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DEVELOPMENT OF CREPE BANDAGE WITH ORCHID TREE LEAVES

K. Gowsika Devi [1], Dr.V. Maheshwari [21] M. Sc Student, [2] Associate Professor

Department of Costume Design and Fashion, PSG College of Arts & Science, Coimbatore India.

ABSTRACT:

In the medical field, crepe bandages are frequently used to support and compress wounded limbs. Crepe bandage is typically made from cotton or a blend of cotton and other elastic fibers like polyester or latex. Nevertheless, most traditional crepe bandages are composed of synthetic materials, which some people may find uncomfortable or induce allergic reactions. The crepe weave gives the bandage its characteristic texture and elasticity, allowing it to conform to the shape of the body and provide compression and support. In this work, we investigate the synthesis of a new type of crepe bandage from natural materials obtained from the leaves of orchid trees. The special qualities of orchid tree leaves such as their strength, flexibility, anti inflammatory, antimicrobial, wound healing and analgesic nature have led to their selection. Mature orchid tree leaves are harvested, treated to increase their flexibility and resilience, and then woven into a cloth appropriate for use in medical applications. To make sure the created crepe bandage satisfies the requirements needed for medical use, its mechanical qualities such as tensile strength, elasticity, and compression capabilities are assessed. Furthermore, biocompatibility testing is done to evaluate any possible negative reactions that can occur when the bandage comes into contact with the skin. Some species of orchids contain compounds like flavonoids have been used for pain relief. Pain is common among adults and most often associated with general wear and tear from daily activities. It can be a nuisance and even debilitating in some circumstances. In this study we aim to develop crepe bandage with orchid tree leaves. These bandages are more comfortable to wear and at the same time pain relieving.

KEY WORDS: Crepe bandage, cotton, anti inflammatory, antimicrobial, analgesic, flavonoids, healthcare.

INTRODUCTION:

Orchid crepe bandages are eco friendly and also helpful in relieving pain. A popular and adaptable medical tool, a crepe bandage is renowned for its elasticity, suppleness, and capacity to support and compress stressed or wounded body parts. Crepe bandages are an essential component of first aid kits, hospitals, clinics, and sports arenas across the globe. They are made from a unique blend of cotton and other synthetic fibers and are characterized by their comfort, breathability, and ability to conform to different body contours. Promoting the healing process and easing pain from sprains, strains, and other soft tissue injuries is one of the main purposes of a crepe bandage. Crepe bandages assist minimize pain and promote a quicker recovery by reducing edema, irritation, and fluid buildup in the affected area through regulated compression. Furthermore, by stabilizing injured joints and muscles and supporting appropriate alignment during rest and activity, crepe bandages prevent future damage. Because of its adaptability, effectiveness, and simplicity of usage, crepe bandages are regarded as an essential tool in the medical and first aid fields. Whether used for wound care, chronic condition prevention, or acute injury therapy, crepe bandages are still vital for fostering health, mobility, and well-being in a variety of contexts and populations. Now a

day's new brand is developing with ecofriendly ideology. Our aim is to our aim to develop crepe bandages incorporated with orchid leaves extract. Orchid leaves have traditional medicinal values. Orchid (family Orchidaceae), any of nearly 1,000 genera and more than 25,000 species of attractively flowered plants distributed throughout the world, especially in wet tropics. Orchid leaves has anti – inflammatory and antimicrobial properties. It is useful in alleviating skin diseases. It is useful in joint pains, improve healing times after surgery or illness. It improves blood Circulation in our body by using crepe bandage. Combining orchid leaves with a crepe bandage can offer several benefits, primarily due to the medicinal properties of orchid leaves includes anti-inflammatory properties, analgesic effects, antimicrobial action, enhanced healing, natural remedy.

