SOME ASPECTS ON THE FAUNA FROM THE RAPE CULTURES FROM THE S.E. PART OF TRANSYLVANIA

UNELE ASPECTE PRIVIND FAUNA DIN CULTURILE DE RAPIŢĂ DIN S.E. TRANSILVANIEI

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Abstract. *Collection of material was made with fillet of entomological rape crops in the agricultural society of the town Rotbav, Brasov County and the "spontaneous rape" of the surrounding areas. The culture of rape in the company were made two sweeping the vegetation "June on 3.06.2008 and 9.06.2008, while the spontaneous rape, were made a number of 4" cosiri, all in June, the following dates: 3.06.2008, 9.06. 2008, 17.06.2008 and 22.06.2008. The material thus collected was then cleaned of plant debris and then was kept for a period of time in an alcohol solution of about 20% concentration. The determination of material collected from the two variants was found that pest species are mainly the order Coleoptera, more common species being: Phyllotreta atra, Phyllotreta nemorum and Meligethes aeneus. Numerical density /m², fauna useful, harmful and overall had different values depending on the variant and the time of collection. Thus, the fauna in varianta useful "rapeseed cultivation" was worth 8.99% and the "spontaneous rape" of 7.53%.*

Key words: harmful entomophauna and useful entomophauna, rape

Rezumat. *Colectarea materialului s-a făcut cu ajutorul fileului entomologic din culturile de rapiţă din cadrul unei societăţi agricole din localitatea Rotbav, judeţul Braşov cât şi din "rapiţa spontană" din împrejurimile acestei zone. În culturile de rapiţă din cadrul Societăţii comerciale, au fost efectuate două „cosiri", în luna iunie, la data de 3.06.2008 şi 9.06.2008, în timp ce la rapiţa spontană, au fost făcute un număr de 4 „cosiri", tot în luna iunie, la următoarele date: 3.06.2008; 9.06.2008; 17.06.2008 şi 22.06.2008. Materialul astfel colectat a fost apoi curăţat de resturile vegetale apoi a fost păstrat o perioadă de timp într-o soluţie de alcool cca 20% concentraţie. În urma determinării materialului colectat la cele două variante s-a constatat că speciile dăunătoare aparţin cu precădere ordinului Coleoptera, mai frecvente fiind speciile: Phyllotreta atra, Phyllotreta nemorum şi Meligethes aeneus. Densitatea numerică/m², a faunei utile, dăunătoare şi totale a avut valori diferite în funcţie de variantă dar şi de momentul colectării. Astfel, procentul de faună utilă la varianta „rapiţă cultivată" a avut valoarea de 8,99%, iar la „rapiţa spontană" de 7,53%.*

Cuvinte cheie: entomofaună dăunătoare şi entomofaună utilă, rapiţă

INTRODUCTION

In Romania, the total losses following the attack of the pathogen agents, pests and weeds reach annually 2.5-3 billion dollars, namely a few times more

than the sum necessary to purchase phytosanitary products, including the costs of works for the application of treatments.

As well as other cultures, the rape culture is attacked by a series of pests producing important damages.

The autumn rape culture occupies large surfaces, especially in the areas with lower temperatures where it replaces sunflower (Poland, Germany, England, the Scandinavian countries etc. (Arion, 1957; Balachowschi, Mesnil, 1935-1936, Knechtel, 1951; Manolache et al., 1946-1957, 1969). In our country, though having a long tradition and being cultivated since the first decades of the past century, this culture has registered in recent years a strong reversal so that at present the cultivated surfaces exceed sometimes 100,000 ha annually (Baicu, 1982, Panin, 1951; Bărbulescu et al., 1993, 2002; Boguleanu, 1980; Hulea et al. 1975; Rădulescu et al., 1973; Săvulescu et al., 1982; Sin, 2000; Şandru, 1996). Following the progress achieved in the improvement process by obtaining breeds whose oil content reaches 40% and the protein reaches 40% in the defatted groats with a low content of erucic acid, the rape has turned from an industrial-fodder plant into an important food plant. Both for its multiple industrial uses and numerous economic advantages, the rape is considered a valuable culture, easy to cultivate and trade but with some protection problems, especially related to pests (Manolache, Boguleanu, 1978; Paulian, Iliescu, 1973; Paulian et al., 1974; Perju et al., 1976; Popov, 2003).

