

COMPARATIVE RESEARCH ON THE STRUCTURE AND ABUNDANCE OF BIODIVERSITY ENTOMOFAUNA IN SOME RAPE CULTURES

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Abstract

The rape seed culture, occupy the first place among plants of the family *Cruciferae* protein meal, both by the production and by its high oil content. In European community countries, rape is cultivated on significant areas through the use of rapeseed oil in industry and agriculture. Research on entomofauna were made in rapeseed farm S.C. AGRO IND COM S.R.L. Botoșani from 2011. The material was collected using soil traps Barber type. In totally, in the ecosystem of the year 2011 were collected 1184 samples. The species collected belonging to 7 orders: *Diptera*, *Arachnidae*, *Hymenoptera*, *Coleoptera*, *Orthoptera*, *Homoptera* and *Heteroptera*. The damaging fauna from the rape cultures belongs to the *Coleoptera* orders with the species *Meligethes aeneus* F., *Phyllotreta atra* L. and *Phyllotreta nemorum* F.; *Diptera* order, *Anthomyidae* families. The useful fauna belongs to *Hymenoptera* and *Diptera* orders and *Ichneumonidae*, *Braconidae* families.

Key words : rape seed culture, damaging fauna, useful fauna

The rape seed culture, occupy the first place among plants of the family *Cruciferae* protein meal, both by the production and by its high oil content. In European community countries, rape is cultivated on significant areas through the use of rapeseed oil in industry and agriculture.

Following progress in the ameliorating process, rape has become industrial , forage plant, an important food plant. rape is considered a valuable crop, easily established and marketed, but with some protection problems, especially caused by pests. (Manolache, Boguleanu, 1967; Paulian et al. 1974; 1979; Perju, 1995; Popov, 2003).

MATERIAL AND METHODS

Research on entomofauna were made in rapeseed farm S.C. AGRO IND COM S.R.L. Botoșani from 2011.

In 1992, the birth S.C. AGRO IND COM S.R.L., registered in the trade registry serial number J07/105/06.02.1992. The main activity of the company is composed of mixed activities: growing vegetables and animal breeding.

S.C. AGRO IND COM S.R.L. Botosani is situated in the Moldavian Plateau, where meet a temperate continental climate with an annual average temperature of 8.60 C, average annual precipitation is 569 mm and the soil on which it is located is composed of loess unit and cambic chernozem type. Currently the unit has a total area of 561.75 hectares, of which 555 ha is agricultural area. The material was collected using soil traps

Barber type (Tălmăciu et al. 2010). The meeting materials from trap to make interspace of 7-14 days. For each collection was used NaCl solution which has been replaced completely or after only case to put back another solution.

The material thus collected was then cleaned of scrap plant then was kept in a solution in alcohol concentration of about 20%, where they were kept for a period of time. In some situations, especially if coleopterelor determination was made to species level, in other cases the determination was made to family or genus, less to species.

The resultant material was brought into the laboratory, where the species of coleopters were selected and determined, using different catalogues for determining breeds „Guide des colepters d'Europe” (Chatened du Gaetan, 1990), “Fauna germanica” (Reitter, vol. I, 1908), Panin (1951), „Determinator pentru colepterele din Romania” (Bobarnac, Stanoiu, Nastase, 1994) or other materials:

RESULTS AND DISCUSSIONS

In 2011 in the rapeseed culture in farm S.C. AGRO IND COM S.R.L. Botoșani, were effectuates a number of 5 collected thus:

- at the 1st harvest, ou the 12.05, there were collected 213 exemplary belonging to the following 21 species/family. The species collected belonging to 5 orders: *Diptera*, *Arachnida*, *Hymenoptera* *Coleoptera* and *Heteroptera*. The most frequently species collected belonging to orders *Coleoptera* were: *Opatrum sabulosum* (48 samples), *Amara eurynota* (13 saples), *Harpalus*

aeneus (12 samples) and family *Formicidae* (77 samples), *Anthomyidae* (16 samples);

Table 1

The situation regarding the collections of entomofauna on 12.05

Order	No. crt.	family/species	No. of exemplars /trap						Total
			1	2	3	4	5	6	
Diptera	1	Anthomyidae	2	1	6		7		16
Arachnida	1	Arachnidae	1	1	1		8	3	14
Hymenoptera	1	Apidae			1				1
	2	Formicidae	7	3	22	24	4	17	77
Coleoptera	1	<i>Opatrum sabulosum</i>	4	13	3	11	8	9	48
	2	<i>Plattysoma frontale</i>	1					1	2
	3	<i>Amara similata</i>		2					2
	4	<i>Carabus cancellatus</i>					2		2
	5	<i>Amara eurynota</i>	3		8		2		13
	6	<i>Harpalus aeneus</i> F.	4	4	3		1		12
	7	<i>Pterostichus cupreus</i>			1				1
	8	<i>Amara aenea</i>				1	2	7	10
	9	<i>Brachynus crepitans</i>				1			1
	10	<i>Tanymecus dilaticollis</i>						1	1
	11	<i>Dermestes frischii</i>	1	1		1	2		5
	12	<i>Cantharis pulicaria</i>						1	1
	13	<i>Hister stercorarius</i>			1				1
Heteroptera	1	<i>Geotomus punctulatus</i>	1				2		3
	2	<i>Galgupha</i> species				2		1	3
Total			24	25	46	40	38	40	213

