APIONIDAE WEEVILS (*COLEOPTERA: CURCULIONOIDEA*) – POPULATION OF MAJOR IMPORTANCE IN THE FORAGE LEGUMINOUS CROP FOR SEED PRODUCTION FROM THE WESTERN PART OF ROMANIA

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Abstract: *Areas cultivated with perennial forage leguminous are growing, both globally and in our country; this is due primarily to the increased requirements for feeding animals. The Apionidae weevils are insects of major importance in the perennial forage leguminous crops for seed productions, this due to the fact that production losses that can be between 50 – 80% of the amount of seed. In our country, have been identified a several species of Apionidae, without knowing their exact number, because studies have not been undertaken of such complex quantification insects. In this paper are presented the data in an Apionidae study on pest populations collected from Trifolium repens and Lotus corniculatus crops at Didactical Station from Timisoara, throughout the year 2011. The insects were collected with the help of an entomological net, on a plot were made 25 double cuts for each repetition. The material cropping made once at 7-10 days in function of the weathers conditions, samples cropped in dry time, without precipitations, in the morning around 9-11, when the weevils were the most active. The analysis of the 722 specimens showed presence of 14 species, from 3 tribes: Apionini, Piezotrachelini and Oxystomatini; 5 subtribes: Apionina, Piezotrachelina, Catapiina, Oxystomatina, Synapiina and 8 genuses: Apion, Protapion, Catapion, Cyanapion, Eutrichapion, Oxystoma, Ischnopterapion and Stenopterapion. By analyzing the composition of species based on material found in both crops, the most common species are Apion aestivum, Apion apricans, Apion columbinum. In comparison with the first results obtained by Pălăgeşiu (1980) from the same areas, the Apionidae fauna is quantitatively richer. The results point out the necessity to continue the study of Apionidae fauna on Didactical Station from Timisoara, particularly from ecological view, through a comparative analysis of the influence of climatological factors on these insects' populations from a much longer period of time.*

Keywords: *Apionidae, populations, forage leguminous, seed production*

INTRODUCTION

Perennial forage leguminous had cropped in different parts of the country, on cents of hectares, thanks to its nutritional value that it had. Those plants were valuable not only for alimentary and zootechnical industry but also for apiculture, through the high apiarian productions that obtained from those species. (BĂRBULESCU et all., 1991).

From the perennial leguminous species, the *Trifolium repens* and *Lotus corniculatus* presented a great importance, not only thanks to its high adaptability to the weathers conditions, but also to its cultural value (DRAGOMIR and all., 2003), (VARGA and all., 1998), (BADEA, 2008 a).

The seeds production, for these plants, depended in a great measure by the insect's activity, those presenting for many times also the main limitative factors.

At global level, the losses produced by the pest insects to forage leguminous crop could constitute 30-100% from the seeds population (BADEA, 2008 b). In our country, the production losses were situated between 5-10% in case of the attack produced by *Bruchophagus platypterus* Walk; 50-80% in case of the attack produced by weevils from

Apionidae family; 100% in case of the attack produced by *Odontothrips loti* Hal (PERJU et all., 1993).

The disequilibrium appeared in the last decades, thanks to climatic changes, but also to anthropic influences, it get to an mass ocurence of some pests, and it reminded also the pest species of *Apionidae* family.

In the last decade, in our specialty literature, it were few information about that family, but especially about the pest species frequently in perennial forage leguminous crop, that made the object of the work.

Family *Apionidae* took part from *Curculionidea* superfamily - *Coleoptera* order - *Insecta* class - *Arthropoda* phylum, and numbered approximate 48000 of known species in all over the world (ANDERSON, 1993), and in the Paleartic region were mentioned over 900 of species and variety (WANAT, 2007). After WWW.GALERIEINSECTE.ORG., were registered in Europe over 353 species of *Apionidae*, its number increasing continuous thanks to the discovery of a new species.

