

OBSERVATIONS REGARDING THE USEFUL ENTOMOFAUNA OF SOME APPLE ORCHARDS AND CABBAGE CROP

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Abstract

The purpose of this research paper is to identify the useful entomofauna from some apple orchards and cabbage crop. The observations were made in the Adamachi 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 mean of Barber soil traps from May 7th to August 1st of 2018, at intervals between 4 and 9 days. The dates of samples were as follows: 07.05, 14.05, 22.05, 30.05, 02.06, 07.06, 14.06, 21.06, 28.06, 04.07, 11.07, 18.07, 23.07, 01.08. One with another, 14 samples were made. The traps were placed every 6 in a row, and inside of them a mix of water and powder in proportion of 16% was added. After finishing the experiments, the insects were brought to the laboratory of Entomology. Here they were counted and identified. In the apple orchards, from the Coleoptera order, the dominant species were: -*Brachinus crepitans* (Carabidae)-50 samples; *Phytodecta fornicata* (Chrysomelidae)-30 samples; *Coccinella septempunctata* (Coccinellidae)-42 samples.

In the cabbage crop, from the Coleoptera order, the dominant species were: -*Anisodactylus signatus* (Carabidae)-22 samples; *Phytodecta fornicata* (Chrysomelidae)-12 samples; *Adalia bipunctata* (Coccinellidae)-16 samples.

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

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*.

Chrysomelidae family are often named "gold insects" because of their special colours. These species are small and a little bigger coleopteras, their shape is almost the same with the species from *Coccinellidae* family, but they

are very dangerous. Some characters bring them close to the insects from *Cerambycidae* family. There are over 26,000 species known and studied. They appear mostly during the day.

MATERIALS AND METHODS

In order to carry out the researches, the insects were collected from one station: Adamachi from Iasi county, belonging to "Ion Ionescu de la Brad" University, by using the method of Barber soil traps. The experiments have taken place between May and August of 2018. The traps were placed within crop of apple trees, each five in a row. As a conservative liquid, water and washing powder have been used, in order to prevent the maceration of insects. There were each 14 samples in total, the first one took place on May 7th, and the last one on August 1st.

RESULTS AND DISCUSSIONS

The samples of the biological material were carried out at the following dates: 07.05, 14.05, 22.05, 30.05, 02.06., 07.06., 14.06, 28.06, 04.07, 11.07, 18.07, 23.07, 01.08.

In the apple orchards, for the year of research of 2018, (Table 1), the situation is as follows:

07.05: there were 14 samples identified, all of them belonging to *Carabidae* family: *Amara communis* (3 samples); *Harpalus tardus* (3 samples); *Poecilus chalcites* (4 samples), *Helops permittens* (4 samples);

14.05: there were 9 samples identified: 4 of them belonging to *Carabidae* family: *Brachinus crepitans* and 5 to *Coccinellidae* family: *Stethorus punctillum*;

22.05: there were 4 samples identified, all of them belonging to *Carabidae* family: *Brachinus crepitans*;

30.05: there were 12 samples identified, 4 of them belonging to *Carabidae* family: *Carabus nemoralis* and 8 to *Coccinellidae* family: *Coccinella septempunctata*;

02.06: there were 20 samples identified, 5 samples belonging to *Chrysomelidae* family: *Phytodecta fornicata*, 5 belonging to *Coccinellidae* family: *Coccinella septempunctata*, 10 belonging to *Carabidae* family: *Cicindela germanica*;

07.06: there were 17 samples identified, 7 belonging to *Carabidae* family: *Brachinus crepitans* and 10 belonging to *Chrysomelidae* family: *Phytodecta fornicata*;

14.06: there were 15 samples identified, 8 belonging to *Carabidae* family: *Brachinus crepitans*; and 7 belonging to *Coccinellidae* family: *Coccinella septempunctata*;

21.06: there are 18 samples identified, 5 of them belonging to *Carabidae* family: *Brachinus crepitans*, 8 belonging to *Chrysomelidae* family: *Phytodecta fornicata* and 5 belonging to *Coccinellidae* family: *Coccinella septempunctata*;

28.06: there were 10 species identified, 5 of them belonging to *Carabidae* family: *Amara aenea* and 5 belonging to *Coccinellidae* family: *Coccinella septempunctata*;

04.07: there were 30 samples identified, all of them belonging to *Carabidae* family: *Brachinus crepitans* (10 samples), 10 to *Harpalus aeneus* and 10 to *Harpalus tardus*;

