ASSESSMENT OF MICROBIOLOGICAL QUALITY OF WATER IN SEA BATHING SITES IN THE WEST COAST OF SRI LANKA

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Abstract

Globally, there is a growing interest in investigating microbiological water quality (WQ) in sea bathing sites due to the increasing coastal pollution. This is more important for islands such as Sri Lanka, since coastal pollution has considerable socio-economic implications. Therefore, this study was conducted to assess the current status of the WQ in two sea bathing sites; Mount Lavinia (ML), Moragalla (MR) and a reference site in Kalutara district of Sri Lanka. Since ML (Colombo district) and MR (Kalutara district) are two popular sea bathing sites among tourist, these sites were selected for the study. Further, non-bathing site in Kalutara district was selected as the reference site. Weekly changes of WQ parameters of the selected sites were recorded for three months and microbiological tests were performed to detect fecal coliforms (FC) and fecal streptococci (FS) in each sample separately. The comparison of WQ parameters in all three sites during the experimental period was conducted by ANOVA using Minitab 16 software. Sanitary inspection was conducted in both sea bathing sites to identify the potential sources of fecal contamination and finally beach suitability grades (BSG) were determined by combining categories obtained from sanitary inspection and microbial assessment. Results showed that temperature, dissolved oxygen and pH were in standard range for healthy sea bathing sites whereas other physio-chemical WQ parameters including salinity, conductivity, turbidity and total dissolved solids were below the standard range throughout the experimental period. A significant different was observed in temperature, salinity, total dissolved solids and electrical conductivity among three experimental sites ($P<0.05$). Further, ML has reported significantly higher FC count compared to the reference site ($P<0.05$). Based on the FC count, BSG for both ML and MR Sea bathing sites were determined as 'very high'. However, based on FS count, the BSG for ML and MR were 'poor' and 'fair' respectively. Hence, it is recommended to develop and implement strategies including environmental education, WQ monitoring procedures and beach management to create healthy sea bathing sites in Sri Lanka.