In Romania, along time were put in reviewing more species of *Apionidae*, without a complex study exclusivity dedicated to that group. After PĂLĂGEŞIU, 1974, in Banat, the first investigations were made by FRIDWALSKI (1872, 1873, 1876, 1880), REITTER (1877), GANGLBAUER (1896), HOSTINSKI (1875), SZMOLAV (1875).

In the last decade those pests were a few studied in the West Plain, and more from the problems caused by those ones in forage leguminous crop hadn't been actualized, they being investigate and elucidate in the future.

MATERIAL AND METHODS

Investigations were made during the year 2011, beginning with the end of April and developing until the beginning of August month. The entomological material constituted the object of that work collected to the Didactical Station from Timisoara. It was mentioned, that in the location it cropped the *Trifolium repens* and *Lotus corniculatus*, those representing culture plants where the investigations were made; the cropped being on the same surface during more years, thus the entomofauna was rich in insects, but especially in specific pests (weevils).

The experience field to study the fauna of *Apionidae* pest for *Trifolium repens* and *Lotus corniculatus* crops, was placed after standard method of experiences place, according to CIULCĂ (2002), in three repetitions, every repetition having a length of 25 m, a width of 4 m, and distance among rows being of 0.25 m.

The cropping method of samples was made with the help of the entomological net. On a plot made 25 double cuts for every repetition. After collecting the insects, they were introduced in paper bags for which it made determination, preparing and preserving.

The material cropping made once at 7-10 days in function of the weathers conditions, samples cropped in dry time, without precipitations, in the morning around 9-11, then the weevils were the most active.

The insects collected from the experimental field were determined in the Entomology Laboratory of University of Agricultural Sciences and Veterinary Medicine of Banat Timisoara. To identify it were used more keys: ALONSO- ZARAZAGA, 2005; PĂLĂGEŞIU, 1980 a – b, 1986, 1995 a – b – c, 1996 a – b, 2002; PERJU, 1974.

RESULTS AND DISSCUSIONS

In the investigated period were collected from *Trifolium repens* and *Lotus corniculatus* crops, a number of 722 species. Taxonomy identification confirmed the presence of insects appertaining to *Apionidae* family, with 8 genus and 14 species (table 1).

Table 1.

Taxonomy of *Apionidae* insects collected from S.D. Timişoara in 2011

Family *Apionidae* Schoenherr, 1823
Subfamily *Apioninae* Schoenherr, 1823
Supertribe *Apionitae* Schoenherr, 1823
I. Tribe *Apionini* Schoenherr, 1823
1. **Subtribe *Apionina*** Schoenherr, 1823
a. Genus *Apion* Herbst, 1797
Species *Apion miniatum* sin. *frumentarium* Linnaeus, 1758
II. Tribe *Piezotrachelini* Voss, 1959
2. **Subtribe *Piezotrachelina*** Voss, 1959
b. Genus *Protapion* Schilsky, 1906
Species *Protapion apricans* Herbst, 1797
Protapion aestivum sin. *trifolii* Linnaeus, 1768
Protapion varipes Germar, 1817
Protapion assimile Kirby, 1808
Protapion flavipes sin. *fulvipes* Foureroy, 1785
III. Tribe *Oxystomatini* Alonso – Zarazaga, 1990
3. **Subtribe *Catapiina*** Alonso – Zarazaga, 1990
c. Genus *Catapion* Schilsky, 1906
Species *Catapion seniculus* Kirby, 1808
4. **Subtribe *Oxystomatina*** Alonso – Zarazaga, 1990
d. Genus *Cyanapion* Bokor, 1923
Species *Cyanapion columbinum* Germar, 1817
e. Genus *Eutrichapion* Reitter, 1916
Species *Eutrichapion ervi* Kirby, 1808
f. Genus *Oxystoma* Dumeril, 1806
Species *Oxystoma subulatum* Kirby, 1808
5. **Subtribe *Synapiina*** Alonso – Zarazaga, 1990
g. Genus *Ischnopterapion* Bokor, 1923
Species *Ischnopterapion loti* Kirby, 1808
Ischnopterapion virens Herbst, 1797
h. Genus *Stenopterapion* Boker, 1923
Species *Stenopterapion tenue* Kirby, 1808
Stenopterapion intermedium Eppelsheim, 1875

In the year 2011 in the *Trifolium repens* crop was signaled the presence of 402 species of insects of *Curculionoidea* suprafamily, with 7 genus and 12 species (table 2). The most representative was *Protapion* genus, thanks to *Apion apricans* and *Apion aestivum* species (with 150 specimens, respectively 131 specimens, that represented 83,08% from the total of insects collected from that crop).

