**EFFECT OF HYDROMETHANOLIC LEAF EXTRACT OF *ENGLERINA GABONENSIS* (MISTLETOE) ON BENIGN PROSTATIC HYPERPLASIA IN EXPERIMENTAL ANIMAL MODELS**

**BY**

**OFFOR, JOSEPH EBUBE**

**G2018/MSC/PHYS/FT/020**

**UNIVERSITY OF PORTHARCOURT**

**FACULTY OF BASIC MEDICAL SCIENCES**

**DEPARTMENT OF HUMAN PHYSIOLOGY**

**FEBRUARY, 2022.**

**EFFECT OF HYDROMETHANOLIC LEAF EXTRACT OF *ENGLERINA GABONENSIS* (MISTLETOE) ON BENIGN PROSTATIC HYPERPLASIA IN EXPERIMENTAL ANIMAL MODELS**

**BY**

**OFFOR, JOSEPH EBUBE**

**B.SC (AAU), P.GD (UPH)**

**G2018/MSC/PHYS/FT/020**

**A DISSERTATION SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES, UNIVERSITY OF PORT HARCOURT, NIGERIA IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE (M.SC.) DEGREE IN HUMAN PHYSIOLOGY**

**Dr O.M.ADIENBO FEBRUARY, 2022**

# DECLARATION

I, OFFOR, JOSEPH EBUBE with Registration Number G2018/MSC/PHYS/FT/020 declare that the work in this Thesis on EFFECT OF HYDROMETHANOLIC LEAF EXTRACT OF *ENGLERINA GABONENSIS* (MISTLETOE) ON BENIGN PROSTATIC HYPERPLASIA IN EXPERIMENTAL ANIMAL MODELS was carried out by me, that it is my original work and that it has not been submitted wholly or in part for the award of a degree in this or any other institution.

|  |  |  |
| --- | --- | --- |
| ……………………………………. | | ………………………….. |
| EBUBE JOSEPH OFFOR | | SIGNATURE/DATE |
| (DECLARANT) | |  |
| …………………………… | ………………………………… | |
| DR. O.M. ADIENBO | DATE | |
| (SUPERVISOR) |  | |

# CERTIFICATION

UNIVERSITY OF PORT HARCOURT

SCHOOL OF GRADUATE STUDIES

EFFECT OF HYDROMETHANOLIC LEAF EXTRACT OF *ENGLERINA GABONENSIS* (MISTLETOE) ON BENIGN PROSTATIC HYPERPLASIA IN EXPERIMENTAL ANIMAL MODELS

BY

OFFOR, JOSEPH EBUBE

G2018/MSc/PHYS/FT/020

The Board of Examiners certifies that this Thesis/Dissertation is accepted in partial fulfilment of the requirements for the award of the Master of Science (M.Sc.) in Human Physiology.

**DESIGNATION NAME SIGNATURE DATE**

Supervisor (1) …………………….... ……………………. ………………….

Supervisor (2) ………………………. ……………………. ………………….

Chairman, Dept Graduate

Studies Committee ………………….…… ……………………. ………………….

Head of Department/ ………………………. ……………………. ………………….

Director of Centre

Dean of Faculty ………………….…… ……………………. ………………….

External Examiner ………………….…… ……………………. ………………….

Dean, School of Graduate

Studies/Chairman, Board

Of Examiners ………………….…… ……………………. ………………….

# DEDICATION

This work is dedicated to God almighty for his love, provisions, inspiration and protection throughout my years in university of Port Harcout in pursuit for Master’s degree in human physiology.

To my loving parents Mr. and Mrs. J. OFFOR, brother and sister, friends and relatives for their encouragement, love and financial support.

# ACKNOWLEDGMENT

My heartfelt gratitude goes to the lord God Almighty for his faithfulness, protection and guidance throughout my stay in the University of Port Harcourt.

Also, much regards to my supervisor DR. O.M ADIENBO whose criticism and corrections during the course of the study, brought out the best in me.

To my lovely parents, Mr. and Mrs. J. OFFOR and my lovely brother and sister, I am so grateful for their financial and moral support, love and care shown to me throughout the program.

