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# Research on coccinelids species in some agricultural crops and their role in agroecosystems

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**Abstract** The material was collected from wheat and corn fields on the Ezareni Iasi farm. In this stationary crops were 15th harvested between June and September 2017 and in 2018 the harvest period was from May to July, where the salt solution 25% was completed or replaced and the biological material collected was brought to the laboratory. From the biological material collected, the species of "ladybugs" were retained, which were then determined and centralized. During the whole period of observations 2017-2018, 858 samples of "lady bugs" were collected, belonging to 14 species. On crops, the situation as a result of the 15 harvests was as follows: on wheat in 2017 we totaled 261 of the 8 species collected, in 2018 the total number of specimens was 131. In the maize crop as a result of collection the data pesented that in 2017 the number of coccnelidae was 312 and in 2018 the number was 285. Analyzing the collected material, it was found that the species most frequently collected were: *Coccinella septempunctata, Propylaea quatordecimpunctata*, *Harmonia axyridis, Coccinella var.5-punctata, Adalia bipunctata, Coccinella hieroglyphic* and *Coccinella 10-punctata*.

**Key words**

wheat crops, maize crop, „lady bug"

In the present context, in our country there is a special emphasis on the development of agriculture, which implies getting production as big as possible but qualitatively at a lower production cost.
According to the FAO 2015, crop-related crops and crops losses amount to about 35% of world production, and therefore more rigorous. The plant protection measures are required, even to the extent that the productive potential of agricultural plants The base would remain stationary [1, 4].
The populations of "ladybugs" fluctuate from one year to the next. The species are very different, they prefer different food and habitats.
In the context of biological control, coccinelids have been widely used in the control for two centuries (1815), the method of use of these predators has remained almost unchanged over time.
The principle of their use in the population reduction of harmful species and is based on their protection in the natural environment, by a selection of pesticides used to control of aphids or other species [2, 6].

## Material and Method

The soil traps type Barber were used to collect the biological material. These consisted in the introduction into the soil of recipients in which a solution of salt (NaCl- 25%).
The experience was organized in wheat and maize fields, which belongs to the Ezareni stationary, from Iasi country. The placement of the traps has been done on two rows at a distance of 12 m between the rows and 6 meters from the traps by three per row [5, 10]. The gathering of the entomological material was done between June of September at intervals of 10-20 days. At each harvest, the insects collected from each trap were put into gauze cloth, each sample separately, and the liquid in the trap was replaced or filled. The material was then labeled, on the label specifying: the date of collection; trap number and the stationary. In the laboratory, the material was cleaned from plant debris and then washed under the jet of water, selected by order, family, or species of "lady bugs".
As for the data interpretation, a number of ecological indices have been calculated as follows: abundance, constancy, dominance, and ecological significance.
**Abundance (A)** – Expresses the number of collected specimens.
**Constance (C)** - represent the number of samples in which the species appears, based on the number of samples taken, according to the formulate:

$$C_A = \frac{N_p \cdot A \cdot 100}{N_p}$$

$C_A$- constance of species;
$N_pA$ - the number of traps in which species A appears;
$N_p$ - total number of traps with 4 classes of constants:
$C_1$ - accidental species (1–2%);
$C_2$ - accessory species (25.1–50%);
$C_3$ - constant species (50.1–75%);
$C_4$ - euconstant species (75.1–100%).

**Dominance (D)** Is the total number of samples relative to the total number of individuals harvested according to the formula:

$$D_A - \frac{N_A \cdot 100}{N_t}$$

$D_A$ - constance of the A;
$N_A$ - total number the samples of A species;
$N_t$ - total number of samples for all species with 5 dominance classes:
$D_1$ - subrecedent (< 1.1%);
$D_2$ - recedent (1,1–2%);
$D_3$ - subdominant (2,1–5%);
$D_4$ - dominant (5.1–10%);
$D_5$ - eudominant (above 10%).

**The Significance Ecological Index (W)** by formulate:

$$W_A = \frac{C_A \cdot D_A \cdot 100}{10000}$$

$W_A$- ecological significance index of the A species;
$C_A$- constance of the A species;
$D_A$- dominance of the A species, with 5 clases:
$W_1$ - Less than 0.1% (Accidental species);
$W_2$ - 0.1–1%;
$W_3$ - 1.1-5% (Accompanying species);
$W_4$ - 5.1-10%;
$W_5$ - above 10% (Edifying species)

The Ecological Significance Index is used to deepen the interrelationships between constancy and dominance, emphasizing even more clearly the structure of some species, reflecting its importance in the analyzed field.

The material thus labeled was brought to the laboratory, then was cleaned of all plant debris, and then from the collected material were selected only „lady bug"species.

As a methodological and theoretical-scientific support for the investigations carried out, they served the fundamental works and research of the many authors [1, 3, 9, 11].

## Results and Discussions

**The structure, abundance and dynamics of *Coccinellidae* entomofauna collected using soil traps type Barber in 2017 from wheat and maize crop**

In the research year 2017, 15th regular collections of biological material were carried out on wheat and maize crops on dates presented in ***Material and Method.***

**In the wheat crop, in 2017**, the situation regarding the structure of lady bugs (*Coleoptera-Coccinellidae*) collected **from the wheat crop** is presented in table 1.

Table 1

**Structure of coccinelids sampled by the mean of Baber traps-Ezareni-Wheat crop**

| No. | Name of species | Number of specimens |
|---|---|---|
| 1. | *Coccinella septempunctata* | 92 |
| 2. | *Propylaea quatordecimpunctata* | 72 |
| 3. | *Harmonia axyridis* | 36 |
| 4. | *Adalia bipunctata* | 23 |
| 5. | *Coccinella 10-punctata* | 20 |
| 6. | *Coccinella hieroglyphica* | 10 |
| 7. | *Hippodamia variegata* | 5 |
| 8. | *Coccinella 10-punctata var.subpunctata* | 3 |
| | **TOTAL SPECIES = 8 species** | **261** |

The coccinelids account for 45.23% of the total number of colected beetles. A number of 8 species of coccinelids were identified, the most abundant being *Coccinella septempuntata* (92 specimens), followed by *Propylaea quatordecimpunctata* (72 specimens) and *Harmonia axyridis* (36 specimens) (Table 2).

