THE STRUCTURE OF THE NOCTURNE ENTOMOFAUNA CAPTURED BY LIGHT TRAP DURING 2005-2007 IN SIBIU RESULTS USED BY THE PHYTOSANITARY BOARD

STRUCTURA ENTOMOFAUNEI NOCTURNE CAPTURATE LA CAPCANA LUMINOASĂ ÎN PERIOADA 2005-2007 ÎN SIBIU ÎN CADRUL DIRECȚIEI FITOSANITARE

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Abstract: *Following the study of the entomological material captured by the light trap during 2005-2007 summing up 9.723 sample, we identified a number of 21 species of lepidoptera and 12 species of coleoptera. We concluded that the dominant species were Culex pipiens, Aphis ssp., and Leucoptera scitella. In year 2005 were captured the highest number 3.867 samples, the dominant species was Aphis spp. due to the favourable weather conditions and biotop with poplars and other ornamental bushes.*

Rezumat: *Studiul de față se referă la materialul entomologic capturat la capcana luminoasă în perioada 2005-2007, iar în urma acestui studiu au fost colectate 9.723 exemplare, un număr de 21 de specii de lepidoptere, 12 specii de coleoptere. Speciile dominante au fost Culex pipiens, Aphis ssp. și Leucoptera scitella. În anul 2005 au fost capturate 3.867 exemplare, iar specia dominantă a fost Aphis spp. pentru că în acel an au fost condiții favorabile dezvoltării acestei specii.*

Key words: *nocturne entomofauna, light trap*
Cuvinte cheie: *entomofauna nocturnă, capcana luminoasă.*

INTRODUCTION

The light trap is a physical method for limitation of the insect populations under PED (the economic limit of pest). As a way of action this method uses light for capturing the phototropic positive insects (noctuide, tortricide, etc.).

The light sources used could be electric bulbs or acetylene lamps. The disadvantage of this method lies in the fact that except the pest insects visited for being seized, many insects can be also attracted by the source of light from the useful entomofauna.

In this paperwork are presented the results of the captures at light trap during 2005-2007 in Sibiu, results used by Phytosanitary Board Sibiu for prognosis and warning, for making the flight curves and the knowing the entomofauna where the light trap is placed, in a view to trace out the attack periods of some insects species which harm the agricultural cultures.

Taking into account the geographical position and its altitude, Sibiu county has a temperate continental clime in conditions of rainfall and moderate nebulosity climate which influenced a certain entomofauna specific to the microclimate.

MATERIALS AND METHOD

The light trap was installed during the three years of study in the courtyard of the Phytosanitary Board Sibiu, in the garden of the Institution courtyard. In the North part of the trap lies the administration building, in the South part different species of fruit trees, the main species being the apple in the Eastern and Western part there are also fruit trees.

The type of the trap is STAS and in placed at 3,5 m above the ground at the distance of 5 m from the administration building. The trap is composed of metal frame supported on 4 feet. On its feet there is a parallelepiped box with a little door by which one has access to the collecting pot. The collecting pot is placed inside the box where is the cotton imbued with chloroform. Every time when material is collected the cotton in replaced.

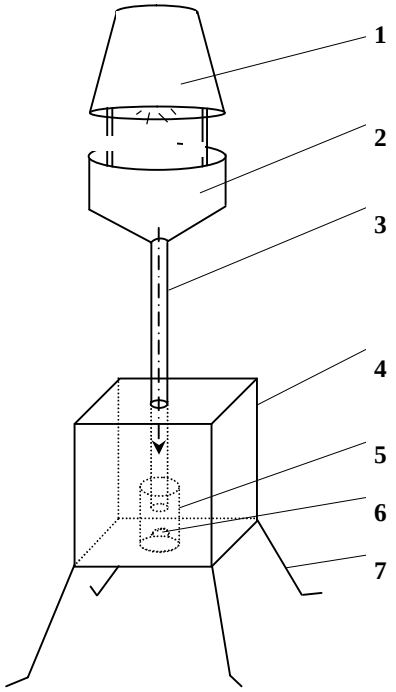

Fig.1. Light trap – 1. light source; 2. capturing surface: 3. tube; 4. box; 5. collecting pot; 6. cotton imbued with chlorophorm; 7. feet.

