MOSQUITOE LARVICIDAL ACTIVITY OF SOME ENDEMIC ANNONACEAE PLANTS

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The family Annonaceae has been reviewed from the point of view of the frequent presence of isoquinoline alkaloids and more recently on the basis of the restrictive existence of a very active class of natural products, the acetogenins. The potent antitumour and/or insect antifeedant properties of the Annonaceous acetogenins have been previously reported. Annonaceae plants have also exhibited antifungal, antiviral and antibactirial properties. The important insecticidal properties of the Annonaceous acetogenins have led to the proposal that crude extracts of several Annonaceae species containing a variety of acetogenins could be employed as safe, effective, economical and environmentally friendly pesticides.

In this study, endemic Annonaceae plants *Xylopia championii*, *Goniothalamus hookeri*, *Uvaria semecarpifolia*, *Alphonsea hortensis*, *Desmos zeylanica*, *Enicosanthum acuminata*, *Xylopia nigricans*, *Uvaria sphenocarpa* were collected from the Central Province of Sri Lanka. Air-dried, ground plant materials were sequentially extracted with dichloromethane followed by methanol at room temperature. The combined extracts were concentrated in vacuo at 35 °C to obtain their respective crude extracts. The mosquitoe larvicidal activity of 40 extracts made out of leaves, stem, stem bark and seeds from the above eight endemic Annonaceae plants were studied using the larvae of *Aedes aegypti*. Initially, solutions of 500 ppm for the plant extracts were prepared by dissolving the appropriate weight in acetone (2 ml) and polyethylene glycol (24 µl/ 4 mg) and making up the solution to 200 mL with distilled water. To 40 ml of this solution contained in a glass beaker was introduced 5 second instar larvae of *A. aegypti*. This experiment was replicated into four. For active extracts, serial dilutions gave solutions for testing at lower concentrations; to 25 mL of solution contained in a glass beaker was introduced 5 second instar larvae of *A. aegypti*. Each concentration was replicated into four. The lethal concentrations (LC_{50}) were determined using SAS and Minitab statistical software programs.

Of the extracts studied, 23 extracts showed toxicity (readings taken at 48 h) against the second instar larvae of *A. aegypti* (LC_{50} < 500 ppm). The dichloromethane and methanol extracts of stem bark of *G. hookeri* demonstrated high larvicidal activity (LC_{50} = 1.9 and 2.1 ppm, respectively) while its leaves exhibited even higher activity (LC_{50} = 0.4 ppm). The dichloromethane extracts of stem of *A. hortensis* and leaves of *E. acuminata* (LC_{50} = 46.9 and 41.5 ppm, respectively) and the methanol extracts of seeds of *D. zeylanica* and bark of *A. hortensis* (LC_{50} = 44.6 ppm and 46.9 ppm, respectively) showed significant activity. The most active was the dichloromethane extract of the leaves of *G. hookeri*, with an LC_{50} = 0.4 ppm and LC_{100} = 15.6 ppm, indicating an activity comparable to β-asarone, a natural botanical insecticide (reported LC_{100} value of β-asarone is 16.0 ppm). The results suggest that the extracts of the above Annonaceae plants are promising as larvicides against *A. aegypti* larvae and could prove useful in the search for new biologically active natural products.

Financial assistance by the National Science Foundation is acknowledged.