



Effect Of Vetiver Roots On The Fabric Roller Window Blind

¹ Dr. Mrs. Jayalakshmi.I, ² Mr. Gokul. K,

¹ Associate Professor, ² PG Scholar,

¹Department Of Costume Design And Fashion,

¹Chikkanna Government Arts College, Tiruppur, Tamil Nadu, India.

ABSTRACT: Vetiver Roots have coolant, carminative, stomachic, constipating, expectorant, anti-spasmodic, anti-gout, and antihelminthic properties. The plant possesses hepatoprotective, antituberculosis, antidiabetic, antidepressant, antiemetic, cytostatic, and antimicrobial action. Vetiver extract improves skin hydration, skin glow and has anti-ageing properties too. Roller shades will unify the style of any window treatment and give any home a clean, uncluttered appearance. This form of shade can greatly benefit modern homes. Roller shades appear tidy and compact when installed properly. Roller Fabric window blind in which a voile layer is added to reduce glare if the sun is too bright will be a new innovation. The prepared vetiver fabric roller window blind is a unique product with aromatic and its results were very fruitful.

Key: Vetiver Root, Natural Dye, Fabric Roller window blind.

I INTRODUCTION

Medicinal and aromatic plants are looked upon not only as a source of affordable health care products but also as a source of income. Balasankar et al. (2013) describes that there is a growing demand for plant based medicines, health products, essential oils, fragrances, cosmetics and natural aroma chemicals in the national and international markets. Home textile is a branch of technical textile comprising application of textiles in household purposes. Vasanth kumar et.al (2012) suggest home textiles are an internal environment, which deals with internal spaces and their furnishings. Anjali Chhabra et al. (2010) aver home textiles are mainly used for their functional and aesthetic properties which provides us the mood and also gives mental relaxation to the people. A window blind is a type of window covering. There are many different kinds of window blinds which use a variety of control systems. Window blinds can be manoeuvred with either a manual or remote control by rotating them from an open position, with slats spaced out, to a closed position where slats overlap and block out most of the light. When comparing the light-blocking abilities of drapes vs. curtains vs. blinds, all three can do a fairly good job. However, when it comes to blinds, some light can seep through the cracks between slats and in around the edges. Still, blinds can be suitable for bedrooms and always can be topped them with curtains to more thoroughly block the light. Blinds can come in different colors and wood tones. Topping them with curtains or a valance can soften their rigid appearance and add some visual interest.

Vetiver root as an natural organic source can be used for preparing window blinds product. Jeremy Berkoff (2003) explain vetiver has traditionally been used as medicinal and aromatic plants in many countries, especially in Asia. Recently it has received widespread recognition as being an ideal plant for soil and water conservation as well as environmental protection. Agus Setyo Muntohar (2016) delineate as a campaign to go 'back to nature' is everywhere, the utilization of vetiver as a medicinal plant to produce pharmaceutical products on a commercial scale has great potential for development. Putiyanan (2006) explain the uniqueness of vetiver root crafts have certain function, have interesting characteristics, and also can be a good give a fragrance on the room. Weerachai Nanakorn and Narong (2010) says vetiver root crafts has been increasing year by year in local, national and international levels. This increase in demand, as well as tremendous competition in the market, opens up opportunities for value addition to all forms of textile materials. Vetiver crafters use Vetiver leaves and roots to create an extensive range of beautiful woven handicrafts. Vetiver would seem suited to producing soft, durable fabric. Dhirendra Kumar and Kumar Nikhil (2016) convey that dry aromatic roots are used to make curtains, mats, fans and other fancy goods as the product emits a sweet cooling aroma for a long period when moistened during summer season. Gopinath et al. (2015) suggest the oil is used for blending of perfumes, cosmetics and scenting of soaps. The roots have been used in Asia for centuries for their fragrance, and are woven into aromatic matting and screens. Jayashree et al. (2013) announce that the roots of some cultivars and ecotypes possess essential oil that has been utilized as fragrant material since ancient times. Negisa Darajeh (2019) clarify the plant also contains active ingredients used in traditional medicine and as botanical pesticide.