1.1 OBJECTIVES:

- To Improve wound healing: By fusing the wound-healing qualities of orchid tree leaves with the protective qualities of a crepe bandage, one can speed up the healing process for wounds.
- To Reduce inflammation and discomfort: The anti-inflammatory and analgesic properties of orchid tree leaves lessen swelling and pain respectively.
- To Prevent infection: The protection offered by the crepe bandage with the antibacterial qualities of orchid tree leaves, infections can be avoided, aiding in healthy healing process.
- To Provide support and stability: Orchid tree leaves may help to maintain an environment that is favourable for healing, while the crepe bandage provides support and stability to the damaged area.
- To Improve patient comfort: The combined therapy seeks to improve patient comfort during the healing process by lowering pain and inflammation.
- To reduce cost effective: Using natural remedies like orchid leaf extract may offer some cost savings.

2. METHODOLOGY:

2.1. MATERIAL REQURIED

1. Collection of Orchid tree leaves,
2. Crepe bandage,
3. Rosewater,
4. Water,
5. A bowl.

2.2. SELECTION OF COLLECTED LEAVES

The investigator collects 200g of fresh leaves from orchid tree and inspect for presence of any debris. Select healthy leaves that are free from any diseases or pests. Choose mature leaves from the middle or upper part of the tree as they tend to contain more active compounds. Avoid damaged or yellowing leaves.

2.3. SELECTION OF CLEANING SOLUTION

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

2.4. SELECTION OF DYING PROCESS

Shadow dry is the method selected to dry the orchid leaves. Place the 200g of cleaned leaves on a clean dry towel or paper towels in a single layer. Allow them to shadow dry at room temperature. Avoid exposing them to direct sunlight or heat sources, as this could cause damage the functional properties of leaves.

2.5. SELECTION OF ORCHID EXTRACT PREPARATION

By boiling 200g of orchid leaves with 1.5 litter water at 100° c for 30minutes we get orchid leaf extract.

2.6. SELECTION OF DIP AND DRY METHOD

Dip the Crepe bandage of size 6cm*4m in the prepared orchid tree leaves extract. The extract must be at room temperature. Then the bandage must be dry at room temperature.

2.7. SELECTION OF FRAGRANCE FINISH

Rose petals are distilled to create the aromatic liquid known as rosewater. Rosewater's natural scent and possible skin-soothing qualities make it popular in skincare and cosmetics. Rosewater has been used for a very long time and is still appreciated for its pleasant aroma. Hence, it can be used as a fragrance finisher for our developed crepe bandage. So, the investigator has selected 100ml of rosewater & applied on to the orchid extract incorporated crepe bandage.

3.RESULT AND DISCUSSION:

3.1. Preparation of the antibacterial inoculum:

Stock cultures were maintained at 4° C on slopes of nutrient agar and potato dextrose agar. Active culture for experiments were prepared by transferring a loop full of cells from stock cultures to test tubes of 50ml nutrient broth bacterial cultures were incubated with agitation for 24hours and at 37°c on shaking incubator and fungal cultures were incubated at 27°c for 3-5 days. Each suspension of test organism was subsequently stroke out on nutrient agar media and potato dextrose agar. Bacterial cultures then incubated at 37°c for 24 hours and fungal incubated at 27°c for 3-5 days. A single colony was transferred to nutrient agar media slants were incubated at 37°c for 24 hours and potato dextrose slant were incubated at 27°c for 3-5 days. These stock cultures were kept at 4°c. For use in experiments, a loop of each test organism was transferred into 50ml nutrient broth and incubated separately at 37°c for 18-20 hours for bacterial culture.

Well Diffusion method

The antibacterial activity and antifungal activity of crude extract extracts was determined by Well Diffusion method (Bauer *et al*., 1996). The 2-20 µl of Nanoparticle extract was poured into the wells. After that, the plates were incubated at 37°C for 24 hours. Assay was carried into triplicates and control plates were also maintained. Zone of inhibition was measured from the edge of the well to the zone in mm. The tested cell suspension was spread on muller hintonagar plate and potato dextrose agar. well, were put into the agar medium using sterile forceps. plant extract was poured on to wells. Then plates were incubated at 37°c for about 24 hours and control was also maintained. Zone of inhibition was measured from the clear zone in mm.

