

RESULTS ON SPECIFIC HARMFUL ENTOMOFAUNA FROM RAPESEED CROPS IN THE CENTRAL MOLDAVIAN PLATEAU CONDITIONS

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Abstract

The rape is a plant originating from the Mediterranean basin, which due to its rich oil seeds, used in food and illuminated, was widespread during the Middle Ages in the Central and Nordic European countries. Result of the breeding researches, the rape currently occupies a very important place in the world economy as a source of vegetable oils used in food and especially in industry by creating alternative energy solutions. The agronomic importance of rape is undeniable, it is considered one of the most productive crops, one of the best preceding plant for the most demanding culture and a good neighbor of wedge with crops attacked by the same disease. During the period 2010 - 2012, in the ARDS Secuieni conditions, was pursued the identification of harmful entomo-fauna from winter rape crops of Central Moldavian Plateau. The harmful entomo-fauna collected during 2010 - 2012, in rape crops in the Agricultural Research - Development Station Secuieni territory was composed of 15 species which for entire period totaled 4046 specimens/sqm, of the following orders: *Coleoptera*, *Hymenoptera*, *Heteroptera* and *Lepidoptera*. The *Coleoptera* order had the highest number of species and the highest number of collected specimens. From *Coleoptera* order, the *Meligethes aeneus* had the largest share (62.90%). The collected species were integrated into the five classes of dominance (D1 - subrecedent species, D2 - recedent species, D3 - subdominant species, D4 - dominant species and D5 - eudominant species); the highest rate from the total of collected species, 62.90%, was registered to the D5 class - eudominant species.

Key words: winter rape, pests, dominance, percentage.

The rapeseed currently occupies an important role in the global economy as a source of vegetable oils used in food industry and especially in the industry by creating some alternative energy solutions. (Elena Trotus, 2001; Talmaciu Nela, 2009). Reflecting on the many pests of rape culture, it is necessary to mention the importance of the attacks that lead to the failure of the productive potential of the varieties and hybrids grown or even compromise the harvest, in extreme situations of risk related to the insect abundance. (Elena Trotus, 2003; Elena Trotus, 2009). The knowledge of insect pests is of special practical interest, because the moment of attack is difficult to see due to their small size, sometimes milimeter, of the species and their phytophagous stages, as well as their specific parasite attack hidden inside or between plant tissues, in soil or sometimes diminished by vegetative growth and phenological development of plants.

MATERIALS AND METHODS

The researches were conducted at the Agricultural Research – Development Station Secuieni – Neamt, on winter rapeseed crop, and consisted of the collection:

In recent years, the constant attention given to study the dynamics of pest attack in conjunction with the evolution of zonal agri – environmental factors complex, has led to the observation of impact produced by climate changes on rapeseed crop entomocenoses. The global warming, the installation of very hot, drought and heat periods, in spring – summer months, were particularly strong ecological factors which led to changes in species composition, favoring the development of narrow – spectrum populations of problem species that became dominant, dangerous by increasing or even by the numerical bursts through local invasion and powerful attacks.

In this paper we present information regarding the identification of specific harmful entomofauna from rapeseed crops in the conditions of Central Moldavian Plateau.

- Barber traps type;
- Yellow bowl trap type;
- Glue traps;
- Trap light;

- Collections with the entomological net from plants rosette stage until the seed formation in silicve, from 10 to 10 days;
- Ground surveys, of 25/25/25 cm size and soil entomofauna collection.

The collections and measurements were made from the stem elongation phenophase until the end of seed ripening phenophase, from 2010 to 2012.

The collected entomofauna was determined in laboratory at the binocular loupe and selected species and orders then was calculated the density/sqm of identified species throughout the growing season. The dates obtained allowed to establish the collected species dominance and their inclusion in the 5 classes of dominance.

The species dominance was calculated using the formula:

$$D_A = \frac{N_A \times 100}{N_1}$$

N_A = total number of individuals of A species;

N_1 = total number of individuals of all collected species.

The dominance classes include species whose rate of spread is within the following values: D1 – subrecedent species – rate of spread $P < 1,1\%$;

D2 – recedent species - $P = 1,2 - 2,0\%$;

D3 – subdominant species - $P = 2,1 - 5,0\%$;

D4 – dominant species - $P = 5,1 - 10,0\%$;

D5 – eudominant species - $P > 10,1\%$.

RESULTS AND DISCUSSIONS

The observations and measurements made on the collected fauna from winter rapeseed crops in A.R.D.S. Secuieni territory, showed that the harmful entomofauna consisted of 15 species which totale don average over the entire period of observations (2010 – 2012) a total of 4046 specimens/sqm. (table 1).

The average density of the pest during the phenophases of strains elongation – buds – flowering – silicve formation – silicve maturation ranged from 4 specimens/sqm and 2439 specimens/sqm. (table 1).

