

Relative Toxicity of Insecticides on Larvae of *Spilosoma obliqua* Walker (Arcitiidae : Lepidoptera)

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Abstract

The toxicity of two insecticides, endosulfan 35 EC (organochlorine) and quinalphos 25 EC (organophosphate) with six concentrations viz. 0.005, 0.001, 0.015, 0.02, 0.025 and 0.03% were used against fourth instars larvae of *Spilosoma obliqua* Walker. The relative toxicity and LC₅₀ values after 24 hours of insecticides application revealed that endosulfan 35 EC LC₅₀ was higher than quinalphos 25 EC whereas relative toxicity of quinalphos was highest. The percentage of mortality observed after 24 hours on two insecticides with six concentrations showed quinalphos 25 EC having higher percentage of mortality in all concentrations.

Key words : Concentration, Insecticides, Relative toxicity, *Spilosoma obliqua*.

Spilosoma obliqua Walker is a polyphagous pest and are sporadic in nature and attack various crops during different season of the year (Bakhetia and Sindhu 1970, Singh et al. 1978). A number of experiments were conducted with various insecticides for controlling *Spilosoma obliqua* Walker by some workers (Bakhetia and Sindhu 1970, Singh and Singh 2000, Singh et al. 1978, 1985). With the available information on the use of different insecticides to control polyphagous pest, *Spilosoma obliqua*, present experiment was carried out to determine LC₅₀ value and relative toxicity of two insecticides against this pest.

Methods

The insecticides, endosulfan 35 EC (organochlorine) and quinalphos 25 EC (organophosphate) with six concentration viz. 0.005, 0.01, 0.015, 0.02, 0.025

and 0.03% were used in the present experiment to evaluate mortality reared on leaves of *Vigna mungo*. Freshly moulted fourth instar larvae were selected from the culture and were subjected to topical application of insecticides with the help of micro liter syringe ; 10 micro liter of each concentrations were applied on the posterior abdominal segment to each of the test insects kept separately in individual petridish with fresh food just after treatment. The mortality count was taken 24 hours after treatment. The moribund insects also were considered as dead. Using Abbott's (1925) formula the mortality percentages were corrected and probit analysis (Finney 1971) was done for estimation of LC₅₀.

Results and Discussion

The insecticides, endosulfan 35 EC and quinalphos 25 EC with concentrations of 0.005, 0.01,

Table 1. Relative toxicity of two insecticides tested on fourth instar larvae of *Spilosoma obliqua* Walker. df = Degree of freedom, χ^2 = Chi-square value, Y = Probit kill, X = Log concentration, LC₅₀ = Concentration calculated to give 50% mortality.

Insecticides	df	Heterogeneity χ^2	Regression equation	LC ₅₀ (%)	Fiducial limit (%)	Relative toxicity
Endosulfan 35EC	4	1.466	Y=3.30524+2.02832x	0.02347	0.02059 0.02775	1.00000
Quinalphos 25 EC	4	4.790	Y=6.00636+3.18269x	0.01297	0.01184 0.01409	1.80956

Table 2. Percentage of mortality on two insecticides at different concentration on the fourth instar larvae of *S. obliqua* Walk.

Concentration (%)	Percentage of mortality	
	Endosulfan 35 EC	Quinalphos 25 EC
0.005	13.33	15.56
0.01	26.67	37.78
0.015	35.56	57.78
0.02	47.67	68.89
0.025	51.11	82.22
0.03	64.44	93.33

0.015, 0.02, 0.025 and 0.03 revealed that the mortality of larvae of *Spilosoma obliqua* Walker was found to be in increasing order with increase of concentrations of insecticides. The summarized data on the post-treatment observation relating the LC_{50} value, regression equation and relative toxicity are presented in Table 1.

Based on the LC_{50} values of the insecticides endosulfan had highest LC_{50} value. The relative toxicity value of quinalphos (1.80956) was higher than endosulfan. Between insecticide quinalphos was 1.81 times as toxic as endosulfan. Percentage of mortality observed 24 hours after treatment at different concentrations against this pest is shown in Table 2.

The insecticide quinalphos showed higher percentage of mortality than endosulfan even at high concentrations (0.025 and 0.03%) of endosulfan. The data show that quinalphos (organophosphate) was more toxic than endosulfan (organochlorine) to the larvae of *S. obliqua* Walk.

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