

RESEARCH ON THE BIODIVERSITY OF HARMFUL AND USEFUL SPECIES FROM SOME AGRICULTURAL AND HORTICULTURAL CROPS IN 2018

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Abstract

Observations were made during the research period of the year 2018 in the apple tree plantation, and in the cabbage crop and maize crop belonging to Vasile Adamachi and Ezareni farm, from Iasi county. The aim of the paper was to make a comparison regarding the entomofauna of the three very different cultures as technology and agroecosystem conditions. The collection of the material was carried out using the soil traps type Barber method from June to September inclusive. The collected material was cleaned of the vegetable debris was then prepared for identification up to the level of the spece only for coccinamide. From the analysis of the collected material it follows that the specimens of coleopters species belong to the: *Coccinella septempunctata*, *Adalia bipunctata*, *Propylaea quatordecimpunctata*, *Hippodamia variegata*, *Harmonia axyridis*, *Nephus quadrimaculatus*, *Carabidae*, *Scarabaeidae*, *Elateridae*. In terms of the abundance of entomofauna, on the crops, it is found that most specimens were collected and determined from the cabbage crops (649), from the apple orchard a number of 362 specimens. and 540 specimens in the maize crop from Ezareni.

Key words: entomofauna; horticultural crops; abundance, dynamics

Coleoptera is one of the orders with the most predatory species with s major importance in pest reduction.

Of all arthropod species, coccinellids are more numerous, common in all crops and throughout the growing season. They have a particular importance in reducing the number of aphids, mites, trips and other species of harmful insects, both larvae and adults feeding abundantly throughout period of evolution (Cozma *et al*, 2006).

Useful fauna is represented by the existence of animal species such as: predators and parasites. While predators feed on live food, parasites feed on it develops on account of other species, inside (endoparasites) or on the surface of the body (ectoparasites). The special importance of beetles as zoophagous insects has been emphasized since the early nineteenth century (Baicu and Săvescu 1978, Baicu, 1992).

The coccinellids are some of the most useful insects, they are represented by a number of over 1,000 species on the surface of the earth, live on trees and feed both in the larval stage (Ciochia, 1997) and in the adult stage with plant

fleas and coccidia that are very harmful to fruit trees.

MATERIAL AND METHOD

The research aimed to identify useful and harmful entomofauna from the crops studied in the Ezareni and Vasile Adamachi farm in Iasi County.

As a method of collecting entomological material, we used Barber-type soil traps.

Barber floor traps are 500 ml plastic boxes that have a diameter of 10 cm and a height of 8 cm. A solution of detergent in water in a concentration of 20% was placed in these traps (Tălmăciu *et al*, 2010). The traps were buried at ground level (*figure 1*). The pits were made with the help of a spade, and the traps were buried carefully, so that the edge of the trap was at ground level so that the insects could easily enter them (Ionescu and Apetrei, 1988).

A fixing liquid (detergent solution with a water concentration of 20%) was introduced into the Barber type floor traps.

The traps were installed at a distance of about 5 m between them. 6 traps were set for each of the following crops: apple, corn and cabbage. In 2018, the traps were installed on 30.05, the first collection being on 03.06.2018.

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Figure 1. Barber soil trap

RESULTS AND DISCUSSIONS

In the research year 2018, a number of 15 periodic collections were carried out for the harvesting of biological material for apple, corn and cabbage crops in the two stations at the following dates: 03.06, 07.06, 13.06, 20.06, 30.06, 05.07, 09.07, 14.07, 20.07, 25.07, 01.08., 07.08, 14.08, 21.08, 01.09.

