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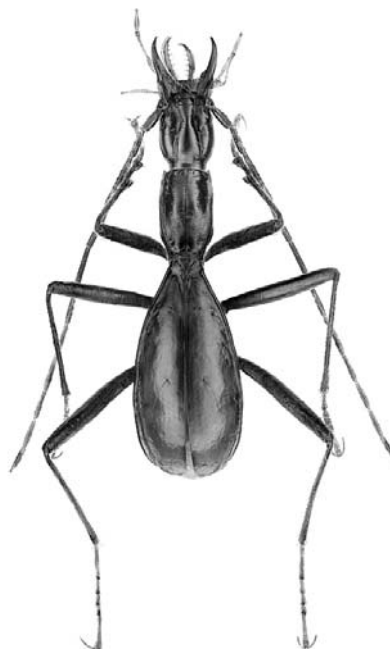


# Кавказский Энтомологический Бюллетень

CAUCASIAN ENTOMOLOGICAL BULLETIN

Том 6. Вып. 1

Vol. 6. No. 1



Ростов-на-Дону  
2010

## Aphids (Hemiptera: Aphidoidea) of the Ajameti reserve (Georgia) Тли (Hemiptera: Aphidoidea) из Аджаметского заповедника Грузии

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**Key words:** Aphids, new records, tritrophic relationships, Ajameti reserve, Georgia.

**Ключевые слова:** тли, новые находки, тритропические взаимосвязи, Аджаметский заповедник, Грузия.

**Abstract.** 43 aphid species, living on 39 host plants, were recorded from the Ajameti reserve (Georgia) in 2008. Two species (*Aphis rubiae* Narzikulov, 1964 and *A. violae* Schouteden, 1900) were recorded for the first time from Transcaucasia, while fourteen species were new records for Imereti Region. Fundatrices of *Macrosiphum symphyti* Barjadze et Chakvetadze, 2008 were found for the first time. Tritrophic relationships between aphids, their natural enemies and host plants were studied.

**Резюме.** 43 вида тлей, живущих на 39 видах кормовых растений, отмечены в Аджаметском заповеднике Грузии в 2008 году. 2 вида из них (*Aphis rubiae* Narzikulov, 1964 и *A. violae* Schouteden, 1900) впервые обнаружены в Закавказье, 14 видов зарегистрированы первый раз в Имеретинском районе Грузии. Впервые были найдены тли-основательницы вида *Macrosiphum symphyti* Barjadze et Chakvetadze, 2008. Изучены тритропические взаимосвязи между тлями, их естественными врагами и кормовыми растениями.

### Introduction

There were very poor data about aphids in the Colchic relict forest protected in the Ajameti reserve. Until our investigation only 10 species of aphids were registered on the above mentioned territory [Dzhibladze, 1960, 1965; Shavliashvili et al., 1980; Barjadze et al., 2008]. Tritrophic relationships between aphids, their natural enemies and host plants weren't investigated.

### Material and methods

Fundatrices, apterous and alate viviparous females were collected, cleared and individually mounted in Canada balsam on microscope slides using techniques as described by Martin [Martin, 1983]. Blackman and Eastop's monographs were used during aphids' identification process [Blackman, Eastop, 1994, 2006].

The aphid's specimens were studied under microscope and each character was measured by microscope ocular-micrometer.

Collection of aphid's natural enemies and mounting were performed by using widely used methods in Entomology [Kavallieratos et al., 2004; Schauff, 2005].

