

Genetic evidence for malaria vectors of the *Anopheles sundaicus* complex in Sri Lanka with morphological characteristics attributed to *Anopheles subpictus* species B

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Abstract

Background: *Anopheles subpictus* sensu lato, a widespread malaria vector in Asia, is reportedly composed of four sibling species A - D. Mosquitoes morphologically identified as belonging to the Subpictus complex were collected from different locations near the east coast of Sri Lanka, and specific ribosomal DNA sequences determined to validate their taxonomic status. **Methods.** *Anopheles subpictus* s.l. larvae and blood-fed adults were collected from different locations in the Eastern province and their sibling species status was determined based on published morphological characteristics. DNA sequences of the D3 domain of 28 S ribosomal DNA (rDNA) and the internal transcribed spacer -2 (ITS-2) of mosquitoes morphologically identified as *An. subpictus* sibling species A, B, C and D were determined. **Results.** Phylogenetic analysis based on D3 domain of rDNA resulted in two clades: one clade with mosquitoes identified as *An. subpictus* species A, C, D and some mosquitoes identified as species B, and another clade with a majority of mosquitoes identified as species B with D3 sequences that were identical to *Anopheles sundaicus* cytotype D. Analysis of ITS-2 sequences confirmed a close relationship between a majority of mosquitoes identified as *An. subpictus* B with members of the *An. sundaicus* complex and others identified as *An. subpictus* B with *An. subpictus* s.l. **Conclusions.** The study suggests that published morphological characteristics are not specific enough to identify some members of the Subpictus complex, particularly species B. The sequences of the ITS-2 and D3 domain of rDNA suggest that a majority that were identified morphologically as *An. subpictus* species B in the east coast of Sri Lanka, and some identified elsewhere in SE Asia as *An. subpictus* s.l., are in fact members of the Sundaicus complex based on genetic similarity to *An. sundaicus* s.l. In view of the well-known ability of *An. sundaicus* s.l. to breed in brackish and fresh water and its proven ability to transmit malaria in coastal areas of many Southeast Asian countries, the present findings have significant implications for malaria control in Sri Lanka and neighbouring countries.

Indexed keywords

EMTREE drug terms: internal transcribed spacer 2; ribosome DNA

EMTREE medical terms: *Anopheles subpictus* species b; *Anopheles sundaicus*; article; DNA sequence; larva; malaria; morphological trait; mosquito; nonhuman; phylogeny; Sri Lanka