



## THE EFFECT OF INSECTICIDES ON SPIDERS IN GROUNDNUT FIELD KADAYANALLUR, TIRUNELVELI DISTRICT

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**ABSTRACT** The populations of spiders and their predatory potency have been studied in groundnut field area of Kadayanallur, Tirunelveli District, and Tamil Nadu. The effects of commonly used insecticides via, Dimecron (Phosphamidon 85% EC) and Anucron (Monocrotophos was 36% SL) studied at 0.04% on five species of spiders via, *Cyrtophora cicutrosa* (Stoliczka), *Crossopriza lyoni* (Black wall), *Oxyopes salticus* (Hentz), *Argiope pulchella* (Thorell) and *Oxyopes birmanicus* (Thorell). The toxicity of dimecron was higher than of Anucron.

**KEYWORDS :** Insecticides, spider, toxicity, groundnut field

### INTRODUCTION:

The indiscriminate use of insecticides has resulted in search for biocontrol measures based on natural control on insect pests by predaceous or antagonistic organisms of spiders are one such organism controlling the pest species in natural environment. But spraying insecticides cause negative significant impact on spider population under laboratory and field conditions has been examined earlier by number of workers (Dondale, 1972; Gladney and Dawkins, 1972; Sterling *et al.*, 1972; Dippenaar *et al.*, 1978; patel *et al.*, 1986 and Patel and Nigam, 1989).

They are efficient predators of insect pests in the crop fields sometimes spiders feed on domestic pest and are considered as generalist predators colonizing almost all the habitats as well as quit abundant and diverse in natural systems (Nyffeler, 1981).

Spiders serve as buffers that limit the exponential growth of pest populations invarious ecosystems by virtue of their predatory potency (Knitani *et al.*, 1972; Mansour *et al.*, 1981 and nuffeler and Benz, 1981). The formers in and around Tirunelveli district used chemical pesticide to control pests. An ideal biological control against would be one that is tolerant to synthetic insecticides. Although spiders may be more sensitive to insecticides than insects (Thomas *et al.*, 1990 and Ravi *et al.*, 2008).

Nonetheless, information pertaining to the effects of insecticides on spiders in meagre. Spiders such as *Cyrtophora cicutrosa*, *Crossopriza lyoni*, *Oxyopes salticus*, *Argiope pulchella*, *Oxyopes birmanicus*, were collected from the Kadyanallur area in Tirunelveli District, Tamil Nadu, South india (MSL  $\pm$  164.90m. Lat 10° IN and Long 77° 42'E) and acclimated at 29 $\pm$ 2°C (RH 8  $\pm$  5 %) we tested the insecticides Dimecron (Phosphamidon 85% and solvent 15%) and anucron (Monocrotophos 36% SL). Hence in the present study an attempt has been made to evaluate the toxicity of insecticides on different species of spiders in figure 1 and figure 2.

### METHODS AND MATERIALS:

A slightly modified method of Dippenaar *et al.*, 1978 was used for evaluation of the effect of the insecticides. A 0.04% concentration was sprayed on rectangular strips (22 cm x 7 cm) and round pieces (64#cm dia) of blotting paper. The paper dried for 50 min, were placed in plastic cylindrical containers (10 cm x 8cm) with the round piece forming the base and the rectangular strip forming wall. The spider's were introduced into containers and allowed to feed on mosquitoes. The effect of insecticides was observed every 24h after placing the spiders in the containers for each of the insecticidal test group consist of 10 spiders was used at a time. The control was maintained in separate containers.

### RESULT AND DISCUSSION:

In the present study on Dimecron caused 100% mortality on *Oxyopes salticus*, *Cyrtophora cicutrosa*, and *Crossopriza lyoni*, within 24hours whereas Anucron also killed *Argiop pulchella*, *Oxyopes birmanicus* with in 24 hour, but the other three species survived for a little longer time. Dimecron was highly toxic to *Crossopriza lyonic* and

*Oxyopes salticus* (100% mortality in 24#b). The similar result was obtained occurred for Anucron to *Argiope pulchella* within 24 hours in Table 1.

The 100% mortality may have occurred as a result of asphyxiation and probably due to the inhibition of the respiratory centre in the brain (O'Brien, 1967). All spiders being carnivores, feed almost exclusively on insects and yet little attention has been paid to their possible use in insect pest suppression (Subramanyan T, 1969).

**Table 1: Percentage mortality of spiders after 24, 48 and 72hours of exposure to insecticides at 0.04% concentration.**

Spiders Name	No. of spiders	Insecticides					
		Dimecron (Phosphamidon)			Anucron (Monocrotophos)		
		24 hours	48 hours	72 hours	24 hours	48 hours	72 hours
<i>A. pulchella</i>	5	60	40		50	40	10
<i>C. lyoni</i>	5	100			70	20	10
<i>C. cicutrosa</i>	5	100			60	40	
<i>Oxyopes birmanicus</i>	5	70	30		100		
<i>O. salticus</i>	5	100			90	10	

The results confirm the earlier reports of Patel *et al.*, 1986 who found these insecticides are highly toxic to spiderlings of *Argiope nathabha*, *Cyrtophora metanostoma* and *Pardosa birmanica*. Dimecron is recorded as more toxic to spiders than other pesticides (Patel *et al.*, 1986 and Patel and Nigam, 1989). A little different mortality percentage was recorded in two test insecticides and proved highly toxic to spiders (Patel and Nigam, 1989). The application of insecticides the spider population was reduced and subsequently increased and attained a peak. The above result that the spiders are ideal predators of insect pests in man made ecosystems.



**Figure.1: Showing on the spraying with insecticides are used in groundnut field**

Many farmers use chemical pesticide to control pests. An ideal biological control agent would be one that is tolerant to synthetic insecticide. The same results were observed in the present study also DDT and parathion and their residues were reported by Herne and

Putman (1966) to the toxic to predaceous arthropods. Heptachlor, Dieldrin and chlorpyrifos are other insecticides that are injurious to brown recluse spiders (Sterling et. al., 1972) reported that the use of these chemicals for controlling insect's pest needs more careful considerations because of their potentially negative influence on the natural enemies of these pests.



**Figure.2: Showing on the Spiders collecting from groundnut field**

### CONCLUSION:

Dimecron is recorded as more toxic to spiders than other pesticides in the present study, the same results were observed in the present study also DDT and parathion and their residues. Heptachlor, Dieldrin and Chlorpyrifos are other insecticides that are injurious to brown recluse spiders use of these chemicals for controlling insect pests needs more careful considerations because of their potentially negative influence on the nature enemies of these pests the present study have been made to evaluate the toxicity of insecticides on different species of spiders. Thus it can be generally suggested based on the literature that both dimecron and anucron were inducing mortality in the spiders through the suppression in the general metabolism and dimecron was caused high mortality.

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