International Journal for Social Studies
Available at
https://edupediapublications.org/journals

ISSN: 2455-3220
Volume 04 Issue 02
February 2018

Eco Friendly Finishing To Bed Spreads Using Cactus Extract for Mosquito Repellency

Mrs.D.AnitaRachel.,B.E.,M.Tech.,(Ph.D)[1], Assistant Professors, Department of Apparel Manufacturing and Merchandising and Research Scholar Department of Rural Industries and Management , Gandhigram Rural Institute-Deemed University, Gandhigram – Dindigul ,

Balakrishnan.M(1526P0005)[2],IIIyearB.Sc(AMM)[2]NIFT – TEA COLLEGE OF KNITWEAR FASHION, Tirupur – 641 606.

Dr.B.SenthilKumar[3], Asst.Professor& Department of Rural Industries and Management, Gandhigram Rural Institute-Deemed University, Gandhigram – Dindigul – 624 302, TamilNadu, India.

ABSTRACT

In the Textile Industry the Functional textiles of any product varies with its Finishing nature. My idea of this project is to produce an Eco friendly antimicrobial finishing to bed spreads using cactus extract for mosquito repellence. Finishing improves the fabrics performance and give special Cactus Miller, Psidium guajava and Azadirachtaindica etc for the mosquito repellent is one of the most effective tools for protecting human from vector borne diseases. To impact the Eco friendly antimicrobial finishing to bed spreads using cactus extract for mosquito repellence, the method chosen is Dip-Dry method of Cactus Extract. This work is a small effort in developing an eco friendly mosquito repellent finished fabric using the cactus extract. The fabric was finished by padding mangle method and evaluated using a exito chamber test. After finishing, the finished fabric showed 100% of repellent activity for direct application method. This study helps in the development of a mosquito repellent fabric which protects the human beings from the mosquito bites and thereby promising safety from the mosquito borne diseases. The Aim of this Project is to serve the Society without mosquito and the diseases.

Keywords: *Cotton fabric, Extract of cactus Miller, Exito Chamber, Mosquito repellent in textile, Cotton, Knitted Fabrics, Bed Spreads and Bed Sheets, Pad- dry-cure method.*

1 INTRODUCTION

Mosquitoes are most medically significant vector and they transmit parasites and pathogens, which continue to have an over whelming impact on the human beings. Also, they are the main cause of spreading the deadly diseases like malaria, dengue, filariasis and chickungunya[1]. A textile fabric with the mosquito repellent is one of the revolutionary ways and the much needed feature of driving away the mosquitoes. It protects the humans from the bite of mosquitoes and there by promising safety from the mosquito borne diseases [3]. The use of medicinal plants as a source of relief from illness can be traced back to over five million, years in the early civilization of china, India and north east, which is as old as mankind. Plant products have been used traditionally by human communities in many parts of the world against the vectors and species of insects [2]. Catcus extract from Leaf, Flower and the blocky stem is aromatic, almost exclusively perennial, rarely annual herbs. They have wide-spreading underground and over ground

ISSN: 2455-3220
Volume 04 Issue 02
February 2018

stolons and erect, square, branched stems. Itis used as a cure for respiratory tract, kidney stone, headache, neck and back pain. It also has high repellent activity against mosquitoes and insects. The present investigation focuses on developing an eco friendly natural mosquito repellent fabric treated using the plant extracts of Catcus Extract

1.1 OBJECTIVE

- To produce a chemical free bedspread
- To prepare a eco-friendly bedspread to have harmless night
- To produce antimicrobial finish to the bedspread with a insect proof material.

1.2 SPECFICATION

- Cactus flower, leaf and fruit
- GSM :100
- COLLOR : All over print
- PRODUCT : Bed spread
- AREA : Finishing

2 REVIEW OF LITERATURE

2.1 MOSQUITO REPELLENT FINISH BY CONVENTIONAL METHOD

Mosquitoes are incredibly unsafe insects and are responsible for propagating ailments like malaria, encephalitis (inflammation of brain) and dengue fever. At present, there are very few durable repellents that can be applied to clothing and almost all the repellents are designed to be applied directly on the skin.

2.2RECIPE

- Extract - Cactus flower, leaf and fruit
- Chemical - Tolumide Complex
- Solubility - Soluble in water
- Ionic - Non-ionic
- pH - 6.0 1.0

3 MATERIALAND METHODS

The fabric used in the current study was cotton fabric. The wet processing techniques used here were scouring, bleaching and dyeing. Then the mosquito repellent finish was applied on the fabric by herbal process.

