

OBSERVATION ON THE STRUCTURE, DYNAMICS AND ABUNDANCE OF SPECIES OF BEETLES (INSECTA- COLEOPTERA) OF THE WHEAT CROP

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Abstract

The collection of the material was made in 2014, from April to June, to the following data: 29.04, 07.05, 29.05, 13.06 and 27.06. For the collection were used the soil traps type Barber which was placed with a solution of NaCl in the concentration of 6-8%. We have been selected from the collected material only of the coleopteran species to establish the structure, dynamics and abundance of collected species. Most frequently harvested species were *Opatrum sabulosum* L., *Dermestes lanarius* L., *Pentodon idiota* Hbst, *Pterostichus* spp., *Harpalus* spp., etc.

Keywords: abundance, Barber traps, beetles, collection.

1. INTRODUCTION

Of late years, the wheat pest control technologies have made the methodological recommendations on the impact of climate change on pest structure and attack. (Baban, 2006; Varvara, 2008).

Continuing the long-term research, the elaboration of the current pest control system in soil minimization technology is based on the research carried out within the experimental field in Galati stationary in 2014 to study the structure, dynamics and abundance of the populations of useful and harmful coleopteran species from wheat crops in southern of Moldova (Talmăciu, 2008).

2. MATERIALS AND METHODS

The data from this paper were obtained following the observations made in 2014 in a wheat crop located in Galați County.

Galati is located in the southern part of Moldova, in the Siret Valley, crossed by the Danube. It is situated in the eastern part of Romania, at the southern extremity of the Moldavian Plateau at 45 ° 27 'north latitude and 28 ° 02' east longitude. Located on the northern bank of the Danube, it occupies an area of 246,4 km², at the confluence of the rivers Siret (west) and Prut (east), near Lake Brateș, around. 80 kilometers from the Black Sea. The nearest town is Braila, just 15 kilometers south.

A total of 15 traps were installed in 3 variants, 5 each for each variant:

- wheat for consumption without treatments, V1
- wheat consumption with seed and field treatments, V2
- seed wheat with seed and field treatments and higher doses of fertilizer, V3

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

- the date of collection,
- number of traps (from 1 to 5);
- Experimental variant.

The material thus labeled was brought to the laboratory, then was cleaned of all plant debris, 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: Csiki, 1927; Panin, 1951; Neculiseanu and Matalin, 2000; Talmaciu et al., 2005, 2008; Varvara, 2008.

3. RESULTS AND DISCUSSIONS

In total, the 3 variants were collected in 2501 to 106 specimens belonging to species .

The situation is the following:

- in variant V1, with a total of 805 specimens;
- in variant V2, a total of 672 specimens;
- in variant V3, a total of 1024 specimens.

Table 1. The structure and abundance entomofauna gathered belonging to Ord. Coleoptera at Variant 1

Nr. crt.	Scientific name	No. of specimens	%
1.	<i>Anthicus humilis</i>	159	19.75
2.	<i>Dermestes lanarius</i>	115	14.29
3.	<i>Opatrum sabulosum</i>	73	9.07
4.	<i>Cryptophagus dentatus</i>	58	7.20
5.	<i>Anthicus humeralis</i>	41	5.10
6.	<i>Haplothrips tritici</i>	33	4.10
7.	<i>Formicomus pedestris</i>	28	3.48
8.	<i>Anthicus antherinus</i>	23	2.85
9.	<i>Pedinus femoralis</i>	21	2.60
10.	<i>Otiorrhynchus laevigatus</i>	21	2.60
11.	<i>Harpalus distinguendus</i>	20	2.48
12.	<i>Pteryngium crenatum</i>	16	1.99
13.	<i>Conosoma bipunctata</i>	13	1.61
14.	<i>Blaps mortisaga</i>	13	1.61
15.	<i>Amara aenea</i>	12	1.49
16.	<i>Phyllotreta nemorum</i>	11	1.36
17.	<i>Cassida nobilis</i>	11	1.36
18.	<i>Harpalus tardus</i>	10	1.24
19.	<i>Broscus cephalotes</i>	10	1.24
20.	<i>Coccinella 5 punctata</i>	9	1.12
21.	<i>Anthicus floralis</i>	8	0.99
22.	<i>Calosoma inquisitor</i>	8	0.99
23.	<i>Metabletus truncatulus</i>	7	0.89
24.	<i>Anthicus gracilis</i>	6	0.75
25.	<i>Orchestes fagi</i>	6	0.75

