, pine forest, 67.642°N, 32.681° E, MT, 26.VIII–21.IX.2014, 2♀.

DISTRIBUTION: Palaearctic region, reported from Karelia (Shotozero) as *T. hincksi* Mackauer, 1960; known from Murmansk Prov. (Kuzomen) and Komi Republic [Mackauer, 1968; Davidian, 2016; 2019b].

***Trioxys microceratus* Mackauer, 1968

MATERIAL. **Karelia,** *Kon*: Medvezh'egorsk Distr., Bolshoy Klimenetskiy Is., Vatnavolok Headland, 61.97°N, 35.34° E, meadow, 6.VII.2017, 1♀.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2016, 2019b]. New for Karelia.

Tribe Ephedrini

***Ephedrus* (*Breviephedrus*) *brevis* Stelfox, 1941

MATERIAL. **Karelia**, *Kpoc*: Kalevala Distr., Nyuk L., 7 km W of Piz'maguba, 64.580°N, 31.639°E, 13.VIII.2016, 1♀.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2018b]. New for Karelia.

Ephedrus (*Ephedrus*) *lacertosus* (Haliday, 1833)

MATERIAL. **Karelia**, *Kon*: Medvezh'egorsk Distr., Turastamozero surr., 62°33'54"N, 34°41'59"E, pine forest, MT, 24.VII–22.VIII.2012, 1♂, 1♀; Turastamozero surr., 62°33'37"N, 34°42'59"E, pine forest, MT, 21.VII–22.VIII.2012, 2♂; Suoyarvi Distr., Veshkelitsa, Ar'koila, 61.94°N, 32.86°E, 19.VI.2018, 3♀; Prionezhsky Distr., 13 km NNE of Petrozavodsk, Yalgora, 61.90°N, 34.47°E, 15.VI.2023, 1♀; *Kp*: Pudozh Distr., 3 km SSW Prirechnyi, 61.772°N, 37.583°E, mixed forest, MT, 24.VI–13.VIII.2009, 1♀; *Kk*: Kem' Distr., Palostrov I., 65.93°N, 34.71°E, 9.VIII.2006, 1♀; 4 km NW of Gridino, along brook from Samylino L., 65.93°N, 34.64°E, 6.VIII.2007, 1♀; Loukhi Distr., NP Paanayarvi, 66.3055°N, 30.4399°E, Verkhniy Neris L., MT, 3–27.VI, 27.VI–28.VII, 28.VII–28.IX.2021, 3♀; Siltayoki R., 66.2835°N, 30.4622°E, MT, 28.VII–28.IX.2021; 1♀; Vartiolampi, 66.24636°N, 30.5556°E, MT; 1–27.VI.2021, 1♀; **Murmansk Prov.,** *Lps*: Pechenga Distr., Pasvik NR, Varlam I., 69.1376°N, 29.2616°E, MT, pine forest, 6.VI–10.VII.2007, 15♂, 11♀; 3.VIII–10.X.2007, 4♂; *Lp*: Lovozero Distr., Ponoy, Orlovka Bay, 67.2077° N, 41.1885° E, YPT, 7–8.VII.2022, 1♂; *Lim*: Laplandsky NR, 4 km SE of Chunozero settlement, MT, 67.642°N, 32.681°E, 23.VI–28.VII.2014, 1♂.

DISTRIBUTION: Palaearctic region, known from Karelia (Petrozavodsk), Murmansk Prov. (Kandalaksha, Belaya Guba, Ponoy, Luostari, Trifonovo, Kola) and Komi Republic [Mackauer, 1968; Davidian, 2018b].

***Ephedrus* (*Ephedrus*) *nacheri* Quilis, 1934

MATERIAL. **Karelia,** *Kon*: Suoyarvi Distr., Veshkelitsa, Ar'koila, 61.94°N, 32.85°E, 21.VIII.2018, 1♀; *Kp*: Pudozh Distr., 3 km SSW of Prirechnyi, 61.772°N, 37.583°E, mixed forest, MT, 24.VI–13.VIII.2009, 1♀; *Kpoc*: Kem' Distr., Nemetskiy Kuzov I., 64.95°N, 35.16°E, supralittoral meadow, 17.VII.2001, 1♀; *Kk*: Loukhi Distr., NP Paanayarvi, Siltayoki R., 66.2835°N, 30.4622°E, MT2, 27.VI–28.VII.2021, 1♀.

