

SUSCEPTIBILITY OF LARVAL STAGES OF *EPILACHNA VIGINTIOCTOPUNCTATA* FABRICIUS TO INSECTICIDES

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Epilachna vigintioctopunctata is a serious pest of various solanaceous and cucurbitaceous crops. The grubs of this beetle, being more persistent on the crops, are more destructive than their adults. Much information is available on the effect of insecticides on the grubs. (Sengupta and Panda 1958, Shi and Satpathy 1960, Shi et al 1960 Jotwani et al 1962). It is well known that insects exhibit stage specificity in their susceptibility to toxic action of insecticides (Mukerjee 1953, Pradhan and Bindra 1953 & 1957). There is, however, no information on the relative susceptibility of larval instars of *E. vigintioctopunctata* to insecticides. Hence the present studies were undertaken the results of which are represented below.

For these studies, log concentration probit mortality relations between each instar of the grub and different insecticides were worked out. The insecticides used were DDT, BHC, parathion, mala-

thion and sevin the spray formulations of which were prepared from their technical products using benzene as the solvent and Triton X 100 as the emulsifier. Sevin was, however, used as suspension prepared from a proprietary water wettable powder. The different stages of the grub required for the studies were reared out in the laboratory on bitter gourd leaf. Precision sprayings were made with a Potter's Spraying Tower. The grubs were sprayed directly with the insecticides and supplied with fresh leaves.

Results

The ld_{50} lines for the different instars of the grub and for the different insecticides for mortalities observed at two occasions, namely, 24 hours and 48 hours after treatment, are represented in Figures 1 to 10.

The relative susceptibility of the instars of the grub to the different insecticides under test is summarised below:-

Insecticides	Order of susceptibility of instars	
	at 24 hours	at 48 hours
DDT	III > I > II	III > II > I
BHC	II > I > III	II > III > I
Parathion	I > II = III	I > II > III
Malathion	III > I > II	III > II > I
Sevin	I > II = III	I > II - III

It will be seen that the different instars of the grub show varying susceptibilities to the same insecticide. Further, the order of susceptibility of the three instars is not identical for the different insecticides and it varies. It is also seen that the susceptibility of the different instars to the same insecticide varies at the different intervals after application of the insecticides. Thus, to DDT and malathion the third instar stage of the grub is the most susceptible while to BHC it is the second instar and to parathion and sevin the first instar which is the most susceptible. It is interesting to note that it is the first instar grub which is the most resistant to the action of DDT and BHC. Definite correlation between the susceptibility to toxic action of the insecticide and the progressive instars of the insect is observed in the case of DDT and parathion (at 48 hours), this being positive in the case of parathion and negative in the case of DDT. The variations in the order of susceptibility observed at the different intervals after treatment may perhaps be due to the relative capacity of the different instars in eliminating the absorbed insecticides.

Since the different stages of the grub show varying susceptibilities to the insecticides with no regularity or sequence the overall susceptibility of the grub stage of the beetle taking into consideration its stage specificity has been found out statistically. Analysis of variance of the whole data shows that there exists significant difference (at 5% level) between the toxicities of the different insecticides to the grubs and that the five insecticides can be ranked as below in their descending order of toxic action.

Sevin-Parathion-Malathion - BHC DDT.

Thus in overall action against all the stages of the grub sevin is the most highly toxic followed by parathion, malathion, BHC and DDT.

Summary

The relative susceptibility of the three larval instars of *E. vigintioctopunctata* to the toxic action of DDT, BHC, parathion, malathion and sevin has been determined. In overall toxicity to the grub stage as a whole sevin ranks the highest followed by parathion, malathion, BHC and DDT.

