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Insect Repellent Finish on Bamboo Fabric for Hijab Cap

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Abstract: ***Wearing the hijab (a veil covering the hair and neck) can give the wearer a few discomforts. Some of it may be being more prone to mosquito attack due to its black color, increased sweating which can cause itchy scalp and lice infestation. To prevent this, one can wear a cap under the hijab that has good wicking property. For this reason, bamboo fiber is suitable in making the cap. It has in-built anti-bacterial properties. When bamboo fabric is treated with chrysanthemum extract, it can be an effective combination to overcome the above-mentioned problems and make the wearer comfortable. The purpose of this paper is to present an overview of bamboo fabric and chrysanthemum coronarium, including its characteristics, techniques of processing, and numerous textiles uses.***
Keywords: mosquito, chrysanthemum, anti-microbial finish, insect repellent, bamboo)

I. INTRODUCTION

Textiles that repel mosquitoes provide protection against mosquito bites, keeping the wearer safe. Applying an extract of a natural insect repellent to textile materials may result in mosquito protection as well as environmental and user safety. It is possible to trace the use of herbal plants and plant derivatives, such as flowers, barks, roots, and leaves, for therapeutic purposes. Over the world, nature has bestowed upon us an enormous botanical wealth of plants and trees with a variety of medical benefits and the ability to cure various diseases.[1,2]

Insect bites may trigger disease, discomfort, and other negative effects. Simple irritation, swelling, and discomfort are the less serious side effects which can occur from insect bites like those caused by mosquitoes. Because of their breath and skin scents, humans are a magnet for mosquitoes and other blood-feeding insects. The carbon dioxide in a person's breath attracts the bug. Since repellents only work on the skin and in close proximity to the treated region, mosquitoes may still be visible in the surrounding area. As a matter of medical need, many synthetic repellents were employed to keep people from getting bitten by mosquitoes.[2]

Effective mosquito protection has been demonstrated with N, N-diethyl-3-methylbenzamide, often known as DEET, picaridin, or lacridin, as well as permethrin and IR3535. Although synthetic repellents such as lotions, sprays, liquidators, coils, and the like are currently on the market and work well, they have drawbacks that have an adverse effect on both people and the environment. Humans are experiencing unpleasant side effects from synthetic repellents, such as a strong odour, skin rashes, burning in the eyes, headaches, sore throats, coughing, nausea, dizziness, and respiratory irritation. Botanical compounds can be used in place of chemical repellents to prevent these negative effects. Applying insect repellent on their skin, clothing, housemates, and holsters can help people avoid getting bitten by mosquitoes. Applying repellents to the skin or clothing creates a layer of vapor that has an unpleasant natural aroma and keeps the user from getting bit. Using fabric impregnated with a mosquito repellent chemical is one of the cutting-edge techniques.[2,3]

Excellent moisture-wicking qualities of bamboo fabric enable sweat to be drawn away from the body and swiftly evaporate. Bamboo fabric stays breathable and comfortable whether worn in hot and muggy weather or after vigorous exercise, improving the wearer's entire experience. The unique and inherent properties of bamboo fibre include bacteriostasis, deodorization, and antibacterial properties which makes it best suited for wearing as cap.[3]

A. Objectives

1) To source the bamboo fabric
2) To source the chrysanthemum flowers
3) To source the mordant pomegranate
4) To apply the finish on the fabric
5) To test the fabric after the application of finish

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6) To construct a hijab cap
7) To evaluate the final product by practical experiments

B. *Need For The Study*

Hijab caps are an essential part of modest wear. It is necessary to keep the veil in place. These caps can cause sweating due to poor air ventilation. Sweating can lead to bacterial infection and infestation of lice in some people. This can cause discomforts like itchy scalp.

Since hijabs are mostly worn in black colour, it also attracts mosquito. Mosquito bites are mostly not fatal but can cause irritability, swelling and itching. In rare cases, it can cause fatal diseases like malaria, dengue, and chikungunya.

Textile goods with the ability to provide protection are referred to as protective textiles. These fabrics aid in providing protection against species that are likely to harm people or property.

