Mosquito larvicidal toxin production of *Hirsutella thompsonii* in different broth mediums and incubation times

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Mosquito control is a major priority to minimise the infections and transmission of mosquito-borne diseases in the tropical region including Sri Lanka. Increased public concern regarding the potential adverse environmental effects of chemical insecticides has prompted the search of alternative methods for mosquito control. Biological control has been considered as an alternative to conventional chemical control methods as a means of mosquito control. Acaricidal activity of *Hirsutella thompsonii* have been previously reported against coconut and citrus mites and considered as promising biological control agent. Our recent studies have indicated that Sri Lankan isolates of *H. thompsonii* exhibited an effective mosquito larvicidal activity against laboratory reared *Anopheles tessellatus, Aedes aegypti and Culex quinquefasciatus*. The objective of the present study is to investigate the different liquid culture mediums and incubation times on production of mosquito larvicidal activity of *H. thompsonii*.

A suspension of infected mites was prepared, pour plated and incubated to obtain discrete colonies of *H. thompsonii*. Fungal colonies were identified by phase contrast microscope by examining the mycelia and conidiophores. *H. thompsonii* was grown in broth mediums, Czapek-Dox broth (CZ) and Glucose-Yeast extract (GY) at different incubation times of 7, 11 and 15 days to obtain crude broth extract, mycelium and spores. Mosquito larvicidal bioassay for *Cx. quinquefasciatus* followed the WHO standard protocol and LC_{50} values were obtained by probit analysis using SPSS software package.

The mycelia, crude broth and spore amount production by *H. thompsonii* in GY and CZ culture media differed significantly and were depend on the incubation time. Mosquito larvicidal activity also varied with the culture medium and the incubation time. *Hirsutella thompsonii* gained its highest yield of spores, mycelium and the crude broth in CZ medium after 11 days shaking at 26 °C. The highest larvicidal activity against *Cx. quinquefasciatus* has been shown in CZ medium for crude broth (LC_{50} = 35.347 ppm) and mycelium (LC_{50} = 81.110 ppm) after 11 days shaking. For spores the highest

larvicidal activity against *Cx. quinquefasciatus* (LC_{50} = 9.76 x 10^2 spores/mL) has been shown in GY medium.

This study indicated that Sri Lankan isolate of *H. thompsonii* exhibited mosquito larvicidal properties and highest production of toxins was achieved in CZ medium after 11 days incubation time.

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