

**ANALYSIS OF WATERBORNE ENTERIC BACTERIA IN THIBA RIVER OF
KIRINYAGA COUNTY AND THEIR SEASONAL VARIATION**

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ABSTRACT

Water is essential requirement for life and survival for all life forms. However, water pollution and interference with and of ecosystems is on the rise universally. Pollution of water sources with microbes, including bacteria, viruses, parasites, as well as fungi, has been on increase in the recent past. The major source of microbes in water is faecal contamination. Thiba River is facing serious water pollution due to discharge of industrial, commercial and domestic waste. Consumers downstream however, pump and use raw water from this river for cooking, drinking and irrigation without information of health implication it would pose to them. This study aimed at analysing waterborne enteric pathogens in the water of Thiba River and their seasonal variations. Water samples were collected from Thiba River located in Kirinyaga County. A purposive convenient study design was used. Standard method of isolation of bacteria was performed. Characterization and identification of the isolates was performed by morphological and biochemical methods. The enumeration of enteric bacteria revealed that the number of faecal coliform (*E. coli*) in water was higher than standard set by World Health Organization. The number of faecal coliform (*E. coli*) was varying in different seasons and at different stages of the river. The health impact of that unsafe drinking water could be the prevalence of diarrhoea in the population. Such water with a high number of total and faecal coliform could be the potential sources of waterborne enteric pathogens. Bacteria belonging to eight genera were isolated and identified as follows; *Escherichia sp*, *Salmonella sp*, *Klebsiella sp*, *Proteus sp*, *Enterobacter sp*, *Erwinia sp*, *Serratia sp*, *Citrobacter sp* and *Vibrio sp*. The frequency of isolation of the organisms identified varied as follows; *E. coli sp* (38%), *Salmonella sp* (19%), *Klebsiella sp* (9%), *Proteus sp* (9%), *Enterobacter sp* (7%), *Erwinia sp* (6%), *Serratia sp* (4%), *Shigella* (4%), *Citrobacter sp* (3%) and *Vibrio sp* (1%). The microbial counts were statistically significantly higher in the rainy season ($f=690.983$; $P<0.0001$) than the dry season ($f=74.690$; $P<0.0001$). This study has established and identified several waterborne enteric pathogens in Thiba River and recommends that strict measures to be taken to prevent water contamination in this river.