Antibacterial activity was performed by agar diffusion method. Van der Watt *et al.,* 2001. The stock culture of bacteria *(E. coli and Streptococcus)* was received by inoculating in nutrient broth media and grown at 37 % for 18 hours. The agar plates of the above media were prepared. Each plate was inoculated with 18 hours old cultures the bacteria were swab in the sterile plates. Cut the 5 wells Pour the extract in ratio 25 µl, 50 µl 75 µl 100 µl. All the plates were incubated at 37ºC for 24 hours and the diameter of inhibition zone was noted in Cm.

Agar well diffusion method has been used to determine the antimicrobial activities and minimum inhibitory concentrations or plant extracts against Gram-positive, Gram-negative bacteria. The extracts exhibited antibacterial activities against tested microorganisms.

BAND

antibacterial test

Organisms Concentration	***E.* Coli**	***Strephylococcus aureus***
25 µl	0.6 cm	0.7 cm
Standard drug (Chloramphenicol)	0.8 cm	0.8 cm

FUNGUS

antifungus test

Organisms Concentration	***Candida albicans***
25 µl	0.8 cm
Standard drug (Fluconozole)	0.7 cm

RESULT:

The result finds Given band having antimicrobial activity against the E. coli and *Staphylococcus aureus and Candida albicans.* The result shows the given band shows Anti-microbial activity.

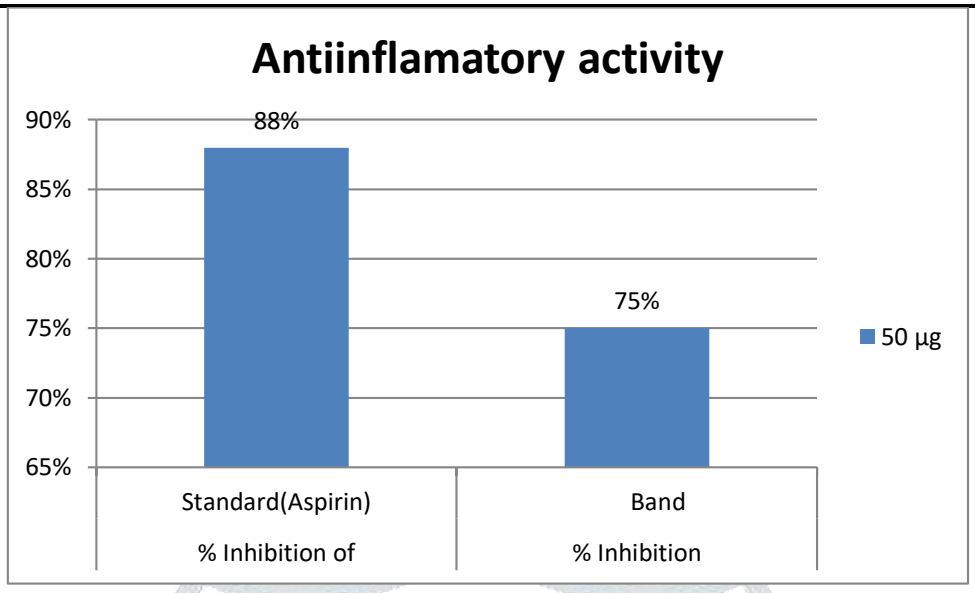
3.2. Anti-inflammatory activity- Protein Denaturation assay

Inhibition of protein denaturation was evaluated by the method of Mizushima and Kobayashi 1968 and Sakat *et al*. 2010 with slight modification. 500 µL of 1% bovine serum albumin was added to 10, 20, 30, 40 and 50 µL of sample. This mixture was kept at room temperature for 10 minutes, followed by heating at 51°C for 20 minutes. The resulting solution was cooled down to room temperature and absorbance was recorded at 660 nm. Aspirin using as a standard. The experiment was carried out in triplicates and percent inhibition for protein denaturation was calculated using:

$$\text{Percentage inhibition} = \frac{100 - (\text{O.D. of test} - \text{O.D. of product control}) \times 100}{\text{O.D. of Control}}$$

anti-inflammatory test

Concentration	**% Inhibition of Standard (Aspirin)**	**% Inhibition Band**
50 µg	88%	75%



represents anti-inflammatory activity

RESULT:

The given Band shows an Anti-inflammatory activity. The higher concentration of 50 µg of the band shows 75 % and standard Aspirin drug shows 88 %.

