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MICROBIOLOGICAL ASSESSMENT OF BOREHOLE WATER IN NAGONGERA TOWN COUNCIL, TORORO UGANDA

BY

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A RESEARCH REPORT SUBMITTED TO THE DEPARTMENT OF BIOLOGY IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF BACHELORS OF SCIENCE EDUCATION (BIOLOGICAL) OF BUSITEMA UNIVERSITY

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DECLARATION

I Chelangat Emmanuel, Reg. No. BU/UP/2019/1532, hereby declare that this research project report as my original work, and has never been submitted to any board of examiners for award of degree in Bachelor of Science and education or any other kind of qualification.

Signature ..... Date.....17/may/2023.....

CHELANGAT EMMANUEL

APROVAL

This research project Report has been submitted with approval of my supervisor.

Signature.....Date.....May 17, 2023.....

Dr. Ochieng Hannington

DEDICATION

I wholly dedicate this research to my lovely Mother Chemutai Janet, my uncle, my sisters, brothers and to all my classmates of biology, Nagongera campus, Busitema University.

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ABSTRACT

The quality of drinking water is necessary for good health. Many diseases have been associated with poor drinking water quality including diseases caused by diarrheagenic pathogens, especially in developing countries where access to a consistent water supply is a problem. The objective of the study was to evaluate the health risks and quality of drinking water in Nagongera town council Tororo district using *E. coli* as a measurement tool. In this study, four functional boreholes were selected and drinking water samples were collected and assessed for their quality. Water samples were obtained from boreholes A which is behind Nagongera gospel church, B in joy Christian school and C in Nagongera mosque and *E. coli and total coliform* counts were determined using the pour plate method. Assessment for suitability was done using the WHO drinking water quality assessment guidelines. Generally, the study revealed significantly higher *E. coli* counts than the total coliform counts in the sampled boreholes , water samples from borehole A was found to poses the highest count compared to water samples from borehole B and C as seen from table 2 bellow. In conclusion, observations from the study implied that most water sources in the study district are highly polluted with bacteria pathogens beyond recommended safety guidelines. The main causes of faecal contamination in these water sources were purported to be anthropogenic. Therefore, there is a need to formulate a policy aimed at managing and improving rural water sources.

KEY TERMS

Borehole water, microbes, microbiological assessment, total coliform, E-coli

ACRONYMS

EMB agar – Ethyl methyl blue agar

CFU- Colony forming unit

WHO-world health organization

TC –Town council

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CHAPTER ONE: INTRODUCTION

1.0 Background

Ground water (borehole water) is widely used in Nagongera town council located in Tororo district, eastern Uganda. More than 70% of the population here use borehole water more than the municipal water distribution systems, 80 to 95% of all drinking and domestic water comes from boreholes; drinking water quality is a sensitive issue. Despite a generally high level of drinking water safety, contamination events do occur. (Karthe, Rehkopp, Faust, & Reeh, 2017). This addresses the question whether the quality of this water safe for human consumption due to increasing risks of microbial contamination. My investigation was based on a quantitative analysis of different water microbes in water samples from different water bore holes. The greater dependence on this source has not resulted in corresponding understanding of microbiological process that occurs in the ground environment as water table keeps on changing due to climatical changes and human activities.(B. K. Singh, Bardgett, Smith, & Reay, 2010), increasing attention was given to predicting the fate and effect of ground water contamination on microbiological quality of the resource therefore an investigative study was needed to be carried out to determine the microbial quality of those borehole water samples using basic methods. The total coli form count was then determined by pour plate technique. Coli-form bacteria are important factors for assessing the water safety because these bacteria are well-known indicators of faecal contamination. (Momba & Notshe, 2003). This guided us if the waters from those sources were safe for consumption or not. A t test method was used to test the hypothesis and bar graph to compare the prevalence of total coliform and e-coli in the four sample boreholes then proper measures was to be taken in cleaning and treating of bore hale water for consumption.

1.1 Problem statement

Many individuals have trouble getting access to clean water. In developed nations in Africa, such as Uganda, access to clean water is not the norm and waterborne diseases are frequent. While having a clean and treated water supply to every home may be the standard in Europe and North America, it is not the case in developing nations in Africa. Over 5 million people die each year from diseases linked to water, says the WHO. More than 50% of them are intestinal infections caused by microbes.

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