

ASPECTS REGARDING THE BIODIVERSITY OF
COLEOPTEROFAUNA IN THE RAPE CROP

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ABSTRACT - The observations were made in the rape crop in Făgăraș area, Brașov county in 2008. For this, there were set soil traps of Barber type at two experimental variants: V₁ – untreated rape from S.C. Gusutri, Brașov county; V₂ – treated rape from the same agricultural company. Of the material collected we selected the coleopteran species, which were then determined. At first variant (V₁) – “untreated rape”, there were collected samples of coleoptera belonging to the following 15 species: *Meligethes aeneus* F., *Elater nigerrimus* Lac., *Tachyporus nitidulus* F., *Apion apricans* Herbst., *Psylliodes chrysocephala* L., *Longitarsus tabidus* F., *Drasterius bimaculatus* Rossi, *Orchestes stigma* Wagner, *Coccinella 14 - punctata* L., *Staphylinus* spp., *Phyllotreta atra* F., *Phyllotreta nemorum* L., *Amara eurynota* Panz., *Cassida nobilis* L. și *Platynaspis luteorubra* Goeze. The second variant (V₂), “treated rape” there were collected samples of coleoptera belonging to the following 16 species: *Phyllotreta atra* F., *Phyllotreta nemorum* L., *Psylliodes chrysocephala* L., *Panagaeus cruxmajor* L., *Meligethes aeneus* F., *Longitarsus tabidus* F., *Coccinella 7-punctata* L., *Otiorrhynchus raucus* F., *Bembidion lampros* Herbst., *Peritelus*

familiaris Boheman, *Galeruca tanacetii* L., *Amphimallon solstitialis* L., *Ceuthorrhynchus obsoletus* Germ., *Amara eurynota* Panz., *Pterostichus cupreus* L., *Tachyporus nitidulus* F.

Key words : Coleoptera; Rape crops; Entomofauna; Harvest.

REZUMAT - Aspecte privind biodiversitatea coleopterofaunei din culturile de rapiță. Observațiile au fost făcute în anul 2008, în culturile de rapiță din zona Făgăraș, județul Brașov. Pentru aceasta au fost montate capcane de sol tip Barber, la două variante experimentale: V₁ – rapiță netratată din cadrul S.C. Gusutri, județul Brașov; V₂ – rapiță tratată din cadrul aceleiași societăți agricole. Din materialul colectat au fost selectate speciile de coleoptere, care au fost apoi determinate. La varianta 1 (V₁), „rapiță netratată“, au fost colectate exemplare de coleoptere aparținând următoarelor 15 specii: *Meligethes aeneus* F., *Elater nigerrimus* Lac., *Tachyporus nitidulus* F., *Apion apricans* Herbst., *Psylliodes chrysocephala* L., *Longitarsus tabidus* F., *Drasterius bimaculatus* Rossi, *Orchestes stigma* Wagner, *Coccinella 14 - punctata* L.,

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Staphylinus spp., *Phyllotreta atra* F., *Phyllotreta nemorum* L., *Amara eurynota* Panz., *Cassida nobilis* L. și *Platynaspis luteorubra* Goeze. La varianta 2 (V₂), „rapiță tratată“, au fost colectate exemplare de coleoptere aparținând la următoarele 16 specii: *Phyllotreta atra* F., *Phyllotreta nemorum* L., *Psylliodes chrysocephala* L., *Panagaeus cruxmajor* L., *Meligethes aeneus* F., *Longitarsus tabidus* F., *Coccinella 7-punctata* L., *Otiorrhynchus raucus* F., *Bembidion lampros* Herbst., *Peritelus familiaris* Boheman, *Galeruca tanacetii* L., *Amphimallon solstitialis* L., *Ceuthorrhynchus obsoletus* Germ., *Amara eurynota* Panz., *Pterostichus cupreus* L., *Tachyporus nitidulus* F.

Cuvinte cheie : coleoptera, culturi de rapiță, entomofaună, recoltări.

