



DESIGN, DEVELOPMENT AND EVALUATION OF RICE NEEM TAN REMOVAL HERBAL SCRUB

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ABSTRACT:

This study focuses on the development and evaluation of a Rice Neem Tan Removal Herbal Scrub. The scrub is made using a range of herbal powders, including rice, neem, potato starch, coconut oil, and others. The scrub's appearance, smoothness, complexity, impact on black spots, white and black head formation, acne, spread ability, astringent and emollient properties, and irritability were tested. The scrub is suitable for both normal and dry skin types and performs well on oily skin. The scrub is edible, reducing the risk of adverse side effects.

Key words: Rice Neem Tan Removal Herbal Scrub, Herbal cosmetic, Natural skincare, Rice powder, Neem powder, Potato starch, Herbal ingredients.

1) INTRODUCTION:

The skin, the body's largest organ, serves as a protective barrier against microorganisms. It consists of three layers: the epidermis, dermis, and hypodermis. The skin's intricate structure forms the body's primary defense against viruses, UV rays, chemicals, and physical injury. Plant-derived flavonoids have been shown to arrest the cell cycle, induce apoptosis, limit the growth of cancer cells, and inhibit invasion processes. Excessive exposure to ultraviolet (UV) radiation leads to skin tanning and the buildup of melanin, a natural skin pigment. Although tanning is a protective response, many people seek to reduce or remove their tanned skin for cosmetic reasons. Herbal tan removal scrubs have gained popularity as a safe, natural alternative for reversing tans. Free from synthetic chemicals that might harm the skin, herbal cosmetics are safe to use. Many individuals appreciate and use various herbal products to enhance their appearance.^[1] Rice neem scrub is a tan removal scrub designed for removing tan caused due to harsh U.V rays It makes skin light, bright and free from blemishes due to its anti-bacterial properties of neem This scrub provides natural brightness and glow to skin due to rice and potato extract which helps in removing dirt and making skin bright. It consists of all natural ingredients such as Rice, Neem,

Potato, Vitamin E, Coconut Oil and Lavender oil, etc. This Cosmetic Preparation is free from harsh and toxic chemicals.^[2]

❖ **Ideal Properties of a Scrub:**

An ideal scrub is considered to have the following characteristics:

- Non-toxic
- Contains small gritty particles
- Acts as a mild abrasive
- Is non-irritating to the skin
- Is non-sticky
- Effectively removes dead skin cells^[3]

❖ **Benefits of Scrubbing Your Skin**

- 1) They allow your skin to absorb moisturizer better. By removing dead skin cell buildup, any moisturizer applied afterward will soak into the skin more thoroughly.
- 2) They unclog pores and prevent ingrown hairs. By regularly using a body scrub, you'll unclog your pores, which can prevent razor bumps and ingrown hairs.
- 3) They leave your skin smoother and more even. When dry skin isn't removed, it makes the skin rough to the touch and gives it a dull, cracked texture and appearance. By removing the dead, dry cells, you should have smoother and more even skin.^[4]

Cosmetics come in many different forms and are frequently used to enhance one's look. Skincare products are designed to tackle a range of skin concerns, including anti-aging, sun protection, wrinkle reduction, and skin protection. Herbs and herbal cosmetics have been used for centuries to treat dark circles, oily skin, acne, and pimples. They are also used for cleansing and cosmetic purposes. Scrubbing your face can effectively remove oil, debris, and grime from your pores, keep your skin supple, and encourage the skin's natural renewal process. It removes dead skin cells from the skin, exfoliates it, and increases blood circulation. Face scrubs should have light abrasive and non-aggressive qualities. An exfoliating scrub made of herbs can help lessen the symptoms of aging on protects the skin and undoes environmental damage. Technically speaking, it is possible to employ herbal remedies with anti-aging, vitamin, antioxidant, and antibacterial qualities to cleanse the skin's surface or exfoliate dead skin cells. This eliminates dead skin cells and helps to deeply cleanse the skin, giving it a radiant, appealing appearance. Using a facial scrub is as simple as choosing a standard scrub that is appropriate for your skin type, rubbing it in for a minute on hydrated skin, and then washing it off. Every skin type can use the scrub. Dry, oily, and sensitive skin types are the three varieties of skin. It is advised to gently massage all regions of the skin to promote blood circulation and oxygenation after using the scrub gel.^[5]

The Objective Of this project includes:

- 1.To identify and select suitable herbal ingredient that have been used traditionally to treat sun tan.
- 2.To make tan removal scrub by combining those ingredients.
- 3.To assess Rice Neem tan removal herbal scrub.

