

## Diversity of Culturable Aerobic Bacteria in the Midgut of Filariasis Vector, *Culex quinquefasciatus* Adults in Gampaha District, Sri Lanka

HEMRTK Hathnagoda<sup>1</sup>, PA Goonathilake<sup>1</sup>, KAT Buddhinee<sup>1</sup>, WDP Welgama<sup>1</sup>, PKHN Gunarathna<sup>1</sup>, HAK Ranasinghe<sup>1#</sup>, and EHL Perera<sup>1</sup>

<sup>1</sup>Faculty of Health Sciences, CINEC Campus, Malabe, Sri Lanka

#achinikoshilaa@gmail.com

### Abstract

Symbiotic bacteria established in mosquito gut significantly influence disease transmission, host-parasites interaction, and determination of vectorial capacity. The present study focused on screening of midgut microbial diversity of adult *Culex quinquefasciatus* as a fundamental pre-requirement to support the paratransgenesis process, which is progressing in Sri Lanka. Mosquito surveys were conducted from September 2022 to December 2022 at 3 sites (Kelaniya, Gampaha, and Meerigama) in the Gampaha Medical Office of Health area of Sri Lanka. Unfed adults were sacrificed using a cold shock and surface sterilization was performed using 70% ethanol followed by rinsing with Phosphate Buffer Saline (PBS). The midgut of adults was dissected and the midgut of ten individuals was pooled in sterile PBS (250  $\mu$ l) to make a homogenized lysate. A dilution series (100 – 10<sup>-7</sup>) was made from lysate and 100  $\mu$ l from each dilution was plated on Plate Count Agar and pure cultures for each microbe were obtained. Isolated bacteria were subjected to 16S rRNA amplification. A total number of 4 bacterial families Staphylococcaceae, Streptococcaceae, Bacillaceae, and Moraxellaceae were identified. Family Bacillaceae (43%) and Moraxellaceae (4%) were found as the highest and least abundant bacterial families respectively. Better separation of colonies was observed at 10<sup>-3</sup>, 10<sup>-4</sup>, and 10<sup>-5</sup> dilutions. Species composition was dominated by 5 major genera; Staphylococcus, Streptococcus, Lysinibacillus, Acinetobacter and Pseudomonas. *Lysinibacillus sphaericus* was identified as the most abundant microbial species isolated from the midgut. The relative distribution of midgut bacteria differed significantly among field-caught adult strains, collected from three different study areas. The present data strongly encourage further investigations to explore the potential usage of the microbes in paratransgenesis control approaches.

**Keywords:** *Eco-friendly, Mosquito, novel, Paratransgenesis, Symbiotic*