**ISOLATION AND IDENTIFICATION OF FUNGI FROM PACKAGED AND UNPACKAGED POWDERED MILK, CORN FLOUR AND SOYBEAN FLOUR**

**BY**

**DRISU VICTORIA OJONOKA**

**U14/NAS/MCB/O77**

**DEPARTMENT OF MICROBIOLOGY**

**FACULTY OF NATURAL AND APPLIED SCIENCES**

**GODFREY OKOYE UNIVERSITY UGWUOMU NIKE ENUGU STATE**

**TITTLE PAGE**

**ISOLATION AND IDENTIFICATION OF FUNGI FROM PACKAGED AND UNPACKAGED POWDERED MILK, CORN FLOUR AND SOYBEAN FLOUR**

**BY**

**DRISU VICTORIA OJONOKA**

**U14/ NAS/MCB/077**

**A REASEARCH PROJECT SUBMITED TO THE DEPARTMENT OF MICROBIOLOGY, FACULTY OF NATURAL AND APPLIED SCIENCES**

**GODFREY OKOYE UNIVERSITY UGWUOMU NIKE, ENUGU STATE**

**IN PARTIAL FUFILLMENT OF THE REQUIRMENT FOR THE AWARD IN BACHELOR OF SCIENCE (B. Sc) DEGREE IN MICROBIOLOGY**

**SUPERVISOR**

**PROF. J.I. OKAFOR**

**JULY 2018**

**APPROVAL PAGE**

This is certified that this research work “isolation and identification of fungi from corn flour, soybean flour and milk (measured and sachet). By Drisu Victoria Ojonoka in the Department of Microbiology has been presented and approved in partial fulfillment of the requirement of the award of Bachelor of Science (B. Sc.) Degree in Microbiology. Faculty of Natural and Applied Sciences Godfrey Okoye University, Enugu.

………………………. ………………..

Drisu Victoria Ojonoka Date

…………………….. ………………..

Supervisor Date

Prof. J.I. Okafor

……………………. ....….…………

Head of Department

Dr. (Mrs.) M. N. Unachuwu Date

DEDICATION

I dedicate this project to God Almighty my creator, my pillar, my source of inspiration, wisdom, knowledge and understanding. He has been the source of my strength throughout this program and on his wings only have I soared.

**ACKNOWLEDGMENT**

The success and final outcome of this project required a lot of guidance and assistance from many people and I am extremely privileged to have got this all along the completion of my project. All that I have done is only due to having a wonderful supervision and assistance and I would not forget to thank them. I respect and thank the vice chancellor, REV. FR. PROF. DR.Christian Anieke for providing me an opportunity to do the project work in microbiology laboratory Godfrey Okoye University and giving me all support and guidance which made me complete the project duly. I am extremely thankful to my head of department (Dr. N. M. Unachukwu) for providing such a nice support and guidance, although she had busy schedule managing the corporate affairs.I owe my deep gratitude to my project supervisor, Prof. J.I. Okafor who took keen interest on my project work and guided me all along.I would not forget to acknowledgemy able parents who were there for me financially and with their words of encouragement and prayer.I can’t also forget my very own brothers (Simeon and Precious) for their prayers and words of encouragement. I am very grateful to my friends and bunk mate (Anas, Chiamaka, Charity and Anita) who were also there to support and encourage me to see the completion of this project work.I am thankful to and fortunate enough to get constant encouragement, support and guidance from all Teaching staffs of department of microbiology who helped me in successfully completing my project work. Also, I would like to extend my sincere esteems to all staff in laboratory for their timely support.

