

Height Mountain Species of Aphidiinae (Hymenoptera: Braconidae) from Bulgaria

Ognian Todorov

Regional Museum of Natural History – Plovdiv, 34 Hristo G. Danov Str., 4000 Plovdiv, Bulgaria; E-mail: ogi_lion@abv.bg

Abstract: Twenty-four species from nine genera of aphids were identified from five alpine Bulgarian mountains. They were collected with three different methods: pitfall traps, Moerike traps and entomological net. Four species are new records to the fauna of the Balkan Peninsula (*Pauesia silvestris*, *Pauesia similis*, *Trioxys lambersi*, *Trioxys mutilus*). Six species are new to the fauna of Bulgaria (*Aphidius colemani*, *Aphidius ribis*, *Pauesia silvestris*, *Pauesia similis*, *Trioxys lambersi*, *Trioxys mutilus*).

Key words: Aphidiinae, Braconidae, Hymenoptera, alpine mountain, Bulgaria

Introduction

Aphidiinae is a subfamily of Braconidae (Hymenoptera) with approximately 51 genera and 400 species (ASTAFUROVA 2007). They are exclusively solitary endoparasitoids of aphids. Several species are used successfully in biological control programs throughout the world (STARY 1970).

The aphidiids fauna in Bulgaria consists of 63 species from 21 genera (TODOROV 2008). The alpine mountain species from *Aphidiinae* subfamily are not well studied (TOMANOVIĆ *et al.* 2002, TOMANOVIĆ *et al.* 2004, TOMANOVIĆ *et al.* 2007).

For Bulgaria this is the first study of timberline fauna of *Aphidiinae* subfamily. Only one species (*Lysiphlebus dissolutus*) has been found previously in alpine areas – in Rila Mountain, Musala Peak, at 2300 m a.s.l. (STARY 1962).

Material and Methods

The aphidiids were collected between 1993–2009, from various localities of some alpine areas of the mountains Rila, Pirin, Stara Planina, Slavyanka and Belasitsa (Fig. 1), at elevations from 1460 to 2911 m.

The specimens were collected by three different methods: pitfall traps with 75% alcohol, Moerike traps and through standard collection using an entomological net. The methods used did not include host plants and host aphids identification.

The aphidiids were preserved in plastic test-tubes with 75% alcohol for identification. The identification was carried out only on the basis of females (MEDVEDEV 1986). The processed specimens and places of inhabitation are presented in alphabetical order. The specimens are deposited in the collection of the author.

Results and Discussion

From 89 specimens of subfamily *Aphidiinae* were identified 9 genera and 24 species. Six species (marked with * in the text) are new for Bulgarian fauna.

Seven species (*Aphidius absinthii*, *A. rhopalosiphi*, *A. uzbekistanicus*, *A. hortensis*, *Pauesia abietis*, *P. silvestris*, *P. similis*, *Lysiphlebus fabarum*) were collected with Pitfall trap, one (*Diaeretiella rapae*) with Moerike trap and rests of parasitoids were collected with entomological net.

The aphidiids found at Musala Peak at 2911 m are the highest found parasitoids of the sub-family of the Balkan Peninsula. Most species (12 species) are found in Rila Mt. (Table 1).

Faunistic list

Aphidius absinthii Marshall, 1896 - Rila Mt., Musala Hut, 12.06.2008, 2390 m, 2♀, (42°11'34.12"N; 23°35'27.94"E); Slavyanka Mt., Suhoto ezero range, 17.10.2006-09.06.2007, 2065 m, 1♀, (41°22'54.78"N; 23°36'10.39"E).

Aphidius aquilus Mackauer, 1961 - Rila Mt., Musala Hut, 12.06.2008, 2390 m, 2♀, (42°11'34.12"N; 23°35'27.94"E).

* *Aphidius colemani* Viereck, 1912 - the Rhodopes Mts., Snezhanka Peak, 26.05.2004, 1917 m, 7♀, (41°38'14.51"N; 24°40'39.61"E).

Aphidius ervi Haliday, 1834 - Belasitsa Mt., Radomir Peak, 26.05.2004, 2029 m, 7♀, (41°19'15.11"N; 23°07'14.62"E); Rila Mt., Musala Peak, 12.06.2008, 2911 m, 2♀, (42°10'44.00"N; 23°35'6.11"E), Zaslona Hut, 12.06.2008, 2700 m, 1♀, (42°11'6.15"N; 23°35'22.78"E).