In the case of **apple plantation**, the situation is as follows (*table 1*):

- at the first collection on 03.06, 30 specimens belonging to the order were identified *Coleoptera*-families: *Carabidae* (6) and *Coccinellidae* (24);

- at the second collection on 07.06, 12 specimens of the order *Coleoptera*-families were identified: *Carabidae* (3) and *Coccinellidae* (9);

- the 34 specimens were identified at the third collection on 13.06 belong to the order *Coleoptera*-families: *Carabidae* (5) and *Coccinellidae* (29);

- at the fourth collection on 20.06, 29 specimens belonging to the order *Coleoptera*-families were identified: *Carabidae* (5) and *Coccinellidae* (24);

- the 41 specimens registered at the fifth collection on 30.06 belong to the order *Coleoptera*-families: *Carabidae* (8) and *Coccinellidae* (33);

- at the sixth collection from 05.07 the 21 specimens belong to the order *Coleoptera*-families: *Coccinellidae* (13), family *Carabidae* (6) and *Scarabeidae* (2);

- at the seventh collection from 09.07, 23 specimens belonging to the order *Coleoptera*-families were identified: *Carabidae* (13) and *Coccinellidae* (10);

- at the eighth collection on 14.07, 14 specimens belonging to the order *Coleoptera*-families were identified: *Coccinellidae* (8) and *Carabidae* (6);

- at the ninth collection on 20.07, a number of 16 specimens of the order *Coleoptera*-families were identified: *Carabidae* (10) and *Coccinellidae* (6);

- at the tenth collection on 25.07, a number of 26 specimens of the order *Coleoptera* were identified - families: *Coccinellidae* (19) and *Carabidae* (7);

- the 11 specimens registered at the eleventh collection on 01.08 belong to the order *Coleoptera*-family *Coccinellidae*;

- at the twelfth collection on 07.08, a number of 32 specimens of the order *Coleoptera* – families were identified: *Carabidae* (5) and *Coccinellidae* (27);

- at the thirteenth collection dated 14.08, a number of 30 specimens of the order *Coleoptera*-families were identified: *Carabidae* (9) and *Coccinellidae* (21);

- at the fourteenth collection on 21.08, a number of 24 specimens of the order *Coleoptera* – family *Coccinellidae* were identified;

- at the fifteenth collection on 01.09, a number of 19 specimens of the order *Coleoptera*-families were identified: *Carabidae* (2) and *Coccinellidae* (17).

Table 1

Structure, abundance, dynamic of Coleopteras sampled within the apple orchards—Barber-2018

