Monthathip Kongmee 2012: Characterization of the *Anopheles minimus* Complex in Thailand: Seasonal Population Surveys, Morphological-Molecular Identifications, and Behavioral Responses to Insecticides. Doctor of Philosophy (Entomology), Major Field: Entomology, Department of Enotomolgy. Thesis Advisor: Professor Theeraphap Chareonviriyaphap, Ph.D. 115 pages.

Two different ecological breeding habitats of the Minimus Complex from Bong Ti Noy (BTN) and Pu Teuy (PT) were characterized using the Geographical information system (GIS) and the remote sensing technology in combination with field data. Differences in species diversity existed between the two study sites, indicating that surrounding land cover is associated very well with species-specific productive larval breeding habitats. Fluctuations of larval population densities in BTN were strongly affected by rainfall patterns. Changing environmental habitats associated with human activity also influenced larval population densities from PT. This information on environmental modifications of larval habitats is a potentially important strategy for anopheline larval control.

The characteristics of specific species within the Minimus Complex using molecular technique indicated that no morphological characters are completely reliable for distinguishing the adults of Minimus Complex species. Using molecular markers, nine species were obtained from BTN and eight species were identified from PT. Such correct identification is absolutely essential and mandatory for any relevant for the additional application of successful control strategies.

In addition, behavioral responses of these two species within the Minimus Complex, *Anophles harrisoni* and *Anopheles minimus* were evaluated following exposure to two pyrethroid insecticides, bifenthrin or deltamethrin, using an excito-repellency test system in the presence and absence of live host cues. The result demonstrated that deltamethrin elicited stronger irritant chemical effects than bifenthrin but that behavioral responses in vector populations are dampened in the presence of an available host. This information is useful for estimating probability of pathogen transmission when using irritant chemicals in proximity to a blood-meal source.

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