RESEARCH ON THE COLEOPTERANS EPIGEUS FAUNA FROM SOME WHEAT CROPS

CERCETARI PRIVIND FAUNA DE COLEOPTERE EPIGEE DIN UNELE CULTURI DE GRAU

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Abstract. *The study of beetles (Coleoptera) appears as a necessary scientific and practical taking into account, in particular its frequency on the meridian of the Earth, the number of species that they comprise (250,000), the largest of the class Insecta, which groups more than one million species and the many species that cause damage to global agriculture.The material was collected using Barber soil traps, from a wheat culture for consumption in the town of Delesti, Vaslui County.The observations were made in 2017, the material was collected from May to October. The material was harvested at intervals between 8 and 17 days, with a total of 5 harvests.The species most frequently collected were Opatrum sabulosum L., Otiorrhynchus raucus F., cupreus Carabus L., Pseudophonus rufîpes, Harpalus aeneus Amara aenea F.şi Payk.*
Key words: diversity, Coleoptera, wheat, useful fauna, harmful fauna.

Rezumat. *Studiul coleopterelor (gândacii) apare ca o necesitate ştiinţifică şi practică având în vedere mai ales frecvenţa lor pe meridianele Terrei, a numărului mare de specii ce le cuprinde(peste 250.000), cel mai mare din clasa Insecta, care grupează peste un million de specii şi a numeroaselor specii care produc pagube agriculturii mondiale. Colectarea materialului s-a făcut cu ajutorul capcanelor de sol tip Barber, dintr-o cultura de grâu pentru consum din localitatea Deleşti, judeţul Vaslui.Observaţiile au fost efectuate în anul 2017, colectarea materialului s-a făcut din luna mai până în luna octombrie. Recoltarea materialului s-a făcut la intervale cuprinse între 8 şi 17 zile, în total efectuându-se un număr de 5 recoltări.Speciile cel mai frecvent colectate, au fost: Opatrum sabulosum L.,Otiorrhynchus raucus F., Carabus cupreus L., Pseudophonus rufipes, Harpalus aeneus F.şi Amara aenea Payk*
Cuvinte cheie: diversitate, coleoptere, grâu, faună utilă, faună dăunătoare.

INTRODUCTION

Of the total number of species of animals inhabiting the land, insects are responsible for about 70%. Every year specialists entomologists discover and describe hundreds of thousands of new species, and according to recent data from the literature, are known worldwide about 2 million species of insects.

Among insects, Coleoptera is the largest and most diverse order, which meets over 350,000 global fauna species.

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Coleopterans are insects of different sizes, ranging from 0.25mm (Ptilliidae) to the most giant (Titanus giganteus, Cerambycidae) reaching up to 25 cm.

With great ecological plasticity, the beetles are found in all ecosystems - from the polar regions to the equatorial forests. They are common in almost all types of habitats, they feed on any kind of food. Numerically, the coleopteran insects are superior to other groups, constituting the majority of more than 80% of the total ecosystem insect species exist.

Coleopters perform various useful functions for humans, are good indicators, can serve as one of the main objects in solving the problems of cadastre and integrated ecological monitoring (Baban, 2006)

This paper presents the species of beetles found in a wheat crop in eastern Romania, Vaslui beetle fauna of this area remains poorly studied so far.

MATERIAL AND METHOD

The data presented in the paper were obtained following the observations made in 2017 in a wheat crop located in the Delesti-Vaslui area.

Observations have been made since May, after planting until the beginning of August. Coleopters were captured with Barber soil traps.

A total of 18 traps were installed in 3 variants, 6 each for each variant:

- wheat after wheat, V1
- wheat after sunflower, V2
- wheat after maize, V3

Samples were harvested at 15-day intervals when the material was trapped in gauze, and each sample was recorded as follows:

- date of collection,
- the number of traps (from 1 to 6);
- Experimental variant.

The material thus labeled was brought to the laboratory, was then cleaned of all vegetal remains, and then from the collected material were selected only coleopteran species.

As a methodological and theoretical-scientific support for the investigations carried out, they served the fundamental works and research of the authors: E. Csiki, S. Panin and N. Săvulescu , Z. Neculiseanu and A. Matalin, M.Talmaciu *et al*. , M.Varvara .

The data from the methodological works of E. Miller and N. Zubovschi , Ienistea M. , S. Panin , N. Săvulescu , Reitter E. , Paul Gîdei, Ionuț Ştefan Iorgu and Elena Iulia Pisică , were used by us for the collection, determination, inventory and classification of existing coleopteras.

