THE DIVERSITY OF USEFUL BEETLES FROM THE POBORU ORCHARD ECOSYSTEM, OLT COUNTY

Venera Daniela STAN[1], Marian DOBRE[2], Ion MITREA[3],

(1)PhD University Of Craiova, Faculty Of Horticulture
(2)University of Craiova, Faculty of Agronomy
(3)University of Craiova, Faculty Of Horticulture

***Coresponding author:** danielastan2022@yahoo.com

Abstract

This paper presents data on the abundance and diversity of useful coleopteran species collected in the plum plantation in Poboru, Olt county. The research was carried out in 2022, starting from April to September. During the observation period, research was carried out on the entomofauna of useful coleoptera found in the Poboru orchard ecosystem. This was subjected to an analysis regarding the structure and abundance of useful coleopterans encountered in the studied fruit crop, and they were selected from the total of coleopterans identified and treated separately. Thus, in 2022, 8 species from the Carabidae family, 2 species from the Staphilinidae family and 10 species from the Coccinellidae family were identified. According to the data obtained in 2022, the Coccinellidae family represented 61.12%, the Carabidae family accounted for 28.75% and the Staphilinidae family 10.13%.

Key words: *biodiversity, coleopterans, fauna, ecology, entomophagy*

INTRODUCTION

One of the main measures to limit the attack of pests on cultivated plants is forecasting and warning, which is the most modern preventive method in plant protection.

In the biological cycle of pests, there are critical periods, in which individuals show an increased sensitivity to the action of pesticides, as well as periods in which they are more exposed to the action of treatments.

Also, during the vegetation period and the cycle of the pest, there are periods in which the respective pest does not cause damage, or causes damage far below the economic threshold.

In many cases, agricultural pest control measures are applied to most species, only when attacks or invasions are reported and, in fewer cases, are planned in advance.

For this reason, predicting in time the eras of appearance of pests is of great importance and this must be generalized, as much as possible to as many species of pests as possible. (E.Velichi, Agricultural Entomology, 2014, page 89).

In the 19th century, a series of authors published monographs on insects. Thus, Mulsant presents coleoptera, and Riley makes calculations regarding the damage that can be produced by different species of insects. We are currently witnessing an accelerated development of research in the field of entomology, research that focuses on problems of biology, ecology and combating phytophagous pests. .(I. Oltean, Monica Porca, I. Ghizdavu, 2004, Entomologie generala, pag.12-13).

One of the methods of combating it is the biological method.

This method aims to restore agrobiocenoses, in order to reduce the numerical density of harmful populations, below the limit of the economic damage threshold.

The biological method of combat consists in the use of parasites, predators, pathogens, as well as other natural enemies, in order to destroy the various pests of crop plants.

Biological control is a response to the alternative of applying pesticides in agriculture, which led to good results in the short term, but their secondary effects, like the accumulation of residues, began to be felt through the disruption of agroecosystems.

Biological control measures try to restore the balance between pests and their predators or parasites in the systems. (E. Velichi, Agricultural Entomology, 2014, page 11; Mitrea I., 2001, Entomologie specială, pag. 25.).

MATERIALS AND METHODS

Plum species originate in the Northern Hemisphere, most in the temperate zone. All plum species and varieties (over 35 in number) belong to the genus *Prunus* in the *Rosaceae* family, Prunoide subfamily.

The common plum is a polymorphic species, through a large number (over 2000) of cultivated varieties, it has great possibilities of adaptation, being spread over large areas, within the European continent. The northern limit of culture is parallel 56-57 degrees.

Plum culture enjoys a lot of attention in all countries that have climatic conditions corresponding to the biological requirements of the known species and varieties.

Scientific research on the structure and abundance of useful coleopterans from the plum plantation in Poboru, Olt county was carried out in 2022, using the Barber method. The Barber type traps, consisting of vessels with a volume of 500 ml, filled with a fixing liquid (water + NaCl, in a concentration of 10%), 5 traps were placed at distances of 10-15 m between them. (Fig. 1 and Fig. 2).

