Formulation And Evaluation of Herbal Soap Using Neem, Turmeric, Aloevera, And Tulsi For Skin Care Applications

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Abstract- *Investigation of herbal components in soap recipes has been driven by the rising need for skin-friendly and all-natural beauty products. Herbal soaps employing the antimicrobial, antiviral, anti-inflammatory, and moisturizing characteristics of Neem (Azadirachta indica), Turmeric (Curcuma longa), Aloe Vera (Aloe barbadensis Miller), and Tulsi (Ocimum sanctum) are the subject of this research. We conducted physicochemical and biological tests after preparing these herbal soaps by mixing dry herbs with a soap base.Parameters such as pH, foam retention, foam height, clarity, odor, free alkali content, and skin irritation potential were assessed. The results showed that all three formulations were effective, stable, and non-irritating, making them suitable for sensitive and normal skin types. The study suggests that herbal soaps can serve as a natural, safe, and eco-friendly alternative to commercial chemical-based products.*

Keywords- CST Herbal soap, Neem, Turmeric, Aloe Vera, Tulsi, Natural skincare, Antimicrobial, Skin irritation test, Soap formulation, Ayurvedic ingredients, Eco-friendly soap, Foam retention, pH evaluation, Herbal cosmetic.

I. INTRODUCTION

Due to their inherent medicinal properties, herbs have long been used to treat a wide range of skin disorders, from the most minor to the most serious. Herbal remedies for skin infections have been the subject of research in many ancient medicinal systems, including Ayurveda, Siddha, and Unani.(1) If you want to keep skin problems at bay, you need to keep the outer environment clean and free of germs, as the skin is the body's biggest organ and is constantly exposed to the elements.(2)

Soap may also refer to any salt of fatty acids that is water-soluble and has eight or more carbon atoms. Many people use soaps for many reasons, including cleaning their hands, taking medicine, and bathing.(.3) Soap gets its cleansing power from the negative ions on hydrocarbon chains linked to carboxylic groups of fatty acids.

The low in blood pressure, anti-diuretic, anti-inflammatory, anti-spasmodic, anti-diabetic, anti-hemorrhagic, and anti-helminthic effects of several herbs have led to their discovery as dietary supplements with high nutritional value. To treat skin disorders including acne, eczemas, wounds, and ringworms, as well as for cosmetic and antimicrobial reasons, the active chemicals that give these plants their therapeutic effects are isolated and used topically in the form of creams, soaps, oils, and ointments. (4.)

Conditions related to psoriasis may be alleviated by using the succulent gel. To ease the skin's surface, facilitate deeper penetration and cleansing, hasten healing and resolution of acne, and use a crude soapy plant preparation are all possible.(8) With its low irritation level, long-lasting scent, excellent moisturizing benefits, and strong detergency or washing strength, this soap is a great choice. Soap bases are traditionally enriched with a variety of dried herbs, flowers, and stems to create herbal soaps.(5)

Features

Soaps and detergents are both made from sodium salts of carboxylic acids with long chains, whereas benzene sulphonic acids are salts of long chains of sodium.(6)In contrast to some detergents, soaps can break down naturally.

Types of soap _

1] Laundry soaps
2] Cleaning soaps
3] Personal soaps
4] Novelty soaps
5] Perfumed soaps
6] Guest soaps
7] Beauty soaps
8] Medicated soaps
9] Glycerin soaps
10] Transparent soaps

The different **kinds of skin** are

•Oily skin
• Dry skin
•Normal skin
• Combination

Benefits include

- Herbal soaps are free of dangerous synthetic detergents and foaming chemicals; they are soap, not bars of detergent.
- Helps with Blood Sugar Levels
- Promotes Oral Health(5)
- Helps Detoxify the Body
- May Help with Gastroesophageal Reflux Disease (GERD)
- Fantastic for the Skin(14)
- Free of parabens and sulphates
- Herbal soap, Handcrafted soap.
- Addresses skin issues.
- No colouring agents are added to herbal soaps.
- Animals are not used in the testing of herbal soap.
- The skin is nourished and moisturized by herbal soap.

