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FORMULATION AND EVALUATION OF HERBAL NUTMEG TAN REMOVAL CREAM

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Abstract : Skin tanning is a common concern, particularly in tropical regions like India, where prolonged exposure to sunlight can cause pigmentation, uneven skin tone, and other skin-related issues. The skin's natural reaction to ultraviolet (UV) radiation results in the overproduction of melanin, which causes tanning. While tanning is a protective mechanism of the skin, it often leads to aesthetic concerns and contributes to skin dullness, premature aging, and uneven complexion. Commercial tan removal creams are widely available in the market, but most contain synthetic chemicals, preservatives, and artificial fragrances that may cause irritation, allergies, or long-term damage to the skin. There is a growing demand for safe, natural, and herbal alternatives to chemical-laden cosmetics.

Keywords: Nutmeg, Shea butter, anti-tannig, extract, cream, skin, herbal, hydration, Myristika fragrance.

INTRODUCTION

The skin, being the largest and most visible organ of the human body, is constantly exposed to various environmental factors such as sunlight, pollution, and chemicals. One of the most common problems caused by excessive exposure to sunlight is skin tanning, which results from the overproduction of melanin, the pigment responsible for skin color. Tanning is the skin's natural defense mechanism to prevent deeper damage from ultraviolet (UV) radiation. Although melanin protects the skin from harmful UV rays, it also leads to uneven skin tone, dark patches, and pigmentation, which many people find undesirable, especially from a cosmetic and aesthetic point of view.

In a country like India, where the climate is predominantly hot and sunny, people are more prone to tanning and other sun-related skin issues. The increasing awareness about personal appearance and skincare has led to a surge in the demand for cosmetic products that can help in reducing tan and improving skin texture. However, most of the commercial tan removal creams available in the market are loaded with synthetic chemicals, artificial preservatives, and bleaching agents, which may produce quick results but can be harmful to the skin in the long run. Prolonged usage of these products can lead to skin dryness, allergies, irritation, and in some cases, irreversible skin damage.

In recent years, people have started moving towards herbal and natural skincare solutions that are not only effective but also safer and environmentally friendly. Herbal cosmetics are made using natural ingredients such as plant extracts, essential oils, and minerals, which are known to have therapeutic properties without causing side effects. One such herbal ingredient is nutmeg (Myristica fragrans), a well-known spice with medicinal and cosmetic benefits. Nutmeg possesses antibacterial, anti-inflammatory, antioxidant, and skin-brightening properties. It has been used in traditional systems like Ayurveda and Unani for treating various skin problems such as acne, scars, and pigmentation.

NEED OF THE STUDY.

In the present era, maintaining healthy and glowing skin is not just a cosmetic concern but also a part of personal hygiene and self-care. Skin tanning, caused by prolonged exposure to sunlight and UV radiation, is one of the most common skin-related issues faced by people, especially in sunny and tropical regions like India. Tanning leads to uneven skin tone, dark patches, pigmentation, and dullness, which can affect an individual's confidence and overall appearance.

While a wide range of commercial tan removal products are available in the market, many of them contain harsh chemicals, artificial bleaches, and preservatives that may cause allergic reactions, skin irritation, dryness, or long-term skin damage. Moreover, regular use of synthetic products can disturb the natural balance of the skin.

DRUG PROFILE

1. NUTMEG

Synonyms: Myritica fragrans

Family: Myristicaceae

Uses: Nutmeg and its oil are used as stimulants, flavouring agents and carminatives. The expressed fatty oil and the volatile oil have been used externally in chronic rheumatism.

Effects: Ingested in small amounts as a spice, nutmeg produces no noticeable physiological or neurological response, but in large doses, both raw nutmeg freshly ground from kernels and nutmeg oil have psychoactive effects, which appear to derive from anticholinergic-like hallucinogenic mechanisms attributed to myristicin and elemicin.

2. Shea butter

Shea butter has been shown to have skin-lightening effects. The active ingredients in shea butter, such as vitamins A and E, help to reduce the appearance of dark spots and improve the overall complexion shea butter is a creamy fat found in nuts growing on shea trees in African countries. It's solid at room temperature but melts on contact with skin, similar to and while it's edible and used in many African recipes, it's primarily found in skin and hair care product in the United States you can safely apply shea butter to your face and lips and body. Some body scrubs and hair conditioners also contains shea butter for its moisturizing effect.

3. Liquid Paraffin

Synonyms: paraffinum liquidum, paraffin oil, liquid paraffin oil or Russian mineral oil.

Uses: Liquid paraffin is primarily used as a pediatric laxative in medicine and is a popular treatmentfor constipation and encopresis. Because of its ease of titration, the drug is convenient to synthesize. Itacts primarily as a stool lubricant, and is thus not associated with abdominal cramps, diarrhoea, flatulence, disturbances in electrolytes, or tolerance over long periods of usage, side effects that and stimulant laxatives often engender (however some literature suggests that these may still occur).