No of harvest	Data	Species	Trap						Total
			1	2	3	4	5	6	
I	03.06	1. <i>Coccinella septempunctata</i>	5	4	3	-	2	-	14
		2. <i>Adalia bipunctata</i>	-	-	4	5	-	1	10
		<i>Carabidae</i>	1	-	2	-	1	2	6
TOTAL exemplare coleoptere			6	4	9	5	3	3	30
II	07.06	1. <i>Coccinella septempunctata</i>	-	3	-	2	4	-	9
		<i>Carabidae</i>	1	-	-	-	-	2	3
TOTAL exemplare coleoptere			1	3	-	2	4	2	12
III	13.06	1. <i>Coccinella septempunctata</i>	4	-	-	5	3	1	13
		2. <i>Propylaea quatordecimpunctata</i>	-	-	-	6	7	3	16
		<i>Carabidae</i>	1	2	-	-	-	2	5
TOTAL samples of coleopters			5	2	-	11	10	6	34
IV	20.06	1. <i>Coccinella 10-punctata</i>	9	-	-	-	-	-	9
		2. <i>Propylaea quatordecimpunctata</i>	6	9	-	-	-	-	15
		<i>Carabidae</i>	1	1	-	1	1	1	5
TOTAL samples of coleopters			16	10	-	1	1	1	29
V	30.06	1. <i>Coccinella septempunctata</i>	9	-	7	5	-	-	21
		2. <i>Adalia bipunctata</i>	7	-	4	-	-	1	12
		<i>Carabidae</i>	3	-	-	3	-	2	8
TOTAL samples of coleopters			19	-	11	8	-	3	41
VI	05.07	1. <i>Coccinella septempunctata</i>	-	-	4	-	3	6	13
		<i>Carabidae</i>	2	-	-	-	-	4	6
		<i>Scarabaeidae</i>	2	-	-	-	-	-	2
TOTAL samples of coleopters			4	-	4	-	3	10	21
VII	09.07	1. <i>Coccinella septempunctata</i>	-	2	-	5	3	-	10
		<i>Carabidae</i>	-	-	7	3	2	1	13
TOTAL samples of coleopters			-	2	7	8	5	1	23
VIII	14.07	1. <i>Coccinella septempunctata</i>	-	6	-	2	-	-	8
		<i>Carabidae</i>	-	-	2	-	2	2	6
TOTAL samples of coleopters			-	6	2	2	2	2	14
IX	20.07	1. <i>Propylaea quatordecimpunctata</i>	-	-	-	3	1	2	6
		<i>Carabidae</i>	-	-	-	4	5	1	10
TOTAL samples of coleopters			-	-	-	7	6	3	16
X	25.07	1. <i>Hippodamia variegata</i>	-	-	-	6	2	6	14
		2. <i>Harmonia axyridis</i>	-	-	5	-	-	-	5
		<i>Carabidae</i>	3	-	2	-	-	2	7
TOTAL samples of coleopters			3	-	7	6	2	8	26
XI	01.08	1. <i>Coccinella septempunctata</i>	3	-	-	-	-	-	3
		2. <i>Harmonia axyridis</i>	5	-	-	-	-	-	5
		3. <i>Propylaea quatordecimpunctata</i>	-	3	-	-	-	-	3
TOTAL samples of coleopters			8	3	-	-	-	-	11
XII	07.08	1. <i>Nephus quadrimaculatus</i>	3	-	-	-	-	-	3
		2. <i>Adalia bipunctata</i>	15	-	-	-	-	-	15
		3. <i>Coccinella septempunctata</i>	-	9	-	-	-	-	9
		<i>Carabidae</i>	-	-	4	-	1	-	5
TOTAL samples of coleopters			18	9	4	-	1	-	32
XIII	14.08	1. <i>Coccinella 10-punctata</i>	3	-	-	-	-	-	3
		2. <i>Propylaea quatordecimpunctata</i>	12	-	-	-	-	-	12
		3. <i>Coccinella septempunctata</i>	-	-	-	6	-	-	6
		<i>Carabidae</i>	-	-	-	4	3	2	9
TOTAL samples of coleopters			15	-	-	10	3	2	30
XIV	21.08	1. <i>Coccinella septempunctata</i>	-	7	-	-	-	-	7
		2. <i>Adalia bipunctata</i>	-	-	9	-	-	-	9
		3. <i>Harmonia axyridis</i>	-	-	8	-	-	-	8
TOTAL samples of coleopters			-	7	17	-	-	-	24
XV	01.09	1. <i>Adalia bipunctata</i>	-	-	-	6	-	-	6
		2. <i>Coccinella 10-punctata</i>	-	-	-	7	-	-	7
		3. <i>Coccinella septempunctata</i>	-	-	-	-	4	-	4
		<i>Carabidae</i>	1	-	-	-	1	-	2
TOTAL samples of coleopters			1	-	-	13	5	-	19
Total			362 samples						

For **maize crop**, in 2018, the situation is as follows (*table 2*):

- at the first collection on 03.06, 49 specimens were identified belonging to the order Coleoptera - families: Coccinellidae (27) and Carabidae (22);

- at the second collection dated 07.06 were identified 42 specimens belonging to the order Coleoptera - families: Coccinellidae (22) and Carabidae (20);

- the 47 specimens identified at the third collection on 13.06 belong to the order Coleoptera-families: Carabidae (32) and Coccinellidae (15);

- at the fourth collection on 20.06, 45 specimens belonging to the order Coleoptera – family Carabidae (33) and Coccinellidae (12) were identified;