INTRODUCTION

In Romania, the total losses from the attack of pathogens, pests and weeds rise annually to 2.5 to 3 billion dollars, that is several times greater than the amount required to purchase crop protection products, including the cost for carrying out treatments. As with other cultures, a number of pests, causing serious damage, also attacks the rape culture.

The winter rape crop occupies large areas, particularly in areas with lower temperatures, where it has replaced the sunflower Poland, Germany, U.K., Scandinavian countries etc. (Arion, 1957; Balachowschi and Mesnil, 1935-1936; Knechtel, 1951; Manolache *et al.*, 1946-1957; Manolache and Boguleanu, 1967).

In our country, although it has a long tradition, being cultivated since the first decades of last century, in recent years this culture has suffered a strong revival, the area under cultivation, sometimes being beyond 100 000 ha annually (Baicu, 1982; Panin, 1951; Bărbulescu *et al.*, 1993, Bărbulescu *et al.*, 2002; Boguleanu, 1994; Hulea *et al.*, 1975; Săvescu, 1962-1964; Șandru, 1996).

Following progress in the ameliorating process, by obtaining varieties whose oil content reaches 40% and protein reaches 40% fat and a low erucic acid, rape has turned from an industrial, forage plant into an important food plant. Both due to its many industrial uses and numerous agronomic advantages, rape is considered a valuable crop, easily established and marketed, but with some protection problems, especially caused by pests (Manolache and Boguleanu, 1967; Paulian *et al.*, 1974; Paulian *et al.*, 1979; Perju, 1995; Popov, 2003).

MATERIALS AND METHODS

Gathering the entomological material was made by using soil traps of Barber type in the rapeseed crops, using two experimental variants: V₁ – “untreated rape” from S.C. Gusutri, Brașov county; V₂ – “treated rape” from the same agricultural company. For each variant, six traps were used. For this, there were made five harvests of traps in June the following dates: 2.06.2008, 6.06.2008, 16.06.2008, 25.06.2008, 30.06.2008.

Such material collected it was cleared of debris, only species of beetles have been detained were then determined.

RESULTS AND DISCUSSION

At the untreated variant, the situation on the harvests is as follows (Table 1):

- Harvest-I, dated 02.06.2008, 19 samples were collected, belonging to two species: *Meligethes aeneus* F. and *Elater nigerrimus* Lacordaire

- Harvest-II, dated 16.06.2008, 6 samples were collected, belonging to three species: *Meligethes aeneus* F., *Tachyporus nitidulus* F. and *Apion apricans* Herbst.;

- Harvest-III, dated 6.06.2008, 19 samples were collected, belonging to eight species: *Psylliodes chrysocephala* L., *Longitarsus tabidus* F., *Drasterius bimaculatus* Rossi, *Orchestes stigma* Sch., *Coccinella 14-punctata* L., *Meligethes aeneus* F., *Staphylinus* spp. and *Platynaspis luteorubra* Goeze;

- Harvest-IV, dated 25.06.2008, 50 samples were collected, belonging to seven species: *Phyllotreta nemorum* L., *Psylliodes chrysocephala* L., *Longitarsus tabidus* F., *Meligethes aeneus* F., *Drasterius bimaculatus* Rossi, *Phyllotreta atra* F. and *Amara eurynota* Panz.;

- Harvest-V, 42 coleoptera samples were collected, belonging to six species: *Phyllotreta atra* F., *Cassida nobilis* L., *Phyllotreta nemorum* L., *Meligethes aeneus* F., *Longitarsus tabidus* F., *Coccinella 4 punctata* L..

At the treated variant, the situation on harvest is as follows (Table 2):

- Harvest-I, dated 02.06.2008, 32 samples were collected, belonging to seven species: *Phyllotreta atra* F., *Phyllotreta nemorum* L., *Psylliodes chrysocephala* L., *Panagaeus cruxmajor* L., *Meligethes aeneus* F., *Longitarsus tabidus* F. and *Coccinella 7-punctata* L.;

- Harvest-II, dated 06.06.2008, 5 samples were collected, belonging to three species: *Phyllotreta atra* F., *Phyllotreta nemorum* L. and *Meligethes aeneus* F.;