For studies refer to the structure, dynamics and other aspects of the species of beetles were used M.Varvara work of authors, Ionuț Ştefan Iorgu and Elena Iulia Pisică, M.Tălmaciu *et all.*

RESULTS AND DISCUSSIONS

They were collected in total 3052 samples from 97 species belonging to the three experimental variants.

The situation is the following:

- variant V1, a number of 1185 copies
- variant V2, a number of 987 copies
- variant V3, a number of 880 copies

The largest number of specimens collected were: *Gryllus campestris* Gyll with 654 specimens, representing 21.4% of the total species collected, *Formicomus pedestris* R. with 408 specimens, representing 13.4% of the total species harvested *Dermestes laniarius* L. with 393 specimens, representing 12.9% of the total species collected, *Opatrum sabulosum* L. with 314 specimens, representing 10.3% of the total collected species, *Otiorrhynchus pinastri* L.with 235 specimens, representing 7.7% of the total collected species.

In terms of coleoptera species (tab. 1), 1944 specimens were collected in total, the highest number of specimens collected were:

Table 1

The structure and abundance of species of beetles in wheat existing in the Delesti Vaslui

No.	Scientific name	Variant			Total
		1	2	3	
1.	Formicomus pedestris Rossi	116	210	82	408
2.	Dermestes laniarius L.	165	168	60	393
3.	Opatrum sabulosum L.	123	75	116	314
4.	Otiorrhynchus pinastri Latreille	60	80	95	235
5.	Idiochroma dorsalis Pontopp.	11	13	61	85
6.	Anthicus floralis L.	20	14	13	47
7.	Pteryngium crenatum Fabricius	15	10	22	47
8.	Anthicus humilis Germ.	26	10	8	44
9.	Conosoma bipunctatum Gravenhorst	7	17	19	43
10.	Coccinella 7 punctata L.	14	7	16	37
11.	Pentodon idiota Hbst	6	12	8	26
12.	Otiorrhynchus orbicularis	5	5	10	20
13.	Pterostichus cupreus L.	6	3	9	18
14.	Agriotes lineatus L.	4	3	6	13
15.	Epicometis hirta Poda	7	3	1	11
16.	Harpalus distinguendus Duft	4	4	3	11
17.	Cypticus quisquilius L.	2	8		10
18.	Eurygaster spp. Laporte	1	6	3	10
19.	Micraspis 12 punctata Linnnaeus	5	3	2	10
20.	Tanymecus dilaticollis Gyll.		2	8	10
21.	Aelia spp.	9			9
22.	Ophonus obscurus Fabricius	9			9
23.	Harpalus aeneus Panzer	4	1	3	8
24.	Metabletus truncatelus L. L.	1	3	4	8
25.	Agriotes ustulatus Schaller	1	3	3	7
26.	Hister stercorarius	1	1	4	6
27.	Letrus apterus	3	1	2	6
28.	Zabrus blapoides		2	3	5
29.	Anthicus quadriguttatus Haldeman		4		4
30.	Carabus coriaceus Linnaeus	3	1		4
31.	Amara eurynota Panz.		2	1	3
32.	Anisodactylus binotatus F.			3	3