The drug acts by softening the feces and coats the intestine with an oily film Because of this it reduces the pain caused by certain conditions such as piles (haemorrhoids). These traits make the drug ideal for chronic childhood constipation and encopresis, when large doses or long- term usage is necessary.

4. Borax

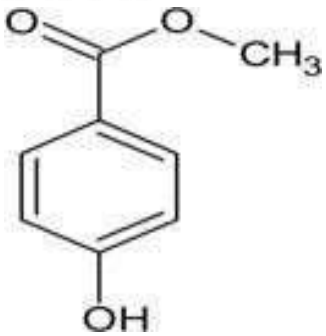
Synonyms : sodium borate, sodium pyroborate, sodium tetraborate

Uses: The best-known use for borax is as a cleaner, but you can find the ingredient in many other household products, including:

- Cosmetics such as lotions, skin creams, moisturizers, sunscreen, and acne care products
- Paint and ceramic glaze
- Specialty toothpastes and mouthwashes
- Herbicides

Borax health risks: Borax can cause nausea, vomiting, and diarrhoea if you ingest it by itself, and large amounts can lead to shock and kidney failure. It's banned in U.S. food products. It also can irritate your skin and eyes, and it can hurt your nose, throat, and lungs if you breathe it in. If you're around it often, it can cause rashes and might affect male reproductive organs

5. METHYL PARABEN



IUPAC name : Methyl 4hydroxybenzoate

Other names : Methyl paraben

Chemical Formula : C8H8O3

Molar mass : 152.15 g·mol−1

Uses : Methyl paraben is an antifungal agent often used in a variety of cosmetics and personal care products. It is also used as a food preservative. Methyl paraben is commonly used as a fungicide in Drosophila food media. Solubility : Soluble in water (2.5 g/l at 25° C), benzene (slightly soluble), carbon tetrachloride (slightly soluble), ethanol, ether, acetone, DMSO, methanol, warm oil (25 g/l), and warm glycerol (1 g/70 ml).

- *Description:* Methylparaben is a 4-hydroxybenzoate ester resulting from the formal condensation of the carboxy group of 4- hydroxybenzoic acid with methanol. It is the most frequently used antimicrobial preservative in cosmetics. It occurs naturally in several fruits, particularly in blueberries. It has a role as a plant metabolite, an antimicrobial food preservative, a neuroprotective agent and an antifungal agent.

6. ROSE WATER

Synonyms: attar of roses; attar; atar; athar; ottar.

Botanical Name: Rosa damascene
Solubility: Soluble in alcohol and oils.

Uses: 1. Eases Pain

In a 2015 study, postoperative children inhaled either almond oil or rose oil. The patients in the group that inhaled rose oil reported a significant decrease in their pain levels. Researchers think the rose oil may have stimulated the brain to release endorphins, often called the "feel- good" hormone.

2. Relief from Menstrual Discomfort

Patients with menstrual pain received abdominal massages to relieve their discomfort. One group was massaged with a carrier oil (almond oil) only, while the other group was massaged with almond oil plus rose oil. The rose oil group reported having less cramping pain following the massage than the almond oil group did.

INGREDIENT TABLE :

Sr no	ingredients	Role
1)	Nutmeg	Anti-tanning, remove dark spot, anti-inflammatory, anti-fungal, anti-bacterial
2)	Shea butter	Emulsifying agent, moisture, gives thickness to the cream, high conc. Of vitamin c
3)	Borax	Alkaline agent which react with emulsifying agent
4)	Methyl paraben	Preservative
6)	Liquid paraffin	Lubricating agent
7)	Rose water	Fragrance

Table no.1 ingredient table

METHOD OF PREPARATION

- **Extract Preparation**

One of the most crucial processes entailed maceration, which involved soaking plant components (leaves or powders) in a container with a cold solvent and letting it lie at room temperature for at least three days while stirring it frequently. In order to

release the soluble phytochemicals, the plant's cell wall was meant to be softened and broken during the processing. The mixture is pressed or strained by the filtration process after three days.

Extraction Procedure:

1. One thousand gram of nutmeg powder were obtained.
2. Nutmeg powder was blended and macerated with 96 % of ethanol for 5 days.

The solution then filtered with flannel, to obtain a thin filtrate. The aqueous filtrate is then evaporated on the water bath until all the ethanol has evaporated and a thick filtrate is produced.

CREAM FORMULATION

Procedure

1. Heat liquid paraffin and shea butter in a borosilicate glass beaker and maintain that heating temperature. (Oil phase).
2. In another beaker, dissolve borax, methylparaben in distilled water and heat this beaker to dissolveborax and methylparaben and to get a clear solution. (Aqueous phase).
3. Then slowly add this aqueous phase to heated oily phase . Then add a measured amount of extractand stir vigorously until it forms a smooth cream.
4. Then add few drops of rose water as a fragrance.
5. Put this cream on the slab and add few drops of distilled water if necessary and mix the cream in ageometric manner on the slab to give a smooth texture to the cream and to mix all the ingredients properly. this method is called ass lab technique or extemporaneous method of preparation of cream.

