



Effect of Pyrethrin on Adult of *Thrips tabaci* and *Scirtothrips dorsalis* (Thysanoptera: Thripidae)

Mahesh Chandra*, R.K. Verma*, Rajesh Prakash**, Manish Kumar**, Deepmala Verma and D.K. Singh**

*Dept. of Zoology, R.B.S. College, Agra

**Dept. of Zoology, Govt. P.G. College, Jalesar, Etah

***Dept. of Zoology, Ganjundwara P.G. College, Ganjundwara, Etah

Email.- maheshagnivanshi@yahoo.co.in

ABSTRACT

Thrips are minute insects and belong to family thripidae of order Thysanoptera. They are opportunist, exploiting intermittently occurring environment. 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 russeted appearance, cracking and decay. The results of all the experiments conduct on the residual toxicity of pyrethrin for adult *T. tabaci* and *S. dorsalis* communities have studied. The half life value of pyrethrin against the adult stages of two experimental thrips was recorded 4 at different LC_{50} values. The degradation was faster in the beginning while in later stage is slow down until there were no changes in LC_{50} values. The LT_{50} values of pyrethrin against *T. tabaci* and *S. dorsalis* were 120 and 152 minutes respectively; and LT_{90} values were 242 and 270 minutes respectively. Pyrethrin took least time to kill *T. tabaci* and maximum time for *S. dorsalis*. So it is recommended that Biopesticide (pyrethrin) should be use in place of synthetic pesticide, because it has no damage to other insects of pollination and the cheapest as our noble affords be productivity without any hazardous conditions.

KEYWORDS: *T. tabaci*, *S. dorsalis*, pyrethrin, Knock-down Speed, Residual Life.

INTRODUCTION

T. tabaci is a great horticultural importance and is considered an important pest of agricultural crops and ornamentals. Body is pale yellow to dark brown in colour; legs are pale and eyes are black. *Scirtothrips dorsalis* (Chilli thrips) are pale colored, and 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.

Pyrethrins naturally obtained from the white flower of *Chrysanthemum cinerariae* Folium (guldaudi). Pyrethroids are synthetic chemicals and 'Pyrethrum' is a general name covering both compounds pyrethrins and prethroids. Pyretherin is a group of six esters which hydrolyzed easily by alkalis decomposed by sun light. Pyrethrin was first used in Iran as an insecticide in 1800.

MATERIALS AND METHODS

Living thrips have been collected from their particular host plant from Motilal Nehru Park, Near Taj Mahal, Agra and 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 *T. tabaci* and *S. dorsalis* 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 pyrethrin (various labels) was 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]. Some workers studied on few insecticides for management of *T. tabaci* [9, 10, 12, 13]. 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]. And some

reported the various insecticides to control the pests of vegetables [3]. Some researchers compared between unsprayed and sprayed peaches in Georgia [11].

During the course of experimental study, the activity of pyrethrin was under taken against thrips. 30 adult thrips released in each petri-dish containing different concentrations of used pesticide, the test conducted at room temperature (27°C to 30°C). At each of the given concentration, five replicates comprising 30 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 (LC₅₀ value). The value of relative toxicity of pyrethrin of various concentrations was calculated by taken the LC₅₀ 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 DISCUSSION

Some species of thrips 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 Pyrethrin Against Adult of Thrips at 5779 ppm Dosage

Insect Pest	Percent Mortality in Minutes						LT ₅₀ (In Minute)	LT ₉₀ (In Minute)
	7.5	15	30	60	120	240		
<i>Thrips tabaci</i>	0	10	20	30	60	75	120	242
<i>Scirtothrips dorsalis</i>	0	0	10	22.5	47.5	75	152	270

Table- 2 Residual Life of Pyrethrin Against Adult Thrips

S.No.	Dosages (ppm)	Average Percent Mortality in Days Interval					Half Life (In Days)
		0	2	4	8	16	
1	500	40	30	0	0	0	<4
2	1000	60	60	30	0	0	
3	2000	80	80	60	20	0	
4	4000	100	100	70	50	10	
5	8000	-	-	80	60	40	

The knock-down effects of pyrethrin 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, which show the greater toxicity of the pesticide. The LC_{50} value of pyrethrin against thrips community reported 5779 ppm in the case of adult thrips (Table.-1). Pyrethrin exhibits 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 pyrethrin against adult thrips.

During experiment, knock-down speed of three identified species of thrips separately calculated in their adult stage. Adult stages of *T. tabaci* and *S. dorsalis* were exposed to treatment doses of 100ppm pyrethrin; and mortality counts were made at different time intervals of 7.5, 15, 30, 60, 120 and 240min.

The half life value of pyrethrin against the adult stages of two experimental thrips was recorded 4 at different LC_{50} values (Table.-2). The degradation was faster in the beginning while in later stage is slow down until there were no changes in LC_{50} values. The LT_{50} values of pyrethrin against *T. tabaci* and *S. dorsalis* were 120 and 152 minutes respectively; and LT_{90} values were 242 and 270 minutes respectively. Pyrethrin took least time to kill *T. tabaci* and maximum time for *S. dorsalis*. So it is recommended that Biopesticide (pyrethrin) should be used in place of synthetic pesticide, because it has no damage to other insects of pollination and the cheapest as our noble affords be productivity without any hazardous conditions.

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