

FORMULATION AND EVALUATION OF HERBAL SCRUB**Yogita M. Talmale*, Snehal V. Salve, Suyog N. Ghatol, Tanuja N. Agole, Vaishnavi D. Kadu**

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ABSTRACT

The primary aim of the present study was to formulate a polyherbal face scrub. Facial skin is continuously exposed to dirt, pollution, dust particles, and accumulates a large number of dead cells. To eliminate these dead cells and maintain the skin in a healthy, clean, and nourished condition, some suitable facial preparations are required. The formulated scrub contains various natural ingredients that are safer to use, produce fewer side effects, and exhibit properties such as antiseptic, anti-infective, antioxidant, anti-aging, and humectant effects. The scrub was prepared by a simple mixing method using ingredients like Beal fruit powder, Orange peel extract, Moringa extract, Neem powder, Turmeric powder into Carbopol 934. Additional components, including Apricot oil, triethanolamine, preservatives, and a perfuming agent, were also added with uniform mixing to obtain a homogeneous formulation. The prepared scrub was evaluated for several parameters such as physical appearance, color, texture, odor, pH, consistency, irritability, washability, extrudability and spreadability. It showed satisfactory results for all the tested parameters. Therefore, the formulated scrub can be effectively used as it demonstrates good scrubbing properties and helps in achieving healthy, clean, and glowing skin.

KEYWORDS: Herbal scrub, anti-aging, Beal fruit, Spreadability.**INTRODUCTION**

The skin is one of the largest organs of the human body and plays a vital role as a protective barrier for internal structures. It acts like a shield, safeguarding the body from environmental factors such as sunlight, wind, pollution, and harmful microorganisms.^[1,2] The skin also maintains its own ecosystem of microbes, including bacteria and yeast, which cannot be completely removed through cleaning. In addition, it serves as a sensory organ and reflects an individual's overall health. Structurally, the skin contains components like amino acids, lipids, and carbohydrates, and therefore requires proper nutrition to remain healthy, clear, and radiant.^[3,4] Cosmetics are products used for cleansing, enhancing beauty, and improving appearance.^[5] Since ancient times, herbal ingredients have been widely used for skin care and beautification. The face, being the most visible part of the body, often indicates a person's health status.^[6] Proper skin care is essential to maintain freshness and vitality. Although many commercial products are available, skin care lies at the intersection of cosmetology and dermatology, and does not always require medical supervision.^[7] Herbal exfoliants play an important role in

maintaining healthy skin by removing dead skin cells and promoting the growth of new cells beneath the surface.^[8] As aging occurs, the natural process of cell turnover slows down, leading to the accumulation of dead cells on the skin, which can cause dullness and highlight fine lines.^[9] Regular cleansing is necessary to remove dirt, sebum, dead cells, and cosmetic residues. Exfoliation using herbal scrubs enriched with vitamins, antioxidants, antiseptic, and anti-aging properties helps in deep cleansing, improves skin texture, and enhances its natural glow and attractiveness.^[10] **Aim:** To formulate and evaluate a herbal scrub using natural ingredients such as bael fruit, orange peel, moringa, apricot oil, neem, turmeric.

OBJECTIVES

To formulate a polyherbal scrub, to evaluate its physicochemical properties, to assess its skin compatibility and safety.

Benefits of scrubbing your skin

- For A Squeaky Spotless Skin: Scrubbing gives you clear skin, free from dirt, oil, and sweat.

- Helps In Removing Dead Cells
- Adds Glow to Skin
- Removes Dark Patches.
- Removes Acne Scars
- Prevents Ingrown Hair
- For Smooth Skin
- Improve the Smoothness of Your Skin.
- Promotes Clear Complexion.

Ideal features of a face scrub^[11]

- It must be non-toxic, mildly abrasive as well as non-sticky.
- Dead skin cells and grime must be removed.
- It must be non-irritating.
- It must have minute grit in it.

ADVANTAGES OF FACE SCRUB

- Promotes healthy, glowing skin, minimizes pores, reduces breakouts and acne, and helps in reducing the appearance of wrinkles.
- Enhances the absorption of skincare products, improves tanning results, and helps maintain the skin's natural pH balance.
- Scrubbing involves the removal of dry or dead skin cells from the surface and is an essential step in a proper skincare routine.
- It not only addresses various skin concerns but also boosts blood circulation, which contributes to healthy and radiant skin.
- Abrasive scrub cleansers are commonly used for mechanical exfoliation of the skin.

