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Formulation and Evaluation of Polyherbal Soap Enriched with Rice Water

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ABSTRACT

Herbal cosmetics are gaining significant attention due to their safety, natural origin, and minimal side effects compared with synthetic products. The present study focuses on the formulation and evaluation of a polyherbal soap enriched with rice water and medicinal plant extracts such as Aloe vera, Tulasi, and Turmeric. Rice water is known for its moisturizing, antioxidant, and skin-brightening properties, making it a valuable ingredient in skincare formulations. The polyherbal soap was prepared using a glycerine soap base through the double boiling method to preserve the heat-sensitive herbal constituents. The prepared formulation was evaluated for various physicochemical and organoleptic parameters including pH, color, odor, texture, hardness, foaming ability, foam stability, and skin irritation. The results revealed that the formulated soap possessed good foaming properties, acceptable pH range suitable for skin, and excellent stability over time. The patch test showed no signs of irritation, confirming its safety for regular use. The synergistic effect of herbal ingredients provided moisturizing, antioxidant, and antimicrobial benefits. Therefore, the developed rice water–enriched polyherbal soap can be considered an effective, eco-friendly, and natural alternative to commercially available synthetic soaps.

Keywords: Polyherbal Soap, Rice Water

INTRODUCTION

Herbal cosmetics have become increasingly popular due to the growing awareness of the harmful effects associated with synthetic chemicals used in conventional cosmetic products. Herbal formulations are derived from plant sources and are considered safer, eco-friendly, and beneficial for maintaining healthy skin. Traditional medicinal systems such as Ayurveda have long utilized plant-based ingredients for skincare and therapeutic purposes.

Pharmacognosy is the scientific study of medicinal substances obtained from natural sources including plants, animals, and minerals. The term pharmacognosy was first introduced in the early nineteenth century by Schmidt and Seydler to describe the study of crude drugs used in medicine. Natural plant extracts have been widely used for cosmetic and pharmaceutical applications because of their therapeutic properties and biological activity.

Herbal cosmetics are cosmetic preparations that incorporate plant extracts or herbal ingredients into their formulation. These products help improve the appearance and health of the skin while providing therapeutic benefits. Herbal ingredients such as Aloe vera, Turmeric, Neem, and Tulasi are widely used in skincare formulations due to their antimicrobial, antioxidant, anti-inflammatory, and moisturizing properties.

Soap is a cleansing agent obtained by the saponification of fats or oils with an alkali. It is commonly used for removing dirt, microorganisms, and excess oil from the skin. Herbal soaps contain natural plant extracts that enhance the cleansing effect while providing additional skin benefits such as hydration, protection against infections, and improved skin texture.

Rice water has been traditionally used in Asian cultures as a natural skincare ingredient. It contains beneficial nutrients such as vitamins, amino acids, minerals, and antioxidants including ferulic acid and gamma-oryzanol. These compounds help brighten the skin, reduce pigmentation, maintain moisture balance, and protect the skin from environmental damage. Rice water also exhibits anti-inflammatory properties and helps soothe irritated skin.

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Tulasi (Ocimum sanctum), commonly known as holy basil, is an important medicinal plant widely used in Ayurvedic medicine. It contains bioactive compounds such as eugenol, ursolic acid, and rosmarinic acid that possess antimicrobial, anti-inflammatory, and antioxidant properties. Tulasi helps prevent skin infections and promotes healthy skin.

Aloe vera is another important medicinal plant used in cosmetic and pharmaceutical preparations. The gel extracted from Aloe vera leaves contains vitamins, enzymes, amino acids, and polysaccharides that provide moisturizing, soothing, and healing effects. It helps maintain skin hydration and supports wound healing.

Turmeric (Curcuma longa) is well known for its antibacterial, antioxidant, and anti-inflammatory properties due to the presence of curcumin. It helps reduce acne, improve skin tone, and protect the skin from microbial infections.

The present study aims to formulate a polyherbal soap enriched with rice water and evaluate its physicochemical and performance characteristics. The combination of multiple herbal ingredients is expected to provide synergistic effects, enhancing the therapeutic potential of the formulation while ensuring safe and effective cleansing.

