

CONTROL OF AEDES LARVAE USING CRUDE EXTRACTS OF PLANT MIXTURES OF CAPSICUM FRUTESCENS, ALLIUM SATIVUM AND PSOPHOCARPUS TETRAGONOLOBUS

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Dengue is a vector-borne viral disease transmitted by mosquito species *Aedes aegypti* and *Ae. albopictus*. Control of the vector mosquito population is challenging due to human-influenced breeding sites. Larval control is one of the most effective methods compared to other mosquito control methods. In this study, larvicidal activities of hot water, cold water and water:acetone extracts of plant mixtures of *Capsicum frutescens* (king chilli/ “Naimiris”), *Allium sativum* (garlic) and *Psophocarpus tetragonolobus* (winged beans) were tested against third instar larvae of mosquitoes of genus *Aedes*. Also, red and green *C. frutescens* were separately added to the plant mixtures to investigate the significant difference in larval mortalities. Stock solutions were prepared using each solvent extract; final concentrations of test solutions were set as 1,000, 2,000, 5,000, and 10,000 mg L⁻¹, while distilled water was used as the control. Larval mortalities were observed after 24 and 48 h exposure periods. Cold water and water:acetone extracts showed 90 and 100% mortality after 24 h, respectively, and 100% larvae mortality after a 48 h exposure period at 10,000 mg L⁻¹. Larval mortalities increased with increasing concentrations and exposure time. The hot water extracts did not show any significant larval mortalities. LD₅₀ values of the mixture, which includes green *C. frutescens* was relatively low (LD₅₀=2,460.29 mg L⁻¹) compared to that of red *C. frutescens* (LD₅₀= 2,577.86 mg L⁻¹). Water:acetone extracts had the highest efficacy against larvae (100% larval mortality). Larvicidal effect of water:acetone extracts of *P. tetragonolobus* (leaves and pods) alone and a mixture of green *C. frutescens* and *A. sativum* showed that the mixture of green *C. frutescens* and *A. sativum* has the highest efficacy (100% larval mortality within 9 h). *Psophocarpus tetragonolobus* pods and leaves showed 30 and 25% mortality after 24 h exposure, respectively, and 70 and 35% mortality after 48 h exposure, respectively. These results revealed that the water:acetone extract of green *C. frutescens* and *A. sativum* mixture showed relatively high larvicidal activities against *Aedes* larvae with the lowest LD₅₀ values (2,051.01 and 1,097.69 mg L⁻¹ for 24 and 48 h exposure periods, respectively). The results of the study suggest that the plant mixture of green *C. frutescens* and *A. sativum* could be used as an environmentally friendly alternative to chemical insecticides.

Keywords: *Aedes* larvae, Dengue, Larvicidal activity, Plant extracts