

Mosquito Vectors of Malaria

Principal Investigators: Douglas J. Gould, Ph.D.
Bruce A. Harrison, CPT, MSC
Michael F. Sullivan, CPT, MSC

Assistant Investigators: Prajim Boonyakanist
Larp Panthusiri

OBJECTIVE: To investigate the bionomics and population dynamics of those species of Anopheles responsible for transmission of human malaria in Southeast Asia.

DESCRIPTION: Specific factors being studied in the attempt to define the actual and potential vector species present in Thailand include determination of host preferences, susceptibility to infection with malaria, flight range, longevity and patterns of biting activity.

PROGRESS: During this period, malaria surveys were conducted in Buriram and Prachinburi provinces. A persistent foci of vivax malaria in Tambon Lam Duan, Amphur Krasang in northeastern Buriram province prompted the first survey from 19–25 May. This trip was a follow up to surveys reported in the previous year. Neither An. minimus nor balabacensis has been collected in this area in recent years, thus the identity of the malaria vector is not known. A total of 759 anophelines were collected, with ten man-biting collections yielding 241 mosquitoes and two buffalo-biting collections yielding 518 mosquitoes. An annularis accounted for 624 of the adults, of which 70% were collected from buffalos. A regional Malaria Eradication Project team made 401 blood smears from residents in two villages in the Tambon during this period. All smears were negative for malaria. Dissections from 643 mosquitoes were also negative for malaria, thus the identity of the vector there is still not known.

The second survey was prompted by reports of a malaria epidemic in Amphurs Aranyaprathet and Kabinburi, Prachinburi province. This survey was divided into two trips. The first trip (26 June 6 July) involved 21 collections of adult anophelines, 4 from buffalo, 9 from human bait and 8 collections of mosquitoes resting on vegetation around houses in both districts. A total of 632 mosquitoes were collected, of which 187 were An. balabacensis, one of the primary malaria vectors in Thailand. Seven balabacensis out of 182 dissected contained malaria parasites.

The second trip (19–29 July) into Prachinburi concentrated on a malaria epidemic in Tambon Thung Pho, Amphur Kabinburi. Thick blood films, taken at random from 327 residents of 7 villages, were examined by the Department of Epidemiology and 157 (48%) were found to have malaria parasites. Of these, 131 (83%) had Plasmodium falciparum, 21 (13%) had P. vivax, and 4 (2.5%) had mixed P. falciparum–P. vivax infections. One P. malariae infection was found. During this period 19 adult mosquito collections were made, 10 from human bait, and 9 collections of mosquitoes resting in houses or in vegetation near houses. These collections yielded 1,602 mosquitoes, of which 1,099 were An. balabacensis. Four different collecting methods were used to obtain adult balabacensis. A comparison of the efficiency of these 4 methods is as follows:

- A) biting man—inside house — 0.5 mosq./man/hour
- B) biting man—outside house — 1.3 mosq./man/hour
- C) resting—inside house — 3.5 mosq./man/hour
- D) resting—outside vegetation near house—1.4 mosq./man/hour

No explanation can be given at present for the disparity between "biting man—inside" and "resting—inside" collections. A total of 1,035 balabacensis were dissected during the trip and 9 were positive for malaria parasites.