

ABSTRACT

Mosquito-borne diseases pose significant public health challenges worldwide, and traditional chemical insecticides face challenges due to resistance, environmental pollution, ecological disturbances, and rising costs. The current study was aimed to evaluate the larvicidal potential of methanolic extracts from three common medicinal plants – *Allium sativum* (garlic), *Zingiber officinale* (ginger), and *Syzygium aromaticum* (clove) against *Culex quinquefasciatus* larvae. Laboratory bioassays revealed potent toxicity of all three plant extracts against the larvae in a concentration and time-dependent manner. Garlic extract exhibited the highest potency, with LC50 values of 0.48% (24 hours) and 0.34% (48 hours), followed by ginger and clove extracts. Gas Chromatography-Mass Spectrometry (GC-MS) analysis revealed the presence of diverse bioactive phytochemicals including organosulfur, phenolic, and terpenoid derivatives, which can overcome insecticide resistance in mosquito populations and have larvicidal properties. As traditional medicinal plants, garlic, ginger, and clove offer an economical, eco-friendly, and culturally acceptable approach for community-based mosquito larval control. These plants are locally available, sustainable, and can reduce dependence on synthetic pesticides.

Keywords: *Culex quinquefasciatus*, *Allium sativum*, *Zingiber officinale*, *Syzygium aromaticum*, larvicidal potential