Detection of viable bacteria in environmental water samples using DNase I and PCR method

Abstract

In this study, we tested the potential application of a previously developed method in detecting *Escherichia coli* in environmental water samples. To increase the sensitivity of the method, and the recovery of microbial cells, water samples were filtered before being subjected to DNase treatment and polymerase chain reaction amplification. Results showed that DNase I treatment and PCR reaction were not affected by inhibitors as the expected amplicon was successfully amplified in autoclaved environmental waters spiked with *E. coli*. Then, we applied this method to naturally contaminated environmental water samples. We firstly confirmed the presence of coliforms and *E. coli* in these water samples by plating in eosin methylene blue agar. Simultaneous PCR amplification targeting *Lac Z* and *uidR* gene of total coliforms and *E. coli* respectively demonstrated that this developed method is potentially applicable for routine microbial assessment of health risks related to viable microorganisms in environmental or drinking waters.