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Real-time detection of adenovirus and faecal indicator bacteria in the discharged final effluents of two wastewater treatment facilities in the Eastern Cape Province of South Africa

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Exposure to pathogenic microorganisms can occur via drinking water associated with faecal contamination; seafood from wastewater contaminated rivers or fresh produce irrigated or processed with contaminated water. Frequent disposal of untreated or poorly treated wastewater effluent remains a major source of surface water pollution particularly in developing countries. The current study attempted to detect and quantify the prevalence of human adenovirus (HAdV) and faecal indicator bacteria (FIB) in the discharged effluents of two selected wastewater treatment facilities in the Eastern Cape Province of South Africa. Wastewater samples were collected monthly from the final effluents tanks and the points of discharged of the final effluents into the receiving watershed for twelve months (September 2012 to August 2013). Forty eight samples were collected in all. Detection and quantification of HAdV was done using quantitative real-time polymerase chain reaction (qPCR) while the detection and enumeration of FIB (including faecal coliforms and *Escherichia coli*) was done using standard membrane filtration techniques (MF). HAdV was detected in 87.5% (42 out of 48) wastewater samples with concentration ranging from 8.4×10^1 genome copies (GC)/litre to 1.0×10^5 GC/litre. Presumptive FIB counts ranged between 0 and 2.7×10^4 CFU/100 ml for faecal coliforms and between 1 and 1.2×10^5 CFU/100 ml for *E. coli*. Lack of correlation between FIB counts and HAdV concentrations highlights the inadequacy of using FIB as surrogate for enteric virus assessment in water system. The outcome of this study suggest a need for proper monitoring of wastewater treatment plants to ensure that pathogenic microorganisms including enteric viruses of public interest are properly inactivated by disinfection before treated wastewater effluents are released back into environment.

Biography

Martins Ajibade Adefisoye is currently registered for PhD at the Department of Biochemistry and Microbiology, University of Fort Hare South Africa. His current research interest covers the area of water and wastewater quality monitoring around the Eastern Cape Province of South Africa. He has presented some of his findings at different conferences and published some in reputable journals.

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