

## FAUNISTIC COMPOSITION OF SPECIES FROM THE FAMILY APHIDIIDAE AT PEPPER IN STRUMICA REGION

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### ABSTRACT

During two years of research (2009-2010) of useful entomofauna of pepper, qualitative and quantitative analysis is performed. Three species of parasitic insects of the family Aphidiidae are determined: *Lysiphlebus fabarum* (Marshall, 1896), *Ephedrus persicae* (Froggatt, 1904) and *Trioxys angelicae* (Haliday, 1833). Research is conducted in three localities in the Strumica region. No significant differences between regions in presence of predatory insect species were determined in the examinations.

**Key words:** pepper, parasites, qualitative and quantitative analysis.

### INTRODUCTION

Evident rise to spread the peppers here are from the seventies of the XX century, mainly as a result of the construction of irrigation systems and the development of canned industry.

In Macedonia, almost there is no area where peppers it is not grown. In some areas despite agro ecological conditions, there is a long tradition of cultivation of pepper. Mostly used is in Strumica-Radovis area about 3.000 ha, in Gradsko-Rosoman area with 2.300 ha, and in other localities pepper is represented on smaller areas.

Harmful insects are one of the main reasons for reducing the yield and quality of fruits of pepper in the country. But part of the pepper entomofauna includes species that are parasites of harmful species. From practical significance are species whose hosts are phytophagous kinds of insects, important pests of peppers.

The relevance and importance of the need for studying harmful and beneficial insect species emerged from pepper representation in the Strumica region and the problems that occur each year as from the economic and the ecological aspect. Bearing in mind that pepper was the leading crop in this region, but due to health problems and getting low yields and poor quality, area of this important culture each year are reduced.

### MATERIAL AND METHODS

Studies on parasites of pests in peppers are performed at three sites in the Strumica region: Vasilevo, Robovo and Strumica, on areas with size of 0,1 ha. Tests for achieving the set objectives were conducted in two years (2009 and 2010). During cultivation of peppers usual agrotechnical measures were applied, including the use of fertilizers and pesticides.

Studies on qualitative and quantitative representation of parasitic complex were performed with appropriate methods in field and laboratory conditions. As a method for field research were used yellow water traps. Insects from the yellow water traps were preserved with 75% alcohol and kept in refrigerator on 4 °C.

Laboratory processing of preserved insects was continuously performed after the vegetation of pepper after each studied year. Collected insects were triaged and review under microscope and binoculars. During the triage singled out were the species of all represented families, and were preserved in 75% alcohol and kept in closed glass containers.

### RESULTS AND DISCUSION

Species of the family Aphidiidae are very tiny parasitic wasps that are specialized to infect only leaf aphids. Species from this family are among the most important natural enemies of leaf aphids. They lay eggs in the aphid body, where larvae feed. They lay eggs in the aphids' body, where larvae feed. Remains intact only the skin of the victim that gets swollen appearance and glass shine, etc. mummified aphid. Morphologically this group, is indistinguishable from braconids (Braconidae, Hymenoptera)

Qualitative analysis of material in our research showed the presence of three species:

Ordo: **Hymenoptera**

Fam: **Aphidiidae**

1. *Lysiphlebus fabarum* (Marshall, 1896)
2. *Ephedrus persicae* (Froggatt, 1904)
3. *Trioxys angelicae* (Haliday, 1833)

### 1. Fauna of fam. Aphidiidae in Vasilevo

Analysis of qualitative composition of the fam. Aphidiidae in Vasilevo, in 2009 showed the presence of two species: *L. fabarum* and *E. persicae*. The quantitative analysis of material in 2009 of fam. Aphidiidae showed that the presence of both species is identical. *L. fabarum* is represented by 52,9% and *E. persicae* is represented with 47.1% of total analyzed material (Table 1).

Analysis of qualitative composition of the fam. Aphidiidae in Vasilevo, in 2010 showed the presence of two species: *L. fabarum* and *E. persicae*. The quantitative analysis of material in 2010 of fam. Aphidiidae showed that the presence of *L. fabarum* was higher compared to 2009, and is represented by 55.5% while *E. persicae* is represented with 44.5% of total analyzed material.

Qualitative analysis of the fam. Aphidiidae in Vasilevo in the two year examination did not show up variable composition of the species. In 2009 and 2010 were present the two same species *L. fabarum* and *E. persicae*.

The quantitative analysis showed a different number, ie in 2010 were recorded 155 individuals, and in 2009 138 individuals of the family Aphidiidae.

The dynamics of population fam. Aphidiidae is related to the appearance and development of leaf aphids. The population curve shows that the emergence of the species of the fam. Aphidiidae is with pepper seeding. The species reach spring maximum at the beginning of June. The second maximum they reach late in August and early in September. Attendance of the species last until the end of September.

Table 1. Qualitative and quantitative representation of the species of fam. Aphidiidae in Vasilevo in 2009/2010

Species	2009		2010	
	No. of individuals	%	No. of individuals	%
<i>L. fabarum</i>	73	52,9	86	55,5
<i>E. persicae</i>	65	47,1	69	44,5
<b>Total</b>	138	100	155	100

### 2. Fauna of fam. Aphidiidae in Strumica

Analysis of qualitative composition of the fam. Aphidiidae in Strumica, in 2009 showed the presence of two species: *L. fabarum* and *E. persicae*. The quantitative analysis of material in 2009 of fam. Aphidiidae showed that the presence of both species is identical. *L. fabarum* is represented by 51,4% and *E. persicae* is represented with 47,1% of total analyzed material (Table 2).