Table 2

Data of wevils collected from *Trifolium repens* at S.D. Timişoara in 2011

Month	**IV**	**V**		**VI**		**VII**		**∑**
Species Date	**19.04.**	**09.05.**	**25.05.**	**07.06.**	**23.06.**	**12.07.**	**28.07.**	
Apion aestivum	5	15	10	25	17	27	32	**131**
Apion apricans	8	10	22	11	29	43	27	**150**
Apion virens		3	4	1	3	2	7	**20**
Apion flavipes	2	2	2		8	5	6	**25**
Apion assimile	2		2		2	1	3	**10**
Apion varipes	3	1	4	3	3	2	2	**18**
Apion seniculus	1	3	1	2	1	5		**13**
Apion miniatum				1	1	1	4	**7**
Apion loti		2		1		2	3	**8**
Apion ervi				1	3		3	**7**
Apion tenue		1	2	4	2			**9**
Apion columbinum							4	**4**
Total	**21**	**37**	**47**	**49**	**69**	**88**	**91**	**402**

It might underline the fact that those two species were presented in the crop during all the period when investigations were made. That percentage of participation of those two species was bigger than the one registered by PERJU et all. (1981) and PĂLĂGEŞIU (1996 a). All of those indicated the fact that those two species were harmfully for crop; its dominance determined us to take measures of protection, especially in case of seed production.

Out of those two species that presented values of participation in the samples, it were collected others insects considered to be specific pests of that crop and it was reminded the following: *Apion flavipes* (25 specimens), *Apion virens* (20 specimens) - species collected for the first time in 9th of May, *Apion varipes* (18 specimens) and *Apion seniculus* (13 specimens), those represented 18,91% from the total of collected species. In case of investigations made by Pălăgeşiu (1995 a, b, c), the percentage was lower. In case of the present investigations that percentage was almost double.

Table 3

Data of wevils collected from birds – foot trefoil at S.D. Timişoara in 2011

Month	**IV**	**V**		**VI**		**VII**		∑
Species **Date**	**23.04.**	**09.05.**	**25.05.**	**07.06.**	**23.06.**	**12.07.**	**28.07.**	
Apion loti	6	7	8	14	9	11	20	
Apion aestivum	3	4	5	14	5	4	11	
Apion apricans	2	4	3	7	6	10	8	
Apion columbinum		2		4	2	4		
Apion tenue		1	2	4	4	3	5	
Apion ervi	3	1	4	5	3	7	2	
Apion subulatum		1	1	1	3	3	3	
Apion intermedium	1	3	1	1	10	9	6	
Apion assimile		1	1	3	1	5	3	
Apiom virens		2	3	4	1	6	2	
Apion seniculus		1	2	1	1	3		
Apion flavipes				1		6	1	
Apion varipes	2			1	2	2	5	
Total	**17**	**27**	**30**	**60**	**47**	**73**	**66**	**320**

During the year 2011, from the *Lotus corniculatus* crop, were collected 320 species of insects appertaining to *Apionidae* family, with 7 genus: *Protapion, Catapion, Cyanapion, Eutrichapion, Oxystoma, Ischnopterapion* and *Stenopterapion*; and 13 species: *apricans, aestivum, varipes, assimile, flavipes, seniculus, columbinum, ervi, subulatum, loti, virens, tenue* and *intermedium.*

Protapion genus was the same that in case of *Trifolium repens* crop, the most abundant, (120 specimens that represented 37,5% from the total of *Apionidae* collected), being followed by *Ischnopterapion* genus with the species *A. loti* (75 specimens) and *A. virens* (18 specimens). It could be observed in case of that crop, *A. loti* was a dominant species.

