The Ipomoea batatas Leaf: Isolation and Identification of Its Mosquito Larvicidal Agent

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Past research shows that Ipomoea batatas leaf solutions yield high mortality rates in Aedes albopictus larvae (Doyle, 2013). The purpose of this project was to isolate and identify effective larvicidal agents from the leaf of the Ipomoea batatas. The hypothesis was that if Aedes albopictus larvae were added to solutions of isolated Ipomoea batatas leaf compounds, one or more solutions would be as effective as the leading commercial larvicide. Ipomoea batatas leaves were fed into a juicer. The juice was then funneled to remove solids. The remaining solution was then separated into components with flash chromatography and gas chromatography (GC). The components were characterized through mass spectrometry (MS). Pharmaceutical grade samples of the identified compounds through GC-MS were ordered and tested on the larvae in varying concentrations and combinations. At 48 hours, larvae exposed to 0.04% palmitic acid, 0.04% stearic acid and a mix of both acids at 0.04% yielded 100% mortality. At 24 hours, 0.04% stearic-palmitic acid yielded 57% mortality but all remaining live larvae were notably moribund. The lowest lethal concentration needed to achieve 90% mortality was a 0.027% mix of stearic and palmitic acid. The hypothesis was supported. Future studies would focus on small-scale field trials with these solutions. The great abundance of Ipomoea batatas leaves make their application as a mosquito larvicide promising. As Aedes albopictus invade through the international used tire trade, a 0.027% stearic-palmitic acid mix sprayed on tires at exit and entry ports throughout the world could be an effective supplement to the oviposition traps already in use.

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