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Relative Toxicity of Some Newer Insecticides to the Adults of *Caliothrips indicus* Bagnall on Groundnut*

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The thrip, *Caliothrips indicus* Bagnall, is one of the important pests of *kharif* groundnut crop. It appears in a serious form under drought which greats hot and dry weather conditions (Amin, 1984). It appears in moderate to severe form in Andhra Pradesh, Tamil Nadu, Bihar, Maharashtra and Kerala (Vavai, 1969). The pest causes damage by bleaching off the chlorophyl of the leaves which resembles stipling. There was frequently discolouration of leaves which may be tinged with red or even black colour. The infested leaf surface can be marked with numerous dark spots of excreta. In severe infestation, the plant growth is stunted with stipled leaves which ultimately dry up and results in heavy yield loss. Upadhyay and Vyas (1983) reported losses of 21.97 and 22.54 per cent during *kharif* and summer seasons, respectively systemic insecticides such as dimethoate 0.03 per cent, monocrotophos 0.05 per cent and phosphamidon 0.03 per cent were recommended for effective control of this pest (Amin, 1984 and Anonymous 1986), but information on relative toxicity of different insecticides is very scanty. Therefore, an attempt is made to determine the toxicity of some selected insecticides against this pest.

Relative toxicity of six insecticides (Table 1) was determined against the adults of this pest. Six graded concentrations of each insecticide (0.02, 0.01, 0.005, 0.0025, 0.00125 and 0.0006 per cent for dimethoate and phosphamidon; 0.04, 0.02, 0.01, 0.005, 0.0025 and 0.00125 per cent for monocrotophos, endosulfan and quinalphos and 0.01, 0.005, 0.0025, 0.00125, 0.0006 and 0.0003 per cent for fenvalerate) were prepared in distilled water from the commercial formulations. Individual concentration was applied @ 4 ml per 20 days old potted groundnut plant with the help of Potter's spraying tower. A constant pressure of 1 kg/cm^2 was maintained during spraying. After treatment, potted plants were kept under an electric fan for about 15 minutes to dry the film of insecticides. The plants were then covered with glass *Chimaney*. Ten laboratory reared adults of 24 hours old were transferred on the plant with the help of a glass aspirator and the pots were kept at a constant temperature (25 ± 1°C). There were three replications for each concentration along with a control (no treatment).

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TABLE 1

Relative toxicity of different insecticides against adult of *C. indicus*.

Sr. No.	*Insecticides*	*Heterogeneity*	*Regression equation*	*LC_{50} values*	*Fiducial limits*	*Relative toxicity*
1.	Dimethoate	*X^2 (4) = 1.0949	Y = 1.4510 + 2.4980X	0.002691	+ 0.0123 − 0.0038	0.9887
2.	Endosulfan	X^2 (4) = 0.4526	Y = 1.5740 + 1.8620X	0.007762	+ 0.0416 − 0.0001	0.3427
3.	Fenvalerate	X^2 (4) = 0.3087	Y = 2.3000 + 2.0272X	0.002344	+ 0.0101 − 0.0044	1.1351
4.	Monocrotophos	X^2 (4) = 0.5433	Y = 0.9532 + 2.2145X	0.005880	+ 0.0046 − 0.0014	0.4581
5.	Phosphamidon	X^2 (4) = 0.8858	Y = 2.3629 + 1.8828X	0.002661	+ 0.0085 − 0.0008	1.0000
6.	Quinalphos	X^2 (4) = 4.2409	Y = 2.6571 + 1.7028X	0.002600	+ 0.0033 − 0.0014	1.0233

* In none of the cases the data were found to be heterogeneous at p = 0.05

Y = Probit kill X = Log (concentration X 10^4)

LC_{50} = Concentration calculated to give 50 per cent mortality.

For the assessment of toxic effect of the inseticides, mortality counts were taken 48 hours after the treatment. The per cent mortality was corrected by Abbott's formula (Abbott, 1925) and then subjected to probit analysis (Finney, 1978). The values of relative toxicity of different insecticides have been calculated by taking the LC_{50} value of phosphamidon as unity and given in Table 1.

It is evident from (Table 1) that fenvalerate, a synthetic pyrethroid proved to be the most toxic and effective insecticide (LC_{50} = 0.002344) and was 1.135 times as toxic as phosphamidon. On the other hand endosulfan found to be the least toxic (LC_{50} = 0.007762). On the basis of LC_{50} values, the order of toxicity of these insecticides against the adults of *C. indicus* was : fenvalerate > monocrotphos > endosulfan. Among the six insecticides fenvalerate and quinalphos were found to be more toxic than phosphamidon, being about 1.135 and 1.023 times as toxic as phosphamidon, respectively, whereas dimethoate, monocrotophos and endosulfan proved less toxic and were respectively about 0.983, 0.452 and 0.343 times as toxic as phosphamidon. Gargav and Vaishampayan (1981) tested certain organophosphate and chlorinated hydrocarbon insecticides against this pest and compared their toxicity with DDT. They reported that dimethoate was slightly more toxic than DDT, but information on relative toxicity of newer insecticide and against this pest on groundnut is scanty.

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