DISADVANTAGES OF SCRUB

- Excessive or harsh scrubbing, along with the use of strong chemical-based scrubs, can lead to skin irritation such as redness and inflammation. Individuals with sensitive skin may also experience allergic reactions due to the chemicals present in synthetic scrubs.
- Over-exfoliation can cause pores to open, making the skin more exposed to pollution and harmful UV rays. This can increase the risk of infections and lead to tanning.

Plant Profile

1. Beal fruit



Fig. 1: Beal fruit.

- a] Synonyms: Bael, Stone apple
- b] Biological Source: It consists of dried fruit pulp of

Aegle marmelos Family: Rutaceae c] Chemical Components: Tannins, Marmelosin, Coumarins, Alkaloids, Pectin, Essential oils

- d] Description: Yellowish-brown coloured powder, Characteristic aromatic odour, Slightly bitter and astringent taste
- e] Uses: Used in herbal cosmetics (like scrubs), Helps in skin cleansing and exfoliation

2. Moringa leaf



Fig 2: Moringa leaf.

- a] Synonyms: Drumstick tree leaf
- b] Biological Source: Leaves of *Moringa oleifera* Family: Moringaceae
- c] Chemical Components: Minerals (Calcium, Iron, Potassium), Flavonoids, Polyphenols, Proteins & amino acids
- d] Description: Green coloured fine powder, Mild characteristic odour, Slightly bitter taste
- e] Uses: Antioxidant, Used in herbal cosmetics (face packs, scrubs), Promotes healthy skin & hair

3. Orange peel powder



Fig. 3: Orange peel powder.

- a] Synonym: orange zest
- b] Biological source: *citrus reticulata* in the Rutaceae family c] Synopsis Colour: orange-red; Aromatic taste
- d] chemical components: flavonoids, carotenoids, and terpenes
- e] Uses: Treat acne and pimples, lessen skin blotches.

4. Turmeric powder



Fig. 4: Turmeric powder.

- Synonym: Curcuma longa
- Biological source: of the substance is the dried rhizomes of *Curcuma longa*, which is a member of the Zingiberacea family.
- Description: Yellow in colour, Aromatic Taste, Bitter Odor
- chemical components: include curcumin and curcuminoid.
- Use: Minimize acne; Brighten skin; Lighten skin.

5. Neem powder



Fig. 5: Neem powder.

- Synonym: -Neem
- Biological source: *Azardicta indica*. Meliaceae family.
- Characteristics: - Green hue, pungent taste
- Chemical components: Quercetin, Nimbidin, and Nimbinin.
- Uses: Skin toner. brightens dark spots on the skin, Take out the blackheads.

6. Apricot oil



Fig. 6: Apricot oil.

- Synonyms: Apricot kernel oil, Prunus oil
- Biological Source: It is obtained from kernels (seeds) of *Prunus armeniaca*
- Family: Rosaceae
- Chemical Components: Oleic acid, Linoleic acid, Palmitic acid, Vitamin E (tocopherol)
- Description: Pale yellow coloured oil, Light texture, non-greasy, Mild pleasant odour
- Uses: Excellent skin moisturizer, Nourishes dry & sensitive skin.

MATERIALS AND METHODS

A. Collection of Bael fruit powder

Bael fruit were Collected from farm. The bael were washed well using tap water. The peel is separated, then the pulp of orange was separated and then it was dried in shade for a period of 3-4 days. The dried samples were grinded properly grinder to obtain the coarse powdered form. Passed through sieve no 60.

B. Collection of Neem leaves powder

Fresh neem leaves were collected from college campus. Fresh neem leaves were dried in shade for 4-5 days These leaves are grinded properly using mixture to obtain and pass through sieve no. 60.

C. Collection of Turmeric powder

Fresh turmeric were collected from market. They were dried in shade for 3-5 days. Then grinded properly to form powder. Then Pass through sieve no. 60.

D. Collection of Apricot oil

Apricot oil is purchase from market.

E. Collection of orange peel

Orange fruit were Collected from farm. The orange were washed well using tap water. The peel is separated, then it was dried in shade for a period of 3-4 days. The dried peels were grinded properly grinder to obtain the coarse powdered form.

