

# The Effect of Some Pesticides on the *Trichogramma dendrolimi* Mats. Species in the Climatic Conditions of the D. S. Banu Maracine

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## Abstract

During 2002–2004 within a complex scheme (Marcu, Florentina et al., 2003) for controlling the plum moth *Grapholitha funebrana* Tr., there has been used oophagous wasps *Trichogramma dendrolimi* Mats. as biological control agents. The research has been made in a plum orchard 2.5ha, Stanley variety, at the Didactical Station Banu Maracine, Craiova.

In order to study the action of some pesticide on adult and nymph stages of the oophagous parasite *Trichogramma dendrolimi* Mats. (Li, YuanXi and al. 2004) there has been used the following fungicides: Topsin M 70 WP, Captadin 50 WP; insecticides: Calypso 480 SC, Supersect 10 EC and the acaricide Mitigan 18,5 CE.

Key words: pesticides, *Trichogramma dendrolimi* Mats.

## Introduction

Thus the biocenotic complex from the plum orchards comprise a relative great number of damaging species (pests), in order to decrease the number of chemical treatments, a viable method for controlling the plum moth *Grapholitha funebrana* Tr. is the use of the oophagous parasites. The oophagous wasps *Trichogramma* spp. (Fig. 1) are among the most widely used biological control agents against lepidopteran pests.

During 2002 – 2004 within a complex scheme for controlling the plum moth *Grapholitha funebrana* Tr., there has been used oophagous wasps *Trichogramma dendrolimi* Mats. as biological control agents. The research has been made in a plum orchard 2.5ha, Stanley variety, at the Didactical Station Banu Maracine, Craiova.

In order to study the action of some pesticide on adult and nymph stages of the oophagous parasite *Trichogramma dendrolimi* Mats. there has been used the following fungicides: Topsin M 70 WP, Captadin 50 WP; insecticides: Calypso 480 SC, Supersect 10 EC and the acaricide Mitigan 18,5 CE.

## Material and method

In order to study the action of some pesticide on adult and nymph stages of the oophagous parasite *Trichogramma dendrolimi* Mats. there has been used the following fungicides: Topsin M 70 WP, Captadin 50 WP; insecticides: Calypso 480 SC, Supersect 10 EC and the acaricide Mitigan 18,5 CE.

For observing the action of the chemical products on the adults of *Trichogramma dendrolimi* Mats, in the same day of the treatment there has been instaled in 5 plum trees, 2 plates with mediteranean flour moth *Anagasta kuehniella* Zell. eggs parasited by *Trichogramma dendrolimi* Mats, from which under way of appearance the adults of *Trichogramma dendrolimi* Mats (Marcu, Florentina 1999). The noting has been made after 24 and 72 hours from the treatment (Fig. 2).

In the case of the nymphs, the plates contain eggs of mediteranean flour moth parasited by *Trichogramma dendrolimi* Mats., 8 days old, when the oophagous parasitoids is in the stage of nymph. There has been

placed 10 plates, in 5 plum trees, 2 plates per tree. After the treatment the plates has been take it into the laboratory and there has been counted the adults appeared from the total of parasitated eggs.

Also, in the treatment day there has been placed in 5 plum trees 2 plates with fresh eggs of mediterranean flour moth. After the treatment, these eggs has been take it into the laboratory and offered to the trichogrammas for parasitisation.

The observations regarding the effects of the pesticides on the adults of *Trichogramma dendrolimi* Mats. has been made in orchard, in natural conditions, using specific cages.

The data of the experiment are presented as an average of the research years 2002 -2004. The experiments has been conducted each year during June and July, corresponding to the second generation of the *Grapholitha funebrana* Tr.



Fig. 1. *Trichogramma* spp. adult, parasiting lepidopterean eggs



Fig. 2. Plates with mediteranean flour moth eggs placed in plum tree (original)

### Results and discussion

The chemical treatments apply in the plum orchards had an toxic effect only on the adults of *Trichogramma* species, not on the other stages of this oophagous parasites: eggs, larva, nymph, these stages being protected by the parasited egg chorion.