Aphidius rhopalosiphii DeStefani-Peres, 1962 - Belasitsa Mt., Kongura Peak, 26.05.2004, 1980 m, 1♀, (41°19'18.79"N; 23°10'29.14"E); Stara Planina Mts., Mazalat Peak, 17.05.2009, 2096 m, 1♀, (42°43'20.34"N; 25° 5'24.56"E); Slavyanka Mt, Shabran Peak, 29.08 -18.10.2007, 2000 m, 1♀, (41°22'50.93"N; 23°35'44.22"E); Pirin Mt., Orlek Peak, 08.06.2006-02.07.2007, 2270 m, 1♀, (41°34'12.60" N; 23°36'45.00" E).

Aphidius hortensis Marshall, 1896 - Rila Mt., Musala Peak, 12.06.2008, 2911 m, 1♀, (42°10'44.00"N; 23°35'6.11"E); Slavyanka Mt., near Gotse vrah Peak, 17.10.2006-09.06.2007, 2065 m, 1♀, (41°22'50.88"N; 23°37'9.60"E).

Aphidius matricariae Haliday, 1834 - Rila Mt., Musala Peak, 12.06.2008, 2911 m, 1♀, (42°10'44.00"N; 23°35'6.11"E).

Aphidius picipes (Nees, 1811)-Pirin Mt., Vihren Peak, 07.09.2006, 2659 m, 2♀, (41°45'50.29"N; 23°24'7.38"E); Rhodope Mts., Perelik Hut, 19.07.2001, 2000 m, 1♀, (41°36'10.75"N; 24°35'26.66"E).

* *Aphidius ribis* Haliday, 1834 - Belasitsa Mt., Kongura Peak, 26.05.2004, 1980 m, 1♀, (41°19'18.79"N; 23°10'29.14"E).

Aphidius uzbekistanicus Luzhetski, 1960 - Rila Mt., Musala Hut, 12.06.2008, 2390 m, 2♀,

(42°11'34.12"N; 23°35'27.94"E); Zaslona Hut, 12.06.2008, 2700 m, 2♀, 12 ♂, (42°11'6.15"N; 23°35'22.78"E); Slavyanka Mt., Livade range, 17.10.2006-09.06.2007, 1720 m, 1♀, (41°23'17.05"N; 23°36'27.93"E).

Binodoxys acalephae Marshall, 1896 - Rila Mt., Musala Hut, 12.06.2008, 2390 m, 2♀, (42°11'34.12"N; 23°35'27.94"E); Yastrebets range, 12.06.2008, 2365 m, 1♀, (42°13'23.17"N; 23°34'46.43"E).

Diaeretiella rapae (M'Intosh, 1855) - Pirin Mt., Dzhamdzhievi skali, 19.10.2006-07.06.2007, 2270 m, 1♀, (41°45'58.22"N; 23°24'43.50"E).

Ephedrus cerasicola Starý, 1962 - Rila Mt., Zaslona Hut, 12.06.2008, 2700 m., 1♀, (42°11'6.15"N; 23°35'22.78"E).

Ephedrus minor Stelfox, 1941- Rila Mt., Zaslona Hut, 12.06.2008, 2700 m, 1♀ (42°11'6.15"N; 23°35'22.78"E); the Rhodopes Mts., Snezhanka Peak, 06.07.1993, 1917 m, 1♀, (41°38'14.51"N; 24°40'39.61"E); Golyam Perelik Peak, 23.07.2002, 2000 m, 1♀, (41°35'58.35"N; 24°34'28.51"E); Prespa Peak, 21.08.1993, 1987 m, 1♀, (41°42'31.21"N; 24°52'20.05"E).

Lysiphlebus fabarum (Marshall, 1896) - Slavyanka Mt., Shabran Peak, 29.08-18.10.2007, 2000 m, 1♀, (41°22'50.93"N; 23°35'44.22"E).

Monoctonus crepidis Haliday, 1834 - Rhodope Mts., Golyam Perelik Peak, 23.07.2002, 2000 m, 2♀, (41°35'58.35"N; 24°34'28.51"E).

Pauesia abietis (Marshall, 1896) - Pirin Mt., Kazana range, 19.10.2006- 07.06.2007, 2270 m, 1♀, (41°46'13.07"N; 23°24'36.00"E); Orlek Peak, 08.06.2006- 02.07.2007, 2270 m, 1♀, (41°34'12.60"N; 23°36'45.00"E).

Pauesia laricis Haliday, 1834 - Rila Mt., Yastrebets range, 12.06.2008, 2365 m, 2♀, (42°13'23.17"N; 23°34'46.43"E).

