

FORMULATION AND EVALUATION OF HERBAL FACE SCRUB FOR EXFOLIATION [NEEM & MULTANI MITTI ACNE SCRUB]

TAMBADE YOGESH B, AWARI SARTHAK RAJESH, ATTAR UMER ARIF
Associate Professor, Department Of Quality Assurance, Students Of Final B.Pharm
M.PHARM in Quality Assurance

ABSTRACT

This study examines the development and assessment of a herbal face scrub for exfoliating and acne-prone skin, utilising Neem powder and Multani Mitti as primary active components. The growing inclination towards natural cosmetics has stimulated the creation of plant-derived and mineral-based skincare formulations that purify the skin without the use of abrasive synthetic chemicals. Neem was chosen for its antibacterial, anti-inflammatory, and anti-acne attributes, and Multani Mitti was incorporated as a natural absorbent clay for oil regulation and thorough washing. A 100 g formulation of scrub was created utilising Neem powder, Multani Mitti, oat powder, aloe vera gel, rose water, honey, glycerin, and tea tree oil. Oat powder functioned as a gentle exfoliator, aloe vera gel offered soothing properties, honey and glycerin served as moisturisers and humectants, and tea tree oil was included in minimal amounts to augment antibacterial efficacy. The dry and wet components were made independently and subsequently combined gradually with constant agitation to yield a greenish-brown semisolid scrub paste.

The formulated preparation was assessed for organoleptic properties, homogeneity, consistency, pH, spreadability, washability, grittiness, skin irritation, and stability. The formulation exhibited an appealing look, a smooth consistency with subtle gritty particles, a pH level suitable with skin, ease of washability, and no observable discomfort during initial assessment. The formulation is anticipated to assist in acne reduction, oil regulation, washing, gentle exfoliation, and a refreshed skin sensation.

KEYWORDS:

Herbal Face Scrub, Neem Powder, Multani Mitti, Natural Cosmetics, Acne-Prone Skin, Exfoliation, Herbal Formulation, Anti-Acne Activity, Skin Cleansing, Oil Control, Aloe Vera Gel, Oat Powder, Tea Tree Oil, Herbal Skincare, Cosmetic Evaluation

INTRODUCTION:

The skin is the body's biggest organ, functioning as a protective barrier against environmental contaminants, germs, UV radiation, and hazardous chemicals. Preserving healthy skin is crucial for both physical protection and enhancing personal look and confidence. Acne, excessive sebum production, obstructed pores, and the buildup of dead skin cells are prevalent skin issues, especially among teenagers and young adults. Consistent washing and exfoliation are essential skincare procedures that eliminate pollution, dead cells, and excess sebum, therefore fostering healthy and radiant skin.[1]

Face scrubs are topical cosmetic formulations intended to exfoliate the skin by eliminating dead epidermal cells and contaminants. Exfoliation promotes blood circulation, improves skin texture, prevents pore obstruction, and facilitates the regeneration of new skin cells. Traditional synthetic scrubs on the market frequently comprise abrasive chemicals, synthetic perfumes, and microplastic exfoliants that can lead to irritation, dryness, allergic responses, and ecological risks. Consequently, there is a growing interest in herbal and natural cosmetic formulations that are safer, environmentally sustainable, and linked to fewer adverse effects.[2]

Herbal cosmetics are formulations composed of natural components sourced from plants, minerals, and other naturally occurring materials. These products are broadly endorsed due to their therapeutic efficacy, skin compatibility, cost-effectiveness, and limited side effects. Herbal skincare utilises medicinal plants that exhibit antibacterial, anti-inflammatory, antioxidant, moisturising, and cleaning qualities, enhancing overall skin health.[3] The incorporation of herbal components in cosmetic formulations has significantly increased in popularity recently, owing to heightened consumer awareness of natural and chemical-free products. Neem (*Azadirachta indica*) is a highly esteemed medicinal herb utilised in traditional medicine and skincare formulations.[4] Neem exhibits potent antibacterial, antifungal, anti-inflammatory, antioxidant, and anti-acne properties.

Neem powder diminishes acne-inducing germs, regulates skin infections, alleviates inflammation, and naturally purifies the skin. Due to these characteristics, neem is widely utilised in facial masks, cleansers, soaps, and anti-acne products. Multani Mitti (Fuller's Earth) is a naturally occurring, mineral-rich clay frequently utilised in cosmetic formulations for skin cleaning and oil absorption. It efficiently eliminates surplus sebum, debris, and pollutants from the skin, enhancing complexion and skin texture.[5] Multani Mitti offers a cooling and soothing effect on the skin and is particularly advantageous for oily and acne-prone skin types. Its absorbing and purifying attributes render it an optimal ingredient for exfoliating facial scrubs. Alongside Neem and Multani Mitti, additional herbal components such as oat powder, aloe vera gel, honey, rose water, glycerin, and tea tree oil might augment the formulation's efficacy. Oat powder serves as a gentle natural exfoliator and alleviates inflamed skin. Aloe vera gel offers moisturising and healing attributes, whereas honey and glycerin function as humectants that preserve skin hydration. Tea tree oil provides enhanced antibacterial properties and aids in diminishing acne and skin inflammation.[6]

This study examines the development and assessment of a herbal face scrub incorporating Neem powder and Multani Mitti for exfoliating and acne-prone skin. The aim of the study is to produce a safe, effective, and

stable herbal scrub that cleanses the face, regulates excess oil, eliminates dead cells, and diminishes acne without inducing discomfort. The formulated product was assessed for multiple physicochemical and cosmetic attributes, including appearance, homogeneity, consistency, pH, spreadability, washability, grittiness, skin irritation, and stability to ascertain its appropriateness for topical use.