26.	<i>Hypnoidus pulchellus</i>	6	0.75
27.	<i>Aphthona euphorbia</i>	5	0.62
28.	<i>Colodera nigrita</i>	5	0.62
29.	<i>Coccinulla quatuordecimpustulata sinensis Wse</i>	5	0.62
30.	<i>Anisoplia segetum</i>	5	0.62
31.	<i>Coccinella 7 punctata</i>	4	0.50
32.	<i>Ceuthorrhynchus punctiger</i>	4	0.50
33.	<i>Callistus lunatus</i>	4	0.50
34.	<i>Agriotes lineatus</i>	3	0.37
35.	<i>Oxyporus rufus</i>	3	0.37
36.	<i>Gryllus campestris</i>	3	0.37
37.	<i>Idiochroma dorsalis</i>	3	0.37
38.	<i>Drasterius bimaculatus</i>	2	0.25
39.	<i>Pentodon idiota</i>	2	0.25
40.	<i>Pseudophonus rufipes</i>	2	0.25
41.	<i>Pleurophorus caesus</i>	2	0.25
42.	<i>Emphilus glaber</i>	2	0.25
43.	<i>Tanymecus dilaticollis</i>	1	0.12
44.	<i>Corticaria longicornis</i>	1	0.12
45.	<i>Pterostichus lepidus</i>	1	0.12
46.	<i>Pterostichus marginalis</i>	1	0.12
47.	<i>Tachyporus ruficolis</i>	1	0.12
48.	<i>Cetonia aurata</i>	1	0.12
49.	<i>Otiorrhynchus singularis</i>	1	0.12
50.	<i>Pseudocleonus cinereus</i>	1	0.12
51.	<i>Crypticus quisquilius</i>	1	0.12
52.	<i>Ityocara rubens</i>	1	0.12
53.	<i>Necrophorus antennatus</i>	1	0.12
54.	<i>Pterostichus aterrimus var. niger</i>	1	0.12
55.	<i>Zabrus blapoides</i>	1	0.12
TOTAL		805	100%

Table 2. The structure and abundance entomofauna gathered belonging to Ord. Coleoptera at Variant 2

Nr. crt.	Scientific name	No. of specimens	%
1.	<i>Epicometis hirta</i>	111	16.52
2.	<i>Phyllotreta nemorum</i>	108	16.07
3.	<i>Opatrum sabulosum</i>	70	10.42
4.	<i>Anthicus antherinus</i>	57	8.48
5.	<i>Pentodon idiota</i>	40	5.95
6.	<i>Drasterius bimaculatus</i>	31	4.61
7.	<i>Colodera nigrita</i>	28	4.17
8.	<i>Formicomus pedestris</i>	22	3.27
9.	<i>Gryllus campestris</i>	21	3.13
10.	<i>Dermestes lanarius</i>	19	2.83
11.	<i>Phyllotreta atra</i>	17	2.53
12.	<i>Phyllotreta nodicornis</i>	17	2.53

