

**MICROBIAL DIVERSITY OF SACHET WATER PACKS AND ITS HEALTH
IMPLICATIONS**

BY

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CERTIFICATION

This is to certify that **OKUNOLA, OLUWASEUN JOY** (Matric No: **16PCQ01452**) carried out this research work in partial fulfilment of the requirements for the award of Master of Science (M.Sc.) degree in Microbiology of Covenant University, Ota, under the supervision of **Prof. Solomon U. Oranusi**.

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Signature and Date

DECLARATION

It is hereby declared that this research work titled “**MICROBIAL DIVERSITY OF SACHET WATER PACKS AND ITS HEALTH IMPLICATIONS**” was undertaken by **OKUNOLA OLUWASEUN JOY**. It is based on original study in the Department of Biological Sciences, College of Science and Technology, Covenant University, Ota, under the supervision of Prof. Solomon. U. ORANUSI and the ideas and the views of other researchers have been dully expressed and acknowledged.

OKUNOLA OLUWASEUN JOY

(Student)

Signature and Date

DEDICATION

I dedicate this work to the Almighty God; my help since ages past.

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All praise be to God Almighty in Heaven without whom I would have never made it this far, His name alone be highly exalted.

My most profound gratitude and heartfelt appreciation goes to my supervisor, Prof. S.U. ORANUSI for his patience and guidance, throughout the course of this project. God bless you sir.

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With Love

Oluwaseun

TABLE OF CONTENT

CERTIFICATION	ii
DECLARATION	ii
DEDICATION	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	xi
ABSTRACT	xii
CHAPTER ONE	1
INTRODUCTION	1
1.1 Statement of Research Problem	6
1.2 Justification	7
1.3 Aim and Objectives	7
CHAPTER TWO	8
Literature Review	8
2.1 Sources of Drinking Water	8
2.1.1. Rivers and streams.	8
2.1.2. Lakes.	9
2.1.3. The Sea	9
2.1.4. Rainwater.	9
2.1.5. Wells.	10
2.1.6. Reservoirs	10
2.2 Human Health and Water Quality	10
2.3 Drinking Water Quality and Regulations	12
2.4 Microbiological Water Contamination	13
2.5 Fecal Coliforms and <i>E.coli</i> as Indicator Organisms	14
2.6 Factors Affecting Water Quality	15
2.7 Water-Related Diseases	16
2.8 Water Borne Diseases	18

2.9 Bacteriological Analysis of Water	18
<u>2.10</u> Physicochemical Analysis of Water	19
<u>2.11</u> Hand as a Vector Of Microorganisms.....	21
CHAPTER THREE.....	26
Materials and Methods.....	26
3.1 Study Sites.....	26
3.1.2 Samples Collection	26
3.2 Bacteriological Analysis of Samples	27
3.2.1 Sterilization of Materials.....	27
3.2.2 Preparation of Culture Media.....	27
3.3 Microbiological Assessment of Samples Prepared.....	27
3.3.1 Identification of Fungal Isolates	28
3.3.2 Identification of Bacterial Isolates	28
3.4 Characterization and Identification of Bacterial Isolates	28
3.4.1 Gram Reaction/ Microscopy	28
3.5 Biochemical Characterization of Isolates	29
3.5.1 Indole Test:	29
3.5.2 Citrate Utilization Test.....	29
3.5.3 Urease Test.....	29
3.5.4 Oxidase Test.....	30
3.5.5 Sim Agar Test	30
3.5.6 Catalase Test	30
3.5.7 Coagulase Test:	31
3.5.8 Starch Hydrolysis Test	31
3.5.9 Methyl Red and Voges-Proskauer Test (MRVP)	31
3.5.9.1 Methyl Red (MR) Test.....	31
3.5.9.2 Vogues Proskauer (VP) Test.....	32
3.5.10 Sugar Fermentation Test	32
3.6 Molecular Identification of Bacterial Isolates.....	32
3.6.1 Pcr Amplification of the 16SrRNA Gene (27f And 1492r).....	32
3.6.2 Pcr Amplification of the Its Gene	33
3.6.3 Sequencing	34

3.7 Determination of Physicochemical Parameters of Sachet Water.....	34
CHAPTER FOUR.....	36
Results.....	36
4.1 Distribution of Fungi Species in the Different Brands of Sachet Water.....	36
4.2 Distribution of Isolated Bacteria Species From Three Brands of Sachet Water.....	37
4.2a: Statistical Analysis	37
4.1 Distribution of Fungi Species in Different Brands	39
4.2 Mean Value of Bacterial cfu/ml of Water or cfu/cm ² Swabbed Surfaces (From Surface Sachet Water, Swabs of Sachet Water Packs and Hand of Production Workers, Transport Workers, Hawkers and Consumers).	43
4.3 Distribution of Isolated Bacteria Species from Three Brands of Sachet Water.....	53
4.4: Physicochemical Analysis	70
4.5: Molecular Identification.....	71
CHAPTER FIVE.....	72
DISCUSSION	72
5.1 CONCLUSION AND RECOMMENDATION.....	75
REFERENCES.....	76
Appendix 1; Preparation of Stain and Reagents	92
Appendix 2: Preparation of Media.....	94
Appendix 3: Analysis of Variance Result of the Data that was used for this Research Work ...	98
Appendix 4: Represents Duncan Multiple Test for Total Aerobic Plate Count	99
Appendix 5: Duncan Multiple Test for Total Coliform Count.	100
Appendix 6: Duncan Multiple Test for Total Count On Mannitol Agar	100
Appendix 7: Duncan Multiple Test for Total Coliform Count for Brand A, B and C.....	102
Appendix 8: Duncan Multiple Test for Total Count On Mannitol Agar for Brand A, B and C	102
Appendix 9: T-T=Test and Correlation Value for Brand A. B and C	103
Appendix 10; Physicochemical Analysis of Sachet Water from Brand A, B and C.	104
Appendix 11; Bacteria DNA Preparation Kit	105
Appendix 12: Molecular Result	104

