

## OBSERVATIONS ON EXISTING ARTHROPODS FAUNA IN SOME ORCHARDS

### OBSERVAȚII PRIVIND FAUNA DE ARTROPODE EXISTENTE ÎN UNELE PLANTAȚII POMICOLE

HEREA Monica<sup>1\*</sup>, TALMACIU M.<sup>1</sup>, BOBOC Cristina<sup>1</sup>, TALMACIU Nela<sup>1</sup>

\*Corresponding author e-mail: monica28is @yahoo.com

**Abstract.** Observations on the structure of the arthropods entomofauna were carried out between May – September 2019 in two apple tree orchards belonging to SC Loturi Service SRL Delești, Vaslui and Vasile Adamachi teaching farm, Iasi. For the collection of insects in the orchard, the method of soil traps type Barber has been chosen, in total 6, placed 3 at row, which have as fixative solution a salt solution (NaCl) with a concentration of 25%. The insects thus collected were cleaned from the plant and soil debris, then the insects was coservate in alcohol 90 °. As soon as they were brought into the laboratory, they were determined and centralised. The collected material is represented by species belonging to arthropods fauna, which is systematically falling in the following order: Coleoptera, Hymenoptera, Diptera, Arachnida et all.

**Key words:** orchard, arthropods, soil traps type Barber

**Rezumat.** Observațiile cu privire la structura entomofaunei de artropode au fost realizate în perioada mai-septembrie în anul 2019 în două plantații pomicole de măr ce aparține SC Loturi Service SRL Delești, Vaslui . Pentru cât și Stațiunii Didactice Vasile Adamachi, Iași. Pentru colectarea insectelor din livada s-a ales metoda de cercetare utilizarea capcanelor de sol de tip Barber, în total 6, amplasate câte 3 pe rând, ce au ca soluție fixatoare o soluție de sare (NaCl) cu o concentrație de 25%. Insectele astfel colectate au fost curățate de resturile vegetale și de pământ, apoi au fost coservate în alcool 90°. Imediat ce au fost aduse în laborator acestea au fost determinate și centralizate. Materialul colectat este reprezentat de specii ce aparțin faunei de artropode ce se încadrează sistematic în următoarele ordine: Coleoptera, Hymenoptera, Diptera, Arachnida s.a.

**Cuvinte cheie:** ecosistem pomicol, artropode, capcane Barber

## INTRODUCTION

Reproduction of harmful insects populations can be more or less dangerous, depending mostly on the pressure exercised by regulatory factor, in this case the entomophagous species.

The arthropods species are mostly marauders and they can be harmful and useful for human enterprises because they prey on worm, crustaceans, harmful insects molluses.

Thus representatives of, *Pterostichus*, *Carabus*, *Coccinella 7 punctata*, *Arachnidae* etc., orderes prey on the larvae of the apple worm (*Cydia pommonella*., *Aphis* sp.), the leafe moth and also they prey on beetle larvae, wire worms etc. (Varvara, 1995, Herea, 2019, Tălmăciu, 2016).

This paper presents the analysis of study results regarding the structure and population dynamics of the arthropods species in the apple fruit ecosystems from Vaslui and Iasi.

---

<sup>1</sup> University of Agricultural Sciences and Veterinary Medicine from Iasi, Romania

## MATERIAL AND METHOD

The observations were made in the conditions of the apple ecosystems of Delesti and Iasi. The material was collected during 2019, with the help of soil trap type Barber. The collection of materials was made every 10 to 20 days time. The resultant biological material was brought into the laboratory, where the species of fauna were selected and determined (Chatened du Gaetan, 1990; Panin, 1951; Rogojanu and Perju, 1979; Reitter, 1908).

## RESULTS AND DISCUSSIONS

*In the stationary Delesti*, there were effectuated a number of 4 collections, at the followings dates: 23. 07. 2019; 9. 08. 2019; 1. 09. 2019 and 20. 09. 2019 (tab. 1)

- at the first harvest, there were collected a number of 3 species, with a total of 50 specimens. The collected species were *Carabus besseri*, *Harpalus distinguendus* and *Pseudophonus rufipes*;

- at the second harvest, there were collected a number of 32 of specimens, belonging to a number of 4 species. These were: *pseudophonus rufipes*, *Coccinella 7 punctata*, *Harpalus distinguendus* and *Arachnidae*.

