Assessment of Diversity of Entomopathogenic Fungi Associated with Cabbage Caterpillars

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Biological control is a trending solution for insect pest control around the world. Use of entomopathogens as a biological control agent is recognized as a promising strategy. In Sri Lanka, research on entomopathogens is scant. Therefore, this research study was planned with the objective of identifying and determining the bio-efficacy of entomopathogenic fungal species associated with cabbage caterpillars. In order to fulfill this requirement a survey of cabbage ecosystems and a series of laboratory experiments were conducted. During the survey, *Metarhizium* sp. was identified in a sample collected from an ecological farm at Bandarawela as a potential biological control agent for cabbage caterpillars. The performance of the fungal species was evaluated by conducting a bioassay using cabbage cluster caterpillar (*Crocidolomia pavonana* (F.)). A pure culture of *Metarhizium* sp. was obtained and the fungal inoculum was prepared from spores harvested from two week old cultures. As treatments, three different concentrations of spore suspension; 1×10^2, 1×10^4, 1×10^6 spores/mL, and distilled water was used as a control. Five healthy second-instar larvae were used, each with four replicates. Direct spraying method and leaf dip method were used as application methods. In both application methods, all the spore concentrations gave significantly ($P<0.05$) higher mortality than the control. In direct spraying method, the spore concentration of 1×10^6 spores/mL produced 50% mean mortality, while lower concentrations produced lower mortality (20%). In the leaf dip method, a similar mortality trend was observed. The spore concentration of 1×10^6 spores/mL produced 65% mean mortality, while the lower spore concentrations produced 20% mortality. *Metarhizium* sp. significantly ($P<0.05$) reduced larval growth and the durations of larval instars and pupal stage. The research outcomes indicate that the entomopathogenic fungus *Metarhizium* sp. was pathogenic to cabbage caterpillars and has the potential to develop as a microbial pesticide.

Keywords: Bioassay, Cabbage caterpillars, Entomopathogens, *Metarhizium* sp., Mortality

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