



Journal homepage: <http://www.journalijar.com>

INTERNATIONAL JOURNAL
OF ADVANCED RESEARCH

RESEARCH ARTICLE

DEVELOPMENT OF UV PROTECTIVE FABRIC FINISHED WITH HERBAL LEAVES EXTRACT

Dr. S. Grace Annapoorani¹, S.Yamuna Devi²

1. Associate professor Department of Textiles and Apparel Design, Bharathiar University, Coimbatore.
2. Research Scholar Department of Textiles and Apparel Design, Bharathiar University, Coimbatore.

Manuscript Info

Manuscript History:

Received: 12 April 2015
Final Accepted: 15 May 2015
Published Online: June 2015

Key words:

UV protection, green tea leaf, betel leaf, curry leaf and twill weave cotton fabric.

*Corresponding Author

S.Yamuna devi

Abstract

A Protective textile is now a major part of textiles classified as technical or industrial textiles. Ultraviolet rays constitute a very low fraction in the solar spectrum but influence all living organisms and their metabolisms. These radiations can cause a range of effects from simple tanning to highly malignant skin cancers, if unprotected. Sunscreen lotions, clothing and shade structures provide protection from the deleterious effects of ultraviolet radiations. Alterations in the construction parameters of fabrics with appropriate light absorbers and suitable finishing methods can be employed as UV protection fabrics. Ultraviolet – Visible (UV – VIS) spectroscopy is useful to characterize the absorption, transmission and reflectivity of a variety of compounds and technologically important materials, such as pigments, coating etc. This paper deals with the deleterious effects of UV rays and protection against them through textile materials by using green tea, curry leaf and betel leaf in twill weave fabric. The product developed is of natural herbs and is eco friendly, this is also skin friendly.

Copy Right, IJAR, 2015,. All rights reserved

1. INTRODUCTION

When textile assumes an additional function over and above the conventional purpose, it may be regarded as specialty or functional textile. Ganesan P. and Sasikala L.(2008)that, Functional finishes represent the next generation of finishing industry, which, make textile materials act by themselves. This means that they may keep us warm in cold environments or cool in hot environments or provide us with considerable convenience, support, and even fun in our normal day-to-day activities.The huge popularity and usage of cotton clothing is due to its properties, which makes the best clothing for humans. Cotton is durable, comfortable, soft and the superior fiber in clothing manufacturing. Sara J.Kadolph(2009) Twill weave, each warp or filling yarn floats across two or more filling or warp with a progression of interesting by one to the right or left, forming a distinct diagonal line, or wale. A float is the portion of a yarn that crosses over two or more yarns from the opposite direction.

Palacin F.,(1997) opines that the ultraviolet radiation band consists of three regions: UVA(320 TO 400 nm), UVB(290 TO 320 nm), and UVC(200 to 290 nm). UVC is totally absorbed by the atmosphere and does not reach the earth.

2. EXPERIMENTAL PROCEDURE

2.1 SELECTION OF FABRIC

2.1.1. COTTON

Cotton is cool, soft and comfortable clothing on the world. It absorbs and releases perspiration quickly thus allowing the fiber to breathe. The superiority of cotton is easy availability, comfort during wear and excellent wash properties. Cotton is the king of textile. It is used all over the world. Cotton is one of the strongest fiber. It is not affected by moisture or friction and it's stronger when moisture content increases expressed Ajgaonkar (1998).

2.1.2. TWILL WEAVE

There are several different variations of twill weaves, including

RIGHT-HAND TWILL: twill lines run from the lower left to the upper right. Right-hand twills are the most common twill weave.

LEFT HAND TWILL: twill lines run from the lower right to the upper left.

The twill order of interlacing produces diagonal lines on the cloth. These weaves are Employed for the purpose of ornamentation, and to make cloth heavier of closer setting, and better draping quality than can be produced with the same yarns in plain weave found Virginia Hencken Elsasser (2010).

2.2. SELECTION OF HERBS:



(a) Fresh betel leaf



(b) Fresh tea leaf



(c) Fresh curry leaf

2.3. EXTRACTION OF HERBS

The dried leaf powder of murrayakoenigii, piper sarmentosum and camellia sinesis were ground into powder using a blender and the grounded herbal powder were sequentially extracted. Extraction was carried out by dissolving 6 grams of the powder in 100ml of 80% methonal, kept overnight under shaking condition. Then the extract was flitered using whatmann filter paper, filtrate was collected and evaporated at room temperature . The concentrate extract was stored at 4 degree Celsius and used for futher studies.

