BUSITEMA UNIVERSITY
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF TEXTILE AND GINNING ENGINEERING

BACHELOR OF SCIENCE IN TEXTILE ENGINEERING

PRODUCTION OF A BLENDED YARN FROM SILK WASTES AND COTTON FIBRES

BY

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DECLARATION

I KYOKUNZIRE PROSCOVIA declare that the contents of this research report is my original composition to the best of my knowledge and observations, this work has not been submitted or published for any or to any institution of learning.

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Student's signature

19th. 05. 2016

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Date

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APPROVAL

This project report has been submitted to the Busitema University Faculty of Engineering, Textile and Ginning Department for examination with approval from the following supervisors.

MR. LOUM JANANI

Signature.....

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MR. WANDERA GEORGE

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Date .....

DEDICATION

I dedicate this report to my family, my uncle Mr. Mugisha and his family and Mr. Makumbi Fred for the support they gave me during the period of my entire report writing both financially and health wise, and mainly to my parents because they have done and sacrificed a lot for my education.

I also dedicate this report to all the staff Busitema University Textile and Ginning department for the courage and support they rendered to me in my struggle of pursuing excellence during my project report writing.

ABSTRACT

Silk occupies a unique position as a textile fibre with a rare combination of beauty and strength. Production and processing of silk is labour intensive which leads to high cost and limited production of the silk fibre.

Unfortunately the high cost of silk makes it unaffordable for many consumers; therefore mixed yarns could be constructed in order to lower the price of the fabric, without changing the unique properties of the silk negatively.

The aim of this study was to produce and compare the properties of different yarn blends of silk waste/ cotton with the properties of cotton. This was done in order to determine which of the blend ratio creates a more suitable mixed yarn with desired properties.

Standard test methods were used to evaluate the fibre properties such as fibre fineness (ASTM D 1448), fibre length and length uniformity of cotton fibres (ASTM D 1447), cotton trash content (ASTM D 2812), single yarn strength (ASTM D 2256), yarn count was determined as per the ASTM D 1059 test method and blend analysis was analysed using the solubility test as per AATCC 20A test method.

The silk waste/cotton yarn blend produced showed relatively good strength compared to the 100% cotton yarn. The strength of the yarn was found to increase with an increase in the silk composition within the blend. In addition, the blend yarns were found to have higher counts than 100% cotton yarn. 50/50 silk/cotton yarn blend showed the best results.

LIST OF ACRONYMS

AATCC	American Association of Textile Chemists and Colorists
ASTM	American Society for Testing and Materials
Cm	centimeters
CSP	count strength product
Kg	kilograms
NARL	National Agricultural Research Laboratories
Ne	English count
Nm	metric count
RKM	Reisskilometer
RPM	revolutions per minute
UR	uniformity ratio

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CHAPTER ONE

1. INTRODUCTION

1.1 Background

It is not exactly known how long people have used silk as fine threads spun by the larvae of the moth family Bombycidae described and named by Lynnaeus in 1758 as Bombyx mori. The origins of silk date back to Ancient China. Legend has it that a Chinese princess was sipping tea in her garden when a cocoon fell into her cup, and the hot tea loosened the long strand of silk. Ancient literature, however, attributes the popularization of silk to the Chinese Empress Si-Ling, to around 2600 B.C. called the Goddess of the Silkworm; Si-Ling apparently raised silkworms and designed a loom for making silk fabrics (*Sakunthala Athukorala*, 2012).

World silk production has approximately doubled during the last 30 years in spite of man-made fibers replacing silk for some uses. China and Japan during this period have been the two main producers, together manufacturing more than 50% of the world production each year. China during the late 1970's drastically increased its silk production and became the world's leading producer of silk. The 1970's were a period of tumultuous political and social upheaval in China, resulting in various economic reforms. Undoubtedly, these reforms are partially responsible for China's increased silk production. Thus the country that first developed sericulture approximately 4,700 years ago has again become the world's main producer of silk (*Ron Cherry*, 2011). India is the second largest producer of silk, contributing to about 18 per cent of the world production (Fashion & Fabrics, 2009).

The major silk producing countries in the world are; china, India, Brazil, Japan, Republic of Korea, Thailand, Vietnam and Iran. Few other countries also engaged in the production of cocoons and raw silk in negligible quantities include; Kenya, Botswana, Nigeria, Zambia, Zimbabwe, Bangladesh, Colombia, Turkey, Uganda, Malaysia, Romania etc. The major silk consumers of the world are; USA, Italy, Japan, India, France, China, United Kingdom, Switzerland, Germany, UAE, Korea and Vietnam. (International Sericultural Commission, 2013)

Silk is a natural protein fibre (*Kadolph & Langford*, 2002), produced by silk worms, through a practice known as sericulture. Most commercially cultivated silks are the product of Bombyx mori (*Wingate & Mohler*, 1984), a genus developed specifically by the Chinese over many

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