

RESEARCHES REGARDING THE ENTOMOFAUNA OF COLEOPTERAS WITHIN SOME AGRICULTURAL CROPS FROM THE NORTH PART OF PORTUGAL

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Abstract

The purpose of this research was that to identify the useful entomofauna of Coleopteras from the agricultural crops which have been taken into the study: olive trees and orange trees. The researches were carried out within the Quinta da Pinhao station, which belongs to the University of "Tras os Montes e Alto Douro". The biological material was sampled by the mean of D-Vacuum at 20th of June of 2017, from each 6 trees belonging to each crop, which have been aimlessly chosen. The D-Vacuum has worked one minute for each tree taken into the study. After carrying out the experiments, all the sampled insects were bringing into the Laboratory of Entomology in order to be counted and determined.

From the *Coleoptera* order, species with the biggest number of samples were:

-within the olive trees: *Chrysomelidae* family-91 samples, *Coccinellidae*- 56 samples, *Aderidae*-42 samples and *Scarabaeidae*-38 samples. From the *Coccinellidae* family, species with the biggest number of samples were: *Coccinella septempunctata* (31) and *Hippodamia variegata* (16).

-within the orange trees: *Chrysomelidae* family-142 samples and *Coccinellidae* family- 54 samples.. From the *Coccinellidae* family, species with the biggest number of samples was: *Coccinella septempunctata* (33) .

Key words: D-Vacuum, *Chrysomelidae*, *Scarabaeidae*, *Coccinellidae*.

The insects of *Chrysomelidae* family are commonly known as leaf beetles and include more than 50.000 species, making up one of the largest and most common encountered of all beetle families. Leaf beetle are partially recognizable by their tarsal formula, which appears to be 4-4-4, but is actually 5-5-5 as the fourth tarsal segment is very small and hidden by the third one. Adult and larval leaf beetles feed on all sorts of plant tissue, and all species are fully herbivorous. Many are serious pests of cultivated plants (eg. *Leptinotarsa decemlineata*-Colorado potato beetle).

Coccinellidae family has species of round or oval species, almost hemispherical, with spots on the wings with color spots and contrasting patterns. The most species of *Coccinellidae* are beneficial predators which prefer the aphids as main feed.

According to the author (Foltz, 2002), there are more than 5.000 species all around the world. The most representative species of the *Coccinellidae* family are: *Coccinella septempunctata*, *Hippodamia variegata*, *Propylaea quatuordecimpunctata*.

MATERIAL AND METHOD

In order to carry out the researches, the insects were sampled from one station: Quinta da Pinhao, belonging to University of "Tras os Montes e Alto Douro", by using the method of D-Vacuum. The experiments were carried out at 20th of June of 2017. Each 6 trees belonging to olive and orange orchards were taken into this study, the vacuum working 1 minute for each tree. After finishing the experiments, all the samples were bringing into the laboratory, counted and determined by the mean of binocular magnifier.

RESULTS AND DISCUSSIONS

The samples of the biological material were carried out at 20th of June of 2017. Within the olive trees orchard, the situation regarding the entomofauna of Coleopteras looks as follows (*table 1*):

-Tree number 1: there were 83 samples identified from Coleoptera order, belonging to *Chrysomelidae* family (22), *Coccinellidae* family (21), *Scarabaeidae* (15), *Staphylinidae* (11),

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Aderidae (14). From the *Coccinellidae* family, 13 species, 5 belong to *Hippodamia variegata* species, and 3 samples belong to *Propylaea quatordecimpunctata* species;

-Tree number 2: there were 51 samples identified from *Coleoptera* order, belonging to *Chrysomelidae* family (19), *Scarabaeidae* (8), *Mordellidae* (11) and *Coccinellidae* family (13). From the *Coccinellidae* family, 7 samples belongs to *Coccinella septempunctata* species, 4 samples belong to *Nephus quadrimaculatus* species and 2 samples belong to *Propylaea quatordecimpunctata* species;

-Tree number 3: there were 53 samples identified from *Coleoptera* order, belonging to *Chrysomelidae* family (20), *Aderidae* (17), *Cerambycidae* (12) and *Staphylinidae* (2) and *Coccinellidae* family (2). From the *Coccinellidae* family, the both samples belong to *Coccinella septempunctata* species;

- Tree number 4: there were 50 samples identified from *Coleoptera* order, belonging to

samples belong to *Coccinella septempunctata* *Chrysomelidae* family (14), *Scarabaeidae* (12), *Aderidae* (8), *Mordellidae* (7), *Coccinellidae* (6 samples) and *Cetonidae* (3). From the *Coccinellidae* family, all the collectes samples belong to *Hippodamia variegata* species;

-Tree number 5: there were 30 samples identified from *Coleoptera* order, belonging to *Coccinellidae* family (9), *Anthicidae* family (8), *Chrysomelidae* (4), *Aderidae* (3), *Scarabaeidae* (3); *Dermestidae* (3). From the *Coccinellidae* family, 7 samples belong to *Coccinella septempunctata* and two samples belong to *Hippodamia variegata* species;

- Tree number 6: there were 21 samples identified from *Coleoptera* order, belonging to *Chrysomelidae* family (12), *Cerambycidae* family (4) and *Coccinellidae* (5). From the *Coccinellidae* family, 3 samples belong to *Hippodamia variegata* species and two samples belong to *Coccinella septempunctata* species.

