



UV PROTECTED BAMBOO HAND GLOVES USING GUAVA LEAVES EXTRACT

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ABSTRACT:

By the rapid growth in the textile industry the global market needs some different and unique ideas rather than the traditional and usual patterns. My research has been focused on creating sustainable products that meet modern needs and offer the highest UV protection available, substituting traditional hand gloves by using extraction of Guava leaves in bamboo fabric. Guava leaves contain a high concentration of flavonoids, tannins, and phenolic chemicals, they have been traditionally employed for a variety of medical and therapeutic purposes. According to some study, ingredients in guava leaves provide UV protection hand gloves when used topically or added to skincare products. Guava leaves might be able to shield UV rays. Antioxidants found in guava leaves assist in scavenging free radicals produced by UV light. Antioxidants are essential for shielding the skin from UV-induced damage since free radicals have the potential to harm skin cells and hasten the aging process. Anti-inflammatory Effects: Skin inflammation brought on by UV exposure can result in redness, irritation, and sunburn. Anti-inflammatory compounds found sun exposure. Bamboo clothing provides natural UPF 50+ protection against UVA and UVB radiation, allowing 98% of these rays to be blocked out. There are numerous health advantages to wearing bamboo clothing, including comfort and skin-friendly properties. Bamboo fibers have some intrinsic UV-blocking qualities. Bamboo fibers' inherent structure may aid in the absorption or scattering of UV rays, lowering the quantity that reaches the skin. Guava leave extract was employed to give cotton textiles multipurpose qualities including antioxidant and antibacterial qualities along with UV protection. Ethanol and water were the two solvents utilized in the extraction process.

KEYWORDS:

Bamboo fabric , Guava leaves , Ultraviolet protection , Extraction of Guava leaves , Hand gloves.

INTRODUCTION:

A type of cellulosic fiber derived from the bamboo plant is called bamboo fiber. It is completely biodegradable, making it extremely sustainable, and its strength is on par with that of regular glass fiber. Because of its distinct rhizome-dependent system, bamboo is one of the fastest-growing plants in the world. In a 24-hour period, some species of bamboo can grow up to 910 mm (36 in) at a rate of nearly 40 mm (1 1/2 in) every hour (or around 1 mm every 90 seconds or 1 inch every 40 minutes). Bamboo is a naturally occurring, renewable, biodegradable, and environmentally beneficial textile fiber. In addition to being environmentally sustainable, this fiber possesses intrinsic antimicrobial and UV protection qualities, making it a special eco-friendly textile material for the twenty-first century. Due to its high tensile strength, stability, and durability, it is not only utilized in conventional textiles but is also a highly valuable composite material for high performance end applications. UV Protection: The skin is protected from damaging UV rays by the inherent UV protection qualities of bamboo fabric. This makes it a fantastic option for apparel intended for outdoor use and sun protection.

Natural Sunscreen: Studies have looked into the potential UV protection properties of the natural substances found in guava leaves, such as flavonoids and polyphenols. These substances have antioxidant qualities that could aid in scavenging free radicals produced by exposure to UV light. Anti-inflammatory Effects: Skin inflammation can be brought on by ultraviolet light. Anti-inflammatory compounds found in guava leaves may help lessen inflammation brought on by UV exposure, possibly offering some sunburn protection. The cloth made of bamboo has some inherent UV protection qualities. It has been discovered that bamboo fibers naturally absorb some ultraviolet (UV) light. However, the kind of bamboo fabric (such as bamboo viscose or bamboo lyocell) and the method of manufacture can have an impact on how much UV protection bamboo fabric offers. In summary, although guava leaves might provide some health benefits, there is much research or documentation on how well they work to protect against UV rays when integrated into bamboo fabrics. To determine the potential UV protection qualities of guava leaves in bamboo fabric and how successful they are in comparison to other UV protection techniques, more research is required.

1.1. OBJECTIVES:

- To improve UV Protection from natural resource
- To increased sustainability.
- To disable the UV rays from sun.
- To get Sunburn Relief.
- To relief the skin from disease caused by UV rays.

2. METODOLOGY:

2.1. MATERIAL REQUIRED:

1. Bamboo fabric,
2. Ethanol,
3. Collection of guava leaves,
4. Water.

2.2. SELECTION OF GUAVA LEAVES:

The investigator collects 200g of fresh leaves from guava tree and inspect for presence of any debris. Select healthy leaves that are free from any diseases or pests. After gathering the leaves, give them a quick wash under running water to get rid of any remaining dust, debris, or grime. Use a fresh towel to gently pat them dry or let them dry naturally on the Sun.

2.3. SELECTION OF CLEANING SOLUTION:

After selecting the leaves, thoroughly wash them with a cleaning solution of 200 ml. The cleaning solution can be made by mixing a small amount of gentle dish of 20 ml or a botanical cleaner of 20ml with lukewarm water. Then rinse it with clean water.

2.4. SELECTION OF DYING PROCESS:

Sun dry is the method selected to dry the guava leaves. Place the 200g of cleaned leaves on a clean dry towel or paper towels in a single layer. To promote even drying, make sure they are arranged evenly. To shield them from dust and insects, you might want to cover them with a mesh or thin linen.

2.5. SELECTION OF GUAVA LEAVES FOR CRUSHING METHOD :

The dried guava leaves can be powdered in a food processor or blender. To get a fine powder, just add the leaves to a food processor or blender and pulse.

2.6. SELECTION OF BOILING METHOD BY ADDING ETHANOL:

Put the guava leaf powder in pot. Fill the pot with water until the leaves are completely submerged. After the water reaches a boiling point, simmer the mixture for 30 to 40 minutes.

To the extract, add ethanol. The ideal concentration and intended application will determine the appropriate ratio of ethanol to guava leaf extract. One part of ethanol to four part of guava leaves extract.

2.7. SELECTION OF FABRIC FOR DIP AND DRY METHOD:

Soak the bamboo fabric in that extract for 6-7 hours. Dry that fabric in room temperature for 2 hours.

3. RESULT AND DISCUSSION:

UV Protection Test:

UPF testing for clothing and fabrics to all major worldwide standards: AATCC 183, BS EN 13758-1, GBT18830-2009, and NZS 4399 .

TEST RESULT:

The given sample under the UV light. The output is approximately 20 times the intensity of the sun , and simulates the ultraviolet spectrum of the sun with over 91% homogeneity.



RESULT:

After undergoing the UV transmission test on the sample , it was clear that 91% of the UV rays were being prevented from affecting the skin through the gloves .since the gloves is being soaked with the guava leaves extract which has a UV protection property associated with it.

4. SUMMARY AND CONCLUSION:

Guava leaves added to bamboo cloth, guava leaves have been investigated for their potential as an all-natural UV protector. Flavonoids and polyphenols, two substances found in leaves, have the ability to inhibit ultraviolet light. Bamboo fabric presents a suitable material for mixing with guava leaf extracts to generate UV-protective hand gloves because of its softness and breathability. The sample bamboo which was finished with guava leaf was evaluated for its UV transmission tests. Because of its dense fiber structure, research has indicated that bamboo fabric itself offers some degree of UV protection. The combination of guava leaves and bamboo fabric has the potential to improve

textile UV protection. Fabrics with enhanced UV-blocking properties can be made by combining guava leaf extracts with bamboo fibers; however, more research is required to find the best blend ratios and processing techniques to provide reliable UV protection for a variety of fabric types and applications. Scalability and environmental sustainability issues should also be taken into account. In summary, integrating guava leaves into bamboo fabric for UV protection hand gloves is a novel way to develop sustainable textiles that could benefit both consumers and the environment.

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