- Harvest-III, dated 16.06.2008, 8 samples were collected, belonging to four species: *Phyllotreta atra* F., *Meligethes aeneus* F., *Otiorrhynchus raucus* F. and *Bembidion lampros* Herbst.;

- Harvest-IV, dated 25.06.2008, 13 samples were collected, belonging to seven species: *Galeruca tanacetii* L., *Phyllotreta atra* F., *Peritelus familiaris* Boheman, *Psylliodes chrysocephala* L., *Meligethes aeneus* F., *Longitarsus tabidus* F. and *Amphimallon solstitialis* L.;

- Harvest-V, dated 30.06.2008, 50 samples were collected, belonging to eight species: *Phyllotreta atra* F., *Phyllotreta nemorum* L., *Ceuthorrhynchus obsoletus* Germ., *Longitarsus tabidus* F., *Meligethes aeneus* F., *Amara eurynota* Panz., *Pterostichus cupreus* L. and *Tachyporus nitidulus* F..

Table 1 - Species of beetles collected in untreated rape cultures from SC Gusutri Braşov

No. harvest	Date of collection	Name of species	No. samples /collection					No. ex./species	No. ex./harvest
			1	2	3	3	4		
1	2.06.2008	1. <i>Meligethes aeneus</i> F.	1	-	-	5	6	6	18
		2. <i>Elater nigerrimus</i> Lac.	-	-	-	-	1	-	1
2	6.06.2008	1. <i>Meligethes aeneus</i> F.	1	-	-	1	-	2	4
		2. <i>Tachyporus nitidulus</i> F.	-	1	-	-	-	-	1
		3. <i>Apion apricans</i> Herbst.	-	-	-	-	-	1	1
3	16.06.2008	1. <i>Psylliodes chrysocephala</i> L.	1	-	-	-	-	-	1
		2. <i>Longitarsus tabidus</i> F.	-	3	-	-	-	-	3
		3. <i>Drasterius bimaculatus</i> Rossi	-	1	-	-	7	-	8
		4. <i>Orchestes stigma</i> Sch.	-	1	-	-	-	-	1
		5. <i>Coccinella 14-punctata</i> L.	-	-	-	1	-	-	1
		6. <i>Meligethes aeneus</i> F.	-	-	-	-	-	3	3
		7. <i>Staphylinus</i> spp.	-	-	-	-	-	1	1
		8. <i>Platynaspis luteorubra</i> Goeze.	-	-	-	-	-	1	1
4	25.06.2008	1. <i>Phyllotreta nemorum</i> L.	2	-	2	2	1	-	7
		2. <i>Psylliodes chrysocephala</i> L.	1	1	1	-	2	-	5
		3. <i>Longitarsus tabidus</i> F.	-	3	-	2	1	-	6
		4. <i>Meligethes aeneus</i> F.	-	1	3	2	9	-	15
		5. <i>Drasterius bimaculatus</i> Rossi	-	-	9	3	-	-	12
		6. <i>Phyllotreta atra</i> F.	-	-	1	2	-	-	3
		7. <i>Amara eurynota</i> Panz.	-	-	-	2	-	-	2
5	30.06.2008	1. <i>Phyllotreta atra</i> F.	5	8	3	-	3	-	19
		2. <i>Cassida nobilis</i> L.	-	1	-	-	-	-	1
		3. <i>Phyllotreta nemorum</i> L.	-	3	-	-	-	-	3
		4. <i>Meligethes aeneus</i> F.	-	4	3	-	2	-	9
		5. <i>Longitarsus tabidus</i> F.	-	2	2	3	2	-	9
		6. <i>Coccinella 4-punctata</i>	-	-	-	1	-	-	1
Total samples								136	

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Table 2 - Species of beetles collected in treated rape cultures from S.C. Gusutri Braşov