- at the second harvest, on the 23.05, there were collected 572 exemplars belonging to the following 28 species/family. The species collected belonging to 6 orders: *Diptera*, *Arachnida*, *Hymenoptera*, *Coleoptera*, *Orthoptera* and

Heteroptera. The most frequently species collected belonging to orders *Coleoptera* were: *Opatrum sabulosum* (94 samples), *Amara eurynota* (27 samples), *Harpalus aeneus* (28 samples) (table 2);

Table 2

The situation regarding the collections of entomofauna on 23.05

Order	No. crt.	family/species	No. of exemplars /trap						Total
			1	2	3	4	5	6	
Coleoptera	1	<i>Brachynus crepitans</i>	2	1	2	1	4	1	11
	2	<i>Phyllotreta atra</i>	-	2	-	-	-	-	2
	3	<i>Agriotes sputator</i>	-	1	-	-	-	1	2
	4	<i>Amara eurynota</i>	5	2	4	6	9	1	27
	5	<i>Opatrum sabulosum</i>	6	-	5	48	25	10	94
	6	<i>Pterostichus cupreus</i>	2	-	-	-	5	-	7
	7	<i>Brachinus psophia</i>	3	-	-	-	-	-	3
	8	<i>Carabus cancellatus</i>	-	1	-	1	1	2	5
	9	<i>Cantharis fusca</i>	-	-	1	-	1	-	2
	10	<i>Platysoma frontale</i>	-	-	-	4	-	-	4
	11	<i>Harpalus aeneus</i>	2	-	5	14	4	3	28
	12	<i>Pterostichus niger</i>	1	-	-	-	-	-	1
	13	<i>Meligethes aeneus</i>	-	1	-	-	-	-	1
	14	<i>Dermestes frischii</i>	3	1	1	2	2	-	9
	15	<i>Baris chlorizans</i>	-	-	-	1	-	-	1
	16	<i>Harpalus aeneus</i>	-	-	-	-	7	-	7
	17	<i>Tanymecus dilaticollis</i>	-	-	-	-	-	1	1
Arachnida	1	Arachnidae	5	27	-	40	39	32	143
Diptera	1	Anthomyidae	2	22	1	3	7	28	63
	2	Chloropidae	-	3	-	-	-	-	3
	3	Sciaridae	-	4	-	-	-	-	4
	4	Stratiomyidae	-	-	-	-	-	1	1
Hymenoptera	1	Apidae	1	-	2	2	-	-	5
	2	Formicidae	12	55	6	18	17	17	125
	3	<i>Athalia rosae</i>	-	1	-	-	-	-	1
Heteroptera	1	Miridae	1	-	-	-	-	-	1
	2	<i>Geotomus punctulatus</i>	1	-	2	8	8	-	19
Orthoptera	1	<i>Gryllus campestris</i>	-	-	-	2	-	-	2
Total			46	121	29	150	129	97	572

- at the third harvest, on the 31.05, there were collected 161 exemplars belonging to the following 16 species/family. The species collected belonging to 6 orders: *Diptera*, *Arachnidae*,

Hymenoptera, *Orthoptera*, *Coleoptera* and *Heteroptera*. The most frequently family were: *Formicidae* (104 samples), *Arachnidae* (10 samples), *Anthomyidae* (4 samples), (table 3);

Table 3

The situation regarding the collections of entomofauna on 31.05

Order	No. crt.	family/species	No. of exemplars /trap						Total
			1	2	3	4	5	6	
Hymenoptera	1	Apidae	1	-	-	-	1	-	2
	5	Formicidae	4	-	39	42	19	-	104
Coleoptera	1	Opatrum sabulosum	2	-	2	9	-	3	16
	2	Carabus cancellatus	-	-	1	-	2	-	3
	3	Amara eurynota	-	-	-	1	-	-	1
	4	Harpalus griseus	-	1	-	4	-	1	6
	5	Dermestes frischii	-	-	-	-	1	2	3
	6	Pterostichus cupreus	2	-	-	-	-	1	3
	7	Epicometis hirta	-	1	-	-	-	-	1
Arachnida	1	Arachnidae	-	2	3	-	3	2	10
Diptera	1	Anthomyidae	-	4	-	-	-	-	4
	2	Stratiomyidae	-	1	-	-	-	-	1
Heteroptera	1	Miridae	1	1	1	-	-	1	4
	2	Baris chlorizans	-	-	1	-	-	-	1
	3	Geotomus punctulatus	-	-	-	1	-	-	1
Orthoptera	1	Gryllus campestris	-	-	-	1	-	-	1
Total			10	10	47	58	26	10	161