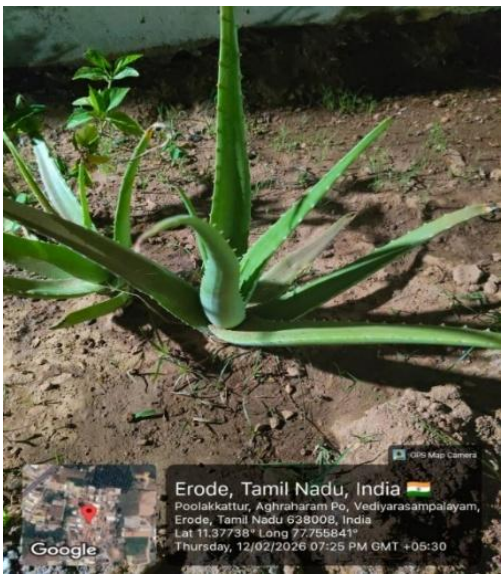
AIM

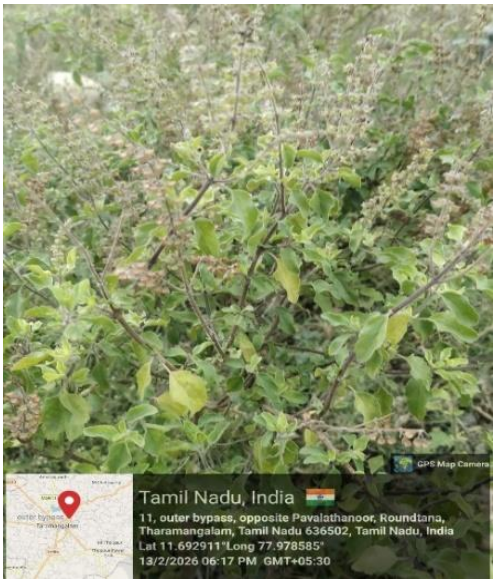
The aim of this study is to formulate and evaluate a polyherbal soap enriched with rice water and selected herbal ingredients beneficial for skin health. The formulation is intended to cleanse the skin effectively while maintaining its natural moisture. The prepared soap will be evaluated for its physicochemical properties, stability, and skin compatibility. The study also aims to explore the potential of rice water as a natural ingredient for improving skin texture and appearance.

OBJECTIVES

- To select suitable herbal ingredients, including rice water, with cleansing, moisturizing, antioxidant, anti-inflammatory, and skin-brightening properties.
- To prepare a polyherbal soap formulation enriched with rice water using an appropriate saponification method.
- To evaluate physicochemical properties such as pH, appearance, color, odor, texture, hardness, and moisture content.
- To assess performance characteristics including foaming ability, foam stability, cleansing efficiency, and washability.
- To assess the moisturizing effect and improvement in skin smoothness after use.

MATERIALS AND METHODS





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Materials

The ingredients used for the formulation of polyherbal soap included rice water, glycerine soap base, Aloe vera gel, Tulasi powder, turmeric powder, almond oil, rose water, and lavender oil.

Rice water was used as the primary herbal base due to its moisturizing and antioxidant properties. Aloe vera gel was incorporated for its soothing and hydrating effects. Tulasi powder was used for its antimicrobial and anti-inflammatory properties. Turmeric powder was included for its antibacterial and skin-brightening effects. Almond oil acted as an emollient that helps maintain skin moisture. Rose water provided a cooling and soothing effect, while lavender oil was added as a natural fragrance.

Collection of Plant Materials

Fresh Aloe vera leaves and Tulasi leaves were collected from the local residential area to ensure maximum freshness and phytochemical content. Turmeric powder was obtained from a reliable local market. Rice grains were purchased locally and used to prepare rice water. All plant materials were thoroughly washed with tap water followed by distilled water to remove dirt and contaminants.

PREPARATION OF HERBAL EXTRACTS

Preparation of Rice Water

Rice grains were washed thoroughly with distilled water to remove impurities. The cleaned rice was soaked in distilled water for approximately 30 minutes. The soaking water was then filtered through muslin cloth to obtain rice water extract. Due to its limited stability, the extract was used immediately in the formulation.