No. harvest	Date of collection	Name of species	No. samples /collection						No. ex./species	No. ex./ harvest
			1	2	3	4	5	6		
1	2.06.2008	1. <i>Phyllotreta atra</i> F.	4	4	4	2	2	-	16	32
		2. <i>Phyllotreta nemorum</i> L.	2	2	-	-	-	-	4	
		3. <i>Psylliodes chrysocephala</i> L.	-	3	2	-	-	-	5	
		4. <i>Panagaeus cruxmajor</i> L.	-	1	-	-	-	-	1	
		5. <i>Longitarsus tabidus</i> F.	-	-	2	-	-	1	3	
		6. <i>Meligethes aeneus</i> F.	-	-	2	-	-	-	2	
		7. <i>Coccinella 7-punctata</i> L.	-	-	-	-	1	-	1	
2	6.06.2008	1. <i>Phyllotreta atra</i> F.	-	-	1	1	-	2	5	
		2. <i>Phyllotreta nemorum</i> L.	-	-	1	-	-	1		
		3. <i>Meligethes aeneus</i> F.	-	-	-	1	1	2		
3	16.06.2008	1. <i>Phyllotreta atra</i> F.	1	-	2	-	-	3	8	
		2. <i>Meligethes aeneus</i> F.	-	1	-	-	1	1		
		3. <i>Otiorrhynchus raucus</i> F.	-	1	-	-	-	1		
		4. <i>Bembidion lampros</i> Herbst.	-	-	-	-	-	1		
4.	25.06.2008	1. <i>Galeruca tanacetii</i> L.	1	-	-	-	-	1	13	
		2. <i>Phyllotreta atra</i> F.	-	2	1	1	-	4		
		3. <i>Peritelus familiaris</i> Boheman	-	1	-	-	-	1		
		4. <i>Psylliodes chrysocephala</i> L.	-	2	-	-	-	1		
		5. <i>Meligethes aeneus</i> F.	-	2	-	-	-	2		
		6. <i>Longitarsus tabidus</i> F.	-	-	1	-	-	1		
		7. <i>Amphimallon solstitialis</i> L.	-	-	-	1	-	1		
5.	30.06.2008	1. <i>Phyllotreta atra</i> F.	2	5	-	6	11	2	26	50
		2. <i>Phyllotreta nemorum</i> L.	1	4	2	2	3	-	12	
		3. <i>Ceuthorrhynchus obsoletus</i> Germ.	1	-	-	-	-	-	1	
		4. <i>Longitarsus tabidus</i> F.	-	2	-	1	1	-	4	
		5. <i>Meligethes aeneus</i> F.	-	2	-	2	-	-	4	
		6. <i>Amara eurynota</i> Panz.	-	1	-	-	-	-	1	
		7. <i>Pterostichus cupreus</i> L.	-	1	-	-	-	-	1	
8. <i>Tachyporus nitidulus</i> F.	-	-	1	-	-	-	1			
Total samples									108	

Table 3 - Structure and abundance of beetles of species collected from rape crops in treated and untreated variants

No.	Name of species	Variant		Total
		Untreated (no.ex.)	Treated (no.ex.)	
1	<i>Meligethes aeneus</i> F.	49	13	62
2	<i>Elater nigerrimus</i> Lac.	1	-	1
3	<i>Tachyporus nitidulus</i> F.	1	1	2
4	<i>Apion apricans</i> Herbst.	1	-	1
5	<i>Psylliodes chrysocephala</i> L.	6	8	14
6	<i>Longitarsus tabidus</i> F.	18	8	26
7	<i>Drasterius bimaculatus</i> Rossi	20	-	20
8	<i>Orcheater stigma</i> Sch.	1	-	1
9	<i>Coccinella 14-punctata</i> L.	1	-	1
10	<i>Staphylinus</i> spp.	1	-	1
11	<i>Platynaspis luteorubra</i> Goeze.	2	-	2
12	<i>Phyllotreta nemorum</i> L.	10	17	27
13	<i>Phyllotreta atra</i> F.	22	51	73
14	<i>Amara euryrata</i> Panz.	2	1	3
15	<i>Cassida nobilis</i> L.	1	-	1
16	<i>Panagaeus cruxmajor</i> L.	-	1	1
17	<i>Coccinella 7-punctata</i> L.	-	1	1
18	<i>Otiorrhynchus raucus</i> F.	-	1	1
19	<i>Bembidion lampros</i> Herbst.	-	1	1
20	<i>Galeruca tanacetii</i> L.	-	1	1
21	<i>Peritelus familiaris</i> Boheman	-	1	1
22	<i>Amphimallon solstitialis</i> L.	-	1	1
23	<i>Ceuthorrhynchus obsoletus</i> Germ.	-	1	1
24	<i>Pterostichus cupreus</i> L.	-	1	1
Total		136	108	244

