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Formulation and Physicochemical Evaluation of Polyherbal Soap Enriched with Aloevera and Natural Antioxidants

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ABSTRACT
In the last few years, herbal cosmetics have become very popular because they are safer, work better, and have fewer side effects than synthetic products. The present study focuses on the formulation and evaluation of herbal soap made from natural ingredients, such as aloe vera, turmeric, sandalwood powder, orange peel powder, vitamin E and shampoo ginger. These things are known to kill bacteria, reduce swelling, protect against free radicals, and feed the skin. To make the soap, glycerine was melted and mixed together, then shaped and hardened. We checked the herbal soap for a number of physical and chemical properties, including its color, smell, pH, foam height, foam retention, irritant, and free alkali content. The tests showed that the soap made a lot of foam, had a pH that was good for the skin, and didn't bother the skin. It can be used every day because it has bioactive phytoconstituents that make it better for treating skin problems. The study concludes that herbal soap made from natural ingredients can be a safe and effective alternative to regular soap, improving skin health and cleanliness without causing any issues.
Keywords: *Herbal soap, Cosmeceuticals, Antioxidant, Antimicrobial, Natural cosmetics, Skin care.*

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INTRODUCTION

The word "cosmetics" comes from the Greek word "Kosmetikos," which means "to adorn" or "to beautify" [1]. Cosmetics are substances designed for application to the human body for the purposes of cleansing, enhancing appearance, or promoting attractiveness without modifying physiological functions [2]. There has been a significant shift toward herbal cosmetics in recent years, mainly because people are becoming more aware of the negative effects of synthetic ingredients and are looking for safer, more natural options [3].

Herbal cosmetics are made with plant-based ingredients like extracts, essential oils, and powders. They can be used for both beauty and health purposes [4]. People generally think that these products are safe, good for the environment, and good for living things [5]. Cosmeceuticals have broadened the definition of cosmetics by including biologically active ingredients that can make skin healthier and work better [6]. Herbal soaps are an important type of soap because they not only clean but also have other effects, such as being antimicrobial, anti-inflammatory, and antioxidant [7].

The skin is the largest organ in the body and is the main barrier that protects the body from things like pollution, UV rays, and germs [8]. If you are constantly exposed to these stressors, your skin may not be able to heal properly, so you need to take care of it properly. People have long used medicinal plants like aloe vera, turmeric, sandalwood, and orange peel for their skin benefits. Turmeric is known for its strong anti-inflammatory and antioxidant effects, while aloe vera is known for its ability to heal wounds and keep skin moist [9]. Sandalwood is known for its calming and cooling effects, and orange peel powder is good for exfoliating and brightening the skin because it is high in vitamin C and flavonoids [10].

The growing interest in herbal formulations is mostly due to the fact that they work well with different skin types and have a lower chance of causing side effects. In addition, herbal soaps often have natural antioxidants, vitamins, and essential oils added to them that make them better for your skin (The Wealth

of India). They don't have any harsh chemicals like synthetic soaps do, so they are better for long-term and regular use [12].
In this context, the current study seeks to develop and assess the herbal soap utilizing specific natural ingredients, while also evaluating its physicochemical properties to determine its efficacy, safety, and appropriateness for regular skincare use [13].

MATERIAL AND METHODS

Collection of Plant Material

The herbal ingredients used to make the product came from trustworthy sources and included turmeric powder, aloe vera gel, sandalwood powder, orange peel powder, vitamin E capsules, menthol, and shampoo ginger gel. All of the plant-based materials were chosen because they are known to have medicinal and cosmetic benefits, such as being antimicrobial, anti-inflammatory, antioxidant, and good for the skin. Before use, the materials were cleaned, dried if necessary, and stored in a way that kept them from getting dirty or breaking down.

Preparation of Herbal Soap

The glycerine soap base was the main ingredient in the herbal soap. First, the soap base was cut into small pieces and melted in a double boiler while stirring constantly until it became a smooth, even liquid. After the mixture had completely melted, it was taken off the heat and the pre-measured herbal ingredients were slowly added while stirring constantly to make sure they were evenly mixed. After that, the mixture was poured into molds and left to cool and harden at room temperature. The prepared soaps were taken out of the molds and dried in a cool, dry place after they had hardened. This was done to get the final product ready for testing.