DISTRIBUTION: Palaearctic region, was known from Murmansk Prov. [Davidian, 2018b]. New for Karelia.

****Ephedrus* (*Ephedrus*) *niger* Gautier, Bonnamour et Gaumont, 1929

MATERIAL. **Arkhangelsk Prov.,** NP "Onezhskoe Pomor'e", Shidrovo surr., supralittoral meadow, 64.76°N, 36.53°E, 1.VIII.2020, 1♀.

DISTRIBUTION: Palaearctic region, known from Karelia and Murmansk Prov. (Kuzomen) [Mackauer, 1968; Davidian, 2018b]. New for Arkhangelsk Region.

***Ephedrus* (*Ephedrus*) *plagiator* (Nees, 1811)

MATERIAL. **Karelia,** *Kon*: Kondopoga Distr., 1 km E of Malaya Gomsel'ga, 62.06°N, 33.99°E, 9.VIII.2018, 1♀; *Kk*: Kem' Distr., 4 km NW of Gridino, along brook from Samylino L., 65.93°N, 34.64°E, 6.VIII.2007, 1♀; **Murmansk Prov.,** *Lim*: Laplandsky NR, vicinity of Pusozero, 68.232°N, 31.143°E, pine forest, MT, 20.VI–18.VII.2017, 1♀.

DISTRIBUTION: Palaearctic region, known from Karelia (Petrozavodsk), Murmansk Prov. (Kandalaksha, Belaya Guba, Ponoy, Pechenga) [Mackauer, 1968, Davidian, 2018b] and Komi Republic (erroneously listed as Arkhangelsk Prov.) [Davidian, 2018b]. The species was missed in the Catalogue for N [Davidian, 2019b].

***Ephedrus* (*Ephedrus*) *validus* (Haliday, 1833)

MATERIAL. Not available for study.

DISTRIBUTION: Palaearctic region, known from Karelia (Petrozavodsk and Paanayarvi) [Mackauer, 1968]. The species was missed in the Catalogue for N [Davidian, 2019b].

****Ephedrus* (*Fovephedrus*) *longistigmus* Gärdenfors, 1986

MATERIAL. **Karelia,** *Kp*: Pudozh Distr., 3 km SSW of Prirechnyi, 61.772°N, 37.583°E, mixed forest, MT, 24.VI–13.VIII.2009, 2♀.

DISTRIBUTION: Palaearctic region, known from Arkhangelsk Prov. [Davidian, 2018b]. New for Karelia.

Ephedrus (*Fovephedrus*) *persicae* Froggatt, 1904

MATERIAL. See Davidian, 2019b.

DISTRIBUTION: Palaearctic region, known from N [Davidian, 2019b].

Toxares deltiger (Haliday, 1833)

MATERIAL. See Davidian, 2018b.

DISTRIBUTION: Palaearctic region, known from Karelia [Davidian, 2018b].

Tribe Praini

Areopraon helleni Starý, 1981

MATERIAL. See Davidian, 2019a.

DISTRIBUTION: Palaearctic region, known from Komi Republic [Davidian, 2019a].

Areopraon pilosum Mackauer, 1959

MATERIAL. See Davidian, 2019a.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2019a].

***Praon abjectum* (Haliday, 1833)

MATERIAL. **Karelia,** *Kon*: Kondopoga Distr., 1 km E of Malaya Gomsel'ga, 62.06°N, 33.99°E, clear-cut site, 17.VII.2019, 1♀.

DISTRIBUTION: Palaearctic region, the species is not listed in the Catalogue for N [Davidian, 2019b]. New for Karelia.

Praon absinthii Bignell, 1894

MATERIAL. See Davidian, 2019a.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2019a].

