

OBSERVATION ON THE ENTOMOFAUNA BIODIVERSITY IN SOME CROPS

Ionela Mocanu*, Mihai Tălmăciu*, Nela Tălmăciu*, Monica Herea*

* University of Applied Life Science and Environment „Ion Ionescu de la Brad” from Iasi
E-mail: rares.mocanu@yahoo.com

Abstract

For gathering the material were used the soil traps type Barber, which were installed in a wheat crop area Tișița, Vrancea county. The observations were made in 2013 in May-June.

The traps gathering was done on the following dates: 17.05; 29.05; 13.06; 27.06 using three variants:

- Option 1 - untreated wheat consumption
- Option 2 - treated drinking wheat
- Option 3 - treated wheat seed

The collected insect species belonging to the following orders: Coleoptera, Hymenoptera, Orthoptera, Heteroptera, Diptera and Colembolla etc.

Were collected in addition to insects, a species belonging to the Subphylum Crustacea, ord. Isopoda and species belonging to the class Arachnida, ord. Araneae.

Keywords: entomofauna, wheat, traps type Barber

1. INTRODUCTION

The cereals represent the group of plants with greatest importance for humankind. This assures the basic food for peoples and the animals, as well as the main raw materials for flesh, milk and eggs production, foods that provides the necessary products for life.

The increase of cereals production is possible through the technologies that presupposes the use of the varieties with big capacity of production, the fertilization of the soils, according to their necessities, complete mechanisation of the works and through measures of prevention and struggle the weeds and specific pests.

Regarding the pests from the cereal crops, these can produce annual damage of 13.8 against 11.6% produced by the pathogenic agents and against 9.5% due to the weeds.

In the present work are presented the species from the cereal crops in the period 2015, from the Tișița zone, the Vrancea County.

The species most frequently encountered in this period were: the cereals beetles (*Anisoplia spp.*); the cereals bugs (*Eurygaster spp.*); wheat stem sawfly (*Cephus pygmaeus*); the red worm of the straw (*Haplodiplosis marginata*); wheat thrips (*Haplothrips tritici*); the oat beetle (*Lema melanopa*); the green louse of cereals (*Schizaphis graminum*); the ground beetle (*Zabrus tenebrionides* Goeze); Diptera pests (*Oscinella frit*, *Mayethiola destructor*, *Phorbia spp.*)

2. MATERIALS AND METHODS

To collect material were used Barber soil traps. They were placed in wheat area from Tișița in Vrancea country, 6 traps in each variant, namely:

- Untreated wheat for consumption during the growing season, only seed;
- Wheat for consumption on treatments that were applied during the growing season against pathogens and pests;
- Wheat seed which was applied technology to do so.

The traps were placed in two rows, 3 each in turn to the distance between them between 6 and 8 m and between two rows distance of about 10 m. To capture the species collected using a solution of formalin into the item concentration of 4 -5 %. Traps have worked from May until late June. Harvesting collected material was done at intervals of between 10 and 20 days during 2013. At each harvest species collected from each arm and traps were placed in gauze, previously eliminating crop residues or soil particles other impurities. Such evidence is in this way was then labelled, the label specifying: date of collection; variant; trap number.

The material was then brought to the laboratory after being washed under running water species has been identified or counted specimens collected per trap, the variants and species.

The determination was made using the German Identification Manual by Reitter, 1908, another manual for identification by Panin (1951) with other determinants and the internet to compare different species pictures on the internet.