11.07: there were 33 samples identified, 23 belonging to *Carabidae* family: *Brachinus crepitans* (12 samples), 11 to *Bembidion properans* and 10 belonging to *Coccinellidae* family: *Coccinella septempunctata*;

18.07: there were 12 samples identified, 7 of them belonging to *Chrysomelidae* family: *Phytodecta fornicata*, 3 to *Dermestidae* family: *Dermestes maculatus* and 2 to *Coccinellidae* family: *Coccinella septempunctata*;

23.07: there were 20 samples identified, all of them belonging to *Carabidae* family: *Pterostichus cupreus* (10 samples) and 10 to *Pterostichus melanarius*;

01.08: there were 22 samples identified, 10 of them belonging to *Carabidae* family: *Anisodactylus signatus*, 7 to *Brachinus texanus* and 5 to *Chrysomelidae* family: *Oulema melanopus*.

In the cabbage crop (Table 2), the situation is as follows:

07.05: there were 12 samples identified, all of them belonging to *Carabidae* family: *Anisodactylus signatus* (5) and *Amara aenea* (3) and 4 belonging to *Elateridae* family: *Agriotes lineatus*;

14.05: there were 21 samples identified, 13 of them belonging to *Carabidae* family: *Brachinus crepitans* (7); *Pterostichus cupreus* (6); and 8 belonging to *Coccinellidae* family: *Coccinella septempunctata*;

22.05: there were 7 samples identified, 5 of them belonging to *Chrysomelidae* family: *Phytodecta fornicata* and 2 belonging to *Dermestidae* family: *Dermestes maculatus*;

30.05: there were 15 samples identified, 3 of them belonging to *Carabidae* family: *Harpalus tardus* and 7 belonging to *Coccinellidae* family: *Adonia variegata* and 5 belongs to *Chrysomelidae* family: *Lilioceris merdigera*;

02.06: there were 20 samples identified; 8 of them belonging to *Carabidae* family: *Anisodactylus signatus*, 6 belonging to *Chrysomelidae* family: *Phytodecta fornicata* and 1 belonging to *Coccinellidae* family: *Adalia bipunctata* and 5 belonging to *Elateridae* family: *Agriotes lineatus*;

07.06: there were 17 samples identified, 7 belonging to *Carabidae* family: *Brachinus crepitans* and 10 belonging to *Coccinellidae* family: *Nephus quadrimaculatus* (4) and *Adonia variegata* (6);

14.06: there were 11 samples identified, 6 belonging to *Carabidae* family: *Amara aenea*; 1 to *Chrysomelidae* family: *Phytodecta fornicata*, 4 to *Coccinellidae* family: *Adonia*

variegata (1) and *Coccinella septempunctata* (3);
 21.06: there were 9 samples identified, all of them belonging to *Carabidae* family: *Anisodactylus signatus* (5) and *Harpalus tardus* (4);
 28.06: there were 13 samples identified, 5 of them belonging to *Carabidae* family: *Anisodactylus signatus* (2) and *Harpalus tardus* (3) and 3 belonging to *Coccinellidae* family: *Adalia bipunctata* (3) and 5 belonging to *Elateridae* family: *Agriotes lineatus* (5);
 04.07: there were 13 samples identified, 3 of them belonging to *Carabidae* family: *Anisodactylus signatus* (2) and *Amara aenea* (1) and 6 belonging to *Coccinellidae* family: *Adalia bipunctata* and 1 belonging to *Dermestidae* family: *Dermestes maculatus* and 3 belonging to *Chrysomelidae* family: *Lilioceris merdigera*;

11.07: there were 17 samples identified, 11 belonging to *Carabidae* family: *Brachinus crepitans* (5) and *Harpalus tardus* (6) and 6 belonging to *Elateridae* family: *Agriotes lineatus*;
 18.07: there were 4 samples identified, 2 belonging to *Carabidae* family: *Pterostichus cupreus* and 2 belonging to *Coccinellidae* family: *Adalia bipunctata*;
 23.07: there were 9 samples identified, 3 of them belonging to *Carabidae* family: *Pterostichus cupreus* and 3 to *Coccinellidae* family: *Adalia bipunctata* and 3 belonging to *Chrysomelidae* family: *Lilioceris merdigera*;
 01.08: there were 4 samples identified, 2 belonging to *Carabidae* family: *Harpalus tardus*, 1 belonging to *Coccinellidae* family: *Adalia bipunctata* and 1 belonging to *Dermestidae* family: *Dermestes maculatus*.