Advantages

- Gentle on the skin:Soaps made from herbs are often gentler and less harsh than synthetic soaps, making them an excellent choice for those with very sensitive skin. (7)
- Natural ingredient: Shea butter, coconut oil, olive oil, and aloe vera are some of the common natural components found in these products, which help to moisturize and nourish the skin.(8)
- Chemical-Free: Because they don't include any harsh chemicals, artificial scents, or synthetic colors, herbal soaps are safer for sensitive skin and less prone to trigger allergic responses. (4)
- Eco-Friendly: Unlike synthetic soaps, herbal soaps are often made with natural ingredients, making them biodegradable and less hazardous to the environment.(9)
- Benefits of Aromatic Oil: By combining essential oils with herbal soaps, aromatherapy may be achieved for a variety of advantages, including stress alleviation, mood improvement, and relaxation.(10)
- Natural antimicrobial properties: Plants like neem and tea tree oil have antibacterial qualities that make them great skin cleanser and infection protectors.(11)

Disadvantages

- After reading about all the advantages of organic soap, it's difficult to conceive of a drawback. (12)Some people may experience problems with organic soaps because they include essential oils to which they are allergic.

II. MATERIALS & METHODS

1.Tulsi leaves

Fig1:TulsiLeaves

- Biological Name: Ocimum Sanctum or Ocimum tenuiflorum
- Common Name: Holy Basil
- Genus: Ocimum
- Species: Tenuiflorum or sanctum
- Family: Lamiaceae
- Use: It is used as an antiviral and antibiotic, Antiseptic(14)

2.Turmeric

fig 2.Turmeric

Name in biology: Curcuma longa

- Haldi is the common name.
- Zingiberaceae is the family.
- Curcuma is the genus.
- The Curcuma Longa species
- Use: Reduces dark circles and treats dull skin.

3. Aloe vera

fig 3.Aloe vera

Aloe barbadensis Miller is its biological name.

- Aloe vera is the common name for
- Asphodelaceae (Liliaceae) is the family.
- Barbadensis Mill is a species of the genus Aloe.(13)
- Use: Aids in skin hydration.

4. **Neem:**

fig 4.**Neem**

- Azadirachta indica is its biological name.
- Common Name: Kadu Nimb, Neem
- Meliaceae is the family.
- The Azadirachta genus
- Indica is the species.
- Use: Antiviral action, skin conditions(15)

5.Glycerin

6.sodium lauryl sulphate

Procedure

- In a beaker, place the 22 g soap base.
- Using water, raise and maintain the temperature to heat the soap base.
- A soap base will transform into a liquid after being heated.
- Next, add the materials listed in the formulation table.
- Use a water bath to bring the mixture to a boil.
- Don't stir to get the right mixture.
- A soap mold is filled with this mixture.
- cooled it for two to three hours at room temperature.
- The formation of soap(16)

Evaluation of Soap:

To verify the calibre of the developed formulation, the following physicochemical properties were assessed.

1. **Clarity, color, and odor determination**: On a white background, clarity, color, and scent were visually inspected.(17)
2. **PH determination**: All of the generated mixtures had their pH values measured using a digital pH meter. After dissolving the four recipes in 100 cc of distilled water, they were each let to sit for two hours. (6) A calibrated digital pH meter was used to test the pH.
3. **Foam retention time**: The term "foam retention time" describes how long the soap-produced foam lasts. The foam interval was measured for roughly five to ten minutes after the aforementioned process was repeated.(3)
4. **Foam height**: There was a 50 ml mixture of distilled water and 1 gram of trial soap. The next step was to add 100 milliliters of water to it after placing it in a measuring cylinder. Following 25 standing strokes until the aqueous volume reached 100 ml, the height of the foam above the volume was measured.(8)
5. **Percentage free alkali content**: The beaker holding around 10 grams of dry soap was then filled with 150 milliliters of clean water. For 30–40 minutes, the soap was reflux-heated over a water bath until it dissolved. When the solution had cooled, it was transferred to a 250 ml conical flask together with the washings. Then, distilled water was added until the flask was full. Two drops of phenolphthalein indicator were added to ten milliliters of soap solution in the titration flask. The next step was to titrate the solution with 0.1M HCl until the color disappeared.
6. **Skin irritation test**:The region on the dorsal surface of the left hand should be 1 cm square. Soap was then applied to the area and the time was recorded. This is followed by reporting any irritation, redness, or swelling that may occur at intervals of up to 24 hours. In light of the findings, all three formulations (F1, F2, and F3) Devoid of redness, swelling, and irritation.

III. CONCLUSION

QThe herbal soaps formulated with Neem, Turmeric, Aloe Vera, and Tulsi exhibited excellent skincare qualities including **moisturizing**, **cleansing**, **antimicrobial**, and **non-irritant**properties.(18) Evaluation results confirmed that the soaps had desirable pH levels, adequate foam characteristics, and no adverse effects on the skin. These results show that natural components might be a good substitute for manufactured soaps. (19) In cases of more severe dermatological issues, however, these herbal remedies should be used in conjunction with conventional medical care, rather than in substitute of it. Regular users, especially those with preexisting medical issues or allergies, should talk to their doctors before using this product.(20)

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