**ROLLER SHADES
FIG. 1**

Window coverings can be static or dynamic. Static window coverings are fixed in place while dynamic window coverings can change their status manually or automatically. Dynamic

window coverings can control daylight and solar energy entering the building. Dynamic window coverings are effective in adapting to changing outdoor and indoor conditions. Optimal control of window coverings can increase occupant comfort while saving building energy use (lighting, cooling, and heating energy). Typical dynamic window coverings include automated blinds and automatic shades. Sawant Pooja Rajesh (2004) window blinds and shades can be controlled to avoid glare while introducing daylight to the building. The height of the blind and the angle of the slat can be determined by day lighting demand and solar positions. By controlling the height of shades or blinds, the optimal amount of sunlight can be introduced to meet the target horizontal illuminance. Tokuoka (2018) pronounce the optimal angle of the blind slats can protect occupants from direct sunlight. Glare can also be controlled by glare index-based models, such as discomfort glare probability. Window coverings can be controlled to minimize overheating. When the sunlight is strong, fully closed window coverings can decrease the cooling load while maintaining occupants' thermal comfort. When the outdoor temperature is extremely low, fully closed drapes or curtains can reduce the heating load. Window shades (Fig. 1) Sun filters - It is a woven voiles made up for polyester fiber flax, it consists of curtains, nets and Pemet made up from Rhone- Poulene fiber advantage of material is that ease of washing, simple system, absence of seams in the side pieces. There are different window shades such as cellular shades, layered shades, natural shades, pleated shades, roller shades, roman shades. Roller shades offer the sleekest and most seamless appearance of all the options. These shades feature a single panel of fabric that rolls up discreetly into its own casing. Roller Shades are offered in a variety of light filter options and fabrics. the look of their home without window covers, but are looking for something that can provide temporary privacy because roller shades are nearly undetectable when they are not being used.

A window blind is a type of window covering. There are many different kinds of window blinds which use a variety of control systems. Truong (1999) comment a typical window blind is made up of several long horizontal or vertical slats of various types of hard material, including wood, plastic or metal which are held together by cords that run through the blind slats. The term window blinds can also be used to describe window coverings. Harini Balasubramanian (2022) clarify window blinds include almost every type of window covering, whether it is a hard or soft material; i.e. shutters, roller shades, cellular shades (also called honeycomb shades), wood blinds, roman shades, standard vertical, and horizontal blinds (also called Venetians). In the United Kingdom, awnings are sometimes called blinds or shades. Roller blinds are a type of window blind that is typically made from a polyester fabric wrapped around a plastic or metal roller. The roller may either be exposed or enclosed inside of a frame and can be placed at the top of the window recess or outside of the recess. Sanjay and Wazir Advisors (2021) convey control the roller blind there is typically a chain or string on either side of the blind. When the side chain is pulled one direction the roller will raise, and if pulled in the opposite direction it will lower. Roller fabric Window blinds are wonderful to help tie together a room. Though they are often overlooked when initially moving in, window blinds are essential for maintaining a comfortable environment throughout in a home. Mishra Snigdha (2013) these fixtures ensure proper privacy in windowed areas, and they make it easier to control how much light shines into the room. They are easy to clean, maintain, and with proper dusting, they'll look great for years to come.

Hence this study was framed based on Roller window blinds using vetiver root for it cooling and fragrance entitled **"EFFECT OF VETIVER ROOTS ON THE FABRIC ROLLER WINDOW BLIND"** with the following objective as to construct a fabric window blind using vetiver roots and evaluate and analyze the constructed fabric window blind.

II METHODOLOGY

The methodology process is as follows:

2.1 SELECTION OF HOME TEXTILE PRODUCT

Window Blinds are of many different kinds .Roller shades will unify the style of any window treatment and give any home a clean, uncluttered appearance. Roller shades appear tidy and compact when installed properly, and do not appear bulky to the eye. Roller blinds are a type of fabric blind that come in a choice of one or two rollers. They are called roller blinds and double roller blinds for simplicity. When using two rollers a voile layer is added to reduce glare if the sun is too bright, but it's paired with a blackout layer for night-time. Hence, roller blind is selected for the study.

2.2 SELECTION OF NATURAL SOURCE FOR WINDOW BLIND

Window blinds are typically made of materials such as bamboo, reeds, jute, and grass. These earthy materials are woven together to give a shade, can roll up and down to achieve desired amount of light. Burger (2017) natural Shades are great for people looking to achieve a private and relaxing ambiance. Vetiver dry roots (Plate 1) is selected as natural source for creating window blind for the study.