Any compound, or combination of substances, designed to prevent, eliminate, repel, or mitigate any pest is called an insect repellent. Mitigating is the process of lessening an impact.

To prevent and reduce the occurrence of the above problems, the hijab caps can be made of bamboo fabric and finished with an anti-microbial, insect- repellent finish. While in bamboo fabric anti- microbial and good-wicking properties are inherent, the chrysanthemum coronarium also is a well- known natural insect- repellent. Bamboo fabric is breathable and ventilating. It causes lesser sweating and easy drying even when a person sweats.

Although they are not used in all anti-mosquito treatments, repellents have a significant function to play and are necessary raw ingredients for their production. Applying insect repellent, such as N, N-diethyl-meta-toluamide (DEET), directly to the skin or in together with textiles containing permethrin, is one way to prevent attacks by mosquitoes.[3]

It has special qualities that include breathable, antibacterial, soft handle and resistant to UV rays. Its cross section contains a variety of micro-gapes and micro-holes that improve its moisture absorption. Bamboo cloth feels comfortable since it absorbs and releases sweat extremely easily.[4]

II. REVIEW OF LITERATURE

The fashion industry has been exploring alternative materials as a result of the growing demand in eco-friendly and sustainable textiles in recent years. Bamboo fabric is one such material that has drawn attention. This fabric, which is made from bamboo, is prized for being hypoallergenic, breathable, and soft.[5]

The purpose of the review of the literature is to investigate the qualities and possible advantages of employing bamboo fabric in different textiles and clothing. Bamboo fabric's eco-friendliness and appealing qualities have made it a major topic of discussion in the textile business.[5]

A. *Characteristics Of Bamboo Fiber*

Bamboo fabric has a number of beneficial qualities, such as softness, breathability, moisture wicking, and antibacterial qualities. It is a desirable option for many textile applications because of these qualities, especially in apparel and household textiles.[5]

B. *Chrysanthemum Coronarium*

The plant species selected for the purpose of research was the chrysanthemum.

Chrysanthemum flowers were shade dried before being ground into a fine powder.

Recent environmental degradation and population growth have driven experts to develop new health and hygiene solutions for the benefit of humankind. The distress brought on by microorganisms, which are tiny organisms but have the potential to seriously affect our way of life. A lot of attention has been paid to the sustainability of the earth's environment in the last century. This worry is compounded by the recent surge in interest in healthy living and the need for clean components among customers.

The goal of this research is to create a long-lasting antibacterial coating on bamboo fabric using chrysanthemum flower extract.[6,7]

III. METHODOLOGY

1) *Material Selection:* For the research work, the bamboo fabric was purchased from Woodwose Organic Clothing, Tirupur. The fabric is washed and ensured of zero dirt for better penetration of the finish that is to be applied.

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2) *Sourcing of Herb:* Based on our end-use criteria, the plant species that we preferred for the study was Chrysanthemum coronarium. It was sourced from a local flower market in the city. This herb has strong antibacterial activity and strong pest control
3) *Preparation of C. Coronarium:* The C. coronarium blossoms were gathered, shade-dried, and ground into tiny particles with a grinding machine.
4) *Finish Application Method on Bamboo Fabric:* Using the in-situ method and a M:L ratio of 1:10, the C. coronarium extract was applied to bamboo fabric at the ideal finish process parameters, which included a temperature of 40°C and a period of 1 hour.
5) *Fixation:* Afterwards, the herbal extracts were fixed into the fabric by using the mordant pomegranate as a binding agent for the finish fixing. After some time, the fabric was dried for 10 minutes at 80°C to get rid of the moisture. Make sure the fabric is completely dry before proceeding to the subsequent stage.
6) *Rinsing and Washing:* Rinse the fabric well with cold water after fixing to get rid of any leftover finishing agents and loose mordant molecules. To get rid of any last bits, give it a gently hand wash with a mild detergent.
7) *Drying and Finishing:* To avoid fading, let the finished bamboo fabric air dry away from direct sunshine. After the fabric has dried, iron it using a low heat setting to remove any creases.

