

## RESEARCHES REGARDING THE ENTOMOFAUNA OF SOME AGRICULTURAL CROPS FROM N-E MOLDAVIA

Valentin-Teodor TUDORACHE, Mihai TĂLMACIU, Nela TĂLMACIU, Monica HEREA

“Ion Ionescu de la Brad” University of Agricultural Sciences and Veterinary Medicine of Iasi,  
3 Mihail Sadoveanu Alley, Iasi, Romania

Corresponding author email: tudorachevalentin2007@gmail.com

### Abstract

The purpose of these research is to identify the useful entomofauna from the agricultural crops which were taken for the study: maize and wheat. The researches were carried out in the Ezareni station, which belongs to “Ion Ionescu de la Brad” University of Applied Life Sciences and Environment of Iasi, Romania. The biological material was sampled by the mean of the Barber soil traps from April 30th of June until 7th of August 2018. The samples were carried out at the following dates: 30.04, 03.05, 07.05, 12.05, 15.05, 18.05, 22.05, 25.05, 05.06, 08.06, 13.06, 21.06, 05.07, 12.07, 18.07, 25.07, 01.08, 07.08. One with another, 18 samples were made for every crop. The traps were placed every six in a row. To prevent the maceration of insects, a conservative liquid was used (water+ washing powder) in proportion of 16%. After finishing the experiments, the insects were bringing to the laboratory of Entomology in order to be counted and determined. From the Coleoptera order, the most dominant species are:

-within the crop of maize: *Carabus nemoralis* (Carabidae) - 48 samples; *Dermestes maculatus* (Dermestidae) - 27 samples; *Coccinella septempunctata* (Coccinellidae) - 33 samples;  
-within the crop of wheat: *Pterostichus cupreus* (Carabidae) - 52 samples; *Dermestes maculatus* (Dermestidae) - 21 samples; *Coccinella septempunctata* (Coccinellidae) - 30 samples.

**Key words:** soil traps, Coccinellidae, Dermestidae, Carabidae.

### INTRODUCTION

*Carabidae* family includes ground beetles, with fast moving, which move to the surface of the soil, and only seldom walk on the trees. There are over 40,000 species known around the world, from which 2,700 are known in Europe. Almost all species of this family are predators for invertebrates, some of the being specialized for a certain type of food.

*Coccinellidae* family has species of round or oval species, almost hemispherical, with spots on the wings with color spots and contrasting patterns. The most species of *Coccinellidae* are beneficial predators which prefer the aphids as main feed.

According to the author (Foltz, 2002), there are more than 5,000 species all around the world. The most representative species of the *Coccinellidae* family are: *Coccinella septempunctata*, *Adalia variegata*, *Chilocorus bipustulatus*, *Adalia bipunctata*.

*Dermestidae* family includes, in general, small insects, of cylindrical shape, with short legs and covered with fine hair. Their larva are very

hairy. They feed with material animals, bodies, tendons.

### MATERIALS AND METHODS

In order to carry out the researches, the insects were collected from one station: Ezareni from Iasi county, belonging to "Ion Ionescu de la Brad" University, by using the method of Barber soil traps. The experiments were made between April and August of 2018. The traps were placed within two crops: maize and wheat, each six in a row. As a conservative liquid, water and washing powder were used, in order to conserve the insects. There were 18 samples in total, the first one took place on 30<sup>th</sup> of April, and the last one on 7<sup>th</sup> of August.

### RESULTS AND DISCUSSIONS

The samples of the biological material were carried out at the following dates: 30.04, 03.05, 07.05, 12.05, 15.05., 18.05., 22.05, 25.05, 05.06, 08.06, 13.06, 21.06, 05.07, 12.07, 18.07, 25.07, 01.08, 07.08.

Within the crop of maize (Table 1), the situation is as follows:

**30.04:** there were 2 samples identified, the both belonging to *Dermestes maculatus* (*Dermestidae* family);

**03.05:** there were 10 samples identified: all of them belonging to *Dermestes maculatus* (*Dermestidae* family);

**07.05:** there were 32 samples identified, all of them belonging to *Carabidae* family: *Carabus nemoralis* (10 samples); *Amara aenea* (10 samples); *Brachinus crepitans* (10 samples); *Amara communis* (2 samples);

**12.05:** there were 16 samples identified, all of them belonging to *Carabidae* family: *Carabus nemoralis* (3 samples); *Pterostichus melanarius* (10 samples); *Amara aenea* (1 sample); *Amara communis* (2 samples);

**15.05:** there were 15 samples identified, 13 of them belonging to *Carabidae* family: *Anisodactylus binotatus* (3 samples); *Anisodactylus signatus* (10 samples) and 2 belonging to *Dermestidae* family: *Dermestes maculatus*;

