

**IMPACT OF *CHOREBUS GEDANENSIS* (RATZ.)
(HYMENOPTERA: BRACONIDAE) ON *HEXOMYZA SCHINERI*
(GIR.) (DIPTERA: AGROMYZIDAE) AT LOW HOST POPULATION
DENSITY IN VITOSHA MOUNTAIN (BULGARIA)**

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Abstract

The parasitoids of *Hexomyza schineri* (Gir.) (Diptera: Agromyzidae) were studied in 2015 and 2016 in 3 localities (Tihyat kat, Dendrariuma and Zlatni mostove) in Vitosha Mt. (Bulgaria). Biological material (cuttings with galls containing *H. schineri* larvae) was collected in late winter or early spring on young twigs on *Populus tremula*. The population density of the host was very low – less than 0.01 larvae/m of twigs. As a result, only one parasitoid, *Chorebus gedanensis* (Ratz.) (Hymenoptera: Braconidae), was reared from host galls in laboratory conditions. The studied sites are new localities of *C. gedanensis* in Vitosha Mt. It was highly effective parasitizing between 40.0 and 100.0% (an average of 66.7%) of *H. schineri* larvae in different samples.

Key words: *Chorebus gedanensis*, *Hexomyza schineri*, *Populus tremula*, low density, impact, Vitosha Mt.

The poplar twiggall fly, *Hexomyza schineri* (Giraud, 1861) (Diptera: Agromyzidae) is Holarctic species (Shtakelberg, 1955; Eckberg, Cranshaw, 1995), trophically connected with poplars (*Populus* spp.) (Spencer, 1991). The larvae develop in one-sided smooth galls on the young twigs. In Bulgaria, the species was first observed near town of Svishtov (Georgiev, 1991) and later in other regions of the country – Sofia, Mezdra, Vitosha Mt., Plana Mt. and West Balkan Range (Georgiev, 2004).

In Bulgaria, three species were found and reported as parasitoids of *H. schineri*: *Eupelmus annulatus* Nees, 1834 (Hymenoptera: Eupelmidae), *Sphegigaster glabrata* Graham, 1969 (Hymenoptera: Pteromalidae) (Tsankov et al., 1991) and *Chorebus gedanensis* (Ratzeburg, 1852) (Hymenoptera: Braconidae) (Georgiev, 2004).

This note reports data about new findings of *C. gedanensis* and its impact on *H. schineri* at low population density of the host in Vitosha Mt. in Bulgaria.

The studies were conducted in 2015 and 2016. Biological materials (cuttings of approximate length 4-5 with galls containing *H. schineri* larvae) were collected in late winter or early spring on young aspen (*Populus tremula* L.) twigs in three localities - Tihyat kat, Dendrariuma and Zlatnite mostove, in Vitosha Mt. (Table 1). The population density of *H. schineri* was very low (less than 0.01 galls/m of twigs) and only 27 galls with host larvae were collected and examined during the entire study period. After collection, the galls were carried in a laboratory. They were reared individually in test tubes covered with cotton stoppers at room temperature (18-22°C). The samples were observed daily

Table 1. Main characteristics of study areas and biological materials

Location	Coordinates	Altitude, m a.s.l.	Date of sample collections	Studied host larvae, N	Reared parasitoids		Parasitism, %
					number	date	
Tihiat kat	42°38'21.2"N, 23°13'09.5"E	1055	19.04.2015	8	3♂♂, 2♀♀	14-25.05.2015	62.5
Dendrariuma	42°37'40.9"N, 23°13'45.9"E	1206	19.04.2015	6	4♂♂, 1♀♀	18-28.05.2015	83.3
Tihiat kat	42°38'21.2"N, 23°13'09.5"E	1055	23.02.2016	5	1♂, 1♀	20.04.-02.06.2016	40.0
Dendrariuma	42°37'40.9"N, 23°13'45.9"E	1206	23.02.2016	1	1♂	20.04.2016	100.0
Zlatni mostove	42°36'48.7"N, 23°14'16.5"E	1412	23.02.2016	7	2♂, 3♀♀	20-26.04.2016	71.4
Total				27	11♂♂, 7♀♀		66.7

for emergence of adult hosts or parasitoids. At the end of the observational period, the galls were opened and their contents analyzed in detail in order to establish some bioecological characteristics of the parasitoids. Emerged parasitoids were identified by the key of Tobias et al. (1986).

As a result, 11 males and 7 females specimens of *C. gedanensis* were reared from host galls (Table 1). No other parasitoid species were established in this study. Tihiat kat, Dendrariuma and Zlatnite mostove are new localities of *C. gedanensis* in Vitoshka Mt. In previous study, only one male specimen was found in outskirts of Zheleznitsa vill. (Georgiev, 2004). The mortality of *H. schineri* caused by *C. gedanensis* in different samples ranged between 40.0 and 100.0%, with an average of 66.7% (Table 1).

The cosmopolitan genus *Chorebus* Haliday, 1833 includes 460 valid species described mainly in northern hemisphere (Li, van Achterberg, 2017). *C. gedanensis* is distributed in Western Europe, Central Russia, Kazakhstan and Russian Far East (Tobias et al., 1986; Lelej, 2012).

In Bulgaria *H. schineri* usually occurs at very low population density (Georgiev, unpublished). It is very likely that the low agromyzid number is due to the impact of biotic factors, including the specialized parasitoid *C. gedanensis*, which is connected with this host only (Tobias et al., 1986; Li, van Achterberg, 2017). Previous studies in Bulgaria showed that in sites with low density of *H. schineri* only *C. gedanensis* was established (Georgiev, 2004). Conversely, at a large number of the host (an average of 2.3 larvae per 1 m of poplar twigs), two other species (*E. annulatus* and *S. glabrata*) were reared from host samples in the region of Svishtov (Tsankov et al., 1991).

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