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Short Communication

Microbiological Assessment of Well Water Obtained in Burutu Town, Delta State, Nigeria

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Abstract

This study was carried out to assess the microbial quality of ground water sources (well water) in Burutu town. Five randomly selected wells from five(5) areas of the town were selected and water samples obtained. The samples were subjected to standard methods of analysis. The results showed that the total coliform present in the water samples ranged from 2204 cfu/100ml to 2477 cf/100ml. These values are far above the World Health Organization (WHO) standard of 0cfu/100ml (absence of coliform) for safe potable water. These values may be as a result of poor groundwater source (well) construction, poor handling and lack of maintenance. Individuals who utilize water from these wells for consumption and domestics purposes are at risk of contacting water borne diseases if not properly treated before use.

Keywords: Ground water, Glaziers, ice caps, Water borne disease, Analysis and Microbes.

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Introduction

Water is viewed as the dissolvable of life (Reece *et al*., 2013), as it is fundamental for the endurance of each type of life, and the requirement for water is continually expanding because of high paces of populace development and urbanization. In any case, the expanded requests for water for drinking, residential, agrarian and modern procedures are not equivalent with water accessible, accordingly presenting critical dangers in keeping up worthy water quality (DESA, 2008). It is believed that by the year 2025, the greater part of the total populace would be confronted with water-based weakness (Kulshreshthan, 1998). Water is an all inclusive and significant dissolvable required throughout everyday life. It has numerous utilization relying upon needs of people. Water covers over 70% of the world's surface. It makes what we call groundwater and surface water, for example, well, waterway, downpour, stream, and so on (Fashae *et al*., 2017; Herman, 2009, 2010; Khongwir *et al*., 2014; Slimani and Kalla, 2017; Yasin *et al*., 2015). According to the Water Project (2016), WHO (2016), UNDP (2014) and Living Water Africa (2016), about one billion people do not have access to clean and save water. In many places of the world, access to water has been potentially a critical factor in alleviating poverty and enhancement of economic growth.

Groundwater represents an important source of water and constitutes the largest source of dug well water, as well as borehole water. Water from these shallow and profound wells is frequently of preferable quality over surface vast water source; if the dirt is fine-grained and its bedrocks don't have breaks, hole and bedding plants which license the free section of contamination water. The accessibility and virtue of groundwater are influenced by area, development and activity of wells. It is regularly expected that common uncontaminated water from profound wells is spotless and solid, and this is normally evident with respect to bacteriological synthesis.

There are numerous wellsprings of water defilement, notwithstanding, the vast majority of them are arranged or ordered into two gatherings, specifically: immediate and roundabout sources. The immediate sources incorporate profluent outfalls and squanders from industrial facilities, processing plants squander treatment plants, sewage treatment plants, and horticultural practices (manures and pesticides), and so on, that produces liquids of different characteristics legitimately into urban water supplies. Backhanded sources incorporate sources incorporate contaminants that enter the water gracefully from soils or underground frameworks and from the air by means of downpour water and human practices, (for example, vaporous oversights from autos, industrial facilities and even pastry kitchens).

Different wellsprings of water defilement emerge from the poor development, absence of support and poor treatment of water gracefully frameworks, particularly ground water, (for example, wells and boreholes).

The nature of water from ground or surface can be affected anytime by the lithology of the bowl, environmental, climatic, and anthropogenic information sources (Shrestha *et al*., 2008; Al Aizari *et al*., 2017). Tainting of water are from anthropogenic sources of info which are man-produced using urban, modern and agrarian exercises, traffic, and expanding utilization of water assets) and furthermore from common procedures which remember changes for precipitation inputs, disintegration, enduring of crustal materials.

Tainting of water debilitates its utilization for drinking, modern, rural, diversion or different purposes (Muangthon, 2015).

Defilement of water is related gastrointestinal disease in people, with sickness, retching, and additionally looseness of the bowels, pneumonia (Yu, 2000; Ahmed *et al*., 2010), dreariness among small kids (Heyworth *et al*., 2006), typhoid fever, cholera, hepatitis A, flu, dengue, and leptospirosis (Rappler, 2015).

