

Determination of Phytochemical Constituent of *Steganotaenia araliacea* for Antioxidant and Antibacterial Activity

BY

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BU/UP/2019/1510

A RESEARCH REPORT SUBMITTED TO THE DEPARTMENT OF CHEMISTRY IN
PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE
OF BACHELORS OF SCIENCE EDUCATION FROM BUSITEMA UNIVERSITY

MAY 2023


DECLARATION

I MUGALAGALA NICHOLUS declare that this research dissertation is my original work and has not been submitted elsewhere for examination, award of degree or publication .Where other people’s work has been used, it has been appropriately acknowledged and referenced following the Busitema university requirements.

Signature ..... Date24/05/2023.....

APPROVAL

This under graduate research report has been submitted for examination with my / our approval as research

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DEDICATION

I dedication this piece of work to my beloved father Dembe Richard, my dear mum Baidhi Jesca my head master Kabakubya Anthony master Baggage Grace who have done great work to ensure that I reach this far. Their love, care and support cannot be measured may the almighty God bless them abundantly.

I also want to dedication it to Kagoda David, Edhengo Andrew, Opolot Andrew, Mwesezi Wilson, Nanyiri Ivan, Mugyisha Augustine, Mulondo Derek, sis Nabiryo Victoria, sis Salaamu Hilda, sis lovina Annet who have always been together with me in the struggle, I wish the best in your struggles always.

Finally, I would like to dedicate this piece of work to all my friends like Ibrahim, Denis, Tangausi, and Lulali, relatives who have supported me spiritually, financially and encourage me through this program

1 ACKNOWLEDGE

The study was carried out at the department of chemistry, faculty of Science and Education, Busitema University. I am so grateful to all people who made the completion of this research possible and this is attributed to their moral, financial and spiritual support. I greatly acknowledge the following;

Dr Owor Oriko Richard; My supervisor through this research indeed doctor I appreciate very much because you had a tight schedule but you were always there for me in times of consultation and to add on the guidance you offered in every step of the work and financial support you rendered to us as the natural products groups long live doctor. Your effort and support cannot be equated to any thing

My lectures Dr. Kamoga Omar Lwako, Dr Kigozi Moses, Dr Egor Moses and Dr Andima Moses for their guidance, professional advice, encouragement, their time and resources rendered to make the accomplishment of this research a success. My classmates Jared, Sammy, Jacob, Flavia, Maria, Jacob, Sezi, Nathan, Jesse, Derek, Rogers, Wilson and the whole class of chemistry for the addition support they rendered to throughout the course.

I also thank madam Nakijoba Lydia and her colleague madam Mary our laboratory technicians for the technical support and also appreciating the Busitema University for the financial support through the Busitema university research and innovation fund awarded to my lecturer and the same time my supervisor.

Finally , I would like to extend my sincere gratitude to my former primary school Kamuli Junior School and secondary school Matuumu Secondary school that laid a crucial foundation in my academic life time.

ABBREVIATIONS AND TERMINOLOGIES USED

SA	<i>Staphylococcus aureus</i>
W.H.O	World Health Organization
W.H.A	World Health Assembly
H.I.V	Human Immunodeficiency Virus
AIDS	Acquired Immune Deficiency Syndrome
NTDs	Neglected Tropical Diseases
GDB	Global Disease Burden
UV	Ultra Violet
SSSS	Staphylococcal Scalded Skin Syndrome
TSS	Toxic Shock Syndrome
AE	Aqueous Extract
OE	Organic Solvent
EtOAc	Ethyl Acetate
EtOAcE	Ethyl Acetate Extract
HT	Hydrolysable Tannins.

