

New data on distribution and trophic relationships of the parasitoids family Aphidiidae (Hymenoptera: Ichneumonoidea) for the fauna of Russia

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Новые данные о распространении и трофических связях паразитоидов семейства Aphidiidae (Hymenoptera: Ichneumonoidea) в фауне России

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Abstract. The records of the Aphidiidae species for the fauna of tree regions of Russia are provided. *Areopraon lepellei* (Waterston, 1926), *Aphidius colemani* Viereck, 1912, *A. balcanicus* Tomanović et Petrović, 2011 and *Praon dorsale* (Haliday, 1833) were found for the first time in the Western Siberia, and *Trioxys inulaecola* Starý et Remaudière, 1987 in North-West region of the European part of Russia. The original data for the trophic relations for 11 aphidiid species from NW of the European part of Russia are provided for the first time.

Key words. Parasitoids, Aphidiidae, new records, aphids, Russia.

Резюме. Приводятся сведения о новых находках видов сем. Aphidiidae в фауне трех российских регионов. *Areopraon lepellei* (Waterston, 1926), *Aphidius colemani* Viereck, 1912, *A. balcanicus* Tomanović et Petrović, 2011 и *Praon dorsale* (Haliday, 1833) впервые обнаружены в Западной Сибири, а *Trioxys inulaecola* Starý et Remaudière, 1987 – на северо-западе европейской части России. Приводятся оригинальные данные о трофических связях для 11 видов наездников-афидиид, впервые выведенных на северо-западе европейской части России.

Ключевые слова. Паразитоиды, Aphidiidae, новые находки, тли, Россия.

Introduction

Aphidiidae is a solitary koinobiont endoparasitoids exclusive of aphids (Hemiptera). Most of them, including Ephedrinae and Aphidiinae, pupate their cocoons within the mummified body of the hosts, but all Prainae form their cocoons under the remains of the hosts (its mummy). Although several authors have regarded this group of parasitoid only as a subfamily of Braconidae (Yu et al., 2016), I am treated it here as a separate family Aphidiidae within the superfamily Ichneumonoidea including three subfamilies, Aphidiinae, Ephedrinae and Prainae with about 600 known species. The Aphidiidae have almost worldwide distribution.

In the current study new and additional data about distributional of the Aphidiidae species on the territory of Russia as well as new trophic relations for some of them are provided.

Material and methods

All material used for this study are deposited in the collection of Zoological Institute of the Russian Academy of Sciences (St Petersburg, ZISP). It was collected by K.G. Samartsev and author (sweeping and rearing). Host-aphids of parasitoids were determined by A.V. Stekolshchikov (ZISP). The abbreviations of the regions of Russia were used from the first volume of the “Annotated catalogue of the Hymenoptera of Russia” (Belokobylskij, Lelej, 2017). General distribution of the species follows Starý (2006), Davidian (2007), Davidian and Gavril'yuk (2014) and Yu et al. (2016). New distribution records and new hosts are marked with an asterisk (*).

Taxonomic results

Family Aphidiidae

Subfamily Aphidiinae

Genus *Aphidius* Nees, 1819

Type species: *Aphidius avenae* Haliday, 1834.

Aphidius (Aphidius) arvensis (Starý, 1960)

Material examined. RUSSIA. St Petersburg: 65 females, 32 males, reared from *Coloradoa* sp. on *Achillea millefolium* (Asteraceae), 28.VIII.2019 (E. Davidian leg.); 2 females, ibid, 31.VIII.2019 (E. Davidian leg.).

Hosts. Parasitoid of aphids from the genus *Coloradoa*.

Distribution. Russia: EP (NW), UR. – Europe (WE, SE, EE), Iran.

Remarks. It was collected on the bank of the Pryazhka River. Small size mummies of *Coloradoa* sp. were located on the leaves of *Achillea millefolium* (Asteraceae). The plants were without peduncles after mowing.

