

BUSITEMA UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF GINNING AND TEXTILE ENGINEERING

**THE STUDY OF ANTIMICROBIAL PROPERTY OF COTTON FABRIC DYED
WITH EXTRACTS FROM SELECTED INDIGENOUS PLANTS**

BY

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Declaration

I ODONGO JAMES Registration Number BU/UG/2011/1182 hereby declare that this final year project is my original work except where explicit citation has been made and it has not been presented to any institution of higher learning for any academic award

Sign *J. Odongo James*

Date *28th May 2015*



Approval

This is to certify that the final year project under the title “The study of antimicrobial property of cotton fabric dyed with extracts from selected indigenous plants” has been done under my supervision and is now ready for examination

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Sign

Date

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Dedication

With God's blessing, I would like to pay gratitude to my late parents; Mrs. Logose Anna and Mr. Outeke John Stephen, for their unconditional love and faith in my strengths that wherever they are may God bless them. They were my role model who used to inspire me to pursue my dreams and fly high on the wings of my ambition.

Abstract

Clothing textiles are in permanent contact with microorganisms, which can cause serious problems, including fabric rotting, staining, unpleasant odours and health concerns ranging from simple discomfort to physical irritation, allergic sensitization, toxic responses, infection and disease.

Therefore, the control of undesirable effects of microbes on textiles is becoming an important issue in textile industry. One possible approach to limit growth of microorganisms is the use of biocides in textile finishing. However, this may lead to health and environmental concerns in everyday use of textiles. In this context the use of materials with inherent activity to reduce microbial growth, prevent transmission of cross infection by pathogenic microorganisms, to control the infestation by microbes, to arrest metabolism in microbes. Also the research tends to increase the production value of *Vernonia amygdalina* and *albizia coriaria* through exploring its potential use in biomedical applications especially in the textile field.

Antimicrobial efficiency of the unrinsed samples was more effective compared to the rinsed samples and that why there was reduction rates in the number of colonies found on unrinsed samples meaning that the fabrics will be worn once and dispose

List of Acronyms

MRSA -	Multiresistant <i>Staphylococcus Aureus</i>
MHA -	Muller Hinton Agar
DNA -	Deoxyribonucleic Acid
MICs -	Minimum Inhibitory Concentrations
AATCC -	American Association of Textile Chemists and Colorists
W -	Weak Growth Rate
H -	High Growth Rate
+	Clear Inhibition Zone
-	No clear Inhibition Zone

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CHAPTER ONE

1. INTRODUCTION

1.1 Back Ground

The 'antimicrobial property of textile material' refers to a broad range of technologies that provide varying degrees of protection for textile materials against microorganisms. Antimicrobials are very different in their chemical nature, mode of action, impact on people and the environment, handling characteristics, durability, costs, regulatory compliance, and how they interact with microorganisms (White et al, 2010). The purpose of imparting antimicrobial activity to textiles is to protect the material from microbial attack, prevent the transmission and spreading of pathogenic microorganisms, inhibit odour development resulting from microbial degradation, and creating a material that will act as preventive or curative treatment (*Gao et al, 2004*).

With the growing public health awareness of the pathogenic effects, malodors and stain formations caused by microorganisms, there is an increasing need for antibacterial materials in many application areas like medical devices, health care, hygienic application, water purification systems, hospital, dental surgery equipment, textiles, food packaging, and storage. (*Shahidi et al, 2007*). The spread of HIV and hepatitis viruses by contact of contaminated materials has created increased pressure for protection of personnel with functional clothing; also, all articles of apparel and home textiles are susceptible to problems of hygiene in normal daily use, for example, socks, sport wear and working clothes as well as mattresses, floor coverings, and shoe linings. Most textile materials currently used in hospitals and hotels are conducive to cross infection or transmission of diseases caused by microorganisms (*Vigo et al, 2001*). Textile goods, especially those made from natural fibers (cotton) provide an excellent environment for microorganisms to grow, because of their large surface area and ability to retain moisture. cotton fiber based textiles is desized (for woven fabric only), scoured and bleached as preparatory process before dyeing with either natural or synthetic dyes, well prepared cotton textiles are then mordanted (single or double mordanting using harda and aluminum sulphate individually or in

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