

LARVICIDAL ACTIVITIES OF *Capsicum frutescens* (“KOCHCHI”) VARIETIES AND COMBINED EFFECT WITH *Allium sativum* (GARLIC), AGAINST *Aedes* MOSQUITO LARVAE

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Dengue is spread primarily by *Aedes* mosquitoes and affects about 2.5 billion people globally. While synthetic mosquito larvicides are effective, their non-target effects and environmental concerns drive the demand for natural larvicidal agents. This study aimed to evaluate the larvicidal properties of three different widely distributed *Capsicum frutescens*, “Kochchi”, varieties in Sri Lanka; white bird’s eye chilli (variety 1), purple tobasco pepper (variety 2) and African bird’s eye chilli/African devil (variety 3). The ground “Kochchi” was extracted into the three solvent systems; water (maceration 24 hr × 3), hot water (reflux for 3 hr) and 1:1 water-acetone mixture (maceration 24 hr × 3). The larvicidal activity of each crude extract was evaluated through larvicidal assays, exposing three replicates of 20 mosquito larvae of the third and fourth instar to varying concentrations of each extract for 24 hr. The combined larvicidal effect of the most active extract with garlic (1:1 w/w%) was also determined. The cold-water extracts exhibited the highest larvicidal activity, with mortality percentages of 90%, 75% and 30% at 2500 mg/L for varieties 1, 2, and 3, respectively. The hot water and acetone-water extracts showed relatively lower percentage mortalities at 2500 mg/L; 58%, 50% and 48% in hot water, and 30%, 21% and 14% in water-acetone for varieties 1,2 and 3, respectively. The cold-water extract of variety 1 demonstrated the highest larvicidal activity (90% at 2500 mg/L). The cold-water extracts of three varieties, when combined with garlic, showed relatively higher activity compared to the individual extracts. The percentage mortalities observed at 10,000 mg/L, and the estimated LC₅₀ values were 88%, 83% and 98%, and 3384 mg/L, 4940 mg/L, and 2614 mg/L for cold water extracts of variety 1, garlic, and mixture, respectively. These findings revealed that the mixture of variety 1 and garlic has a larvicidal effect against *Aedes* mosquitoes. Ongoing studies with positive controls aim to evaluate its potential as a natural larvicide for dengue control.

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