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A Comparative Laboratory Evaluation of Efficacy of Two Fungi: Beauveria bassiana and Acremonium perscinum, on Dichomeris eridantis Meyrick (Lepidoptera: Gelechiidae) Larvae, an Important Pest of Dalbergia sissoo

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Abstract : Dalbergia sissoo Roxb., (Family- Leguminosae; Subfamily- Papilionoideae), is an economically and ecologically important tree species having medicinal value. Of the rich complex of insect fauna, ten have been recognized as potential pests of nurseries and plantations. Present study was conducted to explore an effective ecofriendly control of Dichomeris eridantis Meyrick, an important defoliator pest of D. sissoo. Health and environmental concerns demanded devising a bio-intensive pest management strategy and employing ecofriendly measures. In the present laboratory bioassay two entomopathogenic fungi Acremonium perscinum and Beauveria bassiana were tested and compared for evaluating the efficacy of their seven different concentrations (besides control) against the 3rd, 4th and 5th instar larvae of D. eridantis, on the basis of mean percent mortality data recorded and tabulated for seven days after treatment application. Analysis showed that both treatments vary significantly among themselves. Also, variations amongst instars and duration with respect to their mortality were highly significant ($p < .001$). All their interactions were found to vary significantly. B. bassiana at 0.25x107 spores / ml spore concentration caused maximum mean percent mortality (62.38%) followed by mean percent mortality at its 0.25x106 spores / ml concentration (56.67%). Mean percent mortality at maximum spore concentration (0.054x107 spores / ml) and next highest spore concentration (0.054 x106 spores / ml) due to A. perscinum treatment were far less effective (mean percent mortality of 45.40% and 31.29%, respectively). At 168 hours mean percent mortality of larval instars due to both fungal treatment applications reached its maximum (52.99%) whereas, at 24 hours mean percent mortality remained least (5.70%). In both cases, treatments were most effective against 3rd instar larvae and least effective against 5th instar larvae. A comparative acccount of efficacy of B. bassiana and A. perscinum on the 3rd, 4th and 5th instar larvae of D. eridantis on 5th, 6th and 7th post treatment observation days after their application, on the basis of their median lethal concentrations (LC50) proved B. bassiana to be more potential microbial pathogen of the two fungal microbes, for all the three instars (3rd, 4th and 5th) of D. eridantis, on all the three days (5th, 6th and 7th post observation days after application of both treatments). Percent mortality of D. eridantis increased in a dose dependent manner. Koch's Postulates tested positive, thus confirming the pathogenicity of B. bassiana against the larval instars of D. eridantis. LC90 values of 0.280x1011 spores/ml, 0.301x108 spores/ml and 0.262x108 spores/ml concentrations of B. bassiana were standardized which can effectively cause mortality of all the larval instars of D. eridantis in the field after 5th, 6th and 7th day of their application, respectively. Therefore, these concentrations can be safely used in nurseries as well as plantations of D. sissoo for effective control of D. eridantis larvae.

Keywords : Acremonium perscinum, Beauveria bassiana, Dalbergia sissoo, Dichomeris eridantis
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