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Survey on The Natural Occurrence of Entomopathogenic Fungi on Lepidopteran Pests in Chittoor District of Andhra Pradesh

Key words : *Beauveria bassiana,* Entomopathogenic fungi, *Nomuraea rileyi, Spodoptera litura.*

Biological control plays an important role in Integrated Pest Management. Biological control of insects with entomopathogens including viruses, bacteria, fungi and nematodes are ideal candidates for incorporation into IPM strategies due to their specificity and minimal effects on natural enemies. Entomopathogens induces epizootics in several lepidopteran larvae throughout the world. In India, natural occurrence of *N. rileyi* has been recorded on many insect pests like *Helicoverpa armigera* Hubner, *Spodoptera litura* Fabricius, (Vimala Devi & Prasad, 1997), *H. armigera* (Manjula et al 2003), *Chrysodeixis acuta* (Gupta 2003) and *Beauveria bassiana* on *Cnaphalocrocis medinalis* (Alice et al 2003).

The present investigations were carried out on the natural occurrence of Entomopathogenic fungi in Chittoor District of Andhra Pradesh.

Roving survey for the natural occurrence of entomopathogenic fungi viz., *Beauveria bassiana, Metarhizium anisopliae, Nomuraea rileyi* etc., on lepidopteran caterpillars like S*podoptera litura* Fabricius*, Helicoverpa armigera* Hubner was carried out in twenty four villages covering three Agricultural divisions of Chittoor district from October 2009 to March 2010 at fortnight intervals. Major crops grown in the district like groundnut, cowpea, green gram, field bean, castor, vegetables were examined for the fungal infected larvae. Weather parameters like maximum, minimum temperatures, morning and evening relative humidity were recorded during the period of survey for identifying favourable factors .

The survey revealed that there were no mummified cadavers of lepidopteran larvae like S. litura and H. armigera in all the crops observed between October and December,2009.

Two types of fungal infected mummified *S. litura* cadavers were observed during I & II fortnights of January 2010 in groundnut fields located in Nacchaneru and Yerpedu villages of Srikalahasthi division. Cadavers were found covered with light green powdery material throughout the body except head capsule. These mummified larvae were noticed on groundnut leaves where, they were firmly attached to the leaf with the help of prolegs. A few cadavers with whitish mycelium were also noticed in groundnut fields of Yerpedu. These two types of cadavers were collected in to the fresh sterile polythene bags separately with the help of brush and brought to the laboratory and kept in sterilized Petri plates on moistened filter paper for further development of fungus.

The fungi from the two types of cadavers collected from the ground nut fields were inoculated separately on to Saboraud's maltose agar with yeast extract (SMAY) in petri plates and slants, incubated at 25^{0}C for 10 to 15 days. Microscopic examination of milky white fungal mass revealed, branched conidiophores arising from vegetative hyphae bearing a group of clustered conidiogenous cells. Conidia were born on the thread like apex of the phialide on a series of zigzag branchlets. These morphological characters indicate that the fungus was *Beauveria bassiana* (plate 1 & 2). In malachite green colour sporulation, conidiophores were seen bearing dense whorls of branches and phialides which were short necked. Conidia were broadly ellipsoid confirming the fungus, *Nomuraea rileyi* (plate 3 & 4).

The incidence of mycosis in only groundnut crop was probably due to the dense canopy which smothers the ground and maintains favorable microclimate in crop ecosystem. Occurrence of *S.litura* during *Rabi* (December to March) as major pest of groundnut may be one of the reasons. Moreover, *S.litura* is relatively more susceptible to entomopathogenic fungi as the larvae hide in soil during day time which makes it more prone to come in contact with the entomopathogenic fungal spores present in the soil may cause epizootics.