* *Pauesia silvestris* (Starý, 1960) - Pirin Mt., Orlek Peak, 08.06.2006- 02.07.2007, 2270 m, 1♀, (41°34'12.60"N; 23°36'45.00"E).

* *Pauesia similis* Starý, 1966 - Slavyanka Mt., Shabran Peak, 10.06-02.07.2007, 2000 m, 1♀, (41°22'50.93"N; 23°35'44.22"E).

Praonathenaeum Kavallieratos & Lykouressis 1999 - Rila Mt., Musala Peak, 12.06.2008, 2911 m, 1♀, (42°10'44.00"N; 23°35'6.11"E).

Trioxys pallidus Haliday, 1833 - Belasitsa Mt., Kongura Peak, 26.05.2004, 1980 m, 1♀,

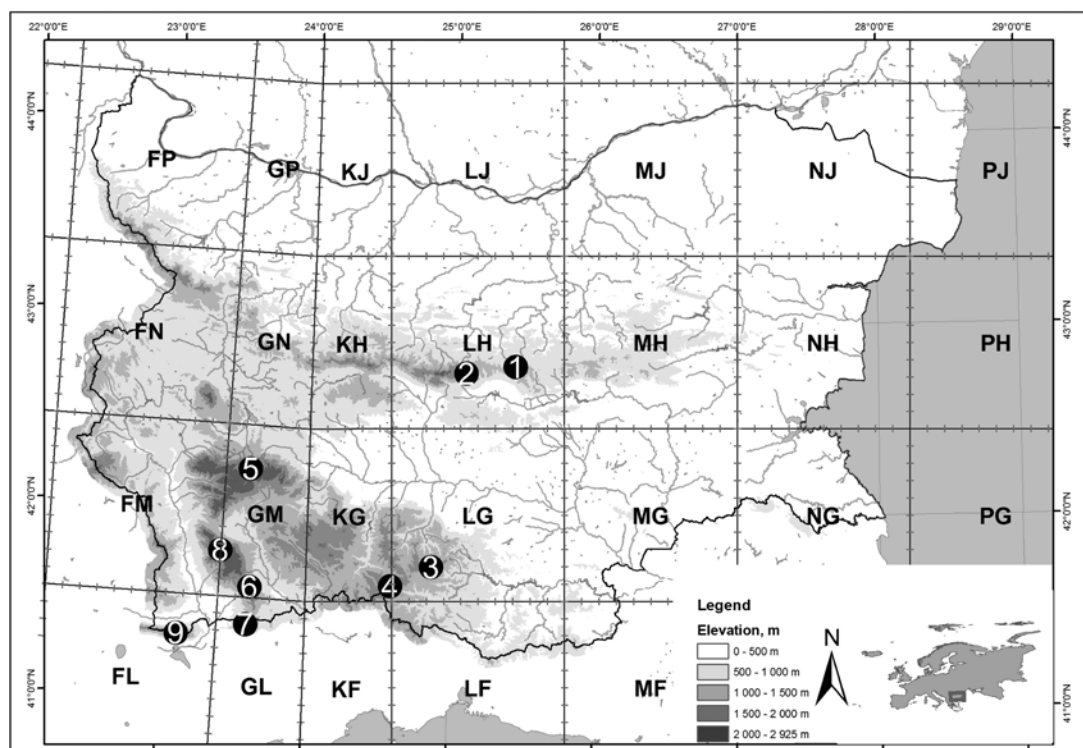


Fig. 1. Locations of *Aphidiine* from high elevations of Bulgaria.

Table. 1. Species of *Aphidiinae* from the alpine mountains.