- at the third harvest, there were collected 74 specimens, belonging to 7 species. These were: *Formicidae*, *Coccinella 7 punctata*, *Amara aenea*, *Harpalus distinguendus*, *Gryllus campestris*, *Calathus fuscipes* and *Pterostichus vulgaris*;

- at the fourth harvest, there were collected 48 specimens, belonging to 7 species: *Pseudophonus rufipes*, *Coccinella 7 punctata*, *Ophonus azureus*, *Harpalus distinguendus*, *Formicidae*, *Bracynus crepitans*, and *Calathus fuscipes*;

*In the Iasi stationary*, there were effectuated a number of 6 collections, thus:

- at the first harvest, on the 10<sup>th</sup> of June 2019, there were collected 6 specimens belonging to the following 4 species: *Pseudophonus rufipes*, *Bracynus explodens*, *Harpalus tardus* and *Harpalus calceatus*;

- at the seconds harvest, on the 2<sup>nd</sup> of July 2019, there were collected 36 specimens of coleopters, belonging to the following 3 species: *Formicidae*, *Harpalus distinguendus*, *harpalus tardus* and *Harpalus calceatus*;

- at the third harvest, on the 22<sup>nd</sup> of July 2019, there were collected 32 specimens, belonging to the following 4 species: *Pseudophonus rufipes*, *Harpalus tardus*, *Coccinella 7 punctata* and *Harpalus aeneus*;

- at the fourth harvest, on the 26<sup>th</sup> of August 2019, there were collected 38 specimens, belonging to the following 4 species: *Formicidae*, *Coccinella 7 punctata*, *Calathus fuscipes* and *Diptera*;

- at the fifth harvest, there were collected on a single species, *Pseudophonus rufipes*;

- at the sixth harvest, on the 25<sup>th</sup> of September 2019, there were collected 7 specimens, belonging to 2 species: *Pseudophonus rufipes* and *Formicidae*.

The collected species, and also their abundance, in the two stationaries, during all the observation period, are presented as following (tab. 2):

- *in the Delesti, Vaslui stationary*, there were collected, a sum of 204 specimens belonging to a number of 11 species. These were *Carabus besseri*, *Pseudophonus*

*rufipes*, *Harpalus distinguendus*, *Pseudophonus griseus*, *Harpalus tardus*, *Zabrus tenebrioides*, *Amara aenea*, *Calathus fuscipes*, *Pterostichus vulgaris*, *Brachynus crepitans* and *Ophonus azureus*. The species that had the largest number of specimens were: *Pseudophonus rufipes*, with 79 specimens *Pseudophonus griseus*, with 37 specimens, *Harpalus distinguendus*, with 33 specimens and *Carabus besseri*, with 29 specimens;

Table 1

**The situation of arthropods in Delesti, Vaslui country and the number of specimens collected**

No.	Name of the species	No. of the specimens	Total
<b>1<sup>st</sup> harvest: 23.07.2019</b>			
1	<i>Carabus besseri</i> Fischer	29	<b>50</b>
2	<i>Harpalus distinguendus</i> Duft.	18	
3	<i>Pseudophonus rufipes</i> Mull.	3	
<b>2<sup>nd</sup> harvest: 1.08.2019</b>			
1	<i>Pseudophonus rufipes</i> Mull	16	<b>32</b>
2	<i>Coccinella 7 punctata</i> L.	8	
3	<i>Harpalus distinguendus</i> Duft.	5	
4	Arachnidae	3	
<b>3<sup>rd</sup> harvest: 9.08.2019</b>			
1	Formicidae	35	<b>74</b>
2	<i>Coccinella 7 punctata</i> L.	22	
3	<i>Amara aenea</i> Degeer	6	
4	<i>Harpalus distinguendus</i> Duft.	5	
5	<i>Gryllus campestris</i> F	3	
6	<i>Calathus fuscipes</i> Goeze	2	
7	<i>Pterostichus vulgaris</i> L.	1	
<b>4<sup>th</sup> harvest: 20.09.2019</b>			
1	<i>Pseudophonus rufipes</i> Mull	25	<b>48</b>
2	<i>Coccinella 7 punctata</i> L.	7	
3	<i>Ophonus azureus</i> F.	6	
4	<i>Harpalus distinguendus</i> Duft.	5	
5	Formicidae	3	
6	<i>Brachynus crepitans</i> L.	1	
7	<i>Calathus fuscipes</i> Goeze	1	

- in Iassy stationary, there were collected 124 specimens, belonging to 9 species: *Pseudophonus rufipes*, *Pseudophonus griseus*, *Harpalus distinguendus*, *Harpalus tardus*, *Harpalus aeneus* and *Amara crenata*.

