IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 1, January 2024

DOI: 10.17148/IARJSET.2024.11119

EXTRACTION AND APPLICATION OF *NYCTANTHES ARBOR-TRISTS* FOR CURTAINS

Dr. V. Kavitha[1], Ms. A. Tharni[2]

Associate Professor and Head, Department of Costume Design and Fashion, Dr. N.G.P. Arts and Science College[1]

Student, Department of Costume Design and Fashion, Dr. N.G.P. Arts and Science College[2]

Abstract: This project addresses insomnia with Night Jasmine and explores the intricate process of natural dye extraction centered around Nyctanthes arbor-tristis, commonly known as Night Jasmine. The journey begins with carefully collecting, washing, and shadow-drying Night Jasmine flowers. Subsequently, the dried flowers undergo grinding to create a powder, initiating two distinct dye extractions. One mixture incorporates pomegranate peel powder, while the other utilizes Terminalia chebula. The chosen material serves as the canvas for the curtains crafted through meticulous dyeing and shadow-drying processes. This cotton fabric becomes a vital element in the visually pleasing synthesis of botanical richness. A defining aspect of these curtains is the incorporation of the soothing aroma from Night Jasmine, specifically aimed at providing benefits for individuals struggling with insomnia. The specially crafted curtains not only offer an aesthetically calming environment but also emphasize the unique synergy between traditional dyeing techniques and the therapeutic utilization of botanical resources. In essence, this project seeks to contribute to insomnia relief by combining the natural properties of Night Jasmine with the artistry of traditional dyeing methods, resulting in curtains that enhance both visual appeal and well-being.

Keywords: Insomnia relief, Nyctanthes arbor-tristis, Pomegranate peel powder, Terminalia chebula, curtains, Soothing aroma, Traditional dyeing techniques, Therapeutic utilization.

I. INTRODUCTION

Insomnia, influenced by stress, anxiety, depression, medications, medical conditions, caffeine, irregular sleep schedules, environmental disruptions, shift work, jet lag, poor sleep hygiene, and hormonal changes, requires a comprehensive approach to treatment. Identifying the specific cause is crucial, prompting consultation with healthcare professionals for persistent cases. Traditional management includes a consistent sleep schedule, a comfortable environment, relaxation techniques, limited stimulants, herbal remedies, controlled napping, exercise (excluding bedtime), dietary adjustments, reduced screen time, and mindfulness. Cognitive Behavioral Therapy for Insomnia (CBT-I) addresses thoughts and behaviors related to sleep.

Nyctanthes arbor-tristis, or night-flowering jasmine, is culturally significant and believed to contribute to a calming atmosphere, though limited scientific evidence directly links it to insomnia reduction. Creating a soothing sleep environment involves factors like pleasant fragrances and dim lighting, but effectiveness varies. Cotton fabric is chosen for curtains due to its texture and breathability, enhancing comfort and ventilation. However, fabric choices alone may not directly address insomnia, a complex condition influenced by various factors. A holistic approach is recommended, considering sleep hygiene, stress reduction, and individual preferences. While environmental elements contribute to a calming atmosphere, addressing root causes and seeking professional guidance remain crucial for effective insomnia management.

II. MATERIALS AND METHODS

Selection of fabric:

Cotton fabric stands out for its myriad benefits, making it a preferred choice in the textile realm. Renowned for its exceptional comfort, the fabric's breathability ensures optimal ventilation, especially in warm weather. Its soft and hypoallergenic nature caters to sensitive skin, while absorbency makes it ideal for items like towels. Durability, versatility in color and pattern, and ease of care contribute to its widespread use. Additionally, cotton's biodegradability aligns with environmental concerns, and its insulating properties offer adaptability to diverse climates. With timeless appeal and a knack for blending style with practicality, cotton fabric remains a cornerstone in the fashion and textile industry [23].

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 1, January 2024

DOI: 10.17148/IARJSET.2024.11119

Fig. 1. Cotton fabric

Selection of Herb: Nyctanthes arbor-tristis Linn., known as night jasmine or Parijat, is a shrub in tropical and subtropical regions. Despite its ornamental nature, it boasts rich medicinal and pharmacological properties. The flowers emit a strong, pleasant fragrance at night, making them popular in traditional medicine among local tribes. Various plant parts are known for treating stomach aches, carminative, astringent, antibiotic, expectorant, hair tonic, piles, and various skin diseases. The flowers also have historical use for ophthalmic purposes. Widely cultivated globally in tropical and subtropical regions [23].

