ANTIBACTERIAL FINISH OF ETHANOL EXTRACTED THESPESIA POPULNEA FLOWER AND EICHHORNIA CRASSIPES FLOWER ON COTTON FABRICS BY USING ALUM MORDANT

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ABSTRACT

Thespesia populnea, otherwise referred to as the Portia Tree, comprises the Malvaceae family. Eichhornia Crassipes is an annual, freely floating aquatic plant, also known as water hyacinth, native to southern tropical America. Ethanol extraction from composites of Thespesia populnea and Eichhornia Crassipes flowers has strong anti-bacterial activity of phenolic antioxidant steroids, flavonoids, alkaloids, tannins, and anthroquion glycosides. Antimicrobial activity has been demonstrated in ethanol extracts from flower buds.The flowers' ethanol extracts displayed antihepatotoxic activity. A water-soluble, yellowish pigment is released by the flowers of Thespesia populnea and Eichhornia Crassipes emit a violet pigment. The ethanol extracted from the cotton fabrics was completed by one mordant (Alum) with Thespesia populnea and Eichhornia Crassipes composites in color. Excellent antibacterial activity for sows derived from ethanol.The fabrics made of alum displayed excellent fabric color. The color was extracted from composites of Thespesia populnea and Eichhornia Crassipes that show promising fabric color. Therefore, natural dye-finished fabrics have a wide variety of applications in different areas, such as medical textiles, home textiles, sportswear fabrics, performance fabrics, etc.

Keywords: Thespesia populnea, Eichhornia Crassipes, synergistic effects, ethanol extraction, antibacterial activity, alum mordant finishing, cotton fabric.

I.INTRODUCTION

1.1. Thespesia Populnea Flower

PLATE: I

(Thespesia Populnea Flower)

The Malvaceae family includes the Thespesia populnea, otherwise referred to as Portia Tree, which also provides a strong cordage thread, fishing lines, coffee bags, and caulking boat. In lamps, seed oil can be used. Wood, fruit, seeds, and all coloring-producing leaves. Gums are produced from fruits, seeds, and bark as well. It is necessary to use the leaves as food wrappers. For light construction, flooring moulds, musical instruments, utensils, vessel frames, boat construction, oil, etc., wood is highly valued.The tree leaves were converted into a paste and the

inflammation was applied as a bandage. In the areas of pain and inflammation, the oil that leaves and castor oil create is added. Milky secretion of the fruit is linked to skin illnesses. Leucoderma and other skin diseases are externally added to the bark paste. The bark prepared decoction for harmful conditions, ascites, and inflammations is treated internally. A healthy tonic for the body is the decoction of the roots.

1.2.Eichhornia Crassipes Flower

PLATE: II

(Eichhornia Crassipes Flower)

A free floating, perennial aquatic plant native to tropical South America, also known as water hyacinths, is Eichhornia crassipes. This geographic distribution of floral morphs shows that the founding activities played a major role in the global spread of the genus. The farm was used as animal feed, fertilizer, art production, paperboard, mushroom substrates, and solid state. There are applications in every segment of the herb. The plant also has delicate lilac flowers that can be used to produce color. This plant has beautiful lilac flowers that can be used for dye extraction. Isolated by anthocyanin from the flower. There is only one delphinine glycoside in the pale purple flower of the water hyacinth. Anthocyanin (water soluble vacuolar pigs) may appear to be red, violet, blue or black depending on their PH. The antioxidant function and the anti-inflammatory, anti-viral and anti-cancer properties of anthocyanin. Recent research indicates that anthocyanin's can help classify serious health conditions, including cancer and disease.

1.3. Synergistic Effect

Interaction between two or more entities of agents, variables or substances that generate an effect greater than the quantity of their dual effects in Indi. It had a synergistic impact on the product, and they all began to play harder and work together even more effectively. Synergistic effects are non-linear cumulative effects of two active ingredients having similar or connected outcomes from their respective activities, or of active ingredients having parallel or additional activities. Vitamin E is an antioxidant, for example, and vitamin C may help to recycle oxidized vitamin E into active vitamin E, allowing the two to have a synergistic effect.

New therapeutic methods and active antifungal drugs with new mechanisms of action are urgently needed, with increased mortality rates of immunecompromised patients affected by invasive fungal infections and evolving drug resistance. In-depth studies of known successful and unsuccessful drug combinations would also lead to a greater understanding of the nature of synergistic drug combinations and, at the same time, facilitate the development of new drug combinations. Synergistic drug combinations are a promising strategy and help to improve therapy-appropriate selectivity.

1.4. Cotton Fabric

The backbone of the worldwide textile trade is cotton. Also known as "the Fiber King" and "the White Gold." Cotton is the oldest and most important textile fiber due to its spin-ability. In fact, it is also the most flexible synthetic fiber and is commonly used. The textile fiber that is created the most is cotton. The first cotton growing nation has now proven to be India. It can be very tightly twisted due to natural twisting cotton spins, and this helps to make sturdy fabrics. Cotton allows the ambient cooler temperature to reach the body and send out body heat and is therefore considered to be a tropical wear. To make us feel better, they make use of knitted cotton. To dress comfortably, they use trimmed cotton.

1.3.Finishing

The essence of processing textiles is finishing. Textile fabric finishing is done to enhance the fabrics' desirability and versatility. Different finishing techniques are available to achieve different outcomes, increasing the value of textile materials. While processing is a key component of making it available, finishing provides additional values and makes the clothing attractive and comfortable to wear. The method of finishing can also incorporate desirable properties. Fabric finishes are wet or dry processes that render a textile complete. Various finishing treatments for various effects are available that add value to the basic textile fiber.

