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RESEARCH ARTICLE

Effect of Malathion on Adult of *Scirtothrips dorsalis* and *Rhiphiphorothrips cruentatus* (Thysanoptera: Thripidae)

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ABSTRACT

Thrips, order Thysanoptera, are tiny, slender insects with fringed wings. Thrips are plant feeders that scar leaf, flower, or fruit surfaces or distort plant parts. Infested leaves are spotted on the upper surface. Heavy feeding on fruit causes a russetted appearance, cracking and decay. The results of all the experiments conduct on the residual toxicity of malathion for adult thrips community have studied, the synthetic pesticide malathion has long half life, so malathion required seldom applications. Pesticidal experiments evident that suitable pesticide will have the lowest LC_{50}, shortest LT_{50} and maximum half life value, which will cause maximum mortality in shortest time and remain effective for longer period.

KEYWORDS: *S. dorsalis, R. cruentatus, malathion, Residual Life, Knock-down Speed.*

INTRODUCTION

Chilli thrips (*Scirtothrips dorsalis*) are pale colored and the lengths of their first and second instar larvae and the pupae are 0.37-0.39, 0.68-0.71 and 0.78-0.80 mm, respectively. Adults are about 1.2 mm long with dark wings and dark spots forming incomplete stripes which appear dorsally on the abdomen. *S. dorsalis* is a polyphagous species with more than 100 recorded hosts.

Rhiphiphorothrips cruentatus Hood (Family- Thripidae) is an important pest of a large number of horticultural plants and does basically foliage inhabit. It is commonly known as grapevine thrips due to its abundance on grapevine leaves and being a major pest of this host plant. It is found frequently on rose leaves and it may inhabit flowers in rare cases. R. cruentatus Hood belong to the Subfamily Panchaetothripinae of family Thripidae (order Thysanoptera).

Malathion is an insecticide of organophosphate group which used as dermal toxicant. It is light yellow to dark brown liquid with a strong offensive odor, which is slightly soluble in water and mineral oil. It has a low phytotoxicity and the lowest toxicity to mammals as compared to other organophosphates. Malathion is highly effective against crop pests like thrips, aphids and lepidopteron pests.

MATERIALS AND METHODS

Living thrips have been collected from their particular host plant from Bichpuri Horticultural Farm of R.B.S. College, Bichpuri Campus, Agra, with the help of camel brush and 70% alcohol. Observations did make on leaves and fruit for *S. dorsalis* and *R. cruentatus* during summer and fall for any developing infestation. Frequent inspections of fruit are recommended for thrips beginning in early August and continuing until fruit harvest. The malathion (various labels) were labelled for use against thrips. [6] experimented on control of *S. dorsalis.* [2]. Sampling methods, dispersion patterns and fixed precision sequential sampling plants for western flower thrips and cotton flea hoppers gave by [7]. Malathion, thiamethoxam, acetaphate, carbofuran, and dimethoate are the best insecticides for management of cotton thrips, but pyrethroids may not be the best option for controlling thrips because they do not work systematically [9]. The use of any pesticide against thrips population during standing crop

gives significant result irrespective of the season [10]. Some workers observed that all the pesticides, which are thigmotoxic to thrips and different pesticides use in rotation, have given better results against thrips than anyone has pesticide use [2]. Ann some reported the various insecticides to control the pests of vegetables [3].

During the course of experimental study, the activities of pesticide (malathion) was under taken against thrips. 25 larvae of the adult thrips released in each petri-dish containing different concentrations of used pesticide, the test conducted at room temperature (27ºC to 30ºC). At each of the given concentration, five replicates comprising 25 insect pests expose, results scored after 24 hrs of continuous expose and expressed as percent mortality. The data was analyzed statistically to calculate the medium concentration (LC_{50} value). The value of relative toxicity of malathion of various concentrations was calculate by taken the LC_{50} values [5].

Mortality count was done as per formula given by [1]:-

$$P' = \frac{P\ C}{100\ C} \times 100$$

Where, P' = Corrected mortality percent with test insect
P = Observed mortality percent with test insect.
C = Mortality count in the control.

RESULT AND DISSCUSSION

R. cruentatus was identified by their antennae [4]. Thrips possesses piercing and sucking mouthparts and causes damage by extracting the contents of individual epidermal cells leading to necrosis of tissue. Adult and nymphs of *S. dorsalis* suck the cell sap of leaves, causing rolling of the leaf upward and leaf size reduction According to [8].

Table- 1 Knock-down Speed of Malathion Against Adult of Thrips at 0.000320 ppm Dosage

Insect Pest	Percent Mortality in Minutes						LT_{50} (In Minute)	LT_{90} (In Minute)
	7.5	15	30	60	120	240		
Rhiphiphorothrips cruentatus	0	10	15	30	45	-	165	>240
Scirtothrips dorsalis	0	10	17.5	25	45	85	150	>240

Table- 2 Residual Life of Malathion Against Adult Thrips

S.No.	Dosages (ppm)	Average Percent Mortality in Days Interval					Half Life (In Days)
		0	4	8	16	32	
1	0.00038	10	10	0	0	0	>4
2	0.00034	30	30	10	0	0	
3	0.0003	80	70	40	10	0	
4	0.00026	100	80	60	30	0	
5	0.00022	-	100	90	40	10	

The knock-down effects of malathion pesticide has been determined on the basis of LT_{50} and LT_{90} values. Lesser the time required (in minutes) for the knock-down of 50% or 90% population, witch show the greater toxicity of the pesticide. The LC_{50} value of malathion against thrips community reported 0.00032 ppm in the case of adult thrips (Table.-1). Malathion exhibit varying degree of residual protection, which is very important for the relative effectiveness. Therefore, the residual toxicity was determined by estimating the half-life value of the malathion against adult thrips. During experiment, knock-down speed of three identified species of thrips separately calculated in adult stages of both species. Adult stages of *R. cruentatus*, and *S. dorsalis* were exposed to treatment doses of 100ppm malathion and mortality counts were made at different time intervals of 7.5, 15, 30, 60, 120 and 240min.

The LT_{50} values of malathion against *R. cruentatus*, and *S. dorsalis* were 165, 110 and 150 minutes respectively; and LT_{90} values were 240, 200 and 240 minutes respectively. To calculate the residual toxicity of malathion against the adult stages of *R. cruentatus* and *S. dorsalis*, the half life values of the pesticides should determine on the basis of LC_{50} values. The half life value of malathion against the adult stages of two experimental thrips was recorded 4 at different LC_{50} values (Table.-2).

The results of all the experiments conduct on the residual toxicity of malathion for adult thrips community have studied, the synthetic pesticide malathion has long half life, so malathion required seldom applications. Pesticidal experiments evident that suitable pesticide will have the lowest LC_{50}, shortest LT_{50} and maximum half life value, which will cause maximum mortality in shortest time and remain effective for longer period.

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