THE DIVERSITY OF COLEOPTERANS (COLEOPTERA: SCARABAEIDAE, SCOLYTIDAE, CURCULIONIDAE RHYNCHITIDAE) FROM THE PLUM ECOSYSTEMS IN POBORU LOCATION, OLT COUNTY

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Abstract

The present work is dedicated to the research of the current state of the fauna and the diversity of the coleoptera in the plum ecosystems in Poboru, Olt county. As a result of the investigations carried out in 2022, in the North-Eastern area of Olt county, the harmful coleoptera species collected in the analyzed orchard ecosystem were classified into 4 families: Scarabaeidae, Scolytidae, Curculionidae and Rhynchitidae. (P.Pasol, Ionela Dobrin , Loredana Frasin, , Treatise on special entomology, Pests of horticultural crops, 2007, page 209-220). Thus, in 2022, 11 species from the Scarabaeidae family, 3 species from the Scolytidae family, 5 species from the Curculionidae family and one species from the Rhynchitidae family were identified. According to the data obtained in 2022, the Scarabaeidae family represented 36.90%, the Scolytidae family was found in a proportion of 22.62%, the Curculionidae family 38.10%, and the Rhynchitidae family 2.38%.

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

INTRODUCTION

The production of agricultural crops is influenced to a great extent, both quantitatively and qualitatively, by the attack of digested species of harmful animals. Among these species, the largest group is represented by insects (over 80%). Most insects known today have a phytophagous feeding mode. They feed on different plant organs, causing damage to different cultivated species. These losses are estimated worldwide at approximately 35% of world production, of which 13.8% are caused by animal pests.

In Romania, the losses caused by pests in horticultural plants are: for vegetables 10%, for fruits 22% and 10% for grapes. In addition to direct losses, certain species of pests (especially insects) are vectors of serious diseases for a number of agricultural crops.

Currently, there are many species of pests, which in certain favorable years, produce large losses in the absence of effective control measures. .(Eugen Velichi, 2014, Agricultural Entomology, page 10-11).

In small, isolated orchards, as well as trees in family gardens, pests and

diseases can be combated primarily by agrotechnical and mechanical measures and only as a last resort resort to chemical measures.

To combat pests, mechanical control measures are of great importance, which, often, can replace chemical treatments, if they are carried out on time and correctly.

Thus, collecting the nests of caterpillars hanging in the plums during the winter and destroying them by burning, eliminates the chemical treatment that would be useful for combating these pests.

Shaking the insects from the tree on tarpaulins in the cool mornings and then destroying them with oil or by burning is another measure that gives good results in combating the May beetle (Melolontha melolontha), gargles (Rhynchites bacchus), and especially the hairy cockroach (Epicometes hirta), which are more difficult to combat with chemical treatments. .(Lenuta Chira, D. Hoza, 2010, Cultura prunului, page 180-181).

Research in the field of entomology in our country registered a greater development in the second half of the 19th century. During this period, works appeared on some groups of insects from Transylvania, such as for example the orders: Orthoptera, coleopteran, Isoptera, etc., (E. Velichi, 2014, Agricultural Entomology, page 13; Mitrea I., 2001, Entomologie specială, pag. 15.)

MATERIALS AND METHODS

The common plum, scientifically called Prunus domestica L, is one of the main fruit tree species of temperate climates. The plum, being adapted to the most diverse climate and soil conditions and having much reduced technological requirements compared to the other fruit tree species, will continue to populate even further the hilly areas where, over the course of hundreds of years, some of the most valuable varieties were formed and survived (Lenuta Chira, D. Hoza, 2010, Cultura prunului, page 7).

Taking into account the relatively large area of the area proposed to be analyzed, faunal investigations in the town of Poboru were taken into account.

Scientific research was carried out in 2022 in an orchard ecosystem (plum orchard), private property, from the town of Poboru, a town located in the north-eastern part of Olt county, where the following varieties were planted: Tuleu gras, Vanat by Italy and Anna Spath. (Fig 1)..

In April 2022, traps were installed in this 5000 square meter orchard, established in 2015.

Fig.1. Poboru Orchard

The beetles were collected by means of the Barber-type soil traps, using vessels with a volume of 500 ml (Fig. 2 and 3). The concentrated solution of sodium chloride (NaCl) served as a fixing-preservative liquid of 10%.

Fig. 2. Installation of Barber traps

The placement was made randomly of 5 traps at a distance of about 10-15 m between them. The material was collected as follows in 2022: May 21, June 25, July 16, August 13, September 4 and September 17.

