Suppaluck Polsomboon 2008: An Automated Field Device for Conducting Behavioral Tests on Two Mosquito Populations, *Aedes aegypti* L. and *Anopheles harrisoni* Harbach and Manguin (Diptera: Culicidae). Master of Science (Entomology), Major Field: Entomology, Department of Entomology. Thesis Advisor: Associate Professor Theeraphap Chareonviriphap, Ph.D. 75 pages.

The behavioral responses of six-day-old *Aedes aegypti* adult females under four different physiological conditions exposed to deltamethrin and DDT were characterized using an improved excito repellency test chamber. The four physiological conditions examine were two non bloodfed groups (unmated and mated nulliparous) and two bloodfed groups (parous and full bloodfed). High escape rates from contact and noncontact chambers with deltamethrin were observed in non bloodfed groups. There were no significant differences in escape responses between unmated and nulliparous ($P > 0.05$). With DDT, a greater escape response was observed in unmated population as compared to other conditions ($P < 0.05$), while a more moderate escape response was seen in nulliparous females and even less by full bloodfed females. All test populations were completely susceptible to deltamethrin, while showing high resistance to DDT. There was no significant difference ($P > 0.05$) in escape response between chemicals and mosquito conditioning.

An investigation of the biological effect of catnip oil (*Nepeta cataria* L.) on the behavioral response of field collected *Ae. aegypti* and *An. harrisoni* were conducted using an automated excito-repellency test system. *Aedes aegypti* showed significant higher escape rates from the contact chamber at 5% catnip oil compared to other concentrations ($P < 0.05$). With *Anopheles harrisoni*, a high escape response was seen at 2.5% catnip oil from the contact chamber, while in the noncontact chamber, a higher escape response was observed at a concentration of 5%. In summary, the behavioral action of catnip oil on two field caught mosquito species were identified by automated excito repellency test system and revealed that this compound exhibits both irritant and repellent properties.

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