The average maximum, minimum temperatures and relative humidity recorded in Srikalahasti division during occurrence of both the entomopathogens were 24.0^{o}C, 18.5^{o}C and 82% respectively. These finds were supported by

Plate 1: Vegetative growth of *B. bassiana* on SMAY

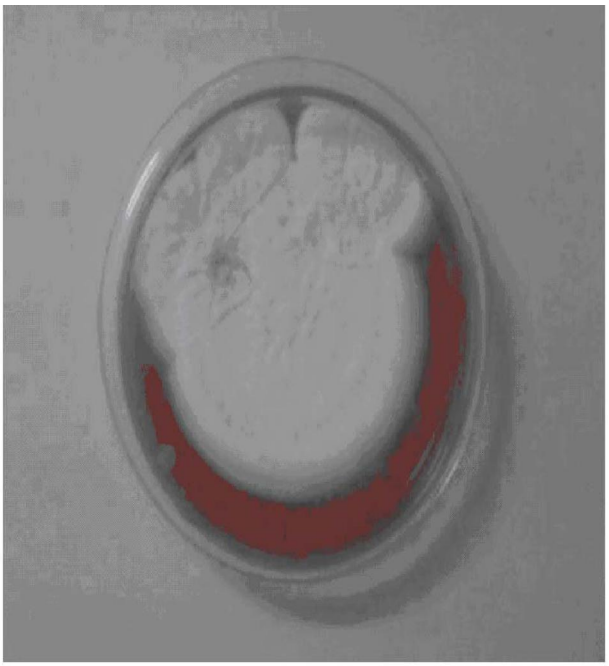


Plate 2: Condidiophores and conidia of *B. bassiana*

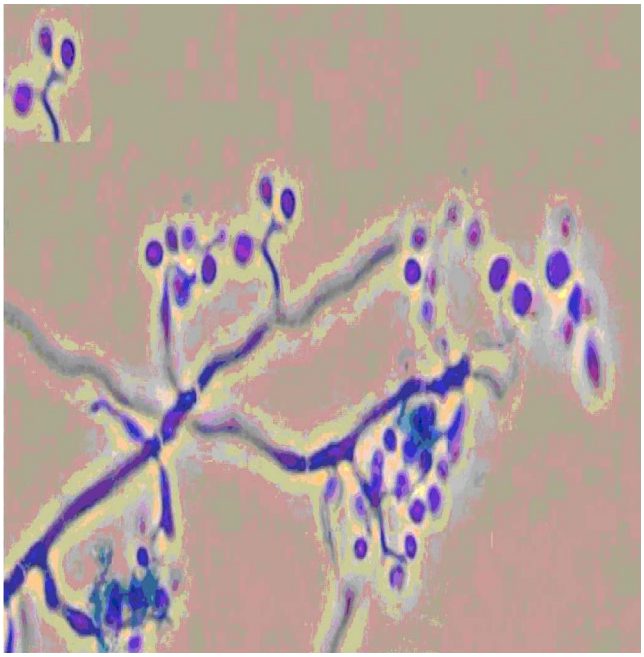
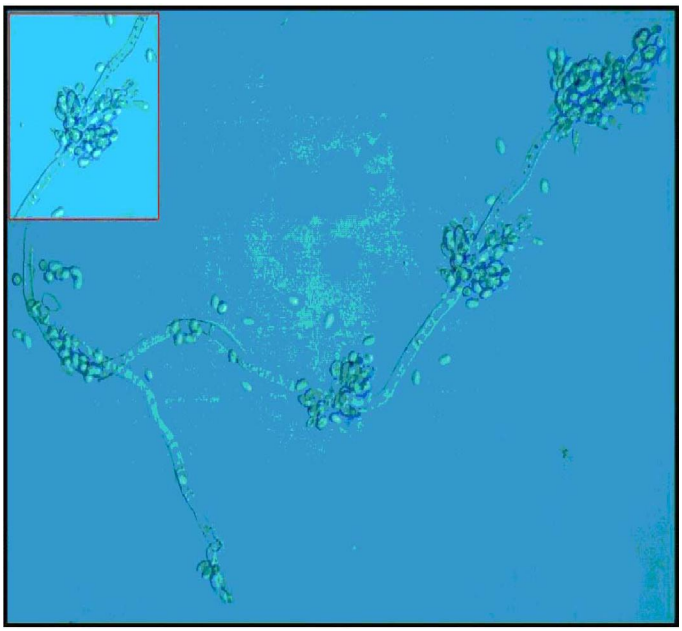


Plate 3: N. rileyi culture on SMAY in slants (Light green mass is the sporulation)

Plate 4: Conidiophores and conidia of *N. rileyi*



Vimaladevi *et al.* 1996 and Veena Kumari *et al.* 2006 as they have reported that 21-27°C maximum temperatures and 70-92% relative humidity were congenial for buildup of *N. rileyi* and *B. bassiana*

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