Aphidius (Aphidius) balcanicus Tomanović et Petrović, 2011

Material examined. RUSSIA. Novosibirsk Province: 1 female, Novosibirsk, 4.VIII.2017 (K. Samartsev leg.).

Hosts. Parasitoid of aphids from the genus *Acyrtosiphon*.

Distribution. Russia: EP (NC), WS (TM, *NS, AL). – Europe (SE), Caucasus.

Aphidius (Aphidius) colemani Viereck, 1912

Material examined. RUSSIA. Novosibirsk Province: 1 female, Novosibirsk, 4. VIII.2017 (K. Samartsev leg.).

Hosts. Parasitoid of numerous aphids from the family Aphididae (subfamilies Aphidinae, Chaitophorinae and Thelaxinae).

Distribution. Russia: EP (S, NS), WS (*NS), ES (BR). – Europe (WE, NE, SE, EE), N Africa, Caucasus, Turkey, Syria, Iraq, Jordan, Lebanon, Israel, Qatar, Iran, Pakistan, Central Asia, China (NE, CC, SE), Korean Peninsula, Japan (introduced), N America (introduced), Mexico, India, SE Asia, Africa, Madagascar, Costa Rica, S America (introduced), Oceanic region (introduced), Australia (introduced).

Aphidius (Aphidius) eadyi Starý, Gonzalez et Hall, 1980

Material examined. RUSSIA. St Petersburg: 1 female, 2 males, Pushkin, reared from *Acyrtosiphon* sp. on *Melilotus officinalis* (Fabaceae), 8.VIII.2019; 1 female, 2 males, ibid, 11.VIII.2019; 6 females, 6 males, ibid, 16.VIII.2019; 2 females, 1 male, ibid, 17.VIII.2019; 1 female, ibid, 23.VIII.2019 (all E. Davidian leg.).

Hosts. Parasitoid of aphids from the genera *Acyrtosiphon*, *Aphis* and *Sitobion*.

Distribution. Russia: EP (NW, C), UR, WS (TM, AL). – Europe (WE, NE, SE, EE), N Africa, Caucasus, Turkey, Iran, Central Asia, Kazakhstan, N America (introduced), Afrotropics (introduced), New Zealand (introduced).

Aphidius (Aphidius) microlophii Penacchio et Tremblay, 1988

Material examined. RUSSIA. St Petersburg: 16 females, 5 males, reared from *Microlophium* sp., on *Urtica dioica* (Urticaceae), 28.VIII.2019; 13 females, 4 males, ibid, 30.VIII.2019; 3 females, ibid, 31.VIII.2019 (all E. Davidian leg.).

Hosts. Parasitoid of aphids from the genus *Microlophium*.

Distribution. Russia: EP (N, NW), WS (AL). – Europe (WE, SE, EE).

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

Material examined. RUSSIA. St Petersburg: 7 females, 1 male, reared from *Microlophium* sp. on *Urtica dioica* (Urticaceae), 26.VIII.2019; 1 male, 1 female, ibid, 28.VIII.2019; 2 females, ibid, 30.VIII.2019 (all E. Davidian leg.).

Hosts. Parasitoid of numerous aphids from the family Aphididae (Aphidinae).

Distribution. Russia: EP (N, NW, C, NC), UR, WS (NS, AL), FE (PR). – Europe (WE, NE, SE, EE), N Africa, Caucasus, Turkey, Israel, Iran, Afghanistan, Pakistan, Central Asia, Kazakhstan, China (CC, SE), Korean Peninsula, Japan, N America (introduced), India, New Zealand.

Genus *Monoctonus* Haliday, 1833

Type species: *Aphidius caricis* Haliday, 1833.

***Monoctonus crepidis* (Haliday, 1834)**

Material examined. RUSSIA. Krasnodar Territory: 15 females, 3 males, NW of Krasnaya Polyana Township, western slope of Achishkho Mt., beech forest, H = 1811 m, 43,726983°N, 40,098993°E, reared from *Nasonovia* sp. on *Lactuca* sp. (Asteraceae), 15.IX.2019 (E. Davidian leg.).