Above the box there is a pipe having inside the collecting tube which connects the capturing surface and the collecting pot. Above the capturing surface lies the light source which is transmitted by an electric bulb neon type with the power of 200 W. The functioning period of the trap lasted from May to the 31st of August every year.

The functioning was daily from the evening to the morning of the next day, the collecting being made depending on the weather conditions (1-2 times weekly, on decades as it follows: 1-10 first decade, 11-20 the second decade, 21-31 the third decade).

The captured material was collected periodically, being taken out from the light trap to be placed into plastic boxes, in which there was a layer of peat which maintains the collected material in natural state for a adequate identification.

The butterflies (Lepidoptera) were stretched on wood stretcher, then the identification after Koch (1991). To every sample was attached the adequate label with the collecting datum and the systematic framing.

The beetles (Coleoptera) were pinned, labelled and identified with the help of Perju's works (1995). The results centralized by every study year as it follows:

Table 1

Meteorological Table

Year/Month	Air temperature (^{o}C)			Air humidity (%)	Nebulosity (0-10)	Rainfall (l/mp)
	maximum	minimum	medium			
2005						
May	30.2	5.5	17.6	63.3	2.5	12.5
June	33.3	6.3	19.2	75.2	3.7	37.6
July	32.5	10.6	21.3	81.2	4.0	125.0
August	27.5	8.9	18.8	85.6	5.2	108.8
2006						
May	33.3	5.5	19.0	69.4	3.1	28.8
June	36.9	7.1	21.4	64.4	2.6	4.0
July	35.7	11.0	20.2	81.0	5.3	122.2
August	34.9	6.3	21.7	70.6	7.6	14.0
2007						
May	27.0	3.5	14.0	76.3	6.0	56.8
June	30.2	8.6	18.1	78.9	3.8	64.8
July	33.7	7.8	78.9	80.6	5.3	
August	32.9	8.2	18.9	83.0	5.4	98.4

Table 2

The Structure of Entomofauna Captured during May-August 2005

Nr. Crt.	FAMILIA/CAPTURI	MAI				IUNIE				IULIE				AUGUST				Total gene-ral
		I	II	III	Total	I	II	III	Total	I	II	III	Total	I	II	III	Total	
	Fam. MUSCIDAE																	
1	*Musca domestica*	-	-	11	11	5	7	2	14	7	10	11	28	7	4	9	20	73
	Fam. COCCINELLIDAE																	
1.	*Subcoccinella septempunctata*	-	-	-	0	3	3	1	7	2	1	1	4	-	-	6	6	17
2.	*Adalia bipunctata*	-	-	-	0	3	2	1	6	2	1	-	3	5	3	2	10	19
3.	*Propilaea 14 punctata*	-	-	1	1	-	1	1	3	1	-	-	1	-	-	-	0	4
	Fam. VESPIDAE																	
1.	*Vespa germanica*	-	-	4	4	5	3	1	9	1	2	-	3	4	1	4	9	22
	Fam. ELATERIDAE																	
1.	*Agriotes spp.*	-	-	5	5	4	3	1	8	6	3	2	11	-	-	-	0	19
	Fam. PENTATOMIDAE																	
1.	*Palomena prasina*	-	4	-	4	1	2	-	3	3	2	-	5	-	2	-	2	14
	Fam. APHIDIDAE																	
1.	*Aphis spp.*	-	-	467	467	451	520	529	1500	122	130	241	986	256	241	121	618	3571
	Fam. APIDAE																	
1.	*Apis mellifica*	-	-	-	-	1	4	6	11	-	1	-	1	3	1	1	5	17
	Fam. GEOMETRIDAE																	
1.	*Calothysanis amata*	-	-	-	0	2	4	-	6	2	4	0	4	-	-	-	0	10
	Fam. NOCTUIDAE																	
1.	*Autographa gamma*	-	-	-	0	2	1	2	5	2	1	4	7	-	-	-	0	12
2.	*Sileptra ruralis*	-	-	-	0	2	1	2	5	-	-	-	0	-	-	-	0	5
3.	*Calothisanis amata*	-	-	-	0	-	-	-	0	-	-	-	0	1	-	-	1	1
	Fam. TORTRICIDAE																	
1.	*Cydia pomonella*	-	-	-	0	10	35	5	50	4	6	8	18	4	2	0	6	74
2.	*Cydia funebrana*	-	-	-	0	3	5	5	13	5	5	3	13	-	2	2	5	9