Fig. 3. Barber traps

RESULTS AND DISCUSSION

The harmful coleoptera species collected in the orchard ecosystem analyzed in 2022 were classified into 4 families:*Scarabaeidae*, *Scolytidae*, *Curculionidae* and *Rhynchitidae.* (P. Pasol, Ionela Dobrin, Loredana Frasin). (Table 1)

Table 1.The structure of harmful coleopteran species by family in the Poboru orchard ecosystem in 2022

No. Crt.	Family name	Species name
1	*SCARABIDAE*	*Oryctes nasicornis* *Epicometis hirta* *Oxythyrea funesta* *Cetonia aurata* *Potosia (Cetonischema) aeruginosa* *Polyphylla fullo* *Melolontha melolontha* *Anoxia (Protanoxia) orientalii* *Amphimallon solstitialis* *Pbyllopertha horticola* *Rizotrous aechinoctialis*
2	*SCOLYTIDAE*	*Scolytus Mali* *Ruguloscolytus rugulosus* *Anisandrus dispar*
3	*CURCULIONIDAE*	*Anthomorus pyri* *Anthonomus pomorum* *Rhynchites bacchus* *Sciaphobus squalidus* *Xyleborus dispar*
4	*RHYNCHITIDAE*	*Rhynchites aequatus*

In 2022, 11 species of the *Scarabaeidae* family, 3 species of the *Scolytidae* family, 5 species of the *Curculionidae* family and one species of the *Rhynchitidae* family were identified. (Table 2)

Table 2. The abundance of species from the *Scarabaeidae* Family in the Poboru orchard ecosystem

No. crt.	Species name	Abundance
1	*Oryctes nasicornis*	13
2	*Epicometis hirta*	10
3	*Oxythyrea funesta*	12
4	*Cetonia aurata*	11
5	*Potosia aeruginosa*	27
6	*Polyphylla fullo*	8
7	*Melolontha melolontha*	14
8	*Anoxia orientalii*	22
9	*Amphimallon solstitialis*	18
10	*Pbyllopertha horticola*	10
11	*Rizotrous aechinoctialis*	10

From the analysis of the data on the abundance of the *Scarabaeidae* family, it can be seen that the species *Potosia aeruginosa* recorded the highest number of individuals (27), followed by *Anoxia orientalii* with 22 individuals, and the last place was recorded by *Polyphylla. fullo* species with 8 individuals. (Table 2).

Regarding the abundance of species from the *Scolytidae* family, it was observed that the species *Anisandrus dispar* has the highest number of specimens collected (41), and the lowest number of individuals collected belong to the species *Scolytus Mali* (18) (Table 3)

Table 3. Abundance of species from the *Scolytidae* family in the Poboru orchard ecosystem

No.crt.	Species name	Abundance
1	*Scolytus Mali*	18
2	*Ruguloscolytus rugulosus*	36
3	*Anisandrus dispar*	41

Analyzing the results regarding the abundance of coleopteran species from the *Curculionidae* family, it can be seen that the *Rhynchites bacchus* species presented the largest number of specimens collected (37), and the smallest number of individuals collected, 26, belong to the species *Xyleborus dispar. (Table 4) .*

Table 4. The abundance of species from the Family *Curculionidae* in the Poboru orchard ecosystem

No.crt	Species name	Abundance
1	*Anthomorus pyri*	33
2	*Anthonomus pomorum*	28
3	*Rhynchites bacchus*	37
4	*Sciaphobus squalidus*	36
5	*Xyleborus dispar*	26

The abundance of the *Rhynchitidae* family shows that the only species *Byctiscus betulae* has a total of 10 specimens collected (Table 5).

Table 5. The abundance of species from the Rhynchitidae family in the Poboru orchard ecosystem

No.crt	Species name	Abundance
1	Bycticus betulae	10

From the analysis of the values recorded in 2022, regarding the total abundance of harmful beetle species, depending on the harvest period, it can be seen that the most abundant family was the *Curculionidae* family with 160 specimens, followed by the *Scarabaeidae* family with 155 specimens, then the family *Scolytidae* with 95 specimens, and the fewest specimens were from the *Rhynchitidae* family with 10 specimens. (Table 6)

Table 6. The structure and abundance of harmful coleopteran species in the orchard ecosystem in Poboru in 2022

No.crt.	**Family name**	**Total individuals**
1	*Family Scarabaeidae*	155
2	*Family Scotylidae*	95
3	*Family Curculionidae*	160
4	*Family Rhynchitidae*	10
	Totally harmful beetles	**420**

CONCLUSIONS

The year 2022 was very difficult in terms of climatic conditions, with very little precipitation and high temperatures.

During the entire growing season, collections of entomological material were carried out using the Barber method. 420 harmful insects were collected in the Poboru orchard), belonging to 4 botanical families: *Scarabaeidae,Scolytidae, Curculionidae* and *Rhynchitidae.*

According to the data obtained in 2022, the *Scarabaeidae* family represented 36.90%, the *Scolytidae* family 22.62%, the *Curculionidae* family 38.10%, and the *Rhynchitidae* family 2.38%.

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