

Some new records of aphid species from Georgia, Germany, Iran and the Netherlands and new aphid-plant interactions

(Hemiptera, Aphididae)

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Nine aphid species are recorded for the first time from the following countries in the Palearctic region: four species from Iran, three species from Georgia and one species each from Germany and the Netherlands. Information on biology and geographical distribution for each species is also provided. Besides, three host plant species and one new host plant genus are recorded for four of the aphid species for the first time.

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Introduction

More than 5500 valid species of Aphidomorpha have been described worldwide (Favret 2017). Aphids are a predominantly northern temperate group and more than 75 % of the species are known from the Palaearctic region (Holman 2009). About one third of these species are known from Europe (Coeur d'acier et al. 2010). More than 320 species of aphids are recorded from Georgia (Barjadze et al. 2010, Özdemir & Barjadze 2015), 733 species – from Germany (Thieme & Eggers-Schumacher 2003), more than 480 species – from Iran (Rezwani 2010) and 550 species – from the Netherlands (Heie 1994). Here, we report new records of nine aphid species from Georgia, Germany,

Iran and the Netherlands, based on an investigation of aphid slides deposited at Hayk Mirzayans Insect Museum of Iranian Research Institute of Plant Protection, Tehran, Iran; at the Institute of Zoology, Ilia State University, Tbilisi, Georgia, at the Zoologische Staatssammlung München, Germany and at the Natural History Museum in London (BMNH), UK. From the new recorded species four species are new for Iran, three species for Georgia and one species each for Germany and the Netherlands. Information on biology and geographical distribution for each species is also provided. Three host plant species and one new host plant genus are recorded for four aphid species for the first time.

List of aphids and new aphid-plant interactions

Aphidura pakistanensis Nieto Nafría, Mier Durante & Remaudière, 2013 (Aphidinae, Macrosiphini)

Material examined. Four apterous viviparous females, on *Dianthus* sp. (Caryophyllaceae), Iran, Mazandaran Province, Amol, Kamarbon (36°13'1.13" N, 52°17'31.48" E), altitude 2097 m, 03.VIII.1991, leg. A. Rezvani.

Biology. It lives on *Dianthus* sp. (Caryophyllaceae) (Nieto Nafría et al. 2013). Life cycle is unknown.

Distribution. This species was known from Pakistan (Nieto Nafría et al. 2013). New record for Iran.

Aphidura togaica Kadyrbekov, 2013 (Aphidinae, Macrosiphini)

Material examined. Ten apterous viviparous females, on *Gypsophila polyclada* Fenzl ex Boiss. (Caryophyllaceae), Iran, Western Azerbaijan Province, Ghasemlu valley (37°20'59.12" N, 45°09'11.86" E), altitude 1338 m, 16.VI.1987, leg. A. Zargani.

Biology. It lives on *Gypsophila perfoliata* L. (Caryophyllaceae) (Kadyrbekov 2013). Life cycle is unknown.

Distribution. This species was known from Kazakhstan (Kadyrbekov 2013). New record for Iran. New host plant species for this aphid.

Aphis (Aphis) brotericola Mier Durante, 1978 (Aphidinae, Aphidini)

Material examined. Two apterous viviparous females, on *Euphorbia* sp. (Euphorbiaceae), Iran, Western Azerbaijan Province, Ghasemlu valley (37°20'59.12" N, 45°09'11.86" E), altitude 1338 m, 25.VI.1988, leg. Zargani; two apterous viviparous females and one oviparous female, on *Euphorbia macroclada* Boiss. (Euphorbiaceae), Iran, Lorestan Province, Borujerd (33°53'39.11" N, 48°46'01.30" E), altitude 1564 m, 25.X.1998, leg. A. Pirhadi.

Biology. Its colonies live on leaves of *Euphorbia* spp. (Euphorbiaceae) (Blackman & Eastop 2017). It is a monoecious holocyclic species with alate males (García Prieto et al. 2001).

Distribution. This species is distributed in Andorra, Bulgaria, France, Greece, Italy, Morocco, Spain and Turkey (Holman 2009, Blackman & Eastop 2017). New record for Iran. *Euphorbia macroclada* is a new host plant species for this aphid.

Aphis (Aphis) droserae Takahashi, 1921 (Aphidinae, Aphidini)

Material examined. Three apterous viviparous females, *Drosera rotundifolia* L. (Droseraceae), Germany, Bavaria, Fichtelsee (50°00'54.07" N, 11°51'27.68" E), altitude 758 m, 05.IX.1964, leg. K. Heinze.