Fig. 2. *Nyctanthes arbor-tristis*

Fig. 3. After 15 days of drying the flower

Selection of Modrants:

Terminalia chebula: Chebula, also known as chebulic myrobalan or harda, is a traditional medicine found in Asia and Africa. It possesses various properties, including laxative, diuretic, cardiotonic, hypoglycemic, antibacterial, antifungal, antioxidant, and anticancer properties. Myrobalans contain hydrolyzable tannins, such as chebulagic acid, chebulinic acid, gallic acid, and ellagic acid. They also yield Natural Red dye. This dye, with its yellow application to textile substrates, offers a wide range of colors and fastness properties. Ongoing research aims to develop eco-friendly natural dyes, but challenges remain in achieving fastness properties and reproducibility. Comprehensive physical studies are crucial to understanding the dyeing mechanism and improving natural dye performance on various textile materials [9].

Fig. 4. *Terminalia chebula*

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 1, January 2024

DOI: 10.17148/IARJSET.2024.11119

Punica granatum: Pomegranate, originating around 3000 B.C. in Iran, India, China, and the Mediterranean region, is now cultivated globally, including in North and tropical Africa, as well as North and South America and the Caucasus area. Global pomegranate production reached around 3.8 million tons in 2017. The fruit, comprising peels, juice, and seeds, is consumed fresh or processed. The peels boast bioactive compounds like polyphenols, dietary fiber, vitamins, and minerals, offering health benefits such as antioxidant, anti-inflammatory, and anti-cancer properties. They are also linked to preventing and treating chronic metabolic diseases like cardiovascular diseases, diabetes, and obesity [1].

Fig. 5. *Punica granatum*

Finishing: Nyctanthes arbor-tristis undergoes a meticulous natural dye extraction process. Initially, the flowers are carefully collected, washed, and subjected to a 15-day drying period in the shade. Once dried, they are finely ground into a powder. Two distinct dye extractions are prepared: one involves combining 200 gms of Nyctanthes arbor-tristis with 100 gms of pomegranate peel powder (P. granatum Linn) in 4 liters of distilled water, while the other entails mixing 200 gms of Nyctanthes arbor-tristis with 100 gms of Terminalia chebula (kadukkai powder) in 4 liters of distilled water. These mixtures are added to boiling water and simmered for 30 minutes. Afterward, a 2-meter length of cotton fabric is immersed in the extraction water for 20 minutes, allowing the natural dyes to permeate the fabric. The dyed fabric is then shadow-dried and expertly transformed into curtains through the art of stitching. This intricate process results in beautifully crafted curtains with vibrant hues derived from the rich botanical sources of Night Jasmine, pomegranate peel, and Terminalia chebula.

Method of dyeing: The hot dyeing process is conducted using a dedicated dyeing unit. Pure natural dyes are utilized to extract vibrant colors. In the dyeing process, the extracted color is blended in boiling water, and the cotton is immersed. To ensure optimal color application, the cotton is continuously dipped in the color solution. Once dyed, the colored cotton yarn is dried and subsequently forwarded to the weaving process [16].

Fig. 6. Dyeing fabric of *Nyctanthes arbor-tristis* with *Terminalia chebula*

Fig. 7. Dyeing fabric of *Nyctanthes arbor-tristis* with *Punica granatum*

III. RESULT AND CONCLUSION

Antimicrobial Study: Stock cultures at 4°C on nutrient agar and potato dextrose agar slopes preserve microorganisms. Active cultures, transferred to 50 ml nutrient broth, incubated at 37°C for 24 hours for bacteria and 27°C for 3-5 days for fungi. Suspensions streaked on agar determine antibacterial and antifungal activities. Well, Diffusion assesses this more precisely, with 2-20 µl of Nanoparticle extract incubated for 24 hours at 37°C.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 1, January 2024

DOI: 10.17148/IARJSET.2024.11119

Zone of inhibition measures effectiveness. For antibacterial activity, E. coli and Streptococcus in nutrient broth at 37°C for 18 hours exhibited remarkable effectiveness of extracts against tested microorganisms.

UV protection study: The UPF testing for clothing and fabrics follows major worldwide standards: AATCC 183, BS EN 13758-1, GBT18830-2009, and NZS 4399. Solar Light's Materials Testing Services Lab offers Accelerated UV Testing, including outdoor and indoor accelerated light testing. Additionally, the lab provides Spectroradiometric Testing, which includes spectral irradiance measurements and response testing. Other services include Spectral Transmission Tests, involving UPF testing and UV/VIS/IR spectral transmission tests, along with Visible Light Reflectance Tests and Custom Tests.