The species with the largest number of specimens collected were: *Pseudophonus rufipes*, with 78 specimens, *Harpalus distinguendus*, with 17 specimens and *Pseudophonus griseus*, with 12 specimens.

Table 2

The situation of arthropods in Vasile Adamachi teaching farm, Iasi country and the number of specimens collected

No.	Name of the species	No. of the specimens	Total
<b>1<sup>st</sup> harvest: 10.06.2019</b>			
1	<i>Pseudophonus rufipes</i> Mull.	2	6
2	<i>Harpalus calceatus</i> Duft.	2	
3	<i>Brachynus explodens</i> L.	1	
4	<i>Harpalus tardus</i> Panz.	1	
<b>2<sup>nd</sup> harvest: 02.07.2019</b>			
1	Formicidae	16	36
2	<i>Harpalus distinguendus</i> Duft.	15	
3	<i>Harpalus tardus</i> Panz.	3	
4	<i>Harpalus calceatus</i> Duft.	2	
<b>3<sup>rd</sup> harvest: 22.07.2019</b>			
1	<i>Pseudophonus rufipes</i> Mull.	25	32
2	<i>Harpalus tardus</i> Panz.	3	
3	<i>Coccinella 7 punctata</i>	2	
4	<i>Harpalus aeneus</i> Faler.	2	
<b>4<sup>th</sup> harvest: 26.08.2019</b>			
1	Formicidae	25	38
2	<i>Coccinella 7 punctata</i>	10	
3	<i>Harpalus distinguendus</i> Duft.	2	
4	Diptera	1	
<b>5<sup>th</sup> harvest: 13.09.2019</b>			
1	<i>Pseudophonus rufipes</i> Mull.	5	5
<b>6<sup>th</sup> harvest: 25.09.2019</b>			
1	<i>Pseudophonus rufipes</i> Mull.	5	7
2	Formicidae	2	

Totally, in the two stationary, in 2019, there were collected 328 specimens of arthropods, belonging to 15 species (tab. 3).

Table 3

The structure, dynamics and the abundance of the arthropods species collected from the apple orchards

No.	Name of the species	Stationary												Total
		Delesti - Vaslui						Iasi						
		Harvests												
		I	II	III	IV	Total	I	II	III	IV	V	VI	Total	
1	<i>Carabus besseri</i> Fischer	29	-	-	-	29	-	-	-	-	-	-	0	29
2	<i>Pseudophonus rufipes</i> Mull.	3	16	-	25	44	2	-	25	0	5	5	37	81
3	<i>Harpalus distinguendus</i> Duft	18	5	5	5	33	-	15	-	2	-	-	17	50
4	<i>Harpalus tardus</i> Panz.	-	-	-	-	0	1	3	3	-	-	-	7	7
5	<i>Coccinella 7 punctata</i>	-	8	22	7	37			2	10			12	49

6	<i>Amara aenea</i> Degeer	-	-	6	-	6	-	-	-	-	-	0	6	
7	<i>Calathus fuscipes</i> Goeze	-	-	2	1	3	-	-	-	-	-	0	3	
8	<i>Pterostichus vulgaris</i> L.	-	-	1	-	1	-	-	-	-	-	0	1	
9	<i>Brachynus crepitans</i> L.	-	-	-	1	1	-	-	-	-	-	0	1	
10	<i>Ophonus azureus</i> F.	-	-	-	6	6	-	-	-	-	-	0	6	
11	Arachnidae	-	3	-	-	3	-	-	-	-	-	0	3	
12	Formicidae	-	-	35	-	35	-	16	-	25	-	2	43	78
13	<i>Gryllus</i> sp.	-	-	3	-	3	-	-	-	-	-	0	3	
<b>DELESTI</b>		<b>50</b>	<b>32</b>	<b>74</b>	<b>45</b>	<b>201</b>								
<b>TOTAL 13 SPECIES</b>														
14	<i>Harpalus calceatus</i> Duft.	-	-	-	-	-	2	2	-	-	-	4	4	
15	<i>Brachynus explodens</i> L.	-	-	-	-	-	1	-	-	-	-	1	1	
16	<i>Harpalus aeneus</i> Faler	-	-	-	-	-	-	2	-	-	-	2	2	
17	<i>Amara crenata</i> Dejean	-	-	-	-	-	-	-	-	-	-	0	0	
<b>IASI</b>							<b>6</b>	<b>36</b>	<b>32</b>	<b>37</b>	<b>5</b>	<b>7</b>	<b>123</b>	<b>-</b>
<b>TOTAL 8 SPECIES</b>														
<b>Total</b>		<b>17 specimens</b>											<b>324</b>	

