PHYSICO-CHEMICAL AND BACTERIOLOGICAL ANALYSIS OF SELECTED BOREHOLE WELL WATER SAMPLES IN THE OMANJOR COMMUNITY IN THE ACCRA METROPOLIS, GHANA

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ABSTRACT

The quality and safety of groundwater normally changes slowly because more often the water is not directly exposed to pollution sources but can become contaminated as a result of improper drilling of wells and improper waste disposal procedures in the vicinity of the well. This study was to evaluate the physico-chemical and bacteriological quality of selected borehole well water samples in the Omanjor community, Accra Metropolis, Ghana. Samples of water for the investigations were collected in sterile bottles (200 ml). All the 5 selected borehole wells water had their water pumped into tanks and stored in overhead poly-tanks prior to fetching. Physico-chemical parameters were determined using standard instruments and methods whiles the presence of pathogenic bacteria were detected, isolated, and identified by the multiple tube/most probable number (MPN) method, culture, and biochemical testing. The ranges of mean values of the various physico-chemical parameters of the selected borehole water samples investigated were temperature (29-31^{o}C), pH (7.2-7.5), and dissolved oxygen (5.6-6.9 mg/l). Also turbidity and electrical conductivity mean values ranged from 1.3-2.2 neophelometric turbidity units (NTU), and 510.5-869 microSiemens per centimeter (µS/cm) respectively. All the physico-chemical parameters except conductivity values were within the permissible limits of the United States Environmental Protection Agency (EPA) and World Health Organization (WHO) standards. However, the mean MPN/100 ml values ranged 1-98. The most prominent bacteria isolated from the water samples were coliforms including species of *Citrobacter*, *Enterobacter*, and *Klebsiella*. Although no faecal coliforms were isolated from the selected borehole water samples investigated and also the 3 bacterial strains isolated and identified are still under debate as there should be used as indicators of feacal contamination of water bodies there is still the need for proper sanitary checks and regular maintenance to prevent future contamination of the borehole water in Omanjor community, Accra Metropolis, Ghana.

Keywords: Borehole water, physical, chemical, bacteriological analysis, enterobacteriaceae.