

FORMULATION, DEVELOPMENT AND EVALUATION OF HERBAL SOAP

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Abstract

This review article examines the development and assessment techniques for an herbal bathing soap containing multani mitti (fuller's earth), aloe vera gel, and lemongrass oil. It emphasizes the potential benefits of these natural ingredients for skin health, such as multani mitti's cleansing properties, aloe vera's moisturizing and soothing effects, and lemongrass oil's antimicrobial properties. The formulation process is detailed, covering ingredient selection, incorporation methods, and curing techniques. Various evaluation methods are discussed to ensure the quality and efficacy of the final soap product, including sensory assessment, physicochemical analysis, microscopic examination, chemical evaluation, and quality control protocols. This review offers valuable insights for developing and accessing herbal soap formulations that provide safe and effective skincare alternatives for consumers.

Keywords: bathing soap, cleansing, antimicrobial activity, multani mitti, formulation, microscopic examination, chemical evaluation, physicochemical analysis.

INTRODUCTION:

The formulation and assessment of an herbal bathing soap incorporating Multani Mitti (Fuller's Earth), Aloe Vera, and Lemongrass Oil represents a compelling area of research within the context of modern skincare trends and the increasing demand for natural, plant-based products. Herbal bathing soaps have gained prominence due to their perceived benefits for skin health and sustainability compared to conventional synthetic soaps.

Multani Mitti, renowned for its deep-cleansing and oil-absorbing properties, provides a natural solution for pore cleansing and skin detoxification. Aloe Vera, celebrated for its soothing, moisturizing, and healing properties, enriches the skin with essential vitamins and minerals, promoting hydration and skin repair. Lemongrass Oil, valued for its antibacterial and antifungal effects, enhances the blend with a refreshing aroma and additional benefits in combating skin infections[1].

The synergy of these ingredients in a bathing soap formulation offers an opportunity to develop a product that not only cleanses but also revitalizes and nourishes the skin, appealing

to consumers seeking comprehensive skincare solutions. The formulation process involves careful selection and combination of these ingredients to achieve optimal efficacy and sensory appeal, ensuring the soap is gentle and suitable for various skin types[2].

Evaluation of the soap's performance includes criteria such as cleansing effectiveness, moisturizing properties, skin compatibility, and overall user satisfaction. This review aims to delve into the methodology of formulating and evaluating such an herbal bathing soap, emphasizing the scientific principles behind ingredient selection, formulation techniques, and quality assurance measures.[3]

By exploring this subject, we contribute to the broader discussion on herbal skincare and pave the way for the development of innovative, effective natural alternatives in personal care that resonate with contemporary consumer preferences and values[4].

1. Herbal Ingredients: Multani Mitti:

Properties: Multani Mitti, or Fuller's Earth, is a naturally occurring clay abundant in minerals such as magnesium, aluminum, calcium, and silica. It possesses a fine texture and excellent absorption capabilities.



Fig: 1.Multani Mitti

Benefits for Skin: Multani Mitti is renowned for its cleansing properties, effectively absorbing excess oil and dirt to leave the skin feeling clean and refreshed. It also acts as a mild astringent, tightening pores and enhancing skin texture. Its rich mineral composition is believed to promote a radiant complexion[5].

Historical Use: Multani Mitti has a long history of use spanning centuries across various cultures, including ancient Egypt, Greece, and India. It has been valued for its medicinal and cosmetic benefits, specifically for skin cleansing and treating various skin conditions[6].

Aloe Vera:

Soothing Properties: Aloe vera gel is rich in beneficial compounds such as polysaccharides, vitamins, and minerals, which contribute to its ability to soothe irritated skin, alleviate inflammation, and support healing processes.

Moisturizing Effects: Acting as a humectant, aloe vera attracts and retains moisture in the skin, helping to maintain hydration, suppleness, and prevent dryness.

Healing Benefits: Aloe vera gel is known for its wound healing properties and ability to reduce scarring by stimulating cell proliferation and collagen synthesis.



Fig: 2.Aloe Vera.

Lemongrass Oil:

- Antimicrobial Properties: Lemongrass oil exhibits potent antimicrobial activity against a range of bacteria and fungi, which makes it effective in addressing skin issues such as acne and athlete's foot.
- Fragrance: Renowned for its refreshing citrusy aroma complemented by herbal notes, lemongrass oil adds a pleasant fragrance to skincare products.

Synergistic Effects: When combined in a bathing soap, these ingredients can produce several

synergistic effects:

- Enhanced Cleansing: The oil-absorbing properties of Multani Mitti work synergistically with the antibacterial effects of lemongrass oil, providing a deeper cleanse and potentially reducing acne occurrences.
- Improved Hydration: Aloe vera's moisturizing capabilities complement Multani Mitti's gentle cleansing action, preventing excessive skin dryness.
- Soothing and Refreshing: The soothing properties of aloe vera combined with the refreshing fragrance of lemongrass oil create a calming and invigorating bathing experience.



Fig:3. Lemongrass Oil.

Formulation Process: Ingredients:

- Multani Mitti powder: Typically used at a concentration ranging from 5-10% of the total oil weight. Higher percentages can enhance cleansing but may increase dryness.