3.1 PRE-TREATMENT

Desizing

Desizing involves impregnation of the fabric with the desizing agent, allowing to degrade or solubilise the size material, and finally to wash out the degradation products.

Scouring

The desized cotton woven fabric contains oils, fats, waxes, minerals, leafy matter and motes as impurities that interfere with dyeing and finishing. Synthetic fibers contain producers pin finishes, coning oils and/or knitting oils, mill grease used to lubricate processing equipment, mill dirt, temporary fabric markings and the like may contaminate fabrics as they are being produced.

Recipe

Alkali -2 to 5 gm per litre.
Soda ash -50 gm per litre to adjust ph (ph required for
scouring is 10.5).
Wetting agent -1 gm per litre.
Sequestering agent - 1 gm per litre.
Detergent -1 to 2 gm per litre.
Temperature 100 to 1250c.
Time -6 hours (close vessel) and 8 hours (open vessel)

Bleaching

Hydrogen peroxide is virtually the only bleaching agent available for protein fibers and it is also used very extensively for the cellulosic fibers. Hydrogen peroxide is a

ISSN: 2455-3220
Volume 04 Issue 02
February 2018

colorless liquicd soluble in water in all proportions. It is reasonably stable when the ph is below 7, but tends to become unstable as the alkalinity increases. Commercial hydrogen peroxide, therefore, is made slightly acid so that it will not lose strength during storage. Solutions of hydrogen peroxide of more than 20 volumes cause intense irritation when they come into contact with skin andshould be washed away immediately.

Recipe

NaoH - 17ml/kg
Soap (dtc) - 2ml/kg
H202 - 30ml/k
Reaction time - 25min.
Speed - 0-70m/min

3.2 COLLECTION OF RAW MATERIALS

Cactus Extract from the plant in and around the Coimbatore district and it is dried under shade in room temperature for 3 weeks and then it is powdered

3.3 SOLVENT EXTRACTION OF COLLECTED

Extraction was carried out by dissolving 6 grams of Catcus Extract in 100ml of 80% methanol, kept overnight under shaking condition in an air tight container without space. Then the each extract was filtered using Whatmann no.1 filter paper (0.4um), filtrate was collected and evaporated at room temperature. The concentrated extract was stored at 4 degree Celsius and used for further studies.

3.4 FINISHING BY PADDING MANGLE

The finishing of three different Catcus Extract on to the cotton woven fabrics that is Bedspreads was done through padding mangle. The finished samples immersed in the prepared extracts was passed through a padding mangle run at a speed of 30 rpm/min and a mangle pressure of 15 kgf/cm2. The padded fabric was air dried and then cured for 3 min at 140 'C. The finished fabric sample was subjected to mosquito repellent testing. Then the three treated samples were tested by excito chamber and among the three treated sample Catcus Extract treated fabric showed better result.

3.5 MOSQUITOREPELLENCY

Basically mosquito repelling textiles are the ones which have a character of repelling mosquitoes. This feature was developed as a need in sense of protection from the mosquitoes in the areas which are habitats of the mosquitoes and are prone to disease like malaria.

3.6 MOSQUITO COLLECTION

Anopheles mosquitoes were identified based morphologic keys and they were collected during the evening hours. All mosquitoes were starved of blood and sugar of hours before the tests.

3.7 REPELLENCY BEHAVIORAL TESTS

Specially designed two excite repellency test chambers were used to evaluate the efficiency of repellency activity. The wooden outer chamber of excito-repellency testing device measures 34 cm × 32 cm × 32 cm and faces the front panel with the single escape portal. The box is composed of a rear door cover, an inner Plexiglas glass and with a rubber latex-sealed door, a Plexiglas holding frame, a screened inner chamber, an outer chamber, a front door, and an exit portal slot. Mosquitoes were deprived of all nutrition and water for a minimum of4 hours before exposure. Laboratory tests were performed during daylight hours only and each test was replicated four times. Observations were taken at one-minute interval for30 minutes. After each test was completed, the number of novation (TRI-2017) scalped specimens and those remaining inside the chamber were recorded separately for each exposure chamber, external holding cage, and paired control

ISSN: 2455-3220
Volume 04 Issue 02
February 2018

chamber. Escaped specimens and those remaining inside the chamber, for the treated samples, were held separately in small holding containers with food and water. Mosquito Repellency Testing of Catcus Extract of leaf, Stem, Fruit extract finished Fabric that is Bed spread.