All through the world, a few research works have been done. Ahmed *et al*. (2010) decided the microbial dangers of water acquired in Australia, Al Aizari *et al*. (2017) evaluated the nature of groundwater in Dhamar City, Yemen, Budiwati *et al*. (2016) chipped away at the synthetic qualities of water in Sumatera, Indonesia, same was recorded for Nigeria (Bada *et al*., 2012; Abulude *et al*., 2017). No records of such evaluations were found for ground water in Buruku town in Nigeria. It won't be strange if the water found in this area is assessed for its quality.

Some portion of the 2030 Agenda is Good Health and Well-being (Goal 3) and Clean Water and Sanitation (Goal 6) (UN, 2018). These imply that there must be water accessible for utilize each season and should be spotless and solid for use. This motivation can't be accomplished if groundwater isn't kept sterile. Not all waters can be put away particularly whenever debased (truly, artificially, and microbiologically) and steady checking must be guaranteed. Before water can be tanked or saved for sometime later, the quality should initially be determined. It is on this reason our exploration depended on the evaluation of the nature of well water in Burutu town dependent on the microbiological properties.

The reason of this paper was to determine the microbiological constituents of well water got in Burutu Town, Delta State, Nigeria.

Materials and Methods

The well water was obtained in five extraordinary (Amba, Okorodudu, Low Beach, Quarters, and Court street) zones in Burutu town, Delta State with plastic pails pre-washed with dilute HCl, flushed with refined water and later with a lot of water from the areas. The water was then moved into the plastic containers and secured after all the air bubbles had been wiped out. The samples were marked and sent to the lab for examination after six hours of assortment. The climate around there is a tropical atmosphere which is made of downpour (April-October) and dry (November-March) seasons. The testing locales were encircled by horticultural fields, trees, private structures, untarred streets for vehicular exercises (low traffic), and homesteads.

The nutrient agar was prepared by weighing 28g of the powdered nutrient agar and dissolving in 100ml of distilled water. The resulting solution was then heated to boiling point to dissolve the medium completely. It was then sterilized by autoclaving at 121^{O} C (15 ibs pressure) for 15 minutes. The sterilized nutrient agar was then allowed to cool (50^{O} C).

The determination of the total coliform in the water samples was carried out using the plate count method. The recently prepared warm molten nutrient agar was added to 100ul (approximately 2 drops) of the water sample in a Petri dish and allowed to cool and solidify, after which it was inversely placed in the incubation period of 24 hours at 37 ^{O} C. At the end of the incubation period, the colonies formed were counted and recorded and their corresponding coliform forming units were recorded.

Data obtained were generated in triplicates and analyzed, using Minitab 16 Statistical Software.

Results and Discussion

Table 1: Results obtained from the microbial analysis of water samples

s/n	Location of Groundwater source (Well)	Total coliform (cfu/100ml)	WHO standard (cfu/100ml)
1	Amba	2380±0.06	0
2	Okorodudu	2462±0.05	0
3	Low Beach	2431±0.05	0
4	Quarters	2477±0.08	0
5	Court Road	2204±0.05	0

