

## FORMULATION AND EVALUATION OF HERBAL FACE SCRUB CONTAINING NEEM & TURMERIC

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### ABSTRACT

The present study focuses on the formulation and evaluation of a herbal scrub containing Neem and Turmeric as major active ingredients. Herbal cosmetics have gained significant importance due to their safety, effectiveness, and minimal side effects compared to synthetic cosmetic products. The formulated herbal scrub was prepared using natural ingredients such as neem powder, turmeric powder, rice powder, aloe vera gel, honey, and rose water. Neem possesses antibacterial and antifungal properties that help in reducing acne and skin infections, while turmeric exhibits anti-inflammatory and antioxidant activities that improve skin health and complexion. The prepared formulation was evaluated for various physicochemical and cosmetic parameters including color, odor, consistency, pH, spreadability, washability, grittiness, and irritancy. The results showed that the formulation had good exfoliating action, satisfactory spreadability, acceptable pH, and was non-irritant to the skin. The scrub effectively removed dead skin cells, excess oil, and impurities, leaving the skin smooth and refreshed. The study concludes that the formulated herbal neem and turmeric scrub is safe, stable, economical, and effective for skin cleansing and exfoliation. The use of herbal ingredients makes the formulation suitable for regular cosmetic use with reduced chances of adverse effects.

**KEYWORDS:** Herbal scrub, Neem, Turmeric, Exfoliation, Herbal cosmetics, Skin care, Natural formulation, Evaluation parameters.

### 1. INTRODUCTION

Herbal cosmetics have gained remarkable importance in recent years due to the increasing awareness regarding the harmful effects of synthetic chemicals present in conventional cosmetic products. Consumers are now more inclined toward natural and herbal formulations because they are considered safer, eco-friendly, biocompatible, and associated

with fewer side effects. Herbal cosmetic preparations are formulated using plant-derived ingredients that not only enhance beauty but also provide therapeutic benefits to the skin. These products are widely accepted in the cosmetic industry because they combine cosmetic value with medicinal properties.

Skin is the largest organ of the human body and acts as a protective barrier against environmental pollutants, microorganisms, harmful ultraviolet radiation, and physical damage. Continuous exposure to dust, pollution, excessive oil secretion, sweat, and dead skin cell accumulation can make the skin dull, rough, and prone to acne and infections. Therefore, proper skin cleansing and exfoliation are essential for maintaining healthy and glowing skin.

A scrub is a semi-solid cosmetic preparation containing small abrasive particles that help in exfoliating dead skin cells from the surface of the skin. Exfoliation improves blood circulation, unclogs pores, removes excess oil and dirt, and promotes regeneration of new skin cells. Regular use of scrubs enhances skin texture, smoothness, and brightness. However, synthetic scrubs containing harsh chemicals and artificial exfoliating agents may cause irritation, dryness, redness, and allergic reactions. To overcome these disadvantages, herbal scrubs prepared using natural ingredients are increasingly preferred.

Among various herbal ingredients, Neem is considered one of the most valuable medicinal plants used in Ayurveda and herbal medicine. Neem, scientifically known as *Azadirachta indica*, belongs to the family Meliaceae. Almost every part of the neem tree, including leaves, bark, seeds, and oil, possesses medicinal properties. Neem contains important phytoconstituents such as azadirachtin, nimbin, nimbidin, flavonoids, tannins, and essential oils. These compounds exhibit antibacterial, antifungal, antiviral, anti-inflammatory, antioxidant, and antiseptic properties.

Neem is widely used in skincare formulations because it helps control acne-causing bacteria, reduces skin infections, minimizes inflammation, and regulates excess oil secretion. It is highly effective in treating pimples, blackheads, fungal infections, itching, and skin irritation. Due to its antimicrobial properties, neem also helps maintain skin hygiene and prevents microbial contamination on the skin surface.

Turmeric is another important herbal ingredient extensively used in cosmetic and medicinal preparations. Turmeric, scientifically known as *Curcuma longa*, belongs to the family Zingiberaceae. It has been used traditionally in Ayurveda for centuries for wound healing, skin protection, and enhancement of complexion. The major active constituent of turmeric is curcumin, which is responsible for its characteristic yellow color and therapeutic activities.

Turmeric possesses strong anti-inflammatory, antimicrobial, antioxidant, antiseptic, and skin-brightening properties. It helps reduce redness, pigmentation, acne scars, and skin irritation. Turmeric also protects the skin from oxidative stress caused by free radicals and environmental pollution. Due to its antioxidant activity, it helps delay premature aging and improves overall skin appearance. Turmeric is commonly used in face packs, creams, lotions, soaps, and scrubs for improving skin complexion and maintaining healthy skin.

