Microbiological quality of packaged bottled water product sold in Ovia North East and Ovia South-West Local Government Areas of Edo State, South-South Region of Nigeria

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Abstract

Non-portable drinking water can predispose human consumers to preventable life-threatening diseases. Hence, this research evaluated the extent of contamination of commercially packaged bottled water product sold in Ovia North East and Ovia South-West Local Government Areas (LGAs) of Edo State, South-South region of Nigeria. Eight popular brands of bottled water product that were sold in these LGAs were selected for sampling. Heterotrophic plate count (HPC) was carried out on the water samples with the pour-plate technique. The most probable number technique (MPN) was used to estimate the total coliform count (TCC). Bacterial isolates were subsequently identified with phenotypic tests and 16S rRNA gene sequencing techniques. In the brands of bottled water product where bacterial colonies were isolated, mean HPC of the samples from these brands ranged from 0.25 ± 0.25 CFU/ml to 4.75 ± 2.93 CFU/ml. However, these HPC values were within recommended limits of   100 CFU/ml stipulated by the World Health Organization (WHO) and the National Agency for Food and Drug Administration and Control (NAFDAC). Values of TCC were less than 1.00 ± 0.00 MPN/100 ml in all the brands of bottled water product examined, and were, therefore, within recommended limits of 10 MPN/100 ml stipulated by WHO and NAFDAC. *Bacillus subtilis*, such as *B. subtilis* strain PDA 231 and *B. subtilis* strain NVS 11, were the main bacterial species that were isolated. Hence based on the recommended microbiological limits of WHO and NAFDAC, all the different brands of bottled water product examined were confirmed to be fit for human consumption and would not pose any adverse health effects.

Key words: Bacillus subtilis, Portable, Diseases

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