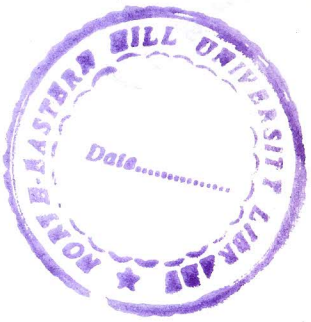
STUDIES ON SOME ASPECTS OF INSECT – PLANT INTERACTIONS



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AN ABSTRACT OF THE THESIS

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ABSTRACT

Since the collapse of synthetic compounds in combating and controlling insect pests, there is an urgency to explore other source of insecticides from the plant world. With the advent of Integrated Pest Management, insecticides from botanical sources have also found a major role to play. Although many plant families are rich in such insecticidal sources, somehow their applications in Integrated Pest Management have been largely restricted due to many technical reasons; one may be due to the cost involved in synthesis and production of such compounds in large scale. So the alternatives are either in the form of crude extracts or semi purified forms. The North Eastern Region is rich in flora and fauna, and the human population still depends largely on rice cultivation and production as their livelihood.

The immediate problem is to control the insect pests of rice in the field. One such insect pest is the small rice grasshopper, *Oxya hyla*, which is emerging as a major pest of rice in this region and in adjacent countries.

With this view in mind, the present investigation was undertaken. Common plants namely, *Ageratum conyzoides*, *Artemisia nilagarica*, *Eupatorium adenophorum*, *Eupatorium riparium* and *Lantana camara* were chosen for source of crude extracts for assaying their insecticidal activity against the small rice grasshopper, with the aim of controlling the pest at any stage of its life cycle.

Out of the five plants assayed only *Ageratum conyzoides* has been observed to show more positive results against this pest in comparison to other plants tested. The extracts of this plant apart from disrupting behaviour, feeding and molting in the nymphs and adults, also disrupt normal digestive physiology and affect the histology

of the gastrointestinal epithelial cells of the insects. The extracts also show some inhibition in amylase activity. Another observation is that, the testicular cell cycle is also affected, where some stages like Diplotene of Prophase I, Metaphase I, Metaphase II and Telophase stages are arrested.

Closely monitored experiments in laboratory conditions show that various indices like consumption, growth and conversion efficiencies, etc were affected when specific stages were fed on host leaves *Oryza sativa*, treated with extracts of *A. conyzoides,* and also with the active compounds of *A. conyzoides,* Precocene I and II.

In field experiments where rice plots were sprayed by extracts of *A. conyzoides*, it was observed that the attack by *O. hyla* was lesser than in control plots, thereby leading to higher yield.

Being crude extracts, either in methanol or aqueous, the possible field application of such extracts in controlling the invasion of *O. hyla* in paddy fields during the growing season may be largely controlled. Thereby, paving the way for safer, cheaper, more ecofriendly and biodegradable insecticides from plants source, which may not induce resistance in insects.