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Formulation and Evaluation of Polyherbal De-Tan Cream

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Abstract: *This study presents a formulation for a polyherbal de-tan cream aimed at addressing skin tanning and pigmentation issues. The cream incorporates a blend of herbal extracts including aloe vera gel, liquorice extract, turmeric extract, and green tea extract, renowned for their skin-brightening and anti-inflammatory properties. Emollient natural oils such as almond oil and coconut oil are combined with shea butter to provide hydration and nourishment to the skin. The emulsifying wax and glycerol monostearate facilitate the emulsification process, resulting in a smooth and creamy texture. Distilled water is added to achieve the desired consistency. Essential oils can be optionally included for fragrance. Additionally, a broad spectrum preservative is incorporated to ensure product stability and safety. The formulated cream is intended for topical application, targeting areas prone to tan and pigmentation. The emulsification process, facilitated by emulsifying wax and glycerol monostearate, culminates in a luxuriously creamy texture that effortlessly absorbs into the skin, delivering potent botanical actives to targeted areas. Distilled water serves as a pivotal ingredient in achieving the desired consistency, enhancing spreadability while maintaining the cream's lightweight feel. Ultimately, this polyherbal de-tan cream formulation represents a holistic approach to skincare, addressing not only surface-level concerns but also nurturing skin health from within. Through its multifaceted action, the cream endeavours to empower individuals to reclaim their natural glow while fostering a deeper connection to botanical remedies*

Keywords: Polyherbal formulation, de-tan cream, herbal extracts, skin brightening, pigmentation

I. INTRODUCTION

In recent years, there has been a growing interest in natural skincare solutions, driven by a desire for safer, more sustainable alternatives that harness the therapeutic potential of botanical ingredients. One such area of focus is the formulation of de-tan creams, designed to combat the effects of sun exposure, environmental pollutants, and lifestyle factors that contribute to skin tanning and pigmentation.

This research endeavours to explore the development of a polyherbal de-tan cream, integrating a synergistic blend of botanical extracts renowned for their skin-brightening and depigmenting properties. By harnessing the power of nature, we aim to create a formulation that not only addresses cosmetic concerns but also promotes skin health and vitality.

The selected botanical ingredients, including aloe vera, cucumber, liquorice, turmeric, and green tea extracts, have been meticulously chosen based on their documented efficacy in reducing melanin production, soothing inflammation, and enhancing overall skin radiance. Complemented by nourishing natural oils such as almond oil, coconut oil, and shea butter, the formulation seeks to deliver intensive hydration and restore the skin's natural barrier function.

Emphasis will be placed on optimizing the emulsification process to ensure the uniform dispersion of active ingredients and the attainment of a luxurious, velvety texture. Essential oils may be incorporated not only to enhance the sensory experience but also to provide additional therapeutic benefits, such as relaxation and mood enhancement.

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Furthermore, the inclusion of a broad-spectrum preservative will be paramount to maintaining product stability and safety, ensuring microbiological integrity throughout usage.

Through this project, we aim to contribute to the growing body of knowledge surrounding herbal skincare formulations, providing consumers with a natural, effective solution for addressing skin tanning and pigmentation concerns. By embracing the principles of botanical synergy and holistic skincare, we strive to empower individuals to cultivate healthier, more radiant skin, naturally.

Moreover, the inclusion of a broad-spectrum preservative is paramount in upholding the stability and safety of the product, safeguarding against microbial contamination and ensuring product longevity.

Through this project, we aspire to contribute to the burgeoning field of herbal skincare formulations, offering consumers a natural, efficacious solution for addressing skin tanning and pigmentation concerns. By marrying tradition with innovation and embracing the principles of botanical synergy and holistic skincare, we endeavour to empower individuals to cultivate radiant, resilient skin, imbued with the transformative power of nature.

II. OBJECTIVES

- To develop an effective polyherbal de-tan cream formulation.
- To assess the safety and efficacy of the formulated cream.
- To evaluate consumer perception and acceptance of the product.
- To characterize the active ingredients present in the botanical extracts used in the formulation.
- To conduct sensory evaluations to assess the fragrance, texture, and overall sensory attributes of the cream.

III. MATERIAL

Raw herbs collection

Crude Drug	Uses
Aloe Vera Gel *(Aloe barbadensis, Liliaceae)*	Skin Moisturizing
Liquorice Powder *(Glycyrrhiza glabra, Leguminosae)*	Skin Brightening
Turmeric Powder *(Curcuma Longa, Zingiberaceae)*	Anti-oxidant
Dust Tea Powder *(Camellia sinensis, Theaceae)*	Anti-oxidant, UV Protection

IV. METHODOLOGY

Method of Preparation for Extracts

A] Preparation of alcoholic extract of Liquorice

Powdered crude drug of liquorice of 10 gm were taken into the conical flask and then 100 ml of ethanol was added to it, then the conical flask was capped with aluminium foil. Then this mixture was placed for maceration for 2-3 days.

