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**Comparison of the fecal indicator bacteria in sand collected from three different tidal zones in a beach from West coast of Sri Lanka**

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Beach visitors, especially children tend to spend more time in contact with the sand and therefore the sanitary quality of sand serves as a vital part of an effective coastal management system. Assessment of fecal indicator bacteria in marine environments provides useful information regarding the possible contamination of beaches with fecal pathogens. However, there is no international or national standard for the microbiological quality of beach sand. This study was aimed at carrying out the microbiological quality assessment of sand at a popular bathing site in the Western coast of Sri Lanka. Sand samples were collected across three tidal zones; sub tidal zone (wet sand), inter tidal zone (shoreline sand) and supra tidal zone (dry sand). Fecal indicator bacteria namely; total coliforms, thermo-tolerant coliforms, *E. coli*, fecal streptococci and *Enterococcus* levels were estimated during this study using standard microbiological procedures given for marine water. The fecal indicator bacteria were detected and enumerated using the most probable number technique. The statistical analysis was performed using Minitab 18 program. The results indicated that shoreline sand has higher total coliform counts (3153 MPN/100 g) than both wet (2171 MPN/100 g) and dry sand (1217 MPN/100 g). Thermo-tolerant coliforms were also high in shoreline sand (2745 MPN/100 g) but *E. coli* was high in wet sand (1029 MPN/100 g). Fecal streptococci and enterococci levels were higher in wet sand than the other two types of sand. Sanitary quality of sand based on *E. coli* decreased from dry sand, shoreline sand to wet sand. But based on total coliforms, it decreased from shoreline sand, wet sand to dry sand. The statistical analysis revealed that there were some correlations among fecal indicator bacterial densities within the same tidal zone. In dry sand, enterococci counts were positively correlated with *E. coli* and total coliforms ( $p < 0.05$ ). But there was no significant correlation of these organisms present in the shoreline and wet sand. However the results indicated that bacterial densities of the indicator organisms used in this study comply with the limits given in the proposed Portuguese guideline for the microbiological quality of sand. Based on these results, this selected beach area was determined to be "good." However, the microbiological quality of the beach area is necessary to be monitored using both sea water and sand.

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