THE STUDY OF SEXUAL PHEROMONE TRAPS FOR PEST MONITORING, CABBAGE MOTH – *MAMESTRA BRASSICAE L*

STUDIUL UNOR VARIANTE DE FEROMONI SEXUALI PENTRU MONITORIZAREA DĂUNĂTORULUI BUHA VERZEI – *MAMESTRA BRASSICAE* L.

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Abstract. *For experiments we have used the sexual pheromone traps: V1 – Mb 2008 and V2 – Atrabras (The control). The first generation of adults of Cabbage moth was observed in May and early June. They were cached 1,5 males/traps in V1 – Mb 2008 and 0,5 males/traps in V2 - Atrabras (The control). The second generation of Cabbage moth flew in August. The sexual pheromone traps were cached 11,9 ex/trap in V1 – Mb 2008 and 4,6 ex/trap in V2-Atrabras (The control). The results have been used for flying diagrams from first and second generations and for established the efficiency of MB 2008 – new pheromone variant.*

Key words: sexual, pheromone, traps, cabbage moth.

Rezumat. *În cadrul prezentelor experimente, au fost utilizate mai multe capcane cu feromoni sexuali: V1 – Mb 2008 and V2 – Atrabras (martor). Prima generaţie cu adulţi de buha verzei a fost observată în mai şi la începutul lunii iunie. Au fost capturaţi un număr de 1,5 masculi/capcană la varianta V1 – Mb – 2008 şi 0,5 masculi/capcană la varianta V2 – Atrabras (varianta martor). Cea de-a doua generaţie de buha verzei a zburat în August. Capcanele cu ferononi sexuali au capturat un număr de 11,9 ex/capcană pentru varianta V1 – Mb – 2008 şi 4,6 ex/capcană la varianta V2 – Atrabras (martor). Rezultatele au fost utilizate pentru stabilirea diagramelor de zbor pentru prima şi a doua generaţie şi pentru stabilirea eficacităţii noi variante feromonale Mb – 2008.*

Cuvinte cheie: feromoni sexuali, capcane, buha verzei

INTRODUCTION

The cabbage moth is one of the main pests in cabbage cultures, producing significant damages in the cabbage crops both in summer (Călin, 1998).

Stan et al. (1991) monitoring the populations of noctuide with the pheromonal found two generations of cabbage moth per year. Steene et al. (1990) experimenting the light and pheromonal traps, with the purpose of establishing the biologic cycle of a pest, didn't observe a strict demarcation between the generations. The captures obtained with the pheromonal variants experimented by Steene and al. (1990) demonstrated a maximum of flight curve in August.

An important place in the biology and ecology of cabbage moth population is occupied by the pedo-climatic conditions (Leather, 1995). The warning and prognosis of noctuid apparition, as well as the estimation of larva attack have a great importance in the maintaining of cabbage moth population under the economic damage threat attack (EDTA).

Stan et al. (1991) experimenting numerous variants of pheromonal traps didn't found a positive correlation between the number of captures and the attack developed by the larva in cabbage crops. The authors explain this situation through: photogene, preferential habitat, level of food, polygamies and reproductive isolation between the sympatric species of noctuide.

For the warning and the reduction of number of treatment applied for the control of cabbage moth, SCDL Bacau and I.C.C. Cluj-Napoca has accomplished synthesis of variants with synthetic pheromones as well as experiments in the field during 2007 – 2009. In the present paper we present the generations with the highest number of captures.

MATERIAL AND METHODS

The monitoring of cabbage moth pest in adult stage was accomplished with the pheromonal traps with adhesive.

The sexual pheromones were assured by the Institute for Chemistry Cluj-Napoca. The following variants were experimented: V1 – Mb 2008, V2 - Atrabras.

The pheromonal traps were placed in the cabbage cultures from establishing until harvest, almost 3 traps/ha, at plant level. The pheromonal capsules were changed at each 3 weeks, and the surfaces with adhesive at the clogging with fauna.

The captures were collected from the pheromonal traps twice a week. The dates regarding the development of stages and generations were obtained after different boring, observation in the field and the captures registered in the pheromonal traps. With the results obtained curves of male cabbage moth flight were marked out.

RESULTS AND DISCUSSIONS

In the first generation of cabbage moth, the number of pheromonal captures was very low (table 1, fig. 1).

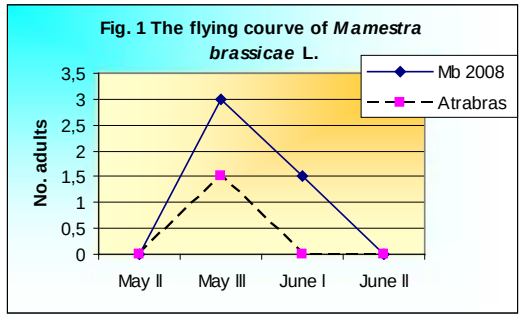
Table 1

The species of Lepidoptera captured on the pheromonal variant Mb 2008, comparatively with Atrabras, in the first generation of noctuides

Specie	Mb 2008 - no. ex./trap		Total ex./ trap	Atrabras - no. ex./trap		Total ex./ trap
	May III	June I		May III	June I	
Mamestra brassicae L.	1	0,5	1,5	0.5	0	0,5
Discestra trifolii H.	0.3	0	0,3	0.5	0.3	0,8
Autographa gamma L.	0.3	0	0,3	0	0	0
Agrotis spp.	0.3	0	0,3	0	0	0

The dates presented shows that many of the Lepidoptera traps were obtained at variant MB 2008, specie *Mamestra brassicae* L., in May third decade and June first decade. Also, the variant MB 2008 captured a number of 4 sympatric species,

comparing with the variant Atrabras that allowed the capture of only two species. Most of the captures belonged to cabbage moth specie, in variant V1 - Mb – 2008 – 1.5 males/trap and in variant V2 Atrabras (control) - 0,5 males/trap. The pest flight curve for the first generation is presented in figure 1. We can observe that the flight started in the second part of May, the curve maximum being registered in the third decade of this month. At the beginning of June the male flight finished, the cabbage moth being present in cabbage crops only in larva stage.