In the present study, a herbal neem and turmeric scrub was formulated using natural ingredients such as rice powder, aloe vera gel, honey, and rose water along with neem and turmeric powder. Rice powder acts as a natural exfoliating agent that removes dead skin cells and improves skin smoothness. Aloe vera gel provides moisturizing, cooling, and soothing effects to the skin. Honey acts as a natural humectant that helps retain skin moisture and prevents dryness. Rose water is used as a refreshing and aromatic vehicle that improves skin tone and freshness.

The formulation was prepared carefully to obtain suitable consistency, smooth texture, and effective exfoliating properties. The prepared scrub was evaluated for various physicochemical and cosmetic parameters such as color, odor, pH, consistency, spreadability, washability, grittiness, homogeneity, and irritancy. These evaluation tests are important to determine the quality, stability, safety, and acceptability of the cosmetic formulation.

The increasing demand for herbal and natural skincare products has encouraged researchers and cosmetic industries to develop effective herbal formulations with multifunctional benefits. Herbal scrubs containing neem and turmeric provide cleansing, exfoliating, antimicrobial, antioxidant, and skin-protective effects without causing major side effects. Therefore, the present project aims to formulate and evaluate an effective herbal scrub using neem and turmeric for safe and economical skincare management.

The formulated herbal scrub may serve as a beneficial alternative to synthetic cosmetic products and can be used regularly for maintaining healthy, clean, smooth, and glowing skin.

## **2. SCRUB**

A scrub is a cosmetic or skincare preparation used to remove dead skin cells, dirt, excess oil, and impurities from the surface of the skin through the process of exfoliation. It contains small granular or abrasive particles that help clean the skin deeply and improve skin texture.

### **Ideal Characteristics of Herbal Scrub (One Line Each)**

- Good exfoliating property – Removes dead skin cells and impurities effectively.
- Non-irritant – Does not cause redness, itching, or skin irritation.
- Smooth consistency – Possesses uniform and smooth texture for easy application.
- Appropriate grittiness – Contains mild abrasive particles for gentle exfoliation.
- Pleasant odor – Has an acceptable and refreshing natural fragrance.
- Attractive appearance – Shows good color and appealing look.
- Good spreadability – Spreads easily on the skin surface.
- Easily washable – Can be removed easily with water without residue.
- Skin-friendly pH – Maintains pH close to normal skin pH.
- Good stability – Remains stable during storage without separation or spoilage.
- Moisturizing effect – Prevents excessive dryness and keeps skin soft.
- Free from harmful chemicals – Does not contain toxic or harsh synthetic substances.
- Antimicrobial property – Helps prevent microbial growth and skin infections.
- Safe for regular use – Suitable for routine skincare application.
- Economical – Prepared using easily available and cost-effective herbal ingredients.

## **3. AIM**

To formulate and evaluate a herbal scrub containing Neem and Turmeric for effective skin cleansing and exfoliation.

## **4. OBJECTIVES**

- To prepare a herbal scrub using natural ingredients.
- To study the cosmetic and therapeutic properties of neem and turmeric.

- To develop a safe and effective herbal exfoliating formulation.
- To evaluate the prepared scrub for physicochemical parameters such as pH, color, odor, consistency, and spreadability.
- To assess the irritancy and washability of the formulation.
- To determine the stability and suitability of the herbal scrub for skincare application.

## 5. Literature Review

Table No. 1: Literature Review.

Sr. No.	Ingredient	Author & Year	Reported Activity / Findings
1	Neem	Patel et al. (2020)	Neem showed strong antibacterial and antifungal activity useful for acne and skin infections.
2	Turmeric	Joshi et al. (2021)	Turmeric exhibited anti-inflammatory and antioxidant properties beneficial for skin protection.
3	Rice powder	Deshmukh et al. (2021)	Rice powder acted as an effective natural exfoliating agent for removal of dead skin cells.
4	Aloe vera gel	Rao and Kulkarni (2018)	Aloe vera provided moisturizing, soothing, and cooling effects on skin.
5	Honey	Mehta et al. (2020)	Honey showed humectant and antimicrobial properties helpful in maintaining skin hydration.
6	Rose water	Jain and Verma (2019)	Rose water improved skin freshness and acted as a natural refreshing agent.
7	Lemon oil	Kaur et al. (2022)	Lemon oil provided fragrance and mild antimicrobial activity in cosmetic preparations.
8	Herbal combination	Shinde et al. (2023)	Combination of neem and turmeric was found effective in herbal anti-acne formulations.