3. RESULTS AND DISCUSSIONS

In total, the 3 variants were collected 6279 specimens belonging to 121 species (taxa). On variants situation is as follows (Table 1, Fig. 1):

- The consumption of untreated wheat were collected copies 2970 belonging to a 72 species;
- Wheat consumption treated specimens were collected in 1658 in total, belonging to a number of 62 species (taxa);
- Wheat seed were collected in 1651 samples in total, belonging to a number of 79 species (taxa);

A total of 25 species collected were common in the 3 experimental variations. These include: *Pentodon idiota*, *Opatrum sabulosum*, *Dermestes lanarius*, *Phyllotreta nemorum*, *Epicometis hirta*, *Agriotes lineatus*, *Amara aenea*, *Tanymecus dilaticollis*, *Formicomus pedestris*, *Pleurophorus caesus*, *Pterostichus marginalis*, *Gryllus campestris*, *Harpalus distinguendus*, *Haplothrips tritici*, *Blaps mortisaga*, *Conosoma bipunctata*, *Otiorrhynchus laevigatus*, *Anthicus antherinus*, *Armadillidium vulgare*, *Coccinella 7 punctata*, *Anthicus floralis*, *Colodera nigrita*, *Hypnoides pulchellus*, *Pteryngium crenatum*, and *Emphilus glaber*.

A number of 57 species were collected in one variant, they were: *Ceuthorrhynchus punctiger*, *Pseudophonus rufipes*, *Pterostichus lepidus*, *Cassida nobilis*, *Anthicus humilis*, *Cryptophagus dentatus*, *Orchestes fagi*, *Otiorrhynchus singularis*, *Calosoma inquisitor*, *Necrophorus antennatus*, *Callistus lunnatus*, *Anthicus gracilis*, *Eurygaster integriceps*, *Anisoplia segetum*, *Oxyporus rufus*, *Coccinella quatuordecimpustulata*, *Crypticus quisquilius*, *Broscus cephalotes*, *Coccinella 5 punctata*, *Onthophagus taurus*, *Stomodes gyrosicollis*, *Anobium punctatum*, *Aphodius fimetarius*, *Staphylinus caesareus*, *Staphylinus caesareus*, *Calathus rufipes*, *Astenus filiformis*, *Mycetophagus populii*, *Cephus pygmaeus*, *Oulema melanopa*, *Psammobius porcicollis* Illiger, *Chrysopa perla*, *Anisodactylus binotatus*, *Ophonus azureus*, *Harpalus smaragninus*, *Paramecosoma melanocephalum*, *Tanymecus palliatus*, *Atomaria fuscicollis*, *Bidessus geminus*, *Amara eurynota*,

Hister quadrimaculatus, *Brachynus explodens*, *Ophonus sabulicola*, *Harpalus cupreus*, *Cantharis fusca*, *Calathus fuscipes*, *Tachyusa constricta*, *Scirtes hemisphaericus*, *Anthicus quadriguttatus*, *Haldeman*, *Selatosomus latus*, *Cercyon lateralis*, *Cryptophagus dorsalis*, *Cartodere ruficollis*, *Paederus limnophilus*, *Cerylon ferrungineum.*, *Paradons quadrisignatus*, *Melanotus brunripes*.

Table 1. The structure and abundance of the collected entomofauna from the wheat crops