Acknowledgment

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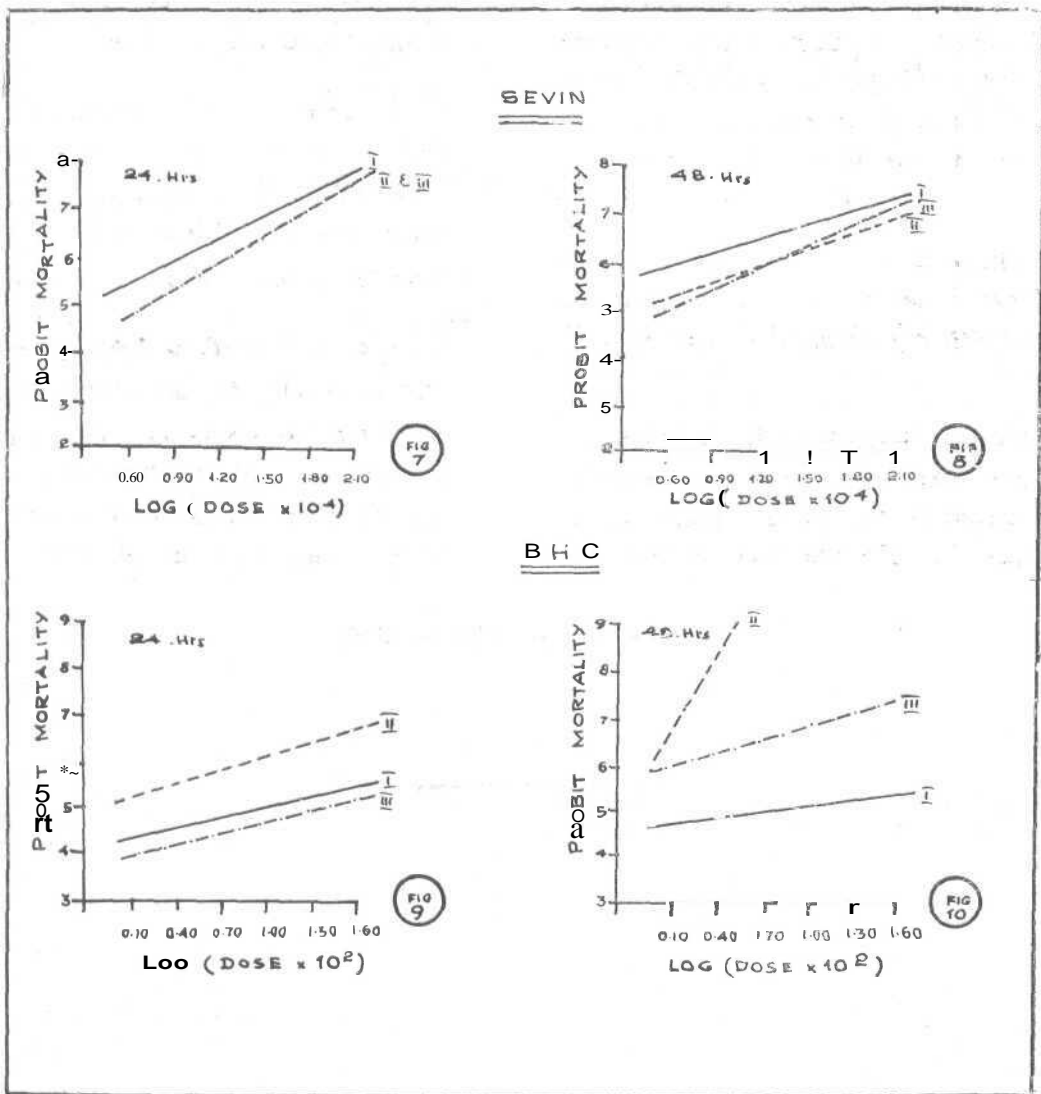
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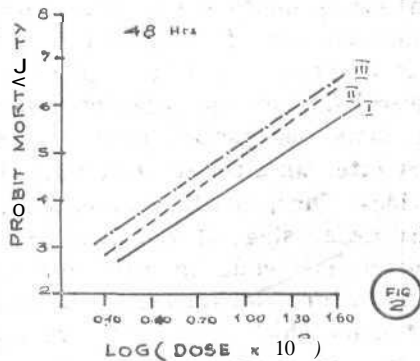
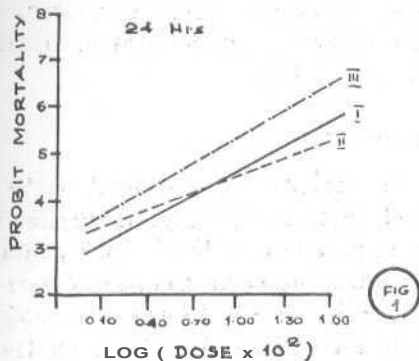
SUSCEPTIBILITY OF EPILACHNA LARVAE TO INSECTICIDES



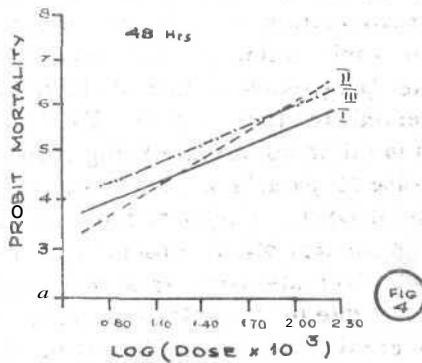
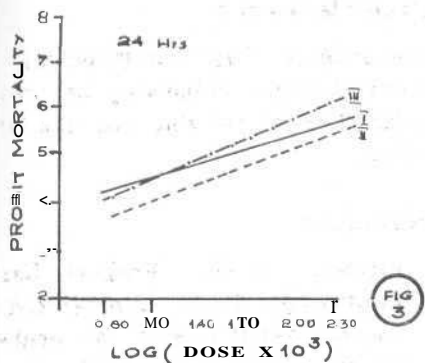
Figs 1 to 10. Log dose-probit mortality relations between different insecticides and the three instars of the larva of *Epilachna vigintioctopunctata*.

SUSCEPTIBILITY OF EPILACHNA LARVAE TO INSECTICIDES

DDT



MALATHION



PARATHION

