

Enteric Bacterial Communities Associated with the Omubhira Stream in Kakamega County, Kenya

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Abstract

The present study was undertaken to establish the distribution and diversity of enteric bacterial communities along the Omubhira stream and also determine if physico-chemical parameters influence their distribution in water in terms of total coliforms (TC) and *Escherichia coli*. Stratified random sampling was used and four strata with 15 selected sampling sites identified along the stream. Selection of the sampling sites was in relation to land use activities that are likely to be sources of bacterial contamination to the stream. The results of bacteriological analysis of water quality revealed that water from some of the selected sites of the stream had bacterial loads that exceeded the WHO value/guidelines for water for recreational use. Mean comparison of coliforms counts using a one way ANOVA test revealed that the difference in coliforms among the sampling sites of Omubhira stream was significant ($F=18.324$, $P=0.0005$). Pearson product-moment correlation showed that there was a strong positive correlation between *Escherichia coli* and electrical conductivity which was statistically significant ($r = .413$, $n = 80$, $p < .0005$), total dissolved solids ($r = .408$, $n = 80$, $p < .0005$), dissolved oxygen ($r = .446$, $n = 80$, $p < .0005$) and total coliforms ($r = .983$, $n = 80$, $p < .0005$). However, there was no relationship between faecal coliforms and temperature, total suspended solids and pH which was not statistically significant; temperature ($r = .185$, $n = 80$, $p > .101$), total suspended solids ($r = -.118$, $n = 80$, $p > .298$) and pH ($r = -.089$, $n = 80$, $p > .433$). The bacteria isolated from water samples in this study included *Escherichia coli*, *Enterobacter spp.*, *Citrobacter spp.*, *Proteus spp.*, *Serratia spp.*, *Shigella spp.*, *Providencia spp.*, *Morganella spp.*, *Salmonellae spp.* and *Klebsiella spp.* *Escherichia coli* was the most predominant enterobacterial isolate during both the dry and the wet season. Intervention measures including creating awareness; educating residents on hygiene practices on the use of Omubhira stream water and improvement of sanitation should be implemented.

Keywords: Enteric bacteria, Omubhira stream, *Escherichia coli*, Total coliforms (TC),