

Formulation and Evaluation of Sesame Face Scrub

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ABSTRACT:-

The growing preference for natural remedies is driven by their perceived safety and fewer side effects compared to synthetic alternatives, resulting in increased global demand for herbal formulations. Among these, herbal cosmetics stand out as a safe option for routine use, offering minimal side effects. Cosmeceuticals, a subset of herbal cosmetics, exert biological effects on the skin. Typically, they contain plant-based ingredients known for their antimicrobial, antioxidant, and anti-aging properties. The current study focuses on formulating and assessing an herbal face scrub. The formulation includes sesame, neem, orange peel, saffron, rose water, carbopol, propylene glycol, magnesium sulfate, GMS powder, stearic acid, sesame oil, triethanolamine, and methylparaben, sodium lauryl sulphate as active ingredients. This product leverages natural ingredients to fight acne, reduce wrinkles, and balance oil production, embodying the principles of herbal or natural cosmetics.

I. INTRODUCTION

Cosmetics encompass a wide array of products designed to cleanse, beautify, enhance attractiveness, or alter appearance.[1] Throughout history, various herbs have been utilized for their cleansing and beautifying properties. The facial skin, being a prominent indicator of overall health, receives particular attention. Cosmetics are available in various forms, each designed to fulfill a specific function for the skin. The use of scrubs, for instance, can effectively combat dullness and restore radiance, often impacted by a range of factors.[2] A facial scrub serves as a cosmetic, beauty product, or treatment aimed at cleansing and exfoliating the skin. Scrubs play a crucial role in skin care by removing dirt, dead skin cells, excess oil, blackheads, and whiteheads, thereby enhancing skin appearance and promoting a healthier complexion. [3]

Scrubs are versatile and can be used on any skin type. The essential oils used in scrubs may vary depending on the skin type. With regular use, scrubs contribute to a glowing and smoother complexion by effectively removing dead skin cells, thereby revealing fresher, newer skin cells underneath.[4] For individuals with dry skin, it's essential to opt for facial scrubs containing moisturizing and hydrating ingredients to prevent further dryness and promote skin hydration. Those with sensitive skin should choose gentle scrubs to avoid irritation or adverse reactions. Conversely, individuals with oily skin benefit from exfoliants that help prevent pimples, dullness, and breakouts while also controlling excess oil production.[5] Depending on skin type, it's generally advised to use facial scrubs two to three times a week. However, for beginners, weekly use is recommended to allow the skin to adjust. Individuals with dry or sensitive skin should limit exfoliation to once or twice a week to prevent irritation. Recommended products for acne-prone skin are one containing salicylic acid and a dermatologist-grade 4% glycolic and polyhydroxy acid complex. These components aid in exfoliating the skin and clearing acne, leading to a smoother complexion.[6]

BENEFITS OF SKIN EXFOLIATION

- 1. Exfoliation:-** Scrubbing eliminates dead skin cells from the skin's surface, enhancing cell turnover and unveiling fresher, more youthful skin beneath. [7]
- 2. Unclogging pores:-** Scrubs help to clear out pores, preventing the buildup of dirt, oil, and other impurities that can lead to acne and blackheads.[8]
- 3. Improves skin texture:-** Regular exfoliation with a scrub can lead to smoother, softer skin by sloughing off rough patches and promoting an even skin texture.[9]

4. **Enhance absorption:**-Scrubs remove the layer of dead skin cells, enhancing the absorption of skincare products and allowing them to penetrate deeper into the skin for improved effectiveness. [10]
5. **Stimulates circulation:**- Massaging the skin with a scrub promotes blood circulation, which can result in a healthy, radiant complexion.[11]
6. **Helps with ingrown hairs:**-Scrubbing helps prevent and treat ingrown hairs by eliminating dead skin cells, thereby reducing the chances of hairs getting trapped under the skin's surface [12]
7. **Promotes skin radiance:**-Regular scrubbing can make the skin appear brighter and more radiant by removing dull, lifeless skin cells and uncovering the natural glow beneath.[13]
8. **Prevents signs of aging:**-By ensuring that the skin exfoliates, it helps erase fine lines and wrinkles by promoting cell turnover and collagen strength. [14]

INGREDIENTS AND THEIR USES

Sesame

Synonyms – Til, ellu

Biological Source: This is derived from the dried seeds of *Sesamum indicum* L.