Skin benefits of Neem and Rice:

Rice has high antioxidant content helps reduce inflammation, making it popular for sensitive skin. Rice extract also enhances skin texture and tone, with gamma-oryzanol being a key ingredient^[6]

The traditional cultivators have been used by traditional healers and local farmers in ayurvedic treatments for a variety of diseases, including enhancing vocal clarity, treating boils, swellings, and skin blemishes, and cooling the body^[7]

Azadirachta indica, a native Indian neem, is traditionally used for skin conditions and herbicidal effects. Its bark, leaves, seeds, fruits, and flowers are used in medicinal treatments, including bio pesticides, anticancer agents, and antiseptics. However, little research has been done on its potential cosmetic application due to its antimicrobial properties.

Neem, rich in antibacterial and anti-inflammatory compounds like nimbolide and nimbin, suppresses acne-causing bacteria, reduces redness and inflammation, minimizes wrinkles and fine lines, and has antioxidant properties, aiding in skin aging and reducing hyperpigmentation^[8]

Ingredients & their category with benefits:

1. Rice Powder	Exfoliant
2. Neem Powder	Anti-Bacterial
3. Potato Starch Powder	Skin Lightening agent
4. Stearic acid	Base
5. Potassium hydroxide	Neutralizer
6. Vitamin E	Anti-Oxidant
7. Coconut Oil	Emollient
8. Gum Tragacanth	Stabilizer
9. Sodium Benzoate	Preservative
10. Glycerin	Lubricant
11. Lavender oil	Fragrance
12. Distilled water	Solvent

Table No. 1 – list of Ingredients with its role.

1. Neem

- Synonyms: *Azadirachta indica*, Indian lilac

- Botanical Features: Neem is a fast-growing tree that can reach up to 20 meters in height, with a dense canopy of leaves. It has compound leaves with numerous leaflets and produces small white flowers.

- Chemical Constituents: Azadirachtin, nimbidin, quercetin, and other flavonoids.

- Role in Tan Removal Scrub: Neem possesses antibacterial, antifungal, and anti-inflammatory properties. It helps to remove dead skin cells, lighten blemishes, and soothe irritated skin, making it effective for tan removal^[9]



Fig. No. 1.1 – Dried leaves of Neem

2. Rice Powder

- Synonyms: *Oryza sativa* flour

- Botanical Features: Rice powder is made from finely milled rice grains. It is light and powdery with a smooth texture.

- Chemical Constituents: Contains starch, protein, and various vitamins (such as B vitamins).

- Role in Tan Removal Scrub: Rice powder acts as a gentle exfoliant that helps to slough off dead skin cells, promoting brighter skin.

It also helps absorb excess oil and provides a smooth texture to the skin.^[10]



Fig. No. 1.2 – Rice Powder.

3. Potato Starch Powder

- Synonyms: *Solanum tuberosum* starch

- Botanical Features: Derived from potatoes, which are tubers with a starchy texture. The starch is extracted from the potato flesh.

- Chemical Constituents: Mainly composed of amylose and amylopectin (types of starch).

- Role in Tan Removal Scrub: Potato starch has skin-lightening properties due to its high content of vitamin C and catecholase, which helps reduce pigmentation and dark spots.^[11]

