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Formulation & evaluation of herbal soap for tanning removal & skin soothing

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Abstract

The increasing demand for healthy skin has led to the development of antioxidant soaps that contain complex synthetic chemicals. Herbal cosmetics, also known as Ayurvedic cosmetics, are gaining popularity due to their perceived safety and potential benefits for skin health. Herbal soaps, formulated using natural plant-derived ingredients, are believed to offer a safer alternative for skincare, especially in today's polluted environment where UV rays can harm the skin. In this study, the researchers aimed to formulate and evaluate polyherbal soaps using a combination of Sandal Wood Powder, Turmeric, Aloe vera, Neem oil, Multani mitti, Coconut oil, Rose water, Essential oil, and assess their properties such as colour, odour, pH, foam retention, and foam height.

Keywords: Soothing, detan, antibacterial, antioxidant, anti-aging, glowing skin, remove dirt

Introduction

Ayurveda, a traditional system of medicine that originated in India thousands of years ago, has been known for its use of plant-based products for medicinal purposes. Despite the availability of synthetic chemicals in modern medicine, Ayurvedic products have maintained their popularity due to their perceived safety and efficacy. Many Ayurvedic products are used topically in the form of creams, soaps, oils, and ointments for treating various skin-related ailments such as acne, wounds, eczemas, and ringworms. These products often contain active constituents derived from natural sources, such as herbs, roots, flowers, and fruits, which are believed to possess medicinal properties. One of the reasons why Ayurvedic products are considered safe is that they are typically made from natural ingredients and do not contain harmful chemicals or synthetic additives^[1]. Many consumers are becoming more conscious about the ingredients in their beauty and cosmetic products, and are actively seeking out natural alternatives. Natural soaps, in particular, have gained popularity as they are often prepared without the use of synthetic chemicals and instead contain functional ingredients derived from natural substances, such as essential oils or plant extracts.

Natural soaps are typically made using traditional soap-making methods that involve combining oils or fats with an alkaline solution, such as lye. This process results in the formation of soap through a process called saponification. Natural soaps are usually made with natural oils or fats, such as olive oil, coconut oil, shea butter, or cocoa butter, which are chosen for their beneficial properties for the skin. In addition to using natural oils or fats, natural soaps often incorporate functional ingredients from natural substances, such as essential oils or plant extracts. Essential oils are concentrated plant extracts that are known for their aromatic properties and potential skin benefits^[2, 3].

Common Skin Diseases

- Acne
 - Dry skin
 - Eczema
 - Psoriasis
 - Urticaria
- Eczema, acne, rashes, psoriasis, allergies, dry skin, and urticaria (hives) are some of the most common skin diseases that affect people of all ages. Let's take a brief look at each of these skin conditions: Eczema: Also known as atopic dermatitis, eczema is a chronic inflammatory skin condition characterized by red, itchy, and dry patches on the skin.

It often occurs in childhood and can persist into adulthood.

- **Acne:** Acne is a common skin condition that results from the overproduction of sebum (oil) in the skin, leading to clogged pores and the formation of pimples, blackheads, and whiteheads.
- **Rashes:** Rashes are a general term used to describe abnormal changes in the colour, texture, or appearance of the skin. Rashes can be caused by a variety of factors, such as allergies, irritants, infections, and skin conditions.
- **Psoriasis:** Psoriasis is a chronic autoimmune skin condition that causes rapid skin cell turnover, leading to the formation of thick, scaly patches on the skin. It can cause discomfort, pain, and embarrassment for those affected.
- **Allergy:** Skin allergies can result from contact with allergens, such as certain foods, plants, chemicals, or metals. Allergic reactions can cause redness, itching, rashes, and other skin symptoms.
- **Dry skin:** Dry skin is a common condition where the skin lacks sufficient moisture, leading to flakiness, tightness, and roughness. It can be caused by various factors, such as environmental factors, genetics, and age.
- **Urticaria (Hives):** Urticaria, commonly known as hives, is a skin condition characterized by raised, itchy, and red welts on the skin. Hives can be triggered by allergens, stress, medications, or infections.

One of the advantages of using natural soap is that it is made from all-natural ingredients, without the use of harmful chemicals or artificial additives. This makes it gentle on the skin, suitable for all skin types, and less likely to cause irritation or allergies. The absence of harsh chemicals also means that natural soaps do not strip the skin of its natural oils, allowing it to retain its moisture and natural barrier function. In addition, natural soaps are known for their good detergency or cleansing power. They effectively remove dirt, oil, and impurities from the skin without leaving a residue, leaving the skin feeling clean and refreshed. The use of natural ingredients also adds moisturizing effects to the soap, keeping the skin hydrated and preventing dryness or flakiness^[4-6].