Table 2

**Entomofauna of *Coccinellidae* on total harvests depending on Coleopteras number–Barber-Wheat crop**

| Species of *Coccinelidae* | No. of specimens | Total coccinelids | Total coleopters | % of total coleopters | No. of harvesting |
|---|---|---|---|---|---|
| *Coccinella septempunctata* | 92 | 261 | 577 | 45,23% | 15 |
| *Propylaea quatordecimpunctata* | 72 | | | | |
| *Harmonia axyridis* | 36 | | | | |
| *Adalia bipunctata* | 23 | | | | |
| *Coccinella 10-punctata* | 20 | | | | |
| *Coccinella hieroglyphica* | 10 | | | | |
| *Hippodamia variegata* | 5 | | | | |
| *Coccinella 10-punctata var subpunctata* | 3 | | | | |
| **TOTAL = 8 species** | **261** | | | | |

Regarding the dynamics of the species of *Coccinelidae* collected from the wheat crop in 2017, using soil traps type Barber, it is shown in the figures 1 and 2.

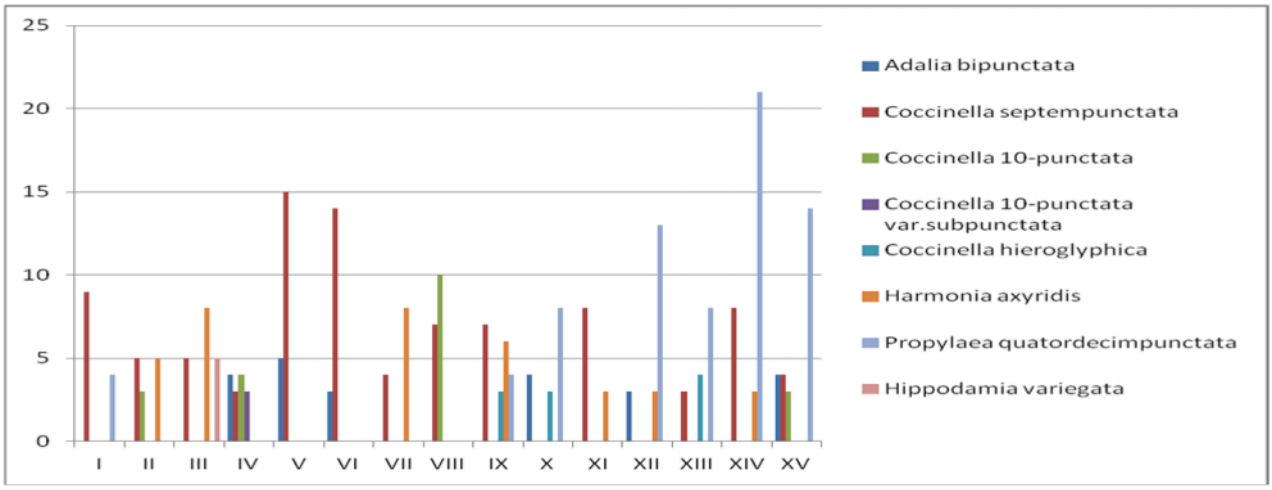


Fig. 1. Dynamic of each coccinelids species within wheat crop

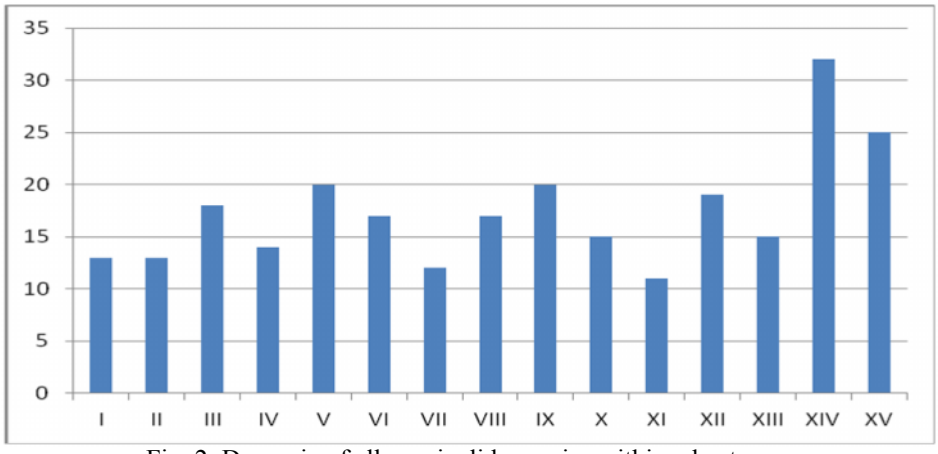


Fig. 2. Dynamic of all coccinelids species within wheat crop

In 2017, 261 specimens belonging to 8 species of *Coleoptera-Coccinellidae* were collected in the Ezăreni stationary for wheat cultivation using the Barber soil traps method.

For the purpose of interpreting the results obtained, were calculated ecological indices: abundance (A), constancy (C), dominance (D) and ecological significance index (W). The values of these indices in 2017 for the wheat crop are shown in table 3. The highest abundance was the species: *Coccinella septempunctata* (92 specimens), *Propylea quatordecimguttata* (72 specimens) and *Harmonia axyrides* (36 specimens).

