

## Parasitism of the horse-chestnut leafminer *Cameraria ohridella* Deschka & Dimic (Lepidoptera: Gracilariidae) in Bucharest area

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### Rezumat

#### Parazitismul moliei miniere a castanului *Cameraria ohridella* Deschka & Dimic (Lep. Gracilariidae) in zona Bucuresti

Molia minieră a castanului a devenit unul dintre dăunătorii cei mai periculoși pentru zonele verzi din zona București în ultimul deceniu. S-au facut studii privind biologia acestei specii și posibilități de combatere. Lucrarea de față prezintă rezultatele observațiilor cu privire la complexul parazitar care influențează nivelul populației de în zona București-Băneasa.

### Abstract

#### Parasitism of the horse-chestnut leafminer *Cameraria ohridella* Deschka & Dimic (Lep. Gracilariidae) in Bucharest area

The horse chestnut leafminer became one of the dangerous pests of the green area in Bucharest in the last ten years. It was carried out studies on the biologie and the control possibilities of this pest.

This paper presents the studies carried out in 2005-2006 at Bucharest-Băneasa on the parasitism influencing the population level of the population in this area.

**Keywords:** parasitism, leafminer, horse chestnut

### Introduction

The horse chestnut leafminer Deschka & Dimic, 1985, a pest of invading Europe, causes damage as a larva by burrowing into the parenchymatic tissue of the leaf (fig. 3). In cases of serious infestation, leaves can be damaged by many confluent mines and these determine the drying out of the leaves and their falling off in summer.

Many studies on the biology and the control of this dangerous pest have shown an important parasitoid complex of that can reduce the attack level of the insect. FREISE & all. (2002) has been carried out studies concerning the parasitism of in Serbia and Macedonia; MORETH & all. (2000) and FREISE & HEITLAND (2004) have been carried out studies on this topic in Bavaria between 1998-2000. In Bulgaria (PELOV & all., 1993) 6 species of the Hymenoptera parasitoids have been isolated from the summer generations of this pest and from the wintering generation.

GRABENWEGER (2003) synthesized the knowledges about 20 species of parasitic Hymenoptera have been reported from the horse chestnut leafminer. Generally, parasitism is low compared to other closely related leafminers and the parasitism level varies considerably. Among other reasons, parasit-

ism rates depend on the developmental stage of the moth and therefore vary with the sampling date.

GRABENWEGER & all. (2005) studied the parasitism of in natural and artificial horse-chestnut stands in the Balkans.

In Bucharest the attack of was observed in the summer of 2001 (DROSU & SESAN, 2003) in the Botanical Garden, placed in the centre of the city. The trees were premature defoliated by heavy infestation of the pest. The Botanical Garden could play the role of a reservoir from which the moths spread all over the city.

This paper presents the studies carried out in 2005-2006 at Bucharest-Băneasa on the parasitism of the population in this area.

### Materials and methods

The pheromone traps (fig. 4) (one in each tree) were set up at the beginning of April, before the date of the appearance of the first moth. Research Institute for chemistry Cluj-Napoca gave the pheromone traps for horse chestnut leafminer. The checking of the traps were twice a week and the graph of the dynamic of the population was done (fig. 5).

The attack level of the pest was calculated numbering the mined leaves from the sample of 1000 leaves collected from the trees.

The leaf samples with mines, inside with mature larvae or pupae were placed in the glass bowls; thus the chrysalides of the natural enemies had the same conditions like the chrysalides of the pest. The identification was done at binocular.

### Results and discussions

In the Bucharest conditions, 3-4 generations/year (DROSU & colab., 2005) have been observed from April to September-October. In the 2005-2006 the flight period start at the beginning of April (Fig.1) and 3 picks of the curve observed (first at the end of May in 2005 and in the first decade of May in 2006, the second one at the end of June-beginning of July and the third in the middle of August). These observations confirm the earlier results.

The infestation level is shown in the table 1; on observes high level of attack in 2005 (74.8%) and lower in 2006 (54.3%). At the same time the analysis of the parasitism level showed the percent of about 20% that could influence the attack. These observations are comparable with those obtained by FREISE & all., (2002) who found in there studies the rates of parasitism at different sampling dates did not exceed 25%. From 14 species of parasitoids were reared. Twelve of the species found belong to the family . FREISE & HEITLAND (2004) assessed parasitism levels related to the seasonal phenology of , and found them to be ranging between 1% and 5 %.