Among the others pests, considered specific to the *Lotus corniculatus* crop, the most species appertaining to *A. intermedium* species (31), being followed by *A. ervi* (25) and *A. tenue* (19).

The percentage of 23,44%, met in case of those pests was in concordance with data presented in the specialty literature (Perju, 1974; Perju and Palagesiu, 1977).

The species as *A. subulatum*, *A. columbinum*, *A. varipes*, *A. flavipes* and *A. seniculus* presented a reduced number of species.

Analyzing the species composition in base of the collected material (figure 1) it observed that both crops the most frequent species were *Apion aestivum, Apion apricans, Apion columbinum, Apion virens, Apion flavipes, Apion assimile, Apion varipes, Apion loti,*

Apion tenue şi *Apion ervi.* The others species identified were specific for one of the crops, *Apion miniatum*, it was specific only at the *Trifolium repens*, and *Apion subulatum* and *Apion intermedium* - to the *Lotus corniculatus* crop.

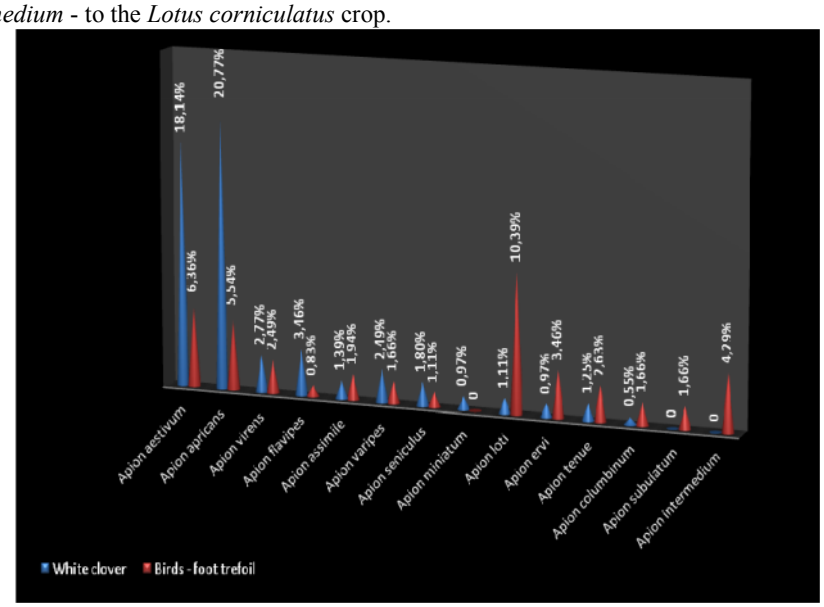

Figure 1. Comparative structure of the insect's species belonging to *Apionidae* family, in *Trifolium repens* and *Lotus corniculatus* crops, in 2011, at S.D. Timisoara

To the common species of two of the crops, it observed that both *Apion aestivum* and *Apion apricans* were in the *Trifolium repens* crop higher in percentages, then the one of *Lotus corniculatus*, with the exception of *Apion columbinum* species, as it followed:

- *Apion aestivum* - 18,14% to the *Trifolium repens*, face to 6,36%, a difference of 11,78%

- *Apion apricans* - 20,77% to the *Trifolium repens*, face to 5,54% at *Lotus corniculatus*, a difference of 15,23%

- *Apion columbinum* - 1,66% to the *Lotus corniculatus* face to 0,55% at *Trifolium repens*, a difference of 1,11%.

CONCLUSIONS

The insects of *Apionidae* family colected from *Trifolium repens* and *Lotus corniculatus* crops belonged to 8 genus and 14 species.

In both crops, the dominant genus was *Protapion.*

The most common species have been *Apion aestivum, Apion apricans* and *Apion columbinum*; they were in higher percentage in *Trifolium repens* crop, than in the *Lotus corniculatus* crop.

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