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Relative toxicity of some chemicals to bihar hairy caterpillar, *Spilarctia obliqua* Walker (Arctiidae, Lepidoptera)

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ABSTRACT

The relative toxicity of six insecticides to third instar larvae of *Spilarctia obliqua* (Wlk) was studied in the laboratory condition. On the basis of LC_{50} values (% ai), the descending order of toxicity was: emamectin benzoate 5 SG (0.00005), cypermethrin 10 AF (0.00013), indoxacarb 14.5 SC (0.00053), endosulfan 35 EC (0.00323), fenvalerate 20 EC (0.00340) and fenpropathrin 30 EC (0.00513). Considering the LC_{50} value of fenpropathrin 30 EC as unity (being least toxic), fenvalerate 20 EC, endosulfan 35 EC, indoxacarb 14.5 SC, cypermethrin 10 AF and emamectin benzoate 5 SG were 1.51, 1.59, 9.68, 39.46 and 102.6 times, respectively, more toxic than fenpropathrin 30 EC.

Key words : *Spilarctia obliqua*, emamectin benzoate 5 SG and indoxacarb 14.5 SC.

Bihar hairy caterpillar, *Spilarctia obliqua* (Wlk) is a polyphagus pest, feeding on pulses, sesamum, linseed, cotton, jute, sorghum, groundnut and some vegetables. During the early instars, the caterpillars feed gregariously on the leaves and then disperse. In severe infestations, plants may be completely denuded (Srivastava, 1993). Earlier, about three dozen insecticides were evaluated by various workers against this pest. Some of these include cypermethrin, deltamethrin, fenvalerate, fenpropathrin, fluvalinate, endosulfan, parathion-methyl and monocrotophos (Nagia *et al.* 1990; Jaglan and Sircar, 1997). In the present study the relative toxicity of two new chemicals namely emamectin benzoate 5% SG and indoxacarb 14.5% SC was investigated on 3rd instar larvae of *S. obliqua* along with some common one like endosulfan, cypermethrin, fenvalerate and fenpropathrin.

MATERIALS AND METHODS

The experiment was conducted in the Department of Agricultural Entomology, Bidhan Chandra Krishi Viswavidyalaya, Nadia, West Bengal during June, 2005 – June, 2006. Bihar hairy caterpillar *Spilarctia obliqua*, taken from nucleus culture maintained in this laboratory, were reared on castor leaves. Six concentrations of each chemical were prepared for the study. Castor leaves were dipped in these chemical solutions, dried under fan and were placed into plastic containers. Thirty 3rd instar larvae of uniform size were released in each container. Each treatment was replicated thrice. For control, leaves are dipped in plain water and then dried. Observations were taken 24 hours after treatment. The percent mortality observed in different treatments was corrected by using modified Abbotts formula (Abbott, 1925). To calculate the LC_{50} values, data obtained on mortality were subjected to probit analysis (Finney, 1971). Relative toxicity of the chemicals was determined on the basis of LC_{50} values, considering the chemicals possessing the highest LC_{50} value as unity.

RESULTS AND DISCUSSION

The data presented in the Table-1, revealed that emamectin benzoate 5 SG showed lowest LC_{50} value (0.00005) and was most toxic among all the chemicals to the 3rd instar larvae of *S. obliqua* followed by cypermethrin 10 AF (0.00013), indoxacarb 14.5 SC (0.00053), endosulfan 35 EC (0.00323), fenvalerate 20 EC (0.00340) and fenpropathrin 30 EC (0.00513). Considering the LC_{50} value of fenpropathrin 30 EC as unity (being least toxic), fenvalerate 20 EC, endosulfan 35 EC, indoxacarb 14.5 SC, cypermethrin 10 AF and emamectin benzoate 5 SG were 1.51, 1.59, 9.68, 39.46 and 102.6 times, respectively, more toxic than fenpropathrin 30 EC. The results of the present studies are in conformity with that of Gupta *et al.* (2004) who reported that emamectin benzoate (proclaim) was more toxic than fenvalerate, indoxacarb, cypermethrin and endosulfan to *Spodoptera litura* (Fabr.).

Hence, it is evident that proclaim is most toxic among all the chemicals tested against larvae of Bihar hairy caterpillar and may be utilized to control this pest.

Table 1 : Relative toxicity and LC_{50} values of different chemicals on 3rd instar larvae of *Spilarctia obliqua*

Chemicals	d.f.	Heterogeneity (χ^2)	Regression equation	LC_{50} (% a.i.)	Fiducial limit	Relative toxicity
Fenpropathrin 30 EC	4	5.261	Y= 4.24032 + 1.85190X	0.00513	0.00442 0.00597	1
Fenvalerate 20 EC	4	6.994	Y= 3.03090 + 1.22770X	0.00340	0.00218 0.00525	1.51
Endosulfan 35 EC	4	14.591	Y= 5.50439 + 2.20970X	0.00323	0.00222 0.00481	1.59
Indoxacarb 14.5 SC	4	12.482	Y= 9.16748 + 2.80099X	0.00053	0.00040 0.00072	9.68
Cypermetrin 10 AF	4	2.807	Y= 5.13157 + 1.32068	0.00013	0.00011 0.00016	39.46
Emamectin benzoate 5 SG	4	11.381	Y= 10.30624 + 2.39476X	0.00005	0.00004 0.00007	102.6

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