

SPATIAL AND TEMPORAL HETEROGENEITY IN *P. VIVAX* DISTRIBUTION IN AN ISOLATED POPULATION IN WESTERN THAILAND

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This study is part of a longitudinal project assessing relationships between the spatial and temporal distribution of potential malaria vectors (Anopheline mosquitoes) and potential malaria reservoirs (gametocytemic humans). The study site consists of an isolated *P. falciparum/vivax* endemic village of approximately 650 individuals in Kanchanaburi Province, Thailand. The village is located in a narrow valley surrounded by mountains that are 300-600 meters higher than the valley. Due to the rugged terrain and isolated location, access to the village is by foot or small boat for 9-10 months/year. In order to conduct our spatial analysis, we mapped out the village (<1 km²) and divided it into 9 “village” quadrants. Each month, thick- and thin-blood films were made from all available individuals in the village and assessed for sexual and asexual-stage *Plasmodium* parasites. Filter paper blood samples were collected from all individuals during selected months. In addition, venous blood (2.5-5cc) samples were collected from 20-30 parasitemic individuals each month. PCR products of the CSP and MSP-3 genes were compared in order to determine the genetic structure of the parasite population both temporally and geographically. Between 1 May 2000 and 30 Apr 2001, a total of 5,181 blood films were made from a total of 630 individuals (mean of 8.2 films/person). 313 individuals (49.7%) were positive for malaria on at least 1 occasion. 229 (4.4%) of films were positive for *P. falciparum*, 283 (5.5%) for *P. vivax*, and 5 (<0.1%) for *P. malariae*. PCR analysis of 2,011 filter paper samples revealed *P. vivax* in 177 (8.8%) of samples. 89 (4.4%) of the *P. vivax* positive samples were type 210, 9 (0.45%) were type 247, and 9 (0.45%) were mixed 210/247. The type of parasite was not determined in 70 of the *P. vivax*-positive samples. Analysis of variability in the MSP-3 gene revealed wide heterogeneity of *P. vivax* isolates in the village over the course of the study. Temporal and spatial heterogeneity of the *P. vivax* population will be discussed.

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