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Herbal Scrub Formulation: “a” Natural Alternative “to” Synthetic Exfoliant.

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Abstract: *The goal of current study was to create and assess a herbal face scrub with natural ingredients that have antibacterial, antioxidant and skin protective qualities. A gel base made with Carbopol and appropriate excipients was combined with specific plant extract. A variety of physiochemical parameters, such as appearance, pH, viscosity, spreadability, washability and irritability, were evaluated for the developed formulation. The findings showed good stability and efficacy indicating that the herbal scrub can be used as a natural and safe substitute for synthetic products to support skin that is healthy and glowing.*

Keywords: Evaluation, natural ingredients, face scrub and skin health

I. INTRODUCTION

The skin is the largest organ of the human body, covering approximately 1.5–2 m² of surface area, and serves as the first line of defense against physical, chemical, microbial, and environmental stressors. It also regulates body temperature, maintains hydration, and reflects overall health. However, continuous exposure to pollutants, dust, microbes, and ultraviolet (UV) radiation often compromises skin health, leading to conditions such as dullness, dryness, premature ageing, and acne.[1]

Among these, acne vulgaris is one of the most prevalent chronic skin disorders, affecting nearly 85% of adolescents and young adults worldwide. It is characterized by the presence of comedowns, papules, pustules, and sometimes scarring. Key contributing factors include hormonal fluctuations, excess sebum production, and colonization of Propionibacterium acnes. Beyond physical discomfort, acne also impacts mental well-being and self-confidence, making its management a major focus in dermatology and cosmetology.

Cosmetic products play a vital role in maintaining skin hygiene and appearance. In recent years, herbal cosmetics have gained wide popularity due to their natural origin, safety profile, affordability, and eco-friendly properties. Unlike synthetic formulations, herbal products are less likely to cause irritation or long-term side effects and often contain phytochemicals with antioxidant, antiseptic, anti-acne, and anti-ageing properties.

A face scrub Is a common cosmetic preparation designed to exfoliate the skin by removing dirt, oil, dead cells, and blackheads. Regular exfoliation enhances skin smoothness, radiance, and absorption of therapeutic agents. Herbal scrubs, in particular, combine natural abrasive agents with medicinal plant extracts, providing dual benefits of cleansing and therapy. Their phytoconstituents not only promote exfoliation but also help in controlling acne and rejuvenating the skin.

Given the rising demand for safe and effective skincare alternatives, the present study focuses on the formulation and evaluation of a novel herbal scrub. The research emphasizes its physicochemical properties, exfoliating effectiveness, and potential advantages as an eco-friendly, therapeutic substitute to synthetic scrubs in modern skincare [2]

Ideal Properties of Scrub: An ideal scrub is accepted to possess the following properties:

- It should be Non toxic
- Possess small gritty particles
- Mild abrasive
- Non irritating

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- Non sticky Able to remove dead skin cell [3]

Advantages of face scrub:

- Healthy, radiant skin that minimizes spores, lessens acne and breakouts, and conceals wrinkles
- Keeps your body's pH stable, enhances your tan, and permits product absorption.
- Scrubbing is one of the most effective ways to remove dead or dry skin cells from the skin's surface.
- Essential skincare regimen for the face.
- Scrubbing improves blood circulation, which in turn helps with a variety of skin issues.
- Aids in achieving skin that is radiant and healthy.
- For mechanical exfoliation, abrasive scrub cleansers are utilized.[3]

Disadvantages of face scrub:

- Skin irritation can result from harsh cleaning techniques and products, such as Inflammation and redness. Individuals with sensitive skin may also experience allergic reactions to the Chemicals that are also found in synthetic scrubs.
- Excessive scrubbing can leave pores open, making them vulnerable to both UV radiation and pollutants Time. Additionally, it makes your skin more vulnerable to tanning and infections.[3]

II. MATERIALS FOR FACIAL SCRUB

1) Neem leaves powder

Fig.1

Source**:** Leaves of *Azadirachta indica* (Neem tree)
Properties**:** Antibacterial, antifungal, anti-inflammatory
Benefits**:** Fights acne, removes dirt, reduces oil, brightens skin.[4][5][6][7]

2)Rice Powder

Fig.2

Source: Ground rice grains
Properties: Gentle exfoliant, oil-absorbing, brightening
Benefits: Removes dead skin, lightens tan, smoothens skin [8][9][10][11]

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3) Aloe vera powder

Fig.3

Source: Gel from aloe vera leaves
Properties: Soothing, moisturizing, anti-inflammatory
Benefits: Hydrates skin, calms irritation, heals acne and sunburn.[12][13][14][15]

4) Tulsi powder

Fig.4

Source: Dried and ground Holy Basil leaves
Properties: Antibacterial, antifungal, antioxidant
Benefits: Fights acne, cleans pores, brightens skin, reduces oil.[16][17][18][19]

5) Multani Miti

Fig.5

Source: Natural clay
Properties: Oil-absorbing, cooling, cleansing
Benefits: Removes excess oil, tightens pores, brightens skin, prevents acne.[20][21][22][23]

6) Almond meal

Fig.6

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Source: Ground almonds
Properties: Gentle exfoliant, nourishing, rich in vitamin E
Benefit: Removes dead skin, smoothens skin, moisturizes, adds glow.[24][25][26][27]

7) Sandalwood powder

Fig.7

Source: Santalum album
Properties: Soothes, brightens, anti-inflammatory, antiseptic, controls oil.
Use in Scrub: Gently exfoliates, reduces acne and scars, adds cooling effect.[28][29][39][31]