Hosts. Parasitoid of aphids from the genera *Aphis*, *Liosomaphis*, *Myzus*, *Hyperomyzus* and *Nasonovia*.

Distribution. Russia: EP (NW, C, NC), UR, FE (PR). – Europe (WE, NE, SE, EE), Turkey, Kazakhstan, N America, India.

Genus *Trioxys* Haliday, 1833

Type species: *Aphidius cirsii* Curtis, 1831.

***Trioxys inulaecola* Starý et Remaudière, 1987**

Material examined. RUSSIA. St Petersburg: 70 females, 72 males, reared from *Capitophorus* sp. on *Tussilago farfara* (Asteraceae), 26.VIII.2019 (E. Davidian leg.).

Hosts. Parasitoid of aphids from the genus *Capitophorus*.

Distribution. Russia: EP (*NW, NC), FE (PR, KU). – Europe (WE).

Remarks. This species was reared in north-west of the European part of Russia for the first time on *Tussilago farfara* (Asteraceae) from *Capitophorus* sp. Mummy light-yellow in color, located on the lower surface of the leaves. Species was described from France, where it was reared from *Capitophorus inulae* (Passerini) on the *Inula viscosa* (Asteraceae). In Russia it was known before only from Krasnodar Territory and Far East.

***Trioxys tenuicaudus* Starý, 1978**

Material examined. RUSSIA. St Petersburg: 1 female, reared from *Aphis* sp. on *Urtica dioica* (Urticaceae), 21.VIII.2019 (E. Davidian leg.).

Hosts. Parasitoid of aphids from the subfamily Calaphidinae and **Aphis* sp. (Aphidinae).

Distribution. Russia: EP (NW, C, NC). – Europe (WE, SE, EE), Caucasus, China (SE), N America (introduced), Australia.

Remarks. Reared from **Aphis* sp. on *Urtica dioica* (Urticaceae) for the first time. It was known only as parasitoid of aphids subfamily Calaphidinae from tree and shrub vegetation.

Subfamily Ephedrinae

Genus *Ephedrus* Haliday, 1833

Type species: *Bracon plagiator* Nees, 1811.

***Ephedrus nasheri* Quilis, 1934**

Material examined. RUSSIA. St Petersburg: 12 females, 15 males, Pushkin, reared from the galls in maroon colour, produced by *Cryptosiphum artemisiae* Buckton, 1879 on the twisted leaves of *Artemisia vulgaris* (Asteraceae), 23.VIII.2019; 1 female, 3 males, ibid, 25.VIII.2019 (all E. Davidian leg.).

Hosts. Parasitoid of aphids from the family Aphididae (Aphidinae).

Distribution. Russia: EP (N, NW, C, NC), UR, WS (TM, NS, KM, AL), ES (IR), FE (AM, PR, SA). – Europe (WE, NE, SE, EE), N Africa, Caucasus, Turkey, China (NE, NC, NW, CC, SW, SE), Korean Peninsula, Japan (Hok, Hon, Kyu), India, Nepal, Afrotropics (introduced), Chile (introduced).

Remarks. The open galls maroon in colour appear on *Artemisia vulgaris* (Asteraceae) in the end of August. It produced by *Cryptosiphum artemisiae* Buckton, 1879 on the leaves of *Artemisia vulgaris* twisted in basal part. Aphids are brown and covered with a white waxy coating, they are situated inside of the overgrown twisted leaves and are well protected. The mummies of aphids black in color, not attached to the walls of the galls were found between the living aphids and drops of the honeydew.

Subfamily Prainae

Genus *Areopraon* Mackauer, 1959

Type species: *Praon lepelleyi* Waterston, 1926.

***Areopraon lepelleyi* (Waterston, 1926)**

Material examined. RUSSIA. Novosibirsk Province: 1 female, Novosibirsk, 4. VIII.2017 (K. Samartsev leg.).