33.	Cetonia aurata L.	1	1	1	3
34.	Harpalus tardus Panzer	1	1	1	3
35.	Pleurophorus caesus Panz.		3		3
36.	Pseudophonus griseus Panzer	2		1	3
37.	Podonta nigrita		1	2	3
38.	Tachyusa constricta Erichson	1	2		3
39.	Anisodactilus signatus	2			2
40.	Atomaria linearis Stephens			2	2
41.	Calathus fuscipes Goeze			2	2
42.	Cantharis fusca L.	1		1	2
43.	Carabus cupreus		2		2
44.	Cartodere ruficollis Marsh		1	1	2
45.	Cymindis axillaris Fabricius			2	2
46.	Dorcadion fulvum		1	1	2
47.	Exosoma lusitanicum Linnaeus		2		2
48.	Ophonus azureus F.		1	1	2
49.	Otiorrhynchus laevigatus Fabricius	1		1	2
50.	Otho spondiloides	1		1	2
51.	Phyllotreta vittula Redtenbacher	2			2
52.	Pterosthichus nigrita Paykull	2			2
53.	Silpha obscura L.	1		1	2
54.	Zabrus tenebrioides Goeze.		2		2
55.	Abax ovalis Duftschmid	1			1
56.	Amara aenea Dejean	1			1
57.	Apion tenue Herbst.	1			1
58.	Apion virens Herbst			1	1
59.	Apion urticarium Herbst.			1	1
60.	Aphthona euphorbia Schrank	1			1
61.	Carabus crenatus Duftschmid		1		1
62.	Ceutorrynchus scapularis Germar			1	1
63.	Cicindela campestris Linnaeus		1		1
64.	Combocerus glaber Schaller			1	1
65.	Cryptophagus subdepressus Gyllenhal		1		1
66.	Cynegetis punctata Linnaeus		1		1
67.	Dolicaon biguttatus			1	1
68.	Dorcadion pedestre Poda		1		1
69.	Dolichosoma lineare Rossi			1	1
70.	Harpalus calceatus Duftschmid			1	1
71.	Hister bimaculatus		1		1
72.	Malachius marginellus Fabricius			1	1
73.	Medon obsoletus	1			1
74.	Otiorrhynchus fuscipes Stierlin & W.G.	1			1
75.	Otiorrhynchus raucus	1			1
76.	Phyllotreta atra Fabricius	1			1
77.	Platynaspis luteorubra Goeze			1	1
78.	Poecilus dimidiatus G.A.Olivier	1			1
79.	Pseudophonus rufipes De Geer	1			1
80.	Selatosomus bipustulatus			1	1
81.	Quedius cruentus Olivier			1	1
82.	Quedius molochinus	1			1

83.	Staphylinus caesareus Cederhjelm			1	1
84.	Tachinus subterraneus Linnaeus	1			1
TOTAL		**655**	**694**	**595**	**1944**

Depending on the food they consume, the coleopteran species have been grouped into 3 categories:

- useful species that are predatory, feeding on insects or other invertebrates;
- Species cited in the literature as harmful to some cultivated plants;
- species of coleoptera which do not cause damage to cultivated plants but which have a phytophagous feed regime.From the analysis of the collected material in relation to the food spectrum, the situation is as follows:
- a total of 25 species totaling 1031 specimens of coleoptera are quoted in the literature as not harmful

Of these, the most numerous were: *Formicomus pedestris Rossi* with 408 specimens, *Dermestes laniarius L* with 393 specimens, *Anthicus floralis L.* with 47 specimens, *Pteryngium crenatum Fabricius* with 47 specimens and *Anthicus humilis Germ.* with 44 copies (tab. 2)

- 41 species of 858 specimens of coleoptera are cited in the literature as harmful.

The most common were: *Opatrum sabulosum L.* with 314 specimens, *Otiorrhynchus pinastri Latreille* with 235 specimens, *Idiochroma dorsalis Pontopp.* with 85 specimens, *Conosoma bipunctatum Gravenhorst* with 43 specimens, *Otiorrhynchus orbicularis* with 20 copies (tab. 3).

- useful coleopteran species belonging to a number of 13, with a total of 55 specimens.

Table 2

Coleoptera species collected that does not cause damage to crop plants

No.	Scientific name	Variant			Total
		1	**2**	**3**	
1.	Formicomus pedestris Rossi	116	210	82	408
2.	Dermestes laniarius L.	165	168	60	393
3.	Anthicus floralis L.	20	14	13	47
4.	Pteryngium crenatum Fabricius	15	10	22	47
5.	Anthicus humilis Germ.	26	10	8	44
6.	Harpalus distinguendus Duft	4	4	3	11
7.	Hypnoidus pulchellus Linnaeus	4	5	1	**10**
8.	Cypticus quisquilius L.	2	8		10
9.	Oxyporus rufus Linnaeus	9	-	-	**9**
10.	Ophonus obscurus Fabricius	9			9
11.	Harpalus aeneus Panzer	4	1	3	8
12.	Amara aenea Dejean	1	4	2	**7**
13.	Anthicus quadriguttatus Haldeman		4		4
14.	Pleurophorus caesus Panz.		3		3
15.	Cetonia aurata L.	1	1	1	3
16.	Harpalus tardus Panzer	1	1	1	3
17.	Amara eurynota Panz.		2	1	3
18.	Silpha obscura L.	1		1	2

19.	Ophonus azureus F.		1	1	2
20.	Cantharis fusca L.	1		1	2
21.	Atomaria linearis Stephens			2	2
22.	Cryptophagus subdepressus Gyllenhal		1		1
23.	Harpalus calceatus Duftschmid			1	1
24.	Cynegetis punctata Linnaeus		1		1
25.	Amara aenea Dejean	1			1
TOTAL		380	448	203	1031