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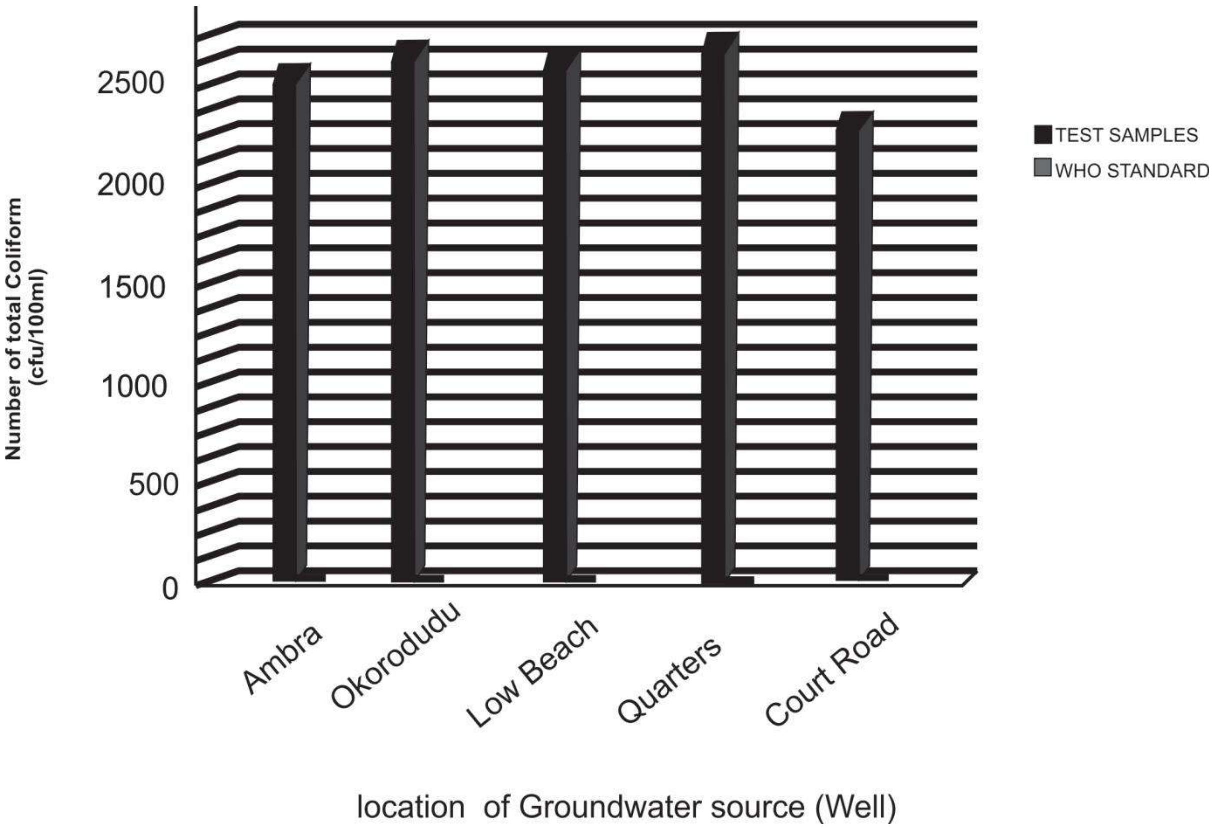

Figure 1: Comparison of test samples values with WHO standard values.

Table 1 and Figure 1 portray the qualities acquired for the microbiological examinations in the investigation. The outcomes got show that the Total coliform in Quarters (2477 cfu/100ml) and Okorodudu (2462 cfu/100ml) had the higher qualities compared to those from different destinations (Amba, Low Beach, and Court Road, 2380, 2431, and 2204 separately). In comparing with the WHO standard, the outcomes here are a lot higher. This uncovers none of water tests satisfied the WHO suggested guideline of 0cfu/100ml for safe consumable drinking water.

This demonstrates the water tests acquired from individual wells are defiled with microbial contaminants and represent a high danger of transmitting water-borne sicknesses because of the significant level of all out coliform. It subsequently shows that occupants and creatures of Burutu town who use such wells as wellspring of water for utilization and for residential purposes face genuine wellbeing hazard emerging from the transmission of any at least one of the diverse water-borne illnesses.

Conclusion

Water is a significant asset that is fundamental forever, populace development and urbanization has realized a regularly expanding interest for safe consumable water, particularly in numerous networks and towns in creating nations has prompted the dependence and usage of dangerous defiled water. Burutu town is one of such networks, and occupants rely essentially upon well water as significant wellspring of water. From this examination, it has been uncovered that the well water in Burutu town are anyway exceptionally tainted with all out coliform that far surpasses the World Health Organization (WHO) standard. This suggests occupants of Burutu town are continually confronted with wellbeing dangers related with the utilization and usage of sullied water got from these sources.

Recommendation

Based on the findings of this study, the following recommendations were made:

- The consumption of water obtained from this the wells in Burutu town should be strictly avoided.
- The periodic availability of relatively less contaminated sources of water (eg. Rain water) should be harnessed by way of harvesting and storage.
- There is the need for the proper sitting and construction of wells
- The handling and maintenance of wells should be greatly improved upon Water treatment processes (such as filtration, chlorination, boiling, use of disinfectant, etc) should be carried out before utilization of the water.
- There should be safe potable water for residents of Burutu town.

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