3.8 MOSQUITO REPELLENCE TESTING

The mosquito repellent activity was tested through Excito Chamber method (Roberts, D, et al ,1997).with Anopheles variety of mosquito's Specially designed two-excitorepellency test chambers were used to evaluate the efficiency of repellency activity. The wooden outer chamber of excito-repellency testing device measures 34 cm × 32 cm × 32 cm and faces the front panel with the single escape portal. The mosquito escape zone consists of an outward projecting funnel with the dimension of 14 cm long in its top and bottom exit funnel, leaving 1.5 cm wide (a horizontal slit) through which mosquitos can escape from the chamber. The back size of the metal door is hinged metal door, which tightly closed. The back side consists of mosquito exposure zone having is a hinged metal door, which is also contains an inner removable panel. This panel fits inside the back of the exposure chamber,in addition to this 4 small flanges were available along with this chamber to serve the imprison the mosquitos. The plexiglass helps to observe the mosquito's population inside the chamber.

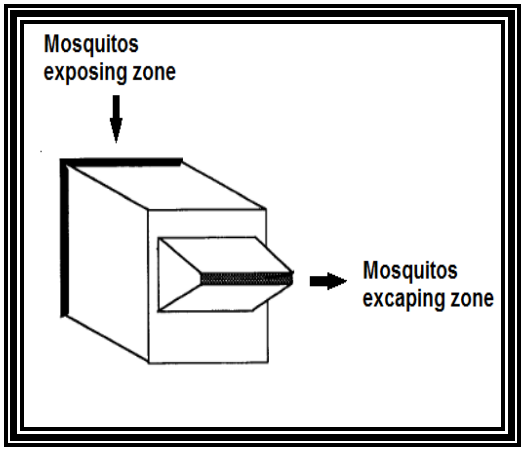
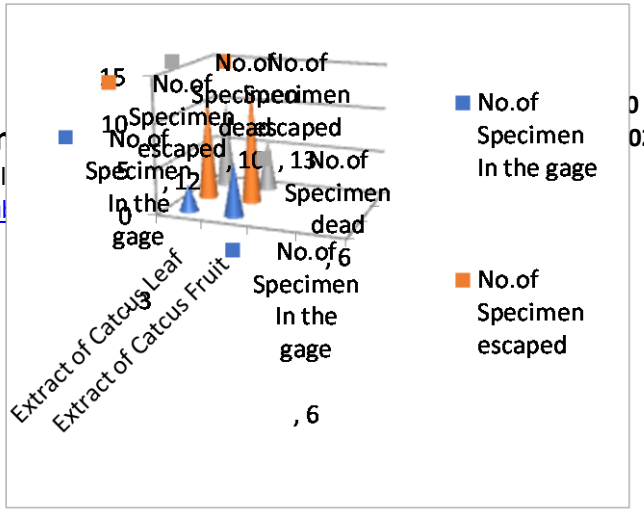


Fig. 1.Excito chamber used for Mosquito repellence testing [14].

This test consists of 4 group of 25 mosquitoes were introduced in to this chamber for one minute. Before conducting the experiments Mosquitoes were deprived of all nutrition and water for a minimum of 4 hours before exposure. Laboratory tests were performed during daylight hours only. Before initiating the testing **procedure** the exit funnels were sealed and mosquitos were permitted exposure in to the chamber without test specimen, which ensures the mosquitoes to adjust the test chamber condition and funnel was opened then the mosquito repellent treated fabric was kept in to the chamber and one by one all the group of 25 mosquitos were exposed in the chamber for one minute. Number of escaping mosquitos from the chamber was recorded manually at 1 min intervals of 5 min of observation. A survival analysis approach was used to estimate the rates of mosquitoes escaping from chambers. In the excito-repellency test, there are only 2 possible outcomes for a specimen: it will either escape or not escape from the exposure chamber (Mosquitos escaped are treated as death).

4 RESULTS AND DISCUSSION



4.1EVALUATION OF MOSQUITO REPELLENCE FOR CATCUS EXTRACT FINISHED FABRIC

Table – 1 – Evaluation of the Mosquito

S.No	Fabric Sample	No.of Specimen exposed	No.of Specimen In the gage	No.of Specimen escaped	No.of Specimen dead	Mosquito
1	Extract of Cactus Leaf and Stem	25	3	12	10	
2	Extract of Cactus Fruit	25	6	13	6	