The identification of the parasitism complex from the samples belonging to Băneasa area showed a percent of 2.8% belonging of the family , 3.3% , 32.3% and 61.6% (Fig. 2). The species found are presented in table 2. From 15 species of parasitoids were reared; 10 of them belong to the family Walk. 1839 and . Walk. 1839 having highest percentage. Generally, the European papers presented this species in high percent too. In Bavaria (MORETH & all. 2000) altogether 13 species were found. Most common is Nees, 1834. Furthermore wasps of the genera and (3 species each) are quite frequent. The parasitoids Wlk., 1839, L., 1758, Ferr. & Del., 1957, and Nees, 1834 (Eulophidae, Hymenoptera), have been isolated from the summer generations of this pest in Bulgaria (PELOV & all., 1993) The parasitoids Zett., 1838, Ratt., 1856 and Ratt., 1977 (), were isolated from the wintering generation.

GRABENWEGER (2003) showed that in the current study, investigations on the parasitism of the moth's first generation were carried out in order to determine which preimaginal stages are parasitized by the most abundant parasitic wasps. (Nees), Walker, 1839 and Walker (all Hymenoptera: Eulophidae) developed as larval or pupal parasitoids and preferred later larval instars of the moth.

Walk. 1834 () also had a high percent (30.9 %) in the samples from Băneasa.

Thanks to the parasitization of the larvae we expect that in the future years the attack level of this pest will be more and more less. Therefore it is advisable to use against this pest only such kinds of protection , which will not kill its parasitoids.

The level of the parasitism of the horse chestnut leafminer *Cameraria ohridella*

Period	Infestation level (%)	Mines		
		Total	Parasited	
			Number	%
Nov. 2005	74,8	840	186	22,1
June 2006	3,4	572	45	7,8
Oct. 2006	54,3	3120	639	20,4

Table 2

The parasitoids of the *Cameraria ohridella* Deschka & Dimic identified at Bucharest area in 2006

SPECIES	FAMILY	FREQUENCY	
		Nr.	%
<i>Itoplectis alternans</i> Grav.	Ichneumonidae	18	2.8
<i>Apanteles solitarius</i> Ratzb.	Braconidae	19	2.9
<i>Macrocentrus marginator</i> Nees	Braconidae	2	0.4
<i>Pteromalus semotus</i> Walk.	Pteromalidae	197	30.9
<i>Pteromalus</i> sp.	Pteromalidae	9	1.4
<i>Chrysocharis nephereus</i> Walk.	Eulophidae	244	38.3

SPECIES	FAMILY	FREQUENCY	
		Nr.	%
<i>Chrysocharis pentheus</i> Walk.	Eulophidae	89	13.9
<i>Cirrospilus pictus</i> Nees	Eulophidae	18	2.8
<i>Pediobius saulins</i> Walk.	Eulophidae	4	0.6
<i>Pnigalio pectinicornis</i> L.	Eulophidae	6	0.9
<i>Pnigalio mediterraneus</i> Ferr.	Eulophidae	15	2.3
<i>Sympiesis sericeicornis</i> Nees	Eulophidae	4	0.6
<i>Sympiesis viridula</i> Thoms.	Eulophidae	9	1.4
<i>Tetrastichus brevicornis</i> Panz.	Eulophidae	4	0.6
<i>Tetrastichus epicharmus</i> Walk.	Eulophidae	1	0.2
Total		639	100

