

# Use of Semiochemical Products in Monitoring and Control of *Epicometis Hirta* Poda

Ion OLTEAN<sup>1</sup>, Laura Ioana MACAVEI<sup>1</sup>, Iuliana VASIAN<sup>2</sup>, Stefania TÖTÖS<sup>2</sup>, Mircea VARGA<sup>1</sup>, Teodora FLORIAN<sup>1\*</sup>

<sup>1</sup> Faculty of Agriculture, Department Environment and Plant Protection, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Calea Mănăştur 3-5, 400372, Cluj-Napoca, Romania

<sup>2</sup> Institute for Research in Chemistry "Raluca Ripan", Babes-Bolyai University, Cluj-Napoca, 30 Fantanele str., 400294, Cluj-Napoca, Romania

\*Corresponding author: [florian.teodora@yahoo.com](mailto:florian.teodora@yahoo.com)

Bulletin USAMV series Agriculture 72(2)/2015  
Print ISSN 1843-5246; Electronic ISSN 1843-5386  
DOI 10.15835/buasvmcn-agr: 11705

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## ABSTRACT

*Epicometis hirta* Poda. is a dangerous pest which can be observed on annual crops and also on fruit tree species.

The adult is a beetle can be easily recognized due to existing pubescence found all over it's body. The pest causes damage by consuming the reproductive organs of flowers. Adults are phytophagous and feed on leaves and flowers of plants such as orchard trees, cereals or ornamental plans. The timing chemical control against this species is very difficult considering that the moment of sprays application is during bloom, thus the pollinating entomofauna is affected. Therefore the need to develop alternative control methods is highlighted. Semiochemical products represent a method of perspective whereas involve only the target species. For this purpose the team of entomology discipline along with Institute of Chemistry "Raluca Ripan" colleagues, tested the attractiveness of two new synthetic products which were placed in three types of traps (Type 1, Type 2, Type 3). Experiments were located in UASVM Cluj Napoca Orchard, fruit tree farm Steluța and fruit tree farm Agroindustrială Cluj Napoca. The best results were obtained by Type 1 trap, in all three locations.

**Keywords:** *bumblebees, blue trap, monitoring strategies.*

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## INTRODUCTION

*Epicometis hirta* is a polyphagous pest, being reported on 48 species of plants (Subchev et al., 2011). The damage is produced by adults which consume the reproductive organs of host flowers, such as orchard trees, cereals or ornamental plans (Aydin, 2011; Vuts et al., 2009). It's attack can diminish up to 70% of flowers in nurseries and young cherry orchards (Kutinkova and Andreev, 2004; Roșca et al., 2011).

In spring, starting from April, the adults become active and fly to flowers of spring-blossoming fruit trees or to different weeds, where they feed until July, with a maximum peak of flight in June (Roșca et al., 2011; Subchev et al., 2011)

The control of this pest can be done only by a rational application of a complex control strategy. Therefore several methods as fizical, mecanical, biological, biotechnical or chemical are used. The chemical control of this species is very difficult considering that the moment of spray application must be done during bloom, therefore the pollinating entomofauna is affected. The mechanical control methods consist in direct colectig of larvae and adults. In order to apply a successful control strategy, morphological, biological and behavioral particularities of this species must be known.

Whereas the pest presents positive phototropism for certain wave length, stiky panells can be used for it's control, however this

method is adequate only for limited areas. In the process of locating the host plant, the insect uses both chemical (chemical mediators) and visual cues (Vuts *et al.*, 2009).

The aim of this experiment was to evaluate the efficacy of two semiochemical products (produced by Institute of Chemistry “Raluca Ripan”) in three type of traps, in order to be used for monitoring actions of *Epicometis hirta* species.

## MATERIALS AND METHODS

The experiment took place in the year 2015, during the adults flight.

Traps were placed in three different locations from Cluj-Napoca area: Steluța farm (cherry orchard), Agroindustrială farm (cherry orchard) and USAMV Cluj-Napoca (apple orchard).

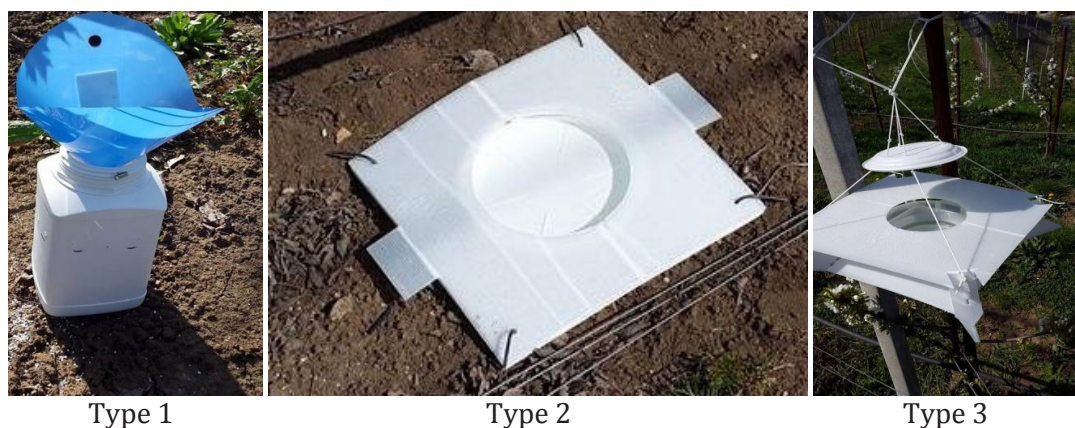
We used two types of semiochemical blends which were placed in three different designs of traps. Type 1 – blue trap with funnel; Type 2 – white trap placed on soil level, Type 3 – white trap placed on tree crown (Fig. 1.).

