Physicochemical and Microbiological Assessment of Source and Stored Domestic Water from Three Local Governments in Ile-Ife, Nigeria

Authors : Mary A. Bisi-Johnson, Kehinde A. Adediran, Saheed A. Akinola, Hamzat A. Oyelade

Abstract : Some of the main problems man contends with are the quantity (source and amount) and quality of water in Nigeria. Scarcity leads to water being obtained from various sources and microbiological contaminations of the water may thus occur between the collection point and the point of usage. Thus, this study aims to assess the general and microbiological quality of domestic water sources and household stored water used within selected areas in Ile-Ife, South-Western part of Nigeria for microbial contaminants. Physicochemical and microbiological examination were carried out on 45 source and stored water samples collected from well and spring in three different local government areas i.e. Ife east, Ife-south, and Ife-north. Physicochemical analysis included pH value, temperature, total dissolved solid, dissolved oxygen, and biochemical oxygen demand. Microbiology involved most probable number analysis, total coliform, heterotrophic plate, faecal coliform, and streptococcus count. The result of the physicochemical analysis of samples showed anomalies compared to acceptable standards with the pH value of 7.20-8.60 for stored and 6.50-7.80 for source samples as the total dissolved solids (TDS of stored 20-70mg/L, source 352-691mg/L), dissolved oxygen (DO of stored 1.60-9.60mg/L, source 1.60-4.80mg/L), biochemical oxygen demand (BOD stored 0.80-3.60mg/L, source 0.60-5.40mg/L). General microbiological quality indicated that both stored and source samples with the exception of a sample were not within acceptable range as indicated by analysis of the MPN/100ml which ranges (stored 290-1100mg/L, source 9-1100mg/L). Apart from high counts, most samples did not meet the World Health Organization standard for drinking water with the presence of some pathogenic bacteria and fungi such as Salmonella and Aspergillus spp. To annul these constraints, standard treatment methods should be adopted to make water free from contaminants. This will help identify common and likely water related infection origin within the communities and thus help guide in terms of interventions required to prevent the general populace from such infections.

Keywords : domestic, microbiology, physicochemical, quality, water