Evaluation test

Physical evaluation:-

In this test, the cream was observed for colour, odour , texture, state.

Sr.no.	Ingredients	Formulation(F1)	Formulation(F2)	Formulation(F3) Optimized
1)	Nutmeg extract	5ml	4ml	4ml
2)	Shea butter	3.6gm	3.5gm	3.5gm
3)	Borax	0.5gm	0.4gm	0.6m
4)	Methyl paraben	0.112gm	0.6gm	0.04gm
5)	Liquid paraffin	9ml	10ml	14ml
6)	Rose water	q.s	q.s	q.s
7)	Distilled water	q.s	q.s	q.s

Sr no.	Parameter	Formulation F1	Formulation F2	Formulation F3
1)	Colour	Brownish yellow	Brownish yellow	Brownish yellow
2)	Odour	Pleasant	Pleasant	Pleasant
3)	State	Semi-solid	Semi-solid	Semi-solid
4)	Texture	Smooth	Smooth	Smooth

no.3 physical evaluation test

Irritancy: -

Mark the area (1 cm2) on the left-hand dorsal surface. Then the cream was applied to that area and the time was noted. Then it is checked for irritancy, erythema, and edema any for an interval up to 24 hand reported.

Sr no.	Irritant effect	Erythema	Edema
1)	Nil	Nil	Nil
2)	Nil	Nil	Nil
3)	Nil	Nil	Nil

Table no.4 : irritancy observation

WASHABILITY :

A small amount of cream was applied on the hand and it is then washed with tap water.

Sr no.	Formulation	Washability
1)	F1	Easily washable
2)	F2	Easily washable
3)	F3	Easily washable

Table no.5 washability observation.

pH

0.5 g cream was taken and dispersed in 50 ml distilled water and then PH was measured by using digital PH Viscosity meter.

Sr no.	Formation	Ph
1)	F1	7.5
2)	F2	7.9
3)	F3	7.2

Table no.6 : pH observation

Phase separation:-

Prepared cream was kept in a closed container at a temperature of 25-100 °C away from light. Then phase separation was checked for 24 h for 30 d. Any change in the phase separation was observed/checked.

Sr no.	Formulation	Phase separation
1)	F1	No phase separation
2)	F2	No phase separation
3)	F3	No phase separation

Table no.7 phase separation observation

Spreadability :-

The spreadability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two slides better the spreadability. Two sets of glass slides of standard dimension were taken. Then one slide of suitable dimension was taken and the cream formulation was placed on that slide. Then other slide was placed on the top of the formulation. Then a weight or certain load was placed on the upper slide so that the cream between the two slides was pressed uniformly to form a thin layer.

Then the weight was removed and excess of formulation adhering to the slides was scrapped off. The upper slide was allowed to slip off freely by the force of weight tied to it. The time taken by the upper slide to slip off was noted.

Spread ability= m × l/t

Where,

m= Standard weight which is tied to or placed over the upper slide (30g)

l= length of a glass slide (5 cm)

t= time taken in seconds.

Sr no.	Formulation	Time	Spread ability
1)	F1	9	21.7
2)	F2	6	31.7
3)	F3	12	13.25

Table no.8 spread ability observation

Evaluation Test Result

The cream prepared was found to be of pale yellow colour and had pleasant odour. Formulated cream was homogenous and smooth and consistent in nature. After many tests this product has been proved safe due to herbal extracts in it and no harmful chemicals used in it as well as it is not synthetic.

It has neutral pH so as it matches to the pH of skin. No allergic inflammation noticed during or after testing of this cream. Investigated herbal cream showed satisfactory organoleptic physico- chemical characteristics. It also increases skin moisturization without changing value of skin pH

Sr no.	Evaluation test	observation
1)	Color	Brownish yellow
2)	Odour	Pleasant
3)	State	Semi-solid
4)	Texture	Smooth
5)	PH	7.2
6)	Irritant effect	Nil
7)	Wash ability	Easily washable
8)	Phase separation	No phase separation
9)	spreadability	13.25

Table no.9 result of nutmeg tan removal cream

Conclusion

The present study aimed to develop a safe, effective, and affordable herbal cream using nutmeg (Myristica fragrans) for the removal of tanning caused by sun exposure. The formulation was designed using a combination of natural and skin-beneficial ingredients, including aloe vera, rose water, lemon juice, coconut oil, beeswax, and vitamin E oil. These ingredients were carefully selected based on their historical use in herbal medicine, scientific relevance, and compatibility with the skin.

The cream was successfully prepared using the fusion method, which provided a smooth, stable, and uniform product. The nutmeg extract, obtained through ethanol extraction, was rich in essential oils and phenolic compounds known for their antioxidant, antibacterial, and skin- brightening properties. Incorporating it into a topical cream allowed localized delivery and visible effects on sun-damaged skin.

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