

Efficacy of Entomogenous Fungi and Botanical insecticides against the Mango leafhopper, *Amritodus atkinsoni* Lethierry*

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Srivastava and Tandon (1986) during the course of survey for natural enemies of major insect pests of mango at Lucknow, found two entomogenous fungi i.e. *Verticillium lecanii* Zimm. and *Beauveria bassiana* (Bals.) Vuill parasitising the mango leafhopper, *Idioscopus clypealis* Lethierry. Kumar *et al.* (1983) recorded an entomogenous fungi, *Isaria tax* parasitising *I. clypealis*. Nirvan and Upadhyaya (1976), reported *V. lecanii* to be pathogenic to *Amritodus atkinsoni* Lethierry. In the present investigations, *B. bassiana* and *V. lecanii* and some botanical insecticides were evaluated for the control of *A. atkinsoni* in a field cage experiment on a Mango (Neelum) tree.

V. lecanii and *B. bassiana* were grown for 10 days on Sabouraud's dextrose agar enriched with 1% yeast extract. A spore concentration of 10^9 spores ml^{-1} was standardised with the help of an improved Neubauer haemocytometer. Neem oil was emulsified by the addition of Teepol 0.1% and the concentration adjusted to 2.5%. The other botanicals were neem cake and *Anona* seed extracts tested at 5% concentration. Neem seed kernels were powdered separately and extracted in water by soaking overnight and filtered through a muslin. Leaves of *Vitex negundo* were macerated with a little water in a pestle and mortar and filtered through a muslin. Teepol was added at 0.1% as a surfactant to all the treatments. Carbaryl 0.1% was included as an insecticide check. Water spray

was included as a control. The different treatments were sprayed on the inflorescence of 8 year old Neelum mango tree and covered with mylar film cages having muslin covered windows for ventilation. Twenty nymphs of *A. atkinsoni* were released in each cage before treatment. The treatments were randomised on the tree and replicated thrice. Observations on the nymphal population before treatment and on the 5th and 7th days after treatment were made.

The data on the seventh day of treatment indicated that both *V. lecanii* and *B. bassiana* were ineffective against *A. atkinsoni* producing only 6.7 and 5.9% nymphal mortality (Table 1). Among the botanical insecticides, neem oil 2.5% was significantly superior to others with a mortality of 32.7% while all other botanicals recorded 15.9 to 24.1% mortality indicating their ineffectiveness. Though Puttarudriah and Lakshminarayana Bhatta (1955) had reported the insecticidal activity of water extracts of *Anona* seeds against the mango leafhopper, in the present study it gave only 24.1% mortality of the hoppers. Carbaryl 0.1% recorded 52.3% mortality. *V. lecanii* and *B. bassiana* were also not effective in producing the desired kill of the leafhoppers, inspite of these two fungi being found parasitising the mango leafhoppers under natural conditions (Srivastava and Tandon, 1986). Fungal pathogens require very high humidities for infection and the use of these organisms might be effective only under such

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Table 1. Effect of botanical and fungal insecticides on the mango hopper (*A.atkinsoni*) on Neelum mango tree

Treatment	Mortality of nymphs (%)*	
	5 days after treatment	7
Neem oil 2.5%	17.5 ^{bc}	32.7 ^b
<i>Anona</i> seed extract 5%	21.4 ^b	24.1 ^c
Neem seed kernel extract 5%	13.9 ^{bed}	22.0 ^c
Neem cake extract 5%	7.1 ^{de}	15.9 ^c
<i>V. negundo</i> leaf extract 5%	17.1 ^{bc}	23.3 ^c
Fish oil rosin soap 5%	12.5 ^{cde}	22.7 ^c
<i>V. negundo</i> 10 ⁹ spores/ml	6.1 ^{de}	6.7 ^d
<i>B. bassiana</i> 10 ⁹ spores/ml	6.1 ^{de}	5.9 ^d
Carbaryl 0.1%	50.0 ^a	52.3 ^a
Untreated (Water spray)	5.0 ^e	5.4 ^d

In a column, means followed by similar letters are not significantly different at 5% level by DMRT

favourable conditions. During the experimental period, the maximum temperature and morning relative humidity ranged from 28 to 30.5°C and 86-93 per cent respectively.

Research should be focussed on identification of effective pest suppression strategies that would be ecologically non disruptive. It would be worthwhile developing effective biocontrol agents for the management of the mango leafhoppers.

KEY WORDS : *Amritodus atkinsoni*,
Verticillium lecanii, *Beauveria*
bassiana, botanicals

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