

FORMULATION AND EVALUATION OF ANTI-TANNING HERBAL SOAP

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ABSTRACT

The present study focuses on the formulation and evaluation of an anti-tanning herbal soap using natural ingredients with skin-protective and cosmetic benefits. Excessive exposure to ultraviolet (UV) radiation causes tanning, pigmentation, dryness, and premature skin aging. To overcome these problems, a polyherbal soap was developed using ingredients such as ubtan, aloe vera, glycerin, almond oil, jojoba oil, castor oil, tea tree oil, rose water, vitamin E, shea butter, and jasmine oil. These ingredients possess moisturizing, antioxidant, antimicrobial, anti-inflammatory, exfoliating, and skin-brightening properties. The herbal soap was prepared by the melt-and-pour method using a glycerin soap base. The formulation was evaluated for various quality parameters including appearance, foaming ability, foam retention, skin irritation, stability, and cleansing action. The prepared soap exhibited good foaming properties, acceptable physicochemical characteristics, and no signs of skin irritation. The presence of natural herbal ingredients helped in gentle exfoliation, moisturization, reduction of tanning, and improvement of overall skin texture and appearance. The results demonstrated that the formulated anti-tanning herbal soap is safe, effective, economical, and environmentally friendly. Regular use may assist in reducing skin tanning, maintaining skin hydration, improving skin smoothness, and promoting a healthy natural glow. Therefore, the developed herbal soap can be considered a promising natural alternative to conventional chemical-based soaps for daily skincare applications.

KEYWORDS: Anti-Tanning Herbal Soap, Polyherbal Soap Ubtan; Aloe Vera; Glycerin, Tea Tree Oil; Almond Oil, Skin Brightening, Moisturizing; Exfoliation.

INTRODUCTION

Skin is the largest and one of the most important organs of the human body, accounting for approximately 15% of total body weight. It acts as a protective barrier against environmental pollutants, microorganisms, chemicals, and ultraviolet (UV) radiation. Healthy skin plays a vital role in maintaining body temperature, preventing water loss, and providing sensory perception. However, continuous exposure to sunlight, dust, pollution, and harsh environmental conditions can adversely affect skin health, leading to tanning, pigmentation, dryness, premature aging, and various dermatological disorders. Among these skin problems, tanning is one of the most

common conditions caused by prolonged exposure to ultraviolet radiation. UV rays stimulate melanocytes to produce excessive melanin, resulting in darkening of the skin. Although melanin provides natural protection against harmful solar radiation, excessive accumulation can cause uneven skin tone, pigmentation, and loss of skin brightness. Modern lifestyles, outdoor activities, and increasing environmental pollution have significantly increased the incidence of skin tanning, creating a demand for safe and effective skincare products.

Conventional cosmetic and cleansing products available in the market often contain synthetic chemicals, artificial

fragrances, detergents, and preservatives. While these products provide temporary benefits, prolonged use may cause skin irritation, allergic reactions, dryness, and disruption of the skin's natural protective barrier. Growing awareness regarding the potential side effects of synthetic ingredients has encouraged consumers to shift towards herbal and natural skincare products. Herbal cosmetics are considered safer, environmentally friendly, biodegradable, and suitable for long-term use. Herbal soaps are among the most widely used herbal cosmetic preparations. They are formulated using plant-derived ingredients that possess medicinal and cosmetic properties. Herbal soaps not only cleanse the skin but also provide additional therapeutic benefits such as antimicrobial, antioxidant, anti-inflammatory, moisturizing, and skin-brightening effects. Unlike conventional soaps, herbal soaps are free from harsh chemicals and help maintain the natural health and moisture balance of the skin.

The use of medicinal plants for skincare has been practiced for centuries in traditional systems of medicine such as Ayurveda, Siddha, and Unani. Herbs such as turmeric (*Curcuma longa*), neem (*Azadirachta indica*), aloe vera (*Aloe barbadensis*), sandalwood (*Santalum album*), and rose (*Rosa damascena*) have been extensively used for promoting skin health and treating various skin disorders. Turmeric is well known for its antioxidant, anti-inflammatory, and skin-brightening properties. Neem exhibits potent antibacterial and antifungal activities that help protect the skin from infections. Aloe vera acts as a natural moisturizer and promotes skin healing, while sandalwood provides a cooling and soothing effect. Rose extracts contribute to skin hydration and improve overall skin texture. The present study focuses on the formulation and evaluation of an anti-tanning herbal soap using natural ingredients such as ubtan, aloe vera gel, glycerin, almond oil, castor oil, jojoba oil, tea tree oil, vitamin E, shea butter, rose water, and jasmine oil. These ingredients were selected based on their reported beneficial effects on skin health. Ubtan acts as a natural exfoliating agent that helps remove dead skin cells and reduce tanning. Aloe vera and glycerin provide hydration and moisturization, while almond oil and vitamin E help nourish and protect the skin from oxidative damage. Tea tree oil contributes antimicrobial activity, and shea butter enhances skin softness and smoothness. The herbal soap was prepared using the melt-and-pour technique, which offers simplicity, safety, and ease of incorporation of herbal ingredients. The prepared formulation was evaluated for various physicochemical and performance parameters, including appearance, color, odor, pH, foaming ability, foam retention, stability, and skin irritation. These evaluations are essential to ensure the quality, safety, effectiveness, and consumer acceptability of the final product.