- the 39 specimens identified at the fifth collection on 30.06 belong to the order Coleoptera: families: Scarabeidae (9), Carabidae (8) and Coccinellidae (22);

- at the sixth collection on 05.07, the 36 specimens belong to the order Coleoptera: the families Carabidae (14) and Scarabidae (4) and Coccinellidae (18);

- at the seventh collection on 09.07, 25 specimens of the order Coleoptera-families were identified: Coccinellidae (19) and Carabidae (6);

- at the eighth collection on 14.07, 27 specimens belonging to the order Coleoptera-families were identified: Scarabeidae (10), Carabidae (6) and Coccinellidae (11);

- at the ninth collection from 20.07 a number of 26 specimens was identified. The order Coleoptera was represented by 5 specimens from the Carabidae family and 21 specimens belonging to the Coccinellidae family;

- at the tenth collection on 25.07, a number of 37 specimens of the order Coleoptera represented by the families: Coccinellidae (30) and Carabidae (7) were identified;

- the 37 specimens identified at the eleventh collection from 01.08.2016 belong to the order Coleoptera-families: Coccinellidae (20), Scarabeidae (12 specimens) and Carabidae (5);

- at the twelfth collection on 07.08, a number of 27 specimens was identified. The order Coleoptera family Carabidae was represented by 6 specimens and the family Coccinellidae by 21 specimens;

- at the thirteenth collection on 14.08, a number of 59 specimens belonging to the order Coleoptera-families Carabidae (18), Scarabeidae (14) and Coccinellidae (27) were identified;

- at the fourteenth collection on 21.08, a number of 19 specimens of the order Coleoptera – families were identified: Carabidae (4) and Coccinellidae (15 specimens);

- at the fifteenth collection on 01.09 a number of 25 specimens was identified. Of the order Coleoptera, the family Carabidae was represented by 4 specimens, while the family Coccinellidae was represented by 21 specimens.

Table 2

Structure, abundance, dynamic of Coleopters sampled within the maize crop-2018

No of harvest	Data	Species	Trap						Total
			1	2	3	4	5	6	
I	03.06	1. <i>Coccinella septempunctata</i>	6	3	-	7	-	-	16
		2. <i>Adalia bipunctata</i>	-	5	-	2	-	4	11
		Carabidae	10	-	7	2	-	3	22
TOTAL samples of coleopters			16	8	7	11	-	7	49
II	07.06	1. <i>Coccinella septempunctata</i>	-	4	-	7	1	-	12
		2. <i>Propylaea quatordecimpunctata</i>	-	-	5	-	3	2	10
		Carabidae	-	-	9	5	4	2	20
TOTAL samples of coleopters			-	4	14	12	8	4	42
III	13.06	1. <i>Harmonia axyridis</i>	2	-	-	-	1	-	3
		2. <i>Propylaea quatordecimpunctata</i>	-	-	-	7	-	-	7
		3. <i>Adalia bipunctata</i>	-	-	-	-	5	-	5
		Carabidae	21	-	7	-	2	2	32
TOTAL samples of coleopters			23	-	7	7	8	2	47
IV	20.06	1. <i>Coccinella septempunctata</i>	3	-	-	-	-	-	3
		2. <i>Adalia bipunctata</i>	-	-	6	-	-	-	6
		3. <i>Harmonia axyridis</i>	-	-	3	-	-	-	3
		Carabidae	27	-	2	-	2	2	33
TOTAL samples of coleopters			30	-	11	-	2	2	45
V	30.06	1. <i>Coccinella var 5-punctata</i>	4	-	-	-	-	-	4
		2. <i>Coccinella septempunctata</i>	-	9	-	-	-	-	9
		3. <i>Coccinella 10-punctata</i>	-	-	6	-	-	-	6
		4. <i>Adalia bipunctata</i>	-	-	3	-	-	-	3
		Carabidae	3	-	3	-	1	1	8
		Scarabaeidae	7	-	2	-	-	-	9
TOTAL samples of coleopters			14	9	14	-	1	1	39