| Locations from Fig. 1 | Locality | Species |
|-----------------------|---|---|
| 1 | Stara Planina Mts. (Bedek Peak) | <i>Trioxys lambersi</i> |
| 2 | Stara Planina Mts. (Mazalat Peak) | <i>Aphidius rhopalosiphi</i> |
| 3 | Rhodope Mts. (Prespa Peak) | <i>Ephedrus minor</i> |
| 4 | Rhodope Mts. (Golyam Perelik Peak, Snezhanka Peak) | <i>Aphidius colemani</i> , <i>Aphidius picipes</i> , <i>Ephedrus minor</i> , <i>Monoctonus crepidis</i> , <i>Trioxys mutilus</i> |
| 5 | Rila Mt. (Musala Hut, Yastrebets range, Zaslona Hut, Musala Peak) | <i>Aphidius aquilus</i> , <i>A. ervi</i> , <i>A. absinthii</i> , <i>A. hortensis</i> , <i>A. matricariae</i> , <i>A. uzbekistanicus</i> , <i>Binodoxys acalephae</i> , <i>Ephedrus cerasicola</i> , <i>E. minor</i> , <i>Pauesia laricis</i> , <i>Praon athenaeum</i> , <i>Trioxys pallidus</i> |
| 6 | Pirin Mt. (Orlek Peak) | <i>Pauesia abietis</i> , <i>Aphidius rhopalosiphi</i> , <i>Pauesia silvestris</i> |
| 7 | Slavyanka Mt. (Shabran Peak) | <i>Aphidius absinthii</i> , <i>Aphidius rhopalosiphi</i> , <i>Aphidius hortensis</i> , <i>Aphidius uzbekistanicus</i> , <i>Lysiphlebus fabarum</i> |
| 8 | Pirin Mt. (Dzhamdzhievi skali range, Kazana range, Vihren Peak) | <i>Aphidius picipes</i> , <i>Aphidius equiseticola</i> , <i>Diaeretiella rapae</i> , <i>Pauesia abietis</i> |
| 9 | Belasitsa Mt. (Radomir Peak, Kongura Peak) | <i>Aphidius ribis</i> , <i>Aphidius ervi</i> , <i>Aphidius rhopalosiphi</i> , <i>Trioxys pallidus</i> |

(41°19'18.79"N; 23°10'29.14"E); Rila Mt., Musala Peak, 12.06.2008, 2911 m, 1♀, (42°10'44.00"N; 23°35'6.11"E); Zaslona Hut, 12.06.2008, 2700 m, 1♀, (42°11'6.15"N; 23°35'22.78"E).

* *Trioxys lambersi* Mackauer, 1960 - Stara

Planina Mts., Bedek Peak, 17.05.2009, 1463 m, 1♀, (42°45'40.73"N; 25°26'4.42"E).

* *Trioxys mutilus* Mackauer, 1961 - Rhodope Mts., Golyam Perelik Peak, 23.07.2002, 2000 m, 2♀, (41°35'58.35"N, 24°34'28.51"E).

Although they found new species poor knowledge on the area and condition of the family is to be found many new species in conducting further research.

References

- ASTAFUROVA V., S. BELOKOBILSKII, E. DAVIDIAN, D. KASPARIAN, A. KOTENKO, N. KUZENKO, V. KUSLICKII, A. LELEI, A. MANUKIAN, P. NEMKOV, J. PESENKO, M. PROSTALKIN, V. RADCHENKO, A. SINOHARA, V. TOBIAS, V. TOLKANITS, S. TRIAPITSIN, A. REGER, V. FURSOV, A. HALAIM and A. HUMALA 2007. Key to the insects of Russian Far East. Neuropteroidea, Mecoptera, Hymenoptera. – *Vladivostok, Dal'nauka*, **IV** (5): 192-202.
- MEDVEDEV G. S. 1986. Determinant for insects of European part USSR, part 2 Hymenoptera, Section 5. – Publishing house 'Nauka', 232-283.
- STARY P. 1962. Faunistic notes on the Aphidiidae of Bulgaria. – *Acta Faunistica Entomologica, Museum Nationalis Prage*, **71**: 83-86.
- STARY P. 1970. Biology of aphid parasites (Hymenoptera: Aphidiidae) with respect to integrated control. – *Series entomologica*, **6**: 643 p.
- TODOROV O. 2008. New records of Aphidiidae species from Bulgaria (Hymenoptera, Aphidiidae). – *Entomofauna*, **29** (15): 209-212.
- TOMANOVIĆ Ž., P. STARY and O. PETROVIĆ 2002. *Monoctonus leclanti* sp. n. (Hymenoptera: Braconidae: Aphidiinae) from highmontane areas of the Southeastern Europe and key to related species. – *Entomologica Fennica*, **13**: 159-162.
- TOMANOVIĆ Ž., N. G. KAVALLIERATOS, C. G. ATHANASSIOU, O. PETROVIĆ and L.J. STANISAVLJEVIĆ 2004. A new Aphidius species (Hymenoptera: Braconidae: Aphidiinae) from highmontane areas of southeastern Europe. – *Phitoparasitica*, **32** (3): 221-225.
- TOMANOVIĆ Ž., N. G. KAVALLIERATOS, P. STARY, V. ŽIKIĆ, V. TOMIĆ and L. LUČIĆ 2007. Re-description of two species of Aphidiinae (Hymenoptera: Braconidae) from high mountain areas of southeastern Europe, with biological and biogeographical notes on co-occurring guild members. – *Entomologica Fennica*, **18** (1): 36-45.