2.4. FABRIC FINISHING – EXHAUST METHOD

The fabric (twill weave cotton) was immersed in the (Methonal extract of curry leaf, Tea leaf and Beetle leaf) solution with binder for 30 minute at 50c in oven. After 30 minute, the fabric was removed from the tub and air dried in shade.

2.5. ANALYSIS OF ULTRAVIOLET PROTECTION FACTOR

The ultraviolet protection of a fabric is expressed by the Ultraviolet Protection Factor (UPF). The UPF evaluates the reduction in the amount of the UV radiation that passes through the fabric to the skin. UV transmittance through the fabric samples was determined with in a wave length range from of 280 to 400 nm using a Shimadzu UV/V is Spectrophotometer. The standard method used for determining the UPF was AATCC 183-1999 (Transmittance or Blocking of Erythemally weighted Ultraviolet Radiation through fabrics).

3.RESULTS AND DISCUSSION

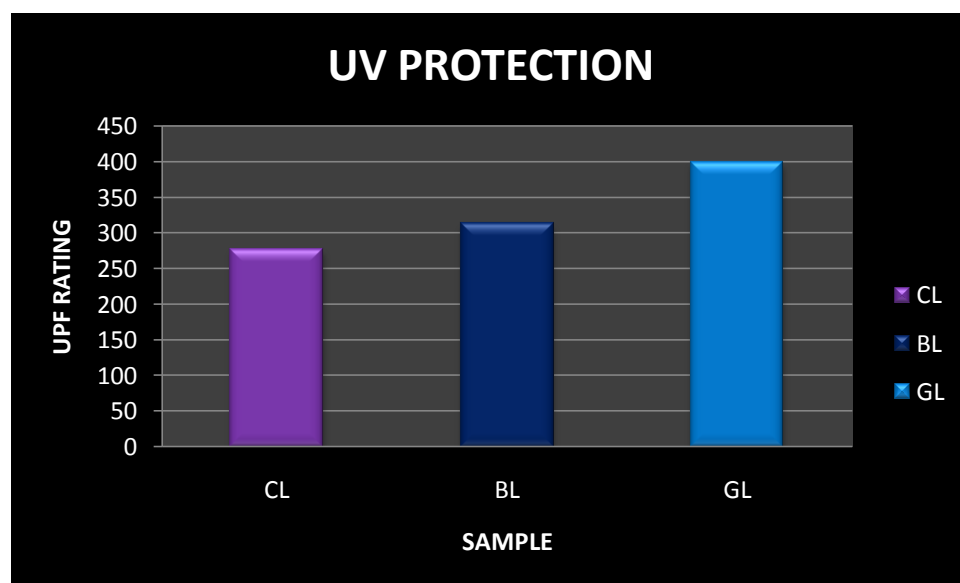
TABLE – 1 STANDARD CHART FOR UPF RATING FOR THE FABRIC[AATCC 183-1999]

UPF RATING	PROTECTION CATEGORY	% UV RADIATION BLOCKED
15 to 20	Good	93.3-95.9
25 to 35	Very Good	96.0-97.4
40 to 50	Excellent	97.5 or more

TABLE – 2 ULTRA VIOLET PROTECTION FACTOR OF THE SELECTED HERBS

S.NO	SAMPLE	Ultra Violet Protection Factor (UPF)# (AS/NZS 4399:196)	
		Mean UPF	UPF Rating
1.	Curry Leaves	276.	50+
2.	Beetle Leaves	312.50	50+
3.	Green tea leaves	398.60	50+

FIGURE – 2 ULTRA VIOLET PROTECTION FACTOR OF THE SELECTED HERBS



In the above figure and table, it is clear that the green tea leaf shows a better UPF rating compare to curry leaf and betel leaf.

CONCLUSION

The present investigation aimed at developing UV protection finish on cotton fabric using herbal leaves extract. The cotton fabric was finished with the herbals extract. It shows that cotton finished with green tea leaf has a better result on UV protection followed by cotton finished with betel leaf and least with cotton finished with curry leaf.

BIBLIOGRAPHY

- Hand Book On Herbals Medicine By Panda(2009)
- Herbal Medicinal plants Plate Vol-5(2009)
- Health Benefits Of Curry Leaves, Organic Facts, Retrieved From
- I.T.Johnson&G.Williamson, phytochemical Functional Foods, Cambridge, UK:Wood head publishing, 2003, Pp.135-145
- Indian Journal Of Fibre And Textile research Vol.38, March(2013)
- Indian Journal Of Fibre And Textile Research December 2013, Subramanian Sundaramoorthy Vol38