VI	05.07	1. <i>Coccinella septempunctata</i>	12	-	-	-	-	-	12
		2. <i>Coccinella hieroglyphica</i>	-	3	-	-	-	-	3
		3. <i>Adalia bipunctata</i>	-	-	-	-	3	-	3
		<i>Carabidae</i>	-	-	6	4	3	1	14
		<i>Scarabaeidae</i>	4	-	-	-	-	-	4
TOTAL samples of coleopters			16	3	6	4	6	1	36
VII	09.07	1. <i>Coccinella septempunctata</i>	4	7	-	-	-	-	11
		2. <i>Propylaea quatordecimpunctata</i>	-	-	-	-	8	-	8
		<i>Carabidae</i>	3	-	2	1	-	-	6
TOTAL samples of coleopters			7	7	2	1	8	-	25
VIII	14.07	1. <i>Coccinella septempunctata</i>	6	-	-	-	-	-	6
		2. <i>Propylaea quatordecimpunctata</i>	-	5	-	-	-	-	5
		<i>Carabidae</i>	6	-	-	-	-	-	6
		<i>Scarabaeidae</i>	3	-	2	5	-	-	10
TOTAL samples of coleopters			15	5	2	5	-	-	27
IX	20.07	1. <i>Coccinella var.5-punctata</i>	-	-	6	-	-	-	6
		2. <i>Coccinella septempunctata</i>	-	-	-	6	-	-	6
		3. <i>Adalia bipunctata</i>	-	-	-	-	9	-	9
		<i>Carabidae</i>	4	-	-	1	-	-	5
TOTAL samples of coleopters			4	-	6	7	9	-	26
X	25.07	1. <i>Coccinella septempunctata</i>	9	3	-	-	-	-	12
		2. <i>Calvia decemguttata</i>	-	2	-	-	7	-	9
		3. <i>Coccinella 10-punctata</i>	-	3	-	-	-	-	3
		4. <i>Adalia bipunctata</i>	-	-	-	-	6	-	6
		<i>Carabidae</i>	1	-	2	1	1	2	7
TOTAL samples of coleopters			10	8	2	1	14	2	37
XI	01.08	1. <i>Coccinella septempunctata</i>	10	4	-	-	-	-	14
		2. <i>Propylaea quatordecimpunctata</i>	-	6	-	-	-	-	6
		<i>Carabidae</i>	4	1	-	-	-	-	5
		<i>Scarabaeidae</i>	6	-	1	3	2	-	12
TOTAL samples of coleopters			20	11	1	3	2	-	37
XII	07.08	1. <i>Coccinella hieroglyphica</i>	6	-	-	-	-	-	6
		2. <i>Adalia bipunctata</i>	6	-	9	-	-	-	15
		<i>Carabidae</i>	1	-	-	4	-	1	6
TOTAL samples of coleopters			13	-	9	4	-	1	27
XIII	14.08	1. <i>Coccinella septempunctata</i>	12	-	-	-	-	-	12
		2. <i>Adalia bipunctata</i>	9	-	-	-	-	-	9
		3. <i>Coccinella 10-punctata</i>	-	6	-	-	-	-	6
		<i>Carabidae</i>	-	-	11	-	5	2	18
		<i>Scarabaeidae</i>	-	-	7	-	3	4	14
TOTAL samples of coleopters			21	6	18	-	8	6	59
XIV	21.08	1. <i>Coccinella septempunctata</i>	5	-	-	-	-	4	9
		2. <i>Coccinella 10-punctata</i>	3	-	-	-	-	-	3
		3. <i>Coccinella 10-punctata var.subpunctata</i>	3	-	-	-	-	-	3
		<i>Carabidae</i>	1	-	-	1	1	1	4
TOTAL samples of coleopters			12	-	-	1	1	5	19
XV	01.09	1. <i>Coccinella septempunctata</i>	6	-	-	-	-	-	6
		2. <i>Harmonia axyridis</i>	-	6	-	-	-	-	6
		3. <i>Adonia variegata</i>	-	-	9	-	-	-	9
		<i>Carabidae</i>	2	2	-	-	-	-	4
TOTAL samples of coleopters			8	8	9	-	-	-	25
Total			540 specimens						

