

Rungarun Tisgratog 2011: Bionomics of Natural Populations of *Anopheles minimus* and *Anopheles harrisoni* (Diptera: Culicidae) and Behavioral Responses to Bifenthrin and DEET. Master of Science (Entomology), Major Field: Entomology, Department of Entomology. Thesis Advisor: Professor Theeraphap Chareonviriphap, Ph.D. 69 pages.

Anopheline adults were surveyed at Ban Tum Sua, Mae Sot District, Tak Province, western Thailand between November 2008-September 2009. A total of 5,392 *Anopheles* was collected with the most commonly prevalent being *Anopheles minimus* (71.57%), followed by *An. maculatus* complex (27.97%) and *Anopheles dirus* complex (0.46%). The trophic behavior and host preference of *Anopheles minimus* was observed throughout the night long. Indoor and outdoor human landing activities by *An. minimus* were observed between 2400 and 0100 hours with a slight predilection to feed outdoor compared to indoor. Significantly greater number of *An. minimus* was collected from human rather than that of cow ($P < 0.0001$). *An. minimus* was more abundant during the wet season compared with the dry and hot seasons. A better knowledge of mosquito behavior related to host and feeding predilection will facilitate the efficiency of vector control operation.

Behavioral responses of two species in the Minimus Complex exposed to an operational field dose of bifenthrin or DEET were described using an excito-repellency test system. Two test populations of *An. minimus*, one from Tak Province, western Thailand, the other from a long-established laboratory colony, and *Anopheles harrisoni* collected from Kanchanaburi Province, western Thailand, were used. Results showed that all test populations rapidly escaped after direct contact with surfaces treated with either bifenthrin or DEET compared to match-paired untreated controls. Greater escape response by exposed females to bifenthrin and DEET were observed in the *An. minimus* colony compared to the two field populations. Field collected *An. minimus* demonstrated a more rapid escape response to DEET than to bifenthrin, whereas *An. harrisoni* showed a converse response. Fewer females escaped from test chambers without direct contact with treated surfaces compared to contact tests, however, the spatial repellency response was significantly pronounced in all test populations compared to match-paired controls ($P < 0.05$). DEET was found to perform as both a contact stimulant and moderate spatial repellent.

Student's signature

Thesis Advisor's signature