### Aphid species list

43 aphid species, living on 39 host plants in the different habitats, were recorded from the Ajameti reserve during our

investigation in 2008 (Table 1). The aphid species belong to 28 genera on the above mentioned territory. The maximum species number – 23 species belong to the subfamily Aphidinae, 11 species – to the subfamily Eriosomatinae, 5 species are united in the subfamily Calaphidinae, 2 species – in the subfamily Chaitophorinae, while the subfamilies Anoeciinae and Lachninae are represented by one species (Diagram 1). Genus *Aphis* is represented by 11 species, 2 species are united in the following genera: *Dysaphis*, *Eriosoma*, *Macrosiphum* and *Tetraneura*, while the minimum species number – 1 species was united in the other genera (Diagram 2). 2 species – *Aphis rubiae* Narzikulov, 1964 and *A. violae* Schouteden, 1900 were recorded for the first time from Transcaucasia, while 14 species were new record for Imereti Region. Fundatrices of *Macrosiphum symphyti* Barjadze et Chakvetadze, 2008 were found for the first time for Science.

**Remarks.** In the Table 1 newly recorded species for Transcaucasia are indicated by one asterisk and new records for Imereti Region by two.

### Tritrophic relationships between aphids, their natural enemies and host plants

Natural enemies were found only for 20 species of the aphids. 6 species of the parasitic wasps (Hymenoptera: Braconidae: Aphidiinae), associated with aphids, were recorded from the Ajameti reserve. Aphidophagous predators belong to 6 species, from which 5 species are ladybirds (Coleoptera: Coccinellidae) and 1 species is howerflies (Diptera: Syrphidae). Tritrophic relationships between aphids, their natural enemies and host plants are given in Table 2.

### Conclusions

1. 43 aphid species were recorded from the Ajameti reserve, which are united in 6 subfamilies and 28 genera, from which 33 species were new record for this reserve.

2. *Aphis rubiae* Narzikulov, 1964 and *A. violae* Schouteden, 1900 were recorded for the first time from Transcaucasia, while 14 species were new records for Imereti Region.

3. Fundatrices of new species – *Macrosiphum symphyti* Barjadze et Chakvetadze, 2008 – were found for the first time for Science.

4. It was given tritrophic relationships between aphids, their natural enemies and host plants.

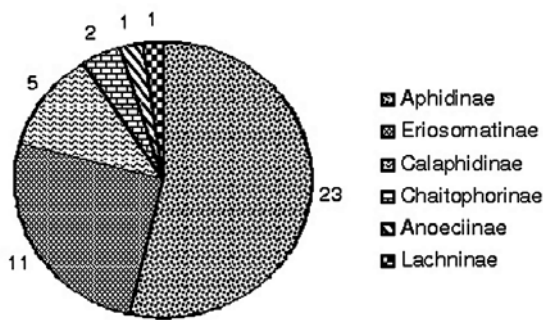


Fig. 1. The aphid subfamilies in the Ajameti Reserve.

Рис. 1. Подсемейства тлей Аджаметского заповедника.