In the case of cabbage cultivation, in 2018, the situation is as follows (table 3):

- at the first collection on 03.06, 44 specimens belonging to the order Coleoptera – families were identified: Coccinellidae (27), Carabidae (12), Elateridae (5);

- at the second collection on 07.06, 57 specimens of the order Coleoptera-families were identified: Coccinellidae (37), Carabidae (17) and Scarabaeidae (3);

- the 32 specimens identified at the third collection on 13.06 belong to the order Coleoptera represented by the family Coccinellidae. The following species were identified: *Coccinella septempunctata* (11 specimens), *Adalia bipunctata* (9 specimens), *Coccinella 10-punctata* (6 specimens) and *Harmonia axyridis* (6 specimens);

- at the fourth collection on 20.06, 45 specimens belonging to the order Coleoptera represented by the families: Carabidae (20),

Chrysomelidae (10 specimens) and Coccinellidae (15) were identified;

- the 26 specimens identified at the fifth collection on 30.06 belong to the order Coleoptera-families: Coccinellidae (13) and Chrysomelidae (13);

- at the sixth collection on 05.07, 41 specimens were identified belonging to the order Coleoptera represented by the families: Scarabaeidae (5), Carabidae (2) and Coccinellidae (34);

- at the seventh collection on 09.07, 39 specimens of the order Coleoptera represented by the families were identified: Chrysomelidae (12), Carabidae (2), Elateridae (one specimen) and Coccinellidae (24);

- at the eighth collection dated 14.07 from the total of 31 specimens collected belonging to the order Coleoptera-family Carabidae (12) and family Coccinellidae (19);

- at the ninth collection on 20.07, a number of 49 specimens of the order Coleoptera-families were identified: Carabidae (2), Chrysomelidae (11) and Coccinellidae (36);

- at the tenth collection on 25.07, a number of 31 specimens of the order Coleoptera-families were identified: Carabidae (2), Elateridae (3) and Coccinellidae (26);

- the 59 specimens identified at the eleventh collection from 01.08. belong to the order Coleoptera-families: Carabidae (32) and Coccinellidae (27);

- at the twelfth collection on 07.08, a number of 63 specimens belonging to the order Coleoptera-families were identified: Carabidae (24), Elateridae (3) and Coccinellidae (36);

- at the thirteenth collection on 14.08, a number of 41 specimens belonging to the order Coleoptera-families were identified: Carabidae (13) and Coccinellidae (28);

- at the fourteenth collection on 21.08, a number of 49 specimens were identified that belonged to the order Coleoptera-families: Carabidae (14) and Coccinellidae (35);

- at the fifteenth collection on 01.09, a number of 42 specimens were identified that belonged to the order Coleoptera-families: Carabidae (22) and Coccinellidae (20);

Table 3

Structure, abundance, dynamic of Coleopteras sampled within the cabbage crop-2018-Barber traps

