



**ANTI-MICROBIAL ACTIVITY OF ETHANOLIC MEDICINAL PLANT EXTRACTS
USED IN MANAGEMENT OF DIARRHEA IN CATTLE IN THE MOUNT ELGON
REGION (MBALE DISTRICT)**

BY

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**A RESEARCH DISSERTATION SUBMITTED TO THE FACULTY OF
AGRICULTURE AND ANIMAL SCIENCES IN PARTIAL FULFILLMENT OF
REQUIREMENTS FOR THE AWARD OF BACHELOR OF ANIMAL PRODUCTION
AND MANAGEMENT OF BUSITEMA UNIVERSITY.**

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APPROVAL

APPROVAL

This dissertation is submitted with the approval of the academic supervisor

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DECLARATION

DECLARATION

I MASAWI MARY do declare that this is my work through my effort through the guidance of my supervisor and has never been submitted, shared or copied to this university or any other higher institution of learning for the award of a bachelor's degree.

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DEDICATION

I dedicate my research report to my father Webundu Benard, my mother Nambuya Aidah, my brothers and all the family at large for their willing support and also my friends Owor Brian and Awino Doreen my God bless you.

Special thanks should go to my supervisor Prof Olila Deo and to the entire fraternity of Busitema University.

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ABSTRACT

Traditional knowledge and practice have been employed by local communities and herbalist to manage cattle diarrhea, but their potential as effective agents against diarrhea-causing pathogens in cattle have not been scientifically well known. The study was both experimental and survey. Cross-sectional survey was conducted in Nyondo sub county, Mbale district, Mount Elgon region on the major medicinal plants the community uses for the management of diarrhea. This was done based on a standard feedback questionnaire (**appendix1**). The experimental part was carried out in the Busitema university microbiology laboratory. Plant leaves were extracted by maceration in 70 percent ethanol and antimicrobial screening was done using disc diffusion method. In the results, *Calliandra calothyrsus*, *Moringa oleifera*, *Tamarindus indica*, and *Harrisonia abyssinica* extracts show relatively low mean inhibition, with minimal impact on microorganism growth. They share the letter 'a,' indicating that their inhibitory effects are statistically similar. Mango extract demonstrates a significantly higher mean inhibition compared to the first group hence ranked in terms of their inhibitory effects on microorganism growth from least to most as follows: *Calliandra calothyrsus* < *Moringa oleifera* < *Tamarindus indica* < *Harrisonia abyssinica* < *Mangifera indica*. The antibacterial findings of *Mangifera indica* extract showed its ability to inhibit the growth of the test organism with the highest zone of inhibition seen in *P. aeruginosa* and *S. aureus*. According to sensitivity, *Staphylococcus aureus* is the most resistant organism, as it has the lowest mean inhibition (8.44 mm). *Pseudomonas aeruginosa* (*P. aeruginosa*) is intermediate in sensitivity, with a mean inhibition of 10.72 mm and *Escherichia coli* (*E. coli*) is the most sensitive organism, exhibiting the highest mean inhibition (11.83 mm). Therefore, in terms of sensitivity of the microorganism to the tested plant extracts, the ranking from most resistant to most sensitive is *Staphylococcus*, *P. aeruginosa*, and *E. coli*.

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CHAPTER ONE: INTRODUCTION

1.1 Background

Diarrhea is a prevalent gastrointestinal disorder upsetting cattle worldwide(Lin *et al.*, 2002). It poses significant challenges to livestock farmers, leading to economic losses, reduced productivity, and compromised animal welfare(Nabukenya *et al.*, 2014). In conventional veterinary medicine, antimicrobial drugs are commonly used to treat bacterial diarrhea in cattle(Marston *et al.*, 2016). However, the widespread use of antibiotics has raised concerns about the emergence of antimicrobial resistance, threatening both human and animal health.

Id *et al.*, (2021) pointed in response to these challenges, traditional knowledge and practices have been employed by local communities to manage cattle diarrhea. Kalayou *et al.*, (2012), Sharma *et al.*, (2023), find out that medicinal plants have played a crucial role in traditional veterinary medicine, offering a natural and sustainable approach to animal health. Local farmers and traditional healers have used medicinal plant extracts for generations to alleviate various ailments, including diarrhea in cattle.

According to Sapkota *et al.*, (2018), the antimicrobial properties of medicinal plants have been known for centuries, but their potential as effective agents against diarrhea-causing pathogens in cattle is yet to be scientifically validated. There is need to conduct a systematic examination of the bioactive compounds present in these plant extracts and evaluating their efficacy against common diarrhea-causing pathogens(Id *et al.*, 2021)

Atef *et al.*, (2019) in his study said the significance of exploring medicinal plant extracts lies in the potential to find viable alternatives to conventional antimicrobial drugs, they could offer a sustainable and cost-effective approach to managing cattle diarrhea while reducing the risk of antimicrobial resistance development.

Salawu *et al.*, (2009) acknowledged that farmers have used medicinal plants for ages in treatment of human health and livestock health complications including diarrhea but there is little research about their potential as effective agents against diarrhea-causing pathogens in cattle.

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