Preparation of Aloe Vera Gel Extract

Fresh Aloe vera leaves were washed thoroughly and cut lengthwise. The outer green rind was removed using a sterile knife, and the inner transparent gel was carefully collected. The gel was blended to obtain a uniform consistency and filtered through muslin cloth to remove fibers. The prepared gel was stored under refrigeration until use.

Tulasi Powder

Fresh leaves of *Tulasi* are collected and any damaged or diseased leaves are removed.The leaves are washed thoroughly with clean water to remove dust and impurities.The washed leaves are shade-dried at room temperature for several days until they become completely dry and crisp. Shade drying helps retain the medicinal properties.The dried leaves are ground into a fine powder using a grinder or mortar and pestle.The powder is sieved using a fine mesh sieve to obtain a uniform and smooth powder.The prepared tulasi powder is stored in an airtight container in a cool and dry place for further use.

Turmeric Powder

Commercial turmeric powder was used directly without further extraction.

FORMULATION OF POLYHERBAL SOAP

Table: 1:Ingredients for Herbal Soap Formulation

s.no	Ingredients	Quantity	Category
1	Rice water	17 ml	Improves skin Texture
2	Glycerine soap base	90 g	Soap base
3	Turmeric powder	2g	Anti septic, Anti bacterial
4	Tulsi Powder	5g	Anti Bacterial, Anti Viral
5	Aloe vera gel	8g	Anti-dandruff
6	Almond oil	1ml	Emollient
7	Rose water	3ml	Cooling and soothing agent
8	Lavender oil	1ml	Perfuming agent

The polyherbal soap was prepared using the **double boiling method** to prevent degradation of heat-sensitive herbal components.

The glycerine soap base was cut into small cubes and placed in a double boiler containing water. The mixture was heated and stirred continuously until the soap base melted completely at a temperature of approximately 75–80°C.

After complete melting, the herbal ingredients were gradually incorporated into the soap base. Aloe vera gel (8 g), rice water (17 ml), Tulasi powder (5 g), turmeric powder (2 g), almond oil (1ml), rose water (3 ml), and lavender oil (1 ml) were added to the melted soap base.

The mixture was stirred thoroughly to ensure uniform distribution of herbal components. The final mixture was poured into soap molds and allowed to cool and solidify at room temperature. Once hardened, the soap was removed from the molds and stored for further evaluation.

RESULTS AND DISCUSSION

Organoleptic Properties

The prepared polyherbal soap exhibited attractive organoleptic characteristics. The presence of Tulasi and turmeric imparted a natural greenish color to the soap. The fragrance was pleasant due to the combination of Tulasi aroma and lavender oil. The soap showed a smooth texture and firm consistency without cracks or deformities.

Physical Characteristics

The formulated soap demonstrated good foaming capacity and foam stability, which are essential qualities for consumer acceptance. The foaming ability was recorded as **154.3 ± 5.4 mm**, while foam retention was **81.4 ± 3.1%** and foam stability was **76.9 ± 2.7%**. These results are comparable to commercially available soaps.

The pH of the soap was found to be **7.7 ± 0.4**, which lies within the acceptable range for skin application. A slightly alkaline pH is typical for soap formulations and helps maintain cleansing efficiency without causing irritation.

Skin Compatibility

The herbal soap don't showed no redness, itching, or inflammation within 24 hours. This indicates that the formulated polyherbal soap is safe for use on different skin types.

Stability Studies

Stability testing showed that the soap maintained its organoleptic and physical properties during storage. Only a slight darkening of color was observed after several weeks, which may be due to the natural oxidation of herbal components. However, this change did not affect the performance or effectiveness of the soap.

Overall, the results suggest that the combination of rice water, Aloe vera, Tulasi, and turmeric provides synergistic benefits, including cleansing, moisturizing, and antioxidant effects.

CONCLUSION

The polyherbal soap enriched with rice water was successfully formulated using natural ingredients such as Aloe vera, Tulasi, and Turmeric. The evaluation results showed that the soap had acceptable pH, good foaming ability, and suitable physical characteristics. The test confirmed that the formulation was safe and non-irritating to the skin. The presence of herbal ingredients provided moisturizing, antioxidant. Therefore, the prepared polyherbal soap can be considered a safe, effective, and eco-friendly alternative to synthetic soaps.

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