Suitability of total coliform β-D-galactosidase activity and CFU counts in monitoring faecal contamination of environmental water samples

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Abstract

Total coliforms are a group of bacteria found in high numbers in mammalian intestines; hence their presence in water indicates the possible contamination with faecal material. Total and faecal coliform counts were monitored over a period of 18 months using mFC, m-Endo and CM1046 media together with enzymatic assays on 215 environmental water samples obtained from the Eastern Cape Province of South Africa. A positive correlation, with an R^2 value of 0.9393 was observed between faecal and total coliform colony units employing mFc and m-Endo media, and 0.8818 using CM1046 media. Also, a positive correlation was observed between *Escherichia coli* colony-forming units and β-D-galactosidase (B-GAL) activity (R^2=0.8542). Overall, this study indicated that faecal contamination of environmental water samples could be monitored by measuring total coliform β-galactosidase activity and total coliform colony-forming units.

Keywords: colony-forming units (CFUs), coliforms, *E. coli*, β-D-galactosidase (B-GAL), β-D-glucuronidase (GUD)