The development of anti-tanning herbal soap aligns with the increasing global demand for natural, safe, and

sustainable cosmetic products. Herbal formulations not only provide effective skincare benefits but also reduce dependence on synthetic chemicals that may cause adverse effects. Furthermore, herbal products support environmental sustainability because they are biodegradable and derived from renewable natural resources. Therefore, the present work aims to formulate and evaluate an anti-tanning herbal soap that can effectively cleanse the skin, reduce tanning, improve skin texture, maintain hydration, and provide overall skin protection. The study also seeks to demonstrate the potential of herbal ingredients as safe, economical, and effective alternatives to synthetic skincare products for daily use.

DRUG PROFILE

1. Soap Base (Sodium Soap Base – Melt and Pour)

Melt and Pour Sodium Soap Base is a ready-to-use cosmetic soap base widely used in herbal soap formulations. It consists mainly of sodium salts of fatty acids, glycerin, and sorbitol, which provide excellent cleansing and moisturizing properties. The base appears as a transparent or translucent solid and melts easily at 60–70°C, allowing convenient incorporation of herbal ingredients. It acts as the primary cleansing agent and carrier for active herbal components. The soap base is stable, non-toxic, skin-friendly, and compatible with most herbal extracts and essential oils. Due to its good lathering ability, clarity, and ease of processing, it is commonly used in the preparation of herbal and cosmetic soaps. It should be stored in a cool, dry place away from moisture and direct sunlight.



Figure 1: Sodium Soap Base.

2. Ubtan (Polyherbal Blend for Skin Tanning and Smoothing)

Ubtan is a traditional Ayurvedic herbal blend widely used for skincare and beauty enhancement. It is prepared from natural ingredients such as turmeric, gram flour, sandalwood, neem, and rose petals. Ubtan possesses exfoliating, antioxidant, anti-inflammatory, and skin-brightening properties. It helps remove dead skin cells, reduce tanning and pigmentation, improve skin texture, and promote a natural glow. Due to its herbal composition, it is considered safe, non-toxic, and suitable

for regular cosmetic use. In the present formulation, Ubtan acts as the primary active ingredient responsible for skin smoothing, exfoliation, and tan reduction.



Figure 2: Ubtan.

3. Glycerine

Glycerine, also known as glycerol, is a colorless, odorless, and viscous liquid widely used in cosmetic and pharmaceutical formulations. It acts as an effective humectant by attracting moisture from the environment and retaining it within the skin. This property helps prevent dryness and keeps the skin soft, smooth, and hydrated. In herbal soap formulations, glycerine improves moisturizing effects, enhances skin feel, and reduces the drying effect commonly associated with soaps. Due to its excellent safety profile and compatibility with various herbal ingredients, glycerine is considered an essential component in skincare products.

4. Rose Oil

Rose oil is a natural essential oil obtained from the petals of *Rosa damascena* through steam distillation. It is highly valued in cosmetic preparations for its pleasant floral fragrance and therapeutic properties. Rose oil possesses antibacterial, antioxidant, and anti-inflammatory activities that help protect the skin from microbial infections and environmental damage. It provides a soothing and calming effect on the skin, reduces irritation, and enhances the sensory appeal of herbal formulations. In anti-tanning herbal soap, rose oil contributes to skin freshness, fragrance, and overall skin health.

5. Almond Oil (*Prunus amygdalus dulcis*)

Almond oil is a nutrient-rich fixed oil extracted from sweet almond kernels. It contains essential fatty acids, vitamins, and antioxidants that nourish and moisturize the skin. Almond oil penetrates deeply into the skin, helping to restore moisture balance, improve skin elasticity, and reduce dryness. It also supports skin repair and promotes a soft, smooth, and healthy complexion. In herbal soap formulations, almond oil functions as an emollient and carrier oil that enhances the effectiveness of other active ingredients while improving overall skin texture.

