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DEPARTMENT OF TEXTILE AND GINNING ENGINEERING

FINAL YEAR PROJECT REPORT

BIOACTIVE AND UV PROTECTION FINISH OF WOVEN COTTON FABRICS USING DYE EXTRACTS FROM SELECTED INDEGENEOUS PLANTS.

BY

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BU/UG/2013/141

A final year project report submitted to the department of textile and ginning engineering as a partial fulfillment of the requirements for the award of bachelor of science degree in textile engineering

MAY 2017

DECLARATION

I OUMA ISIMA YUSUF of Registration Number BU/UG/2013/141 hereby declare that this project report 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 .....

Date 25th. May. 2017.

APPROVAL

This is to certify that the project proposal under the title "BIOACTIVE AND UV PROTECTION FINISH OF WOVEN COTTON FABRICS USING DYE EXTRACTS FROM SELECTED INDEGENEOUS PLANTS" has been done under my supervision and is now ready for examination.

1. MR. LOUM JANANI

Sign .....

Date .....28/5/2017.....

2. MADAM NAMUGA CATHERINE (Mrs.)

Sign.....

Date.....

ACKNOWLEDGEMENT

As the cocoon of silkworm or even the caterpillar that is wonderfully transformed through a pupa to an adult butterfly, so has this dream that started small and simple finally metamorphosed into this fantastic project through the active support and encouragement of various personalities.

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May the good Lord bless and reward you all abundantly. Above all I thank the almighty God for the gift life, knowledge wisdom and understanding.

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ABSTRACT

The main objective of the study was to investigate the UV absorbency of dyestuffs extracted from plain woven cotton and originally dyed with natural colourants from plants *Ricinus Coumunis, Areeta Indica* and *Morind* a *Lucida* and analysing antimicrobial bioactivity of dyed woven cotton fabrics. Unlike lCA, 2CA and 3CA cotton fabric that showed activity against *E. coli* and *S.aureus,* lCR, 2CR and 3CR cotton fabric has effect on the normal flora and hence can suitably be used for clothing purposes.

In reference to literature, the most dangerous UV-light is radiated at a range wavelength of 280-320nm, called UV-B. hence Areeta.I. shows a best absorbency of UV light at the most dangerous UVrange. Ricinus.C. has a good absorbency of up to lOA at 230nm and 30Snm in a wavelength range of 280-400 while applied in silk unlike on cotton where it showed up to an absorbency of only 2.769A, Morinda.L. does better on silk with an absorbency of lOA at 295nm but showed a poor absorbency while on cotton.

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LIST OF ACRONYMS

NYTIL-Southern range Nyanza limited

ASTM – American Standards of testing materials

UPF – UV protection function

BHI -Brain Heart Infusion

UV- Ultra Violet

CHAPTER ONE

1 INTRODUCTION

1.1 BACKGROUND:

Although dyes abound in the natural environment, they can also be formed in different ways and used in different applications depending on their manufacturing process. Dyes can be formed by using chemicals like acids or extracted from earth and mineral sources. Natural dyes can be obtained even from our own backyards and used to colour fabric and other household items. These include various parts of plants such as flowers, roots, and nuts which can be processed to obtain many colours. Natural dyes produce vibrant colours, Creating A Palette That Is Compatible And Blend With Each Other.

Natural dyes of various colours can be obtained from many local plants in Africa and that dyes can be extracted from barks of trees, leaves, roots, seeds, fruits, flowers, or the young shoots. (Adu-Akwaboa 1994:129)

Similarly, plants in the environment can be exploited to achieve natural colors of various shades to color natural fibres and textiles by means of dyeing, printing or painting. Harris mentions that the roots of some species of the madder plant which could be grown practically everywhere were used from the earliest times to produce a whole range of reds. (Harris (1995).

The literature indicates that until the 19th century, all dyes were derived from vegetable or more rarely animal or mineral sources. By the early part of the last century, only a small percentage of textile dyes were extracted from plants.

Natural dyes generally require a mordant, which are metallic salts of aluminum, iron, chromium, copper and others, for ensuring the reasonable fastness of the colour to sunlight and washing.

REFERENCES

Ashis KS, Aagaewal P (2009). Applications of natural dyes on textiles. Indian J. Fibre textile Res. 34:384-399

Agarwal Radhika, Pruthi Neelam and Singh Saroj Jeet S, 2007. Effect of Mordants on Printing with Marigold Flowers dye, *Natural Product Radiance.*, 6 (4): 306-309.

Deo HT, Desai BK (1999). Deyeing of cotton and Jute with tea as a natural dye. Colouration technol. 115:7-8

Debasish Das, Sankar Ray Maulik and Subhash Chandra Bhattacharya, 2008. *Indian Journal of Fibre & Textile Research*, 33:163-170 .

Devi AS, Sumathy BS and Katyayini VKLT, 2006. Trailing *Eclipta* – A Natural Green Colour for Textiles, *Natural Dyes Scope and Challenges* (ed. M. Daniel) Scientific Publication (India) Jodhpur, 103-112.

Kota Chaitanya Sravanthi and Manthri Sarvani, 2011. Antibacterial Activity of Ricinus Communis Leaf Extracts, *International Journal of Pharmaceutical Sciences and Research* , 2(5): 1259-1261

Mossa JS, Al-Yahya MA, Al-Meshal IA, 1987. Traditional Medicinal plants of Saudi Arabia., Riyadh: King Saud University Press.

Gokhale SB, Tatiya AU, Bakiwal SR,Fursule RA (2004). Natural dye yielding plants in India. Natural product Radiance 3(4):228-234

Samanta AK, Agarwal P(2009). Applicarion of natural dyes on textiles. Review article Indian J.Fibre Text Res . 3:384-399.

Wanyama PAG,Kiremire BT, Murum JES ,Kamoga O (2011).Textile dyeing and phytochemical characterization of crude plant extracts derived from selected dye yielding plants in Uganda. Int J. Nat. Prod. Res. 1(2)-31