The largest number of specimens that were collected in the 2 stationaries, was registered by the species:

- In *Delesti*, *Vaslui* stationary, a number of 4 species had the largest number of specimens (Table 4): *Pseudophonus rufipes*, with 79 specimens, presenting 38,72% from the total, *Pseudophonus griseus*, with 37 specimens, presenting 18,14% from the total, *Harpalus distinguendus*, with 33 specimens, presenting 16,18% from the total and *Carabus besseri*, with 29 specimens, presenting 14, 22% from the total;

- In *Iassy* stationary, the species with the largest number of collected specimens (Table 5), they were *Pseudophonus rufipes*, with 78 specimens, presenting 62,90% from the total, *Harpalus distinguendus*, with 17 specimens, presenting 13,71% from the total and *Pseudophonus griseus*, with 12 specimens, presenting 9,68% from the total.

Table 4

**The species with the largest number of specimens collected from Delesti, Vaslui country stationary**

No.	Name of the Species	No. of the specimens	% from total
1	<i>Pseudophonus rufipes</i> Mull.	44	22
2	<i>Coccinella 7 punctata</i>	37	18.3
3	Formicidae	35	17.4
4	<i>Harpalus distinguendus</i> Duft.	33	16.4
5	<i>Carabus besseri</i> Fischer	29	14.4
6	Others sp.	23	11.5

Table 5

The species with the largest number of specimens collected from the Iasi stationary

No.	Name of the species	No. of the species	% from total
1	<i>Formicidae</i>	43	35
2	<i>Pseudophonus rufipes</i> Mull.	37	30
3	<i>Harpalus distinguendus</i> Duft.	17	14
4	<i>Coccinella 7punctata</i> L	12	9.7
5	<b>Others sp.</b>	14	11.3

## CONCLUSIONS

During the research period, in the both stationary, there were collected 3284 specimens, belonging to a number of 17 species. In Delesti stationary, there were collected 201 specimens, belonging to a number of 13 species, and in the Iasi stationary, there were collected 124 specimens, belonging to a number of 8 species.

A number of 4 species were collected in both stationaries. These were *Pseudophonus rufipes*, *Formicidae*, *Coccinella 7 punctatta* and *Harpalus distinguendus*.

The species that had the largest number of collected species were:

-*Pseudophonus rufipes*, with 44 specimens, *Coccinella 7 punctatta* with 37 specimens, *Formicidae*, with 35 specimens and *Harpalus distinguendus* with 33 specimens in the stationary Delesti, Vaslui;

-*Formicidae* with 43 specimens, *Pseudophonus rufipes*, with 37 specimens, *Harpalus distinguendus*, with 17 specimens in the stationary from Iasi.

## REFERENCES

1. Chatened du Gaetan, 1990 - *Guide des Coleopteres d'Europe. Delacrois et Niestlé*, Paris.
2. Herea Monica, Tălmăciu Nela, Mocanu Ionela Tălmăciu M., 2019- *Contributions to the knowlwdge of the structure of coleopters species collected from the apple tree fruit orchards*, SGEM2019 Conference Proceedings, ISBN 978-619-7408-84-3 / ISSN 1314-2704, Vol. 19, Issue 5.1, 125-133 pp, www.sgem.org
3. Panin I., 1951 - *Determinatorul Coleopteleror dăunătoare și folositoare din R.P.R.* Editura de Stat, București.
4. Rogojanu V., Perju T., 1979 - *Determinator pentru recunoașterea dăunătorilor plantelor cultivate*. Editura Ceres, Bucuresti.
5. Reitter E., 1908 - *Fauna Germanica. Die Käfer des Deutschen Reiches Band I*, Stuttgart.
6. Tălmăciu M. Mocanu Ionela, Herea Monica, Tălmăciu Nela, Manole Liliana, 2016 - *Observation on invertebrate fauna encountered in some agricultural crops*, Global Illuminators, Full Paper Proceeding NDMRP-2016, vol. 2, 2016, p 119-129, ISBN: 978-969-9948-51-0
7. Varvara M., Tălmăciu M., Georgescu T., 1995 - *Structura speciilor de carabide (Coleoptera - Carabidae) în câteva plantații viticole din Moldova*. Rev. Cercetări Agronomice în Moldova.