Antimicrobial Test: The provided samples exhibit strong antimicrobial effects against E. Coli, S. aureus, and Candida albicans. The antimicrobial activity of Pomegranate peels is notably higher compared to the extracts treated with Nyctanthes arbor-tristis and Terminalia chebula.

Organisms Concentration	***E. coli***	***Strephylococcus aureus***	***Candida albicans***
Pomegranate	10 mm	8 mm	10 mm
N+T	8 mm	9 mm	9 mm

Table 1: Antimicrobial Test

Fig. 9. *E. coli*

Fig. 10. *Strephylococcus aureus*

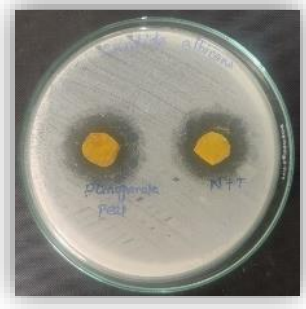

Fig. 11. *Candida albicans*

UV Protection Test: The Given Herbal treated specimens are tested under the UV Light. The pomegranate peel treated specimen shows 55 % protection and *Nyctanthes arbor-tristis* and terminalia chebula treated specimen shows 72 % UV Protection.

Test	% of protection
Pomegranate peel	55 %
N+T	72 %

Table 2: UV Protection Test

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 1, January 2024

DOI: 10.17148/IARJSET.2024.11119

4.2. QUANTITATIVE ANALYSIS:

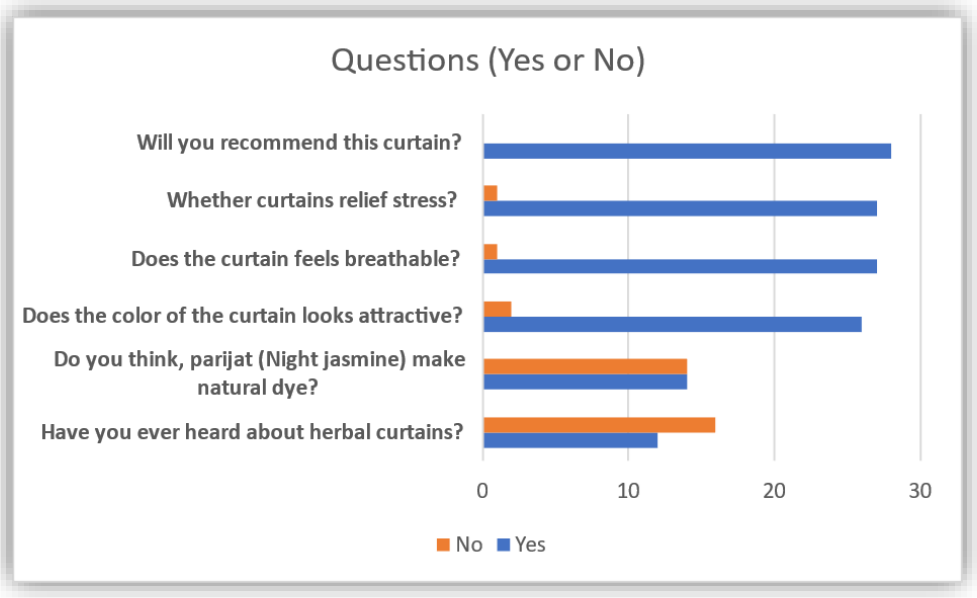

Fig. 8. Survey Questions

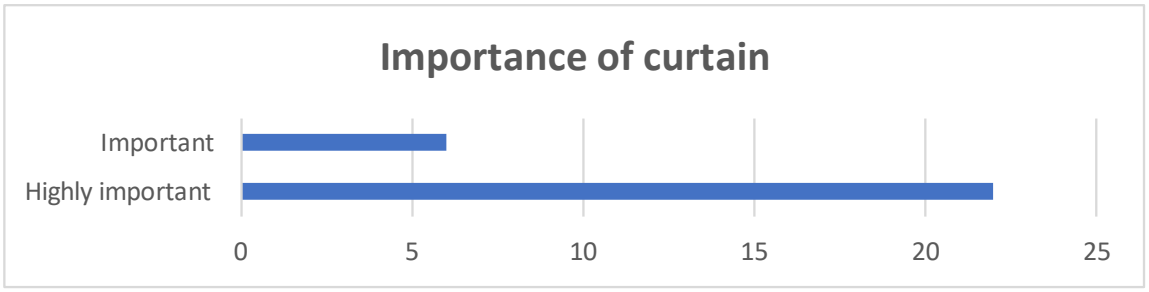