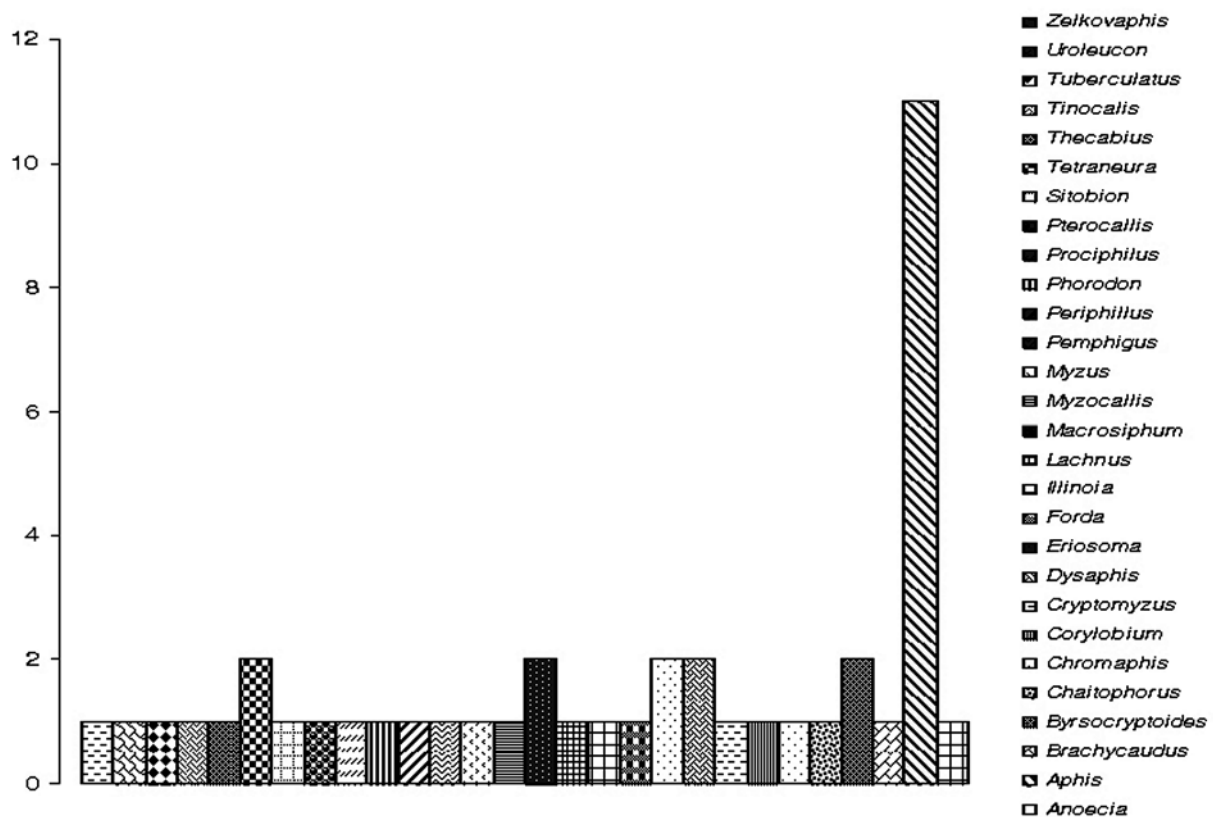


Fig. 2. The aphid genera in the Ajameti Reserve.

Рис. 2. Родовой состав тлей Аджаметского заповедника.

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Table 1. Aphids of the Ajameti reserve and their host plants.

Таблица 1. Тли Аджаметского заповедника и их кормовые растения.