**PLATE 1
VETIVER DRY ROOTS**

2.3 PREPARING THE VETIVER ROOTS

The preparation of fabric roller window blind, First the vetiver roots (Plate 2) of good quality is collected, cleaned, washed well to remove imparts. The wasted vetiver roots are soaked (Plate 3) for 9 days then taken out and again washed. The soaked washed vetiver roots are flattened (Plate 4). It make it loose from its firmer such that it become brittle. Then they are dried in shade (Plate 5).



**PLATE 2
VETIVER ROOT**



**PLATE 3
SOKING OF
VETIVER ROOT**



**PLATE 4
FLATING OF
VETIVER ROOT**



**PLATE 5
DRYING OF
VETIVER ROOT**

2.4 SELECTION OF FABRIC, NATURAL DYES AND MORDANTS

The investigator selected 2 X 2 basket woven for the study. eucalyptus a was selected as a natural dye for dyeing the basket woven cotton material. The collected eucalyptus bark was cleaned and powdered. Sodium chloride was selected as a mordant for dyeing.

2.5 PREPARATION OF BASKET WOVEN COTTON MATERIAL FOR NATURAL DYEING

The basket woven material was prepared for horizontal line tie and dye technique and the same was tied using waxed threads. The tie dyed material was pre soaked in water for better absorbency.

2.6 ACTUAL DYEING PROCESS

For actual tie dyeing process, based on the weight of the basket woven fabric required amount of natural dye eucalyptus bark powder was taken, which M : L ratio of 1:80 ml of water was added and boiled to extract the eucalyptus bark dye for half an hour at 600 - 700 C. Now, required grams of sodium chloride mordant was added to the same bath, and the pre-soaked horizontal tie and dyed basket woven cotton material was steeped inside and again boiled for one hour at 500 - 600 C. After the desired line, the natural dyed tie and dyed basket material was taken out rinsed and dried in shade. After which, the tied threads were removed. Finally the horizontal tie and dyed basket woven fabric is ready to be converted into fabric roller window blinds (Plate 6).



**HORIZONTAL TIE DYED
BASKET WOVEN FABRIC
PLATE 6**

2.7 MAKING OF FABRIC ROLLER WINDOW BLIND USING VETIVER ROOT

The vetiver fabric roller window blind which is prepared is of 39 inch length and 33 inch width. The vetiver are spread evenly and stitched for 1 inch length and 36 inch width. The Basket woven Tie and dyed fabric is taken and stitched on the three sides namely top, bottom and one side leaving another side free. The cleaned vetiver roots are taken and spread across the width and length on to the tie dyed fabric leaving spaces between 1 inch through. Then the tie dyed basket woven material is folded over the spread vetiver roots. The vetiver roots are stitched to the basket woven material to catch it firmer. The extra length of the vetiver root protruding are cut off to make it even at the sides. The fourth side which is open is now closed by folding and stitching. For surface decorating lace is added on the seam lines.



**HALF CLOSED VETIVER FABRIC WINDOW BLIND
PLATE 6**



**FULL CLOSED VETIVER FABRIC WINDOW BLIND
PLATE 7**

A PVC pipe is cut in 36" width. A center cut is given to the pipe for opening and attached to the vetiver fabric roller window blind bottom part to keep it in tact. On the top part, to inset in a rod, for 1 inch vetiver fabric roller window blind is folded and Velcro is attached on the back portions of the blind. Next, roller is attached on to the Velcro which is attached to the thread lock. Now, the tie and dyed fabric roller window blind using vetiver roots is completed. The fabric roller window blind is now hang onto the window (Plates 7,8). The ambience and of the window looks excellent feels good and fragrance is nice, refreshing.

2.8 TESTS

The fabric roller window blind made of vetiver roots are subjected to the following mechanical tests to the weight, Thickness, Air permeability, Bursting strength, Colour fastness to Sunlight and Laundrometer tests.

III RESULTS AND DISCUSSION

The results for the study is discussed below:

3.1 EVALUATION

The evaluation for the Natural source of vetiver fabric Roller window blinds was carried out for the mechanical and subjective tests.

3.2 VISUAL EVALUATION FOR FABRIC ROLLER WINDOW BLIND

The evaluation for the Natural source of vetiver fabric Roller window blinds was carried out for the mechanical and subjective tests Table I.