Biology. It lives on flowers and underside of leaves of *Drosera* spp. (Droseraceae) (Blackman & Eastop 2017). Life cycle is unknown.

Distribution. This species was recorded from Taiwan (Tao 1991). New record for Western Palaearctic. New host plant species for this aphid.

Aphis (Aphis) esulae (Börner, 1940) (Aphidinae, Aphidini)

Material examined. Five apterous viviparous females, *Euphorbia esula* L. (Euphorbiaceae), the Netherlands, North Brabant Province, Lith (51°48'12.77" N, 5°26'07.06" E), altitude 4 m, 30.VI.1930, leg. D. Hille Ris Lambers.

Biology. Its colonies live on stems and inflorescences of *Euphorbia* spp. (Euphorbiaceae) (Blackman & Eastop 2017). Life cycle is unknown.

Distribution. This species is distributed in Austria, Bulgaria, Czech Republic, Denmark, Hungary, Italy, Kazakhstan, Latvia, Moldavia, Poland, Romania, Russia-European part, central zone, Russia-West Siberia, Slovakia, Slovenia, Spain, UK and Ukraine-Crimea (Holman 2009, Blackman & Eastop 2017). New record for the Netherlands.

Aphis (Aphis) rostella (Zhang, Chen, Zhong & Li, 1999) (Aphidinae, Aphidini)

Material examined. Five apterous viviparous females, on *Malva* sp. (Malvaceae), Georgia, Shida Kartli Region, Doesi (41°56'16.29" N, 44°14'33.81" E), altitude 569 m, 28.V.2015, leg. S. Barjadze.

Biology. It lives on underside of leaves of *Malva* spp. and *Lavatera* sp. (Malvaceae) (Zhang et al. 1999, Stekolshchikov & Novgorodova 2013). Life cycle is unknown.

Distribution. This species was recorded from China-Xinjiang and Russia-Western Siberia (Zhang et al. 1999, Stekolshchikov & Novgorodova 2013). New record for Georgia.

***Aphis (Toxopterina) vandergooti* (Börner, 1933)**
(Aphidinae, Aphidini)

Material examined. Two apterous viviparous females, on the root collar of *Achillea millefolium* L. (Asteraceae), Georgia, Racha and Kvemo Svaneti Region, Shkmeri-Kharistvali (42°29'42.45"N, 43°25'11.84"E), altitude 1742 m, 21.VIII.2014, leg. S. Barjadze.

Biology. It is a monoecious and holocyclic species and lives in the ant shelters on roots, stolons and basal leaf petioles of tribe Anthemideae (Asteraceae) (Holman 2009, Blackman & Eastop 2017).

Distribution. This species is distributed from Europe to China (Blackman & Eastop 2017). New record for Georgia.

***Hydaphias molluginis* Börner, 1939**
(Aphidinae, Macrosiphini)

Material examined. Two apterous and four alate viviparous females, on shoots and flower stems of *Galium verum* L. (Rubiaceae), Georgia, Kakheti Region, Sagarejo (41°43'26.71"N, 45°20'00.20"E), altitude 695 m, 27.V.2015, leg. S. Barjadze.

Biology. It is a monoecious and holocyclic species and its colonies live close to ground, on shoots and flower stems of *Asperula cynanchica* L. and *Galium* spp. (Rubiaceae) (Holman 2009, Blackman & Eastop 2017).

Distribution. This species is distributed from Europe to China (Blackman & Eastop 2017). New record for Georgia.

***Uroleucon acroptilidis* Kadyrbekov,
Renxin & Shao, 2002**
(Aphidinae, Macrosiphini)

Material examined. Three apterous viviparous females, on *Acroptilon repens* (L.) DC. (Asteraceae), Iran, Western Azarbaijan Province, Urmia (37°34'48.73"N, 45°02'35.89"E), altitude 1406 m, 14.V.1986, leg. A. Rezwani; six apterous viviparous females, on *Acroptilon repens* (L.) DC. (Asteraceae), Iran, Tehran Province, Tehran-Evin (35°47'42.55"N, 51°23'29.28"E), altitude 1649 m, 12.VI.1990, leg. A. Rezwani.

Biology. It lives on stems of *Rhaponticum* (= *Acroptilon*) spp. (Asteraceae) (Kadyrbekov et al. 2002, Kadyrbekov 2004, 2005, 2013). Life cycle is unknown.