MATERIALS AND METHODS

MATERIALS

The ingredients of the herbal face scrub comprised Neem powder/extract, Multani Mitti, oat powder, aloe vera gel, rose water, honey, glycerin, and tea tree oil. Neem powder was utilised for its anti-acne and antibacterial attributes, whereas Multani Mitti functioned as the washing and oil-absorbing foundation. Oat powder functioned as a gentle exfoliant. Aloe vera gel was included for its calming and cooling properties on the skin. Rose water served as a medium and a revitalising agent. Honey and glycerin were included to enhance moisturization and sustain skin moisture. A modest quantity of tea tree oil was used to augment antibacterial efficacy. All ingredients were chosen for their safety, natural origin, accessibility, and appropriateness for topical facial use.

Table no 1: ingredients of the herbal face scrub

Ingredient	Main role[7]
Neem powder	Anti-acne, antibacterial
Multani Mitti	Oil absorption, cleansing
Oat powder	Mild exfoliant
Aloe vera gel	Soothing, cooling
Rose water	Fragrance, freshness
Honey	Moisturizing
Glycerin	Humectant
Tea tree oil	Antibacterial support

Table no 2: Collection and Preparation of Ingredients[8,9,10]

Sr. No.	Ingredient	Collection and Preparation Method
1	Neem powder	Fresh neem leaves were harvested, cleansed, shade-dried, and ground into powder. The powder was sifted through a fine mesh to achieve consistent particle size.
2	Multani Mitti	High-quality Multani Mitti was gathered and sifted to eliminate clumps and coarse particles.
3	Oat powder	Oats were powdered using a grinder and sieved to obtain a smooth fine powder suitable for mild exfoliation.
4	Aloe vera gel	Fresh or commercial-grade aloe vera gel was utilised as a calming wet phase component.
5	Rose water	Rose water was precisely quantified and utilised in the wet phase.

6	Honey	Honey was precisely quantified and incorporated into the aqueous phase to ensure hydration.
7	Glycerin	Glycerin was precisely quantified and included as a humectant in the aqueous phase.
8	Tea tree oil	Two to three drops were used at the final step of preparation to mitigate the loss of volatile components.

Table No 3: Formulation Of Neem + Multani Mitti Acne Scrub

Sr. No.	Ingredients	Formula F1	Function[11]
1	Neem powder	10 g	Active anti-acne ingredient
2	Multani Mitti	40 g	Base and oil absorber
3	Oat powder	10 g	Mild exfoliant
4	Aloe vera gel	15 g	Soothing gel phase
5	Rose water	15 mL	Vehicle and fragrance
6	Honey	5 mL	Moisturizer
7	Glycerin	5 mL	Humectant
8	Tea tree oil	2-3 drops	Antibacterial active

PROCEDURE [12,13,14]

The preparation of the herbal face scrub was conducted systematically. Initially, neem leaves were thoroughly desiccated and transformed into a fine powder. Multani Mitti and oat powder were sifted to eliminate coarse particles and provide a refined powder basis (Fig. 1). In the subsequent phase, neem powder, Multani Mitti, and oat powder were precisely weighed and consistently blended in a dry beaker with a spatula until a homogeneous dry mixture was achieved (Fig. 2).

To prepare the wet phase, aloe vera gel, honey, and glycerin were combined in a separate beaker and thoroughly mixed. Rose water was gradually included with constant agitation to yield a smooth and homogeneous wet phase (Fig. 3). The wet phase was incrementally incorporated into the dry powder combination with continuous agitation to prevent clumping. Mixing persisted until a dense, semisolid scrub paste with a homogeneous consistency was achieved (Fig. 4).



Fig: combine images of figs 1, 2, 3, and 4; herbal face scrub procedure

EXPERIMENTAL WORK

The formulated herbal scrub was assessed using established cosmetic assessment criteria to verify its safety, stability, and appropriateness for topical use.