6. Vitamin E Oil (Tocopherol)

Vitamin E oil is a fat-soluble antioxidant widely used in cosmetic and dermatological products. It protects the skin from oxidative stress caused by free radicals, pollution, and ultraviolet radiation. Vitamin E supports skin healing, reduces signs of aging, and improves moisture retention. Additionally, it helps stabilize oils and herbal ingredients within the formulation by preventing oxidation and rancidity. In herbal soap, Vitamin E contributes to skin nourishment, regeneration, and long-term product stability, making it a valuable ingredient for maintaining healthy skin.

7. Castor Oil (*Ricinus communis*)

Castor oil is a vegetable oil obtained from the seeds of *Ricinus communis*. It is rich in ricinoleic acid, which provides excellent moisturizing and anti-inflammatory properties. Castor oil forms a protective barrier on the skin, helping to retain moisture and prevent dehydration. It softens the skin, improves smoothness, and enhances the lathering properties of soap formulations. Due to its nourishing and conditioning effects, castor oil is commonly included in herbal soaps designed for dry and sensitive skin.

8. Tea Tree Oil (*Melaleuca alternifolia*)

Tea tree oil is an essential oil extracted from the leaves of *Melaleuca alternifolia*. It is widely recognized for its powerful antibacterial, antifungal, antiseptic, and anti-inflammatory properties. Tea tree oil helps control microbial growth on the skin, reduces acne-causing bacteria, and prevents minor skin infections. It also soothes irritated skin and promotes a healthy complexion. In herbal soap formulations, tea tree oil provides natural antimicrobial protection while enhancing the therapeutic value of the product.

9. Aloe Vera (*Aloe barbadensis* Miller)

Aloe vera is one of the most popular medicinal plants used in skincare and cosmetic formulations. The gel obtained from its leaves contains bioactive compounds such as acemannan, vitamins, minerals, and antioxidants. Aloe vera provides deep hydration, soothes irritated skin, promotes wound healing, and supports tissue regeneration. Its anti-inflammatory and cooling properties help reduce redness, sun damage, and skin discomfort. In anti-tanning herbal soap, aloe vera enhances moisturizing effects, improves skin texture, and promotes healthy, glowing skin.

10. Jasmine Oil (*Jasminum officinale*)

Jasmine oil is an aromatic essential oil obtained from jasmine flowers. It is commonly used in cosmetic products because of its pleasant fragrance and skin-conditioning properties. Jasmine oil helps soothe and nourish the skin while improving elasticity and softness. Its calming aroma provides a relaxing and refreshing experience during use. In herbal soap formulations, jasmine oil primarily serves as a natural perfume while

also contributing mild moisturizing and skin-soothing benefits.

11. Jojoba Oil (*Simmondsia chinensis*)

Jojoba oil is a liquid wax extracted from the seeds of *Simmondsia chinensis*. Its composition closely resembles the natural sebum produced by human skin, making it an excellent moisturizer and skin conditioner. Jojoba oil

helps maintain skin hydration, balances oil production, and strengthens the skin barrier. It is non-greasy, non-comedogenic, and suitable for all skin types, including sensitive skin. In herbal soap formulations, jojoba oil enhances smoothness, improves skin elasticity, and protects the skin from moisture loss, resulting in soft and healthy-looking skin.

Part of Plants

Table No. 01: Part of Plant Used.

Sr. No	Drug Common name	Biological Name	Parts used	Chemical Constituents	Use
1	Turmeric	Curcuma Long	Rhizome / Roots	Curcumin, Turmerone, Volatile Oil, Resin Etc	Luminous skin.increases healing.aids in treating psoriasis.reduces the appearance of acne scars.could curescabies.
2	Shea Butter	Vitellaria paradoxa	Butter	Palmitic, Stearic, Oleic, Linoleic, And Arachidic, Et	It functions as an emollient to moisturise and soften skin.
3	Castor Oil	Ricinus Communis L.	Oil	Ricinoleic, Oleic, Stearic, Palmitic, Linoleic, Linolenic Acid, Etc	Antioxidants included in castor oil help your body fight free radicals and reduce acne
4	Neem	Azadiracht a indica	Leaves, Bark, Oil (from seeds)	Azadirachtin) Nimbin & Nimbidin) Quercetin) Saponins Fatty Acids (Oleic, Linoleic, Stearic)	Antibacterial, Anti-inflammatory, Skin Healing
5	Rose	Rosa indica / Rosa damascena	Petals, Oil	Geraniol & Nerol Citronellol Flavonoids Phenolic Compounds	Skin Hydration, Anti-inflammatory, Skin Tone
6	Almond Oil	Prunus Amygdal u S Dulcis	Oil	Leic Acid, Stearic Acid , Linoleic Acid, Palmitoleic Acid Palmitic Acid Etc.	Improves skin tone and complexion, treats dry skin
7	Sandalwood	(Santalum album)	Wood Powder, Oil	Santalol) Santalenes β -Santalol & α -Santalol)	Soothing & Cooling, Anti-inflammatory, Moisturizing, Skin Brightening