Table 3

The Structure of Entomofaune Captured during May-August 2006

Nr. Crt.	FAMILIA/CAPTURI	MAI				IUNIE				IULIE				AUGUST				Total general
		I	II	III	Total	I	II	III	Total	I	II	III	Total	I	II	III	Total	
	Fam. CHRYSOMELIDAE																	
1.	*Lema melanopa L., 1758*	-	2	1	3	1	7	-	8	-	-	-	0	-	-	-	0	11
	Fam. COCCINELLIDAE																	
1.	*Subcoccinella septempunctata*	-	4	4	8	2	3	7	12	1	3	5	9	2	1	-	3	32
2.	*Adalia bipunctata*	-	-	1	1	1	-	-	1	-	1	-	1	1	-	-	1	4
3.	*Propilaea 14 punctata*	-	1	-	1	1	-	-	1	-	-	-	0	-	-	-	0	2
	Fam. VESPIDAE																	
1.	*Vespa germanica*	-	2	-	2	-	1	1	2	-	1	-	1	-	1	-	1	6
	Fam. MUSCIDAE																	
1.	*Musca domestica*	1	2	-	3	3	3	1	7	2	4	1	7	4	1	-	5	22
	Fam. ELATERIDAE																	
1.	*Agriotes spp.*	-	-	1	1	1	3	-	4	1	2	-	3	1	2	-	3	11
	Fam. PENTATOMIDAE																	
1.	*Palomena prasina*	-	4	-	4	2	3	-	5	3	1	-	4	-	2	-	2	15
2.	*Coreus marginatus*	-	-	-	0	2	2	-	4	1	2	5	8	2	5	1	8	20
3.	*Eurydema ornata*	-	-	-	0	2	7	-	9	1	-	-	1	1	1	-	2	12
	Fam. APHIDIDAE																	
1.	*Aphis spp.*	-	15	92	107	167	251	201	619	203	135	291	629	87	39	107	233	2330
	Fam. CARABIDAE																	
1.	*Harpalus spp.*	-	-	9	9	6	2	4	12	2	3	4	9	-	2	-	2	32
	Fam. APIDAE																	
1.	*Apis mellifica*	4	2	-	6	3	2	1	6	-	-	-	0	-	-	-	0	16
	Fam. GEOMETRIDAE																	
1.	*Calothysanis amata*	-	-	-	0	-	-	-	0	-	1	-	1	-	-	-	0	1
2.	*Operoptera brumata*	-	-	1	1	-	1	-	1	2	-	-	2	-	-	-	0	4
	Fam. NOCTUIDAE																	
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.	*Autographa gamma*	4	3	7	14	1	-	3	4	3	-	2	5	-	-	-	0	23
2.	*Sileptra ruralis*	-	-	-	0	-	-	-	0	-	1	2	3	-	2	-	2	5
3.	*Amathes C-nigrum*	-	-	-	0	-	1	-	1	-	-	-	0	2	-	-	2	3
4.	*Phragmatobia fulginosa*	-	-	-	0	-	-	-	0	-	-	2	2	1	-	-	1	3
5.	*Trachaea atriplicis*	-	-	-	0	-	1	-	1	-	-	1	1	-	-	-	0	2
6.	*Mamestra brassicae*	-	2	-	2	-	-	1	1	-	-	-	0	-	2	-	2	5
7.	*Calothisanis amata*	-	-	-	0	-	-	-	0	-	-	-	0	3	-	-	3	3
	Fam. PIERIDAE																	
1.	*Pieris brassicae*	-	1	2	2	-	2	1	3	-	2	1	3	1	3	-	3	12
2.	*Aporia cartaegi*	-	-	-	0	1	2	-	2	1	-	-	1	-	-	-	0	3
	Fam. TENTHREDINIDAE																	
1.	*Hoplocampa testudinea*	-	-	1	1	-	-	2	2	-	-	1	1	-	-	-	0	4
	Fam. CHRYSOMELIDAE																	
1.	*Leptinotarsa decemlineata*	-	1	-	1	-	-	-	0	-	-	-	0	-	-	-	0	1
	Fam. GRACILARIIDAE																	
1.	*Phyllonorycter blancardella*	2	1	1	4	1	1	-	2	-	2	-	2	1	-	-	1	9
	Fam. TORTRICIDAE																	
1.	*Cydia pomonella*	-	-	1	1	5	2	1	8	1	1	-	2	2	-	-	2	13
2.	*Cydia funebrana*	-	-	1	1	2	3	-	5	-	-	-	0	-	-	-	0	6