4. SUMMARY AND CONCLUSION:

Crepe bandage dipped in prepared orchid leaf extract can give orchid crepe bandage. It is eco- friendly as the extract is taken from the natural leaf. While testing these bandages give positive results for antimicrobial and anti-inflammatory properties. They additionally have compounds like flavonoids to reduce pain. These bandages hasten wound healing process and are cost effective. Orchid crepe bandage help to relieve pain symptoms and improve the quality of life of a person. These crepe bandages can give mixture of the properties of crepe bandage with the properties of orchid tree leaf. Dipping crepe bandages in orchid leaf extract does not affect it's physical properties like flexibility, elasticity, breathability, texture.

REFERENCE:

1. Rasmussen, Hanne N., and Finn N. Rasmussen. "The epiphytic habitat on a living host: reflections on the orchid–tree relationship." *Botanical Journal of the Linnean Society* 186, no. 4 (2018): 456-472.

2. Eskov, Alen K., Elena Yu Voronina, Leho Tedersoo, Alexey V. Tiunov, Vu Manh, Nikolay G. Prilepsky, Violetta A. Antipina, Tatiana G. Elumeeva, Evgeny V. Abakumov, and Vladimir G. Onipchenko. "Orchid epiphytes do not receive organic substances from living trees through fungi." *Mycorrhiza* 30 (2020): 697-704.

3. Folguera-Álvarez, Carmen, Sofía Garrido-Elustondo, Mili Milagros Rico-Blázquez, Miren Iranzu Esparza-Garrido, and José Verdú-Soriano. "Effectiveness of double-layered compression therapy against crepe bandage for healing venous ulcers in primary care. Randomized clinical trial." *Atencion Primaria* 52, no. 10 (2020): 712-721.

4. Chang, Wen-Hsin, Sung-Yi Yang, Chih-Lin Lin, Chih-Hung Wang, Ping-Chen Li, Tzong-Yueh Chen, Fuh-Jyh Jan, and Gwo-Bin Lee. "Detection of viruses directly from the fresh leaves of a Phalaenopsis orchid using a microfluidic system." *Nanomedicine: Nanotechnology, Biology and Medicine* 9, no. 8 (2013): 1274-1282.

5. Gutiérrez, Rosa Martha Pérez. "Orchids: A review of uses in traditional medicine, its phytochemistry and pharmacology." *J. Med. Plants Res* 4, no. 8 (2010): 592-638.

6. Ruznan, Wan Syazehan, Raechel M. Laing, Bronwyn J. Lowe, Cheryl A. Wilson, and Timothy J. Jowett. "Understanding stress-strain behavioral change in fabrics for compression bandaging." *The international journal of lower extremity wounds* 20, no. 3 (2021): 244-250.

7. Milosavljević, Svetlana, and Petar Škundrić. "Contribution of textile technology to the development of modern compression bandages." *Chemical Industry and Chemical Engineering Quarterly/CICEQ* 13, no. 2 (2007): 88-102.

8. Chung, Chinkap, Myunghee Lee, and Eun Kyung Choe. "Characterization of cotton fabric scouring by FT-IR ATR spectroscopy." *Carbohydrate polymers* 58, no. 4 (2004): 417-420.

9. Gao, Dangge, Xinjing Li, Yajuan Li, Bin Lyu, Jingjing Ren, and Jianzhong Ma. "Long-acting antibacterial activity on the cotton fabric." *Cellulose* 28 (2021): 1221-1240.

10. Miranda, H., E. Viikari-Juntura, R. Martikainen, and H. Riihimäki. "A prospective study on knee pain and its risk factors." *Osteoarthritis and cartilage* 10, no. 8 (2002): 623-630.

11. Calmbach, Walter L., and Mark Hutchens. "Evaluation of patients presenting with knee pain: Part II. Differential diagnosis." *American family physician* 68, no. 5 (2003): 917-922.