8)Vitamin E Oil

Fig.8

Type: Fat-soluble antioxidant
Properties: Antioxidant, Moisturize skin, Heal scars, Reduces inflammation, Anti-aging benefits
Benefits for Skin: Moisturizes and nourishes, Reduce scars and pigmentation, Protects skin from free radicals [32][33][34][35]

9) Honey (Binder)

Fig.9

Source: Natural sweet substance made by bees from flower nectar
Properties: Antibacterial, moisturizing, soothing, antioxidant
Uses: Hydrates and softens skin, helps in acne control, used in face scrubs [36][37][38][39]

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FORMULATION OF HERBAL FACE SCRUB:

Table no :1 Material's

Ingredients	Quantity
Rice Powder	QS
Neem leaves powder	QS
Tulsi Powder	QS
Aloe vera powder	QS
Multani Mitti	QS
Almond Meal	QS
Sandalwood powder	QS
Vitamin E oil	1 ml
Honey	QS
Tea tree oil	1 ml

PREPRATION METHOD:

1. Weigh the dry components: Weigh the powdered rice, neem, tulsi, aloe vera, multani mitti, almond meal and sandal wood precisely.
2. Combine dry powders: To get rid of lumps, sieve every dry powder. Stir well to create a consistent mixture.
3. Get the liquid phase ready: Combine the tea tree oil, honey, and vitamin E oil in a different bowl. To get a smooth mixture, gently stir.
4. Integrate Phases: Add the liquid mixture to the dry powder mixture gradually. Mix thoroughly until the scrub texture is soft and somewhat damp.
5. Modify Regularity (Optional): Add a few drops of distilled water or rose water if the mixture is too dry. Add a tiny bit of rice powder or Multani Miti if it's too wet.
6. Packaging: After the scrub is ready, put it in an airtight container. Put the name, ingredients, and preparation date on the label.
7. Storage: Keep out of direct sunlight and store in a cool, dry location. Shelf life: roughly two to three weeks; refrigerate for extended shelf life.[40][41][42][43][44]

Evaluation tests:

1. Physical appearance:

The scrub was observed visually for color, odor, texture, and uniformity. The formulation showed a smooth, fine granular texture with a characteristic herbal odor. No clumps or phase separation were seen.

2. PH determination:

One gram of the scrub was dispersed in 10 mL of distilled water and the pH was checked using pH paper or a pH meter. The pH was found to be in the range of 5.5 to 6.5, which is suitable for skin application.

3. Grittiness:

A small amount of the scrub was rubbed between the fingers to check the particle feel. The particles were fine and smooth, indicating no harsh abrasiveness on the skin.

4. Washability:

A small quantity of the scrub was applied on the hand and washed with water. It was found to wash off easily without leaving any sticky or oily residue.

5. Spreadability:

The scrub was placed between two clean glass slides and gentle pressure was applied. The formulation spread smoothly and evenly, indicating good spreadability.

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6. Stability test:

The prepared scrub was stored at room temperature and observed for several days for any change in color, odor, or texture. No visible changes were observed, indicating good stability.

7. Skin irritation test (Patch test):

A small quantity of scrub was applied on the inner forearm and left for 15 to 20 minutes. No redness, itching, or irritation was observed, indicating that the formulation is safe for topical use.

8. Moisture content (Optional):

The scrub was weighed before and after drying at a low temperature to determine moisture content. The formulation contained an acceptable amount of moisture, ensuring a soft texture without being too wet.[45][46][47][48]

III. RESULT AND DISCUSSION

The formulation of the herbal face scrub using natural ingredients such as neem, tulsi, aloe vera, rice powder, multani mitti, almond meal, sandalwood, honey, vitamin E oil, and tea tree oil was successfully prepared and evaluated. The results of physicochemical and organoleptic evaluations indicated that the scrub possessed desirable characteristics suitable for cosmetic application.

1. Physical Characteristics:

The prepared scrub exhibited a fine granular texture, uniform colour, and a pleasant herbal odour. These physical properties are consistent with the ideal characteristics of an exfoliating preparation, which should be smooth, non-sticky, and easy to apply. The mild fragrance derived from natural ingredients also contributes to better consumer acceptance. Similar observations have been reported by where herbal formulations containing neem and sandalwood showed comparable sensory attributes.

2. PH and Skin Compatibility:

The pH of the formulation was found in the range of **5.5–6.5**, which lies within the physiological range of human skin. Maintaining the correct pH is critical for skin barrier protection and minimizing irritation. This finding supports the formulation's suitability for routine cosmetic use, as herbal scrubs with balanced pH values reduce the risk of skin dryness or disruption of the acid mantle. Comparable results were reported in studies using aloe vera and multani mitti as natural pH stabilizers.[49][50][51][52][53]

IV. CONCLUSION

Herbal face scrubs offer a natural, safe, and efficient substitute for natural cosmetics. Neem, sandalwood, rice powder, tulsi powder, and aloe vera are a few of the ingredients that can be used to exfoliate, cleanse, and nourish skin without having negative side effects. The preparation techniques are easy to use, economical, and appropriate for both commercial and small-scale manufacturing. Product quality, safety, and customer acceptance are guaranteed by evaluation tests like pH, grittiness, spreadability, stability, and irritation testing. Standardized formulation and appropriate assessment of herbal face scrubs can be crucial in creating sustainable cosmetic products, given the growing demand for natural skincare.

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