Table 4

The Structure of Entomofauna Captured during May-August 2007

Nr. Crt.	FAMILIA/CAPTURI	MAI				IUNIE				IULIE				AUGUST				Total general
		I	II	III	Total	I	II	III	Total	I	II	III	Total	I	II	III	Total	
	Fam. CHRYSOMELIDAE																	
1.	*Lema melanopa L., 1758*	-	3	-	3	4	3	-	7	-	-	-	0	-	-	-	0	10
2.	*Lilioceris meltigera*	3	-	-	3	-	-	-	0	-	-	-	0-	-	-	-	0	3
	Fam. COCCINELLIDAE																	
1.	*Subcoccinella septempunctata*	-	2	5	7	2	1	6	9	-	-	2	2	-	2	-	2	20
2.	*Adalia bipunctata*	-	-	1	1	1	1	-	2	1	1	-	2	1	-	-	1	5
3.	*Propilaea 14 punctata*	-	1	-	1	-	-	-	0	-	-	-	0	-	-	-	0	1
	Fam. VESPIDAE																	
1.	*Vespa germanica*	-	1	-	1	1	2	2	5	-	1	-	1	-	-	-	0	7
	Fam. MUSCIDAE																	
1.	*Musca domestica*	7	2	8	17	4	7	2	13	5	2	2	9	2	1	1	4	43
	Fam. ELATERIDAE																	
1.	*Agriotes spp.*	-	-	2	2	1	2	1	4	1	2	1	4	1	2	3	6	16
	Fam. PENTATOMIDAE																	
1.	*Palomena prasina*	-	1	1	2	1	1	1	3	2	1	3	6	1	1	2	4	15
2.	*Coreus marginatus*	-	-	-	0	2	3	1	6	2	3	7	12	2	5	6	13	31
3.	*Eurydema ornata*	-	1	6	7	2	3	2	7	2	3	1	6	1	2	-	3	23
4.	*Graphsoma linatus*	-	-	-	0	-	-	-	0	-	-	1	1	1	1	-	2	3
	Fam. APHIDIDAE																	
1.	*Aphis spp.*	-	10	8	18	152	225	26	403	156	67	216	439	52	63	21	136	996
	Fam. CARABIDAE																	
1.	*Harpalus spp.*	-	2	4	6	7	3	4	14	-	2	5	7	-	3	2	5	32
	Fam. APIDAE																	
1.	*Apis mellifica*	3	2	6	11	1	2	2	5	-	1	2	3	-	-	-	0	19
	Fam. GEOMETRIDAE																	
1.	*Calothysanis amata*	-	-	-	0	-	-	-	0	1	1	-	2	-	-	-	0	2
	Fam. NOCTUIDAE																	
1.	*Autographa gamma*	3	1	4	8	1	7	2	10	2	1	1	4	-	-	-	0	22
2.	*Sileptra ruralis*	-	-	-	0	-	-	-	0	-	1	2	3	-	-	-	0	3
3.	*Amathes C-nigrum*	-	-	-	0	1	2	2	5	4	8	5	17	1	-	-	1	22
4.	*Phragmatobia fulginosa*	-	-	-	0	-	-	-	0	-	-	1	1	2	-	-	2	3
5.	*Mamestra brassicae*	-	2	3	5	-	-	-	0	-	1	4	5	-	-	1	1	11
6.	*Calothisanis amata*	-	-	-	0	-	-	-	0	-	-	-	0	2	1	-	3	3
7.	*Parastictis secalis*	-	-	-	0	-	-	-	0	2	3	1	6	-	-	-	0	6
8.	*Scotia segetum*	-	-	-	0	-	1	-	1	-	-	-	0	-	-	-	0	1
	Fam. PIERIDAE																	
1.	*Pieris brassicae*	-	2	2	4	-	2	2	4	1	2	3	6	1	2	-	3	17
2.	*Aporia cartaegi*	-	5	7	12	3	3	-	6	2	1	-	3	-	-	-	0	21
	Fam. TENTHREDINIDAE																	
1.	*Hoplocampa testudinea*	-	-	2	2	-	1	4	5	-	-	-	0	-	-	-	0	7