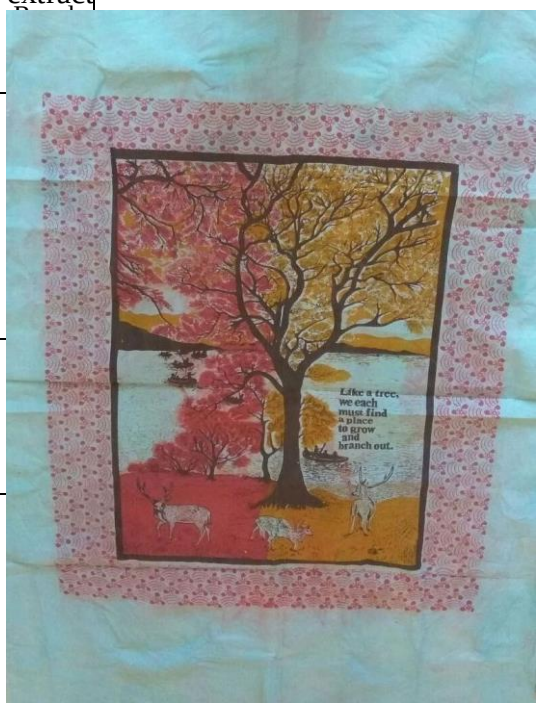
Following the results it was obtained for the evaluation of mosquito repellency for the herbal extract finished fabric. The Catcus extract shows high mosquito repellency percentage is as follows,

Table: 2- Mosquito repellency percentage

S.No	Fabric Sample	No.of Specimen exposed	Mosquito Repellency (%)
1	Extract of Cactus Leaf and Stem	25	88
2	Extract of Cactus Fruit	25	76

5 PRODUCT SAMPLE

Fig 2- Bed Spread treated with the Cactus extract



The above values shows the abrasion resistance of the before and after values of grey sample and finished sample. The both values are equal for the grey sample and finished sample.

6 CONCLUSIONS

Cactus extract treated fabric has found to have good1 mosquito repellent property by direct application method. Vector borne diseases are one of the major problems in developing countries. To avoid such sort of disease transmission to humans can be avoided using mosquito repellent fabrics. This form of natural extraction of the mosquito repellent finishes is very safe and eco friendly and protect the body from mosquitoes. The sample treated with cactus

ISSN: 2455-3220
Volume 04 Issue 02
February 2018

extract is effective, economical and eco-friendly.

7 REFERENCES

(1)Aarthi n, muruganzizanioides L, ocimumspinosad against malarial vector, anophelesdiptera: culicidae). J biopesticides. 2010, 199-204.

(2)Afaffaragshahba, osamahalawa, mohamedragaci, mohamedhashem Development of longer-lasting insect repellence cellulosic based curtain fabrics. Material sciences and applications. 2011, 200-208

(3) Maheshwaran r, sathish s, ignacimuthu s. Larvicidal activity of leucasaspera (willd) against the larvac of ulexquinquefasciatus say. And acdesaegypti1. International integrative biol. 2008, 2:214-217

(4)Rajendran r, radhai r, rajalakshmi v. Development of mosquito repellentFabricusing vitexnegundo loaded nanoparticles. Malaya j biosciences2014; 1:19-23

.(5)Sumithra m, vaasugi raja. Mosquito repellency finished in blended denimfabrics. International j pharm and ife sci. 2012; 3:1614-1616.

(6) Vijaylakshmi s, chandrasekaran vigneswaran. Cotton mosquito repellentfabrics and their performance. elliand international. 2009; 15:110-111.

(7) Thilagavathi G, Krishna Bala S and Kannaian T:Microencapsulation of herbal extracts for microbial resistance in healthcare textiles. Indian J Fibre Text Res 2007; 32: 351 - 354.

(8) Ramya.k&maheshwari.v(2014) . Development of eco friendly mosquito repellent fabric finished with andrographispaniculata plant extracts. International journal of pharmacy and pharmaceutical sciences, Vol 6, issue 5.

(9) British Pharmacopoeia, Vol. II. Her Majesty's Stationery Of- fice, University Press, Cambridge. Appendix XIE, p. A111,1980.

(10) Golja, B., Šumiga, B., & Forte Tavčer, P. (2013). Fragrant finishing of cotton with microcapsules: comparison between printing and impregnation. *Coloration Technology*, *129*(5), 338-346.

(11) Roberts, D. R., Chareonviriyaphap, T., Harlan, H. H., &Hshieh, P. (1997). Methods of testing and analyzingexcito-repellency responses of malaria vectors to insecticides. *Journal of the American Mosquito Control Association*, *13*(1), 13-17.

(12) Christie, K., and Sangeetha, K., 2016, A Comparative study on antimicrobial finish using Pisidiumguajava leaf extraction on cotton, organic cotton and bamboo fabrics. Int. Conf. on Inform. Engg, Mngt and Security, 101-106.