• Extraction of orange peel:

The extraction o from orange peel is most commonly carried out by Soxhlet apparatus. In this process, fresh or dried peels of *Citrus sinensis* are first washed, cut into small pieces, and dry. Dry orange peel is crushed in mortar and pestle. Powder is passed through sieve no 24 The weight 60 g of powder and 350 ml ethanol is then placed in a Soxhlet apparatus and the mixture is heated for 6-9 hrs.^[12]



Fig. 7: Extraction of orange peel.

F. Collection of moringa leaf

Moringa leaf were Collected from farm. The moringa were washed well using tap water. then it was dried in shade for a period of 4-5 days. The dried leaf were grinded properly to obtain the coarse powdered form.

• Maceration of moringa leaf

The leaves were first dried and then ground into a fine powder. A 60 g powder of this powdered material was soaked in 280 mL of 70% ethanol and left to macerate for 48 hours with occasional shaking. After extraction, the mixture was filtered using Whatman No. 1 filter paper to obtain the filtrate. This filtrate was then concentrated using a rotary evaporator at 40 °C. The resulting crude extract was stored in a refrigerator at 4 °C until it was

needed for further use.^[13]



Fig. 8: Maceration of moringa leaf.

FORMULATION TABLE OF HERBAL SCRUB

Table no. 1: Formulation of herbal scrub batches.

Sr. no.	Ingredients	Formulation 1 Qty. (30g)	Formulation 2 Qty. (30g)	Formulation 3 Qty. (30g)	Formulation 4 Qty. (30g)
1.	Bael fruit (powder)	4%	5%	6%	7%
2.	Orange peel (extract)	1.4%	1.8%	2.2%	2.6%
3.	Moringa leaf (extract)	0.01%	0.05%	0.1%	0.15%
4.	Neem leaf (powder)	0.3%	0.3%	0.3%	0.3%
5.	Turmeric	0.2%	0.2%	0.2%	0.2%
6.	Apricot oil	1%	1%	1%	1%
7.	Carbopol 934	1%	1%	1%	1%
8.	Propylene glycol	q. s.	q. s.	q. s.	q. s.
9.	Triethanolamine	q. s.	q. s.	q. s.	q. s.
10.	propyl paraben	0.02%	0.02%	0.02%	0.02%
11.	Sodium Lauryl Sulphate	4%	4.5%	4%	4.5%

A) Preparation of gel

Propyl paraben was accurately weighed and dissolved in a beaker containing water. Required quantity of Carbopol 934 was added in a beaker then add Triethanolamine or propylene glycol and stirred continuously until a gel was formed. And then add sodium lauryl sulphate weight and dissolve separately with water.



Fig. 9: Gel base.

3. Additional ingredients such as turmeric, moringa extract, orange peel extract and Apricot oil are incorporated as required.
4. The formulation is mixed thoroughly to obtain a homogeneous consistency.
5. The final prepared scrub is then transferred into suitable containers for storage.^[14,15]



Fig. 10: Herbal scrub.

B) Formulation of herbal scrub

1. After the gel base is formed, add exfoliating particles (e.g., finely ground bael fruit powder) are added gradually.
2. Gentle stirring is carried out to ensure uniform distribution of particles without disturbing the gel structure.

Evaluation Parameters

The prepared gel was evaluated for appearance, pH, consistency, Spreadability, extrudability, viscosity, irritability, washability, grittiness, foamability.^[16,17]

RESULTS AND DISCUSSION

1. Organoleptic Evaluation:

a] Appearance

The prepared scrub was evaluated for its odour and colour. The colour was found to be brown in colour and odour was found to be characteristic.

b] Consistency

It was found to be semisolid and homogeneity with visual observation.

2. Physical assessment

a. Determination of pH

The pH of different formulations was determined using a digital pH meter. 1 g of gel was dispersed in 100ml distilled water and the pH was recorded.



Fig. 11: pH meter.

b. Determination of Viscosity

The viscosity of the prepared scrub was measured using a Brookfield viscometer at suitable rpm (e.g., 10 rpm), and the corresponding dial reading was noted.

c. Spreadability

Spreadability is an important property that determines how easily the gel spreads on the skin. A small amount of the sample was placed on a glass slide, and another slide was placed on top. A weight of 100 g was applied, and the time required for the gel to spread was recorded. The gel spread up to 4 cm in 60 seconds. Spreadability was

calculated using the formula: $S = (m \times l) / t$ where S = spreadability, m = weight applied, l = length of the slide, and t = time in seconds.

