

EVALUATION OF ENTOMOPATHOGENIC FUNGI IN BIOCONTROL OF SMALL HIVE BEETLE (*Aethina tumida*)

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Small hive beetle (SHB) is considered a scavenger and parasite of honey bees and their colonies especially outside of its native habitats. SHB larvae consume honeybee eggs, brood, pollen, and honey, causing highest destruction. When colonies are highly infected, bees abandon the colony, leaving the honey and their brood behind. To control the SHB, usage of chemical pesticide is very common. But emergence of pesticide resistance varieties, effect on those chemical to the bees and human health lead to investigate other methods of control for SHB. Therefore, there is a positive trend to investigate eco-friendly biological control methods. SHB has been recorded very recently in Kegalle, Sri Lanka, and there is a need to investigate a good biological controlling method to control SHB in Sri Lankan context. Therefore, this research aim is to evaluate fungi species as potential entomopathogenic fungi for the beetle as potential biological control agents. Several fungal species were isolated and tested on the adult SHB and their larval stages. Entomopathogenic fungi species were isolated using two methods: 1. insect bait method to isolate soil fungi using greater wax moth larvae as the bait and 2. Natural insect cadavers with visible mycosis. In the bait method to prevent excessive webbing larvae were heat treated and placed on soil. Visibly mycosis larvae cadavers and collected natural insect cadavers were placed on PDA containing amoxicillin. Isolated fungi were tested with adult and larval SHB. Treatment groups were tested with 10^8 spore solution that adjusted using hemocytometer and the control group was tested with distilled water. Fungal species 1 and 2 had shown 100% mortality in adult SBH in eight days. All the five fungal species had shown mortality in wandering larvae of SBH thus four isolated fungal species had shown 100% mortality in that species 1 and 2 showed 100% mortality from 48 hours. To control the larvae and adult SBH fungal species 1 and 2 are promising but need further investigation in field trials and effect on non-target organisms. This research contributes valuable insights into the biocontrol potential of entomopathogenic fungi against SBH, highlighting the importance of native strains used as biological control agents.

Keywords: *Honeybees, Invasive species, Pest management, Natural pathogenic agents*