

Biting activity and host preference of the malaria vectors *Anopheles maculatus* and *Anopheles sawadwongporni* (Diptera: Culicidae) in Thailand

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Received 5 August 2008; Accepted 8 December 2008

ABSTRACT: Adult mosquitoes in the *Anopheles maculatus* group were surveyed from different regions of Thailand and five different species were morphologically identified, including *Anopheles maculatus*, *Anopheles sawadwongporni*, *Anopheles notanandai*, *Anopheles dravidicus*, and *Anopheles willmori*. Blood-feeding activity and host preference of two species, *Anopheles maculatus* and *Anopheles sawadwongporni*, were observed during a one-year period at Pu Teuy Village, Sai Yok District, Kanchanaburi Province, west-central Thailand. Both species were more prevalent during the wetter period of the year and each had a greater predilection to feed on cattle than humans. Primary feeding activity occurred between 20:00-23:00 and a smaller peak at 01:00-03:00. Findings are discussed relative to the importance of these two vectors for malaria transmission in Pu Teuy. *Journal of Vector Ecology* 34 (1): 62-69. 2009.

Keyword Index: *Anopheles maculatus*, *Anopheles sawadwongporni*, feeding activity, host preference, Thailand.

INTRODUCTION

Malaria remains an important parasitic disease over much of the forest and forest-fringe areas of Thailand, despite decades of organized malaria control activities. Malaria is particularly prevalent along the underdeveloped national borders between Thailand and eastern Myanmar, western Cambodia, and northern Malaysia (Chareonviriyaphap et al. 2000). These areas remain highly conducive to vector-borne diseases due to geography, uncontrolled population movement, and recurring political unrest. In many of these recalcitrant malaria endemic areas, especially along much of the Thai-Myanmar border, members of the *Anopheles (Cellia) maculatus* group are important malaria vectors that are found in abundance in the frontier areas (Green et al. 1985, Rattanarithikul and Green 1986, Chiang et al. 1991, Kittiyapong et al. 1993, Rattanarithikul et al. 1996a).

Some members of the Maculatus group represent important vectors of malaria throughout the Oriental Region, including Thailand, Indonesia, Malaysia, and the Philippines (Reid 1968). This complex contains at least eight closely-related sibling species that can be differentiated based on distinctive morphological, behavioral, and genetic characters (Harrison 1980, Green et al. 1985, Rattanarithikul and Green 1986, Chiang et al. 1991, Baimai et al. 1984, 1993, Kittiyapong et al. 1990, Bangs et al. 2002). In Thailand, six species have been identified, including *An. maculatus* Theobald, *Anopheles sawadwongporni* Rattanarithikul

and Green, *Anopheles dravidicus* Christophers, *Anopheles notanandai* Rattanarithikul and Green, *Anopheles willmori* (James), and *Anopheles pseudowillmori* (Theobald) (Green et al. 1985, Rattanarithikul and Green 1986, Kittiyapong et al. 1990, Green et al. 1992). Two species, *An. pseudowillmori* and *An. maculatus*, have been incriminated as either important or secondary malaria vectors in Thailand (Green et al. 1991, 1992, Rattanarithikul et al. 1996a). *Anopheles sawadwongporni* is a relatively common species often found in high density throughout Thailand, especially along the border regions with Myanmar and Malaysia. Based on feeding behavior and number of natural infections of plasmodia detected in this species, *Anopheles sawadwongporni* is considered to be an important vector of malaria in Thailand (Rattanarithikul et al. 1996a, 1996b, Somboon et al. 1998, Coleman et al. 2002).

Two chromosomal forms of *An. maculatus* are currently recognized, designated *E* and *K*, respectively. Both appear to be allopatric with *K* located in the northeast and *E* present in the south (Rattanarithikul et al. 2006). *Anopheles maculatus* and *An. sawadwongporni* are widely distributed throughout the country except for the far southern region, whereas *An. maculatus (E)* is common throughout the peninsular region and into (peninsular) Malaysia (Baimai et al. 1984, 1993, Upatham et al. 1988, Rattanarithikul et al. 1996c, Kittiyapong et al. 1992, 1993, Rongnoparut et al. 1999). *Anopheles pseudowillmori* is found predominately along the Thai-Myanmar border and northern reaches of