I would also say a big thank you to my course representative, Mr. BLESSED UKORO for his assistance, connections and support in purchasing some materials needed for the study and to Mr Woy for his assistance and advice.

Lastly my appreciation also goes to friends, course mate and spiritual fathers.

**ABSTRACT**

This study was aimed at investigating the effects of hydromethanolic leaf extract of *Englerina* *Gabonensis* (Mistletoe) on Benign Prostate hyperplasia (BPH) in experimental animal models. Hydromethanolic extraction was done. 46 adult male wistar rats were used and assigned into 6 groups. Group1 received 1ml of distilled water daily for 45days, Group2 received 0.32mls of Testosterone and 0.2mls Estradiol thrice weekly, Group 3 received 300mg/kg of extract daily, Group 4 received 0.32mls Testosterone and 0.2mls Estradiol + 150mg/kg of extract, Group5 received 0.32mls Testosterone and 0.2mls Estradiol + 300mg/kg of extract, Group 6 received 0.32mls Testosterone and 0.2mls Estradiol + 5mg/kg Finasteride. BPH was induced 3times weekly for 21 days and extract was administered daily for 24 days. At day45 of the experiment, rats were anaesthetized using chloroform, and blood sample and prostate tissue were collected for analysis. Serum from the blood was used for analysis of Prostate specific antigen (PSA) and Testosterone, while prostate tissue was used for analysis of Oxidative Stress markers (Catalase enzyme (CAT), Glutathione reductase (GSH), Superoxide dismutase (SOD), Malondialdehyde (MDA) and histology. The result showed no significant decrease (p >0.05) in body weight, a significant decrease (p <0.05) in prostate weight, PSA, MDA, and a significant increase (p <0.05) in testosterone, SOD, GSH and CAT (p <0.05) in the BPH group due to extract administration.

**TABLE OF CONTENT**

**CHAPTER ONE (INTRODUCTION) 1**

1.1 BACKGROUND TO THE STUDY 1

1.2 Statement of the Problem 3

1.3 Aim and Objectives of the Study 5

1.4 Significance of the Study 5

1.5 Scope of the Study/Delimitation 6

**CHAPTER TWO (LITERATURE REVIEW) 7**

2.1 Theoretical/Conceptual Framework 7

2.2 Emperical Review 12

**CHAPTER THREE (MATERIALS AND METHODS) 29**

3.0 Collection of Plant Materials 29

3.1 Preparation of Plant Material and Extraction 29

3.2 Study Design 37

3.3 Sacrificing of the animals and sample collections 43

3.4 Measurement of body/organ weights of the animals 51

3.5 Time Frame 51

3.6 Ethical and Environmental Consideration 51

3.7 Conflict of Interest 51

3.8 Statistical Analysis 52

**CHAPTER FOUR (RESULTS AND DISCUSSION) 53**

4.2 Analysis of data 56

4.3 Discussion of Findings 62

**CHAPTER FIVE (SUMMARY, CONCLUSION AND RECOMMENDATIONS) 66**

5.1 Summary of Findings 66

5.2 Conclusion 67

5.4 Recommendations 67

5.3 Contribution to Knowledge 67

**REFERENCES 68**

**List of Tables**

Table3.2.1a Groups that received testosterone and estradiol 38

Table3.2.1b Groups that received extract and finasteride. 41

Table3.2.1c All the groups 42

Table 3.3.1a Preparation of standards at different concentrations 48

Table 3.3.1b Preparation of reagents for Catalase activity 49

Table4.1 The Effects of *Englerina gabonensis*on Body weight and Prostate weight in BPH induced male *wistar* rats. 53

Table4.1.2 The Effects of *Englerina gabonensis* on Prostate specific antigenand Testosterone in BPH induced male *wistar* rats. 54

Table4.1.3 The Effects of *Englerina gabonensis* on Oxidative stress markers in BPH induced male *wistar* rats. 55

**List of Figures**

Fig 2.1. *Englerinagabonensis* 11

**List of Plates**

Plate 4.1.5 Effects of Mistletoe on Prostate tissue histology in BPH induced rats 59

Plate 4.1.6 Effects of Mistletoe on Prostate tissue histology in BPH induced rats. 60