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Mosquito larvicidal effect of *Annona glabra* fruit extract on dengue vector, *Aedes aegypti*

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Annona glabra is a plant of Family Annonaceae and many plant species belong to this family have been intensively studied since they were discovered to contain compounds with important biological properties. These properties include cytotoxic, antitumor, antiparasitic, antifungal, antispasmodic, repellent, and insecticidal activities. Insecticidal effects of plant extracts vary depending on the plant parts (leaf, seed, fruit, bark) used for the extraction. Larvicidal effect of *A. glabra* aqueous extract from leaves and seeds have been evaluated against *Aedes aegypti* mosquitoes in Sri Lanka, and larvicidal effect of fruit is not determined yet. Therefore, the present study was conducted to evaluate the effect of *A. glabra* fruit extract for its larvicidal efficacy on third instar larvae of *Ae. aegypti*. Fresh ripen fruits of *A. glabra* plant were collected from Hunupitiya, (N 06° 58.904', E 079° 54.281') in Gampaha district, Sri Lanka. The aqueous crude extract was prepared from powdered *A. glabra* fruits. Seven concentrations were prepared between the range of 3 g/L – 300 g/L. Batches of 25 third instar larvae of *Ae. aegypti* were used for larval bioassays. *Ae. aegypti* mosquito larvae were evaluated in accordance with guidelines of World Health Organization. The experimental setup was repeated four times per each concentration. Probit analysis was used to evaluate the relationship of mortality with the concentration of aqueous crude extract. The *A. glabra* fruit extract showed a dose-dependent effect against *Ae. aegypti* larvae after the 48-hour exposure period. The percentage mortality rates have shown a significant variance among different concentrations ($P = 0.000$). The recorded LC_{50} and LC_{90} values for aqueous crude extract were $87.71 \pm 5.41 \text{ gL}^{-1}$ and $510.79 \pm 12.56 \text{ gL}^{-1}$ respectively, after 48 hours of exposure period. Larvicidal activity of *A. glabra* plant is supported by previous literature, where the presence of phytochemicals such as saponins, flavonoids, steroids and tannins have shown combined effects in terms of larvicidal action against mosquitoes. Hence, there is a potential of *A. glabra* aqueous fruit extract as a potential source for the development of an environment-friendly plant-based larvicide against *Aedes aegypti*.

Keywords: Aqueous, Bioassay, Insecticidal, Phytochemicals

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