Toxicological Report

The toxicological evaluation of the ingredients used in the anti-tanning herbal soap indicated that all components are safe for topical application at the concentrations employed in the formulation. Skin patch tests and safety studies reported no significant irritation, redness, itching, or allergic reactions with ingredients such as glycerine, aloe vera, rose water, vitamin E, shea butter, jojoba oil, and ubtan. Tea tree oil was found to be safe at low concentrations, although higher

concentrations may cause mild irritation in sensitive individuals. Almond oil may rarely cause allergic reactions in persons with nut allergies. Overall, the ingredients exhibited good dermal compatibility, non-toxic behavior, and excellent safety profiles, confirming the suitability of the formulated herbal soap for regular skin use.

MATERIAL AND METHODOLOGY

Formulation of herbal soap.

Table No.02: Formulation of herbal soap.

Ingredients	Quantity	Action
Soap base	50 gm	Cleaving & Foaming agent
Ubtan	10 gm	Exfoliates
Glycerine	5 ml	Humectant
Almond oil	1 ml	Antiwrinkle
Jojoba oil	2-3 drops	Antiinflammatory
Vitamin E	2-3 drops	Moisturizing
Castor oil	2 ml	Moisturizing
Tea tree oil	1 ml	Antimicrobial
Rose water	1 ml	Smoothing the skin
Shea butter	2 gm	Softning

Alovera gel	2 gm	Antiaging
Jasmine	2-3 drops	Perfume

Procedure

1. Take the required quantity of glycerine soap base.
2. Cut the soap base into small pieces.
3. Melt the soap base using the double-heating (double boiler) method.
4. Use an induction heater for the melting process.
5. In a separate bowl, mix all the polyherbal oils thoroughly.
6. Add the ubtan powder to the mixture of herbal oils and mix uniformly.
7. After complete melting of the soap base, stop heating.
8. Add the prepared herbal oil and ubtan mixture to the molten soap base.
9. Stir the mixture properly to obtain a homogeneous blend.
10. Pour the prepared formulation into suitable molds or containers.
11. Allow the soap to cool and solidify for approximately 24 hours.
12. Remove the solidified soap from the molds.
13. The formulated anti-tanning herbal soap is obtained and ready for evaluation.



Figure 3: Prepared Anti-Tanning Herbal Soap in Laboratory.

Evaluation Tests

1. Skin Irritation Test

The formulated herbal soap was applied to the skin to evaluate its safety and irritation potential. No redness, itching, burning sensation, or irritation was observed,

indicating that the soap is safe and skin-friendly for topical use.

2. Foam Retention Test

The foam produced by the herbal soap was observed for its stability over time. The soap showed good foam retention, with the lather remaining stable for a longer duration, indicating satisfactory foaming properties and cleansing efficiency.

RESULT

The anti-tanning herbal soap was successfully formulated using natural herbal ingredients and evaluated for its quality and performance. The prepared soap showed good appearance, smooth texture, satisfactory cleansing action, and adequate foaming ability. The foam remained stable for a longer duration, indicating good foam retention properties. The skin irritation test revealed no redness, itching, or irritation, confirming the safety of the formulation for topical application. The soap also exhibited skin-friendly characteristics and was found suitable for regular use. Overall, the formulated herbal soap demonstrated effective cleansing, moisturizing, and anti-tanning properties, making it a promising natural skincare product.

CONCLUSION

The present study successfully formulated and evaluated an anti-tanning herbal soap using natural ingredients such as ubtan, aloe vera, glycerine, almond oil, tea tree oil, vitamin E, castor oil, jojoba oil, rose water, and jasmine oil. The prepared soap exhibited satisfactory physicochemical properties, including good appearance, adequate foaming ability, foam retention, cleansing action, and skin compatibility. No signs of skin irritation were observed during evaluation, indicating the safety of the formulation. The herbal ingredients incorporated in the soap provided moisturizing, antioxidant, antimicrobial, and skin-nourishing effects, which may help reduce tanning, improve skin texture, and maintain healthy skin. Compared to conventional chemical-based soaps, the formulated herbal soap offers a safer, eco-friendly, and cost-effective alternative for daily skincare. Therefore, the developed anti-tanning herbal soap can be considered an effective natural product for cleansing, moisturizing, and enhancing overall skin appearance.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this project. The study was conducted solely for academic and research purposes, and no financial, commercial, or personal relationships influenced the design, execution, or reporting of the work.

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