Table 3

**Values of ecological indices for *Coccinellidae* species on total harvests-Barber-wheat crop**

| No. | Name of species | ECOLOGICAL INDICES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | C | | D | | W | |
| | | | % | clasa | % | clasa | % | clasa |
| 1 | *Coccinella septempunctata* | 92 | 18,9 | $C_1$ | 35.2 | $D_5$ | 6,6528 | $W_4$ |
| 2 | *Propylea quatordecimguttata* | 72 | 13,3 | $C_1$ | 27,5 | $D_5$ | 3,6575 | $W_3$ |
| 3 | *Harmonia axyridis* | 36 | 8,89 | $C_1$ | 13.8 | $D_5$ | 1,2268 | $W_3$ |
| 4 | *Adalia bipunctata* | 23 | 6,66 | $C_1$ | 8,8 | $D_4$ | 0,5861 | $W_2$ |
| 5 | *Coccinella 10-punctata* | 20 | 5,55 | $C_1$ | 7,7 | $D_4$ | 0,4273 | $W_2$ |
| 6 | *Coccinella hieroglyphica* | 10 | 2,22 | $C_1$ | 3,8 | $D_3$ | 0,0844 | $W_1$ |
| 7 | *Hippodamia variegata* | 5 | 1,11 | $C_1$ | 1,9 | $D_2$ | 0,0211 | $W_1$ |
| 8 | *Coccinella 10-punctata var subpunctata* | 3 | 1,11 | $C_1$ | 1,1 | $D_2$ | 0,0122 | $W_1$ |
| | **TOTAL = 8 species** | **261** | | | | | | |

The consistancy of the collected *Coccinellidae* species ranged in values between 1.11 and 18.9% and the species with the highest values were: *Coccinella septimepuntata* (18.9%), followed by the *Prophetea quatordecimguttata* (13.3%) and *Harmonia axyrides* (8.89%) -all of which are accidental species. Dominance had the highest values in the *Coccinella septempunctata* (35.2%), *Propylea quatordecimguttata* (27.5%) and *Harmonia axyrides* (13.8%), these species being eudominant. The ecological significance index (W) registered values between 0.0122% and 6.6528%, with the highest value occurring in the species *Coccinella septhempuntata* characteristic species.

**B. In the maize crop in 2017,** the situation regarding the structure of „lady bugs" (*Coleoptera-Coccinellidae*) collected **from the maize crop** is presented by the data in table 4.

Table 4

**Structure of coccinelids sampled by the mean of soil traps Ezăreni-Maize crop**

| No. | Name of species | Number of specimens |
|---|---|---|
| 1. | *Propylaea quatordecimpunctata* | 105 |
| 2. | *Coccinella septempunctata* | 79 |
| 3. | *Harmonia axyridis* | 51 |
| 4. | *Coccinella 10-punctata* | 18 |
| 5. | *Adalia bipunctata* | 16 |
| 6. | *Coccinella var.5-punctata* | 13 |
| 7. | *Calvia decemguttata* | 8 |
| 8. | *Hippodamia variegata* | 7 |
| 9. | *Coccinella hieroglyphica* | 7 |
| 10. | *Coccinella 10-punctata var.subpunctata* | 5 |
| 11. | *Nephus quadrimaculatus* | 3 |
| **TOTAL SPECIES = 11 species** | | **312** |

The coccinelids account for 44.19 % of the total number of beetles. A number of 11 species of coccinelides were identified, the most abundant being: *Propylaea quatordecimpuntata* (105 specimens) followed by *Coccinella septimepunctata* (79 specimens) and *Harmonia axyridis* (51 specimens) (Table 5).

Table 5

**Entomofauna of *Coccinellidae* on total harvests depending on Coleopteras number-Barber-Maize**

| Species of *Coccinelidae* | No. of specimens | Total coccinelids | Total coleopters | % of total coleopters | No. of harvesting |
|---|---|---|---|---|---|
| *Propylaea quatordecimpunctata* | 105 | 312 | 706 | 44.19% | 15 |
| *Coccinella septempunctata* | 79 | | | | |
| *Harmonia axyridis* | 51 | | | | |
| *Coccinella 10-punctata* | 18 | | | | |
| *Adalia bipunctata* | 16 | | | | |
| *Coccinella var 5-punctata* | 13 | | | | |
| *Calvia decemguttata* | 8 | | | | |
| *Hippodamia variegata* | 7 | | | | |
| *Coccinella hieroglyphica* | 7 | | | | |
| *Coccinella 10-punctata* var. *subpunctata* | 5 | | | | |
| *Nephus quadrimaculatus* | 3 | | | | |
| **TOTAL = 11 species** | 312 | | | | |

Regarding the dynamics of *Coccinelidae* species collected from maize crop in 2017, using the of soil traps type Barber, this is presented in Figures 3 and 4.

In 2017, in the Ezăreni stationary in corn field, using the soil traps type Barber method, were collected 312 specimens belonging to 11 species of *Coccinellidae*.

For the purpose of interpreting the results obtained, ecological indices were calculated: abundance (A), constancy (C), dominance (D) and ecological significance index (W).

The values of these indices in 2017 for maize crops are preseted in table 6.

The greatest abundance have the species: *Propylea quatordecimpunctata* (105 specimens), *Coccinella septempunctata* (79 specimens) and *Harmonia axyridis* (51 specimens).

The consistancy of the species of Coccinellidae collected had values between 1.11 and 17.8 % and the species with the highest values were: *Propylea quatordecimpuntata* (17.8%), followed by the species

*Coccinella septempunctata* (11.1%) and *Harmonia axyrides* (11.1%) -all of which are accidental species.
Dominance had the highest values in the species *Propylea quatordecimpuntata* (33.6%), *Coccinella septempunctata* (25.3%) and *Harmonia axyrides* (16.3%), these species being eudominant.

The ecological significance index (W) registered values between 0.0111% and 5.9808%, with the highest value occurring in the species *Propylea quatordecipuntata* - characteristic species.