***Praon barbatum* Mackauer, 1967

MATERIAL. **Karelia,** *Kp*: Pudozh Distr., 3 km SSW of Prirechnyi, 61.772°N, 37.583°E, mixed forest, MT, 24.VI–13.VIII.2009, 1♀.

DISTRIBUTION: Palaearctic region, the species is not listed in the Catalogue for N [Davidian, 2019b]. New for Karelia.

***Praon bicolor* Mackauer, 1959

MATERIAL. **Karelia,** *Kon*: Medvezh'egorsk Distr., Bolshoy Klimenetskiy I., Vatnavolok Headland, 61.97°N, 35.34° E, meadow, 6.VII.2017, 1♀; *Kton*: Pudozh Distr., Besov Nos, 61.67°N, 36.05°E, 6.VII.2018, 1♀; **Murmansk Prov.**, *Lps*: Pechenga Distr., Pasvik NR, Kalkupya Mt, 69.2870°N, 29.3554°E, MT, 30.VII–11.X.2007, 1♀.

DISTRIBUTION: Palaearctic region, the species is not listed in the Catalogue for N [Davidian, 2019b]. New for Karelia and Murmansk Prov.

Praon dorsale (Haliday, 1833)

MATERIAL. **Murmansk Prov.**, *Lps*: Pechenga Distr., Pasvik NR, 1 km SE of Varlam I., 69.1376°N, 29.2616°E, MT, pine forest, 16.VII–3.VIII.2007, 1♀.

DISTRIBUTION: Palaearctic region, known from Karelia, Murmansk and Arkhangelsk Prov. [Davidian, 2019a].

Praon exoletum (Nees, 1811)

MATERIAL. See Davidian, 2019a.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2019a].

Praon flavinode (Haliday, 1833)

MATERIAL. **Murmansk Prov.**, *Lps*: Pechenga Distr., Pasvik NR, Kalkupya Mt, 69.2870°N, 29.3554°E, MT, 30.VII–11.X.2007, 1♂.

DISTRIBUTION: Palaearctic region, known from Karelia and Murmansk Prov. [Davidian, 2019a].

Praon longicorne Marshall, 1896

MATERIAL. **Murmansk Prov.,** *Lps*: Pechenga Distr., Pasvik NR, Menikkajoki R., 69.3737°N, 29.8824°E, birch forest, MT, 14.VIII–25.IX.2007, 1♀.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Davidian, 2019a].

Praon necans Mackauer, 1959

MATERIAL. See Davidian, 2019a.

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. and Komi Republic [Davidian, 2019a].

**Praon spinosum* Mackauer, 1959

MATERIAL. **Komi Republic**, the confluence of the Seida R. with the Usa R., 13.VIII.1972, 1♂ (D.R. Kasparyan).

DISTRIBUTION: Palaearctic region, known from Murmansk Prov. [Litvinova, Rak, 2021]. The species was not listed in the Catalogue for N [Davidian, 2019b]. New for Komi Republic.

***Praon volucre* (Haliday, 1833)

MATERIAL. **Karelia,** *Kon*: Kondopoga Distr., 1 km E of Malaya Gomsel'ga, 62.06°N, 33.99°E, clear-cut site, 17.VII.2019, 1♀; *Kp*: Pudozh Distr., 3 km SSW of Prirechnyi, 61.772°N, 37.583°E, mixed forest, MT, 24.VI–13.VIII.2009, 1♂. **Arkhangelsk Prov.**, 25 km SE of Arkhangelsk, Vatozero, 3.VIII.1977 (D.R. Kasparyan), 1♂.

DISTRIBUTION: Palaearctic Region, known from Karelia (Munozero) and Murmansk Prov. (Kuzomen, Ponoy, Luostari, Trifonovo) [Mackauer, 1968; Davidian, 2019a]. New for Arkhangelsk Prov.