Hosts. Parasitoid of aphids from the genera *Eriosoma*, *Mindarus* and *Schizoneurella*.

Distribution. Russia: WS (*NS), FE (PR). – Europe (WE, NE, SE, EE), Caucasus, Iran, India.

Genus *Praon* Haliday, 1833

Type species: *Bracon exoletum* Nees, 1811.

***Praon barbatum* Mackauer, 1967**

Material examined. RUSSIA. St Petersburg: 1 female, Pushkin, reared from *Acyrtosiphon pisum* Harris, 1776 on *Melilotus officinalis* (Fabaceae), 8.VIII.2019; 1 female, ibid, 16.VIII.2019; 1 female, ibid, 18.VIII.2019; 1 female, 2 males, reared from *A. pisum* on *Medicago sativa* (Fabaceae), 17.VIII.2019; 1 female, ibid, 23.VIII.2019 (all E. Davidian leg.).

Hosts. Parasitoid of aphids from the genus *Acyrtosiphon*.

Distribution. Russia: EP (NW, NC). – Europe (WE, NE, SE, EE), N Africa, Lebanon, Iran, Afghanistan, Central Asia, China, Japan, N America (introduced), Australia (introduced).

***Praon dorsale* (Haliday, 1833)**

Material examined. RUSSIA. Novosibirsk Province: 1 female, Novosibirsk, 4.VIII.2017 (K. Samartsev leg.).

Hosts. Parasitoid of aphids from the family Aphididae (Aphidinae).

Distribution. Russia: EP (N, NW, C, NC), UR, WS (*NS, AL), FE (PR). – Europe (WE, NE, SE, EE), N Africa, Caucasus, Turkey, Iraq, Central Asia, Kazakhstan, China (SE), Korean Peninsula, Japan, N America, India.

***Praon exoletum* (Nees, 1811)**

Material examined. RUSSIA. St Petersburg: 1 female, reared from *Therioaphis tenera* (Aizenberg, 1956) on *Caragana arborescens* (Fabaceae), 21.VIII.2019; 2 females, ibid, 25.VIII.2019 (E. Davidian leg.).

Hosts. Parasitoid of aphids from the genera *Acyrtosiphon*, *Aphis*, *Eriosoma*, *Hyalopterus*, *Macrosiphum*, *Megoura*, *Metopolophium*, *Myzus* and *Therioaphis*.

Distribution. Russia: EP (N, NW, C, NC), UR, WS (NS), ES (IR), FE (PR). – Europe (WE, NE, SE, EE), N Africa, Turkey, Iraq, Israel, Iran, Central Asia, Kazakhstan, N America (introduced), Australia (introduced).

Remarks. Was reared from **Therioaphis tenera* (Aizenberg, 1956) on *Melilotus officinalis* for the first time.

***Praon volucre* (Haliday, 1833)**

Material examined. RUSSIA. St Petersburg: 1 female, reared from **Eucallipterus tiliae* Linnaeus, 1758 on *Tilia* sp. (Tiliaceae), 6.VII.2019; 1 female, reared from *Phorodon humuli* (Schrank) on *Humulus lupulus* (Cannabaceae), 1.IX.2019 (E. Davidian leg.).

Hosts. Parasitoid of aphids from the family Aphididae (Aphidinae, Calaphidinae and Lachninae).

Distribution. Russia: **EP** (N, NW, C, E, NC, CR), **UR**, **WS** (NS, KM, AL), **ES** (IR, ZB), **FE** (PR). – Europe (WE, NE, SE, EE), N Africa, Caucasus, Turkey, Iraq, Lebanon, Israel, Iran, Pakistan, Central Asia, Kazakhstan, Mongolia, China, Korean Peninsula, Japan (Hok, Kyu), N America, India, Afrotropics (introduced), S America (introduced), Australia (introduced).

Remarks. Reared from **Eucallipterus tiliae* Linnaeus, 1758 for the first time.

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