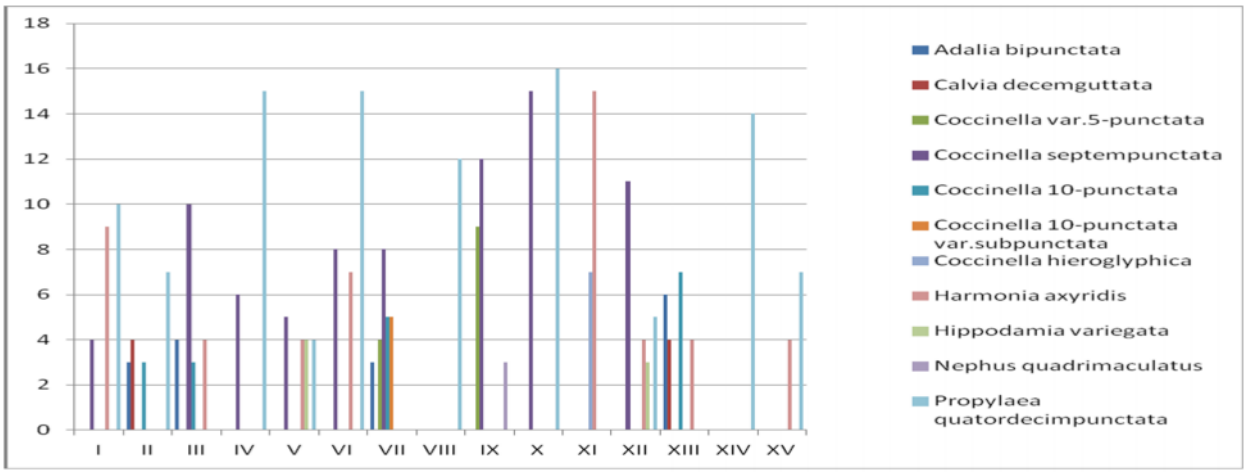


Fig. 3. Dynamic of each coccinelids species within maize crop

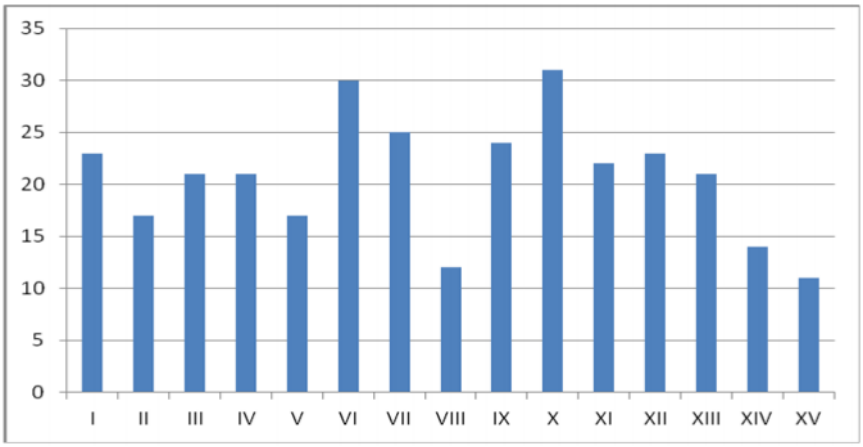


Fig. 4. Dynamic of all coccinelids species within maize crop

Table 6

**Values of the ecological indices for *Coccinellidae* species on total harvests within maize-Barber**

| No. | Name of species | ECOLOGICAL INDICES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | C | | D | | W | |
| | | | % | Class | % | Class | % | Class |
| 1 | *Propylea quatordecimpunctata* | 105 | 17,8 | $C_1$ | 33,6 | $D_5$ | 5,9808 | $W_4$ |
| 2 | *Coccinella septempunctata* | 79 | 11,1 | $C_1$ | 25,3 | $D_5$ | 2,8083 | $W_3$ |
| 3 | *Harmonia axyridis* | 51 | 11,1 | $C_1$ | 16,3 | $D_5$ | 1,8093 | $W_3$ |
| 4 | *Coccinella 10-punctata* | 18 | 4,44 | $C_1$ | 5,8 | $D_4$ | 0,2575 | $W_2$ |
| 5 | *Adalia bipunctata* | 16 | 4,44 | $C_1$ | 5,1 | $D_4$ | 0,2264 | $W_2$ |
| 6 | *Coccinella var 5 punctata* | 13 | 3,33 | $C_1$ | 4,2 | $D_3$ | 0,1399 | $W_2$ |
| 7 | *Calvia decemguttata* | 8 | 2,22 | $C_1$ | 2,6 | $D_3$ | 0,0577 | $W_1$ |
| 8 | *Hippodamia variegata* | 7 | 2,22 | $C_1$ | 2,2 | $D_3$ | 0,0488 | $W_1$ |
| 9 | *Coccinella hieroglyphica* | 7 | 1,11 | $C_1$ | 2,2 | $D_3$ | 0,0244 | $W_1$ |
| 10 | *Coccinella 10-punctata var subpunctata* | 5 | 1,11 | $C_1$ | 1,6 | $D_2$ | 0,0178 | $W_1$ |
| 11 | *Nephus quadrimaculatus* | 3 | 1,11 | $C_1$ | 1 | $D_1$ | 0,0111 | $W_1$ |
| | **TOTAL = 11 species** | **312** | | | | | | |

**Comparative structure of Coccinelidae species in the two crops in 2017**

Analyzing the results obtained in the 2017 research year in the Ezăreni stationary in the wheat and maize crops studied using the Barber soil trap method it can be observed that: (Table 7)

- A total of 11 species with 573 specimens were identified in the two crops studied, the highest number of specimens identified was in maize cultivation (312 specimens).
- The most abundant species was *Propylaea quatordecimpunctata* with a total of 177 specimens in the two cultures studied. The highest number of specimens was identified in maize cultivation (105 specimens), with dominance of 33.6%.
- For the species *Coccinella septempunctata* the total number of specimens identified was 171 specimens, the hightest being identified in the wheat crop (92 specimens), the dominance being 35.2%;
- For the species *Harmonia axyridis* the total number of specimens identified was 87 specimens, the highest number being identified in maize cultivation (51 specimens), with dominance of 16.3%.