ABSTRACT

There are different medicinal plants used by people depending on the culture and knowledge of these plants. This research was carried out on *Steganotaenia araliacea* species from west Budama county in Nagongera since 17th/may /2022 to 18th/may /2023. Phytochemical screening of *S. araliacea* was conducted to determine and analyze the presence of phytochemical compounds. The phytochemical screening of *S. araliacea* involved the extraction of the plant using the appropriate solvents followed by qualitative analysis of the extracted components. Common phytochemical tests such as alkaloid tests, flavonoid tests, tannins tests, phenolic tests, glycoside tests and steroid tests were carried out to determine the specific phytochemicals in the *S. araliacea*. The results of the phytochemical analysis of *S. araliacea* confirmed the presence of various phytochemical compounds including alkaloids, flavonoids, terpenoids, saponins, tannins and phenolic compounds. These compounds are known for their potential health benefits and contribute to the medicinal properties of the plant like anti-inflammatory, anti-cancer, antiaging, cardio protective, neuroprotective, immunomodulatory, antidiabetic, and antibacterial, ant parasitic and antiviral properties. Finding of the phytochemical analysis of the *S. araliacea* stem bark provided valuable information about the chemicals of the plant and its potential pharmacological activities. The aqueous extract of the stem bark of the plant was used in the formulation of the herbal based syrup to be used to curb the increased cases of diarrhea disorder among the natives of the community because it is natural, eco-friendly and generally recognized as safe products. Further studies should be carried to isolate and characterize the individual compounds, explicate their mechanism of action and explore their potential health benefits, supporting its traditional medicinal uses and opening platform for the further research and development.

KEY WORDS

Antioxidant, therapeutic values, bioactive compounds

TABLE OF CONTENTS

DECLARATION	i
DEDICATION	ii
1 ACKNOWLEDGE	iii
ABBREVIATIONS AND TERMINOLOGIES USED	iv
ABSTRACT	v
LIST OF FIGURES.....	viii
LIST OF TABLES	ix
1 INTRODUCTION.....	1
1.1 Back ground.....	1
1.2 PROBLEM STATEMENT.....	2
1.3 RESEARCH OBJECTIVES	3
1.3.1 General objective	3
1.3.2 Specific objectives.....	3
1.4 Justification.....	3
2 LITERATURE REVIEW	4
2.1 Genus pentas.....	4
2.2 MEDICINAL	6
2.3 Phytochemical analysis.....	7
2.3.1 Flavonoids.....	7
2.3.2 Tannins	8
2.3.3 Alkaloids.....	10
3 MATERIAL AND METHODOLOGY	11
3.1 Plant material	11
3.2 Extraction.....	11
3.2.1 Aqueous extract (AE)	11
3.2.2 Extraction with Organic solvents (OE).....	11
3.3 Preliminary Phytochemical analysis;	11
3.3.1 Test for Alkaloids	12
3.3.2 Test for Glycosides	12
3.3.3 Test for Flavonoids	12
3.3.4 Test for alkaloids	13

3.3.5	Tests for Phenolic Compounds:	13
3.3.6	Test for Terpenoids	13
3.3.7	Test for steroids	14
3.3.8	Test for tannins	14
3.3.9	Test for Saponins:	14
3.3.10	Total flavonoid content.....	14
3.3.11	Total alkaloid content:.....	15
3.3.12	Total alkaloid content.....	16
3.3.13	Total phenolic content:	16
3.3.14	Total tannins	17
3.4	<i>Antibacterial assay</i>	18
3.4.1	Preparation of inoculums	18
3.4.2	Preparation of Mueller Hinton Agar (MHA) Medium.....	19
3.4.3	Sample Preparation.....	20
4	DISCUSSION AND TREATMENT OF RESULTS.	21
4.1	<i>Phytochemicals composition of s. araliacea</i>	21
4.1.1	A table of results.....	21
4.1.2	Figure 8 A graph showing total phytochemical components from the bark stem of S. araliacea	23
4.2	<i>Formulation of a syrup from Steganotaenia araliacea</i>	23
4.2.1	THE PHYSIOCHEMICAL EVALUATION OF THE SYRUP FORMULATED.....	23
4.3	<i>THE PHYSICOCHEMICAL PROPERTIES OF THE SYRUP</i>	24
4.3.1	The pH Test.	24
4.3.2	The Smell test.	24
4.3.3	TEST OF DENSITY.....	24
4.3.4	Color test.....	25
5	CONCLUSION AND RECOMMENDATION	26
5.1	<i>CONCLUSION</i>	26
5.2	<i>RECOMMENDATION</i>	26
5.3	<i>REFERENCES</i>	27

LIST OF FIGURES.