From our research regarding the effect of some pesticides (table 1) on the adult stage of the *Trichogramma dendrolimi* Mats. species, it come out that the fungicides Topsin and Captadin, used in treatments for controlling the plum diseases, has not presented a toxic effect, the mortality being of 10,4 – 15,5%, in the first day of the treatment. A toxic effect has been recorded only for the insecticides Calypso 480 SC and Supersect 10 EC and the accaricides Mitigan 18,5 CE. At the control variant, where no treatments has been apply, the natural mortality has been of 9,3% in the first day of the treatment and 3,2% after 3 days. From the insecticides used for controlling the plum moth Calypso 480 SC has been recorded as the most toxic causing a mortality of 100% to the aduls of *Trichogramma dendrolimi* Mats. after the first day of treatment and even after the third day from the treatment. After the first day of treatment, the product Supersect 10 EC has presented a high toxicity 83,4%, after 3 days the recorded mortality for the adults of *Trichogramma dendrolimi* Mats. has been of 62,4%.

The recorded mortality caused by the accaricide Mitigan 18,5 CE, has been of 46,2% after first day of treatment, respectively 30,7% after 3 days from treatment.

For the nympha stage of the trychogramma the fungicides doesn't present toxic effect, and the insecticides and accaricides has presented a low toxicity (table 2).

From the insecticides the product Calypso 480 SC has been recorded with the highest toxicity, from total of analyzed pupa 86,4% has presented emergence oriffices, comparative with control variant where the analyzed pupa has presented 99,3% emergence oriffices.

In the case of the product Supersect 10 EC, 90,9% from the analyzed pupa has presented emergence oriffices.

Treating the parasitation support, the eggs of the mediteranean flour moth *Anagasta kuhniella* Zell., with the pesticides, it come out that the eggs has been parasited by the *Trichogramma dendrolimi* Mats. in high percentage of 86,4 – 98,7% when treated with fungicides and in 86,4 – 90,9% treated with insecticides, in the case of accaricides the eggs has been parasited in a percentage of 92,4% (table 3).

Thus, we can ascertain that if the eggs of *Grapholitha funebrana* Tr. are treated with pesticide, can be parasited by *Trichogramma dendrolimi* Mats.

**Table1. The effect of some pesticides on the adults of *Trichogramma dendrolimi* Mats., at S.D. Banu Maracine, 2002 – 2004 (average)**

The Product	The Dose %	% Adults mortality after	
		1 day	3 days
Control variant	-	9,3	3,2
Topsin M 70 WP	0,07	15,5	7,8
Captadin 50 WP	0,25	10,4	4,5
Calypso 480 SC	0,02	100	100
Supersect 10 EC	0,03	83,4	62,4
Mitigan 18,5 CE	0,1	46,2	30,7

**Table 2. The effect of some pesticide on the nympha stage of *Trichogramma dendrolimi* Mats., at S.D. Banu Maracine, 2002 – 2004 (average)**

The product	The dose %	% emergence oriffices
Control variant	-	99,3
Topsin M 70 WP	0,07	98,7
Captadin 50 WP	0,25	99,2
Calypso 480 SC	0,02	86,4
Supersect 10 EC	0,03	90,9
Mitigan 18,5 CE	0,1	92,4

**Table 3. The effect of some pesticides on the *Trichogramma dendrolimi* Mats. species, by treating the parasitation support**

The product	The dose %	% parasited eggs
Control variant	-	99,1
Topsin M 70 WP	0,07	96,4
Captadin 50 WP	0,25	98,6
Calypso 480 SC	0,02	59,0
Supersect 10 EC	0,03	61,0
Mitigan 18,5 CE	0,1	73,0

## Conclusions

From our research regarding the effect of some pesticides on the adult stage of the *Trichogramma dendrolimi* Mats. species, it come out that the fungicides Topsin and Captadin, used in treatments for controlling the plum diseases, has not presented a toxic effect. A toxic effect has been recorded only for the insecticides Calypso 480 SC and Supersect 10 EC and the accaricide Mitigan 18,5 CE.

For the nympha stage of the trychogramma the fungicides doesn't present toxic effect, and the insecticides and accaricides has presented a low toxicity.

Treating the parasitation support, the eggs of the mediteranean flour moth *Anagasta kuhniella* Zell., with the pesticides, it come out that the eggs has been parasited by the *Trichogramma dendrolimi* Mats. in high percentage of 86,4 – 98,7% when treated with fungicides and in 86,4 – 90,9% treated with insecticides, in the case of accaricides the eggs has been parasited in a percentage of 92,4%.

Thus, we can ascertain that if the eggs of *Grapholitha funebrana* Tr. are treated with pesticide, can be parasited by *Trichogramma dendrolimi* Mats.

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