Material and Methods

1. Sandalwood Powder

The scientific name of sandalwood is *Santalum* spp. There are several species of sandalwood, which are commonly used in soap making and other cosmetic applications. Sandalwood powder is obtained from the heartwood of sandalwood trees and is known for its distinctive aroma, which is often described as woody, sweet, and exotic. In soap making, sandalwood powder is used as a natural colorant, fragrance, and skin-conditioning ingredient.

Here are some common uses of sandalwood powder in soap making

Exfoliation: Sandalwood powder has a fine texture that can act as a mild exfoliant, helping to gently remove dead skin cells and unclog pores, which can contribute to smoother, brighter skin^[7].



Fig 1: Sandalwood Powder

2. Neem Oil

The scientific name of neem oil is *Azadirachta indica*. Neem oil is a vegetable oil extracted from the seeds of the neem tree, which is native to the Indian subcontinent. It has been used for centuries in traditional medicine and has many potential uses, including in soap making. In soap making, neem oil can be used as an ingredient to provide various benefits to the soap. Some potential uses of neem oil in soap include^[7]

- Antimicrobial properties
- Moisturizing properties
- Soothing properties



Fig 2: Neem

3. Multani Mitti

The scientific name of Multani Mitti is Fuller's Earth, which is a type of natural clay that is widely used for various skin care purposes. Fuller's Earth, or Multani Mitti, is a sedimentary clay that is composed of minerals like montmorillonite, kaolinite, and other minerals, which give it unique properties for skin care. In soap making, Multani Mitti can be used as an ingredient to provide several benefits to the soap. Some potential uses of Multani Mitti in soap include^[7]

- Exfoliation
- Oil-absorption
- Cleansing
- Skin-soothing



Fig 3: Multani Mitti

4. Turmeric

The scientific name of turmeric is *Curcuma longa*. Turmeric is a yellow-coloured spice that is widely used in culinary and traditional medicine for its various health benefits. In soap making, turmeric can be used as an ingredient to provide several potential benefits to the soap. Some potential uses of turmeric in soap include ^[7]

- Antioxidant properties
- Anti-inflammatory properties
- Skin-brightening properties
- Mild exfoliation



Fig 4: Turmeric Powder

5. Aloe Vera

The scientific name of Aloe vera is *Aloe barbadensis*. Aloe vera is a succulent plant that has been used for centuries for its various health and skincare benefits. In soap making, Aloe vera can be used as an ingredient to provide several potential benefits to the soap ^[7].

Soap Ingredients ^[10, 11, 12, 13]

Table 1: Soap Ingredients ^[10, 11, 12, 13]

S. No.	Name	Biological Source	Parts	Chemical Constituents	Uses
1.	Sandalwood Powder	<i>Santalum</i> spp Family: Santalaceae	Wood	α -Santalol and β -santalol	Remove suntan, glowing skin
2.	Multani Mitti	Fuller's Earth	Clay	Magnesium chloride	Brighten the skin tone, Fighting acne
3.	Turmeric	<i>Curcuma longa</i> Family: Zingiberaceae	Rhizomes	Curcumin	Anti-oxidant, anti-septic
4.	Aloe Vera	<i>Alobarbadensis</i> Family: Liliaceae	Pulp	Anthraquinone	Anti-aging
5.	Neem	<i>Azadirachta indica</i> Family: Meliaceae	Leaves	Triterpenes	Antibacterial, anti-septic

Formulation of Soap

Table 2: The formula is preparation of herbal soap

S. No	Ingredient	Quantity	Uses
1	Soap Base	55 g	Remove dirt
2	Sandal wood powder	2 g	Remove suntan, glowing skin
3	Turmeric Powder	0.15 g	Anti-oxidant, anti-septic
4	Aloe vera gel	4 g	Anti-aging
5	Multani mitti	1 g	Brighting skin tone
6	Neem oil	2 g	Anti-bacterial
7	Rose water	1 ml	Smoothing the skin
8.	Sandalwood oil	2 drops	Perfume

Some potential uses of Aloe vera in soap include:

- Moisturization
- Soothing and calming properties
- Anti-inflammatory properties
- Antioxidant properties
- Skin conditioning



Fig. 5: Aloe Vera

Material and Methods

Collection of ingredient: Neem leaves were collected from wanadongri, Nagpur Authenticated by Mrs. Seema Y. Mendhekar Department of Pharmacognosy. The neem leaves washed with distilled water and dried at room temperature, then grinded it. Measured grinded leaves 20 g soaked with 300 ml coconut oil and heated up to 120 degree C for 3hr then filtered it. Rose water, Multani mitti, Coconut oil, Essential oil, Turmeric, Sandalwood Powder, purchased local market ^[8, 9].