No.	Name of species (taxa)	Variant			Total
		Untreated wheat for consumption	Wheat consumption	Wheat for seed	
1	Pentodon idiota	33	40	18	91
2	Cetonia aurata	2	-	1	3
3	Opatrum sabulosum	73	70	36	179
4	Pseudocleonus cinereus	2	3	-	5
5	Diptera	42	97	69	208
6	Dermestes lanarius	28	19	60	107
7	Ceutorhynchus punctiger	2	-		2
8	Drasterius bimaculatus	115	31		146
9	Arachnida	224	310	202	736
10	Phyllotreta nemorum	21	108	6	135
11	Epicometis hirta	58	111	18	187
13	Agriotes lineatus	11	9	12	32
14	Himenoptere (wasp)	25	25	13	63
15	Amara aenea	1	4	2	7
16	Tanymecus dilaticollis	20	15	9	44
17	Pedinus femoralis	23	6		29
18	Formicomus pedestris	41	22	37	100
19	Pleurophorus caesus	4	8	14	26
20	Pterostichus marginalis	3	3	259	265
21	Pseudophonus rufipes	6	-		6
22	Collembola	1445	219	68	1732
23	Anthicus humeralis	13	-	4	17
24	Metabletus truncatulus	5	5		10
25	Hymenoptera (ants)	159	212	216	587
26	Gryllus campestris	5	21	17	43
27	Pterostichus lepidus	3	-		3
28	Harpalus distinguendus	16	10	7	33
29	Cassida nobilis	2	-		2
30	Anthicus humilis	6	-		6
31	Miriapoda	2	2	1	5
32	Haplothrips tritici	159	5	1	165
33	Homoptera (cycads)	211	32	21	264
34	Cryptophagus dentatus	21	-		21
35	Blaps mortisaga	2	1	1	4
36	Pyrrhocoris apterus	8	51		59
37	Conosoma bipunctata	11	4	264	279
38	Corticaria longicornis	3	-	3	6
39	Orchestes fagi	7	-		7
40	Aphthona euphorbia	10	-	2	12
41	Otiorrhynchus laevigatus	6	2	1	9
42	Otiorrhynchus singularis	2	-		2
43	Pterostichus aterrimus var. niger	1	1		2
44	Calosoma inquisitor	1			1
45	Necrophorus antennatus	1			1

46	<i>Callistus lunatus</i>	1			1
47	Hemiptera (aphids)	13	3	2	18
48	Orthoptera (locust)	9	2	1	12
49	<i>Anthicus antherinus</i>	13	57	13	83
50	Heteroptera (bedbugs)	8	9	7	24
51	Hymenoptera (parasit wasp)	7			7
52	<i>Anthicus gracilis</i>	11			11
53	<i>Ityocara rubens</i>	1	-	12	13
54	<i>Harpalus tardus</i>	4	2		6
55	<i>Armadilludium vulgare</i>	5	18	21	44
56	Curculionide	1			1
57	<i>Eurygaster integriceps</i>	2			2
58	<i>Anisoplia segetum</i>	1			1
59	<i>Idiochroma dorsalis</i>	1	-	8	9
60	<i>Coccinella 7 punctata</i>	12	5	1	18
61	<i>Anthicus floralis</i>	5	5	31	41
62	Hymenoptera (bees)	2	1		3
63	<i>Colodera nigrita</i>	10	28	15	53
64	<i>Hypnoidus pulchellus</i>	4	5	1	10
65	<i>Pteryngium crenatum</i>	8	9	62	79
66	<i>Oxyporus rufus</i>	9			9
67	<i>Zabrus blapoides</i>	1	1		2
68	<i>Coccinulla quatuordecimpustulata</i>	2			2
69	<i>Tachyporus ruficollis</i>	3		15	18
70	<i>Crypticus quisquilius</i>	1			1
71	<i>Emphilus glaber</i>	1	1	2	4
71	<i>Broscus cephalotes</i>	1			1
72	<i>Coccinella 5 punctata</i>	1			1
73	<i>Silpha obscura</i>	-	1	12	13
74	<i>Onthophagus taurus</i>	-	1		1
75	<i>Phyllotreta atra</i>	-	17	5	22
77	<i>Stomodes gyrosicollis</i>	-	3		3
78	<i>Anobium punctatum</i>	-	5		5
79	<i>Aphodius fimetarius</i>	-	2		2
80	<i>Phyllotreta nodicornis</i>	-	17	5	22
81	<i>Staphylinus caesareus</i>	-	1		1
82	<i>Microletes maurus</i>	-	7	5	12
83	Acari (spider)	-	4	3	7
84	<i>Calathus rufipes</i>	-	1		1
85	<i>Astenus filiformis</i>	-	1		1
86	<i>Mycetophagus populii</i>	-	1		1
87	<i>Cephus pygmaeus</i>	-	1		1
88	<i>Pterostichus cupreus</i>	-	1	1	2
89	<i>Oulema melanopa</i>	-	1		1
90	<i>Sipalis circularis</i>	-	1	1	2
91	<i>Psammobius porcicollis</i>	-	1		1
92	<i>Chrysopa perla</i>	-	-	2	2
93	<i>Anisodactylus binotatus</i>	-	-	3	3
94	<i>Ophonus azureus</i>	-	-	1	1
95	<i>Harpalus smaragninus</i>	-	-	3	3
96	<i>Paramecosoma melanocephalum</i>	-	-	3	3
97	<i>Tanymericus palliatus</i>	-	-	5	5
98	<i>Atomaria fuscicollis</i>	-	-	1	1
99	<i>Bidessus geminus</i>	-	-	1	1

