

POTENTIAL OF NATURAL ESSENTIAL OILS AND CINNAMALDEHYDE AS INSECTICIDES AGAINST THE DENGUE VECTOR *Aedes aegypti* (DIPTERA: CULICIDAE)

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Abstract. In order to search and develop a new and more efficacious natural alternative to synthetic chemicals for mosquito control, plants belonging to families known to possess insecticidal properties were selected for investigation of their lethal potential to adult stage. Essential oils isolated from eight indigenous plants using steam distillation were screened individually at a discriminating dosage (15 µg/mg insect) for topical toxicity towards adult female *Aedes aegypti*, Mueang Chiang Mai-susceptible (MCM-S) strain. Dose-response bioassays of the effective oils indicated *Cinnamomum verum* bark oil, LD₅₀ value of 3.37 µg/mg female insect, as the most effective agent against MCM-S *Ae. aegypti*. Chemical analysis by gas chromatography-mass spectrometry revealed 16 different compounds, constituting 98.3% of *C. verum* oil composition, the most abundant being cinnamaldehyde (90.2%), followed by 2-propanyl benzene (4.2%) and 3-phenylpropanal (1.2%). LD₅₀ value of *C. verum* oil and cinnamaldehyde against adult female MCM-S *Ae. aegypti* was 3.37 and 3.49 µg/mg, respectively, and 3.27 and 3.73 µg/mg, respectively, against adult female Pang Mai Dang-resistant (PMD-R) *Ae. aegypti*, over 1,000 folds less potent than of permethrin, with LD₅₀ value of 0.43 and 3.72 ng/mg female against MCM-S and PMD-R strain, respectively. Although permethrin was more effective than *C. verum* oil (and cinnamaldehyde) against adult female *Ae. aegypti*, the former similar effectiveness against both MCM-S and PMD-R strains indicate the potential of developing *C. verum* oil and/or its main bioactive constituents as natural alternative insecticides to synthetic chemical agents currently employed against adult female *Ae. aegypti*, a vector of dengue virus.

Keywords: *Cinnamomum verum*, *Aedes aegypti*, cinnamaldehyde, essential oil, insecticidal activity

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