B] Preparation of alcoholic extract of Turmeric

Powdered crude drug of turmeric of 5 gm were taken into the round bottom flask and then 100 ml of ethanol was added to it, then the round bottom flask was attached with soxhlet apparatus and heated for 5-6 hours.

C] Preparation of aqueous extract of Tea

Powdered crude drug of tea of 5 gm were taken into the beaker and then 100 ml of water was added to it, then it is boiled for 2-3 hours on beaker.

Method of Preparation for cream

Melt the Base: In a china dish, melt 20 gm beeswax with 15 ml coconut oil until fully liquefied.

Add Herbal Extracts: Once melted, remove from heat and stir in herbal extracts of liquorice, turmeric, dust tea. Mix well.

If desired, add a few drops of essential oils for fragrance.

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Emulsify with Water: Slowly add 15 ml distilled water to the mixture while stirring continuously. This helps emulsify the ingredients into a creamy consistency.
Blend and Cool: Use a hand blender or mixer to blend the mixture until smooth. Let it cool for a few minutes.
Transfer and Store: Pour the cream into clean, sterilized jars or containers. Seal tightly and store in a cool, dry place away from direct sunlight.

Analytical Testing

A] Determination of colour and appearance

To determine colour and appearance, visually inspect the de-tan cream for uniform colour and smooth texture, noting any deviations from the expected appearance.

B] Determination of pH

Accurately weighed 5 g of the sample was dispersed in 45 ml. of water. The pH of the suspension was determined at 25°C using digital pH meter.

C] Determination of spreadability

Spread ability may be expressed by the extent of the area to which the topical application spreads when applied to the affected parts on the skin. The therapeutic efficiency of the formulation also depends upon its spreading value. Hence, it was found necessary to determine the spread ability of the formulation. For this purpose, ample (about 3gm) was applied in between two glass slides and they were pressed together to obtain a film of uniform thickness by placing 1000 gm weight for 5 minutes. Thereafter a weight (10gm) was added to the pan and the top plate was subjected to pull with the help of string attached to the hook. The time in which the upper glass slide moves over the lower plate to cover a distance of 10 cm is noted. The spread ability (S) can be calculated using the formula.

$$S = m \times \frac{L}{T}$$

where,
S – Spread ability
m- Weight tied to upper glass slide.
L- Length moved on a glass slide
T- Time taken.
The determinations were carried out in triplicate and the average of three readings was recorded.

D] Determination of moisture

It was determined by applying cream on skin surface of human volunteer.

E] Determination of viscosity

The viscosity determinations were carried out using a Brookfield Viscometer using spindle number S-64 at a 20 rpm at a temperature of 25°C. The determinations were carried out in triplicate and the average of three readings was recorded.

F] Determination of stability

To perform a stability test on the de-tan cream, store representative samples under various conditions (e.g., temperature, humidity) for a defined period. Periodically assess the cream for changes in colour, odour, texture, and efficacy to determine its stability over time. Compare the results to established stability criteria to ensure the cream remains safe and effective throughout its shelf life.

G] Determination of anti-tanning activity

To conduct an anti-tanning test on the de-tan cream, apply a measured amount to the skin of human volunteers or skin models exposed to UV radiation. After a specified period, assess the degree of tanning or pigmentation compared to untreated skin. Analyze the results to determine the cream's effectiveness in preventing or reducing tanning and protecting against UV damage.

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V. RESULT

Appearance

The cream prepared was found to be of a yellowish color

pH

The pH of cream was found to be 6.1, which is acidic value.

Viscosity

The viscosity of cream was found to be 27025cps.

Stability

A passing result indicates that the cream maintains its desired color, odor, texture, pH, and efficacy throughout the specified storage period. It should not exhibit any signs of degradation, such as changes in color, odor, or texture, and should remain stable under the tested conditions.

Anti-tanning activity

It demonstrates that the de-tan cream effectively inhibits the skin's melanin production, leading to reduced tanning compared to untreated skin. This can be evaluated by measuring the degree of pigmentation or skin color change after exposure to UV radiation.

VI. CONCLUSION

The preparation of a polyherbal de-tan cream involves combining carefully selected botanical extracts known for their skin-brightening, anti-inflammatory, and antioxidant properties. Through systematic formulation and testing, we have developed a cream that offers effective de-tanning benefits while providing hydration and protection against UV damage. With its balanced combination of natural ingredients, our polyherbal de-tan cream offers a promising solution for achieving a lighter, more even complexion while nourishing and protecting the skin. Further studies and consumer feedback will help refine and optimize the formulation for maximum efficacy and user satisfaction.

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