The setup of experiment took place on different dates: 21.04. 2015 for cherry orchards, respectively in 17.04.2015 in apple orchard of USAMV Cluj-Napoca.

## RESULTS AND DISCUSSION

The results regarding number of catches for each experimental treatment from each location, are presented in (Tab. 1.), (Tab. 2.) and (Tab. 3.).

A synthesis regarding the functionality of the two types of semiochemical lures in capturing



**Fig. 1.**

**Tab. 1.** Monitoring of *Epicometis hirta* species in cherry orchard (Steluța farm)

Location	Fruit tree	Trap type	Observation date	Number of <i>Epicometis H.</i> adults	Other insects (bumble bees)
Steluța Farm	Cherry	Blue trap 1	04.05.2015	4	-
		Blue trap 2		18	-
		Blue trap 3		-	13
		Blue trap 4		13	22
		White trap (crown level)			
		White trap (soil level)			
Steluța Farm	Cherry	Blue trap 1	18.05.2015	10	7
		Blue trap 2		40	-
		Blue trap 3		5	3
		Blue trap 4		45	11
		White trap (crown level)		1	-
		White trap (soil level)		-	-

*Epicometis hirta* adults and other species, is represented in (Tab. 4.) and (Tab. 5.).

From (Tab. 4.) it can be noticed the total number of pest's adults collected during experimental period, number that ranged from 135 individuals (Agroindustrială farm) to 41 individuals (Steluța farm), therefore the power

of attraction to semiochemical lure 1 is proven. Similar results were obtained by Schemra *et al.*,(2004) și TÓTH *et al.*,(2004). However, this blend has a negative collateral effect to ecosystem through the high number of bumble bees (516 individuals) that have been captured; the total catches/location ranged from 48 individuals in

**Tab. 2.** Monitoring of *Epicometis hirta* species in cherry orchard (Agroindustrială farm)

Location	Fruit tree	Trap type	Observation date	Number of <i>Epicometis H.</i> adults	Other insects (bumble bees)
Agroindustrială Farm	Cherry	Blue trap 1	04.05.2015	4	50
		Blue trap 2		18	52
		Blue trap 3		-	109
		Blue trap 4		13	104
		White trap (crown level)			-
		White trap (soil level)			-
Agroindustrială Farm	Cherry	Blue trap 1	18.05.2015	2	15
		Blue trap 2		-	5
		Blue trap 3		-	4
		Blue trap 4		4	10
		White trap (crown level)		-	-
		White trap (soil level)		-	-

**Tab. 3.** Monitoring of *Epicometis hirta* species in apple orchard (USAMV Cluj-Napoca)

Location	Fruit tree	Trap type	Observation date	Number of <i>Epicometis H.</i> adults	Other insects (bumble bees)
Orchard USAMV Cluj-Napoca	Apple	Blue trap 1	24.04.2015	4	2
		Blue trap 2		7	-
		Blue trap 3		2	-
		Blue trap 4		5	3
		White trap (crown level)		-	-
		White trap (soil level)		-	-
Orchard USAMV Cluj-Napoca	Apple	Blue trap 1	1.05.2015	8	10
		Blue trap 2		4	4
		Blue trap 3		15	4
		Blue trap 4		4	7
		White trap (crown level)		1	-
		White trap (soil level)		-	-
Orchard USAMV Cluj-Napoca	Apple	Blue trap 1	8.05.2015	4	3
		Blue trap 2		5	4
		Blue trap 3		-	4
		Blue trap 4		1	7
		White trap (crown level)		-	-
		White trap (soil level)			

**Tab. 4.** Total number of catches registered by blue trap (semiochemical blend 1)

Location	No. of catches	Other species
Steluța farm	135	56
Agroindustrială farm	41	349
USAMV Cluj-Napoca orchard	60	48
Total	236	453

**Tab. 5.** Total number of catches registered by semiochemical blend 2 in the tested trap designs

Location	No. of captures		Other species	
	Soil level trap	Crown level trap	Soil level trap	Crown level trap
Steluța farm	-	-	-	-
Agroindustrială farm	-	-	-	-
USAMV Cluj-Napoca orchard	-	1	-	-
Total	-	1	-	-

USAMV Cluj-Napoca orchard to 349 bumble bees in Agroindustrială farm.

In order to improve the functionality of this type of product, future research is needed.

On the other hand, studies regarding the color induced selectivity are needed. It is possible that a big part of the bumble bees captured, were also attracted by the color of trap.

The semiochemical lure 2 did not show satisfactory attraction to *Epicometis hirta* or other species (Tab. 5.), therefore it will not be considered for our further studies.

## CONCLUSION

1. Semiochemical lure 1 presents high attractiveness for adults of *Epicometis hirta* species.
2. In order to be used in monitoring actions, future research concerning the selectivity of semiochemical lure 1 are needed.

**Acknowledgments.** This paper was published under the frame of European Social Fund, Human Resources Development Operational Programme 2007-2013, project no. POSDRU/159/1.5/S/132765.

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