Figure 1:Steganotaenia araliacea Plant	4
Figure 2 A map showing countries where this plant is found.....	5
Figure 3 COLOUR CHANGES DURING THE TEST FOR FLAVONOIDS (M-FOR FERIC CHLORIDE TEST, N-LEAD ACETATE TEST)	12
Figure 4 COLOUR CHANGE DURING ALKALOID TEST	13

LIST OF TABLES

Table 1: Phytochemical results of the crude extract of <i>S. aralaiacea</i>	21
Table 2 Physiochemical evaluation of STETHA syrup	23

1 INTRODUCTION

1.1 BACK GROUND

The term medicinal plants include a variety of plants used in herbalism and some of these plants have a medicinal activities. These medicinal plants are considered as a rich resources of ingredients which can be used in drug development and synthesis. Besides that these plants play a critical role in the development of human cultures around the whole world(Demoz & et.al, 2014).

The term of medicinal plants include a various types of plants used in herbalism and some of these plants have a medicinal activities. These medicinal plants considered as rich resources of ingredients which can be used in drug development and synthesis(Bukenya, Mosango, & Et.al, 2003). Besides that these plants play a critical role in the development of human cultures around the whole world. Hundreds of chemical compounds are synthesized by plants to perform various preventive roles like protection from insects, diseases, fungi as well as herbivores. They are also used by humans as a form of medical antidote used for healing purposes and protection from diseases. The World Health Organization (WHO) reported the use of traditional plants for therapeutic purposes by 80% of the world's population. Awareness of medicinal plants usage is a result of the many years of struggles against illnesses due to which man learned to pursue drugs in barks, seeds, fruit bodies, and other parts of the plants. (Rios & Recio, 2005)

Medicinal plants were only applied on an empirical basis, without mechanistic knowledge on their pharmacological activities or active constituents. The synthesis of acetylsalicylic acid (aspirin) is considered to be the most famous and well known example which was derived from the bark of the willow tree *Salix alba* L(Naboulsi & et.al, 2018). Medicinal plants frequently used as raw materials for extraction of active ingredients which are in the synthesis of different drugs like in case of laxatives, blood thinners, antibiotics, antioxidants, antimicrobial and antimalarial medications contain ingredients from plants .Medicinal plants have provided an alternative medicine with limited or no side effects based on the belief that medicines which come in capsules or pills are the only medicines which we can trust and use.(Rios & Recio, 2005)

S. araliaceae (SAE), locally known as *Fyopola* (Chewa)(Pharaoh & Fastone, 2021). *S. araliacea* Hochst (Apiaceae / Umbelliferae) is used in East and West African ethno medicine for treating gastro-intestinal disorders, peptic ulcer, rheumatism and various diseases of microbial origin. The plant was therefore investigated for its chemical constituents while testing for possible antimicrobial, antioxidant, spasmolytic and anti-inflammatory activities. Through bioactivity-driven fractionation, protocatechuic acid was isolated from the ethyl acetate fraction as the main antimicrobial (agar diffusion) and antioxidant (radical scavenging-DPPH) principle. The crude extract exhibited spasmolytic activity, which was found to reside exclusively in the aqueous fraction. Further fractionation of the aqueous fraction yielded as saponins mixture. The observed spasmolytic effect was found to be antihistaminic rather than anticholinergic. The saponins mixture also demonstrated significant anti-inflammatory activity. At a dose of 1 mg/kg. it gave a 77.7% inhibition of carrageenan-induced rat-paw edema.(Taddese, Asres, & Gebre-Mariam, 2003)

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