Formulation

Table 1: Ingredients to herbal soap with aloe vera gel as main ingredient

S. No	Material	Quantity
1	Aloe vera gel	16 gm
2	Turmeric powder	1gm
3	Orange peel powder	5gm
4	Sandal wood powder	7gm
5	Vitamin E capsules	5 gm
6	Menthol	2.5gm
7	Glycerine soap Base	250gm

Table 2: Ingredients for herbal soap with shampoo ginger as main ingredient

Sl. No	Material	Quantity
1	Shampoo ginger gel	2ml
2	Turmeric powder	1gm
3	Orange peel powder	5gm
4	Sandal wood powder	7gm
5	Vitamin E capsules	5 gm
6	Menthol	2.5gm
7	Glycerine soap Base	250gm

RESULTS AND DISCUSSION

Figure 1: Herbal soap

Figure 2: Foam Height

TEST	RESULTS
Colour	Brown
Shape	Different shapes
Odour	Menthol like odour
PH	8
Foam Retention	1cm per minute
Foam Height	2 cm
Irritation	No irritation
Determination of % free alkali	0.22

Table 3: Results of evaluation parameters

The formulated herbal soap was evaluated for various physicochemical parameters to determine its quality, stability, and suitability for skin application. The results obtained from the evaluation studies indicate that the prepared formulation possessed acceptable characteristics and complied with standard requirements for herbal soap. The colour of the prepared soap was observed to be brown, which can be attributed to the presence of herbal ingredients such as turmeric, sandalwood, and orange-peel powder. The soaps exhibited different shapes depending on the moulds used, indicating good moldability of the formulation. The odour was found to be pleasant with a characteristic menthol-like fragrance, which enhances user acceptability and provides a refreshing effect during application. The pH of the formulated soap was found to be 8, indicating a mildly alkaline nature. This pH range is considered acceptable for soap formulations and is generally safe for skin application without causing irritation. The presence of natural ingredients such as aloe vera and vitamin E may help in balancing the effect of alkalinity and maintaining skin hydration. Foaming ability is an important parameter for cleansing efficiency. The foam height of the formulation was found to be 2 cm, indicating satisfactory foaming capacity. Foam retention was observed to be 1 cm per minute, which suggests good stability of foam over time. These properties are essential for effective cleansing action and user satisfaction. The irritation test showed no signs of redness, itching, or irritation upon application, confirming that the formulation is safe and suitable for topical use. This may be due to the presence of soothing and anti-inflammatory herbal ingredients such as aloe vera and sandalwood. The percentage of free alkali in the soap was found to be 0.22%, which is within acceptable limits. Low free alkali content indicates that the soap is less likely to cause skin irritation or dryness and reflects good quality of the formulation process. Overall, the results demonstrate that the formulated herbal soap possesses desirable physicochemical properties along with potential therapeutic benefits. The incorporation of natural ingredients contributes to enhanced skin compatibility, antioxidant protection, and antimicrobial activity. Therefore, the developed formulation can be considered effective, safe, and suitable for regular use as a herbal skincare product.

CONCLUSION

The present study was carried out to formulate and evaluate a herbal soap using natural ingredients with potential skin-beneficial properties. Herbal ingredients such as aloe vera gel, turmeric powder, sandalwood powder, orange peel powder, vitamin E, and shampoo ginger were selected based on their known antimicrobial, anti-inflammatory, antioxidant, and moisturizing activities. The formulation was prepared using a glycerine soap base through a simple and cost-effective method involving melting, mixing, moulding, and drying. The prepared herbal soap was evaluated for various physicochemical parameters including colour, odour, pH, foam height, foam retention, irritation, and percentage of free alkali. The results indicated that the formulation possessed desirable characteristics such as acceptable pH, good foaming ability, stable foam retention, and pleasant fragrance. The soap showed no signs of skin irritation, confirming its safety for topical application. Additionally, the low percentage of free alkali indicated good quality and reduced chances of skin dryness or damage. The incorporation of herbal ingredients enhanced the functional properties of the soap, providing added benefits such as skin nourishment, protection against microbial infections, and antioxidant effects. Compared to synthetic soaps, the formulated herbal soap offers a safer, eco-friendly, and skin-compatible alternative suitable for regular use. In conclusion, the developed herbal soap formulation was found to be effective, stable, and safe, fulfilling the desired evaluation criteria. The study supports the potential of herbal-based cosmetic products in promoting skin health and encourages further research and development in the field of natural and herbal formulations.

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