

An Ecofriendly Approach for the Management of *Aedes aegypti* L (Diptera: Culicidae) by *Ocimum sanctum*

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Abstract : *Aedes aegypti* (Diptera: Culicidae), commonly known as tiger mosquito is the vector of dengue fever, yellow fever, chikungunya and zika virus. In the absence of any effective vaccine against these diseases, control the mosquito population is the only promising mean to prevent the diseases. Currently used chemical insecticides cause environmental contamination, high mammalian toxicity and hazards to non-target organisms, insecticide resistance and vector resurgence. Present research work aimed to explore the potentials of phytochemicals present in the *Ocimum sanctum* in management of mosquito population. The leaves of *Ocimum* were extracted with ethanol by 'cold extraction method'. 0-24h old fourth instar larvae of *Aedes aegypti* were treated with the extract of concentrations 50ppm, 100ppm, 200ppm and 400ppm for 24h. Survival, growth and development of the treated larvae were evaluated. The adults emerged from the treated larvae were used for the reproductive fitness studies. Our results indicate 77.2% mortality in the larvae exposed to 400 ppm. At lower doses, although there was no significant reduction in the survival after 24h however, it decreased during subsequent days of observations. In control experiments, no mortality was observed. It was also observed that the larvae survived after treatment showed severe growth and developmental abnormalities. There was significant increase in larval duration. In control, fourth instar moulted into pupa after 3 days while larvae treated with 400 ppm extract were moulted after 4.6 days. Larva-pupa intermediates and the pupa-adult intermediates were observed in many cases. The adults emerged from the treated larvae showed impaired mating and oviposition behaviour. The females exhibited longer preoviposition period, reduced oviposition rate and decreased egg output. GCMS analysis of the ethanol extract revealed presence of JH mimics and intermediates of JH biosynthetic pathway. Potentials of *Ocimum sanctum* in integrated vector management programme of *Aedes aegypti* were discussed.

Keywords : *Aedes aegypti*, *Ocimum sanctum*, oviposition, survival

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