Analyzing the collected harmful species, regarding their dominance, it was found that they were classified in the five classes of dominance, as follows:

- 5 species belong to the D1 class – subrecedent species, the percentage of spread of each species was less than 1.1%;
- 3 species were classified in D2 class – recedent species, where the rate of spread of species was less than 2.0%;
- 3 species belong to the D3 class – subdominant species whose rate of spread was less than 5.0%;

- 3 species were classified in D4 class – dominant species, with a prevalence rate between 5.1 – 10.0%;
- 1 species belong to D5 class – eudominant species, whose prevalence percentage was higher of 10.1% (table 2).

Calculating the share of harmful entomofauna on dominance classes it was found out that from the total collected entomofauna, 3.04% belong to the D1 class (sporadic spreading), 4.92% in D2 class (low spread), 11.35% belong to the D3 class (middle spread), 20.41% in D4 class and 60.28% to D5 class (eudominant species) (fig. 1).

Grouping the harmful entomofauna from rapeseed crop on orders showed that the collected species fall into the following orders: Coleoptera, Hymenoptera, Heteroptera and Lepidoptera.

To find the percentage of the orders that attack the rapeseed crop was calculated the orders percentage according to the number of species. Thus, it was found that the *Coleoptera* order held the maximum share of 95.85%, followed by *Lepidoptera* with 1.58%, *Hymenoptera* with 1.33% and *Heteroptera* with 1.24% (fig.2).

In the rapeseed crops the Coleoptera order was represented by 10 species (*Meligethes aeneus*, *Phyllotreta atra*, *Phyllotreta nemorum*, *Phyllotreta nigripes*, *Psylliodes chrysocephala*, *Ceuthorrhynchus napi*, *Ceuthorrhynchus assimilis*, *Ceuthorrhynchus pleurostigma*, *Baris chlorizans*, *Epicometis hirta*) and totaled for the entire experimental period 3878 specimens/sqm. The largest share of 62.90% was held by *Meligethes aeneus* species, followed by the species *Phyllotreta atra* with 7.94%, *Ceuthorrhynchus assimilis* with 6.78% and *Epicometis hirta* with 6.58%. the remaining species (*Phyllotreta nemorum*, *Phyllotreta nigripes*, *Psylliodes chrysocephala*, *Ceuthorrhynchus napi*, *Ceuthorrhynchus pleurostigma*, *Baris chlorizans*) had a low spreading with weight between 0.23% and 4.41%. (fig. 3).

CONCLUSIONS

The harmful entomofauna collected from rapeseed crop in A.R.D.S. Secuieni territory included 15 species and totale don average throught the growing season 4046 specimens/sqm.

The collected species were classified into the five classes of dominance: D1 – subrecedent species, D2 – recedent species, D3 – subdominant species, D4 – dominant species, D5 – eudominant species.

Of all the collected species 60.28% were classified in D5 class, 20.41% in D4 class, 11.35%

in D3 class, 4.92% in D2 class and 3.04% in D1 class.

In A.R.D.S. Secuieni conditions the attack from the rapeseed crops is determined mainly by species belonging to the *Coleoptera* order.

Within the *Coleoptera* order, the *Meligethes aeneus* species recorded a maximum weight of 62.90%, and *Ceuthorrhynchus pleurostigma* species recorded the lowest percentage of 0.23%.

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Table 1

Harmful entomofauna from winter rapeseed crops

2010-2012

No. crt.	Species	Order	Total specimens		Total
			2010 - 2011	2011 - 2012	
1.	<i>Meligethes aeneus</i>	Coleoptera	1754	685	2439
2.	<i>Phyllotreta atra</i>	Coleoptera	62	246	308
3.	<i>Phyllotreta nemorum</i>	Coleoptera	8	112	120
4.	<i>Athalia rosae</i>	Hymenoptera	37	17	54
5.	<i>Psylliodes chrysocephala</i>	Coleoptera	23	53	76
6.	<i>Ceuthorrhynchus napi</i>	Coleoptera	39	132	171
7.	<i>Ceuthorrhynchus assimilis</i>	Coleoptera	88	175	263
8.	<i>Baris chlorizans</i>	Coleoptera	42	126	168
9.	<i>Epicometis hirta</i>	Coleoptera	73	182	255
10.	<i>Eurydema ornatum</i>	Heteroptera	3	1	4
11.	<i>Lygus pratensis</i>	Heteroptera	44	2	46
12.	<i>Mamestra brassicae</i>	Lepidoptera	27	5	32
13.	<i>Phyllotreta nigripes</i>	Coleoptera	0	69	69
14.	<i>Ceuthorrhynchus pleurostigma</i>	Coleoptera	0	9	9
15.	<i>Agrotis segetum</i>	Lepidoptera	14	18	32
TOTAL			2214	1832	4046