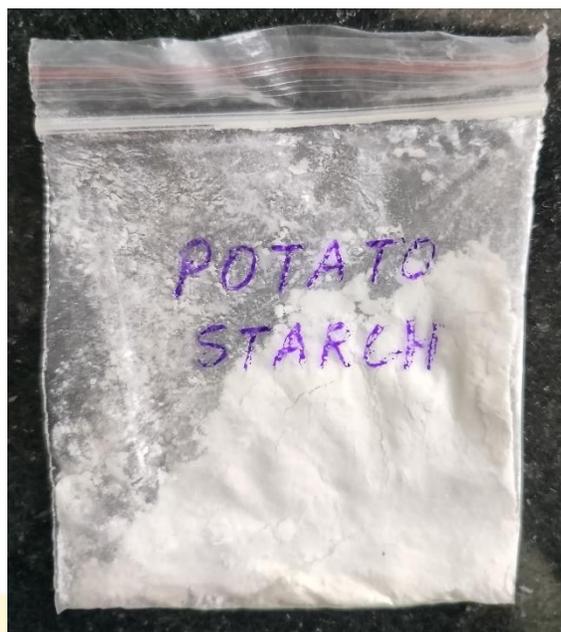


Fig. No. 1.3 – Potato starch powder.

4. Stearic Acid

- Synonyms: Octadecanoic acid
- Botanical Features: A saturated fatty acid found in various animal and vegetable fats. It is a waxy solid at room temperature.
- Chemical Constituents: $C_{18}H_{36}O_2$
- Role in Tan Removal Scrub: Stearic acid acts as an emulsifier, helping to bind water and oil components together. It also contributes to the creaminess of the scrub, providing a smooth application.^[12]

5. Potassium Hydroxide

- Synonyms: Caustic potash
- Botanical Features: An inorganic compound, often found in the form of white solid or flakes.
- Chemical Constituents: KOH
- Role in Tan Removal Scrub: Potassium hydroxide is used as a neutralizer in cosmetic formulations to balance the pH, ensuring the scrub is skin-friendly.^[13]

6. Vitamin E

- Synonyms: Tocopherol
- Botanical Features: A fat-soluble vitamin that occurs in various forms, primarily in vegetable oils, nuts, and green leafy vegetables.
- Chemical Constituents: $C_{29}H_{50}O_2$
- Role in Tan Removal Scrub: Vitamin E acts as an antioxidant, protecting the skin from oxidative stress. It helps to soothe the skin, reduce inflammation, and promote healing, contributing to an overall brighter complexion.^[14]

7. Coconut Oil

- Synonyms: *Cocos nucifera* oil
- Botanical Features: Extracted from the meat of mature coconuts, coconut oil is a white solid at lower temperatures and becomes a clear liquid when warmed.
- Chemical Constituents: Contains medium-chain fatty acids (MCFAs) like lauric acid, capric acid, and caprylic acid.
- Role in Tan Removal Scrub: Coconut oil acts as an emollient, providing hydration and moisture to the skin. It helps to soften the skin and has antibacterial properties, which can aid in preventing post-scrub irritation.^[15]

8. Gum Tragacanth

- Synonyms: *Astragalus gummifer*
- Botanical Features: A natural gum obtained from the sap of the tragacanth plant, which is a small shrub found in the Middle East.
- Chemical Constituents: Composed mainly of polysaccharides.
- Role in Tan Removal Scrub: Gum tragacanth acts as a stabilizer and thickening agent, improving the texture and consistency of the scrub while keeping the ingredients evenly dispersed.^[16]

9. Sodium Benzoate

- Synonyms: Benzoic acid sodium salt
- Botanical Features: A white crystalline powder, commonly used as a food preservative.
- Chemical Constituents: C₇H₅NaO₂
- Role in Tan Removal Scrub: Sodium benzoate serves as a preservative, extending the shelf life of the product by preventing the growth of bacteria and fungi.^[17]

10. Glycerin

- Synonyms: Glycerol
- Botanical Features: A colorless, odorless, viscous liquid derived from plant oils or animal fats.
- Chemical Constituents: C₃H₈O₃
- Role in Tan Removal Scrub: Glycerin acts as a lubricant and humectant, attracting moisture to the skin and preventing dryness. It helps maintain skin hydration, making the scrub more effective.

These ingredients, with their respective properties and roles, contribute to the overall effectiveness of a tan removal scrub. Let me know if you need more information or further details.^[18]

➤ DESIGNING OF FORMULATION:

Name of Ingredients:	Quantity in grams: (For 30 gm)
1. Rice Powder	3.3gm
2. Neem Powder	2.6gm
3. Potato Starch Powder	2.6gm
4. Stearic acid	3.8gm
5. Potassium hydroxide	0.2gm
6. Vitamin E	0.26gm
7. Coconut Oil	1.3ml
8. Gum Tragacanth	0.4gm

9. Sodium Benzoate	0.4gm
10. Glycerin	3ml
11. Lavender oil	0.2ml
12. Distilled water	13ml to q.s

Table No. 2 – List of Ingredients specifying quantities.



