Wanapa Ritthison 2014: The Bionomics of *Anopheles* Species in Relation to Malaria Transmission Dynamics in Chang Island, Trat Province, Thailand, with Susceptibility and Behavioral Responses to Pyrethroids. Doctor of Philosophy (Entomology), Major Field: Entomology, Department of Entomology. Thesis Advisor: Professor Theeraphap Chareonviriphap, Ph.D. 104 pages.

Observations on species diversity of *Anopheles* mosquitoes, biting patterns and seasonal abundance of potential malaria vectors were conducted in two villages on Chang Island, Trat Province, in eastern Thailand, one located near the coast and the other in the low hills of the central interior of the island. From 5,399 female anophelines, 70.25% were in the subgenus *Cellia* with remaining species in the subgenus *Anopheles*. Five important putative malaria vectors were molecularly identified, including *Anopheles epiroticus, An. dirus, An. sawadwongporni*, *An. maculatus,* and *An. minimus.* From both locations, a greater number of anophelines were collected during the dry season compared to the wet. *Anopheles epiroticus* found only along the coast showed greater exophagic and zoophilic tendencies with peak blood feeding occurring between 18:00 and 19:00. In contrast, *An. dirus* in the interior location demonstrated an activity peak between midnight and 1:00 h.

The insecticide susceptibility and behavioral responses of four wild-caught populations of female *An. epiroticus* to synthetic pyrethroids (deltamethrin, permethrin, and alpha-cypermethrin) were assessed. Test populations were collected from different localities along the southern Thai coast, in Trat (TR), Songkhla (SK), and Surat Thani (ST) Phang Nga (PN) Provinces. All four populations were found completely susceptible to the synthetic pyrethroids. Behavioral responses using an excito-repellency test system found TR had the strongest contact irritancy escape response, followed by PN. Moderate noncontact repellency responses to all three compounds were observed in the TR population but comparatively weaker than paired contact tests. Few mosquitoes from the SK and ST populations escaped from test chambers, regardless of insecticide tested or type of trial.

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