Table 1

Entomofauna of coleopteras sampled from olive trees by the mean of D-Vacuum

TREE	FAMILY	SPECIES	TOTAL SPECIES	TOTAL
1.	<i>Chrysomelidae</i>	-	-	22
	<i>Coccinellidae</i>	<i>Coccinella septempunctata</i>	13	21
		<i>Hippodamia variegata</i>	5	
		<i>Propylaea quatordecimpunctata</i>	3	
	<i>Scarabaeidae</i>			15
	<i>Aderidae</i>			14
	<i>Staphylinidae</i>			11
TOTAL			83	
2.	<i>Chrysomelidae</i>	-		19
	<i>Coccinellidae</i>	<i>Coccinella septempunctata</i>	7	13
		<i>Nephus quadrimaculatus</i>	4	
		<i>Propylaea quatordecimpunctata</i>	2	
	<i>Mordellidae</i>			11
	<i>Scarabaeidae</i>			8
TOTAL			51	
3.	<i>Chrysomelidae</i>			20
	<i>Aderidae</i>			17
	<i>Cerambycidae</i>			12
	<i>Staphylinidae</i>			2
	<i>Coccinellidae</i>	<i>Coccinella septempunctata</i>	2	2
	TOTAL			53
4.	<i>Chrysomelidae</i>			14
	<i>Scarabaeidae</i>			12
	<i>Aderidae</i>			8
	<i>Mordellidae</i>			7
	<i>Coccinellidae</i>	<i>Hippodamia variegata</i>	6	6
	<i>Cetonidae</i>			3
	TOTAL			50

5.	Coccinellidae	<i>Coccinella septempunctata</i>	7	9
		<i>Hippodamia variegata</i>	2	
	Anthicidae			8
	Chrysomelidae			4
	Aderidae			3
	Dermestidae			3
	Scarabaeidae			3
	TOTAL			30
6.	Chrysomelidae			12
	Coccinellidae	<i>Hippodamia variegata</i>	3	5
		<i>Coccinella septempunctata</i>	2	
	Cerambycidae			4
	TOTAL			21
TOTAL ENTOMOFAUNA OF COLEOPTERAS				288

Within the orange trees orchard, the situation regarding the entomofauna of Coleopteras looks as follows (table 2):

-Tree number 1: there were 42 samples identified from *Coleoptera* order, belonging to *Chrysomelidae* family (30), *Coccinellidae* (7) and *Curculionidae* (5). From the *Coccinellidae* family, 5 samples belong to *Coccinella septempunctata* species and two samples belong to *Coccinella 5-punctata* species;

-Tree number 2: there were 37 samples identified from *Coleoptera* order, belonging to *Chrysomelidae* family (22), *Coccinellidae* (10), *Curculionidae* (3) and *Staphylinidae* (2). From the *Coccinellidae* family, 5 samples belong to *Coccinella septempunctata* species, 3 samples belong to *Coccinella subpunctata* species and 2 samples belong to *Propylaea quatordecimpunctata* species;

-Tree number 3: there were 28 samples identified from *Coleoptera* order, belonging to *Chrysomelidae* family (16), *Cerambycidae* (4), *Scarabaeidae* (4), *Anthicidae* (2) and *Curculionidae* (2);

-Tree number 4: there were 41 samples identified from *Coleoptera* order, belonging to *Chrysomelidae* family (27), *Coccinellidae* family (9), *Scarabaeidae* (3) and *Staphylinidae* (2). From the *Coccinellidae* family, 6 samples belong to *Coccinella septempunctata* species, 2 samples belong to *Coccinella subpunctata* and 1 samples belongs to *Adalia bipunctata* species;

-Tree number 5: there were 53 samples identified from *Coleoptera* order, belonging to *Chrysomelidae* family (26), *Coccinellidae* (16), *Cerambycidae* (10) and *Staphylinidae* (1). From the *Coccinellidae* family, 7 samples belong to *Coccinella septempunctata* species, 4 samples belong to *Coccinella 5-punctata*, 3 samples belong to *Adalia bipunctata* and 2 samples belong to *Coccinella subpunctata*;

- Tree number 6: there were 38 samples identified from *Coleoptera* order, belonging to *Chrysomelidae* family (21), *Coccinellidae* family (12), *Scarabaeidae* (4) and *Curculionidae* (1). From the *Coccinellidae* family, 10 samples belong to *Coccinella septempunctata* species and 2 samples belong to *Propylaea quatordecimpunctata* species.