Distribution. This species is distributed in Kazakhstan, Uzbekistan and China (Kadyrbekov et al. 2002, Kadyrbekov, 2004, 2005, 2013). New record for Iran.

Besides, *Eremogone rigida* (M. Bieb.) Fenzl (= *Arenaria holostea*), a new host plant genus for *Aphidura amphorosiphon* Nieto Nafría, Mier Durante & Remaudière, 2013, is recorded from Iran, Qazvin Province, Ghoushchi (36°40'1.10"N, 49°19'12.99"E), altitude 570 m, 11.VI.1987, leg. A. Zargani.

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References

- Barjadze, S., Japoshvili, G. & Bakhtadze, N. 2010. New records for the Georgian aphid fauna (Hemiptera, Aphididae). Zoology in the Middle East 50: 140–141.
- Blackman, R. L. & Eastop, V. F. 2017. Aphids of the world's plants: an online identification and information guide. World Wide Web electronic publication. <http://www.aphidsonworldsplants.info> [accessed 24-June-2017]
- Coeur d'acier, A., Pérez Hidalgo, N. & Petrović-Obrađović, O. 2010. Aphids (Hemiptera, Aphididae). Chapter 9.2. In: Roques, A. et al. (eds). Alien terrestrial arthropods of Europe. BioRisk 4: 435–474. doi: 10.3897/biorisk.4.57
- Favret, C. 2017. Aphid species file. Version 5.0/5.0. World Wide Web electronic publication. <http://aphid.speciesfile.org> [accessed 28-May-2017]
- García Prieto, F., Mier Durante, M. P. & Leclant, F. 2001. Variabilidad, nuevas formas y ciclo vital de *Aphis (A.) brotericola* (Hemiptera, Aphididae). Revue Française d'Entomologie (N.S.) 23: 153–160.
- Heie, O. 1994. Why are there so few aphid species in the temperate areas of the southern hemisphere? European Journal of Entomology 91: 127–133.
- Holman, J. 2009. Host plant catalog of aphids. Palaeartic region. 1140 pp., Branisovska.
- Kadyrbekov, R. K. 2004. On the aphid fauna (Homoptera, Aphidinea) of Tarbagatal range. Selevinia 13: 48–55. [in Russian]
- 2005. Survey of aphids of the Kazakhstan part of West Tien-Shan. News of the Academy of Sciences of Kazakhstan. Biological and Medical Series 2: 37–45. [in Russian]
- 2013. Materials on systematics of the genus *Aphidura* Hille Ris Lambers, 1956 (Homoptera, Aphididae). Entomological Review 93: 354–369.

- , Renxin, H. & Shao, H. 2002. To aphid fauna (Homoptera, Aphididae) of Xinjiang-Uygur Region of China. *Tethys Entomological Research* 6: 13–32.
- Nieto Nafria, J. M., Mier Durante, M. P. & Remaudiere, G. 2013. The genus *Aphidura* (Hemiptera, Aphidiidae) in the collection of the Muséum national d'Histoire naturelle of Paris, with six new species. *ZooKeys* 318: 1–33. doi: 10.3897/zookeys.318.5693
- Özdemir, I. & Barjadze, S. 2015. Some new records of aphid species (Hemiptera: Aphididae) from the Middle East and Caucasus. *Turkish Journal of Zoology* 39: 712–714.
- Rezwani, A. 2010. Aphids (Hemiptera: Aphidoidea) of herbaceous plants in Iran. 557 pp., Tehran (Entomological Society of Iran).
- Stekolshchikov, A. V. & Novgorodova, T. A. 2013. New additions to the aphid fauna (Homoptera: Aphidinae) of Western Siberia. *Zoosystematica Rossica* 22: 63–68.
- Tao, C. C. 1991. List of Aphidoidea of China. Special Publishing of Taiwan Agricultural Research Institute 77: 1–144.
- Thieme, T. & Eggers-Schumacher, H. A. 2003. Verzeichnis der Blattläuse (Aphidina) Deutschlands. Pp. 167–193 in: Klausnitzer, B. (ed.). *Entomofauna Germanica*, 6. Entomologische Nachrichten und Berichte 8.
- Zhang, G., Chen, X., Zhong, T. & Li, J. 1999. Aphididae. Pp. 273–508 in: Zhang, G. (ed.). Fauna of agricultural and forestry aphids of northwest China: Insecta, Homoptera, Aphidinea. Beijing (Environmental Science Press). [in Chinese]