Fig. 9. Importance of curtain

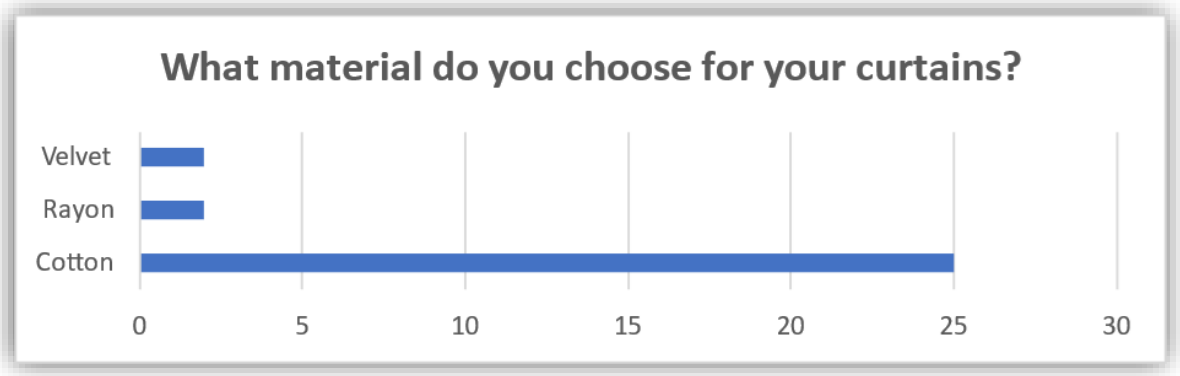

Fig: 10. Material For Curtains

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 1, January 2024

DOI: 10.17148/IARJSET.2024.11119

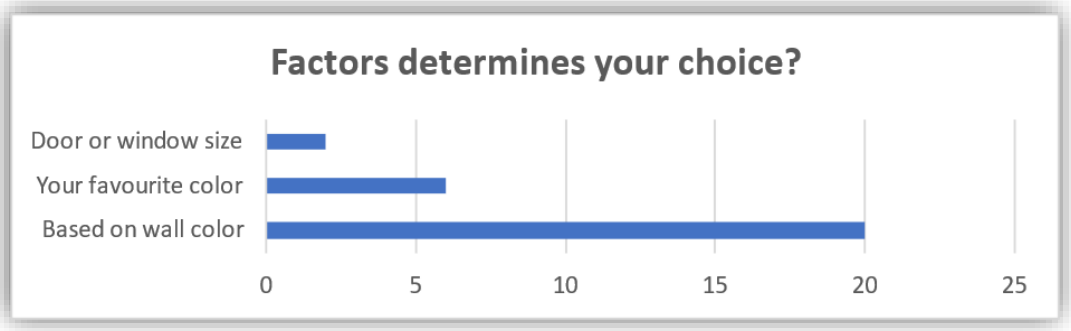

Fig: 11. Factors Of Determine

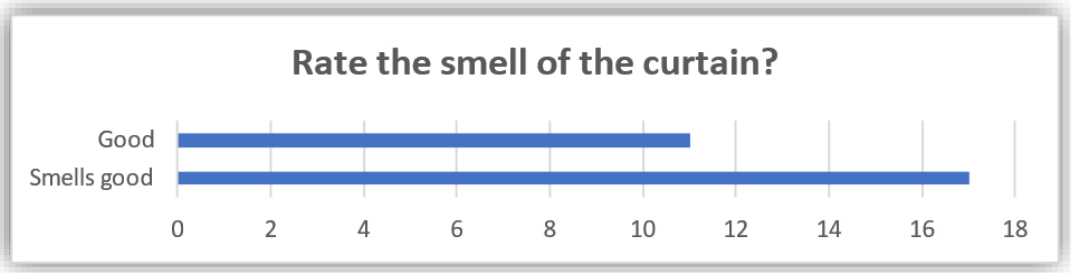

Fig: 12. Smell Of The Curtain

IV. CONCLUSION

The project has explored the potential of Nyctanthes arbor-tristis, commonly known as Night Jasmine, as a natural remedy for insomnia. Through the careful extraction and integration of Night Jasmine's properties into specially crafted curtains, this project proposes a unique approach to addressing insomnia. The soothing aroma emanating from these curtains, combined with the botanical richness of Night Jasmine, aims to create an environment conducive to relaxation and sleep.

By focusing on the therapeutic utilization of this plant, the project contributes to the discourse on natural remedies for insomnia, providing individuals with an aesthetically pleasing and potentially effective solution rooted in the calming properties of Nyctanthes arbor-tristis.