No of harvest	Data	Species	Trap						Total
			1	2	3	4	5	6	
I	03.06	1. <i>Coccinella septempunctata</i>	5	-	9	-	1	-	15
		2. <i>Harmonia axyridis</i>	-	3	2	-	-	2	7
		3. <i>Propylaea quatordecimpunctata</i>	5	-	-	-	-	-	5
		Carabidae	5	-	-	4	-	3	12
		Elateridae	1	-	-	3	1	-	5
TOTAL samples of coleopters			16	3	11	7	2	5	44
II	07.06	1. <i>Coccinella septempunctata</i>	-	2	-	5	-	-	7
		2. <i>Coccinella 10-punctata</i>	-	6	-	-	5	-	11
		3. <i>Harmonia axyridis</i>	-	-	9	-	-	-	9
		4. <i>Adalia bipunctata</i>	-	-	5	-	-	-	5
		5. <i>Calvia decemguttata</i>	-	-	-	4	1	-	5
		Carabidae	4	3	1	-	3	6	17
		Scarabaeidae	3	-	-	-	-	-	3
TOTAL samples of coleopters			7	11	15	9	9	6	57
III	13.06	1. <i>Coccinella septempunctata</i>	-	9	-	2	-	-	11
		2. <i>Coccinella 10-punctata</i>	-	-	-	6	-	-	6
		3. <i>Adalia bipunctata</i>	-	3	-	-	-	6	9
		4. <i>Harmonia axyridis</i>	-	-	-	-	6	-	6
TOTAL samples of coleopters			-	12	-	8	6	6	32
IV	20.06	1. <i>Adalia bipunctata</i>	-	3	3	-	-	-	6
		2. <i>Propylaea quatordecimpunctata</i>	-	6	-	-	-	3	9
		Carabidae	6	-	7	-	5	2	20
		Chrysomelidae	2	-	6	-	-	2	10
TOTAL samples of coleopters			8	9	16	-	5	7	45
V	30.06	1. <i>Adalia bipunctata</i>	4	-	-	-	-	-	4
		2. <i>Propylaea quatordecimpunctata</i>	-	9	-	-	-	-	9
		Chrysomelidae	-	-	-	-	9	4	13
TOTAL samples of coleopters			4	9	-	-	9	4	26
VI	05.07	1. <i>Coccinella septempunctata</i>	-	-	9	-	-	-	9
		2. <i>Coccinella 10-punctata</i>	-	-	4	-	-	-	4
		3. <i>Propylaea quatordecimpunctata</i>	-	-	-	15	-	-	15
		4. <i>Harmonia axyridis</i>	-	-	-	6	-	-	6