Fig. No. 1.4 – Dried Neem leaves to be trituated in a mortar.

2) METHOD OF PREPARATION:

Take required quantity of stearic acid in china dish and melt it at 70° c on a water bath.

Take sodium benzoate , glycerin in another beaker and heat it.

At 40 C mix both these mixture with constant stirring and add other ingredients such as neem powder, rice powder and potato starch, etc.

After cooling, add Lavender oil to the preparation as a fragrance

Store in closed and tight container.



Fig. No. 2 – Mixing all herbal ingredients.

3) EVALUATION:

1. Colour	Light green
2. Odour	Characteristic
3. State	Semi-solid
4. Consistency	Smooth
5. pH	6.1
6. Spreadability	27.77 gm.cm/sec
7. Irritability	Non-Irritability
8. Washability	Washable with water
9. Grittiness	Present
10. Foamability	Present
11. Feel on application	Greasy
12. Removal	Easily Removable

Table No. 3 – List of Evaluation tests.

- pH: 1gm of herbal preparation was diluted in 10 ml of water and pH was determined by pH meter and was



found to be 6.1

Fig. No. 3.1 – pH determination test.

- Spreadability: The scrub sample was applied between two glass slides and was compressed by applying pressure, the length of sample was determined after spreadability test was performed, and was found to be 23.77 gm cm/sec by applying formula mentioned below:

$$m \times l / t$$

Where,

m = weight tied to upper slide

l = length moved on glass slide

t = time taken



Fig. No. 3.2 – Spreadability test.

➤ MICROBIAL TEST:

With the STREAK-PLATE procedure, a mixture of cells is spread over the surface of a semi-solid, agar-based nutrient medium in a petri dish such that fewer and fewer bacterial cells are deposited at widely separated points on the surface of the medium and, following incubation, develop into colonies. the quadrant method for isolating single colonies from a mixture of cells will be described.^[19]



Fig. No. 3.3 – Streak Plate Method.

PROCEDURE:

Streak-planting is a process using metal loops, plastic loops, wooden sticks, or toothpicks to spread a cell suspension or colony on an agar plate

The inoculum can be a cell suspension or a colony from another plate

The process involves flaming the loop or using a new stick or toothpick for each quadrant and The plate is then incubated upside down to prevent cross-contamination and ensure accurate growth.

RESULT:

- Rice neem tan removal herbal scrub was successfully formulated and evaluated.
- The formulation prepared is very effective and have no side effects.
- The consistency of the product was satisfactory for skin application.
- The formulation can be applied for all skin types.
- **CONCLUSION:**

The goal of this study was to develop a stable and effective natural face scrub using herbal medicinal components as active ingredients. Our findings reveal that the herbal face scrub contains exfoliants that wash the skin, remove debris, and give it an instant glow. Antibacterial and antimicrobial properties are provided by key active substances such as, neem powder, potato starch, and rice powder. While we do not advocate sulfate or paraben-containing scrubs for all skin types, our comparisons show that herbal scrubs outperform synthetic counterparts. We also discovered that herbal scrubs created from natural substances have less negative effects, are good for all ages, are less irritating to the skin, and deliver immediate brightness.

**Table No. 4 - DESIGN,
EVALUATION OF RICE NEEM TAN REMOVAL HERBAL SCRUB.**

CONTENT	TITLE OF FIGURES & TABLES
Fig. No. 1.1	Dried leaves of Neem.
Fig. No. 1.2	Rice Powder
Fig. No. 1.3	Potato Starch Powder
Fig. No. 1.4	Dried Neem leaves to be triturated in a mortar.
Fig. No. 2	Mixing all herbal ingredients.
Fig. No. 3.1	pH determination test.
Fig. No. 3.2	Spreadability test.
Fig. No. 3.3	Streak Plate Method.
Table No. 1	List of Ingredients with its role.
Table No. 2	List of Ingredients specifying quantities.
Table No. 3	List of Evaluation tests.

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