



802/A

***Anopheles subpictus* s.l. breeding in polluted water bodies in Vankalai area in the Mannar District**

R M T B Ranathunge¹, P A D H N Gunathilaka^{1&2}, D N Kannangara¹, W Abeyewickreme¹ and M D Hapugoda^{1*}

¹Molecular Medicine Unit, Faculty of Medicine, University of Kelaniya, Kelaniya

²Tropical Environmental Diseases & Health Associates, No 3, Elibank Road, Colombo 05

Recent studies confirm that there are significant changes in the anopheline larval ecology in the North and Eastern Provinces in Sri Lanka. Therefore, the objective of this study was to determine the changes in larval ecology in the Mannar District. All possible breeding habitats for mosquitoes were identified in three selected malaria sensitive (sentinel) sites; Mannar Town, Vankalai and Silawathura. Of these sentinel sites, the Vankalai sentinel site was identified as a high risk area for waste water breeding of anopheline. Identified waste water habitats in Vankalai were surveyed from April, 2013 – March, 2014 using standard dipping method, as described by the World Health Organization. Collected larvae were identified microscopically to species level using the standard taxonomic keys. The relationship between eight abiotic variables (temperature, pH, Dissolved Oxygen (DO), conductivity, salinity, Total Dissolved Solid (TDS), turbidity and hardness) and density of *Anopheles* larvae were investigated. Statistical correlation analysis and ANOVA were used to analyze the associations between physico-chemical parameters and larval abundance. A total of 308 polluted water bodies were identified from this area. These breeding habitats were mainly drains. Morphological identification of 1908 anopheline larvae revealed only the presence of member of the *An. subpictus* consisting of 100% in Vankalai (waste water bodies). However, the abundance of *An. subpictus* showed significant positive correlation ($p < 0.05$) with conductivity, salinity, DO, and turbidity. Temperature and pH were negatively correlated with larval abundance of *An. subpictus* breeding in waste water. Other physico-chemical parameters were not correlated significantly ($p > 0.05$). Values of the eight physico-chemical parameters mean (range) analyzed in the water samples were as follows; temperature = 29.16 (27.20 - 31.00) °C, pH = 7.81 (7.16 - 8.20), DO = 1.81 (3.98 - 0.57) mg/l, conductivity 3,644 (2,080 - 6,010) μScm^{-1} , salinity 2,103 (1,879 - 3,540) mg/l, TDS 2,306(1921-3750) mg/l, turbidity 18.19 (1.26 - 120) NTU and hardness 163.67 (122.00 - 192.00) mg/l. These results confirm that *An. subpictus* is adapting to a wide range of water pollution in this area. This requires entomological surveillance in urban areas to detect vector breeding in order to initiate proper interventions; since *An. subpictus* is a potential vector of malaria in Sri Lanka, and a well-established secondary vector in the country.

Acknowledgment: Financial assistance by the National Research Council (NRC Grant No. 12-133) and technical support by the GFATM (Round 8) are acknowledged.

Keywords: *Anopheles subpictus*, waste water, physico-chemical parameters