**18.05:** there were 21 samples identified, all of them belonging to *Carabidae* family: *Carabus nemoralis* (8 samples); *Amara communis* (2 samples); *Brachinus crepitans* (2 samples); *Anisodactylus signatus* (2 samples); *Pterostichus melanarius* (5 samples); *Anisodactylus poeciloides* (2 samples);

**22.05:** there were 19 samples identified, 16 belonging to *Carabidae* family: *Carabus nemoralis* (7 samples); *Anisodactylus poeciloides* (3 samples); *Carabus lineatus* (9 samples) and 3 belonging to *Dermestidae* family (*Dermestes maculatus*);

**25.05:** there were 7 samples identified, all of them belonging to *Carabidae* family: *Carabus nemoralis* (3 samples), *Brachinus crepitans* (2 samples); *Brachinus texanus* (2 samples);

**05.06:** there were 5 samples identified, all of them belonging to *Carabidae* family: *Carabus granulatus* (2 samples), *Brachinus texanus* (3 samples);

**08.06:** there were 12 samples identified, 2 belonging to *Carabidae* family: *Pterostichus cupreus* and 10 belonging to *Coccinellidae* family: *Harmonia axyridis*;

**13.06:** there were 6 samples identified, 4 belonging to *Carabidae* family: *Carabus*

*nemoralis* and 2 to *Dermestidae* family: *Dermestes maculatus*;

**21.06:** there were 16 samples identified, one belonging to *Dermestidae* family: *Dermestes maculatus* and 15 to *Coccinellidae* family: *Coccinella septempunctata* (13 samples); *Harmonia axyridis* (2 samples);

**05.07:** there were 3 samples identified, all of them belonging to *Carabidae* family: *Carabus nemoralis* (1 sample); *Carabus serratus* (2 samples);

**12.07:** there were 30 samples identified, all of them belonging to *Carabidae* family: *Carabus nemoralis* (5 samples); *Pterostichus melanarius* (3 samples); *Brachinus texanus* (4 samples); *Cicindela germanica* (12 samples); *Calosoma inquisitor* (6 samples);

**18.07:** there were 4 samples identified, 3 belonging to *Carabidae* family: *Carabus nemoralis* and 1 belonging to *Dermestidae* family: *Dermestes maculatus*;

**25.07:** there were 14 samples identified, all of them belonging to *Carabidae* family: *Carabus nemoralis* (1 sample); *Anisodactylus signatus* (3 samples); *Anisodactylus binotatus* (3 samples); *Brachinus crepitans* (2 samples); *Amara aenea* (3 samples); *Amara communis* (2 samples);

**01.08:** there were 15 samples identified, 12 belonging to *Carabidae* family: *Carabus nemoralis* (3 samples); *Anisodactylus binotatus* (2 samples); *Anisodactylus signatus* (3 samples); *Amara communis* (3 samples); *Brachinus crepitans* (1 sample) and 6 to *Dermestidae* family (*Dermestes maculatus*);

**07.08:** there were 31 samples identified, 11 belonging to *Carabidae* family: *Carabus nemoralis* (2 samples); *Anisodactylus binotatus* (2 samples); *Cicindela germanica* (7 samples) and 20 belonging to *Coccinellidae* family: *Coccinella 7-punctata*.

Within the crop of wheat (Table 2), the situation is as follows:

**30.04:** no samples were identified;

**03.05:** there were 10 samples identified, all of them belonging to *Dermestidae* family: *Dermestes maculatus*;

**07.05:** there were 5 samples identified, 2 belonging to *Carabidae* family: *Pterostichus cupreus* and 3 to *Dermestidae* family: *Dermestes maculatus*;

**12.05:** there were 9 samples identified, 6 belonging to *Carabidae* family: *Pterostichus cupreus* and 3 belonging to *Dermestidae* family: *Dermestes maculatus*;  
**15.05:** there were 9 samples identified, 6 belonging to *Carabidae* family: *Pterostichus cupreus* and 3 belonging to *Dermestidae* family: *Dermestes maculatus*;  
**18.05:** there were 30 samples identified, all of them belonging to *Carabidae* family: *Pterostichus cupreus* (5 samples), *Anisodactylus poeciloides* (8 samples); *Amara aenea* (10 samples); *Cicindela germanica* (7 samples);  
**22.05:** there were 30 samples identified, 28 belonging to *Carabidae* family: *Pterostichus cupreus* (8 samples); *Carabus nemoralis* (7 samples); *Brachinus texanus* (5 samples); *Amara communis* (5 samples); *Anisodactylus binotatus* (3 samples); and 2 belonging to *Dermestidae* family: *Dermestes maculatus*;  
**25.05:** there were 21 samples identified, all of them belonging to *Carabidae* family: *Pterostichus cupreus* (4 samples); *Amara communis* (4), *Pterostichus analis* (5 samples).  
**05.06:** there were 13 samples identified, all of them belong to *Carabidae* family: *Carabus obsoletus* (10 samples), *Carabus nemoralis* (3 samples);  
**08.06:** there were 9 samples identified, all of them belonging to *Carabidae* family:

*Pterostichus cupreus* (4 samples); *Carabus obovatus* (5 samples);  
**13.06:** there were 8 samples identified, belonging to *Carabidae* family: *Pterostichus cupreus*;  
**21.06:** there were no samples identified;  
**05.07:** there was 1 sample identified, belonging to *Carabidae* family: *Carabus nemoralis*;  
**12.07:** there were 17 samples identified; all of them belonging to *Carabidae* family: *Pterostichus melanarius* (7 samples); *Amara communis* (4 samples); *Cicindela germanica* (6 samples);  
**18.07:** there were 25 samples identified, all of them belonging to *Carabidae* family: *Pterostichus cupreus* (9 samples); *Pterostichus melanarius* (4 samples); *Anisodactylus signatus* (5 samples); *Anisodactylus binotatus* (5 samples); *Cicindela germanica* (2 samples);  
**25.07:** there were 6 samples identified, all of them belonging to *Carabidae* family: *Calosoma inquisitor*;  
**01.08:** there were 15 samples identified, all of them belonging to *Carabidae* family: *Carabus violaceus* (10 samples); *Calosoma inquisitor* (5 samples);  
**07.08:** there were 30 samples identified, all of them belonging to *Carabidae* family: *Pseudophonus griseus* (15 samples); *Amara consularis* (15 samples).

Table 1. Entomofauna of Coleopteras (Coleoptera) sampled within the maize crop by means of Barber soil traps in the Ezareni station from April 30<sup>th</sup> to August 7<sup>th</sup> of 2018

Current number	Family	Species	Number of samples	Total samples
1	Carabidae	<i>Amara aenea</i>	14	193
2		<i>Amara communis</i>	9	
3		<i>Anisodactylus binotatus</i>	10	
4		<i>Anisodactylus poeciloides</i>	5	
5		<i>Anisodactylus signatus</i>	18	
6		<i>Brachinus crepitans</i>	24	
7		<i>Brachinus texanus</i>	9	
8		<i>Calosoma inquisitor</i>	6	
9		<i>Carabus granulatus</i>	2	
10		<i>Carabus lineatus</i>	9	
11		<i>Carabus nemoralis</i>	48	
12		<i>Carabus serratus</i>	2	
13		<i>Cicindela germanica</i>	19	
14		<i>Pterostichus melanarius</i>	18	
15	Coccinellidae	<i>Coccinella septempunctata</i>	33	43
16		<i>Harmonia axyridis</i>	10	
17	Dermestidae	<i>Dermestes maculatus</i>	27	27
<b>TOTAL ENTOMOFAUNA OF COLEOPTERAS</b>				<b>263</b>

Table 2. Entomofauna of Coleopteras (Coleoptera) sampled within the wheat crop by means of the Barber soil traps in the Ezareni station from April 30<sup>th</sup> to August 7<sup>th</sup> of 2018

Current number	Family	Species	Number of samples	Total samples
1	Carabidae	<i>Amara aenea</i>	10	207
2		<i>Amara communis</i>	13	
3		<i>Amara consularis</i>	15	
4		<i>Anisodactylus binotatus</i>	8	
5		<i>Anisodactylus poeciloides</i>	8	
6		<i>Anisodactylus signatus</i>	5	
7		<i>Brachinus texanus</i>	5	
8		<i>Calosoma inquisitor</i>	11	
9		<i>Carabus nemoralis</i>	11	
10		<i>Carabus obovatus</i>	5	
11		<i>Carabus obsoletus</i>	10	
12		<i>Carabus violaceus</i>	10	
13		<i>Cicindela germanica</i>	13	
14		<i>Pseudophonus griseus</i>	15	
15		<i>Pterostichus analis</i>	5	
16	<i>Pterostichus cupreus</i>	52		
17	<i>Pterostichus melanarius</i>	11		
18	Coccinellidae	<i>Coccinella septempunctata</i>	30	30
19	Dermestidae	<i>Dermestes maculatus</i>	21	21
<b>TOTAL ENTOMOFAUNA OF COLEOPTERAS</b>				<b>258</b>

## CONCLUSIONS

It can be concluded that, during the year of research 2018, within the maize crop, from the total of 263 samples, the most significant number of samples belongs to *Carabidae* family (193), followed by *Coccinellidae* family (43) and *Dermestidae* family (27). The most dominant species of *Carabidae* family is: *Carabus nemoralis* (48 samples collected), and the leastest are: *Carabus granulatus* and *Carabus serratus* (each 2 samples). The most dominant species of the *Coccinellidae* family is: *Coccinella 7-punctata* with a number of 33 samples collected.

