

RESEARCH REGARDING BIOLOGY OF RAPE PESTS

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Abstract

In the recent years, rape has become one of the most profitable crops, when yields are above 1200-1500 kg/ha, look what can be done easy when it is applied an appropriate technology, which can minimize the risks of culture, due to mainly pest occurrence. Economically speaking, from the total collected entomofauna, the most important species, due to both registered densities and attacks in rape, are: Phyllotreta spp., Psylliodes chrysocephala, Ceutorhynchus napi, Ceutorhynchus assimilis, Athalia rosae, Meligethes aeneus and Brevicoryne brassicae in the same time in particular years or places other pest can cause problems in rape culture, such as Entomoscelis adonidis, Epicometis hirta or Dasineura brassicae. In general, in Romania, very little is known about the biology of stem and pod rape weevils (Ceutorhynchus napi – stem weevil and Ceutorhynchus assimilis – pod's and seed's weevil) that may cause significant economic damage, from spring to harvesting. The purpose of this research was to identify the species of Ceutorhynchus of rapeseed crop agroecosystems in south-eastern Romania, their biology and damage caused by them.

INTRODUCTION

This year (2010-2011), as every year the last time, broke a new record for the rape of cultivated land, but keep in mind that with this growing pool of diseases and pests, according to the crop rotation (the recommended that the rape to get back on the same surface after at least three years) is harder. EU Directive 2003/30/EC promotes the use of renewable fuels, and by their obligations in Chapter 14, on energy, Romania has pledged that at least 2% of fuel used to transport either organic origin, is currently the most widely biodiesel made from rapeseed oil. 80% of rape production is exported and demand is very high. Rape is a valuable honey plant, which begins to be visited, bee pollen when the temperature exceeds 9⁰C and when the temperature exceeds 14⁰C nectar, so bees families grow stronger and earlier in a period when supply honey is still quite low. In recent years, rape has become one of the most profitable crops, but cost-effective when productions are over 1200-1500 kg/ha, look what can be done easily when applying appropriate technology that can minimize the risks of culture, due to mainly drought during the sowing, great temperature declines in winter, or its large fluctuations during the

winter and early spring, possibly high temperatures in June-July mainly due to the occurrence of pest risk, etc.

MATERIAL AND METHODS

Collections of biological material were carried out in the field, on a two week basis, in a rape field near Moara Domneasca-Bucharest. Our objective was to establish the structure of main pests of canola crops in south-eastern Romania, the structure and biology of pests' population in rape agroecosystem, particularly of weevil's populations. Fauna was assessed monthly from April to early July, conducted in three repetitions, insects were collected with entomological net (sweeping the vegetation 30 doubles, equivalent to 10 m², total 30 m²), till identifying captured insects, collected materials were kept in 70⁰ alcohol and determined in the laboratory. Pest species collected with entomological net were separated and identified. 10 rape plants were analyzed, in three repetitions, where we watched the number of eggs deposited in strain by *C. napi*, and then through splitting stems was registered the number and length of their galleries. With the formation of pods, it was registered attack of *C. assimilis*, counting 100 pods, in 4 repetitions and registering percentage of attacked pods, the number of larvae/bean and percentage of seeds destroyed by pests. Complementary observations on the entire spectrum of rapeseed crop pests were done during the whole vegetation period.

RESULTS AND DISCUSSION

Table 1 is presents the structure and evolution of main pest populations during autumn of 2009' and 2010' spring and beginning of summer.

We know relatively little about the species structure of *Ceutorhynchus* in rape agroecosystem and especially about their biology [1-4], especially in Romania [5]. We have collected 1337 specimens of *Ceutorhynchus* of which 669 (53%) belong to *C. napi*, 539 (38%) belong to the species *C. assimilis* and only 129 (9%) species *C. picitarsis*. Data collected with entomological net indicates that the species *C. napi* occurs during April, extending her flight until the end of May, and *C. assimilis* species occurs along with formation of floral button at the end of April and is present in culture until beginning of changing into brown color of seeds. It should be noted the presence of species *C. picitarsis*, which develops during the winter as larvae that feed inside the stem and stem base of rapeseed plants, appearing as an adult in mid-May. We followed, from early April until late May, egg laying by *C. napi*, in the main stem tip under floral buttons or lateral shoots when plants have 40-50 cm high, registering the number of larvae/plant and length of larvae' tunnel carved in stem. Data are presented in table 2, distinguishing a very strong pest attack, evidenced by the number of larvae identified by splitting

stems of canola, but also by the number of galleries dinged by the larvae of pests in plant stem and the length of these galleries.