## 6. MATERIALS AND METHOD

### 6.1 Plant Profile

#### 7.1.1 Neem



Fig No. 1: Neem Plant.

**Synonyms:** Indian Lilac, Margosa Tree, Nimba

**Common Names:** Neem, Kadulimb, Nimba, Vembu

**Biological Source:** Neem consists of fresh or dried leaves and other parts of *Azadirachta indica* belonging to family Meliaceae.

**Geographical Source:** Neem is native to India and Myanmar and is widely distributed in tropical and subtropical regions. It is commonly found throughout India, Pakistan, Bangladesh, Sri Lanka, and African countries.

### Chemical Constituents

Neem contains several biologically active compounds including: Azadirachtin, Nimbin, Nimbidin, Nimbolide, Flavonoids, Tannins, Essential oils, Fatty acids.

### Uses of Neem

- Used in face washes and scrubs for acne treatment.
- Helps control excess oil secretion from skin.
- Prevents bacterial and fungal skin infections.
- Used in soaps and creams for skin cleansing.
- Helps reduce pimples, blackheads, and skin irritation.
- Improves skin freshness and hygiene.

### 7.1.2 Turmeric



**Fig No.2: Turmeric.**

**Synonyms:** Indian Saffron, Golden Spice, Haldi

**Common Names:** Turmeric, Haldi, Halad, Haridra

**Biological Source:** Turmeric consists of dried rhizomes of *Curcuma longa* belonging to family Zingiberaceae.

**Geographical Source:** Turmeric is mainly cultivated in India, China, Indonesia, Sri Lanka, Bangladesh, and other tropical countries. India is the largest producer and exporter of turmeric.

**Chemical Constituents:** Turmeric contains several active constituents including: Curcumin, Demethoxycurcumin, Bisdemethoxycurcumin, Turmerone, Essential oils, Proteins and carbohydrates

### Uses of Turmeric

- Used in face packs and scrubs for glowing skin.
- Helps reduce acne, pimples, and blemishes.
- Improves skin complexion and brightness.
- Reduces skin inflammation and irritation.
- Protects skin from oxidative damage and aging.
- Used in herbal creams, soaps, and lotions.

### 7.1.3 Alovera Gel



**Fig No. 3: Alovera Plant.**

**Synonyms:** Aloe barbadensis Miller, Ghritkumari

**Common Names:** Aloe vera, Ghritkumari, Korphad, Kumari

**Biological Source:** Aloe vera consists of fresh mucilaginous gel obtained from the leaves of *Aloe vera* belonging to family Asphodelaceae.

**Geographical Source:** Aloe vera is native to North Africa and Mediterranean regions and is widely cultivated in India, Africa, America, and tropical countries.

**Chemical Constituents:** Aloe vera contains various active constituents including Aloin, Aloe-emodin, Anthraquinones, Vitamins (A, C, E), Enzymes, Amino acids, Polysaccharides

#### Uses of Aloe Vera

- Used in creams and lotions as moisturizer.
- Helps soothe irritated and sensitive skin.
- Used in face washes and scrubs for cooling effect.
- Promotes healing of minor skin damage and burns.
- Improves skin softness and hydration.
- Used in shampoos and hair care products.

## 7. Excipient Profile

### 7.1 Rice Powder



**Fig No. 4: Rice Powder.**

**Synonyms:** Rice flour, Oryza powder

**Description:** Fine white powder obtained from powdered rice grains used as a natural exfoliating agent.

**Uses:** Removes dead skin cells, cleanses skin, improves smoothness, and provides gentle exfoliation in scrubs.

## 7.2 Multani Mitti



**Fig No. 5: Multani Mitti.**

**Synonyms:** Fuller's Earth, Fuller's clay

**Description:** Natural mineral-rich clay used in cosmetic preparations for cleansing and oil absorption.

**Uses:** Removes excess oil, cleanses pores, improves skin texture, and provides cooling effect in scrubs and face packs.