Table 4 - The abundance of species of beetle the most commonly found in the rape crops in treated and untreated variants

No	Name of species	Variant		Total
		Treated	Untreated	
1	<i>Phyllotreta atra</i> F.	51	22	73
2	<i>Meligethes aeneus</i> F.	13	49	62
3	<i>Phyllotreta nemorum</i> L.	17	10	27
4	<i>Longitarsus tabidus</i> F.	8	18	26

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Regarding the structure of beetle species collected from the two variants (*Table 3*) we noticed that:

- at the untreated variant 136 samples were collected, belonging to the following 15 species : *Meligethes aeneus* F., *Elater nigerrimus* Lacordaire, *Tachyporus nitidulus* F., *Apion apricans* Herbst., *Psylliodes chrysocephala* L., *Longitarsus tabidus* F., *Drasterius bimaculatus* Rossi, *Orchestes stigma* Sch., *Coccinella 14-punctata* L., *Staphylinus* spp., *Platynaspis luteorubra* Goeze., *Phyllotreta nemorum* L., *Phyllotreta atra* F., *Amara eurynota* Panz. and *Cassida nobilis* L.;

- at the untreated variant 108 samples were collected, belonging to a total of 16 species: *Meligethes aeneus* F., *Tachyporus nitidulus* F., *Psylliodes chrysocephala* L., *Longitarsus tabidus* F., *Phyllotreta nemorum* L., *Phyllotreta atra* F., *Amara eurynota* Panz., *Panagaeus cruxmajor* L., *Coccinella 7-punctata* L., *Otiorrhynchus raucus* F., *Bembidion lampros* Herbst., *Galeruca tanaceti* L., *Peritelus familiaris* Boheman, *Amphimallon solstitialis* L., *Ceuthorrhynchus obsoletus* Germ. and *Pterostichus cupreus* L.;

- seven common species were being collected at both variants, they were: *Meligethes aeneus* F., *Tachyporus nitidulus* F., *Psylliodes chrysocephala* L., *Longitarsus tabidus* F., *Phyllotreta nemorum* L., *Phyllotreta atra* F. and *Amara eurynota* Panz..

At the two variants a total number of beetles belonging to 24 species was collected (*Table 3*).

The species with the largest number of specimens collected from the two variants were (*Table 4*):

Phyllotreta atra F., with 73 samples (22 samples at untreated variant and 51 samples at treated variant); *Meligethes aeneus* F., with 62 samples (49 samples at untreated variant and 13 samples at treated variant); *Phyllotreta nemorum* L., with 27 samples (10 samples at untreated variant and 17 samples at treated variant); *Longitarsus tabidus* F., with 26 samples (18 samples at untreated variant and 8 samples at treated variant);

We noted that two species, *Phyllotreta nemorum* F. and *Phyllotreta atra* L. showed more copies at the variant treated than at the untreated variant.

CONCLUSIONS

In 2008, in June, 136 specimens of beetles were collected from untreated rapeseed crops belonging to a number of 15 species.

In 2008, in June, 108 specimens of beetles were collected from treated rapeseed crops belonging to a number of 16 species

A total of seven species were common to both variants. They were: *Meligethes aeneus* F., *Tachyporus nitidulus* F., *Psylliodes chrysocephala* L., *Longitarsus tabidus* F., *Phyllotreta nemorum* L., *Phyllotreta atra* F. and *Amara eurynota* Panz..

The species with the largest number of specimens collected from the two variants was: *Phyllotreta atra* F., *Meligethes aeneus* F., *Longitarsus tabidus* F. and *Phyllotreta nemorum* L.

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