Table 1
Structure of pest fauna (exemplare/m²) from rape agroecosystem (2009-2010)

Pest species\Data	23 X	13 XI	02 IV	16 IV	30 IV	14 V	28 V	11 VI	25 VI	9 VII	24 VII
<i>Phyllotreta atra</i>	0	0	0	0	0	0	0	0	1.66	3	0.66
<i>Phyllotreta nemorum</i>	0	0	0	0	0	0	2.33	1	0	0	0
<i>Psylliodes chrysocephala</i>	1.33	2.66	0	0	0	0	0	0	0	0.33	0
<i>Ceutorhynchus napi</i>	0	0	1	12.66	4.66	2.66	1.33	0	0	0	0
<i>Ceutorhynchus picitarsis</i>	0	0	0	0	0	0.33	2.66	0.66	0.66	0	0
<i>Ceutorhynchus assimilis</i>	0	0	0	0	2.66	3.66	8.33	1.33	1.33	0.66	0.66
<i>Meligethes aeneus</i>	0	0	0	0	1.66	11.33	18.66	0.66	0	0	0
<i>Athalia rosae</i>	0.1*	0.1*	0	0	0	0.66	2.33	1.66	0	0	0
<i>Pieris rapae</i>	0.33*	0.66*	0	0	0	0	0	0.33	0	0	0
<i>Colaphelus sophiae</i>	0	0	0	0	0	0.66	0	2.33	0.33	0	0
<i>Epicometis hirta</i>	0	0	0	0	0	0.33	0	0.33	0	0	0
<i>Entomoscelis adonidis</i>	0.1	0.1	0	0	0	0	0	0	0	0	0
<i>Brevicoryne brassicae</i>	0	0	0	0	0	0	0	0	0	0.1 ^c	0.33 ^c

* =larvae; ^c =colony

Regarding the attack of *C. assimilis* is found by analyzing the pods that percentage of attacked pods is between 2.5% and 15.7% depending on the time and pod position. In terms of destroying of rape seeds in pod by attack *C. assimilis* larvae, it is found that the destruction of seeds gradually increases, registering a rate of compromised seeds ranging between 2.7 and 13.2%, depending on the position on the plant of pod which was analyzed and on the time, that of course is higher to end of period. As is known, in attacked pod were found only one *Ceutorhynchus* larvae, but sometime numerous larvae belonging to brassica pod midge (*Dasineura brassicae*). It were registered 1.25% pods attacked by *Dasineura brassicae* on 25 June, 5.75% on 9 July and only 0.25% on 24 July with an average number of larvae/attacked pod of 5.75, 9.5 respectively 1.5.

Table 2
Evolution of egg laying and attack of *Ceutorhynchus napi* in rape culture

Data of observation	02-IV	16-IV	30-IV	14-V	28-V
No. of eggs/plant	1.3	4.6	0.3	0	0
No. of larvae/plant	0	2.6	5.6	3.3	1.3
No. of tunnels/plant	0	1.3	5.6	6.3	6
Average lenght of tunnel (cm)	0	2.5	5.7	6.5	6.2

CONCLUSIONS

1. There is a rich pests fauna in the rape agroecosystem, the most important being species *C. napi* (53%), *C. assimilis* (38%), and *C. piciparsis* (9%).
2. The attack of *C. assimilis* on pods is between 2.5% and 15.7% and destruction of seeds gradually increases, registering a rate of compromised seeds ranging between 2.7 and 13.2%.
3. 1.25% pods attacked by *Dasineura brassicae* were registered on 25 June, 5.75% on 9 July and only 0.25% on 24 July with an average number of larvae/attacked pod of 5.75, 9.5 respectively 1.5.

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