Family – Pedaliaceae



Uses:- Figure :1 Sesame

- **Moisturization:**Sesame oil, abundant in fatty acids, moisturizes and nourishes the skin. A protective barrier is formed on the surface of your skin, preserving water and keeping cells moist.[15]
- **Antioxidant Properties:**The potent antioxidants vitamin E and sesamol in sesame oil safeguard the skin against free radical harm brought about by environmental factors such as UV light and pollution . This shielding is what aids in preventing premature aging and keeping the skin looking youthful and well.[16]

- **Anti-inflammatory** Effects:Additionally, sesame oil has strong anti-inflammatory characteristics that may help people with eczema, psoriasis, and acne.[17]
- **Antibacterial Properties:**Sesame oil features natural antibacterial properties that can help prevent bacterial infections on the skin's surface. It may also help to reduce the spread of acne-causing bacteria. [18]
- **Softens and smoothens:** Regular use of sesame oil can soften and smooth the skin, making it feel supple and appear radiant. With consistent application, it can enhance the overall skin tone over time. [19]
- **UV protection:** Sesame oil contains natural SPF properties, although relatively low. It can offer some degree of protection against the harmful effects of UV radiation from the sun, but it's not a substitute for sunscreen.[20]

Saffron

Synonyms – Saffron crocus

Biological source – It consists of dried stigmas & upper parts of style of *Crocus sativus*.

Family – Iridaceae



Figure 2: Saffron

Uses: -

- **Brightening and Radiance:** Saffron contains compounds like crocin and crocetin, which have skin-lightening properties. Regular use of saffron can help to improve skin tone, reduce pigmentation, and impart a radiant glow to the skin.[21]
- **Anti-inflammatory** Effects:Saffron has anti-inflammatory qualities that may alleviate inflammation and irritation in skin conditions such as acne, eczema, and psoriasis. It may aid in reducing redness, swelling, and discomfort associated with these conditions.[22]
- **Antioxidant Properties:** Saffron is abundant in antioxidants such as crocin, crocetin, and safranal, this herb is packed with antioxidants

that help neutralize free radicals to prevent the skin from oxidative stress and maintain its youthful look to avoid premature aging.[23]

- Hydration and moisturization: Saffron has hydrating properties that nourish and moisturize the skin. It also helps to keep safe the natural moisture barrier of skin. This prevents dryness, keeps the skin soft and supple. [24]
- Acne treatment: Saffron possesses antibacterial and antifungal properties that can combat acne-causing bacteria and fungi. This may help reduce the frequency and severity of breakouts and prevent future flare-ups.[25]
- Anti-aging Benefits: Saffron, rich in antioxidants, combats signs of aging like fine lines, wrinkles, and sagging skin. Regular application of saffron can enhance skin elasticity, firmness, and texture, promoting a more youthful appearance. [26]
- Exfoliation: the spice is an exfoliating agent in its natural state; therefore, it assists in eliminating dead skin cells by unclogging the pores. It helps to reveal fresher, smoother skin underneath and promotes cell turnover for a more youthful appearance.[27]
- Skin Healing: Saffron has been traditionally used to reduce scarring and wound healing. It can accelerate the healing process and help reduce the appearance of scars and blemishes.[28]

Neem

Synonyms – Neem

Biological source – It consist of dried leaves of *Azadirctia indica*

Family –Meliaceae



Uses:- Figure 3: Neem

- Acne Treatment: Neem is endowed with potent antibacterial and anti-inflammatory qualities, making it an excellent natural treatment for acne. It fights acne-causing bacteria, diminishes inflammation, and alleviates the

redness and irritation linked to acne outbreaks. [29]

- Clears Blemishes: Neem is recognized for its capacity to eliminate blemishes and dark spots on the skin. Its anti-inflammatory attributes help reduce swelling and redness, while its antibacterial properties aid in preventing further breakouts. [30]
- Controls Oiliness:Neem aids in regulating sebum production, which is beneficial for oily or mixed skin. By managing excess oiliness, neem helps prevent clogged pores and reduces the likelihood of acne breakouts.[31]
- Treats Skin Infections: Neem boasts antifungal and antiseptic properties that make it effective in treating various skin infections such as ringworm, athlete's foot, and nail fungus. It helps inhibit the growth of fungi and bacteria, which promotes faster healing. [30]
- Soothes Irritation:Neem has a soothing effect on the skin and can help alleviate irritation, itching, and redness associated with conditions like eczema, psoriasis, and dermatitis. Its anti-inflammatory properties reduce discomfort and promote healing. [32]
- Anti-aging Properties:Neem is rich in antioxidants that shield the skin from free radical damage and help prevent early signs of aging. Consistent application of neem can reduce the visibility of fine lines, wrinkles, and age spots, preserving a young and glowing complexion.[11]
- Tightens Pores:Neem possesses astringent properties that tighten the skin, minimizing the enlarged pores. This contributes more refined and smoother skin texture and helps prevent dirt and impurities from clogging the pores. [31]
- Promotes Healing:Neem speeds up the healing of wounds, cuts, and abrasions with its antibacterial and antiseptic properties. It helps to prevent infection and promotes the growth of new, healthy skin cells, facilitating quicker recovery. [33]