№	Aphid species	Host plants	Coordinates
1	<i>Anoecia corni</i> (Fabricius, 1775)	Swida sp.	42°8'12.6708"N / 42°50'40.9308"E
2	<i>Aphis fabae mordvilkoii</i> Börner et Janich, 1922	Rumex conglomeratus	42°8'12.6708"N / 42°50'40.9308"E
3	<i>A. gossypii</i> Glover, 1877	Gleditsia sp.	42°8'50.532"N / 42°46'1.2828"E
4	<i>A. hederae</i> Kaltenbach, 1843	Hedera helix	42°9'24.4296"N / 42°49'19.6284"E
5	<i>A. pomi</i> de Geer, 1773	Malus orientalis	42°7'31.188"N / 42°51'39.3156"E
6	<i>A. rubiae</i> Narzikulov, 1964*	Rubia tinctorum	42°8'12.6708"N / 42°50'40.9308"E
7	<i>A. ruborum</i> (Börner, 1932)	Rubus sp.	42°6'0.8388"N / 42°45'20.0124"E
8	<i>A. sambuci</i> Linnaeus, 1758	Sambucus nigrum	42°6'0.8388"N / 42°45'20.0124"E
9	<i>A. sedi</i> Kaltenbach, 1843**	Sedum sp.	42°7'58.4328"N / 42°47'31.1928"E
10	<i>A. solanella</i> Theobald, 1914	Solanum nigrum	42°9'24.8112"N / 42°44'41.6544"E
11	<i>A. urticata</i> J.F. Gmelin, 1790	Urtica dioica	42°9'24.8112"N / 42°44'41.6544"E
12	<i>A. violae</i> Shouteden, 1900*	Viola arvensis	42°9'24.8112"N / 42°44'41.6544"E
13	<i>Brachycaudus cardui</i> (Linnaeus, 1758)	Cirsium sp., Senecio erraticus	42°8'12.6708"N / 42°50'40.9308"E
14	<i>Byrsocryptoides zerkovae</i> Dzhibladze, 1960	Zelkova carpinifolia	42°8'50.532"N / 42°46'1.2828"E 42°9'24.4296"N / 42°49'19.6284"E
15	<i>B. zerkovaeicola</i> Dzhibladze, 1965	Zelkova carpinifolia	42°8'50.532"N / 42°46'1.2828"E 42°9'24.4296"N / 42°49'19.6284"E
16	<i>Chaitophorus vitellinae</i> (Schrank, 1801)**	Salix alba	42°8'12.6708"N / 42°50'40.9308"E
17	<i>Chromaphis juglandicola</i> (Kaltenbach, 1843)**	Juglans regia	42°7'17.6124"N / 42°45'26.8884"E
18	<i>Corylobium avelanae</i> (Schrank, 1801)**	Corylus avellana	42°9'24.8112"N / 42°44'41.6544"E
19	<i>Cryptomyzus galeopsidis</i> (Kaltenbach, 1843)**	Lamium album	42°8'12.6708"N / 42°50'40.9308"E
20	<i>Dysaphis reaumuri</i> (Mordvilko, 1928)**	Pyrus sp.	42°7'24.1644"N / 42°52'18.7104"E
21	<i>D. sorbi</i> (Kaltenbach, 1843) ? **	host plant unknown	42°7'24.1644"N / 42°52'18.7104"E
22	<i>Eriosoma lanigerum</i> (Hausmann, 1802)**	Malus orientalis	42°7'17.6124"N / 42°45'26.8884"E
23	<i>E. ulmi</i> (Linnaeus, 1758)	Ulmus suberosa	42°7'17.6124"N / 42°45'26.8884"E
24	<i>Forda marginata</i> Koch, 1857	Bromus japonicus	42°9'24.8112"N / 42°44'41.6544"E
25	<i>Illinoia dzhibladzeae</i> (Shaposhnikov, 1964)	Rhododendron luteum	42°9'24.8112"N / 42°44'41.6544"E
26	<i>Lachnus roboris</i> (Linnaeus, 1758)	Quercus imeretina	42°7'14.0232"N / 42°48'45.3348"E
27	<i>Macrosiphum rosae</i> (Linnaeus, 1758)	Rosa sp.	42°6'0.8388"N / 42°45'20.0124"E
28	<i>M. symphyti</i> Barjadze et Chakvetadze, 2008	Symphytum grandiflorum	42°8'50.532"N / 42°46'1.2828"E
29	<i>Myzocallis carpini</i> (Koch, 1855)	Carpinus betulus	42°9'24.8112"N / 42°44'41.6544"E
30	<i>Myzus persicae</i> (Sulzer, 1776)	Convolvulus arvensis	42°8'50.532"N / 42°46'1.2828"E
31	<i>Pemphigus protospyrae</i> Lichtenstein, 1884**	Populus sp., undetermined Apiaceae species	42°8'12.6708"N / 42°50'40.9308"E
32	<i>Periphilus aceris</i> (Linnaeus, 1761)**	Acer sp.	42°9'24.4296"N / 42°49'19.6284"E
33	<i>Phorodon humuli</i> (Schrank, 1801)	Humulus lupulus	42°8'50.532"N / 42°46'1.2828"E
34	<i>Prociphilus fraxini</i> (Fabricius, 1777)**	Fraxinus excelsior	42°7'46.7832"N / 42°45'0.252"E
35	<i>Pterocallis alni</i> (de Geer, 1773)**	Alnus barbata	42°8'12.6708"N / 42°50'40.9308"E
36	<i>Sitobion avenae</i> (Fabricius, 1775)	Hordeum leporinum	42°8'12.6708"N / 42°50'40.9308"E
37	<i>Tetraneura ulmi</i> (Linnaeus, 1758)	Ulmus suberosa	42°6'21.7944"N / 42°46'5.6244"E
38	<i>T. caerulea</i> (Passerini, 1856)	Ulmus suberosa	42°6'21.7944"N / 42°46'5.6244"E
39	<i>Thecabius affinis</i> (Kaltenbach, 1843)**	Ranunculus sp.	42°8'14.9928"N / 42°46'56.4996"E
40	<i>Tinocalis zerkovae</i> Dzhibladze, 1957	Zelkova carpinifolia	42°8'50.532"N / 42°46'1.2828"E
41	<i>Tuberculatus annulatus</i> (Hartig, 1841)	Quercus imeretina	42°7'17.6124"N / 42°45'26.8884"E
42	<i>Uroleucon cichorii</i> (Koch, 1855)**	Cichorium intybus	42°6'0.8388"N / 42°45'20.0124"E
43	<i>Zelkovaphis caucasica</i> (Dzhibladze, 1960)	Zelkova carpinifolia	42°8'50.532"N / 42°46'1.2828"E 42°9'24.4296"N / 42°49'19.6284"E

