Title: Comparative Load of *Escherichia coli* in DAM3 AND DAM5 Of the University of Embu

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Abstract

Escherichia coli (*E.coli*) hardiness, versatility, broad use and ease of handling have made it the most intensively studied and best understood organism worldwide. However, research on *E.coli* has primarily examined it as a model organism, one that is abstracted from any natural history. It is a highly diverse organism with a complex, multi-faceted niche in the wild. Recent studies of 'wild' *E.coli* has, for example, revealed a great deal about its presence in the environment, its diversity and genomic evolution, as well as its role in the human micro biome and disease. *E.coli* is the best indicator of bacteriological quality of water. This, coupled with availability of affordable, fast, sensitive, specific and easier to perform detection methods, makes water analysis simple. University of Embu dams are surrounded by various agricultural practices and human habitats. Such occurrences could lead to contamination of surrounding waters through surface run offs. This experiment intends to determine the comparative load of *E. coli* between dams 3 and 5 of the University of Embu. Water was collected and tested using the Most Probable Number (MPN). MPN is a method used to estimate the concentration of viable microorganisms in a sample by serial dilution. It is commonly used in estimating microbial populations in soils, water and agricultural products. MPN is most commonly applied for quality testing of water i.e. to ensure whether the water is safe or not in terms of bacteria present in it. A group of bacteria commonly referred as fecal coliforms act as an indicator for fecal contamination of water. The presence of very few fecal coliform bacteria would indicate that water probably contains no disease-causing organisms, while the presence of large numbers of fecal coliforms would indicate a very high probability that the water could contain disease-producing organisms making the water unsafe for consumption. Water being tested was diluted serially and inoculated in MacConkey agar which is both a selective and differential media. It contains bile salts and the dye crystal violet, which inhibit the growth of gram-positive bacteria and select for gram-negative bacteria. It also contains the carbohydrate lactose, which allows differentiation of gram-negative bacteria based on their ability to ferment lactose. Organisms which ferment lactose produce acid end product which reacts with the pH indicator neutral red, and produce a pink color. Both dams have high number of E.coli loads though the greatest number was observed in dam 3.E.coli grows in a number of substrates like skimmed milk ,xylose and cellulose and stains negative during gram staining due to the presence of peptidoglycan in their cell wall. Regular water quality analysis should be done and agricultural activities within water bodies avoided to reduce microbial runoffs and contamination of water bodies.