

Sunaiyana Sathantriphop 2015: Evaluation on Plant-Based Insect Repellents Against Mosquito Vectors in Thailand. Doctor of Philosophy (Entomology), Major Field: Entomology, Department of Entomology. Thesis Advisor: Professor Theeraphap Chareonviriyaphap, Ph.D. 120 pages.

Escape response and toxicity studies of essential oils obtained from four plant species, citronella (*Cymbopogon nardus*), hairy basil (*Ocimum americanum*), catnip (*Nepeta cataria*) and vetiver (*Vetiveria zizanoides*) were characterized on two different mosquito species using two assay systems, high throughput screening system (HITSS) and excito-repellency (ER) test system. The HITSS was used to determine the different concentrations of plant essential oils compared with synthetic repellents (DEET and picaridin) to *Aedes aegypti* and *Anopheles minimus*. Results indicated that the two mosquito species exhibited significantly different escape responses between contact treatment and control across all concentrations of test compounds, except the lowest concentration of picaridin against *Ae. aegypti*. Spatial repellent responses were found in both mosquito species when exposed to all compounds but percent escape responses depend on compounds and their concentrations. The study showed that the higher concentrations of test compounds had greater toxicity effects to mosquitoes but toxic effects at all test concentrations of vetiver were not found on *Ae. aegypti* and picaridin on *Ae. aegypti* and *An. minimus*. In contrast excito-repellency test system (contact irritant and non-contact repellent) was performed on the four essential oils compared with two standard repellents (DEET and picaridin) and two synthetic pyrethroids (deltamethrin and permethrin) against *Ae. aegypti*, *An. minimus*, *Aedes albopictus* and *Culex quinquefasciatus*. Results revealed that *Cx. quinquefasciatus* and *An. minimus* exhibited much stronger behavioral responses to all test compounds compared to *Ae. aegypti* and *Ae. albopictus*. Synthetic pyrethroids displayed stronger contact irritant response than non-contact repellents across all four mosquito species. Picaridin had the least effect on all test mosquito species.

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