MATERIAL AND METHOD

The observations were made in 2008 on some rape cultures from Brasov area, in Rotbav locality, in two variants:

- spontaneous rape (untreated);
- cultivated rape (treated).

The material was collected by means of the entomologic netting effectuating several "cuts", each time a sample being obtained from the insects collected on a surface of about 10 m^2.

We effectuated several harvests of the material, more precisely between 2 and 4 harvests as follows:

- for the variant "spontaneous rape" we effectuated 4 cuts on the following dates: 1st cut, on 03.06.2008; 2nd cut, on 09.06.2008;3rd cut, on 17.06.2008;4th cut, on 22.06.2008;

- for the variant "cultivated rape" (treated) we effectuated 2 cuts on the following dates:1st cut, on e 03.06.2008; 2nd cut, on 09.06.2008;

The material collected in this way was cleaned from the vegetal remains, and then it was put in an alcohol solution with 20% concentration where it was left for a certain period of time. For the establishing of the material we used different catalogues for determining breeds (Reitter, Bobârnac and Stănoiu, etc) or other materials: Romanian Hymenoptera guide, entomophagous insects and their use in the integrated protection of agricultural ecosystems; entomophagous insects and their use in the integrated protection of horticultural ecosystems. The material determined in this manner constituted the topic of this paper.

RESULTS AND DISCUSSIONS

After colleting and analyzing the data for the two variants "spontaneous rape" (untreated) and "cultivated rape" (treated) the situation is as follows:

a.For the variant spontaneous rape (untreated), the results of the 4 "cuts" were the following. The damaging fauna belongs to the following insect orders: *Coleoptera, Diptera, Homoptera* and *Lepidoptera*. From the 4 insect orders, the *Coleoptera* order has the largest number of exemplars belonging to 3 species: *Meligethes aeneus* F. with 200 exemplars, *Phyllotreta atra* with 110 exemplars and *Phyllotreta nemorum* with 30 exemplars. As for the useful fauna, it belongs to 3 orders. The *Hymenoptera* order comprises most of the exemplars of useful insects belonging to the families *Aphidiidae, Braconidae* and *Ichneumonidae*. From the *Diptera* order, the collected insects belong to the families *Tachynidae* and *Asilidae.* The density of the fauna collected in this "cut" was 37.2 exemplars/m^2 for the damaging fauna, 2.92 exemplars for the useful fauna and 40.1 exemplars /m^2 for total fauna.

The damaging fauna belongs to a number of 4 insect orders, among which predominant is *Coleoptera,* both as number of exemplars and as number of species. The *Coleoptera* species collected were: *Meligethes aeneus* F. with 50 exemplars, *Phyllotreta atra* with 6 exemplars, *Phyllotreta nemorum* with 3 exemplars and *Tanymecus palliatus* F., with a single exemplar. The other orders had a reduced number of exemplars.

The useful fauna, quite reduced, had only 6 exemplars belonging to *Diptera* order with two families: *Tachynidae* and *Asilidae.*

As for the density of damaging fauna as compared to the surface unit (m^2), it registered 17.1 exemplars for the damaging fauna, 0.6 exemplars for the useful fauna and 17.7 exemplars for the damaging and useful fauna.

The damaging species belong to 4 insect orders: *Coleoptera, Diptera, Heteroptera* and *Orthoptera.* From the 4 orders, the *Coleoptera* order had most of exemplars and species, more precisely: *Meligethes aeneus* with 30 exemplars, *Phyllotreta atra*, with 35 exemplars and *Phyllotreta nemorum* with 3 exemplars. The orders *Diptera, Heteroptera* and *Orthoptera* registered a reduced number of exemplars and species.