2.	*Hoplocampa minuta*	-	3	4	7	-	-	-	0	-	-	-	0	-	-	-	0	7
	Fam. CHRYSOMELIDAE																	
1.	*Leptinotarsa decemlineata*	-	1	-	1	1	2	-	3	1	2	-	3	-	-	-	0	7
	Fam. GRACILARIIDAE																	
1.	*Phyllonorycter blancardella*	5	7	15	27	3	2	7	12	1	3	-	4	1	2	-	3	46
	Fam. LEUCOPTERIDAE																	
1.	*Leucoptera scitella*	15	64	52	131	23	41	63	127	54	62	43	159	20	64	21	105	522
	Fam. HYPONOMEUTIDAE																	
1.	*Hyponomeuta malinlla*	-	-	-	0	-	-	-	0	11	7	16	34	11	3	-	14	48
	Fam. TORTRICIDAE																	
1.	*Cydia pomonella*	-	-	6	6	8	6	3	17	2	1	5	8	1	2	-	3	34
2.	*Cydia funebrana*	-	-	1	1	1	6	-	7	-	1	2	3	1	-	-	1	12
3.	*Adoxophyes reticulana*	-	-	-	0	6	13	2	21	1	2	-	3	-	-	-	0	24
	Fam LIMANTRYDAE																	
1.	*Lymantria dispar*	-	1	2	3	5	2	1	8	-	-	-	0	-	-	-	0	9
2.	*Euproctis chrysorrhoea*	-	-	-	0	-	-	2	2	1	1	-	1	-	-	-	0	3
	Fam. CECIDOMYIIDAE																	
1.	*Culex pipiens*	26	11	12	49	156	368	312	836	14	21	41	76	34	62	41	137	1098
	Fam SPHINGIDAE																	
	Agrius comvolvulii	-	-	-	0	-	-	-	0	-	-	-	0	-	1	3	4	4
	Fam COSSOIDEA																	
1.	*Zeuzera pirina*	-	-	-	0	-	-	-	0	-	-	-	0	-	1	1	2	2

CONCLUSIONS

After the identification of the captured material during the 3 years of study (the months May, June, July, August) we can conclude the next facts: in 2005 the captured material belongs to 10 families (table 2), 15 species totalizing a number of 3867 samples. The dominant species of this year was *Aphis spp*. with a number of 3396 samples, followed by *Cydia pomonella* with a number of 54 samples. The great number of captured aphids is due the biotop in which the dominant species was poplar and other ornamental bushes, which subsequently were cleared.

In 2006 (table 3), there were identified a number of 16 families with a number of 29 species, totalizing 2024 samples. The dominant species was still Aphis spp. with a number of 1757 samples followed by 26 samples of Harpalus spp.

The year 2007 (table 4) was characterized by the identification of 22 families, with 40 species a number of 3210 captured samples. The dominant species were *Culex pipiens* with a number of 1067 samples, *Aphis* ssp. with 937 samples and then 370 samples of *Leucoptera scitella*.

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