Table 1. Entomofauna of Coleopteras (Coleoptera) sampled within the orchard of apple trees by means of Barber soil traps in the Adamachi station from May 7th to August 1st of 2018

Current number	Family	Species	Number of samples	Total samples
1	Carabidae	<i>Amara aenea</i>	5	151
2		<i>Amara communis</i>	3	
3		<i>Anisodactylus signatus</i>	10	
4		<i>Bembidion properans</i>	11	
5		<i>Brachinus crepitans</i>	50	
6		<i>Brachinus texanus</i>	7	
7		<i>Carabus nemoralis</i>	4	
8		<i>Cicindela germanica</i>	10	
9		<i>Harpalus aeneus</i>	10	
10		<i>Harpalus tardus</i>	13	
11		<i>Helops permittens</i>	4	
12		<i>Poecilus chalcites</i>	4	
13		<i>Pterostichus cupreus</i>	10	
14		<i>Pterostichus melanarius</i>	10	
15	Chrysomelidae	<i>Oulema melanopus</i>	5	35
16		<i>Phytodecta fornicata</i>	30	
17	Coccinellidae	<i>Coccinella septempunctata</i>	42	47
18		<i>Stethorus punctillum</i>	5	
19	Dermestidae	<i>Dermestes maculatus</i>	3	3
TOTAL ENTOMOFAUNA OF COLEOPTERAS				236

Table 2. Entomofauna of Coleopteras (Coleoptera) sampled within the cabbage crop by means of Barber soil traps in the Adamachi station from May 7th to August 1st of 2018

Current number	Family	Species	Number of samples	Total samples
1	Carabidae	<i>Amara aenea</i>	10	80
2		<i>Anisodactylus signatus</i>	22	
3		<i>Brachinus crepitans</i>	19	
4		<i>Harpalus tardus</i>	18	
5		<i>Pterostichus cupreus</i>	11	
6	Chrysomelidae	<i>Phytodecta fornicata</i>	12	22
7		<i>Lilioceris merdigera</i>	10	
8	Coccinellidae	<i>Adalia bipunctata</i>	16	45
9		<i>Adonia variegata</i>	14	
10		<i>Coccinella septempunctata</i>	11	
11		<i>Nephus quadrimaculatus</i>	4	
12	Dermestidae	<i>Dermestes maculatus</i>	4	4
13	Elateridae	<i>Agriotes lineatus</i>	20	20
TOTAL ENTOMOFAUNA OF COLEOPTERAS				171

CONCLUSIONS

It can be concluded that, during the year of research 2018, within the orchard of apple trees, from the total of 236 samples, the most significant number of samples belongs to *Carabidae* family (151), followed by *Coccinellidae* family (47), *Chrysomelidae* (35), *Dermestidae* (3). The most dominant species of *Carabidae* family is: *Brachinus crepitans* (50 samples collected), and the leastest are: *Amara communis* (3 samples collected).

The most dominant species of the *Coccinellidae* family is: *Coccinella septempunctata*, with a number of 42 samples collected. From *Chrysomelidae* family, the most dominant species is *Phytodecta fornicata* (30 samples).

Within the cabbage crop, from the total of 171 samples, the most significant number of samples belongs to *Carabidae* family (80), followed by *Coccinellidae* family (45), *Chrysomelidae* (22), *Elateridae* (20) and *Dermestidae* (4).

The most dominant species from the *Carabidae* family is: *Anisodactylus signatus* (22), followed by *Brachinus crepitans* (19) and *Harpalus tardus* (18) and the leastest are: *Amara aenea* (10 samples).

The most dominant species from the *Coccinellidae* family is: *Adalia bipunctata* (16), followed by *Adonia variegata* (14) and the leastest is: *Nephus quadrimaculatus* (4 samples). From the *Crysomelidae* family, the most dominant species is: *Phytodecta fornicata* (12 samples), followed by *Lilioceris merdigera* (10 samples).

From the *Elateridae* family, one species was identified: *Agriotes lineatus* (20 samples).

As a comparison between these two crops, it could be seen that the number of samples belonging to *Carabidae* family (151) within the apple orchards is bigger than the number of samples belonging to the same family from the cabbage crop (80).

Also, the number of samples belonging to *Coccinellidae* family is bigger with the apple orchard (47) in comparison to cabbage crop (45).

Samples from the *Elateridae* family have been identified only within the cabbage crop (20).

The smallest number of samples belongs to *Dermestidae* family (3) within the apple orchard while within the cabbage crop the number of samples from the same family is 4.

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.

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