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Project Title: Larvicidal activity of mushroom extracts against *Aedes aegypti*, *Culex quinquefasciatus* and *Anopheles minimus* mosquito vectors

Investigator: Asst. Prof. Dr. Damrongpan Thongwat [Naresuan University]
Assoc. Prof. Dr. Pradya Somboon [Chiang Mai University]

E-mail Address: damrongpanth@nu.ac.th

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Abstract

Because the adverse effects from using synthetic insecticides to control mosquito have been widely reported, bio-materials from living organisms have been considered as an alternative tool for vector control strategy. For over 50 years, biological control of mosquito larvae has mainly scoped on plants, fish, bacteria, protozoa, filamentous fungi, viruses or nematodes. In this study, we reported a mosquito larvicide from an under researched organism, mushroom. 143 mushroom samples (44 confirmed species) of Thailand were screened for their larvicidal activity. 1%w/v aqueous extract of each mushroom sample was tested against the 3rd stage *Ae. aegypti* larvae. From the screening result, 4 identified mushroom species including *Thaeogyroporus porentosus*, *Xylaria nigripes*, *Chlorophyllum* sp., *Steccherinum* sp., and 2 unidentified species were found for the promising activities ranging from 10 - 70% and 18 - 90% larval mortality rates for 24- and 48-hour exposure times, respectively. After that, the *Steccherinum* mushroom was selected for an intensively bioassay against *Ae. aegypti*, *Culex quinquefasciatus* and *Anopheles minimus* larvae following the standard protocol of WHO. An aqueous, hexane and ethanolic crude extracts of *Steccherinum* were prepared in various concentrations up to 1,000 ppm. For *Ae. aegypti* bioassay, after 48-hour post exposure, the aqueous extract did not show any larvicidal activity, while the ethanolic showed superior activity than the hexane with the 24-hour LC₅₀ and LC₉₀ values of 203.30 and 412.72 ppm, respectively. For *Cx. quinquefasciatus* and *An. minimus* testing, the same activities that the 48-hour showed higher activity than the 24-hour for both the LC₅₀ and LC₉₀ values were also found. From the finding, we firstly reported the mosquito larvicidal potential from the extracts of Thai mushrooms, especially for *Steccherinum* sp.

Keywords: *Aedes aegypti*, *Culex quinquefasciatus*, *Anopheles minimus*, *Steccherinum*, mushroom