Results

A total of 70 species of Aphidiinae from 16 genera are listed from the European North of Russia, of which 23 species are new to Karelia, seven species are new to Murmansk Province, three species are new to Arkhangelsk Province and one species is new to Komi Republic. Among the species new to Karelia, two species are also found in the Murmansk Province, and two more species were recorded for the first time for the European part of Russia. Based on the results of this work, our knowledge of the distribution of aphidiines in the European North has significantly expanded, and the known ranges of many species have been extended. Three species: *Pauesia juniperorum*, *P. maculolachni*, and *P. soranumensis*, are given for the first time for the fauna of Russia.

Discussion

According to this study, 70 species of parasitoid wasps of the subfamily Aphidiinae have been recorded in the European North of Russia. For comparison, in Finland, which is similar in area to the Russian part of Fennoscandia and has similar natural conditions, 103 species of these parasitoid wasps were recorded [Yu *et al*., 2016]. Obviously, the presented faunistic list of Aphidiinae of the European North of Russia is far from complete, and several dozens more species can be expected to be found here later. Of particular interest in this regard are the poorly studied eastern parts of this territory, including the Vologda and Arkhangelsk Provinces and the Komi Republic.

Acknowledgements. The work of the second author was performed as a part of the state order to the Karelian Research Centre of the Russian Academy of Sciences (Forest Research Institute).

Competing interests. The authors declare no competing interests.

References

Ahti T., Boychuk M.A. 2006. The botanical journeys of A.K. Cajander and J.I. Lindroth to Karelia and Onega River in 1898 and 1899, with a list of their bryophyte and lichen collections // Norrlinia. Vol.14. P.1–65.

Boivin G., Hance T., Brodeur J. 2012. Aphid parasitoids in biological control // Canadian Journal of Plant Science. Vol.92. P.1–12. https://doi.org/10.4141/cjps2011-045

Chen X., van Achterberg C. 2019. Systematics, phylogeny, and evolution of braconid wasps: 30 years of progress // Annual Review of Entomology. Vol.64. P.335–358.

Davidian E.M. 2007. [Family Aphidiidae] // Lelej A.S. (ed.) Opredelitel' nasekomykh Dal'nego Vostoka Rossii. Vol.4. Neuropteroidea, Mecoptera, and Hymenoptera. Part 5. Vladivostok: Dal'nauka. P.192–254 [in Russian].

Davidian E.M. 2016. Check-List of the Aphidiid-Wasp Subfamily Trioxinae (Hymenoptera, Aphidiidae) from Russia and Adjacent Countries // Entomological Review. Vol.96. No.9. P.1268–1288. https://doi.org/10.1134/S0013873816090098

Davidian E.M. 2017. Check-List of the Aphidiid-Wasp Subfamily Aphidiinae (Hymenoptera, Aphidiidae) from Russia and Adjacent Countries // Entomological Review. Vol.97. P.1249–1284. https://doi.org/10.1134/S001387381709007X

Davidian E.M. 2018a. Additions and Corrections to the Check-List of the Aphidiid- Wasp Subfamily Aphidiinae (Hymenoptera, Aphidiidae) from the North-West of Russia // Entomological Review. Vol.98. P.937–938. https://doi.org/10.1134/S0013873817070187

Davidian E.M. 2018b. Check-List of the Aphidiid-Wasp Subfamily Ephedrinae (Hymenoptera, Aphidiidae) from Russia and Adjacent Countries // Entomological Review. Vol.98. P.1091–1104. https://doi.org/10.1134/S0013873818080158

Davidian E.M. 2019a. Check-List of the Aphidiid-Wasp Subfamily Prainae (Hymenoptera, Aphidiidae) from Russia and Adjacent Countries // Entomological Review. Vol.99. P.1273–1287. https://doi.org/10.1134/S0013873819090045

Davidian E.M. 2019b. Family Aphidiidae // Belokobylskij S.A., Samartsev K.G., Il'inskaya A.S. (eds.). Annotated catalogue of the Hymenoptera of Russia. Volume II. Apocrita: Parasitica. Proceedings of the Zoological Institute Russian Academy of Sciences. Supplement 8. P.329–340.