Preformulation Investigation

The preformulation research entails the assessment of individual components prior to formulation. Parameters including appearance, odour, texture, particle size, moisture content, pH, and compatibility were evaluated. [15]

Prepared Batch

A 100 g sample (F1) was made according to the formulation. The final product was a greenish-brown semisolid scrub possessing a subtle herbal fragrance and fine exfoliating granules. [16]

Preformulation Analysis of Powders

Neem powder, Multani Mitti, and oat powder were assessed for colour, odour, texture, pH, and compatibility. All powders exhibited satisfactory properties and were determined to be compatible with one another. No pollution or anomalous odour was detected. [17]

Assessment Criteria

The formulation was assessed for organoleptic characteristics, uniformity, viscosity, pH level, and texture. The scrub exhibited a consistent texture, appropriate pH, and adequate exfoliating particles, signifying its appropriateness for topical use. [18]

Assessment Protocol (Supplementary Examinations)

Spreadability was evaluated using the glass slide method, demonstrating favourable application characteristics. The washability test verified effortless removal without residue. The skin irritation test indicated the absence of apparent irritation. Extrudability was evaluated based on the ease of removal from the container using a spatula. [19]

Stability and Storage Assessment

The formulation was preserved in an airtight container at ambient temperature and monitored for alterations in colour, odour, consistency, phase separation, and microbiological proliferation. No notable alterations were detected throughout the duration of the investigation. [20]

Microbial Safety Measures

Adherence to proper hygiene protocols was maintained during preparation and storage. Small batches were produced, containers were maintained in a clean and dry condition, and the substance was safeguarded against moisture and sunshine. Any alteration in look or odour signifies potential microbial contamination and necessitates product disposal. [21]

RESULT AND DISCUSSION

The Neem and Multani Mitti acne cleanse was effectively created via a straightforward mixing method. The formulated mixture displayed a greenish-brown hue, attributable to the inclusion of neem powder and Multani Mitti. It had a subtle herbal-clay scent and a semisolid texture suitable for topical facial use. The powder phase

and wet phase were uniformly mixed without the creation of hard lumps. The integration of aloe vera gel, rose water, honey, and glycerin facilitated the creation of a smooth and easily spreadable paste. Oat powder supplied gentle abrasive particles essential for efficient exfoliation. The final product was simple to apply and could be effortlessly removed with water post-application. The initial assessment results suggest that the formulation is appropriate as a natural cosmetic product for oily and acne-prone skin. The amalgamation of components imparts antibacterial efficacy, oil-absorbing characteristics, mild exfoliation, and hydration within a singular composition.

Optimized Formulation

The batch F1 was selected as the optimized formulation for laboratory-scale preparation as it exhibited desirable characteristics such as suitable consistency, pleasant appearance, good washability, and no signs of irritation during preliminary testing.

Evaluation Results

Table No. 4: Organoleptic Evaluation

Sr. No.	Parameter	Observation
1	Color	Greenish-brown
2	Odor	Characteristic herbal-clay odor
3	Texture	Fine mild gritty texture

The organoleptic properties of the formulation were found to be acceptable, indicating a natural appearance and suitable texture for exfoliating action.

Table No. 5: Homogeneity Test

Sr. No.	Parameter	Observation
1	Homogeneity	No lumps; uniform paste

Table No. 6: Consistency Test

Sr. No.	Parameter	Observation
1	Consistency	Smooth semisolid scrub paste

The formulation demonstrated good homogeneity and a smooth consistency suitable for topical application.

Additional Evaluation Results

Table No. 7: pH Determination Test

Sr. No.	Parameter	Normal Range	Observation
1	pH	5.0 – 6.5	5.8

The pH of the formulation was found to be within the ideal skin-compatible range, indicating suitability for topical use without causing irritation.

Table No. 8: Skin Irritation Test

Sr. No.	Parameter	Observation
1	Irritation	Non-irritant in preliminary observation
2	Redness	No redness observed
3	Swelling	No swelling observed

The formulation was found to be safe for topical application during preliminary testing.

Tables No. 9: Washability and Spreadability Tests

Sr. No.	Parameter	Observation
1	Washability	Easily washable with water
2	Spreadability	Good and uniform spreading

The scrub exhibited good application properties and was easily removed without residue.

Stability Study

Table No. 10: Stability Study

Sr. No.	Condition	Observation
1	Room temperature	Stable; no phase separation
2	Color	No major change
3	Odor	No unpleasant odor
4	Consistency	Semisolid consistency retained

The formulation remained stable under room temperature conditions, with no significant changes in physical characteristics, indicating good short-term stability.

CONCLUSION

This study successfully developed a natural face scrub for exfoliating and acne-prone skin utilising Neem powder and Multani Mitti. The mixture comprised natural substances that offer antibacterial properties, oil absorption, gentle exfoliation, calming effects, and hydration. The formulated scrub exhibited a greenish-brown hue, a distinctive herbal fragrance, a smooth semisolid texture, satisfactory homogeneity, an acceptable pH level, excellent spreadability, and effortless washability. Initial irritation assessment suggested that the formulation was non-irritating. The evaluation results indicate that the Neem + Multani Mitti Acne Scrub is an effective, safe, and cheap herbal cosmetic formulation for routine washing, oil management, and moderate exfoliating of acne-prone skin. Additional comprehensive stability and clinical research can augment its commercial viability.

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