13.	<i>Tanymecus dilaticollis</i>	15	2.23
14.	<i>Harpalus distinguendus</i>	10	1.49
15.	<i>Agriotes lineatus</i>	9	1.34
16.	<i>Pteryngium crenatum</i>	9	1.34
17.	<i>Pleurophorus caesus</i>	8	1.19
18.	<i>Microletes maurus</i>	7	1.04
19.	<i>Pedinus femoralis</i>	6	0.89
20.	<i>Metabletus truncatulus</i>	5	0.74
21.	<i>Haplothrips tritici</i>	5	0.74
22.	<i>Coccinella 7 punctata</i>	5	0.74
23.	<i>Anthicus floralis</i>	5	0.74
24.	<i>Hypnoidus pulchellus</i>	5	0.74
25.	<i>Anobium punctatum</i>	5	0.74
26.	<i>Amara aenea</i>	4	0.60
27.	<i>Conosoma bipunctata</i>	4	0.60
28.	<i>Pseudocleonus cinereus</i>	3	0.45
29.	<i>Pterostichus marginalis</i>	3	0.45
30.	<i>Stomodes gyrosicollis</i>	3	0.45
31.	<i>Otiorrhynchus laevigatus</i>	2	0.30
32.	<i>Harpalus tardus</i>	2	0.30
33.	<i>Aphodius fimetarius</i>	2	0.30
34.	<i>Blaps mortisaga</i>	1	0.15
35.	<i>Pterostichus aterrimus var. niger</i>	1	0.15
36.	<i>Zabrus blapoides</i>	1	0.15
37.	<i>Emphilus glaber</i>	1	0.15
38.	<i>Silpha obscura</i>	1	0.15
39.	<i>Onthophagus taurus</i>	1	0.15
40.	<i>Staphylinus caesareus</i>	1	0.15
41.	<i>Astenus filiformis</i>	1	0.15
42.	<i>Mycetophagus populii</i>	1	0.15
43.	<i>Pterostichus cupreus</i>	1	0.15
44.	<i>Oulema melanopa</i>	1	0.15
45.	<i>Sipalia circularis</i>	1	0.15
46.	<i>Psammobius porcicollis</i>	1	0.15
47.	<i>Calathus fuscipes</i>	1	0.15
TOTAL		672	100%

Table 3. The structure and abundance entomofauna gathered belonging to Ord. Coleoptera at Variant 3

Nr. crt.	Scientific name	No. of specimens	%
1.	<i>Conosoma bipunctata</i>	264	25.78
2.	<i>Pterostichus marginalis</i>	259	25.29
3.	<i>Pteryngium crenatum</i>	62	6.05
4.	<i>Dermestes lanarius</i>	60	5.86
5.	<i>Formicomus pedestris</i>	37	3.61
6.	<i>Opatrum sabulosum</i>	36	3.52
7.	<i>Anthicus floralis</i>	31	3.03

8.	<i>Pentodon idiota</i>	18	1.76
9.	<i>Epicometis hirta</i>	18	1.76
10.	<i>Gryllus campestris</i>	17	1.66
11.	<i>Colodera nigrita</i>	15	1.46
12.	<i>Tachyporus ruficollis</i>	15	1.46
13.	<i>Pleurophorus caesus</i>	14	1.37
14.	<i>Anthicus antherinus</i>	13	1.27
15.	<i>Agriotes lineatus</i>	12	1.17
16.	<i>Ityocara rubens</i>	12	1.17
17.	<i>Silpha obscura</i>	12	1.17
18.	<i>Tanymecus dilaticollis</i>	9	0.88
19.	<i>Idiochroma dorsalis</i>	8	0.78
20.	<i>Harpalus distinguendus</i>	7	0.68
21.	<i>Cercyon lateralis</i>	7	0.68
22.	<i>Phyllotreta nemorum</i>	6	0.59
23.	<i>Brachynus explodens</i>	6	0.59
24.	<i>Cartodere ruficollis</i>	6	0.59
25.	<i>Phyllotreta atra</i>	5	0.49
26.	<i>Phyllotreta nodicornis</i>	5	0.49
27.	<i>Microletes maurus</i>	5	0.49
28.	<i>Tanymecus palliatus</i>	5	0.49
29.	<i>Anthicus humeralis</i>	4	0.39
30.	<i>Ophonus sabulicola</i>	4	0.39
31.	<i>Corticaria longicornis</i>	3	0.29
32.	<i>Anisodactylus binotatus</i>	3	0.29
33.	<i>Harpalus smaragninus</i>	3	0.29
34.	<i>Paramecosoma melanocephalum</i>	3	0.29
35.	<i>Amara eurynota</i>	3	0.29
36.	<i>Amara aenea</i>	2	0.20
37.	<i>Aphthona euphorbia</i>	2	0.20
38.	<i>Emphilus glaber</i>	2	0.20
39.	<i>Cantharis fusca</i>	2	0.20
40.	<i>Calathus fuscipes</i>	2	0.20
41.	<i>Anthicus quadriguttatus</i>	2	0.20
42.	<i>Paradons quadrisignatus</i>	2	0.20
43.	<i>Cetonia aurata</i>	1	0.10
44.	<i>Haplothrips tritici</i>	1	0.10
45.	<i>Blaps mortisaga</i>	1	0.10
46.	<i>Otiorrhynchus laevigatus</i>	1	0.10
47.	<i>Coccinella 7 punctata</i>	1	0.10
48.	<i>Hypnoidus pulchellus</i>	1	0.10
49.	<i>Pterostichus cupreus</i>	1	0.10
50.	<i>Sipalia circularis</i>	1	0.10
51.	<i>Ophonus azureus</i>	1	0.10
52.	<i>Atomaria fuscicollis</i>	1	0.10
53.	<i>Bidessus geminus</i>	1	0.10

