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.**

Prof. Solomon U. Oranusi _____

(Project Supervisor) **Signature and Date**

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(Head of Department) **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.

ACKNOWLEDGEMENTS

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

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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 ressult 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.