

INFLUENCE OF CLIMATIC CONDITIONS ON THE INCIDENCE OF THE ENTOMOFAUNA USEFUL ON VINEYARD ECOSYSTEM DEALU BUJORULUI

INFLUENȚA CONDIȚIILOR CLIMATICE ASUPRA INCIDENTEII ENTOMOFAUNEI UTILE ÎN ECOSISTEMUL VITICOL DIN PODGORIA DEALU BUJORULUI

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Abstract. *This paper presents research conducted to SCDVV Bujoru in 2012 - 2013. Lately, the problem of protecting biodiversity at the ecosystem, species and populations has become increasingly vital to reduce human impact on the biosphere. Vineyard ecosystem is defined as the functional unit of the biosphere created and controlled by humans in order to obtain high yields of grape quality and the economic and social conditions more favorable. Pesticides used in fighting pathogens vine attached to their favorable effect, increase their aggression and contribute to environmental pollution and the grape harvest, when they are used rationally. In the last two decades, public opinion in general and Romanian scientific research proved particularly sensitive to the environment and human health. The research focused on the study of epigeal fauna (the entomofauna useful) vine plantations due to the fact that any pesticide treatment has more influence or less on its specific structure, but also the quantity of individuals of the same species that meet various agricultural ecosystems (Ball et al., 1986).*

Key words: *ecosystem, vines, biodiversity, pathogens, pesticides.*

Rezumat. *Lucrarea prezintă cercetările realizate la S.C.D.V.V Bujoru în perioada 2012 -2013. În ultima perioadă, problema protejării biodiversității la nivel de ecosisteme, specii și populații a devenit tot mai vitală pentru reducerea impactului uman asupra biosferei. Ecosistemul viticol este definit ca fiind acea unitate funcțională a biosferei creată și controlată de către om, în vederea obținerii unor producții ridicate de struguri, de calitate superioară și în condiții economice și sociale tot mai avantajoase. Pesticidele folosite în combaterea agenților patogeni ai viței de vie, pe lângă efectul lor favorabil, sporesc gradul de agresivitate al acestora și contribuie la poluarea mediului și a recoltei de struguri, atunci când nu sunt utilizate rațional. În ultimele două decenii, opinia publică în general și cercetarea științifică românească în special s-au dovedit sensibile la problemele mediului înconjurător și a sănătății oamenilor. Cercetările au vizat studiul faunei epigeice (entomofaunei utile) din plantațiile de viță de vie, datorită faptului că orice tratament cu pesticide are o influență mai mică sau mai mare asupra structurii specifice a acesteia, dar și asupra cantității de indivizi din cadrul aceleiași specii care se întâlnesc în diferite agroecosisteme (Ball et al., 1986).*

Cuvinte cheie: *ecosistem, vița de vie, biodiversitate, agenți patogeni, pesticide.*

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INTRODUCTION

Vineyard ecosystem is defined as the functional unit of the biosphere created and controlled by man to obtain high yields of grape quality and economic and social conditions more favorable.

The pesticides used to combat pathogens of grapevine, in addition to their favorable effect, increase their aggression and contribute to environmental pollution and the grape harvest, when not used rationally.

MATERIAL AND METHOD

The research was conducted in 2020 ADER Sector Programme during 2012-2013 in Research and Development Station for Viticulture and Winemaking Bujoru. The varieties studied were different ages and the technology is applied in the experimental classical and ecologically.

Experimental variants studied:

V1 - classical technology (Fetească regală);

V2 - classical technology (Fetească neagră);

V3 – organic technology (Merlot);

V4 - classical technology (Muscat Ottonel);

V5 - witness - (Merlot).

In order to determine the qualitative and quantitative structure of epigeal fauna of the soil surface were installed on the vine rows Barber traps ground (Fig. 1), filled 2/3 with solution of formalin (formaldehyde) 4% installed in three repetitions. Entomological material was collected and labeled transported to the laboratory where it was washed under running water, then was passed 7% alcohol solution. Epigeal fauna identification and counting was used magnifying trinocular (Kruss) with two magnifiers WF 10x20. Relative numerical abundance (Ar%) of a population is defined as the proportion of the number of individuals of a species or group to the total number of individuals of all species in that sample.