- at the fourth harvest, on the 03.06, there were collected 107 exemplars belonging to the following 16 species/family. The species collected belonging to 6 orders: *Diptera*, *Arachnidae*, *Hymenoptera*, *Coleoptera*, *Orthoptera* and

Heteroptera. The most frequently species collected belonging to orders *Hymenoptera*, family *Formicidae* (70 samples) followed by order *Coleoptera* (16 samples), *Heteroptera* (7 samples) (table 4);

Table 4

The situation regarding the collections of entomofauna on 03.06

Order	No. crt.	family/species	No. of exemplars /trap						Total
			1	2	3	4	5	6	
Arachnida	1	Arachnidae	-	-	-	-	2	1	3
Coleoptera	1	Opatrum sabulosum	1	1	-	1	-	-	3
	2	larva	1	2	-	-	-	-	3
	3	Coccinella 14 pustulata	-	-	1	-	-	-	1
	4	Harpalus pubescens	-	-	-	1	-	-	1
	5	Harpalus azureus F.	1	2	2	1	-	-	6
	6	Harpalus griseus Panz.	-	-	-	1	1	1	3
	7	Baris chlorizans	-	-	-	1	-	1	2
Hymenoptera	1	Formicidae	23	17	9	-	16	5	70
	2	Apidae	-	-	-	2	-	-	2
	3	Pteromalidae	-	-	-	-	1	-	1
Heteroptera	1	Geotomus punctulatus	1	-	-	-	-	-	1
	3	Galgupha species	-	-	-	-	1	-	1
	4	Miridae	-	-	-	-	-	5	5
Orthoptera	1	Gryllus campestris	-	-	2	1	-	-	3
Diptera	1	Anthomyidae	-	-	-	-	-	2	2
Total			27	22	14	8	21	15	107

- at the fifth harvest, on the 09.06, there were collected 131 exemplars belonging to the following 19 species/family. The species collected belonging to 7 orders: *Diptera*, *Arachnidae*, *Hymenoptera*, *Coleoptera*, *Orthoptera*, *Homoptera* and *Heteroptera*.

The most frequently species collected belonging to orders *Hymenoptera* (62 samples), *Coleoptera* (42 samples), *Arachnida* (19 samples) (table 5).

CONCLUSIONS

In totally, in the three ecosystem of the year 2011 were collected 1184 samples. The species collected belonging to 7 orders: *Diptera*, *Arachnidae*, *Hymenoptera*, *Coleoptera*, *Orthoptera*, *Homoptera* and *Heteroptera*. The most frequently species collected belonging to orders *Hymenoptera* (450 samples), *Coleoptera* (397 samples), *Arachnida* (189 samples), *Diptera* (96 samples), *Heteroptera* (42 samples), *Orthoptera* (8 samples) and *Homoptera* (2 samples).

The damaging fauna from the rape cultures belongs to the *Coleoptera* orders with the species *Meligethes aeneus* F., *Phyllotreta atra* L. and *Phyllotreta nemorum* F., *Diptera* order, *Anthomyidae*

families. The useful fauna belongs to *Hymenoptera* and *Diptera* orders and *Ichneumonidae*, *Braconidae* families.

Table 5

The situation regarding the collections of entomofauna on 09.06

Order	No. crt.	family/species	No. of exemplars /trap						Total
			1	2	3	4	5	6	
Arachnida	1	Arahnidae	15	2	-	2	-	-	19
Homoptera	1	Cicadellidae	1	-	-	-	1	-	2
Diptera	1	Anthomyidae	2	-	-	-	-	-	2
Hymenoptera	1	Ichneumonidae	2	-	-	1	1	-	4
	2	Apidae	-	2	-	1	1	-	4
	3	Formicidae	15	9	4	4	13	5	50
	4	Pteromalidae	-	1	-	-	1	2	4
Coleoptera	1	Phyllotreta atra	2	-	-	-	2	-	4
	2	Baris chlorizans	-	-	-	2	-	-	2
	3	Brachynus crepitans	-	-	-	-	-	2	2
	4	Carabus cancellatus	-	-	-	1	-	1	2
	5	Dermestes frischii	1	-	4	-	-	2	7
	6	larva	-	7	3	-	2	2	14
	7	Galeruca tanacetii	-	1	-	-	-	-	1
	8	Pterostichus cupreus L.	-	-	5	-	1	-	6
	9	Amara eurynota Panz.	-	-	2	-	1	-	3
Orthoptera	1	Gryllus campestris	-	-	1	-	-	1	2
Heteroptera	1	Miridae	-	-	1	-	-	1	2
	2	Aradus depressus	-	-	-	-	1	-	1
Total			38	22	20	11	24	16	131

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