Table 7

**Abundance and dominance of *Coccinellidae* species within wheat and maize crops-Ezăreni-Barber-2017**

| No. | Name species | Wheat crop | | Maize crop | | Total |
|---|---|---|---|---|---|---|
| | | A | D(%) | A | D(%) | A |
| 1 | *Propylaea quatordecimpunctata* | 72 | 27,5 | 105 | 33,6 | 177 |
| 2 | *Coccinella septempunctata* | 92 | 35,2 | 79 | 25,3 | 171 |
| 3 | *Harmonia axyridis* | 36 | 13,8 | 51 | 16,3 | 87 |
| 4 | *Adalia bipunctata* | 23 | 8,8 | 16 | 5,1 | 39 |
| 5 | *Coccinella 10-punctata* | 20 | 7,7 | 18 | 5,8 | 38 |
| 6 | *Coccinella hieroglyphica* | 10 | 3,8 | 7 | 2,2 | 17 |
| 7 | *Coccinella var 5 punctata* | - | - | 13 | 4,2 | 13 |
| 8 | *Hippodamia variegata* | 5 | 1,9 | 7 | 2,2 | 12 |
| 9 | *Calvia decemguttata* | - | - | 8 | 2,6 | 8 |
| 10 | *Coccinella 10 punctata var subpunctata* | 3 | 1,1 | 5 | 1,6 | 8 |
| 11 | *Nephus quadrimaculatus* | - | - | 3 | 1 | 3 |
| | **TOTAL = 11 species** | **261** | | **312** | | **573** |

**Structure, abundance and dynamics of the Coleoptera-Coccinellidae entomofauna collected in 2018 from wheat and maize crops**

In **2018 research** year, were carried out 15 periodic collections of biological material on wheat and maize crops on dates presented in ***Material and method.***

**A. In the wheat crop, in 2018,** the situation regarding the structure of coccinels (*Coleoptera*, *Coccinellidae*) collected from **the wheat crop** is presented in the table 8.

Table 8

**Structure of coccinelids sampled by the mean of Barber traps within Ezăreni-Wheat**

| No. | Name of species | Number of samples |
|---|---|---|
| 1. | *Adalia bipunctata* | 28 |
| 2. | *Coccinella septempunctata* | 25 |
| 3. | *Harmonia axyridis* | 21 |
| 4. | *Propylaea quatordecimpunctata* | 14 |
| 5. | *Coccinella 10-punctata* | 13 |
| 6. | *Coccinella hieroglyphica* | 11 |
| 7. | *Coccinella var.5-punctata* | 7 |
| 8. | *Halyzia 22-punctata* | 4 |
| 9. | *Calvia decemguttata* | 3 |
| 10. | *Hippodamia variegata* | 3 |
| 11. | *Coccinella 10-punctata var.subpunctata* | 2 |
| | **TOTAL SPECIES = 11 species** | **131** |

The coccinelids account for 31.41% of the total number of colected beetles. A number of 11 species of *Coccinelidae* were identified, the most abundant being *Adalia bipunctata* (28 specimens), followed by *Coccinella septempunctata* (25 specimens) and *Harmonia axyridis* (21 specimens) (Table 9).

Table 9

**Entomofauna of *Coccinellidae* on total harvests depending on Coleopteras number –Wheat-Barber**

| Species of *Coccinelidae* | No. of specimens | Total coccinelids | Total coleopters | % of total coleopters | No. of harvesting |
|---|---|---|---|---|---|
| *Adalia bipunctata* | 28 | 131 | 417 | 31,41% | 15 |
| *Coccinella septempunctata* | 25 | | | | |
| *Harmonia axyridis* | 21 | | | | |
| *Propylaea quatordecimpunctata* | 14 | | | | |
| *Coccinella 10-punctata* | 13 | | | | |
| *Coccinella hieroglyphica* | 11 | | | | |
| *Coccinella var.5-punctata* | 7 | | | | |
| *Halyzia 22-punctata* | 4 | | | | |
| *Calvia decemguttata* | 3 | | | | |
| *Hippodamia variegata* | 3 | | | | |
| *Coccinella 10-punctata var.subpunctata* | 2 | | | | |
| **TOTAL = 11 species** | **131** | | | | |

Regarding the dynamics of coccinelid species collected from the wheat crop in 2018, using Barber soil traps, this is shown in figures 5 and 6.

