



Systematics of *Anopheles (Cellia) yaeyamaensis* sp. n., alias species E of the *An. minimus* complex in southeastern Asia (Diptera: Culicidae)

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Abstract

Species E of the *Anopheles minimus* sibling species complex is diagnosed and formally named *An. yaeyamaensis* Somboon & Harbach, **sp. n.** Information is provided on the morphology, genetics and bionomics of the species, which has a restricted distribution in the Yaeyama and Miyako Islands located at the southern end of the Ryukyu Archipelago of Japan.

Key words: *Anopheles harrisoni*, *Anopheles minimus*, *Anopheles minimus* E, Minimus Complex, mosquito, new species

Introduction

The Minimus Complex of *Anopheles* subgenus *Cellia* occupies a geographical range in the Oriental Region that extends northward to about 32° 30' N in China, westward to Uttar Pradesh in India, southward to the Thai-Malay Peninsula (Manguin *et al.*, 2008), possibly reaching south to the northwestern corner of Malaysia (Reid, 1968), and eastward to the Ryukyu Archipelago of Japan. The complex may include five or six species, but only three have been fully documented. Green *et al.* (1990) showed that *An. minimus* Theobald consisted of two species (denoted as species A and C) in western Thailand based on the sympatric occurrence of homozygotes of two enzyme loci in the absence of heterozygotes. Green and colleagues (see Baimai, 1989) also recognised a third species (denoted as species D) in sympatry with species A and C based on electrophoretic data. Sharpe *et al.* (1999, 2000) confirmed the presence of species A and C in western Thailand and suggested the possible presence of another species (specimen #157). Chen *et al.* (2002) concluded that forms A and B of Yu & Li (1984) and Yu (1987) in China were morphological variants of species A, and that subspecies X of Baba (1950) in southern China probably referred to *An. aconitus* Dönitz. Recently, Somboon *et al.* (2001, 2005a) provided morphological, cytogenetic, molecular and hybridisation evidence for the recognition of another sibling species of the complex on Ishigaki Island in the Ryukyu Archipelago of Japan, which they informally designated as species E.

Anopheles minimus was named and described by Theobald (1901) from a single female that became non-extant after 1907 (Harrison, 1980). To fix the identity of this species and provide a foundation for further taxonomic studies of the Minimus Complex, Harbach *et al.* (2006) designated a neotype for *An. minimus* from specimens collected near the original type locality in Hong Kong. Sequences for the D3 domain of the 28S locus of ribosomal DNA (rDNA) and the cytochrome oxidase subunit II locus (COII) of mitochondrial DNA