54.	<i>Hister quadrimaculatus</i>	1	0.10
55.	<i>Harpalus cupreus</i>	1	0.10
56.	<i>Tachyusa constricta</i>	1	0.10
57.	<i>Scirtes hemisphaericus</i>	1	0.10
58.	<i>Selatosomus latus</i>	1	0.10
59.	<i>Cryptophagus dorsalis</i>	1	0.10
60.	<i>Paederus limnophilus</i>	1	0.10
61.	<i>Cerylon ferrungineum</i>	1	0.10
62.	<i>Melanotus brunnipes</i>	1	0.10
63.	<i>Metabletus foveatus</i>	1	0.10
64.	<i>Harpalus spp.</i>	1	0.10
65.	<i>Zabrus tenebrioides</i>	1	0.10
TOTAL		1024	100%

The largest number of specimens collected were: *Conosoma bipunctata* with 279 specimens, representing 12.15% of the total Coleoptera species collected, *Pterostichus marginalis* with 265 specimens, representing 11.54% of the total collected Coleoptera species, *Epicometis hirta* with 187 specimens, representing 8.14% of the total collected Coleoptera, *Opatrum sabulosum* with 179 specimens, representing 7.79% of the total collected Coleoptera species, *Drasterius bimaculatus* with 146 specimens, representing 6.36% of the total collected Coleoptera, *Formicomus pedestris* with 100 specimens, representing 4.35% of the total collected Coleoptera collected species. (Table 1, 2, 3).

Concerning the families belonging to the collected species (Table 4), a total of 20 families were collected.

The most represented families with a number of samples were the *Carabidae* family with 387 specimens, representing 16.86%, the *Staphylinidae* family with 381 specimens, representing 16.60%, the *Scarabidae* family with 311 specimens, representing 13.55%, the *Anthicidae* family with 260 specimens, representing 11.31%, the *Tenebrioidae* family with 212 specimens, representing 9.23%, the *Elateridae* family with 190 specimens, representing 8.27%, the *Cryptophagidae* family with 109 specimens, representing 4.74%, the *Dermatidae* family with 107 specimens, representing 4.66%.

Table 4. The most represented families

Nr crt	Family	Variant			No. of specimens	%
		1	2	3		
1.	<i>Carabidae</i>	44	35	308	387	16.86
2.	<i>Staphylinidae</i>	35	35	311	381	16.60
3.	<i>Scarabeidae</i>	98	162	51	311	13.55
4.	<i>Anthicidae</i>	89	84	87	260	11.33
5.	<i>Tenebrioidae</i>	98	77	37	212	9.24
6.	<i>Elateridae</i>	130	45	15	190	8.28
7.	<i>Cryptophagidae</i>	30	10	69	109	4.75
8.	<i>Dermatidae</i>	28	19	60	107	4.66
9.	<i>Curculionidae</i>	39	20	15	74	3.22
10.	<i>Chrysomelidae</i>	12	35	12	59	2.57

