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**FACULTY OF AGRICULTURE AND ANIMAL SCIENCES**

**IN VITRO ANTITREMATODAL EFFICACY OF SELECTED MEDICINAL PLANT  
EXTRACTS AGAINST ADULT LIVER FLUKES IN CATTLE SLAUGHTERED AT  
SOROTI CITY ABATTOIR**

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**A DISSERTATION SUBMITTED TO THE DEPARTMENT OF ANIMAL  
PRODUCTION AND MANAGEMENT IN PARTIAL FULFILLMENT OF  
THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF  
BACHELOR OF ANIMAL PRODUCTION AND MANAGEMENT OF BUSITEMA  
UNIVERSITY**

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### DECLARATION

I, **OKEMA RONALDO**, declare that this dissertation entitled **In Vitro Antitrematodal Efficacy of Selected Medicinal Plant Extracts against Adult Liver Flukes in Cattle Slaughtered at Soroti City Abattoir** is my original work and has not been submitted for any other degree or qualification. All sources and references used in this work have been acknowledged.

Moreover, I fully assume responsibility for the veracity and correctness of the data included in this dissertation.

Signature.....

Date.....5th Nov/2024.....

### Approval

This dissertation has been approved by my supervisor for examination.

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## **DEDICATION**

This dissertation is dedicated to my family for their unwavering support and encouragement. To my parents, who instilled in me the value of education and perseverance; to dearest friends, who stood by me through every challenge; and to all my friends, whose belief in me motivated me to keep going. Your love and support have been invaluable.

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## LIST OF ABBREVIATIONS

1. F. hepatica	Fasciola hepatica
2. F. gigantica	Fasciola gigantica
3. BUAC	Busitema University Arapai Campus
4. OXN	Oxyclozanide
5. NE	Neem extracts
6. ZE	Zanthoxylum extracts.
7. Z. chalybeum	Zanthoxylum chalybeum
8. DMSO	Dimethyl Sulfoxide
9. ANOVA	Analysis of Variances
10. DR	Doctor



## ABSTRACT

Liver flukes, particularly *Fasciola hepatica* and *Fasciola gigantica*, pose a significant health threat to cattle, leading to substantial economic losses in the livestock industry. Synthetic anthelmintic treatments have been associated with issues such as drug resistance and environmental concerns, prompting the need for alternative control strategies. Medicinal plants have been recognized for their potential therapeutic properties, offering a promising avenue for the development of effective, sustainable treatments. This study aimed to evaluate the in vitro antitrepatodal efficacy of selected medicinal plant extracts against adult liver flukes in cattle slaughtered at Soroti City Abattoir.

The present study was envisaged to evaluate the efficacy of ethno-medicinal plant aqueous extracts of *Azadirachta indica* and *Zanthoxylum chalybeum* in vitro in comparison with the chemotherapeutic agent, Oxytetracycline on *Fasciola* species adults where adult liver flukes were cultured in different concentrations of the treatments. The efficacy was evaluated by gross visual motility and mortality of *Fasciola* species with score index. Based on the in vitro trials conducted, the extracts of *Z. chalybeum* showed flukicidal effect at various concentration. However *A. indica* was less effective compared to the control treatment. Based on the research findings, *Z. chalybeum* can be used as a natural alternative to synthetic anthelmintics. There is need conduct in vivo studies to confirm the efficacy and safety of *Z. chalybeum* against liver flukes in cattle. Furthermore, there is need for combining Neem extract with other plants to enhance its efficacy.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background

As of 2022, the cattle population in Africa was approximately 381 million cattle with Uganda being in the 8<sup>th</sup> position having 15.5 million head as published by *Saifaddin Galal, Jan 31, 2024*. According to the national livestock census report in 2021, Uganda has approximately 14.5 million heads of cattle, an increase from 11.4 million in 2008. The largest percentage is indigenous breed constituting 77% and exotic 23%, with eastern and western region having the highest number of cattle estimated at 23% of the total population in the country (Khamis, 2024). Teso sub region was the second after Karamoja region with the highest population of indigenous cattle up to 1.2 million heads according to (JANAAN, 2018) this is because these animals are well adapted to the climatic condition of the area, tolerant to parasites and diseases within the area and because of the mixed farming system of integrating crops and animals, where cattle are used as drought animal to provide animal power in term of animal traction. In 2009, the livestock sector contributed 1.7% to the national GDP; the recent estimate now shows an increase up to 3.2% of the national GDP.

Despite its contribution to the economy of the country and to household as source of income, food security, employment and source of livelihood, the cattle industry is heavily affected by diseases ranging from parasitic, bacterial, viral and protozoan diseases thus affecting their productivity. The most common parasitic disease of cattle of economic and public health concern is fascioliasis (Mehmood *et al.*, 2017). This spans majorly in regions with swamps and rivers of which Soroti has numerous swamps like Awoja swamp which has made fascioliasis a major threat to the productivity of cattle within the region.

The infection caused by liver flukes, mainly by *Fasciola hepatica*, has become a major problem in cattle production worldwide, causing serious problems for animal welfare and financial output. (Lalor *et al.*, 2021) Traditionally, synthetic anthelmintic medications like Albendazole and Triclabendazole have been used to treat these illnesses. However, as evidenced by recent results, the development of treatment resistance in liver fluke populations is progressively endangering the efficacy of these medications (Musa *et al.*, 2024). Additionally, the use of synthetic drugs can lead to environmental contamination and drug residues in milk and meat, posing a risk to human health. Within a contextual of Soroti region, local farmers have been

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