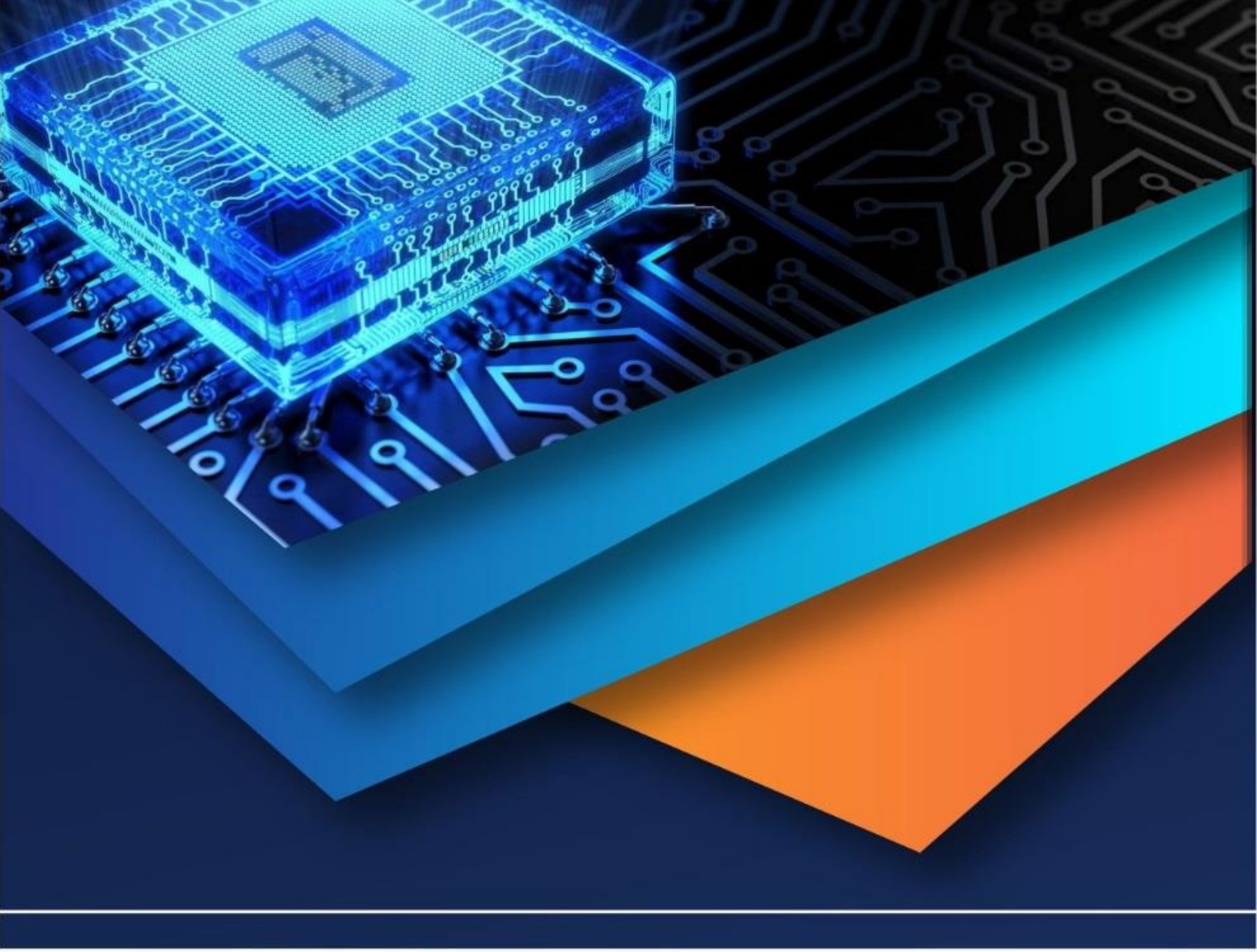
IV. SUMMARY AND CONCLUSION

Bamboo fabric's exceptional moisture-wicking properties allow perspiration to be pulled away from the body and quickly dissipate. Whether worn in hot, muggy weather or after strenuous exercise, bamboo fabric remains breathable and pleasant, enhancing the wearer's overall experience. Bamboo fibre has special and innate qualities that make it ideal for use as a cap, such as bacteriostasis, deodorization, and antibacterial qualities.

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