Davidian E.M. 2020. A New Species of the Aphidiid Wasp Genus *Trioxys* Haliday (Hymenoptera, Aphidiidae) from Orenburg Province of Russia // Entomological Review. Vol.100. No.7. P.1029–1032. https://doi.org/10.1134/S0013873820070106

Davidian E.M., Belokobylskij S.A. 2021. Two new species of the genus *Areopraon* Mackauer, 1959 (Hymenoptera: Braconidae: Aphidiinae) from the Russian Far East // Zootaxa. Vol.4985. No.1. P.131–136. https://doi.org/10.11646/zootaxa.4985.1.10

Davidian E.M., Belokobylskij S.A. 2022. New species of the aphid parasitoids of the genus *Binodoxys* Mackauer (Hymenoptera: Braconidae: Aphidiinae) from the fauna of Russia // Zootaxa. Vol.5209. No.3. P.373–378. https://doi.org/10.11646/zootaxa.5209.3.6

Davidian E.M., Humala A.E. 2017. Aphid wasps (Hymenoptera, Aphidiidae) from Murmansk Region and Karelia // Materials of the XV Congress of the Russian Entomological Society. Novosibirsk, 31 July – 7 August 2017. P.147–148.

DeBach P.M. (ed.) 1964. Biological Control of Insect Pests and Weeds. Cambridge: Cambridge University Press. 844 pp.

Gärdenfors U. 1986. Taxonomic and Biological Revision of Palearctic *Ephedrus* Hal. (Hymenoptera, Braconidae, Aphidiinae) // Entomologica Scandinavica. Suppl.27. P.1–95.

Hågvar E.B., Hofsvang T. 1991. Aphid parasitoids (Hymenoptera: Aphidiidae): biology, host selection, and use in biological control // Biocontrol News and Information. Vol.12. P.13–41.

Heikinheimo O., Raatikainen M. 1971. The recording of locations of biological finds in Finland // Annales Entomologici Fennici. Vol.37. No.1a. P.1–27.

Hofsvang T., Hågvar E.B. 1983. Primary parasitoids (Hym., Aphidiidae) and hyperparasitoids on aphids from Norway // Fauna Norvegica. Ser.B. Vol.30. P.60–62.

Kravchenko A.V., Kuznetsov O.L. 2001. [Peculiarities of biogeographical provinces of the Republic of Karelia on the

basis of analysis of vascular plants flora] // Trudy Karel'skogo nauchnogo tsentra RAN. Biogeographia Karelii. No.2. P.59–64 [in Russian, with English summary].

Litvinova S.V., Rak N.S. 2021. [Natural aphidophages in agrocenoses of dendrological collections of the Polar-Alpine Botanical Garden-institute] // Trudy Kol'skogo nauchnogo tsentra RAN. Ser.9. Vol.12. No.6. P.328–333 [in Russian, with English summary].

Mackauer M. 1968. Die Aphidiiden (Hymenoptera) Finnlands // Fauna Fennica. Bd.22. 40 S.

Starý P. 1970. Biology of aphid parasites (Hymenoptera: Aphidiidae) with respect to integrated control // Series entomologica. Vol.6. The Hague: Springer. 643 pp.

Starý P. 1988. Aphidiidae // Minks A.K., Harrewijn P. (eds.). World Crop Pests. Aphids, their biology, natural enemies and control. New York: Elsevier. Vol.2B. P.171–184.

Tobias V.I., Kiriac I.G. 1986. [Family Aphidiidae] // Nasekomye Evropeiskoi chasti SSSR. Vol.3. Hymenoptera. Pt.5. Opredeliteli po faune SSSR. No.147. Leningrad: Nauka. P.232–283 [in Russian].

Yu D. S. K., Achterberg van C., Horstmann K. World Taxapad 2016, Ichneumonoidea 2015. Taxonomy, Biology, Morphology and Distribution. 2016: Database on USB flash-drive. Nepean, Ontario, Canada.

Žikić V., Lazarević M., Milošević D. 2017. Host range patterning of parasitoid wasps Aphidiinae (Hymenoptera: Braconidae) // Zoologischer Anzeiger. Vol.268. P.75–83. https://doi.org/10.1016/j.jcz.2016.10.001