## 7.3 Rose water



**Fig. No. 6: Rose Water.**

**Synonyms:** Gulab Jal, Rose hydrosol

**Description:** Aromatic aqueous distillate prepared from rose petals having soothing and refreshing properties.

**Uses:** Used as vehicle, cooling agent, toner, fragrance enhancer, and refreshing agent in cosmetic products.

## 7.4 Lemon oil



**Fig. No. 7: Lemon Oil.**

**Synonyms:** Citrus oil, Lemon essential oil

**Description:** Aromatic volatile oil obtained from the peel of lemon fruit by cold pressing method.

**Uses:** Provides fragrance, refreshing effect, antimicrobial activity, and improves product aroma and acceptability.

## 7.5 Glycerin



**Fig. No. 7: Glycerin.**

**Synonyms:** Glycerol, Propane-1,2,3-triol

**Description:** Aromatic aqueous distillate prepared from rose petals having soothing and refreshing properties.

**Uses:** Used as vehicle, cooling agent, toner, fragrance enhancer, and refreshing agent in cosmetic products.

## 7.6 Methyl Paraben



**Fig. No. 8: Methyl Paraben.**

**Synonyms:** Methyl hydroxybenzoate, Nipagin

**Description:** White crystalline powder used as an antimicrobial preservative in cosmetic and pharmaceutical formulations.

**Uses:** Prevents microbial growth, increases shelf life, and maintains stability of cosmetic products.

## 9. METHOD OF PREPARATION

### Step 1: Preparation of Dry Phase

Take neem powder, turmeric powder, rice powder, and multani mitti in a clean dry beaker.

Mix all powders uniformly.

### Step 2: Preparation of Gel Base

In another beaker take aloe vera gel.

Add glycerin and rose water slowly.

Stir continuously to obtain a smooth base.

### Step 3: Mixing

Add dry powder mixture slowly into the gel base with continuous stirring.

Mix properly until a uniform scrub is formed.

### Step 4: Addition of Additives

Add methyl paraben and lemon oil.

Stir gently to distribute evenly.

### Step 5: Packaging

Transfer the prepared scrub into a clean airtight container.

Label properly.

## 10. FORMULATION TABLE

Table 2: Formulation table.

Sr.No.	Ingredient	Quantity	Function
1.	Neem powder	5 g	Anti-Bacterial agent
2.	Turmeric powder	2 g	Anti-inflammatory agent
3.	Alo vera gel	20 g	Moisturizer
4.	Rice powder	10 g	Exfoliating agent
5.	Multani mitti	10 g	Cleansing agent
6.	Glycerin	3 ml	Humectant
7.	Rose water	q.s	Vehicle
8.	Lemon Oil	2-3 drops	Fragrance
9.	Methyl paraben	0.1 g	Preservative

## 11. EVALUATION TEST

### 1. Color and Appearance

The formulation was visually examined for color, homogeneity, and texture.

### 2. Odor

The odor was checked manually.

### 3. pH Determination

The pH of the formulation was determined using a digital pH meter.

$$pH = -\log[H^+]$$

### 4. Spreadability

Spreadability was determined by slide method.

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

Where:

- S = Spreadability

- M = Weight tied to upper slide
- L = Length moved by glass slide
- T = Time taken

### 5. Washability

The ease of washing with water was checked.

### 6. Grittiness

Particle size and exfoliating property were examined.

### 7. Irritancy Test

The formulation was applied on skin to observe redness or irritation.

### 8. Stability Study

The formulation was stored at room temperature and evaluated periodically for changes in color, odor, and consistency.

## 12. RESULTS

**Table 3: Result.**

Parameter	Observation
Color	Yellowish green
Odor	Pleasant
Texture	Smooth
pH	6.5
Spreadability	Good
Washability	Easy
Irritation	No irritation
Stability	Stable

The prepared herbal scrub showed good consistency, smooth texture, and acceptable pH suitable for skin application. The formulation spread easily and washed off without leaving residue. No irritation or redness was observed during skin testing. Stability studies showed no significant changes in formulation characteristics.

## 13. DISCUSSION

The herbal scrub formulation containing neem and turmeric showed satisfactory evaluation parameters. Neem provided antimicrobial and anti-acne effects while turmeric exhibited antioxidant and anti-inflammatory properties. Aloe vera gel improved moisturizing effect and multani mitti enhanced cleansing action. The pH of formulation was found compatible with skin, indicating reduced chances of irritation. Good spreadability and washability suggested acceptable patient compliance. Stability studies confirmed that the formulation remained stable under storage conditions. Thus, the developed herbal scrub can be effectively used as a natural exfoliating cosmetic preparation.

## 14. CONCLUSION

The present study concluded that the herbal neem and turmeric scrub was successfully formulated and evaluated. The formulation exhibited good physical appearance, suitable pH, easy spreadability, and good stability. Neem and turmeric showed beneficial effects in cleansing, exfoliation, and protection of skin. The herbal scrub can be considered as a safe, economical, and effective alternative to synthetic cosmetic scrubs.

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