In the second generation the population was more numerous (table 2). Analyzing the dates presented, on observe that the variant Mb 2008 captured butterflies that belongs to *Mamestra brassicae* L and *Discestra trifolii* H. The population of cabbage moth was higher, being captured 3.3 ex./trap in the first decade of August, 6,1 ex./trap in the second decade of August and 2,5 ex./trap in the third decade of August.

Table 2

The species of Lepidoptera captured in the pheromonal variant Mb 2008, comparatively with Atrabras in the second generation of noctuide

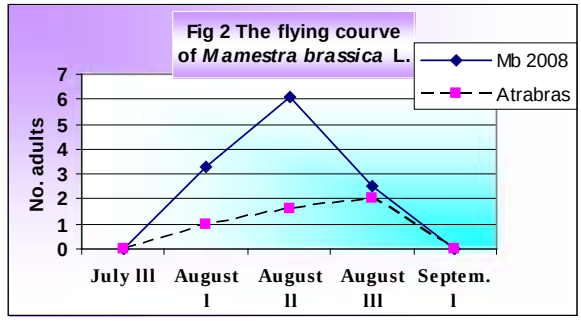
Specification	Medium no. of butterflies /trap in variant Mb 2008				Total	Medium no. of butterflies /trap in variant Atrabas				Total
	August decade			Sept. decade I		August decade			Sept. decade I	
	I	II	III			I	II	III		
Mamestra brassicae L	3,3	6,1	2,5	0	11,9	1	1,6	2	0	4,6
Discestra trifolii H.	0,6	1	2	0,6	4,2	0,6	1	1	0,6	3,2

The number of butterflies belonging to the specie *D. trifolii* was lower, but the period of flight was higher – inclusive for the first decade of September. The control Atrabras captured a lower number of butterflies, respectively: one ex. /trap in the first decade of August, two ex./trap in the second decade of August and two ex./trap in the last decade of August.

The flight curve corresponding to the total number of captures (fig. 2) had a maimum of flight in the following decades of August: second (Mb 2008) and third (Atrabras). The results obtained underline the efficacy of the new synthesized pheromonal variants - Mb 2008, comparatively with Atrabras, (homologated variant).

The researches and experimentations were accomplished at I.C.C. Cluj Napoca and S.C.D.L. Bacau.

Two pheromonal variants Mb 2008 and Atrabras (control) were experimented.



CONCLUSIONS

The highest number of Lepidoptera captures was obtained at variant MB 2008, specie *Mamestra brassicae* L., in the third decade of May and first decade of June. Also, the variant MB 2008 captured a number of four sympatric species, comparing with the variant Atrabras that captured only two species of Lepidoptera. The highest number of captures belonged to cabbage moth specie, in variant Mb 2008 - 1,5 males /trap and in V2 Atrabras (control) - 0,5 males/trap. In the second generation the population was higher. The variant Mb 2008 captured butterflies belonging to the species *Mamestra brassicae* L and *Discestra trifolii* H. The population of cabbage moth was higher, being captured 3,3 ex./trap in the first decade of August, 6,1 ex./trap in the second decade of August and 2,5 ex./trap in the third decade of August.

The variant Atabras (V2) captured a lower number of butterflies, respectively: one ex./trap in the first decade of August, two ex./trap in the second decade of August and two ex./trap in the last decade of August.

The results obtained showed the efficiency of new synthesized pheromonal variant - Mb 2008, comparatively with Atrabras, (homologated variant).

REFERENCES

1. Călin Maria, Gh. Popa, G. Mihu, Tr. Roman, Georgeta Negru, Al Szobo, Maria Tudose, Lorelai Glavan, Lidia Pop, I. Oprean, 1998 - *Cercetări privind ecologia şi avertizarea tratamentelor de combatere a dăunătorului buha verzei* (*Mamestra brassicae* L.). Analele I.C.D.L.F Vidra, vpl. XV, 1998.

2. Leather, S. R. 1995 - *Factors affecting fecundity, fertility, oviposition, and larviposition in insects*. Insect Reproduction. S. R. Leather and J. Hardie. New York, CRC.

3. Stan Gh., Viorica Chiş, Coroiu I., Crişan Al., Tomescu N., Lidia Pop, Oprean I., 1991 - *Utilizarea feromonilor sexuali sintetici în cercetări de biologia comportamentului şi controlul populaţiilor unor specii ale genului Mamestra (Lepidoptera Noctuidae).* Simpozionul Naţional de Protecţia Plantelor Târgu Mureş, Revista de protecţia plantelor, Cluj Napoca, 52-53, 1991.

4. **Steene F., Vanparis L, Benoit E., Ceustermans N., Rooster L., 1990 -** *Phenological observation on Mamestra brassicae L., Mamestra oleracea L. and Plutella xylostella L during 1990*. Parasitica, 46 (2-3), 93-97, (R.AE, 81, 7) , 1990.