



**BUSITEMA  
UNIVERSITY**  
*PURSuing EXCELLENCE*

**FINAL YEAR PROJECT REPORT**

**IN VITRO ANTIBACTERIAL EFFICACY OF *KIGELIA AFRICANA* EXTRACT  
ON PATHOGENIC *ESCHERICHIA COLI* ISOLATED FROM POULTRY IN  
SOROTI CITY**

**By**

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**BU/UP/2021/2369**

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**OCTOBER 2024**

## **DEDICATION**

I dedicate this work to JEHOVAH ALMIGHTY who has brought me this far and to those who supported me spiritually, academically, morally and financially. I will not list you all but JEHOVAH ALMIGHTY Reward you abundantly.

## DECLARATION

### DECLARATION

I ALINOMUGASHA EMMANUEL declare that I wrote this final year research report and have never submitted it to any other institution of learning

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## **LIST OF ABBREVIATIONS**

BUAC - Busitema University Arapai Campus

MIC - Minimum Inhibitory Concentration

MBC - Minimum Bactericidal Concentration

FAAS - Faculty of Agriculture and Animal Sciences

OTC - Oxytetracycline

E.coli – Escherichia coli

K. africana – Kigelia africana

g- grams

mg – milligrams

UV – Ultraviolet

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## ABSTRACT

*Kigelia africana*, commonly referred to as the sausage tree or African sausage tree, is a deciduous tree native to tropical Africa. It belongs to the Bignoniaceae family and is renowned for its large, sausage-shaped fruits.. It is also native to the Soroti City, and the locals call it **edodoi**.. Escherichia coli infections in poultry present a significant public health concern, resulting in heightened morbidity and mortality rates. This is primarily due to the rapid transmission of the bacteria through contaminated feed, water, and inadequate sanitation conditions.. While farmers in Soroti recognised the potential of medicinal plants for treating livestock diseases, most research has primarily focused on E. coli infections in humans. This has resulted in a notable gap in understanding the antibacterial efficacy of *Kigelia africana* against E. coli in poultry.

An in vitro study was conducted on this plant (*K. africana*) to check for its in vitro antibacterial efficacy on pathogenic E. coli harvested from poultry in Soroti City. Only the healthy, disease-free leaves were picked, air-dried in the shade, and ground using an electric grinder.

The method used for extraction was Soxhlet extraction, and then the mixture with extract was transferred to a water bath to remove methanol. The extract was then reconstituted with 0.2% DMSO, and antimicrobial screening was conducted using the Kirby-Bauer disc diffusion method. All the experiments were conducted in the laboratory of Busitema University, Faculty of Agriculture and Animal Sciences.

*K. africana* showed a considerable zone of inhibition of 16.6667 mm on the pathogenic E. coli, meaning that it had strong antibacterial properties against the bacteria. Oxytetracycline, a known commercial antibiotic on the market, was used in the study as a comparative drug, and it was effective as expected, with the maximum zone of inhibition measured was 26.67 mm against the pathogenic Escherichia coli.

In conclusion, *Kigelia africana* leaf extracts possess a range of antibacterial properties that effectively treat colibacillosis in poultry. Furthermore, additional research is needed to assess the efficacy of the fruit, roots, and bark against E. coli derived from poultry.

## CHAPTER ONE

### BACKGROUND OF THE STUDY

#### 1.1 Introduction

*Kigelia africana* commonly known as sausage tree or African sausage tree is a deciduous tree native to tropical Africa. It belongs to the Bignoniaceae family and is characterised by its large, sausage-shaped fruits. (Nabatanzi et al., 2020b). The tree can attain a height of up to 20 metres and possesses a broad, spreading crown. Its leaves are compound and sizeable, consisting of multiple leaflets. The flowers, which are pollinated by birds and bats, are conspicuous and exhibit a reddish-orange colour. (Henry, 2014). The fruits of *K. africana* are notable for their large sausage shaped like appearance, measuring up to 60 cm in length and weighing as much as 10 kg. When unripe, they are green and turn to brown or black when ripe, (Nabatanzi et al., 2020a).

The antibacterial activity of *K. africana* has been extensively studied, and multiple studies have highlighted its potential in this area. Extracts from various parts of the plant, including the leaves, fruit, and bark, have been shown to possess antibacterial effects against a wide range of organisms. For instance, ethanol extracts of *K. africana* leaves have exhibited maximum antibacterial activity against *Escherichia. coli*, while aqueous extracts have shown moderate activity against *S. aureus* and *P. aeruginosa*.

Moreover, the traditional use of roasted seeds, bark, and fruit extracts of *K. africana* in the treatment of bacterial infections further supports its potential antibacterial properties. The presence of specific compounds, such as alkaloids, glycosides, terpenoids, flavonoids, tannins, reducing sugars, saponins anthocyanosides in *K. africana* extracts has also been associated with their antibacterial activity.

These findings emphasize the potential of *K. africana* as a source of antibacterial agents and justify further investigation into its antibacterial properties for potential therapeutic applications, (P. K. Chauhan , Rahul Thory, 2019). Therefore, this study aimed at investigating the antibacterial effect of *K. africana* extract on *Escherichia coli* bacteria isolated from poultry in Soroti city, Uganda.

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