Table 2

The dominance of pests collected in rapeseed crop sat A.R.D.S. Secuieni

2010 - 2012

No. crt.	D1 – subrecedent species < 1,1%	D2 – recedent species 1,2% - 2,0%	D3 –subdominant species 2,1% - 5,0%	D4 – dominant species 5,1% - 10%	D5 –eudominant species > 10%
1.	<i>Eurydema ornatum</i>	<i>Athalia rosae</i>	<i>Baris chlorizans</i>	<i>Ceuthorrhynchus assimilis</i>	<i>Meligethes aeneus</i>
2.	<i>Mamestra brassicae</i>	<i>Phyllotreta nigripes</i>	<i>Ceuthorrhynchus napi</i>	<i>Epicometis hirta</i>	
3.	<i>Ceuthorrhynchus pleurostigma</i>	<i>Psylliodes chrysocephala</i>	<i>Phyllotreta nemorum</i>	<i>Phyllotreta atra</i>	
4.	<i>Lygus pratensis</i>				
5.	<i>Agrotis segetum</i>				
Total	5 species	3 species	3 species	3 species	1 species

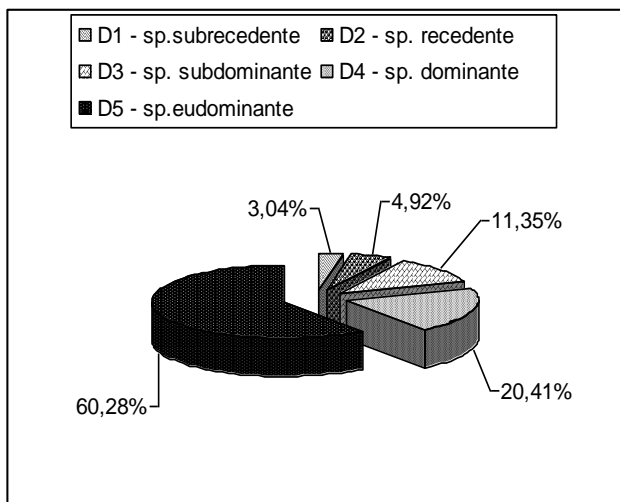


Figure 1 The share of pests on dominance classes

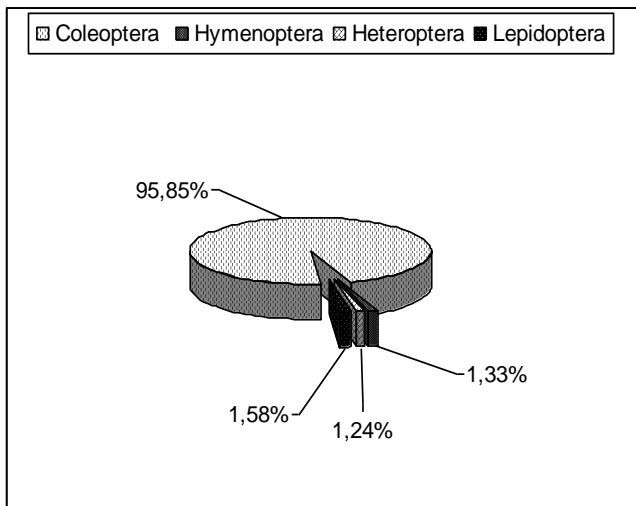


Figure 2 The share of orders based on rapeseed crop species

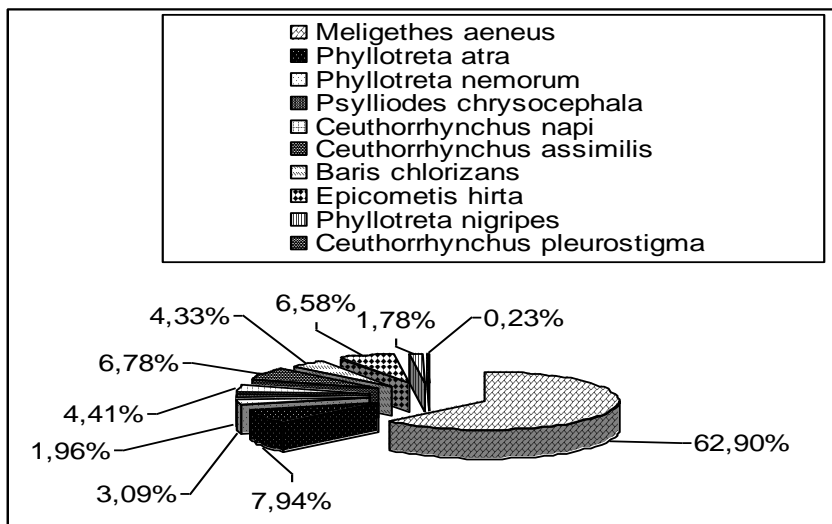


Figure 3 The share of species in Coleoptera order from rapeseed crops