

# DEMOGRAPHIC STABILITY OF *ANOPHELES CULICIFACIES* SIBLING SPECIES E (DIPTERA: CULICIDAE) IN SRI LANKA

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*Anopheles culicifacies* sibling species E is the major vector of malaria in Sri Lanka. Malaria has caused thousands of deaths in the past in Sri Lanka. However, it has now been eliminated with zero indigenous cases and further, continuous insecticide spraying is also stopped by the health authorities to control the mosquito vector. Transmission of malaria by *Anopheles* mosquitoes needs to be completely interrupted for three consecutive years to confirm a malaria free country. The population parameters of major vectors are needed to be critically known to prevent any outbreaks. Therefore, the study was carried out to understand the population status of the sibling species E population of Sri Lanka. Mosquitoes were collected from six localities of Sri Lanka except the North and Easterñ area. To determine the presence of recent population bottleneck and/or expansions, heterozygosity tests were used to test for Mutation-Drift Equilibrium (MDE) within loci, using BOTTLENECK 1.2.02 software. Estimates of expected heterozygosity under MDE were calculated assuming that Stepwise Mutation Model (SMM) and Two Phase Model (TPM) with 10–30% indels are larger than the repeat unit. Statistical significance of the deviation from MDE was assessed for each sample across all loci by the Wilcoxon signed rank tests and sign tests and found all localities were in MDE and the departure of pooled population from the MDE in Wilcoxon signed rank test ( $p < 0.05$ ). Further, this analysis also revealed that number of ( $He > Heq$ ) loci were lower than the ( $He < Heq$ ) loci, suggesting a recent demographic expansion of the population. However, applying the bonferroni correction for the multiple comparisons, the significant departure from the MDE was not observed ( $P < 0.0062$ ) suggesting the fact that the sibling species population is maintaining an effective population size to be in MDE. This stability of the population size might be achieved after ceasing of the continuous insecticide spraying practices in vector abundance areas. Therefore, the ongoing control practices of health authorities need to be focused towards the vector populations to control the population to minimize the impact for any future possible disease outbreaks.

**Keywords:** *Anopheles culicifacies*, malaria, population expansion/bottleneck, MDE