



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

**ANTI-MICROBIAL ACTIVITY OF SELECTED MEDICINAL PLANT EXTRACTS
USED IN THE MANAGEMENT OF DIARRHEA IN SHEEP AND GOATS IN
BUSOGA REGION (IGANGA DISTRICT).**

BY

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**DISSERTATION REPORT SUBMITTED TO THE FACULTY OF AGRICULTURE
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FOR THE AWARD OF A BACHELOR OF ANIMAL PRODUCTION AND
MANAGEMENT OF BUSITEMA UNIVERSITY.**

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DECLARATION

DECLARATION

I hereby declare that this dissertation is mine and I personally did it towards the award of a bachelor of animal production and management.

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ABSTRACT

The health status and productivity of small ruminants i.e. sheep and goats is key in the development of the livestock industry of Uganda and particularly Iganga district. However gastrointestinal challenges majorly diarrhoea continuously causes significant impacts on the health status of the goats and sheep and to livestock farmers in the area.

A comprehensive survey was done in Iganga district to generate information on the traditional use of the selected plants with medicinal importance by farmers in the management of diarrhoea in sheep and goats. The questionnaire is attached as Appendix 3.

Test organisms that cause diarrhoea in goats and sheep including; *Escherichia coli*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* were obtained from clinical isolations at Mbale Regional Referral Hospital. Disc diffusion method was used for the antibacterial assay. The disc diffusion assay was used where Waltman's paper was soaked in crude extract and placed on the inoculated MHA plates.

Generally, all medicinal plants had inhibitory effects against all the test organisms. Among the extracts, *Callistemon viminalis* had the highest inhibitory zone against *E. coli* (7.293 ± 3.322), followed by *Carica papaya* (7.0 ± 1.0), *Psidium guajava* (6.667 ± 0.333) and *Cannabis sativa* and *Nicotiana tabacum* which had the same inhibition zone (6.0 ± 0.00). Oxytetracycline had the highest inhibitory zone (13.0 ± 3.055).

According to sensitivity, *Staphylococcus aureus* is the most resistant organism, as it has the lowest mean inhibition (P value 0.0009). *Pseudomonas aeruginosa* (*P. aeruginosa*) is intermediate in sensitivity, with a mean inhibition of (P value < 0.0001) and *Escherichia coli* (*E. coli*) is the most sensitive organism, exhibiting the highest mean inhibition of (P value > 0.05).

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*.

In conclusion, farmers in Nakigo sub county use medicinal plants in the management of diarrhea in sheep and goats and among the plants are; *Callistemon viminalis*, *Nicotiana tabacum*, *Carica papaya*, *Psidium guajava* and *Cannabis sativa*.

CHAPTER ONE: INTRODUCTION

1.1. Background

The health status and productivity of small ruminants i.e. sheep and goats is key in the development of the livestock industry of Uganda and particularly Iganga district. However gastrointestinal challenges majorly diarrhoea continuously causes significant impacts on the health status of the goats and sheep and to livestock farmers in the area. The non-infectious causes of diarrhoea include; age, size and season as well as the infectious causes include majorly *Escherichia coli*, *Cryptosporidium spp* and *Eimeria spp* (Abdou et al., 2021).

g livelihood of the farmers and also leading to threatened food security to the economy (Abdou et al., 2021). Conventional treatment of diarrhoea often is by use of anti-biotic which in Diarrhoea outbreaks lead to reduction in growth, high mortality and reduced productivity lower in turn has contributed to anti-biotic resistance causing public health concerns in human population (OSU Sheep Team Supporting Ohio Sheep Producers by Providing, n.d.). To address these challenges, local communities have resorted to use of natural remedies like plants to manage diarrhoea. In Iganga district, farmers use some selected plants though their safety and efficacy is not well known. The plants are believed to have antibiotic potential and are extensively used.

1.2. Problem statement

Diarrhoea in goats and sheep has for long been a challenge to farmers impacting on the health and productivity of these animals. This condition is caused by various infectious pathogens like bacteria, protozoa, parasites leading to significant losses through death of animals, reduced productivity and high costs of treatment to farmers and also the economy of the country. The condition also affects the sustainable development of the livestock farming in Iganga district (Biomedicine, 2017). The condition has conventionally been treated by use of antibiotics which raise a threat of anti-biotic resistance and affect human population as they feed on animal products (Binek et al., 2019).

In response to these problems, natural herbal remedies have been identified as potential solutions to diarrhoea treatment in goats and sheep. The local communities in Iganga town have been locally using selected medicinal plants as they perceive that they have antimicrobial activity and properties. However, the safety and efficacy of these plants have

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