Fig. 1 - Barber soil type traps



Fig. 2 - *Coccinella septempunctata*

RESULTS AND DISCUSSIONS

In recent years the vineyard "Dealul Bujoru" was a deviation from the annual average climatic factors (high temperatures, increased the frequency of droughts, desertification) that caused the biological and behavioral changes on the

emergence and evolution of pathogens of grapevine Dealu Bujoru vineyard, with consequences difficult to assess the long-term ecosystem integrity wine.

To characterize the specific microclimate conditions vineyard hill peony were used weather data recorded at the meteorological station at SCDVV Bujoru (Table 1).

Spring season climatic conditions were unusual for the period by average temperatures higher than normal period average air temperature of 12,7 °C / 18,5 °C April/May. April Maxima did not exceed 30,4°C. May the thermally approached multiannuality values.

During June, July and August there were high temperatures above 30,0 °C (4days / June, 7 days / 15 days July / August). The highest temperature was 34,5 °C was recorded in the summer on 06.22.2013, 30.07.2013 and 08.09.2013. Relative humidity is within the normal range, there were only sporadic values below 50% in the first decade of April and in August. During the active growing season began with high rainfall but unevenly distributed in time. Also during this period exceeded the average monthly rainfall recorded normal so in the months from March to May has recorded a surplus of 50,8 mm.

Table 1

**Meteorological station of SCDVV Bujoru
Temperature of the air during the period
of 01.11.2012 - 31.10.2013**

Month of year	Air temperature (t°C)		Precipitations, hygroscopicity humidity and insolation					
	Monthly average		Precipitations (mm)		Air humidity (%)		Insolation (hours)	
	normal	2012-2013	normal	2012-2013	normal	2012-2013	normal	2012-2013
XI.2012	4,8	8,2	34,9	4,3	83	68	52,3	79,4
XII.2012	1,7	-1,7	28,6	102,3	88	69	30,7	29,5
I.2013	-1,7	-0,9	13,8	39,0	87	71	41,2	24,1
II.2013	2,0	2,9	13,6	36,4	79	68	80,4	51,9
III.2013	5,5	4,9	24,2	36,1	75	58	106,5	116,6
IV.2013	11,2	14,1	40,4	27,3	70	52	142,2	216
V.2013	18,6	20,5	31,2	83,2	62	51	237,1	298,4
VI.2013	22,6	22,6	53,2	58,8	62	58	236,8	252,7
VII.2013	24,9	23,3	54,9	38,9	63	51	251,3	295,2
VIII.2013	23,2	24,1	61,7	71,1	66	48	226,4	268,5
IX.2013	17,2	16,9	47,2	174,5	73	54	150,9	188,1
X.2013	11,6	12,2	34,9	40,9	78	64	106,1	122,3
Sum	141,6	147,1	438,6	712,8	886	712,0	1661,9	1942,7
Average	11,8	12,2	-	-	73	59	-	-

Regarding the evolution of rainfall, there is an uneven distribution of them throughout the growing season with a surplus in May (52,0 mm to 31,2 mm multi-annual) and in June, July and August values close normal. The same table also presents data on relative humidity, insolation and cloudiness. Average air hygroscopicity values of 59% from the annual average of 73% and annual insolation was 1942,7 hours to multiannual is 1661,9 hours.

At V1 - classical technology (Fetească regală) were collected insects (Table 2) belonging to 13 species. The species with the highest number of specimens collected were: *Carabus spp.* 198 exemplary; *Forficula auricularia* of 164 exemplary; *Alopecosa pulverulenta* of 83 exemplary; *Apis sp.* of 46 exemplary; *Coccinella septempunctata* of 40 exemplary (Fig. 2), etc. A total of 2 species were collected in a single exemplary. In total, 650 exemplary were collected.

At V2 - classic technology (Fetească neagră) were collected insects belonging to 11 species. The species with the highest number of specimens collected were: *Forficula auricularia* of 144 exemplary; *Carabus spp.* of 131 exemplary; *Alopecosa pulverulenta* of 75 exemplary; *Apis sp.* 54 exemplary; *Coccinella septempunctata* of 36 exemplary etc. In total, 494 exemplary were collected.

At V3 - organic technology (Merlot) were collected insects belonging to 12 species. The species with the highest number of specimens collected were: *Carabus spp.* of 109 exemplary; *Alopecosa pulverulenta* of 84 exemplary; *Forficula auricularia* of 78 exemplary; *Apis sp.* of 29 exemplary; *Coccinella septempunctata* of 40 exemplary etc. A total of three species were collected in a single exemplary. In total the Merlot of 376 exemplary were collected.