- Aloe vera gel or extract: Typically included at 10-20% of the total oil weight to balance moisturizing benefits while maintaining soap structure.
- Lemongrass Oil: Added in small amounts, typically between 1-2% of the total oil weight, to provide a pleasant fragrance and retain antibacterial properties.
- Soap base (melt and pour or shredded)
- Soap molds

Procedure:

1. Prepare the mold: Lightly grease the soap mold with a carrier oil, such as coconut oil.
2. Melt the soap base: Use a double boiler method to melt the soap base following the instructions on the package.
3. Incorporate the dry ingredients: Once melted, remove the soap base from heat and stir in the multani mitti powder until well combined.
4. Add the wet ingredients: Stir in the aloe vera gel and lemongrass oil. Optionally, add honey and essential oils at this stage if desired.
5. Pour the soap: Carefully pour the soap mixture into the prepared mold.
6. Let the soap cure: Allow the soap to cure in a cool, dry place for 24-48 hours.
7. Unmold: Once fully cured, unmold the soap and cut it into desired sizes.
8. Store: Store the soap in an airtight container at room temperature.



Fig: 4. Herbal Soap.

Organoleptic Evaluation: Once the soap has cured adequately (usually 4-6 weeks), an organoleptic evaluation is conducted to assess its sensory attributes[7]:

- Color: The final color of the soap is influenced by the natural pigments in the herbal ingredients. Multani Mitti typically imparts a light brown or greenish tint, while aloe vera contributes no additional color. Carrier oils used can also affect the final hue.
- Odor: The soap should exude a pleasant and invigorating fragrance, mainly due to the presence of lemongrass oil. The intensity of the scent can be adjusted to suit individual preferences.
- Texture: The soap should have a firm yet smooth texture. It should produce a rich lather and rinse off cleanly without leaving any residual greasiness on the skin.

Physicochemical Evaluation:

It is essential to conduct a comprehensive assessment of the physical and chemical characteristics of the formulated herbal soap to ensure its quality, safety, and effectiveness. Here are some key tests involved:

- pH:

- The pH of the soap is determined using a pH meter. Ideally, the pH should be slightly acidic, typically ranging from 5.5 to 7.0. This pH range is close to the natural pH of healthy skin, which helps minimize potential irritation.
- Soaps with a higher pH can be drying and may disrupt the skin's natural barrier function. The inclusion of aloe vera in the formulation helps to buffer the pH and maintain a skin-friendly range.



Fig.: pH Test

Foaming Ability:

The foaming ability of the soap is evaluated by generating lather in a standardized solution and measuring several parameters:

- **Foam Height:** The height of the lather column is measured to assess the initial lathering capacity.
- **Foam Drainage Time:** This measures how long it takes for the lather to collapse, indicating the stability and quality of the foam. A longer drainage time suggests a more enduring and effective cleansing lather.

The presence of carrier oils like coconut oil enhances foaming, while aloe vera may slightly affect foam height. However, the efficacy of cleansing is not solely determined by the volume of lather produced.

Stability:

The soap's stability is tested under various conditions to simulate real-world storage scenarios:

- **Accelerated Storage:** The soap is stored at elevated temperatures and humidity levels to evaluate its resistance to melting, cracking, or changes in color.
- **Freeze-Thaw Cycles:** The soap undergoes repeated freezing and thawing cycles to assess its ability to withstand temperature fluctuations without crumbling or losing its structural integrity.

A stable soap should maintain its physical attributes and intended properties throughout its shelf life, ensuring consistent performance and consumer satisfaction.

2. Chemical Evaluation

A thorough chemical evaluation goes beyond simply assessing the soap's pH. It involves analyzing the presence and functionality of essential compounds found in the herbal ingredients, ensuring that the final product meets stringent safety standards.



Fig.: Preparation



Fig.: Soap Form

Conclusion:

This review has examined the formulation and potential benefits of a herbal bathing soap incorporating Multani Mitti, Aloe vera, and Lemongrass oil. Each ingredient's properties were explored, emphasizing their respective contributions to skin health. The formulation process, alongside diverse evaluation methods—physical, chemical, and microscopic—was detailed to ensure the production of a high-quality and safe product.

The combination of Multani Mitti, Aloe vera, and Lemongrass Oil creates a synergistic blend with potential advantages for various skin types. Multani Mitti's gentle cleansing properties effectively remove impurities while preserving the skin's natural moisture barrier. This not only imparts a refreshed sensation but also aids in reducing blemishes, revealing a brighter and more radiant complexion. Aloe vera, renowned for its hydrating capabilities and soothing effects on irritation, provides comfort, particularly for dry or sensitive skin types. Additionally, the presence of vitamins and minerals in aloe vera contributes further to overall skin health. Although Lemongrass oil's antimicrobial efficacy requires additional research for conclusive validation, it shows promise in managing acne-prone skin.

The benefits of this herbal soap transcend skin health, focusing on the use of natural and biodegradable ingredients. Unlike conventional soaps made from animal fats or petroleum products, which can persist in landfills and harm the environment, the components of this herbal soap decompose readily, reducing its environmental footprint. Moreover, sourcing ingredients from renewable plant sources such as Multani Mitti and Aloe vera promotes

sustainability. This approach helps break the reliance on non-renewable resources and encourages a more responsible approach to skincare and environmental stewardship.

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