

Characterization of Anopheline larval habitats and species composition of aquatic macro-invertebrates in Trincomalee District, Sri Lanka.

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Malaria control methods that aim to reduce adult vector populations by targeting their aquatic immature stages. A better fundamental understanding of the biology and ecology of these essential stages could contribute to the implementation of current control methods and to the development of novel strategies. Objective of this study was to examine breeding habitat diversity and analysis of richness, diversity and geographical distribution of Anopheline larvae and the species composition of aquatic macro-invertebrates in their oviposition sites in Trincomalee District.

Fifteen major permanent breeding places in five possible malaria sensitive sites (Gomarankadawala, Ichchallampaththu, Mollipothana, Padavisiripura and Thoppur) in Trincomalee District were selected. Anopheles larvae and macro-invertebrates were collected using standard methods for 16 months (April, 2013-July, 2014) and they were identified microscopically. The Shannon diversity index (H') was used to characterize species diversity at the five study sites by its abundance and evenness of the species present. ANOVA were used to analyze the correlation between macro-invertebrates and mosquito larval abundance.

In total, 4478 including 11 species of Anopheles larvae were identified. *An. subpictus*, *An. nigerrimus* and *An. peditaeniatus* (71%) were the most abundant and widely-distributed species. Anopheline larval diversity was highest in Mollipothana ($H'=1.986$). Whereas in Gomarankadawala, Ichchallampaththu and Thoppur where $H'=1.721$, $H'=0.857$ and $H'=0.762$ respectively. In total, 28 species of aquatic macro-invertebrates were identified and highest diversity was recorded in Mollipothana, Gomarankadawala and Ichchallampaththu ($H'=3.14-2.56$). This deduces that the species richness and diversity of Anopheles mosquitoes and macro-invertebrates are higher in these areas. The presence of permanent breeding places may be the factors for this phenomenon.

This study represents the first systematic update to the distribution of macro-invertebrates associated with Anopheles mosquito oviposition sites in Trincomalee District. Knowledge generated on the ecology of Anopheles mosquitoes will help to eliminate malaria vectors in the country.

Key words: Anopheles larvae, abundance, macro-invertebrates and diversity index.