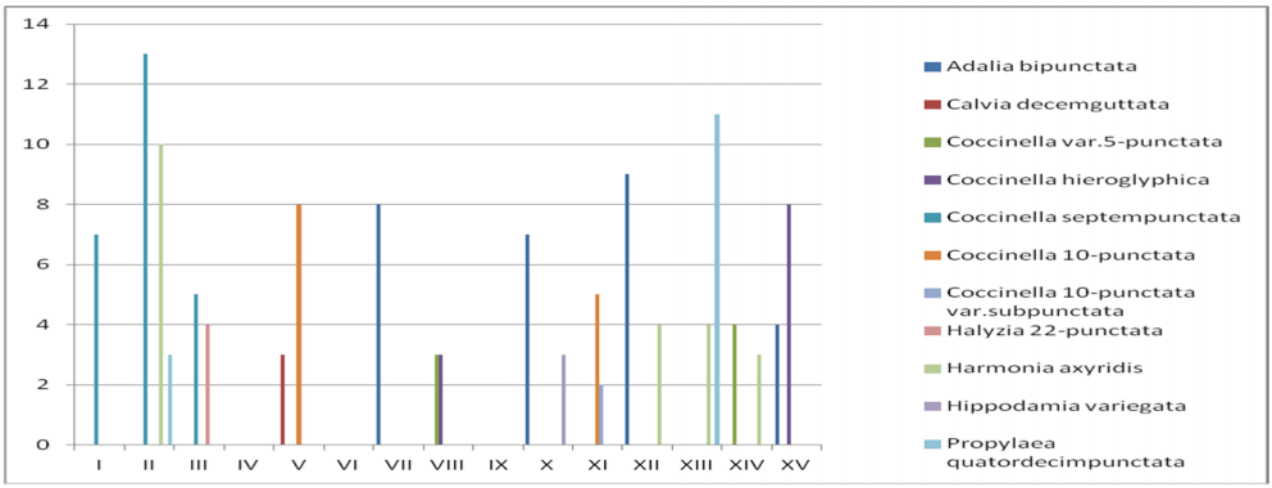


Fig. 5. Dynamic of each coccinelids species within wheat crop

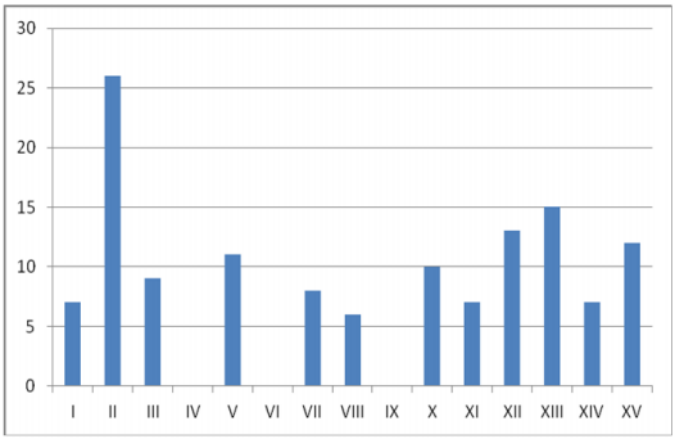


Fig. 6. Dynamic of all coccinelids species within wheat crop

In 2018, 131 specimens belonging to 11 Coccinellidae species were collected in the Ezăreni stationary for wheat crop using the Barber soil traps method.

For the purpose of interpreting the results obtained, ecological indices were calculated: abundance (A), constancy (C), dominance (D) and ecological significance index (W). The values of these indices in 2018 for the wheat crop are shown in table 10.

Table 10

**Values of the ecological indices for *Coccinellidae* species on total harvests within wheat crop-Barber**

| No. | Name of species | ECOLOGICAL INDICES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | C | | D | | W | |
| | | | % | Clasa | % | Clasa | % | clasa |
| 1. | *Adalia bipunctata* | 28 | 12,22 | $C_1$ | 21,37 | $D_5$ | 2,6114 | $W_3$ |
| 2. | *Coccinella septempunctata* | 25 | 8,89 | $C_1$ | 19,1 | $D_5$ | 1,6979 | $W_3$ |
| 3. | *Harmonia axyridis* | 21 | 11,11 | $C_1$ | 16,03 | $D_5$ | 1,7809 | $W_3$ |
| 4. | *Propylaea quatordecimpunctata* | 14 | 4,44 | $C_1$ | 10,7 | $D_5$ | 0,4751 | $W_2$ |
| 5. | *Coccinella 10-punctata* | 13 | 7,78 | $C_1$ | 9,92 | $D_4$ | 0.7718 | $W_2$ |
| 6. | *Coccinella hieroglyphica* | 11 | 6,66 | $C_1$ | 8,39 | $D_4$ | 0,5588 | $W_2$ |
| 7. | *Coccinella var.5-punctata* | 7 | 4,44 | $C_1$ | 5,34 | $D_4$ | 0,2371 | $W_2$ |
| 8. | *Halyzia 22-punctata* | 4 | 2,22 | $C_1$ | 3,05 | $D_3$ | 0,0678 | $W_1$ |
| 9. | *Calvia decemguttata* | 3 | 2,22 | $C_1$ | 2,29 | $D_3$ | 0,0508 | $W_1$ |
| 10. | *Hippodamia variegata* | 3 | 2,22 | $C_1$ | 2,29 | $D_3$ | 0,0508 | $W_1$ |
| 11. | *Coccinella 10-punctata var.subpunctata* | 2 | 2,22 | $C_1$ | 1,52 | $D_2$ | 0,0337 | $W_1$ |
| | **Total 11 species** | **131 specimens** | | | | | | |

The highest abundance was the species: *Adalia bipunctata* (28 specimens), *Coccinella septempunctata* (25 specimens) and *Harmonia axyrides* (21 specimens). The constancy of the collected coccinelids species ranged from 2.22 to 12.22 % and the species with the highest values were: *Adalia bipunctata* (12.22%), followed by *Harmonia axyridis* (11.11%) and *Coccinella septempunctata* (8.89%) -all being accidental species. Dominance had the highest values in the species *Adalia bipunctata* (21.37%), *Coccinella septempunctata* (19.1%), *Harminia axyrides* (16.03%), these species being eudominant.

The ecological significance index (W) registered values between 0.0337% and 2.6114%, with the highest value being recorded in the species *Adalia bipunctata*-accessory species.

**In maize crop in 2018**, the situation regarding the structure of coccinelids (*Coleoptera-Coccinellidae*) collected **from maize crop** is shown in table 11.