The useful fauna collected in this cut belongs to orders *Hymenoptera* and *Heteroptera*. The density of the fauna collected per surface unit (m^2), was 7.9 exemplars for the damaging fauna 1.0 exemplars, for the useful fauna and 8.9 exemplars for the total fauna collected.

b. For the variant cultivated rape (treated), the results of the 2 cuts were the follows:

- at the first cur effectuated on 3.06.2008 (table 2), we collected a number of 20 insect exemplars, 19 belonging to the damaging fauna and 1 exemplar belonging to the useful fauna, this representing 5% from the total fauna collected. The damaging fauna mainly belongs to *Coleoptera* order and one species, *Meligethes aeneus* F. with 19 exemplars. The useful fauna belongs to one order, *Neuroptera, Chryropa* type. The density of damaging fauna as compared to the

surface unit (m^2) registered 1.9 exemplars for the damaging fauna, 0.1 exemplars for the useful fauna and 2.0 exemplars for total fauna.

Table 1

Situation on the fauna collected from Rotbav area, the "spontaneous rape" (untreated)

No. crt.	Fauna type	Systematic classification		No. of exemplars	Total
		Order	Suborder/family/type/species		
03.06.2008					
1	Damaging	Coleoptera	*1.Meligethes aeneusF.* *2.Phyllotreta nemorumL.* *3.Phyllotreta atraF.*	200 110 30	372
		Diptera	*1.Anthomyidae* *2.Tipulidae*	9 6	
		Homoptera	*1.Aphidae*	12	
		Lepidoptera	*1.Tortricidae*	5	
2	Useful	Hymenoptera	*1.Aphydiidae* *2.Braconidae* *3.Ichneumonidae*	10 2 5	29
		Diptera	*1.Tachynidae* *2.Asilidae*	8 2	
		Heteroptera	*1.Miridae*	2	
% of useful fauna from total fauna				401	7.24
09.06.2008					
1	Damaging	Coleoptera	*1.Meligethes aeneus F.* *2.Phyllotreta nemorum L.* *3.Phyllotreta atra F.* *4.Tanymecus palliatus F.*	50 6 3 1	171
		Diptera	*1.Anthomyidae* *2.Tipulidae*	6 2	
		Thysanoptera	*1.Haplothrips spp.*	1	
		Orthoptera	*1.Acridiidae*	1	
		Heteroptera	*1.Pentatomidae*	1	
2	Useful	Diptera	*1.Tachynidae* *2.Asilidae*	5 1	6
% of useful fauna from total fauna				17.7	3.41
17.06.2008					
1	Damaging	Coleoptera	*1. Meligethes aeneus F.* *2. Phyllotreta atra F.* *3. Phyllotreta nemorum L.*	30 35 3	79
		Diptera	*1.Anthomyidae* *2.Tipulidae*	4 1	
		Heteroptera	*1.Miridae*	5	
		Orthoptera	*1.Acrididae*	1	
2	Useful	Hymenoptera	*1.Ichneumonidae* *2.Chalcididae* *3.Apidae*	2 2 3	10
		Heteroptera	*Pyrrhocoridae*	3	
% of useful fauna from total fauna				89	11.23
22.10.2008					
1	Damaging	Orthoptera	*1.Acridiidae*	1	2
		Diptera	*1.Anthomyidae*	1	
2	Useful	-	-	-	-

- in the second cut effectuated on 9.06.2008 (table 2), we collected a number of 69 insect exemplars, 62 belonging to the damaging fauna and 7 exemplars belonging to the useful fauna, this representing 10.14% from the total fauna collected. The damaging fauna mainly belongs to *Coleoptera* order with the following species: *Meligethes aeneus*, with 50 exemplars, *Oedemera flavipes* Fabr., with 3 exemplars, *Chrysomela violacea* Müll. and *Eusomus ovulum* Germ., with one exemplar each.

The useful fauna belongs to *Diptera* and *Hymenoptera* orders and the families *Anthomyidae, Tipulidae, Cecidomyidae, Ichneumonidae* and *Braconidae*, respectively. The density of damaging fauna as compared to the surface unit (m^2) was 6.2 exemplars, 0.7 exemplars for the useful fauna and 6.9 exemplars for the total fauna collected.