100	<i>Amara eurynota</i>	-	-	3	3
101	<i>Hister quadrimaculatus</i>	-	-	1	1
102	<i>Brachynus explodens</i>	-	-	6	6
103	<i>Ophonus sabulicola</i>	-	-	4	4
104	<i>Harpalus cupreus</i>	-	-	1	1
105	<i>Cantharis fusca</i>	-	-	2	2
106	<i>Calathus fuscipes</i>	-	-	2	2
107	<i>Tachyusa constricta</i>	-	-	1	1
108	<i>Scirtes hemisphaericus</i>	-	-	1	1
109	<i>Anthicus quadriguttatus</i>	-	-	2	2
110	<i>Selatosomus latus</i>	-	-	1	1
111	<i>Cercyon lateralis</i>	-	-	7	7
112	<i>Cryptophagus dorsalis</i>	-	-	1	1
113	<i>Cartodere ruficollis</i>	-	-	6	6
114	<i>Paederus limnophilus</i>	-	-	1	1
115	<i>Cerylon ferrugineum</i>	-	-	1	1
116	<i>Paradons quadrisignatus</i>	-	-	2	2
117	<i>Melanotus brunnipes</i>	-	-	1	1
118	<i>Metabletus foveatus</i>	-	-	1	1
119	<i>Forficula auricularia</i>	-	-	1	1
120	<i>Harpalus spp.</i>	-	-	1	1
121	<i>Zabrus tenebrioides</i>	-	-	1	1
Total species		2970	1658	1651	6279

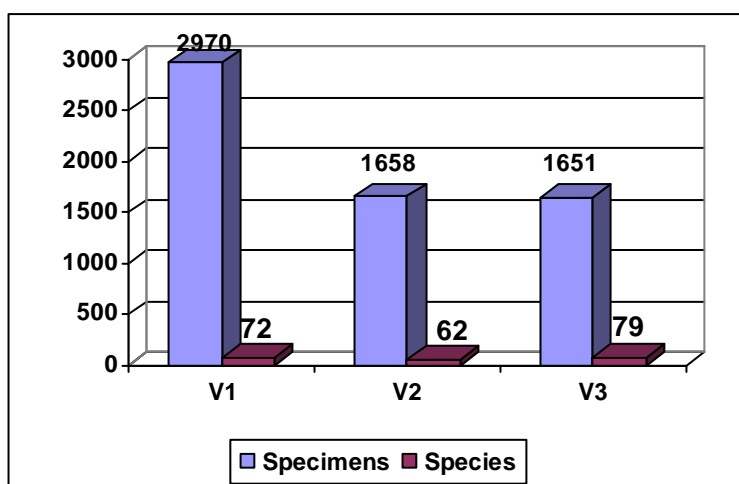


Figure 1. The number of collected specimens and species at the three variants

The largest number of collected specimens from the 3 variants, over 50 specimens has played a total of 14 species. These were (see Table 2): *Conosoma bipunctata*, 279 samples representing 4.44% of the total; *Pterostichus marginalis*, with a total of 265 specimens, representing 4.22% of the total; *Epicometis hirta*, with a total of 187 specimens, representing 2.97% of the total; *Opatrum sabulosum*, with a total of 179 specimens, representing 2.85% of the total; *Haplothrips tritici.*, With a total of 165 specimens, representing 2.62% of the total; *Drasterius bimaculatus*, with a total of 146 specimens, representing 2.32% of the total; *Phyllotreta nemorum*, with a total of 135 specimens, representing 2.25% of the total; *Dermestes lanarius*, with a total of 107 specimens, representing 1.70% of the total; *Formicomus pedestris*, with a total of 100 specimens, representing 1.59% of the total; *Pentodon idiota*, with a total of 91 specimens,