Fig. 13. Dyed Curtains

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 1, January 2024

DOI: 10.17148/IARJSET.2024.11119

REFERENCES

[1]. Parmita Uniyal Pomegranate peels have these amazing benefits; how to consume them for diabetes, cholesterol, New Delhi Dec 21, 2022.
[2]. Singh B, Singh JP, Kaur A, Singh N. Phenolic composition and antioxidant potential of grain legume seeds: a review. Food Res Int. (2017).
[3]. Tang L, Liu L, Sun L, Qin Y, Li J, Li X. Extraction and composition analysis of polyphenols in pomegranate skin. J Food Res Dev. (2010)
[4]. Akhtar S, Ismail T, Fraternal D, Sestili P. Pomegranate peel and peel extracts: chemistry and food features. Food Chem. (2015) 174:417–25.
[5]. Rahimi HR, Arastoo M, Ostad SN. A comprehensive review of Punica granatum (Pomegranate) properties in toxicological, pharmacological, cellular and molecular biology researches. Iran J Pharmaceutical Res. (2012) 11:385–400.
[6]. Ellen Landes Surprising Benefits of Pomegranate Peels Medically reviewed by Kathy W. Warwick, R.D., CDE, Nutrition, MS, RDN, CPT on October 7, 2021
[7]. Veloso J, et al. (2020). Potential antibacterial and anti-halitosis activity of medicinal plants against oral bacteria.(https://pubmed.ncbi.nlm.nih.gov/31838294/)
[8]. Vučić V, et al. (2019). Composition and potential health benefits of pomegranate: a review. (https://pubmed.ncbi.nlm.nih.gov/31298147/)
[9]. Mazharul Islam Kiron Natural Dyeing of Cotton Fabric Using Terminalia Chebula (Kadukkai) and Turmeric (Curcuma Longa). December 11, 2015.
[10]. T. Ammon and M. A. Wahl, "Pharmacology of Curcuma longa," Planta Medica, vol. 57, no. 1, 1991.
[11]. K. Lai and J. Roy, "Antimicrobial and chemo preventive properties of herbs and spices," Current Medicinal Chemistry, vol. 11, 1451–1460, 2004.
[12]. K. Maheshwari, A. K. Singh, J. Gaddipati, and R. C. Srimal, "Multiple biological activities of curcumin: a short review," Life Sciences, vol. 78, 2081–2087, 2006.
[13]. Hayakawa, Y. Minanyia, K. Ito, Y. Yamamoto, and T. Fukuda, "Difference of curcumin content in Curcuma longa L., (Zingiberaceae) caused by Hybridization with other Curcuma species," American Journal of Plant Sciences, vol. 2, 111–119, 2011.
[14]. Anand, H. B. Nair, B. Sung et al., "Design of curcumin-loaded PLGA nanoparticles formulation with enhanced cellular uptake, and increased bioactivity in vitro and superior bioavailability in vivo," Biochemical Pharmacology, vol. 79, no. 3, pp. 330–338, 2010.
[15]. Iyer. k (1953), Introduction to Ayurveda, Sri Hari Publications, Mumbai, Pp 196 – 2011. M. Hart (1956), Herb and Beauty, ENCO publication, USE, Pp 188 -22
[16]. Dyeing of Textiles with Natural Dye November 2011, Natural Dyes by Authors: Shis Kumar Samanta (University of Calcutta) &Adwaita Kona
[17]. Mazharul Islam Kiron Classification, Application and Aftertreatment of Direct Dyes, February 16, 2012
[18]. NYCTANTHES ARBOR-TRISTIS LINN: A SHORT REVIEW, January 2021, World Journal of Pharmacy and Pharmaceutical Sciences 10(3):1047-1054
[19]. Bhosale AV, Abhyankar MM, Pawar SJ, Shoaib K and Patil N., Nyctanthes arbor-tristis: A Pharmacognistic review, Research Journal of Pharmacognosy and Phytochemistry, 1(2): 91-97.
[20]. D.Sasmal, Sanjita Das and S.P.Basu, Phytoconstituents and therapeutic potential of Nyctanthes arbor-tristis Linn., Pharmacognosy Reviews, 2007; 1(2): 344-349.
[21]. Das S, Sasmal D and Basu SP, Anti-inflammatory and antinociceptive activity of arbortristoside-A, Journal of Ethnopharmacology, 2008; 116(1): 198-203.
[22]. David Benwefit, Anticancer activity of Nyctanthes arbor-tristis, International Journal of Advance Research, Ideas and Innovation in Technology, 2019
[23]. Srivastava, Anjali -A Study on Dyeing of Cotton Fabric with Nyctanthes Arbortristis, Linn. (Coral Jasmine) Flower. Mar2018, Vol. 25, Dedhia, Ela

