Evaluation of The Effectiveness of Fruit Pulp Mixed Toxic Sugar Baits against Adult Aedes Aegypti (Diptera: Culicidae) In the Laboratory

P.G.I.S. Kulathunga [1], G.A.J.S.K. Jayasooriya[1], and H.B.C. Harshani[2]*

[1] *School of Entomology, Medical Research Institute, Colombo, 00800, Sri Lanka*
[2] *Medical Research Institute, Colombo, 00800, Sri Lanka*
**hbc.harshani@gmail.com*

Aedes aegypti is the primary vector for dengue, a severe viral disease. Current vector control methods often fail to effectively reduce *Ae. aegypti* populations and control dengue transmission. Attractive Toxic Sugar Baits (ATSB) offer a promising "attract and kill" strategy for mosquito control. This study developed and evaluated an ATSB formulation comprising fruit juice, sugar, and boric acid against male and female *Ae. aegypti* mosquitoes. The formulation included boric acid (1%, 1.5%, 2%, 2.5%), 10% sucrose, and 3% blue dye. Lethal concentration (LC_{50} and LC_{90}) values by "Probit Analysis" for boric acid within 24 and 48 hours were determined. For females (25), 24-hour LC_{50} and LC_{90} were 1.30% and 2.40%, with 48-hour values of 0.86% and 1.64%. For males (25), 24-hour LC_{50} and LC_{90} were 0.88% and 1.39%, with 48-hour values of 0.67% and 1.11%. Bioassays were performed with three replicates, repeated three times with different mosquito generations under controlled laboratory conditions (24±2°C, 70±10% RH, and a 12L:12D photoperiod). Choice tests in a 30x30x30cm cloth cage with 25 males and 25 females assessed the attraction index of three fruit juice-based ATSBs: "Kilo guava", "Karathakolomban mango", and "Mauritius pineapple". Pineapple juice-ASB exhibited the highest attraction index and was selected for further evaluation. The pineapple juice-ASB, augmented with 4% boric acid, induced 90% mortality within 24 hours and 100% within 48 hours of exposure to *Ae. aegypti* mosquitoes. These findings highlight the efficacy of the pineapple juice-ASB with boric acid as a promising method for *Ae. aegypti* control in dengue-endemic regions, offering an innovative approach to vector management.

Keywords: *Aedes aegypti*, Dengue, Attractive Toxic Sugar Baits (ATSB), Boric acid, Mosquito control strategies

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