Within the wheat crop, from the total of 258 samples, the most significant number of samples belongs to *Carabidae* family (207), followed by *Coccinellidae* family (30) and *Dermestidae* (21 samples). The most dominant species of *Carabidae* family is: *Pterostichus cupreus* (52 samples) and the leastest are: *Brachinus texanus*, *Anisodactylus signatus*, *Carabus obovatus* and *Pterostichus analis* (each 5 samples). The *Coccinellidae* family is represented by the *Coccinella septempunctata* (30 samples collected) and the *Dermestidae* family is represented by *Dermestes maculatus* (21 samples).

## ACKNOWLEDGEMENTS

The research was accomplished within the doctoral program from the “Ion Ionescu de la Brad” University of Agricultural Sciences and Veterinary Medicine of Iasi, under the guidance of PhD Mihai Tălmăciu.

## REFERENCES

- Andriev, S.O. (2004). Cercetări privind cunoașterea coccinelidelor (Coleoptera-Coccinellidae) din România din punct de vedere sistematic, biologic, ecologic, biogeografic și etologic. Teză de doctorat Universitatea Alexandru Ioan Cuza din Iași, Facultatea de Biologie.
- Arion, G. (1912). Raport asupra insectelor dăunătoare din familia Coccidelor. *Craiova: Buletin Agricol*, 2005, 8–10.
- Baicu, T. (1977). Elaborarea măsurilor de combatere integrată. *Probleme Protecția Plantelor*, V(3), 203–221.
- Baicu, T., Săvescu, A. (1978). *Combaterea integrată în protecția plantelor*. București: Editura Ceres.
- Baicu, T. (1992). *Perspective în combaterea biologică a bolilor și dăunătorilor plantelor agricole*. București: Editura Tehnica Agricolă.
- Boguleanu, Gh. și colab. (1980). *Entomologie agricolă*. București: Editura Didactică și Pedagogică.
- Borcea, I. (1910). *Rolul insectelor prădătoare și parasite în agricultură*. Iasi: Revista Stațiunii V. Adamachi, 29–46.

- Ciochia, V., Boeriu, H. (1997). *Limitarea populațiilor de homoptere și în special de afide prin metode biologice. Limitarea populațiilor de dăunători vegetali și animali din culturi agricole prin mijloace biologice și biotehnice în vederea protejării mediului înconjurător*. Brașov: Editura. Disz. Tipo, 354–381.
- Cozma, V., Diaconu, A., Grecu, M., Tălmăciu, M., Pareza, M., Vasiliu, G. (2006). Observații privind abundența și diversitatea coleopterelor din coronamentul unor livezi de măr cu management diferit de exploatare. *Lucrari Științifice Seria Horticultură*, I(49), 1093–1096
- Klausnitzer, B. (2004). *Harmonia axyridis* (Pallas, 1773) in Basel-Sradt (Coleoptera-Coccinellidae). Basel: Mitteilungen Entomol. Gesellschaft Basel, 54, 115–122.
- Kovalenkov, V.G., Tyurina, N.M. (1992). *Coccinellids against alfalfa pest*. Moskva: Zashchnita Rasteni, 10, 13–14.
- Lăcătușu, M., Tudor, C, Teodorescu, I. (1981). Structura faunistică din cultura de lucernă. *Stud. Cerc. Biol. Anim.*, 33(2), 179–182.
- Malschi, D., Mustea, D. (1992). Dinamica entomofaunei dăunătoare specifică agrobiocenozelor de grâu din centrul Transilvaniei în perioada 1981-1990. *Probleme Protecția Plantelor*, XX(3-4), 237–48
- Malschi, D., Mustea, D. (1993). Studiul structurii și dinamicii faunei de artropode utile în culturile de câmp în centrul Transilvaniei, în scopul reducerii tratamentelor cu insecticide. *Prob. Prot. Plantelor*, XXI(2), 182–203.
- Panin, S. (1951). *Determinatorul coleopterelor dăunătoare și folositoare din Republica Populară România*. București: Ed. Agrosilvică de Stat.



MISCELLANEOUS

