# Molecular studies of Anopheles culicifacies (Diptera: Culicidae) in Sri Lanka: Sibling species B and E show sequence identity at multiple loci

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**Abstract**

The anomaly that Anopheles culicifacies (Diptera: Culicidae) species B is a major vector of malaria in Sri Lanka, but a non-vector in India, has been noted for several years. In 1999, a Y chromosome dimorphism associated with Plasmodium vivax infectivity within the Indian A. culicifacies species B suggested that this was itself a complex of two sibling species, B and E. A recent cytogenetic analysis shows the sympatric presence of these sibling species in Sri Lanka, a situation similar to that reported from nearby Rameshwaram Island, India. Species E, with a submetacentric Y chromosome, is a more effective vector of P. vivax than species B with an acrocentric Y chromosome. Larval karyotyping, however, is time-consuming and labour-intensive. Recently, the development of a PCR-RFLP assay distinguishing species B and E of A. culicifacies from India, based on differences in one region of the cytochrome oxidase Subunit II (COII) gene, was reported. Here we show that whilst this diagnostic approach reveals polymorphism in Sri Lankan A. culicifacies this variation is not correlated with Y chromosome karyotype. Hence this assay will not be useful for distinguishing species B and E in Sri Lanka. Further, we found no difference between the sequences of Sri Lankan specimens in any of three other regions (ITS2, D3 region of 28S rDNA, and guanylate cyclase intron) often used for species discrimination.

**Author keywords**

28S rDNA; Anopheles culicifacies; Cytochrome oxidase II; Guanylate cyclase; ITS2; Species B; Species E; Y-chromosome dimorphism

**Indexed keywords**

**GEOBASE Subject Index:** molecular analysis

**Species Index:** Anopheles culicifacies; Culicidae; Diptera; Plasmodium vivax