At V4 - classical technology (Muscat Ottonel) were collected insects belonging to 12 species. The species with the highest number of specimens collected were: *Carabus spp.* of 250 exemplary; *Epicometis hirta Poda.* of 147 exemplary; *Forficula auricularia* of 53 exemplary; *Alopecosa pulverulenta* of 52 exemplary; *Apis sp.* of 47 exemplary; *Coccinella septempunctata* of 7 exemplary etc. In total the Muscat Ottonel of 649 exemplary were collected.

At V5 – Witness (Merlot) were collected insects belonging to 13 species. The species with the highest number of specimens collected were: *Forficula auricularia* of 199 exemplary; *Epicometis hirta Poda.* of 84 exemplary; *Carabus spp.* To 47 exemplary; *Gryllus campestris* of 47 exemplary; *Alopecosa pulverulenta* of 46 exemplary; *Apis sp.* of 23 exemplary; *Coccinella septempunctata* of 3 exemplary etc. A total of three species were collected in a single copy. In all the variety Merlot - (Witness) 547 exemplary were collected.

Table 2

Invertebrate species collected by soil type traps Barber

No.	Species., Fam., Ord.	V1		V2		V3		V4		V5	
		T	A.r* (%)	T	A.r* (%)	T	A.r* (%)	T	A.r* (%)	T	A.r* (%)
1.	<i>Alopecosa pulverulenta</i> / fam. Lycosidae	83	12,77	75	15,18	84	22,34	52	8,01	46	8,41
2.	<i>Forficula auricularia</i> / fam. Forficulidae	164	25,23	144	29,15	78	20,74	53	8,17	199	36,38
3.	<i>Epicometis hirta</i> Poda./ fam. Scarabeidae	18	2,77	15	3,04	11	2,93	147	22,65	84	15,36
4.	<i>Apis</i> sp./ fam. Apidae	46	7,08	54	10,93	29	7,72	47	7,24	23	4,20
5.	<i>Carabus</i> sp./ fam. Carabidae	198	30,46	131	26,52	109	28,99	250	38,52	47	8,59
6.	<i>Eurigaster Maura</i> / fam. Scutelleridae	6	0,92	1	0,20	6	1,60	5	0,77	5	0,91
7.	<i>Gryllus campestris</i> / fam. Gryllidae	10	1,54	9	1,82	1	0,26	3	0,46	47	8,59
8.	Fam. Vespidae	12	1,84	4	0,81	1	0,26	2	0,31	1	0,18
9.	<i>Coccinella septempunctata</i> / fam. Coccinellidae	40	6,15	36	7,29	6	1,60	7	1,08	3	0,55
10.	<i>Cicada viridis</i> / fam. Cicadidae	19	2,92	5	1,01	15	3,99	24	3,70	20	3,66
11.	Ord. Diptera	52	8,00	20	4,05	35	9,31	31	4,78	70	12,81
12.	Myriapoda	1	0,15	-	-	1	0,26	28	4,31	1	0,18
13.	<i>Melolontha melolontha</i> , fam. Scarabaeidae	1	0,15	-	-	-	-	-	-	-	-
14.	<i>Peribatodes rhomboidaria</i> / fam. Geometridae	-	-	-	-	-	-	-	-	1	0,18
TOTAL		650	100	494	100	376	100	649	100	547	100

CONCLUSIONS

1. In the vineyard ecosystem Dealu Bujoru, the largest share of insects was the V1 with a number of 650 exemplary, followed by a number of 649 V4 exemplary. The few insects collected was recorded at 376 in V3 with a number of insects.

2. Analyzing the ecological spectrum of all species collected and identified, it can be seen that predominant species *Carabus* sp. / Fam. Carabidae / Ord. Coleoptera with a percentage of 38.52% in V4, followed by *Forficula auricularia* species with 36.38% in V5 and species of fam. Lycosidae / Order Araneae with a percentage of 22.34% at V3.

3. Entomofauna useful was the *Coccinella septempunctata* / fam. *Coccinellidae* / Ord. Coleoptera with a rate of 7.29% to V2, and the lowest percentage, 0.55% to V5.

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