SMELL		APPEARANCE		PERFORMANCE		% OF SUNLIGHT PENETRATION				AIR CIRCULATION	
GOOD	FAIR	GOOD	FAIR	GOOD	FAIR	10%	25%	50%	100%	GOOD	FAIR
500	-	500	-	500	-	450	25	25	-	500	-

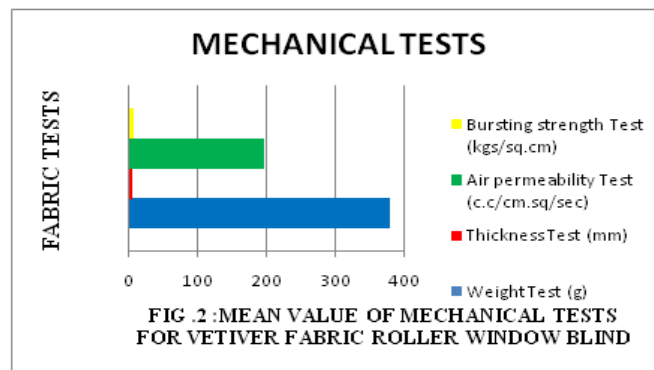
From Table I, the results obtained from 500 post graduate students for the prepared vetiver fabric roller window blind reveal, that all the evaluators had good opinion for smell, appearance, performance, sunlight penetration and air circulation. Regarding % for sun penetration, the vetiver fabric roller window blind results showed that 450 students were of opinion that 10% of sunlight penetrated, 25 students were of opinion that 25% of sunlight penetrated and 25 students were of opinion that 50% of sunlight penetrated, in the sample. But there was no 100% penetration of sunlight, which served the purpose of window blind.

3.3 ANALYSIS OF MECHANICAL TESTS FOR VETIVER FABRIC ROLLER WINDOW BLIND

The prepared vetiver fabric roller window blind was subjected to the weight, thickness, air permeability and bursting strength tests and is recorded in Table II.

MECHANICAL TESTS	MEAN VALUE OF PREPARED VETIVER FABRIC ROLLER WINDOW BLIND	SD	CV%
Weight Test	379.2g	7.89	2.08
Thickness Test	3.65mm	0.19	5.20
Air permeability Test	196 c.c/cm.sq/sec	40	20.4
Bursting strength Test	7.45 kgs/sq.cm	0.06	0.80

From Table II and Fig. 2, the prepared vetiver fabric roller window blind when subjected to mechanical tests, the results revealed that it weighted 379.2g, had 3.65mm Thickness and, 196 c.c/cm.sq/sec of Air permeability through the vetiver window blind sample. The fabric roller window blind withstood 7.45 kgs/sq.cm of Bursting strength, which revealed that the vetiver fabric roller window blind had good strength.



3.4 ANALYSIS OF COLOUR FASTNESS TESTS

The prepared vetiver fabric roller window blind was subjected to color fastness tests such as sunlight and laundrometer test and is shown in Table III.

COLOUR FASTNESS TESTS	GRAY SCAL VALUE	
	Colour change	Colour staining
SUNLIGHT	5	-
WASHING	5	5

From Table III, the prepared vetiver fabric roller window blind when tested for sunlight showed no change a year. When tested for washing, the sample had no colour change and colour staining. Hence, the prepared vetiver fabric roller window blind can be said to have good colour fastness to sunlight and washing.

IV CONCLUSION

The vetiver woven roller blind is an environmentally friendly window covering innovation that can provide an aromatherapy scent produced by vetiver woven fabric. apart from that, there are many blinds in the market that are made of bamboo, but using the fabric in a different way and using Vetiver in it, a roller window blind has been made in a unique way paves way for new revolution. The difference between vetiver blind and bamboo blind is that vetiver is naturally scented and the scent from it is calming and refreshing. Not so with bamboo blind, both are naturally formed but Vetiver has many medicinal properties and immunity. Apart from that, it also has a long lifespan like bamboo, no matter how hot and rainy it is, it will not lose its character. Not only that, but putting it inside the cloth will increase both its smell and lifespan. The use of blind made from natural materials such as wood or bamboo has been widely used, but vetiver has limited usage in market. Vetiver was used in roller blind as an environmentally friendly home roller blind innovation that can provide an aromatherapy fragrance produced by vetiver. Roller blinds function to minimize or protect the room from exposure to sunlight that enters through the window.

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