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National University of



Science and Technology

DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY

(ARUTA (N003 221M))



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STERILIZATION OF WATER USING SUNLIGHT

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Degree in Applied Biology and Biochemistry

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ABSTRACT

The feasibility of using sunlight to inactivate faecal bacterial contaminants in drinking water has been evaluated using water samples from Masendu Dam (Plumtree), Mzingwane River (Esgodini), Khami Dam (Bulawayo), Khumalo Well and water artificially contaminated with *E.coli*. Freshly drawn samples from all three sources were assumed to have an oxygen content of more than 3 mg per liter. However, vigorous mixing followed by exposure to full-strength sunlight in transparent plastic containers (2 liter capacity) caused a rapid decrease in the counts of faecal indicator bacteria, giving complete inactivation within 3 ± 6 hours, with no evidence of reactivation except for Khami Dam water which was realized to be heavily contaminated with sewage. The detection methods used for bacterial enumeration are total bacteria plate count test, total coliform test, total faecal coliform test and the most probable number (MPN), the tests were carried out before and after exposure to sunlight. These results demonstrate that sunlight may provide a practical, low-cost approach to the improvement of drinking water quality in developing countries with consistently sunny climates.