representing 1.44% of the total; *Anthicus antherinus* , with a total of 83 specimens, representing 1.32% of the total; *Pteryngium crenatum* , with a total of 79 specimens, representing 1.25% of the total; *Pyrrhocoris apterus*, with a total of 59 specimens, representing 0.94% of the total; *Colodera nigra.*, with a total of 53 specimens, representing 0.85% of the total.

Table 2. The structure of species (taxa) with the largest number of specimens collected

No.	Name of species (taxa)	Total	%
1	<i>Conosoma bipunctata</i>	279	4.44
2	<i>Pterostichus marginalis</i>	265	4.22
3	<i>Epicometis hirta</i>	187	2.97
4	<i>Opatrum sabulosum</i>	179	2.85
5	<i>Haplothrips tritici</i>	165	2.62
6	<i>Drasterius bimaculatus</i>	146	2.32
7	<i>Phyllotreta nemorum</i>	135	2.15
8	<i>Dermestes lanarius</i>	107	1.70
9	<i>Formicomus pedestris</i>	100	1.59
10	<i>Pentodon idiota</i>	91	1.44
11	<i>Anthicus antherinus</i>	83	1.32
12	<i>Pteryngium crenatum</i>	79	1.25
13	<i>Pyrrhocoris apterus</i>	59	0.94
14	<i>Colodera nigrita</i>	53	0.85
TOTAL		6279	100

4. CONCLUSIONS

1. In the 3 variants were collected a number of 6279 samples belonging to a total of 121 invertebrate species of wheat. The situation, on the variants is as follows:

- In the variant, the consumption of untreated wheat was collected in a total of 2970 samples 72 belonging to a number of species (taxa);
- The variant number 2 treaty wheat consumption has been collected 1658 specimens belonging to a number of 62 species (taxa);
- The variant number three, wheat for seed the samples were collected from to 1651 belonging to 72 one species (taxa).

2. During the period of observations, a number of 25 species were common to the three variants while a total of 57 species were collected from a single experimental variant.

3. A number of 14 species had more than 50 specimens. The species with the highest number of specimens were *Conosoma bipunctata*, with 279 specimens, representing 4.44% of the total; *Pterostichus marginalis*, with 265 specimens, representing 4.22% of the total; *Epicometis hirta* with 187 pieces, representing 2.97% of the total, *Opatrum sabulosum* 179 specimens, representing 2.85% of the total, with 165 samples *Haplothrips tritici*, representing 2.62% of the total; *Drasterius bimaculatus*, with 146 specimens, representing 2.32% of the total and *Phyllotreta nemorum* 135 specimens, representing 2.15% of the total.

5. REFERENCES

- Antonescu C., Tălmăciu M., Robu T., Antonescu M.C, Zaharia M.S. (2012). Comments on the useful and harmful entomofauna according to some treatment seed corn and wheat lots of years, 2011-2012 Trifesti SC ASTRA SRL, Iasi. *Lucrări Științifice USAMV Iasi, seria Agronomie*, 55, 77-80.
- Panin S. (1951). *Determinator coleoptelilor daunatoare si folositoare din R.S.R.* Editura de Stat pentru Lit. Științ. și Didac., București
- Reitter E. (1908). *Fauna Germanica*. Die Käfer des Deutschen Reiches Band I, Stuttgart.
- Tălmăciu M., Tălmăciu N., Diaconu A. (2007). Contributions à l'étude de la faune de Carabidés (Coleoptera) des pâturages de l'est de la Roumanie. *Lucr.Șt.* Vol.XXXIX, partea a II-a. Ed.Agroprint Timișoara, 423-429.