Analysis of qualitative composition of the fam. Aphidiidae in Strumica, in 2010 showed the presence of two species: *L. fabarum* and *E. persicae*. The quantitative analysis of material in 2010

of fam. Aphidiidae showed that the presence of *L. fabarum* was higher compared to 2009, and is represented by 54,5% while *E. persicae* is represented with 45,5% of total analyzed material.

Qualitative analysis of the fam. Aphidiidae in Strumica in the two year examination did not show up variable composition of the species. In 2009 and 2010 were present the two same species *L. fabarum* and *E. persicae*.

The quantitative analysis showed a different number, ie in 2010 were recorded 77 individuals, and in 2009 105 individuals of the family Aphidiidae.

The dynamics of population fam. Aphidiidae in Strumica locality is identical with the the dynamics of population in locality of Vasilevo, and is related to the appearance and development of leaf aphids. The population curve shows that the emergence of the species of the fam. Aphidiidae is with pepper seeding. The species reach spring maximum at the beginning of June. The second maximum they reach late in August and early in September. Attendance of the species last until the end of September.

Table 2. Qualitative and quantitative representation of the species of fam. Aphidiidae in Strumica in 2009/2010

Species	2009		2010	
	No. of individuals	%	No. of individuals	%
<i>L. fabarum</i>	54	51,4	65	50,8
<i>E. persicae</i>	51	48,6	63	49,2
<b>Total</b>	105	100	128	100

### 3. Fauna of fam. Aphidiidae in Robovo

Analysis of qualitative composition of the fam. Aphidiidae in Robovo, in 2009 showed the presence of three species: *L. fabarum*, *E. persicae* and *T. angelicae*. The quantitative analysis of material in 2009 of fam. Aphidiidae showed presence of all three species, whereas *L. fabarum* is represented 38,7%, *E. persicae* is represented 31,3% and *T. angelicae* 30,0% of total analyzed material (Table 3).

Analysis of qualitative composition of the fam. Aphidiidae in Robovo, in 2010 showed the presence of three species: *L. fabarum*, *E. persicae* and *T. angelicae*. The quantitative analysis of material in 2010 of fam. Aphidiidae showed that *L. fabarum* is represented 39,0%, *T. angelicae* is represented 36,5% and *E. persicae* is represented 24,5% of total analyzed material.

Qualitative analysis of the fam. Aphidiidae in Robovo in the two year examination did not show up variable composition of the species. In 2009 and 2010 were present the three same species *L. fabarum*, *E. persicae* and *T. angelicae*.

The quantitative analysis showed a different number, ie in 2010 were recorded 159 individuals, and in 2009 217 individuals of the family Aphidiidae.

Table 2. Qualitative and quantitative representation of the species of fam. Aphidiidae in Strumica in 2009/2010

Species	2009		2010	
	No. of individuals	%	No. of individuals	%
<i>L. fabarum</i>	84	38,7	62	39,0
<i>E. persicae</i>	68	31,3	58	36,5
<i>T. angelicae</i>	65	30,0	39	24,5
<b>Total</b>	217	100	159	100

The dynamics of population fam. Aphidiidae in Robovo locality is related to the appearance and development of leaf aphids. The population curve shows that the emergence of the species of

the fam. Aphidiidae is with pepper seeding. The species reach spring maximum at the beginning of June. The second maximum they reach late in August and early in September. Attendance of the species last until the end of September.

### CONCLUSIONS

- Family Aphidiidae (Hymenoptera) at pepper in Strumica region is represented with three species *L. fabarum*, *E. persicae* and *T. angelicae*.
- In Vasilevo in 2009 and 2010 there are two species of fam. Aphidiidae: *L. fabarum* and *E. persicae*. Quantitative representation is uniform.
- In Strumica in 2009 and 2010 there are two species of fam. Aphidiidae: *L. fabarum* and *E. persicae*. Quantitative representation is uniform.
- In Robovo present are 3 species in three years of examination: *L. fabarum*, *E. persicae* and *T. angelicae*. Quantitative representation is the largest of the three species.

### LITERATURE

1. Elsa, V., Ilharco, C., Mexia, A. (1996): Dinamica das populacoes de afideos (Homoptera: Aphididae) e seus parasitoides (Hymenoptera: Aphidiidae) em cultura protegida de pimento. Abstract. <http://oagricultor.com/afidoes.htm>.
2. Kereši, T. (2000): Štetočine paprika i mere suzbijanja. Biljni lekar, br. 4, 262 – 270, Poljoprivredni fakultet, Novi Sad.
3. Логинова-Димитрова, Е (1986): Проучаване на някои икономически важни неприятелители по пипера в оранжерии. Катедра Ентомология, ВСИ Васил Коларов – Пловдив.
4. Ružić, S., Ševar, M., Kovačev, D. (1996): Zaštita paprika u polju od bolesti, štetočina I korova. Bioljni lekar, br. 3, 235 – 237, Poljoprivredni fakultet, Novi Sad.