LIST OF TABLES

Table 4.1.1: Fungi Species Isolated and their Distribution from Three Different Brands Of Sachet Water Marketed in Ota Ogun State.....	39
Table 4.1.2: Fungi Species Isolated and their Distribution from Hand Swabs of Production Workers, Transport Workers, Hawkers and Consumers	40
Table 4.1.3: Fungi Species Isolated and their Distribution from Sachet Water Packs Swabs of Manufacturers, Transport Workers, Hawkers and Consumers	41
Table 4.1.4: Cultural Characteristics of Named Fungi Isolates.	42
Table 4.3.1: Bacteria Species Isolated and their Distribution from Three Different Brands of Sachet Water Marketed in Ota Ogun State.....	53
Table 4.3.1a: Bacterial Colony Count of Sachet Water from Production Factory for Brand A.....	54
Table 4.3.1b: Bacterial Colony Count of Sachet Water From Hawkers/Consumers for Brand A	55
Table 4.3.1c: Bacterial Colony Count of Sachet Water from Production Factory for Brand B	56
Table 4.3.1d: Bacterial Colony of Sachet Water from Hawkers/Consumers for Brand B	57
Table 4.3.1e: Bacterial Colony Count of Sachet Water from Production Factory for Brand C	58
Table 4.3.1f: Bacterial Colony Count of Sachet Water from Hawkers/Consumers for Brand C	59
Table 4.3.2: Bacterial Species Isolated and their Distribution from Hand Swabs of Production Workers, Transport Workers, Hawkers and Consumers.....	60
Table 4.3.2a: Bacterial Colony Count for Hand Swabs from Brand A, B, and C.	61
Table 4.3.2b: Bacterial Colony Count for Transport Vehicle Swab	62
Table 4.3.2c: Bacterial Colony Count of Production Workers Hand Swab	63
Table 4.3.2d: Bacterial Colony of Hawkers Hand Swab from Brand A, B and C.....	64
Table 4.3.2e: Bacterial Colony Count of Consumers Hand Swab.....	65
Table 4.3.3: Bacterial Species Isolated and their Distribution from Sachet Water Packs Swabs of Manufacturers, Transport Workers, Hawkers and Consumers	66

Table 4.3.3a: Bacterial Colony Count for Production Sachet Water Pack Swabs for Brand A, B, and C.....	67
Table 4.3.3b: Bacterial Colony Count for Consumers Hand Swab	69
Table 4.4.1: Physicochemical Analysis of Sachet Water (Brands A, B & C) In Mean \pm Standard Deviation.....	70

LIST OF FIGURES

Figure 4.2.1: Transport Workers Hand Swabs.....	43
Figure 4.2.2: Transport Vehicles Swab.....	44
Figure 4.2.3; Production Sachet Swab	45
Figure 4.2.4: Production Workers Hand Swab	Error! Bookmark not defined.
Figure 4.2.5: Hawkers Sachet Swab	Error! Bookmark not defined.
Figure 4.2.6: Hawkers Hand Swab	47
Figure 4.2.7: Consumer Sachet Swab	49
Figure 4.2.8: Customer Hand Swabs	50
Figure 4.2.9: Microbial Count of Sachet Water at Prodction Stage	51
Figure 4.2.10: Microbial Count of Sachet Water at Consumption Stage	52

ABSTRACT

Safe drinking water is water with microbial, chemical and physical characteristics that meet WHO guidelines on drinking water quality. The aim of this study was to determine the microbial diversity of different sachet water packs and water marketed in Ota, Ogun State, Nigeria and assess their health implication. Sachet water, swabs of manufacturer's hands, transport vehicle, water sachets and hands of hawkers and consumers were collected. Total aerobic plate count, coliform count and fungal count were carried out using standard microbial procedures. Isolates were subjected to morphological, biochemical and molecular characterization. Physicochemical analysis was also carried out on the water samples. Total aerobic plate count was in the range of 1×10^2 to 6.3×10^3 cfu/ml, coliform ranged between 1×10^2 – 2.1×10^3 cfu/ml for sachet water packs and hand swabs, while, total aerobic plate count of water samples ranged from 1×10^2 - 1.7×10^2 cfu/ml and that of coliform ranged from 1×10^2 - 6×10^1 cfu/ml. Predominant isolates identified includes; *Shigella*, *Salmonella*, *Staphylococcus aureus*, *Escherichia coli*, *Proteus spp*, *Enterococcus spp* *Bacillus spp*, and *Pseudomonas spp*. Morphological characterization of fungi revealed the presence of *Aspergillus spp*, *Penicillium* and yeast. The result of this investigation revealed that the sachet water brands sampled did not conform to Nigeria industrial standard and WHO standard. It is recommended that adequate treatment process should be utilized for production of quality and safe packaging materials and regulatory bodies should enforce strict hygienic measures in this rapidly expanding industry.