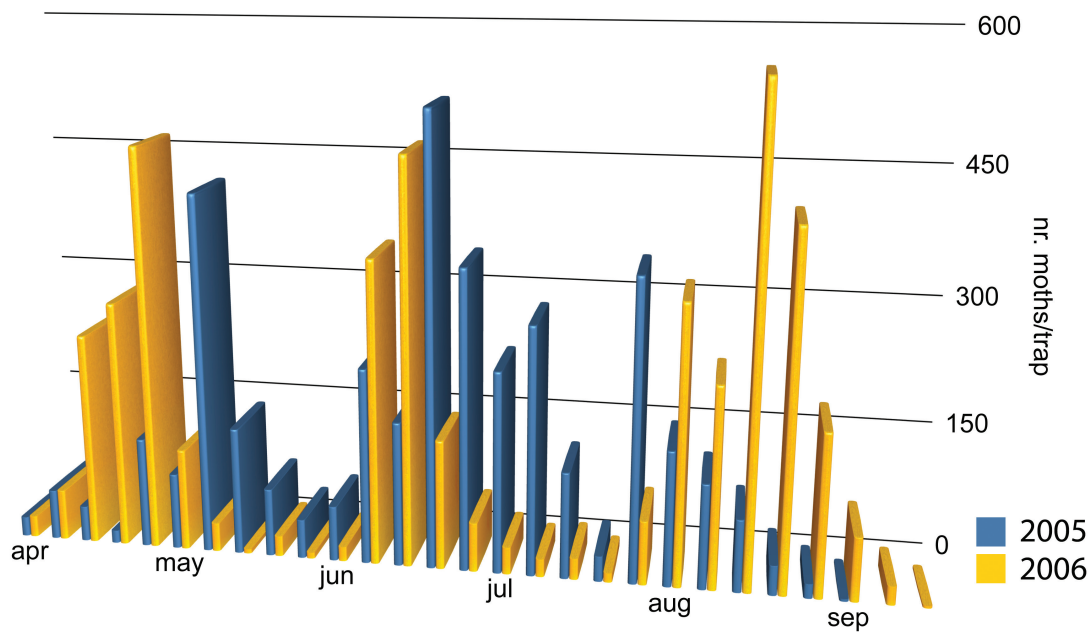


Fig. 1. The dynamic of the population of *Cameraria ohridella*.

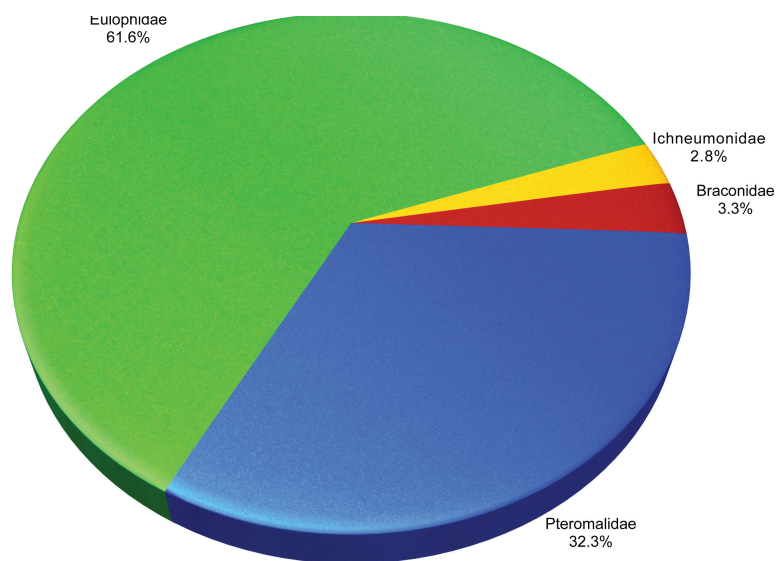


Fig. 2. Parasitic complex of *Cameraria ohridella*.



**Fig. 3.** The attack of the horse chestnut leafminer *Cameraria ohridella*



**Fig. 5.** Pheromone trap in chestnut



**Fig. 4.** The horse chestnut leafminer captures

### Conclusions

The horse chestnut leafminer, a pest of the leaves causes damages in Bucharest area like in whole Europe.

In the 2005-2006 the flight period start at the beginning of April and 3 picks of the curve observed, corresponding at 3 generations.

High level of attack (74.8% in 2005 and 54.3% in 2006) observed.

The analysis of the parasitism level showed the percent of about 20% that could influence the attack.

The identification of the parasitism complex from the samples belonging Băneasa area showed a percent of 2.8% belonging of the family , 3.3% , 32.3% and 61.6% From 15 species of parasitoids were reared; 10 of them belong to the family Walk. and . Walk. having highest percent (38.3 and 13.9 respectively).

Considering the parasitism of the an appropriate means of reducing the attack level, it is advisable to use against this pest only safe protection , which will not kill the parasitoids.

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