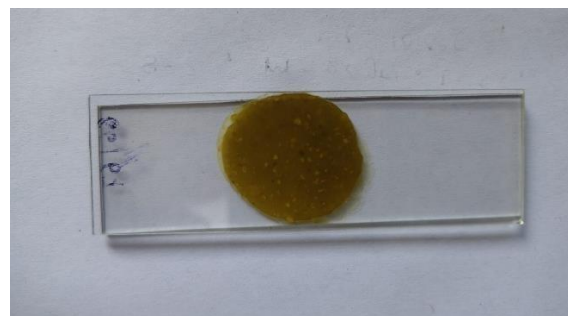


Fig. 12: Spreadability.

d. Extrudability

A small quantity of gel was filled into a collapsible tube. One end was sealed while the other remained open. Gentle pressure was applied, and the amount of gel extruded along with the time required for extrusion was recorded.

e. Irritability

A small amount of the gel was applied to the skin and left for a few minutes. No signs of irritation were observed, indicating that the formulation is non-irritant.

f. Washability

The gel was applied to the skin and then washed off with water. It was found to be easily washable.

g. Grittiness

The scrub was observed to contain a small number of gritty particles.

h. Foamability

Small amount of scrub was shaken with water in a graduated measuring cylinder and foam was measured.

Table no. 2: Evaluation table.

Sr No.	Test parameter	Formulation 1	Formulation 2	Formulation 3	Formulation 4
1.	Colour	Dark green	Brownish green	Peanut brown	Brown
2.	Odour	Characteristic	Characteristic	Characteristic	Characteristic
3.	Consistency	Sticky	Thick	Good	Good
4.	PH	6.46	6.43	6.64	6.65
5.	Viscosity	5968cps	5950cps	6960cps	7091cps
6.	Spreadability	6.8 g.cm/sec	7 g.cm/sec	7 g.cm/sec	7.2 g.cm/sec
7.	Irritability	Non-Irritant	Non-Irritant	Non-Irritant	Non-Irritant
8.	Washability	Washable	Washable	Easily Washable	Easily Washable
9.	Extruability	Easily Extruded	Easily Extruded	Easily Extruded	Easily Extruded
10.	Grittiness	Low Grittiness	Mild Grittiness	Medium Grittiness	High Grittiness
11.	Foamability	Good	Good	Good	Good

The formulated herbal scrubs (F1, F2, F3 and F4) were evaluated for various physicochemical and sensory

parameters including colour, odour, texture, consistency, spreadability, washability, pH, and grittiness. The results

indicate that all formulations possessed acceptable characteristics due to the use of natural herbal ingredients, which are generally considered safe and free from harmful side effects.

Among the four formulations, F3 showed superior performance in comparison to F1, F2 and F4. The colour of F3 was observed to be Brown, indicating the presence of herbal constituents, and it exhibited a characteristic as orange odour without any undesirable smell. The formulation showed no foam formation, which is typical for herbal scrubs lacking synthetic surfactants.

The texture and consistency of F3 were found to be smooth and suitable for topical application, with uniformly distributed fine gritty particles providing effective exfoliation without causing irritation. The scrub also demonstrated good spreadability and washability, as it could be easily applied and removed with normal water.

Extrudability test performed with the help of empty collapsible tube filled with scrub, checked for quantity extruded from the nozzle of 5 mm and found satisfactory. The pH of the formulation was 6.64, which is close to the natural skin pH, suggesting that the product is skin friendly and suitable for all skin types. Overall, the evaluation confirms that formulation F3 is stable, effective, and acceptable for cosmetic use, making it a promising herbal alternative to synthetic scrubs.

CONCLUSION

In the present study, a herbal scrub was successfully formulated using natural ingredients such as beal fruit, moringa, turmeric, neem, orange peel and apricot oil. The prepared formulations were evaluated for various parameters, and the results confirmed that they complied with acceptable standards for cosmetic use. The optimized formulation (F3) showed satisfactory properties in terms of appearance, texture, consistency, spreadability, washability, and pH, indicating its suitability for topical application. The presence of natural exfoliants like Beal fruit provided effective removal of dead skin cells, while ingredients such as moringa contributed antioxidant benefits. Turmeric and Neem antiseptic, soothing, and anti-inflammatory effects. Orange peel and apricot oil enhancing overall skin health and give nourishing to the skin. And used carbapol gel base. The formulation was found to be safe, non-irritant, and suitable for all skin types due to its near skin-friendly pH and absence of harmful chemicals. Overall, the developed herbal scrub offers a natural, effective, and economical alternative to synthetic products, promoting, smoother, and brighter skin.

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