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COMPARATIVE STUDY OF FRESHWATER AND MARINE WATER QUALITY AT PASIKUDA BEACH SITE

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Abstract

Water pollution is becoming a major global issue, as pollutants frequently transfer between freshwater and marine ecosystems, directly impacting recreational water quality. This study compared key water quality parameters including turbidity, temperature, oil and grease, total suspended solids (TSS), electrical conductivity (EC), pH, dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), and *Escherichia coli* (*E. coli*) in both freshwater and marine water around the Pasikuda beach site. The objective was to determine whether the freshwater pollution has any significant effect on marine water quality at that site. Water samples were collected from both marine water and freshwater systems (streams), which are connected to the sea at specific locations over a three-month period, and were analyzed using standard methods. The results were analyzed statistically using SPSS and Minitab software. In freshwater, the average mean values of oil and grease, TSS, DO, COD, and *E. coli* were not within the threshold limits set by EPA and WHO guidelines. In marine water, the average mean values of oil and grease, TSS, DO, and COD were not within the threshold levels. Oil and grease, TSS and COD were above acceptable limits and DO was below the limit in both marine and freshwater systems. The *E. coli* counts in freshwater were significantly high, indicating higher fecal contamination. The presence of *E. coli* in the marine environment indicates potential contamination from freshwater inflows. The results of two sample t-test indicate that there is no a significant difference in the mean values of turbidity, temperature oil and grease, DO, BOD, COD, *E. coli* between marine water and freshwater. However, there is a significant difference ($p = 0.05$) in the mean values of TSS, EC, pH between marine and freshwater. Overall, the results suggest that marine water quality at Pasikuda beach is influenced by nearby freshwater systems, highlighting the interconnected nature of aquatic pollution and the need for integrated water management strategies.

Keywords: *Water Quality, Monitoring, Water Pollution, Recreational Water, Pasikuda*