Table 11

**Structure of coccinelids sampled by the mean of soil traps-Ezăreni-Maize crop**

| No. | Name of species | Number of samples |
|---|---|---|
| 1. | *Coccinella septempunctata* | 68 |
| 2. | *Propylaea quatordecimpunctata* | 36 |
| 3. | *Harmonia axyridis* | 16 |
| 4. | *Coccinella var.5-punctata* | 8 |
| 5. | *Adalia bipunctata* | 7 |
| 6. | *Coccinella hieroglyphica* | 5 |
| 7. | *Coccinella 10-punctata var.subpunctata* | 4 |
| 8. | *Calvia decemguttata* | 3 |
| 9. | *Nephus quadrimaculatus* | 3 |
| 10. | *Halyzia 14-punctata* | 2 |
| 11. | *Scymnus interruptus* | 2 |
| | **TOTAL SPECIES = 11** | **154** |

The coccinelid species account for 36.32% of the total number of beetles. A number of 11 species of coccinelide were identified, the most abundant being Coccinella septempunctata (68 specimens) followed by Propylaea quatordecimpunctata (36 specimens) and Harmonia axyridis (16 specimens) (Table 12).

Table 12

**Entomofauna of *Coccinellidae* on total harvests depending on Coleopteras number-Maize crop**

| Species of *Coccinelidae* | No. of specimens | Total coccinelids | Total coleopters | % of total coleopters | No. of harvesting |
|---|---|---|---|---|---|
| *Coccinella septempunctata* | 68 | 154 | 424 | 36,32% | 15 |
| *Propylaea quatordecimpunctata* | 36 | | | | |
| *Harmonia axyridis* | 16 | | | | |
| *Coccinella var.5- punctata* | 8 | | | | |
| *Adalia bipunctata* | 7 | | | | |
| *Coccinella hieroglyphica* | 5 | | | | |
| *Coccinella 10-punctata var subpunctata* | 4 | | | | |
| *Calvia decemguttata* | 3 | | | | |
| *Nephus quadrimaculatus* | 3 | | | | |
| *Halyzia 14-punctata* | 2 | | | | |
| *Scymnus interruptus* | 2 | | | | |
| **TOTAL=11 species** | **154** | | | | |

Regarding the dynamics of coccinelid species collected from maize crop in 2018, using the soil traps type Barber, this is presented in figures 7 and 8.

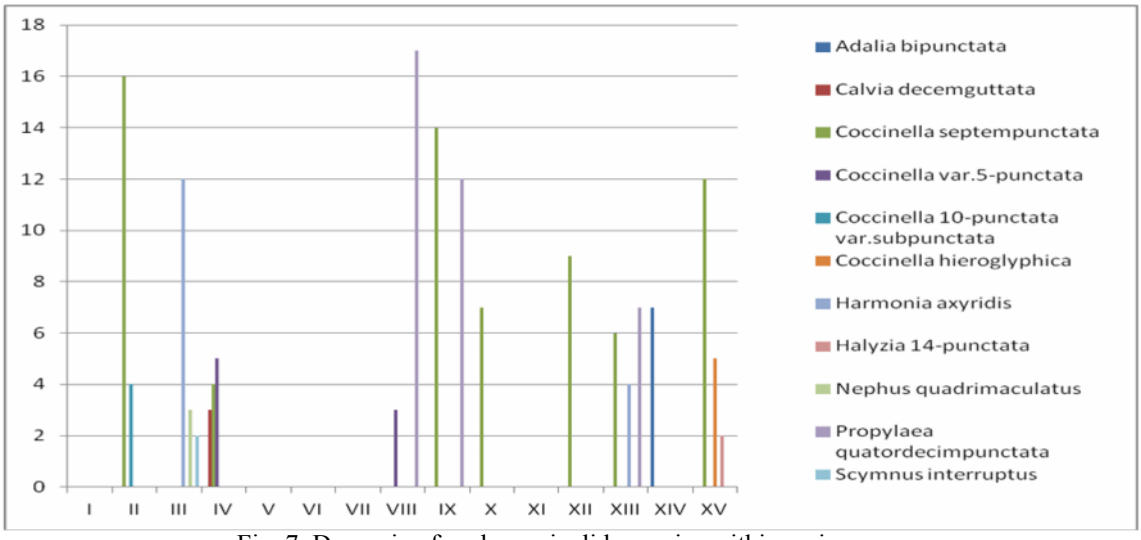


Fig. 7. Dynamic of each coccinelids species within maize crop

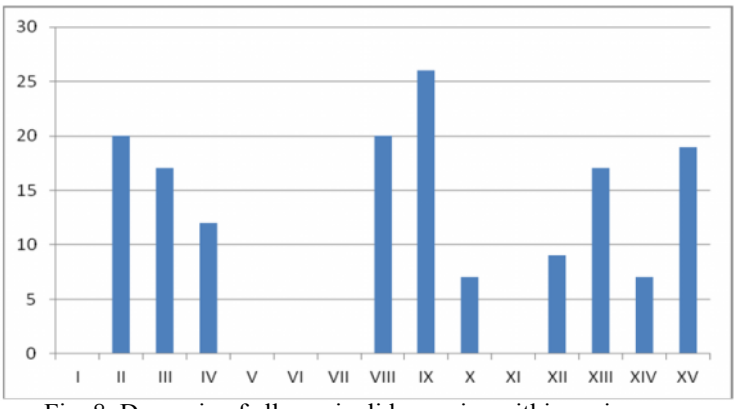


Fig. 8. Dynamic of all coccinelids species within maize crop

In 2018, in the Ezăreni stationary to corn field using the soil traps type Barber method, 154 specimens belonged to 11 *Coccinellidae* species were collected.

For the purpose of interpreting the results obtained, ecological indices were calculated: abundance (A), constancy (C), dominance (D) and ecological significance index (W). The values of these indices in 2018 for maize crop are presented in table 13.