TABLE OF CONTENT

Cover page………………………………………………………………………………..i

Tittle page……………………………………………………………………………..….ii

Approval page ……………………………………………………………………...……iii

Dedication …………………………………………………………………………….....iv

Acknowledgement …………………………………………………………………….....v

List of tables……………………………………………………………………………..vi

List of figures …………………………………………………………………………..vii

Abstract …………………………………………………………………………………vii

CHAPTER ONE:

1.0 Introduction …………………………………………………………………..….... 1

1.1Aim……………….…………………………….…………………………….……….3

1.2 Objective……………….….……………………...…………...……………….…….3

CHAPTER TWO

2.0 Literature review……………………………………………………………………4

2.1 Fungal agents ……………………………………………………………….….. 4

2.2 Fungal activities on food …………….…………………………………..... 8

2.3 Milk and the fungi spoilage ……………………………………………..... 15

2.4 Soybean and the fungi spoilage …………………………………………... 18

2.5 Corn and their spoilage fungi ……………………………………………...21

CHAPTER THREE

3.0 Materials and methodology ……….…………………………………….. 23

3.1 Reagents ………………………………………………………………….23

3.2 Sample collection …………………………………………………………23

3.3 Sterilization of glass wares ……………………………...………………..23

3.4 Preparation of culture media ……………………………..……………...23

3.5 Preparation of samples …………………………………………………….24

3.6 Spread plate method…………………………………………………….. 24

3.7 Isolation of pure culture ………………………………………………… 24

3.8 Identification of isolates ………………………………………………… 24

3.9 Cultural characteristics...………………………………………………… 25

3.9. Use of slide culture techniques….…..…………………………………… 25

CHAPTER FOUR

4.0 Result.………………………...………………...………………….………27

5.0 CHAPTER FIVE

5.1Discussion………………………..…………………………………………….…33

5.2 Conclusion ……………………………………………………………………..36

References…………………………………………………………………………….

**LIST OF TABLES**

Table1: morphological characteritic fungi………………………………………………….27

Table 2: identified fungi……………………………………………………………………28

LIST OF FIGURES

Figure1: morphology of *Aspergillus fumigatu*…………………..…………………….. 30

Figure 2: Morphology of *Aspergillus niger*…………………………….......………….*.*30

Figure3: Morphology of *penicillium*……………………………………………………*.*30

Figure 4: Morphology of *mucor*………………………………….…………..………….*30*

Figure5: microscopic view of *A. flavus* ..……...…………………………..…………….31

Figure 6: microscopic view of *A. niger* …………..………..……………………………31

Figure 7: microscopic view of *p. reoqueforti .*……………..……………………….……31

Figure 8: microscopic view of*F. oxysporum..*…….………..…………………………….31

Figure 9: microscopic view of*M. heimalts..*…….……………..…………………………32

Figure 10: microscopic view of *A. fumigatus ..*……………….………………..………..32

ABSTRACT

This research was carried out for the isolation and identification of fungal spoilage organisms in foods. The foods studied are, packaged and unpackaged powdered milk, corn flour and soybean flour. These samples were bought from Enugu main market (Ogbete) using sterile nylon bags for each samples and taken to the laboratory for analysis. One gram of each sample was put into nine (9) ml of sterile water, tenfold dilution was carried out upto the fithth srerile test tubes to reduce microbial load. Spread plate method was used by taking 0.1 from each dilution unto sterile prepared Sabouraud dextrose agar plates, the plates were incubated atleast for 48hrs for growth to occur. Representative growths from the plates were then sub cultured on agar slant to obtain pure cultures for identification. Slide culture technique was use for proper identification of the filamentous fungi and incubation was at least four (4) - six (6) days. Lactophenol blue was use to stain the fungi growth on the slide and the cover slip which was viewed under the light microscope. From this research carried out genera of fungi isolated were, *Aspergillus, Fusarium, Pennicillium and Mucor*. The dominant genus isolated was *Aspergillus.* The most contaminated food product from this research is the corn flour sample which was contaminated with all the fungal genera identified. The fungi isolated are known to be pathogens of man some species of aspergillus are known to produce toxins which is the aflatoxin causing the diseases known as aflatoxycosis in man. Also some species of *penicillium* and *fusarium* are known to produce mycotoxins which causes human diseases. These food products can be contaminated due to daily exposure to air as fungi spores are known to be present in large number in the air making it easy for them to invade exposed foods.