Table 2

Entomofauna of coleopteras sampled from orange trees by the mean of D-Vacuum

TREE	FAMILY	SPECIES	TOTAL SPECIES	TOTAL
1.	<i>Chrysomelidae</i>	-	-	30
	Coccinellidae	<i>Coccinella septempunctata</i>	5	7
		<i>Coccinella 5-punctata</i>	2	
	<i>Curculionidae</i>			5
	TOTAL			42
2.	<i>Chrysomelidae</i>	-		22
	Coccinellidae	<i>Coccinella septempunctata</i>	5	10
		<i>Coccinella subpunctata</i>	3	
		<i>Propylaea quatordecimpunctata</i>	2	
	<i>Curculionidae</i>			3
	<i>Staphylinidae</i>			2
	TOTAL			37

3.	<i>Chrysomelidae</i>			16
	<i>Scarabaeidae</i>			4
	<i>Cerambycidae</i>			4
	<i>Anthicidae</i>			2
	<i>Curculionidae</i>			2
	TOTAL			28
4.	<i>Chrysomelidae</i>			27
	<i>Coccinellidae</i>	<i>Coccinella septempunctata</i>	6	9
		<i>Coccinella subpunctata</i>	2	
		<i>Adalia bipunctata</i>	1	
	<i>Scarabaeidae</i>			3
	<i>Staphylinidae</i>			2
TOTAL			41	
5.	<i>Chrysomelidae</i>			26
	<i>Coccinellidae</i>	<i>Coccinella septempunctata</i>	7	16
		<i>Coccinella 5-punctata</i>	4	
		<i>Adalia bipunctata</i>	3	
		<i>Coccinella subpunctata</i>	2	
	<i>Cerambycidae</i>			10
	<i>Staphylinidae</i>			1
TOTAL			53	
6.	<i>Chrysomelidae</i>			21
	<i>Coccinellidae</i>	<i>Coccinella septempunctata</i>	10	12
		<i>Prppylaea quatordecimpunctata</i>	2	
	<i>Scarabaeidae</i>			4
	<i>Curculionidae</i>			1
	TOTAL			38
TOTAL ENTOMOFAUNA OF COLEOPTERAS				239

Table 3

Entomofauna of *Coleoptera-Coccinellidae* sampled within both crops (olive and oranges)

Current number	Tree	Species	No.of samples	Total
1.	olive	<i>Coccinella septempunctata</i>	31	56
		<i>Hippodamia variegata</i>	16	
		<i>Propylaea quatordecimpunctata</i>	5	
		<i>Nephus quadrimaculatus</i>	4	
2.	orange	<i>Coccinella septempunctata</i>	33	54
		<i>Coccinella subpunctata</i>	7	
		<i>Coccinella var.6-punctata</i>	6	
		<i>Propylaea quatordecimpunctata</i>	4	
		<i>Adalia bipunctata</i>	4	

Entomofauna of *Coleoptera-Coccinellidae* sampled within olive trees and orange trees is presented in the table 3.

During the day of 20th of June of 2017, by the mean of D-Vaccum method, species from *Coccinellidae* family (*Coleoptera-Coccinellidae*) have been sampled within Quinta da Pinhao station. Results look thus:

Within the olive orchard, 56 samples belonging to *Coccinellidae* family (*Coleoptera-Coccinellidae*) have been sampled. Species with

the biggest number of samples were: *Coccinella septempunctata* (31) and *Hippodamia variegata* (16). In total, 4 species of *Coccinellidae* (*Coleoptera-Coccinellidae*) have been identified.

Within the orange orchard, 54 samples which belong to *Coccinellidae* family (*Coleoptera-Coccinellidae*) have been sampled. Species with the biggest number of samples were: *Coccinella septempunctata* (33) and *Coccinella subpunctata* (7).

In total, 5 species that belong to *Coccinellidae* family (*Coleoptera-Coccinellidae*) have been identified. species.

CONCLUSIONS

It can be concluded that, during the day of 20th of June 2017, within the olive orchard, from a total of 288 samples of *Coleopteras*, the most significant number belongs to *Chrysomelidae* family (91), followed by *Coccinellidae* family (56), *Aderidae* (42) and *Scarabaeidae* (38), while the leastest number of samples belongs to: *Anthicidae* family (8), *Cetonidae* and *Dermestidae* families (each 3). The most dominant species of *Coccinellidae* family are: *Coccinella septempunctata* (31 samples), *Hippodamia variegata* (16 samples), while the leastest number of samples belongs to the following species: *Propylaea quatordecimpunctata* (5 samples) and *Nephus quadrimaculatus* (4 samples).

Within the orange orchard, from a total of 239 samples of *Coleopteras*, the most significant number belongs to *Chrysomelidae* family (142), followed by *Coccinellidae* family (54), while the leastest number of samples belongs to: *Staphylinidae* family (5) and *Anthicidae* family (2). The most dominant species of *Coccinellidae* family is: *Coccinella septempunctata* species (33 samples), while the species with the leastest number of samples are: *Propylaea quatordecimpunctata* and *Adalia bipunctata* (each 4 samples).

The biggest number of samples from *Coleoptera* order was identified within olive orchard (288).

The biggest number of *Coccinellidae* samples has been registered within olive grove (56), in comparison to orange grove (54).

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