

RELATIVE TOXICITY OF INSECTICIDES TO ADULTS OF *MICROBRACON BREVICORNIS* (WESMAEL) (BRACONIDAE)*

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Knowledge on the relative toxicity of various insecticides to the natural enemies of insect pests is a pre-requisite for the effective integration of chemical and biological pressures applied against such pests. Very little work has been done on this aspect in India, the only work of its kind being that of Nirula *et al* (1958). *Trichospilus pupivora* Ferr., (Eulophidae), *Microbracon brevicornis* Wesmael (Braconidae) and *Perisierola nephantidis* Meus., (Bethyidae) are the three species of parasites employed for the biological control of *Nephantis serinopa* Meyr., the coconut cathrpillar. The present contribution reports the results of studies conducted to determine the relative toxicity of different insecticides to adults of *M. brevicornis*.

Fourteen insecticides (Table 1) were used in the present investigations. Each insecticide was used in 5 graded concentrations. The toxicity of the insecticides to the parasite was determined by exposing the adult parasites to films of the different concentrations of each insecticide deposited in petri-dishes and finding out the dosage-mortality relationship between the parasite and each insecticide, after 24 hours of exposure to the films.

Material and Methods

Technical grades of insecticides were used wherever possible, proprietary formulations being used otherwise. The technical materials were dissolved in benzene and emulsified with triton x 100, keeping the contents of benzene and the emulsifier in the emulsions at 5 and 0.625 per cent respectively. The insecticide films were prepared by spraying petri-dishes with 1 ml of each of the emulsion under a Potter's tower and permitting them to dry. The side rims of the petri-dishes were pasted with black paper on their outer sides and the dishes kept inverted on a blackened glass plate. The parasites were then introduced into these dishes after about 30-40 minutes of spraying. Since the petri-dish base carrying the insecticidal film was against the light, the positively phototropic parasite adults rested and moved about on this surface ensuring contact with the insecticide. Mortality counts were taken at the end of 24 hours of contact. All the experiments were done in the laboratory at 27° to 31°C and 86 to 90 per cent relative humidity.

Results and Discussion

The results (Table 1) show that parathion is the most toxic and dichlorvos the least toxic. Dichlorvos does not show

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any mortality among the parasites even at a concentration of 0.05 per cent. This is followed by DDT, endosulfan sevin, BHC, trichlorphon, carbophenothion, diazinon, lindane, endrin, malathion, imidan and phosphamidon in the ascending scale of toxicity. Column 4 in table I gives the relative toxicity of the insecticides as compared with that of DDT, which is taken as one. All the insecticides excepting dichlorvos are more toxic than

DDT. Parathion appears to be the most highly toxic, being 1740 times as toxic as DDT. This is closely followed by phosphamidon which is 1733 times as toxic as DDT. This is followed in the descending order by imidan, malathion, endrin, lindane, diazinon, carbophenothion, trichlorphon, BHC, sevin and endosulfan, they being 1135, 501.0, 127.6, 47.50, 46.18, 27.99, 17.96, 10.76, 8.98 and 1.823 times as toxic as DDT, respectively.

Table 1

Toxicity of different insecticides to *Microbracon brevicornis*

Insecticide	LD 50 Percentage concentration	Fiducial limite of LD 50	Relative toxicity (LD 50 of DDT = 1)
Parathion	0.0001924	0.0001900 0.0001948	1740
*Phosphamidon	0.0001932	0.0001932 0.0001932	1733
*Imidan	0.0002949	0.0002920 0.0002979	1135
Malathion	0.000668	0.0006259 0.0007131	501
Endrin	0.002624	0.002615 0.002637	127.6
Lindane	0.007047	0.007034 0.007076	47.5
*Diazinon	0.007249	0.007034 0.007543	46.18
*Carbophenothion	0.01196	0.01187 0.01204	27.99
*Trichlorphon	0.01864	0.01293 0.02685	17.96
BHC	0.03111	0.03102 0.03119	10.76

Insecticide	LD 50 Percentage Concentration	Fiducial limits of LD 50	Relative toxicity (LD 50 of DDT \approx 1)
Sevin	0.03856	0.03833 0.03877	8.68
Endosulfan	0.1837	0.1810 0.1864	1.823
DDT	0.3248	0.3301 0.3403	1.000
*Dichlorvos	As high a concentration as 0.05% emulsion gave no mortality. Hence no further tests were carried out.		

*Proprietary formulations

Note:— In all the cases the data were not significantly heterogenous (excepting in the case of malathion and parathion) at $p=0.05$.

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Reference

Nirula, K. K., Antony J. Sahasranaman K.N. and Menon K. P. V, 1958. Retentive

toxicity of the field-weathered insecticides to the Eulophid parasite, *Trichospilus pupivora*, associated with *Nephantis serinopa*. *Indian Coconut. J.* 11 (4) • 124—132

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