Formulation Procedure

To prepare polyherbal soap, follow the steps below:

Ingredients: Soap base (required volume) Other ingredients for your desired polyherbal soap blend Soap moulds

Equipment:

- 500 ml beaker
- Stirrer
- Soap moulds
- Petri dish
- Water bath
- Freezer

Instructions: Measure the required volume of soap base and pour it into a 500 ml beaker.

Place the beaker on a water bath and maintain the temperature at 45 °C to heat the soap base without stirring. This will cause the soap base to melt and convert into a liquid form. Once the soap base has melted completely, add all the other ingredients for your desired polyherbal soap blend into the beaker. You can use herbs, essential oils, and other additives according to your preference and formulation. Boil the mixture on the water bath at 45°C without stirring. This will allow the ingredients to blend properly without creating air bubbles. After boiling for a sufficient time, carefully pour the mixture into soap moulds. Place the soap moulds in the freezer and allow the soap to freeze for 2-3 hours. After 2-3 hours, remove the soap moulds from the freezer and let them sit for 5 minutes to allow the soap to solidify. Once the soap has solidified, gently remove it from the moulds ^[14].

Uses of Soap

- Remove suntan
- Smoothen the skin

Evaluation Parameters

- **Texture:** The texture of the soap was evaluated by rubbing the soap between fingers or palms to assess its smoothness, consistency, and feel.
- **Lather:** The lather or foam generated by the soap when used with water was observed and evaluated for its quantity, stability, and creaminess.
- **Cleansing ability:** The ability of the soap to effectively cleanse the skin was assessed by using it to wash the skin and evaluating its ability to remove dirt, oil, and impurities.
- **Rinsability:** The ease with which the soap could be rinsed off from the skin and leave no residue was assessed.
- **Overall sensory evaluation:** The overall sensory attributes of the soap, including color, shape, odour, texture, lather, cleansing ability, moisturization, and rinsability, were evaluated holistically by panellists using their senses to provide an overall assessment of the soap's quality and performance.
- **pH:** The pH of the prepared soap was determined using two methods. Firstly, a pH strip was touched to the freshly formulated soap to obtain a pH reading. Secondly, 1 gram of soap was dissolved in 10 ml of water, and the pH of the resulting solution was measured using a digital pH meter ^[15].
- **Foam Height:** To assess foam height, 0.5 grams of the soap sample was dispersed in 25 ml of distilled water. The mixture was then transferred into a 100 ml

measuring cylinder, and the volume was made up to 50 ml with water. The solution was agitated with 25 strokes and allowed to stand until the aqueous volume measured up to 50 ml. The height of the foam above the aqueous volume was then measured.

- **For foam retention testing:** 25 ml of a 1% soap solution was taken in a 100 ml graduated measuring cylinder. The cylinder was covered with a hand and shaken 10 times. The volume of foam was recorded at 1-minute intervals for a total of 4 minutes ^[16].
- **Irritation testing:** Was carried out by applying the soap on the skin for 10 minutes. If no irritation occurred, the soap was considered non-irritant based on the absence of any adverse skin reactions ^[17].



Fig 6: Herbal soap

Result and Discussion

Table 3: Shows Parameters and Formulation

S. No.	Parameters	Formulation
1.	Colour	Brown
2.	Odour	Aromatic
3.	Shape	Circle
4.	Ph	6.7
5.	Foam height	1 cm
6.	Foam retention	2min
7.	Irritation	Non irritant

Conclusion

The herbal soap was prepared using a cold process technique and contains ingredients with antioxidant and antibacterial properties. Formulation which consists of 55 gm of soap base, 2gm of Sandal wood powder, 4 g gel of *Aloe barbadensis*, and 2 ml oil of *Azadirachta indica*, was found to be a promising polyherbal soap with potential Tan remover, Brighten skin anti-bacterial and anti-oxidant properties. The presence of natural ingredients with potential health benefits may make this polyherbal soap a promising option for skincare routine. Further research and clinical studies can provide more evidence of the efficacy and safety of this polyherbal soap for beauty and skincare purposes.

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