Tabel 3

Species of harmful coleopterans identified in wheat crops

No.	Scientific name	Variant			Total
		1	2	3	
1.	Opatrum sabulosum L.	123	75	116	314
2.	Otiorrhynchus pinastri Latreille	60	80	95	235
3.	Idiochroma dorsalis Pontopp.	11	13	61	85
4.	Conosoma bipunctatum Gravenhorst	7	17	19	43
5.	Otiorrhynchus orbicularis	5	5	10	20
6.	Pterostichus cupreus L.	6	3	9	18
7.	Tanymecus dilaticollis Gyll.		2	8	10
8.	Pentodon idiota Hbst	6	12	8	26
9.	Agriotes lineatus L.	4	3	6	13
10.	Metabletus truncatelus L. L.	1	3	4	8
11.	Hister stercorarius	1	1	4	6
12.	Eurygaster spp. Laporte	1	6	3	10
13.	Agriotes ustulatus Schaller	1	3	3	7
14.	Zabrus blapoides		2	3	5
15.	Anisodactylus binotatus F.			3	3
16.	Letrus apterus	3	1	2	6
17.	Calathus fuscipes Goeze			2	2
18.	Cymindis axillaris Fabricius			2	2
19.	Epicometis hirta Poda	7	3	1	11
20.	Staphylinus caesareus Cederhjelm			1	1
21.	Malachius marginellus Fabricius			1	1
22.	Apion virens Herbst			1	1
23.	Apion urticarium Herbst.			1	1
24.	Ceutorrynchus scapularis Germar			1	1
25.	Pseudophonus griseus Panzer	2		1	3
26.	Cartodere ruficollis Marsh		1	1	2
27.	Dorcadion fulvum		1	1	2
28.	Otiorrhynchus laevigatus Fabricius	1		1	2
29.	Otho spondiloides	1		1	2
30.	Tachyusa constricta Erichson	1	2		3
31.	Pterosthichus nigrita Paykull	2			2
32.	Anisodactilus signatus	2			2
33.	Tachinus subterraneus Linnaeus	1			1
34.	Hister bimaculatus		1		1
35.	Medon obsoletus	1			1
36.	Apion tenue Herbst.	1			1
37.	Aphthona euphorbia Schrank	1			1

38.	Otiorrhynchus fuscipes Stierlin & W.G.	1			1
39.	Otiorrhynchus raucus	1			1
40.	Exosoma lusitanicum Linnaeus		2		2
41.	Phyllotreta vittula Redtenbacher	2			2
TOTAL		253	236	369	858

CONCLUSIONS

1. In total, the three variants were collected from coleoptera wheat cultures belonging to a number of 97 species, amounting to 3052 specimens; the situation is the following:

- wheat version of wheat V1, 1185 specimens
- in wheat version after sunflower V2, a number of 987 copies
- wheat version of corn V3, 880 specimens

2. The largest number of specimens had the following species: Formicomus pedestris Rossi, 408 specimens, Dermestes laniarius L., 393 specimens, Opatrum sabulosum L., with 314 specimens, Otiorrhynchus pinastri Latreille, 235 specimens, Idiochroma dorsalis Pontopp., with 85 copies.

3. In connection with the spectrum of the food, the situation is as follows

- a total of 25 species totaling 1031 specimens of coleoptera are quoted in the literature as not harmful

Among these, the most numerous were: Formicomus pedestris Rossi with 408 specimens, Dermestes laniarius L with 393 specimens, Anthicus floralis L. with 47 specimens, Pteryngium crenatum Fabricius with 47 specimens and Anthicus humilis Germ. with 44 copies.

- 41 species of 858 specimens of coleoptera are cited in the literature as harmful.
- useful coleopteran species belonging to a number of 13, with a total of 55 specimens.
- Coccinella 7 punctata L. is part of the group of shock predators, in cereal crops, the Coccinella 7 punctata determines the mean, equal or lower levels of aphids than those caused by insecticides by chemical treatments.
- Harpalus aeneus Panzer Feeds eggs and corn poppy larvae with eggs and cracked bugs and other insects.
- Pterosthichus nigrita has adult and predatory larvae of larvae and bowel hoofs of wheat flowers
- Anthicus floralis has omnivorous adults, knowing that they consume small arthropods, pollen, mushrooms, and anything else they can find. Some species are of interest as biological control agents because they can consume eggs or pests of pests.

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