Table 2

Situation on the fauna collected from Rotbav area, the "cultivated rape" (treated)

No. crt.	Fauna type	Systematic classification		No. of exemplars	Total
		Order	Suborder/family/type/species		
03.06.2008					
1	Damaging	Coleoptera	*1.Meligethes aeneus F.*	18	19
		Heteroptera	*1.Miridae*	1	
2	Useful	Neuroptera	*1.Chryropidae*	1	1
% of useful fauna from total fauna				20	5,0
9.06.2008					
1	Damaging	Coleoptera	*1.Meligethes aeneusF.*	50	62
			2.Oedemera flavipes Fabr.	3	
			3.Chrysomela violacea Müll	1	
			4.Eusomus ovulum Germ.	1	
		Diptera	*1.Anthomyidae*	4	
			2.Tipulidae	1	
			3.Cecidomyidae	2	
2	Useful	Hymenoptera	*1.Ichneumonidae*	5	7
			2.Braconidae	2	
% of useful fauna from total fauna				69	10,14

Referring to the entomofauna collected for the two variants, "spontaneous rape" (untreated), and cultivated rape (treated), the situation is the following:

- for the spontaneous rape (untreated) (table 3), in the period of observations, we collected at the 4 cuts 624 exemplars of damaging insects and 47 exemplars of useful insects, representing 7.53 from the total fauna collected.

Table 3

Situation on the useful and damaging fauna collected from the spontaneous rape (untreated) cultures from Rotbav area in 2008

No. crt.	**Fauna nature**	**Collecting date**				**Total exemplars**
		3.06.2008	**9.06.2008**	**17.06.2008**	**22.10.2008**	
		Number of exemplars				
1	Damaging	372	171	79	2	624
2	Useful	29	6	12	-	47
% useful fauna from total fauna 7.53						671

The density of damaging fauna was 62.4 exemplars /m^2, of useful fauna was 4.7 exemplars /m^2 and of useful and damaging fauna was 67.1 exemplars /m^2.

For the cultivated rape (treated) (table 4), we collected 89 exemplars in total, 81 belonging to the damaging fauna and 8 exemplars belonging to the useful fauna, representing 8.99 from the total fauna collected.

The density of damaging fauna was 8.1 exemplars /m^2, of useful fauna was 0.8 exemplars /m^2 and of useful and damaging fauna was 8.9 exemplars /m^2.

Table 4

Situation on the useful and damaging fauna collected from the cultivated rape (treated) cultures from Rotbav area in 2008

No. crt.	Fauna nature	Collecting date		Total exemplars
		3.06.2008	9,06.2008	
		Number of exemplars		
1	Damaging	19	62	81
2	Useful	1	7	8
% useful fauna from total fauna 8.99				89

CONCLUSIONS

1. In 2008, from the rape cultures from locality Rotbav, we collected the damaging and useful entomofauna for two variants: V_1 – spontaneous rape (untreated); V_2 – cultivated rape (treated)

2. We made in the period of observations a number of 6 "cuts" to collect the material, as follows: 4 "cuts" for the variant "spontaneous rape" (untreated) on the dates: 3.06.2008; 9.06.2008; 17.06.2008 and 22.10.2008; 2 "cuts" for the variant "cultivated rape" (treated) on the following dates: 3.06.2008 and 9.06.2008.

3. For the spontaneous variant (untreated) we collected 624 damaging exemplars and 47 useful insect exemplars representing 7.53% from the total fauna collected, whereas for the cultivated variant (treated) we collected 81 damaging insect exemplars and 8 useful insects, representing 8.99% from the total fauna collected.

4. The damaging fauna from the rape cultures from locality Rotbav belongs to the *Coleoptera* order with the species *Meligethes aeneus*, *Phyllotreta atra* and *Phyllotreta nemorum*. We also collected some *Diptera* species damaging for plants belonging to the families *Anthomyidae* and *Agromyzidae*.

5. The useful fauna belongs to *Hymenoptera* order and the families *Braconidae* and *Ichneumonidae*.

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