1.4. Natural Dyeing

The colorants and pigments derived from the renewable resources of nature are natural dyes, while natural dyes are also produced from the minerals of the earth. Natural dyes are extracted from plants, animals, and micro-organisms; one of the reasons for their growing importance worldwide is their environmentally friendly existence. The processing of natural dyes is an art and has become one of the most popular methods of dyeing. Although the natural dyes were mainly obtained during the ancient days from berries and fruits, the coloring of vegetables and flowers led to a highly improvised art with experimentation and slow growth.

1.5. Antimicrobial Property

More and more attention has been attracted nowadays by antimicrobial material that can create a comfortable living environment. The rising demand for textile products that are comfortable, aesthetic, durable, practical and healthy dictates the development of modern and contemporary textile processing and design techniques. Textile materials are ideal media for the generation and propagation of microorganisms. Among the different functional abilities of fabrics in direct contact with the human body, the antibacterial property is considered necessary. The production of microorganisms in clothing causes an unpleasant odor, staining and loss of mechanical power, as well as user-related health problems. Therefore, adequate protection from the microorganism, which must have the antibacterial properties of the cloth, is necessary. Multiple antibacterial agents are used to enhance the functional capability of the clothing content.But, recently, as an antibacterial agent, there is a great deal of attraction to natural herbs due to their eco-friendly and health-free nature.

II.MATERIALS AND METHODS

2.1. Extraction of dyes from Thespesia Populnea and Eichhornia Crassipes Flowers Composites



PLATE: III (Portia tree flower- dried)
PLATE: IV (Water hyacinth flower- dried)
PLATE: V (Composites powder)


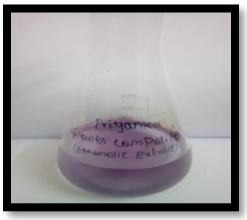

PLATE: VI (Sox let)
PLATE: VII (Ethanol extraction)

Thespesia Populnea and Eichhornia Crassipes gathered and washed the flowers with distilled water. They were dried in shadow for 3 weeks and ground into fine powders. They extracted and stored the fine powders in sterile containers. Using sox let instruments, the bioactive compounds used were extracted. Around 100ml of solvent ethanol was used for 20gm of powder. It took 30mins to extract sox let. They extracted and preserved the extracts.

2.2. Determining Antibacterial Activity of Flowers Composites Extraction

For the establishment of functional finishes on fabrics, the antimicrobial properties of the extracted natural dyes are important. Staphylococcus aureus and Escherichia coli, representing one gramme positive and one gramme negative species, are the test pathogens used for the analysis. Staphylococcus aureus and Escherichia coli were also found to be common pathogens which prevail in Human skin and throughout the body. To distinguish the best among them, natural dyes were extracted from composites of flowers using two separate solvents (water and ethanol).

2.3. Mordanting


PLATE: VIII (Alum)
PLATE: IX (Mordant mixed solution)

Alum mordant was used in the present study to identify the mordant used to dye the fabrics. Mordants were used for fabric dyeing at 2 percent of the fabric weight (o.w.f.) these

mordants, which serve as cross-link agents to bind fiber and dye effectively, treat the cloth. Mordant and distilled water are mixed together in order to obtain a liquor content ratio (MLR) of 1:40. The fabric was soaked at room temperature in a mordant state and gradually elevated to 90 ° C and allowed to stand for 30 minutes. The mordant solution was then allowed to cool and the specimen was left to air dry under laboratory conditions.

2.4. Dyeing of fabric

PLATE: X
(Dye bath)

PLATE: XI
(Finished fabric)

Fabric dyeing was done in an open dye beaker bath containing dyes and mordants at a temperature of 90 ° C for 1 hour. The dyed samples were allowed to cool down at 40-50 ° C, and by running water wash, the excess dye was removed, which also helps to eliminate unreacted mordants and additional surface deposits. Fabric drying was carried out for 2min at 80 ° C and curing followed at 150 ° C. To extract residual dye and other chemical substances, non-ionic detergent (NID) was used for soaping for 10 minutes. The samples were then dried in the air at room temperature under laboratory conditions.

III. RESULT AND DISCUSSION

3.1. Antibacterial Properties of Ethanol Extracted Flowers Composites

PLATE: XII
(*E. coli*)

PLATE: XIII
(*S. aureus*)

S. No	Sample	Solvent	Inhibitory zones(mm)	
			Staphylococcus aureus	***Escherichia coli***
1	Flowers Composites	Water	0	0
		Ethanol	20	18

Table-1: Antibacterial properties of the extracted Natural dyes.

Aqueous extracts of composite flowers showed no inhibitory zones, and ethanol extracts showed 20 mm of inhibitory zones against S. Aureus and 18 mm versus E. Water extracts displayed no inhibitory zones, whereas ethanol extracts showed higher inhibition zones than other solvents. The antibacterial properties of the extracted natural dyes are presented in Table-1.

IV.CONCLUSION

The color derived from the two flowers above on the fabrics offers very good color. The main advantages are that more color is given by very few extracted colors. The ethanol derived from composite flowers exhibits antibacterial properties. Products for dyeing have been analyzed. The color rapidity test shows that further tests can be done well to average by using alum as mordent to offer different shades and colors. The properties of the dyeing process are evaluated. The color speed calculation yields a very good result. The main advantage of that synergistic effect is that the properties were greater than average.

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