QUANTITATIVE PHYTOCHEMICAL ANALYSIS OF DESMODIUM TRIFLORUM FOR POTENTIAL ANTIBACTERIAL ACTIVITY AND FORMULATION OF AN HERBAL REMEDY FOR MANAGEMENT OF RESPIRATORY TRACT INFECTIONS

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APRIL 2023

DECLARATION

I Kiwuso Hassan declare that this research dissertation is my original work and has not been submitted anywhere for award of a degree where other people's work was used, this has been acknowledged and cited according to the university policy.

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APPROVAL

This research dissertation has been submitted for examination with my approval as his university supervisor.

Signature.....Date.....31st/05/2023

DR OWOR ORIKO RICHARD

Contents

DEDICATION

This report is dedicated to my parents Mr. Womusi Micheal and Ms. Mulelengi Edinasi, who supported me spiritually, physically, emotionallly and financially in the entire walk in pursuing my vision. Special thanks also to Nabukwasi Shanitah and Nabirye Sumayyah for the financial in my academic journey.Not forgetting Aunt Natozo Gorrete who showed me the plant and Nambala Oliver who worked with me from the start of this journey. This research is also dedicated to Chemistry students for their special time, support and cooperation exhibited for the success of my research

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LIST OF ABBREVIATION AND ACRONYMS

TCM: Traditional China Medicine

CAP: Community-Acquired Pneumonia

HAP: Hospital-Acquired Pneumonia

VAP: Ventilator-Acquired Pneumonia

DNA: Deoxyribonucleic acid

Vgg16: Visual Geometry Group

PCR: Polymerase Chain reaction

MV: Mechanically ventilated

PSB: Protected Specimen brush

DT: Desmodium triflorum

AE: Aqueous extract

OE: Organic extract

V/V: Volume by Volume

ml: milliliter

Conc H_2SO_4: Concentrated sulphuric acid

$FeCl_3$: Ferric Chloride

DTE: Desmodium triflorum extract

Na_2CO_3: Sodium carbonate

mg: Milligram

M: Molar

HCl: Hydrochloric acid

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ABSTRACT

Objective: To quantitatively analyze the phytochemistry of Desmodium triflorum for potential antibacterial activity and formulation of an herbal remedy for management of respiratory tract infections.

Materials and methods: Phytochemical analysis of Desmodium triflorum belongs to order Fabales in Fabaceae Family, sub family desmodieae, Genus Desmodium and Species: D. triflorum was examined using organic extracts and aqueous extracts of the whole plant. The aqueous extract was used in the formulation of the herbal remedy.

Results: The phytochemical analysis of aqueous and organic extracts confirmed the presence of Alkaloids, tannins, saponins, phenolics, tannins, glycosides, Quinones and flavonoids which show high antibacterial activity.

Conclusion: Although the active components were not isolated but antibacterial active plant principles such as Alkaloids, tannins, saponins, phenolics, tannins, glycosides, Quinones and flavonoids were observed in the extract.

Chapter 1 Introduction

1.1 Background

Medicinal plants are a source of great economic value in the African continent(Dzoyem, Tshikalange, & Kuete, 2013). Ancient knowledge has been the basis of modern medicine and will remain as one important source of future medicine and healing (Sharma, Parashar, & Kabra, 2013). The future of natural products drug discovery is a multi-dimensional problem requiring several parameters such as safety and efficacy of the compound to be evaluated during drug selection(Ahuja & Sharma, 2014). The advent of latest technologies that enhance drug design hypotheses such as Artificial intelligence involving docking techniques means that technology has become part of drug discovery(Bender & Cortés-Ciriano, 2021). This has resulted in increased speed in drug discovery and evaluation of the safety(Bender & Cortés-Ciriano, 2021; Bleicher, Böhm, Müller, & Alanine, 2003).

Recent advances in analytical and computational techniques have opened new avenues to process complex natural products and to use their structures to derive new and innovative drugs (Thomford et al., 2018). Nature has bestowed a very rich botanical wealth and a large number of diverse types of plants grow in different parts of the world. From the very beginning of human existence(Issazadeh et al., 2012; Parekh, Jadeja, & Chanda, 2005), man has familiarized himself with plants and used them a number of ways up to date(Лисицын, 2004). Primitive man in search of food and to cope with human suffering began to distinguish those plants suitable for medicinal purpose from others with definitive pharmacological action. The relationship between plants and man has grown (Shakya, 2016) and many plants are used as medicines for example anti-malarial, quinine (**1**) from bark of *Cinchona* species, anti-bacterial, phellandrene (**2**) from *Eucalyptus phellandra* and anticancer, taxol (3) from the bark of *yew tree.*

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