Fig.1. Barber traps

Fig.2. Barber traps

RESULTS AND DISCUSSIONS

The family structure of the 20 species of useful coleopterans encountered in the orchard ecosystem during 2022 fell into three families, namely: the Carabidae family with 8 species, the Staphilinidae with 2 species and the Coccinellidae with 10 species. (Table 1)

Table 1.The structure of the useful Coleopteran Family from the fruit-growing ecosystem from Poboru

No. Crt.	Family name	Collected species
1.	*CARABIDAE*	*Harpalus distinguendus*
		Carabus cancelatus
		Carabus ulrichi
		Calosoma sycophanta
		Calosoma inquisitor
		Abax ater
		Pterostichus oblongopunctatus
		Pterostichus versicolor
2.	*STAPHILINIDAE*	*Pilonthus decorul*
		Oligota flavicornis
3.	*COCCINELLIDAE*	*Subcoccinella 24-punctata*
		Adonia variegata
		Coccinella 7-punctata
		Coccinella (Coccinella) 14-pustulata
		Coccinella 12-punctata
		Coccinella tessulata.
		Coccinella (Propylea) 14-punctata tetragonata
		Coccinella quinquepuntata
		Coccinella (Adalia) bipunctata
		Exochomus quadripustulatus

Regarding the abundance of the *Carabidae* family, it is as follows: the species *Carabus cancelatus* recorded the highest number of individuals (41), followed by *Carabus ulrichi* with 34 individuals, in last place were recorded the species *Harpalus distinguendus* with 18 individuals and *Pterostichus oblongopunctatus* with 8 individuals.(Table 2).

Table 2. The abundance of the species in Carabidae Family from the fruit growing ecosystem Poboru

No.crt.	Species name	Abundance
1	*Harpalus distinguendus*	18
2	*Carabus cancelatus*	41
3	*Carabus ulrichi*	34
4	*Calosoma sycophanta*	23
5	*Calosoma inquisitor*	24
6	*Abax ater*	19
7	*Pterostichus oblongopunctatus*	8
8	*Pterostichus versicolor*	23

The abundance of the Staphilinidae family is as follows: the species *Pilonthus decorul* recorded the highest number of individuals (40), the last place was recorded the species *Oligota flavicornis* with 27 individuals. (Table 3)

Table 3. The abundance of the species in Staphilinidae Family from the fruit growing ecosystem Poboru

Nr.crt.	Denumirea speciei	Abundenţă
1	*Pilonthus decorul*	40
2	*Oligota flavicornis*	27

Following the analysis of the abundance of the Coccinellidae family, the situation is as follows: the species Coccinella quinquepuntata presented the largest number of collected coleopterans (78), followed by Coccinella 7 - pustulata which recorded 55 individuals, in last place was the species Exochomus quadripustulatus with 22 individuals .(Table 4).

Table 4. The abundance of the species in Coccinellidae Family from the fruit growing ecosystem Poboru

No.crt.	Species name	Abundance
1	*Subcoccinella 24-punctata*	29
2	*Adonia variegata*	23
3	*Coccinella 7-punctata*	55
4	*Coccinella 14-pustulata*	52
5	*Coccinella 12-punctata*	53
6	*Coccinella tessulata*	27
7	*Coccinella 14-punctata tetragonata*	28
8	*Coccinella quinquepuntata*	78
9	*Coccinella bipunctata*	37
10	*Exochomus quadripustulatus*	22

From the analysis of the values recorded in 2022, regarding the total abundance of useful beetle species, depending on the harvest period, it can be seen that the most abundant family was the Coccinellidae family with 404 specimens, followed by the Carabidae family with 190 specimens, and the fewer specimens were from the Staphilinidae family with 67 specimens. (Table 5)

Table 5. The structure and abundance of the useful Coleopteran species from the fruit growing ecosystem from Poboru during 2022

No.crt.	**Family name**	**Total individuals**
1	Familia Carabidae	190
2	Familia Staphilinidae	67
3	Familia Coccinellidae	404
	Totally useful beetles	**661**

CONCLUSIONS

The year 2022 was a difficult year from a climatic point of view, with temperatures above 31-32 degrees and very little precipitation.

During the entire research period, entomological material was collected. Thus, starting from April to September, 661 useful beetles were collected, belonging to three botanical families: Carabidae, Staphilinidae, Coccinellidae

From the data obtained in 2022, the Coccinellidae family represented 61.12%, the Carabidae family accounted for 28.75% and the Staphilinidae family 10.13%.

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