Table 13

**Values of the ecological indices for *Coccinellidae* species on total harvests within maize crop**

| No. | Name of species | ECOLOGICAL INDICES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | C | | D | | W | |
| | | | % | Clasa | % | Clasa | % | clasa |
| 1. | *Coccinella septempunctata* | 68 | 24,44 | $C_1$ | 44,15 | $D_5$ | 10,7902 | $W_5$ |
| 2. | *Propylaea quatordecimpunctata* | 36 | 12,22 | $C_1$ | 23,37 | $D_5$ | 2,8558 | $W_3$ |
| 3. | *Harmonia axyridis* | 16 | 5,55 | $C_1$ | 10,38 | $D_5$ | 0,5760 | $W_2$ |
| 4. | *Coccinella var.5-punctata* | 8 | 3,33 | $C_1$ | 5,19 | $D_4$ | 0,1728 | $W_2$ |
| 5. | *Adalia bipunctata* | 7 | 4,44 | $C_1$ | 4,54 | $D_3$ | 0,2015 | $W_3$ |
| 6. | *Coccinella hieroglyphica* | 5 | 2,22 | $C_1$ | 3,24 | $D_3$ | 0,0719 | $W_1$ |
| 7. | *Coccinella 10-punctata var subpunctata* | 4 | 3,33 | $C_1$ | 2,59 | $D_3$ | 0,0862 | $W_1$ |
| 8. | *Calvia decemguttata* | 3 | 2,22 | $C_1$ | 1,94 | $D_2$ | 0,0430 | $W_1$ |
| 9. | *Nephus quadrimaculatus* | 3 | 2,22 | $C_1$ | 1,94 | $D_2$ | 0,0430 | $W_1$ |
| 10. | *Halyzia 14-punctata* | 2 | 2,22 | $C_1$ | 1,29 | $D_2$ | 0,0286 | $W_1$ |
| 11 | *Scymnus interruptus* | 2 | 2,22 | $C_1$ | 1,29 | $D_2$ | 0,0286 | $W_1$ |
| | **TOTAL = 11 specii** | **154** | | | | | | |

The highest abundance was the species: *Coccinella septempunctata* (68 specimens), *Propylaea quatorcimpunctata* (36 specimens) and *Harmonia axyridis* (16 specimens).

The consistency of the collected coccinelid species ranged from 2.22% to 24.44% and the species with the highest values were: *Coccinella septimepunctata* (24.44%), followed by the species *Propylaea quatordecimpuntata* (12.22%) and *Harmonia axyrides* (5.5%).-all being accidental species. Dominance had the highest values in The *Coccinella septempunctata* (44.15%), *Propylaea quatordecimpuntata* (23.37%) *Harmonia axyrides* (10.38%), these species being eudominant. The ecological significance index (W) registered values between 0.0286% and 10.7902%, with the highest value occurring in the species *Coccinella septrepunctata* -characteristic species.

**Comparative structure of coccinelid species in the both crops in 2018**

Analyzing the results obtained in 2018, research year in the Ezăreni stationary in the wheat and maize crops studied using the Barber soil trap method (Table 14) it can be observed that:

- A total of 14 species with 285 specimens were identified in the two crops studied, the highest number of identified specimens was in maize crop (154 specimens);
- The most abundant species was *Coccinella septempunctata* with a total of 93 specimens in the two fields studied. The highest number of specimens were identified in the maize crop (68 specimens), with dominance of 44.15%;
- For the species *Propylaea quadordecimpuntata* the total number of specimens identified was 50 specimens, the largest being identified in maize crop (36 specimens), the dominance being 23,37%;
- For the species *Harmonia axyridis* the total number of specimens identified was 37 specimens, the highest number being identified in the wheat crop (21 specimens), the dominance being 16,03%.

Table 14

**Abundance and dominance of *Coccinellidae* species within wheat and maize crops-Ezăreni-2018**

| No. | Name of species | Wheat crop | | Maize crop | | Total |
|---|---|---|---|---|---|---|
| | | A | D (%) | A | D (5) | A |
| 1 | *Coccinella septempunctata* | 25 | 19,1 | 68 | 44,15 | 93 |
| 2 | *Propylaea quatordecimpunctata* | 14 | 10,7 | 36 | 23,37 | 50 |
| 3 | *Harmonia axyridis* | 21 | 16,03 | 16 | 10,38 | 37 |
| 4 | *Adalia bipunctata* | 28 | 21,37 | 7 | 4,54 | 35 |
| 5 | *Coccinella hieroglyphica* | 11 | 8,39 | 5 | 3,24 | 16 |
| 6 | *Coccinella var 5 punctata* | 7 | 5,34 | 8 | 5,19 | 15 |
| 7 | *Coccinella 10-punctata* | 13 | 9,92 | - | - | 13 |
| 8 | *Coccinella 10-punctata var subpunctata* | 2 | 1,52 | 4 | 2,59 | 6 |
| 9 | *Calvia decemguttata* | 3 | 2,29 | 3 | 1,94 | 6 |
| 10 | *Halyzia 22-punctata* | 4 | 3,05 | - | - | 4 |
| 11 | *Hippodamia variegata* | 3 | 2,29 | - | - | 3 |
| 12 | *Halyzia 14-punctata* | - | - | 2 | 1,29 | 2 |
| 13 | *Nephus quadrimaculatus* | - | - | 3 | 1,94 | 3 |
| 14 | *Scymnus interruptus* | - | - | 2 | 1,29 | 2 |
| **TOTAL = 14 species** | | **131** | | **154** | | **285** |

## Conclusions

In the Ezareni stationary, analyzing the results obtained in the two years of research 2017 and 2018 in the two crops studied (wheat and maize) using the soil traps type Barber method, a total of 14 species of Coccinellidae totalized 858 specimens.
The number of specimens collected in 2017 in both crops (573 specimens) was higher than in 2018 (285 specimens). The most abundant species was *Coccinella septempunctata* with a total of 264 identified specimens, with the highest number of specimens registred in 2017 in the wheat crop (92 specimens), followed by the *Propylaea quadordecimpunctata* species with a total of 227 identified specimens, with the most specimens registering in 2017 in maize cultivation (105 specimens). The *Harmonia axyridis* species had a total of 124 specimens, the highest number was recorded in 2017 in maize cultivation (51 specimens).

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