

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى

° وَجَعَلْنَا مِنَ الْمَاءِ كُلَّ شَيْءٍ حَيٍّ أَفَلَا يُؤْمِنُونَ

صدق الله العظيم

سورة الأنبياء الآية 30

## **Preface**

This work was carried out at the Laboratory Administrations, Khartoum State, Public Health Laboratory, under supervision and guidance of *Prof. Samia Ahmed Gumaa, Professor of Microbiology, Faculty of Medicine, University of Khartoum.*

## **DEDICATION**

*To my family, friends, colleagues  
and*

*To all those I have learned from*

*With love*

*Feda*

# **Acknowledgement**

*All thanks to Allah, the Lord of the World.*

*I would like to express my sincerest gratitude to my supervisor **Prof. Samia Ahmed Gumaa**, Professor of Microbiology, University of Khartoum, for her close supervision and guidance throughout the study period. To have the opportunity of working with her has been a great privilege.*

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## ملخص الأطروحة

أجريت هذه الدراسة لتحديد النوعية الجرثومية لمياه الشرب الجوفية بمحافظة أم درمان-محلية الثورة خلال فصول السنة الثلاث ( الصيف الخريف الشتاء ) وذلك فى الفترة من أغسطس 2002م إلى أبريل 2003م.

جمعت 54 عينة مياه من 18 بئر (عينه لكل فصل من الفصول المذكوره ) لإجراء الفحص البكتيري باستخدام طريقة Multiple Tube Method لتحديد القولونيات الكلية ( *Total Coliform* ) وبكتريا الاشريكية القولونية (*E. coli*) والقولونيات الغائطية ( *Faecal Coliform* ).

أثبتت الدراسة أن مياه الآبار الجوفية كانت خالية من أى تلوث بجميع أنواع البكتريا الثلاث فى جميع فصول السنة فى كل من حارات الثورة التاسعة (ب)، 11(ب) ، 14، 23، 25 حيث تمثل 27.7% من مجموع الآبار، وجد أن ال MPN يساوى صفر. بينما أثبتت الدراسة وجود البكتريا القولونية غير الغائطية فى فصل واحد من فصول السنة بكل من مدينة النيل (ب) فى فصل الخريف (MPN يساوى 11) الحارة 4 (MPN يساوى 18) فى فصل الخريف، 10 (ب) (MPN يساوى 13) فى فصل الشتاء، بينما فى فصلين من فصول السنة بمدينة النيل (أ)، فى فصل الخريف (MPN يساوى 20) وفى فصل الصيف (MPN يساوى 17). بقية الآبار كانت مياهها صالحة للشرب وكان (MPN أقل من 10). أكدت الدراسة أن التلوث البكتيري يزداد فى فصل الخريف.

## ABSTRACT

This study was carried out to assess the bacteriological quality of ground water in Omdurman, Elthawra Locality.

Fifty-four samples from 18 wells (one sample for each of the three seasons), were collected and examined bacteriologically to detect total coliforms, faecal coliforms and *E. coli*. The method used was Multiple Tube Method.

The study was conducted during the period from August 2002 to April 2003 so as to cover the three seasons (Winter, Summer and Autumn) in Sudan, as spring is not noticed in Sudan.

The study showed that, the ground water quality was excellent in 27.7% of the study area, namely Hara 9(B), 11(B), 14, 23 and 25 which was evidenced by MPN zero throughout the duration of the study. Other site showed the presence of total coliforms, Madinat Elneel (B) (MPN = 11) in Autumn, Hara 4 (MPN = 18) in Autumn and 10(B) (MPN = 13) in Winter.

Madinat Elneel (A) showed coliforms bacteria during two seasons (MPN = 20) during Autumn and (MPN = 17) in Summer. The other sites showed good quality of water (MPN <10).

The study confirmed faecal contamination in Riyadh (Hara 8) during the three seasons of the study. The study found that, there was a seasonal variation of ground water quality. The high number of bacteria were detected during the rainy season.

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### **List of Abbreviation:**

WHO: World Health Organization

UNESCO: United Nations Education Science and cultural Organization

IHP: International Hydrology Program

MPN: Most Probable Number

BOD: Biological Oxygen Demand

CO:D: Chemical Oxygen Demand