11.	<i>Coccinellidae</i>	15	5	1	21	0.92
12.	<i>Hydrophilidae</i>	-	-	8	8	0.35
13.	<i>Lathridiidae</i>	-	-	6	6	0.26
14.	<i>Silphidae</i>	3	-	3	6	0.26
15.	<i>Anobiidae</i>	-	5	-	5	0.22
16.	<i>Cantharidae</i>	-	-	2	2	0.09
17.	<i>Scirtidae</i>	-	-	1	1	0.04
18.	<i>Mycetophagidae</i>	-	1	-	1	0.04
19.	<i>Dytiscidae</i>	-	-	1	1	0.04
20.	<i>Histeridae</i>	-	-	1	1	0.04
TOTAL		643	646	1006	2295	100%

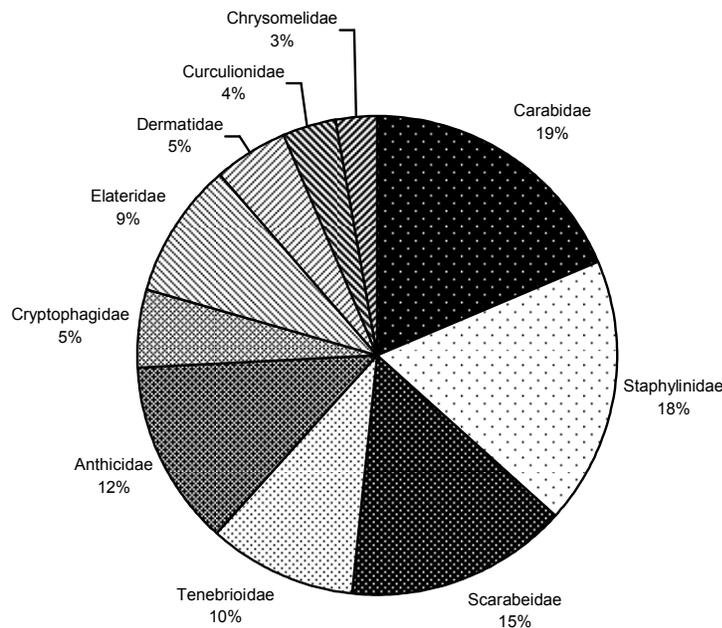


Figure 1. The family structure in 2014

Concerning the number of species collected by families, the situation is as follows:

- the *Carabeidae* family with a total of 25 species
- the *Staphylinidae* family with 12 species
- the family *Curculionidae*, *Scarabeidae* and *Anthicidae* with 7 species
- the family *Cryptophagidae* with 6 species
- *Elateridae* and *Crysomelidae* families with 5 species
- the *Coccinellidae* and *Tenebrioidae* family of 3 species
- the family *Hydrophilidae* with 2 species

- *Dermatidae* families, *Silphidae*, *Anobiidae*, *Mycetophagidae*, *Dytiscidae*, *Histeridae*, *Cantharidae*, *Scirtidae* and *Lathridiidae* with 1 species.

4. CONCLUSIONS

1. In the three variants, 2501 specimens were collected from a number of 106 species of wheat grass wheat. On the variants, the situation is as follows:

- in the case of unprocessed consumption wheat, a number of 805 specimens belonging to a number of 55 species (taxons) were collected;
- at variant number 2, treated wheat, the total 672 specimens belonging to a number of 47 species (taxons) were collected;
- at variant number 3, seed wheat was collected 1024 specimens belonging to a number of 65 species (taxons).

2. A number of 13 species had over 50 specimens. The species with the largest number of specimens were: *Conosoma bipunctata*, with 279 copies representing 10.68% of the total; *Pterostichus marginalis* with 265 copies, representing 10.14% of the total; *Opatrum sabulosum* with a total of 179 species representing 6.85% of the total; *Drasterius bimaculatus* with 146 specimens, representing 6.32% of the total; *Phyllotreta nemorum* with 135 species, representing 5.17% of the total; *Dermestes lanarius* with 107 species, representing 4.10% of the total; *Formicomus pedestris* with a total of 100 species, representing 3.83% of the total; *Pentodon idiot* with 91 species, representing 3.48% of the total; *Colgate nigrita* with 53 specimens, representing 2.03% of the total.

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