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SPATIOTEMPORAL ASSESSMENT OF *Escherichia coli* AND TOTAL COLIFORMS IN COASTAL RECREATIONAL WATERS: INSIGHTS FROM ARUGAM BAY AND PASIKUDA BEACHES IN EASTERN, SRI LANKA

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Abstract

This ongoing study assesses the presence of *Escherichia coli* (*E. coli*) and Total Coliform bacteria in sea beach waters at two popular tourist destinations, Arugam Bay and Pasikuda, located in eastern Sri Lanka, from January to June, 2025. Seven water samples from different location of each places which 100 m far from shore were analysed at a time using the Membrane Filtration method to enumerate microbial levels and two samplings were done per month. The spatial and temporal variations between the two sites were compared. Results revealed a considerable month-to-month variation in contamination levels, in spite of the general similar trend of overall changes in both sites. It might be due to the changing environmental factors or worse anthropogenic activities. The water samples from Pasikuda recorded the higher *E. coli* and Total Coliform colony counts than the water sample from Arugam Bay, While the counts resulted for Arugam Bay waters peaked in April, 2025 (24.9 CFU/100 ml), the highest *E. coli* level (61.6 CFU/100 ml) was observed in beach waters from Pasikuda in March, 2025. Total Coliform levels were highest in Pasikuda beach water in January (135.6 CFU/100 ml) and in Arugam Bay waters in March (116.3 CFU/100 ml). The lowest contamination levels for both sites were recorded in May, 2025. Statistical analysis indicated significant differences in Total Coliform levels between sites in January ($p = 0.001$) and in *E. coli* levels in March ($p = 0.021$). These findings highlight the importance of continuous monitoring and site-specific management strategies to ensure safe recreational waters in Sri Lanka's coastal zones which is more influencing the tourism industry.

Key words: *Arugam Bay, Escherichia coli, Membrane Filtration Method, Pasikuda, Total Coliform*