No of harvest	Data	Species	Trap						Total
			1	2	3	4	5	6	
		<i>Carabidae</i>	2	-	-	-	-	-	2
		<i>Scarabaeidae</i>	2	-	2	-	-	1	5
TOTAL samples of coleopters			4	-	15	21	-	1	41
VII	09.07	1. <i>Coccinella septempunctata</i>	-	12	-	-	-	-	12
		2. <i>Adalia bipunctata</i>	9	-	-	-	-	-	9
		3. <i>Coccinella 10-punctata var.subpunctata</i>	-	3	-	-	-	-	3
		<i>Carabidae</i>	-	-	2	-	-	-	2
		<i>Chrysomelidae</i>	9	-	1	2	-	-	12
		<i>Elateridae</i>	-	-	1	-	-	-	1
TOTAL samples of coleopters			18	15	4	2	-	-	39
VIII	14.07	1. <i>Coccinella septempunctata</i>	-	8	-	-	-	-	8
		2. <i>Hippodamia variegata</i>	-	5	-	-	-	-	5
		3. <i>Propylaea quatordecimpunctata</i>	-	-	6	-	-	-	6
		<i>Carabidae</i>	-	-	4	-	3	5	12
TOTAL samples of coleopters			-	13	10	-	3	5	31
IX	20.07	1. <i>Coccinella septempunctata</i>	9	-	-	-	-	-	9
		2. <i>Adalia bipunctata</i>	9	-	-	-	-	-	9
		3. <i>Harmonia axyridis</i>	-	3	-	-	-	-	3
		4. <i>Propylaea quatordecimpunctata</i>	-	-	15	-	-	-	15
		<i>Carabidae</i>	1	1	-	-	-	-	2
		<i>Chrysomelidae</i>	4	-	4	-	2	1	11
TOTAL samples of coleopters			23	4	19	-	2	1	49
X	25.07	1. <i>Coccinella septempunctata</i>	8	-	6	-	-	-	14
		2. <i>Adalia bipunctata</i>	9	-	-	-	-	-	9
		3. <i>Harmonia axyridis</i>	-	-	3	-	-	-	3
		<i>Carabidae</i>	-	-	-	-	2	-	2
		<i>Elateridae</i>	-	-	2	-	1	-	3
TOTAL exemplare coleoptere			17	-	11	-	3	-	31
XI	01.08	1. <i>Coccinella 10-punctata</i>	-	5	-	-	-	-	5
		2. <i>Adalia bipunctata</i>	-	4	-	-	-	-	4
		3. <i>Propylaea quatordecimpunctata</i>	-	-	6	-	-	-	6
		4. <i>Harmonia axyridis</i>	-	-	-	12	-	-	12
		<i>Carabidae</i>	-	-	-	17	8	7	32
TOTAL samples of coleopters			-	9	6	29	8	7	59
XII	07.08	1. <i>Coccinella septempunctata</i>	-	-	-	-	10	-	10
		2. <i>Harmonia axyridis</i>	-	-	-	-	6	-	6
		3. <i>Adalia bipunctata</i>	-	-	-	-	-	5	5
		4. <i>Coccinella 10-punctata var subpunctata</i>	-	-	-	-	-	6	6
		5. <i>Propylaea quatordecimpunctata</i>	-	-	-	-	-	9	9
		<i>Carabidae</i>	11	-	-	-	7	6	24
<i>Elateridae</i>	2	-	1	-	-	-	3		
TOTAL samples of coleopters			13	-	1	-	23	26	63
XIII	14.08	1. <i>Coccinella septempunctata</i>	-	-	8	6	-	-	14
		2. <i>Harmonia axyridis</i>	-	-	-	-	8	-	8
		3. <i>Adalia bipunctata</i>	-	-	6	-	-	-	6
		<i>Carabidae</i>	-	9	-	1	3	-	13
TOTAL samples of coleopters			-	9	14	7	11	-	41
XIV	21.08	1. <i>Coccinella septempunctata</i>	-	-	6	-	-	-	6
		2. <i>Adalia bipunctata</i>	-	12	-	-	-	-	12
		3. <i>Coccinella 10-punctata</i>	-	-	5	-	-	-	5
		4. <i>Harmonia axyridis</i>	-	-	6	-	6	-	6
		<i>Carabidae</i>	8	-	3	3	-	-	14
TOTAL samples of coleopters			8	12	20	3	6	-	49
XV	01.09	1. <i>Coccinella septempunctata</i>	-	-	7	-	-	-	7
		2. <i>Adalia bipunctata</i>	3	6	-	-	-	-	9
		3. <i>Harmonia axyridis</i>	-	-	-	4	-	-	4
		<i>Carabidae</i>	11	8	-	2	-	1	22
TOTAL samples of coleopters			14	14	7	6	-	1	42
Total			649 samples						

CONCLUSIONS

In 2018, in 15 harvesting of entomological material were performed for each culture studied, being identified a number of 1551 specimens.

- In the **apple culture**, 362 specimens were identified, most belonging to the species: *Coccinella septempunctata*; *Adalia bipunctata* and *Propylaea quatordecimpunctata*; *Hippodamia variegata*, *Harmonia axyridis*, *Coccinella 10-punctata* and *Carabidae*.

- In maize crop, 540 specimens were identified, most belonging to the species: *Coccinella septempunctata*; *Adalia bipunctata*, *Propylaea quatordecimpunctata*, *Coccinella var 5-punctata*, *Coccinella 10-punctata*, *Coccinella hieroglyphica*, *Calvia decemguttata*, *Carabidae* and *Scarabaeidae*.

- In the **cabbage culture**, 649 specimens were identified, most belonging to the species: *Coccinella septempunctata*, *Adalia bipunctata*, *Harmonia axyridis*, *Coccinella 10-punctata*, *Carabidae*, and *Elateridae*

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