

# Determining total bacterial load on Microplastics sampled from Kandy Lake and inlets: A pilot study

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Microplastics represent a critical concern, as they are ubiquitous in the environment. It has already been recorded that pathogenic bacterial species have been found on microplastics. Hence, this study aimed to identify the bacterial community attached to microplastics. The total bacterial load associated with microplastics sourced from Kandy Lake waters was quantified as an initiative. Water samples (300mL each) were collected in July 2023, in a dry season of the year using a plankton net (250 µm, HYDRO-BIOS), two from Kandy Lake (S1 & S2), and four from inlets (S3, S4, S5, S6). The sample (100 mL) was filtered through a 5 mm metal sieve and followed by Whatman Glass Fiber Filters (Pour size-0.7 µm) and the treatment was duplicated. To isolate microplastics, the filter was observed under a light microscope (X10, Olympus-BH2). Aseptic conditions were maintained throughout the procedure. The isolated microplastics were suspended in sterile distilled water, shaken at 170 rpm for an hour, and the suspension was cultured on LB agar. The microbial quantity on microplastics was determined by quantitative real-time PCR using a 16S rDNA primer-probe set. An analysis of variance was performed for data analysis. Eight distinct morphologies were identified from culturable microorganisms, where 57.14% gram-positive rods, 14.29% gram-positive cocci, 7.14% gram-negative rods, and 19.05% gram-negative cocci. The total microbial load on microplastics isolated from the inlets S3, S4, S5, and S6 varied as  $1.73 \times 10^8$  cells/mL,  $4.34 \times 10^6$  cells/mL,  $7.63 \times 10^6$  cells/mL, and  $4.48 \times 10^6$  cells/mL respectively. The total microbial load on microplastics isolated from lake samples S1 and S2 was  $8.14 \times 10^5$  cells/mL and  $2.44 \times 10^5$  cells/mL respectively. A significantly higher microbial count was recorded in microplastics collected from inlets compared to the lake ( $p < 0.05$ ). In conclusion, the total bacterial load on microplastics collected from inlets was ~80-fold higher than in the lake.

**Keywords:** Bacteria, Kandy Lake, Micro-plastics, Microscopy, Real-time PCR

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