

Larvicidal efficacy of local plant species for the development of potential larvicidal agents against *Aedes aegypti* L.

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Abstract

Mosquitoes transmit serious human diseases causing millions of deaths every year. The use of synthetic insecticides to control vector mosquitoes has caused physiological resistance and adverse environmental effects in addition to high operational costs. Insecticides of plant origin have been reported as useful for the control of mosquitoes. Therefore, a study was conducted to identify the local plant species for the development of larvicides against the *Ae. aegypti* mosquito. Crude extracts of 32 plant species collected from the Gampaha district were pre-screened for larvicidal susceptibility assay. After 24 hours, the mortalities of *Aedes* larvae were determined. Larvae with a total absence of movement, even after-touch, were considered dead. Selected plants having promising larvicidal effects were used for the follow-up studies after preparing storable dried powder. A series of larvicidal bioassays were conducted to determine the effectiveness. Eight different concentrations of the most promising results obtained from dried powder prepared from respective plant parts were used to determine the effective concentration for controlling the natural breeding site. The egg hatching and survival rate of *Aedes* second instar larvae were measured against each concentration. Fifteen samples were identified as potential larvicides against *Aedes* out of which 13 were leaf crude extracts. The time taken for the 100% mortality ranged from 5 to 138 minutes. Positive test retesting with larvicidal bioassay was conducted for selected 9 plant leaves crude extracts having less than 60 minutes mortality time. Overall results showed clove leaves powder as the most promising treatment for dengue mosquito breeding control. It reduces larvae development by more than 80% at a concentration of 0.01g/ml. Therefore, it can be recommended for application to potential *Aedes* mosquito breeding water-holding containers. This study opens a path to reduce the *Aedes* mosquito breeding in an eco-friendly way because clove leaves are non-toxic for humans and other vertebrates.

Keywords: *Aedes aegypti*, clove, dengue, larvicidal, plant extracts

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