Table 2. Tritrophic relationships in the Ajameti reserve.

Таблица 2. Тритрофические связи между тлями, их врагами и кормовыми растениями.

№	Aphid species	Natural enemies	Host plants
1	<i>Aphis fabae mordvilkoii</i> Börn. et Janich	<i>Propylea 14-punctata</i>	Rumex conglomeratus
2	<i>A. gossypii</i> Glov.	<i>Propylea 14-punctata</i>	Gleditsia sp.
3	<i>A. hederæ</i> Kalt.	<i>Lysiphlebus fabarum</i>	Hedera helix
4	<i>A. pomi</i> Geer	<i>Coccinella septempunctata</i>	Malus orientalis
5	<i>A. sambuci</i> L.	<i>Diaeretiella rapae</i>	Sambucus nigrum
6	<i>A. sedi</i> Kalt.	<i>Diaeretiella rapae</i>	Sedum sp.
7	<i>A. urticata</i> Gmel.	<i>Episyrphus balteatus</i> , <i>Lysiphlebus fabarum</i>	Urtica dioica
8	<i>Brachycaudus cardui</i> (L.)	<i>Coccinella septempunctata</i> , <i>Diaeretiella rapae</i>	Cirsium sp., Senecio erraticus
9	<i>Chaitophorus vitellinae</i> (Schr.)	<i>Episyrphus balteatus</i>	Salix alba
10	<i>Cryptomyzus galeopsidis</i> (Kalt.)	<i>Coccinella septempunctata</i>	Lamium album
11	<i>Forda marginata</i> Koch	<i>Subcoccinella 24-punctata</i>	Bromus japonicus
12	<i>Lachnus roboris</i> (L.)	<i>Adalia bipunctata</i>	Quercus imeretina
13	<i>Macrosiphum rosae</i> (L.)	<i>Aphidius rosae</i> , <i>Ephedrus plagiator</i>	Rosa sp.
14	<i>Myzus persicae</i> (Sulz.)	<i>Adalia bipunctata</i> , <i>Aphidius ervi</i> , <i>A. picipes</i>	Convolvulus arvensis
15	<i>Periphillus aceris</i> (L.)	<i>Exochomus flavipes</i>	Acer sp.
16	<i>Prociphilus fraxini</i> (F.)	<i>Coccinella septempunctata</i> , <i>Exochomus flavipes</i>	Fraxinus excelsior
17	<i>Pterocallis alni</i> (Geer)	<i>Episyrphus balteatus</i>	Alnus barbata
18	<i>T. caerulea</i> (Pass.)	<i>Subcoccinella 24-punctata</i>	Ulmus suberosa
19	<i>Uroleucon cichorii</i> (Koch)	<i>Exochomus flavipes</i>	Cichorium intybus
20	<i>Zelkovaphis caucasica</i> (Dzhibl.)	<i>Episyrphus balteatus</i>	Zelkova carpinifolia

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