Orange Peel

Synonyms – Orange zest

Biological source – It consists of dried fruits of *Citrus Sinuses*

Family – Rutaceae



Uses:- **Figure: 4 Orange Peel**

- Exfoliation: Orange peel contains natural acids and enzymes that softly exfoliate the skin, eliminating dead skin cells and encouraging cell renewal. This process reveals brighter skin underneath and enhances overall skin texture.[34]
- Anti-oxidant Protection: It is abundant with antioxidants such as vitamin C, flavonoids, and polyphenols, which help neutralize free radicals and shield the skin from oxidative damage. This can help prevent premature aging and keep the skin looking youthful[35].
- Skin Brightening: The abundant vitamin C in orange peel helps to brighten the skin and reduce the appearance of dark spots, hyperpigmentation, and sun damage. Orange peel can help even out skin tone and enhance overall radiance.[36]
- Oil Control: Orange peel possesses astringent properties that help regulate excess oil production and reduce skin shine. It aids in preventing clogged pores and breakouts. [37]
- Acne Treatment: The antibacterial and anti-inflammatory properties of orange peel make it effective in treating acne and preventing future outbreaks. It helps eradicate acne-causing bacteria, diminish inflammation, and alleviate redness and irritation.[25]
- Skin Tightening: Orange peel is rich in natural astringents that help to tighten and improve skin tone, minimizing the visibility of enlarged pores and enhancing the skin's smoothness and texture.[38]
- Scar Treatment: The vitamin C and bioflavonoids found in orange peel stimulate collagen production and enhance skin elasticity, which can help diminish the appearance of scars and stretch marks over time. [7]
- Anti-aging Effects: Orange peel aids in boosting collagen production and enhancing skin firmness, which helps to reduce the visibility of lines and wrinkles. Additionally, it supports the skin's natural moisture barrier,

preventing dryness and dehydration that often accompany aging skin.[39]

Rose water

Uses:-

- Hydration: Rose water helps hydrate, revitalize, and moisturize the skin. Its natural properties make it an excellent toner, leaving the skin feeling refreshed and rejuvenated.[7]
- Balancing PH: Rose water helps to maintain the skin's pH levels, which is essential for maintaining healthy skin. Balanced pH levels can prevent excess oil production and reduce the risk of acne and other skin issues.[40]
- Soothing and Calming: Its gentle nature makes rose water suitable for soothing and calming irritated or sunburned skin. It can also help reduce puffiness and soothe tired eyes when used as an eye compress.[41]
- Aromatherapy Benefits: The scent of rose water is recognized for its mood-enhancing properties. It can help to alleviate stress and anxiety and foster relaxation when used in aromatherapy or added to bathwater.[42]
- Under Eye Treatment: Rose water can be used to diminish puffiness and dark circles around the eyes. Soaking cotton pads in chilled rose water and placing them on closed eyelids for a few minutes can refresh and rejuvenate tired eyes.[7]

Carbopol

Carbomer stands as a quintessential component in skincare and cosmetic formulations, contributing texture, density, and durability. This polymer plays a pivotal role in personal care and pharmaceutical items, primarily serving as a thickener, suspender, and emulsifier.[43]

Propylene Glycol

Propylene glycol functions as a humectant when present in low concentrations. It effectively retains moisture and transports it to the outermost layer of the skin. Consequently, skincare products containing Propylene Glycol prove beneficial for enhancing skin hydration and addressing issues such as dryness and dullness.[44]

Magnesium Sulphate

It effectively binds water molecules, providing hydration to dry skin. This results in skin that is not only clearer but also noticeably more supple and smoother. Moreover, in the manufacturing process of a water-in-oil (W/O) emulsion, the addition of a small quantity of

magnesium sulfate to the water phase aids in stabilizing the emulsion.[45]

Glyceryl Monostearate

Glyceryl Monostearate finds extensive use in skincare and cosmetic formulations due to its exceptional moisturizing capabilities. It effectively seals moisture onto the skin and hair, guarding against dehydration and potential damage. Additionally, glyceryl stearate serves as a binding agent, promoting cohesion among various ingredients within a formulation.[46]

Stearic Acid

Stearic acid exhibits emulsifying properties on its own, yet it can be combined with triethanolamine for enhanced efficacy. Upon mixing, these compounds undergo a reaction, forming a paste known as "triethanolamine stearate." This paste facilitates the creation of a light emulsion, which is readily absorbed by the skin.[47]

Triethanolamine

Triethanolamine (TEA) serves as a non-active ingredient devoid of direct effects on the skin. Its primary role lies in balancing the pH of formulations and ensuring their stability. By doing so, TEA enhances the sensory experience of the product and optimizes its interaction with the skin.[48]

Methyl Paraben

Methylparaben represents a class of chemicals commonly employed by manufacturers as preservatives. Found in various products including food, cosmetics, and pharmaceuticals, they serve to extend shelf life and inhibit bacterial and fungal proliferation. Methylparaben is categorized within the group of compounds known as parabens.[49]

Sesame Oil

Abundant in antioxidants, Sesame oil exerts a potent age-reversing influence on the skin. Its application aids in staving off premature aging, imparting a youthful appearance to the skin. Rich in fatty acids and vitamins, Sesame oil facilitates the repair of damaged skin cells while diminishing the appearance of enlarged pores, wrinkles, and fine lines.[50]

Sodium Lauryl Sulphate

Sodium lauryl sulfate is widely used in cosmetics mainly as an emulsifier or surfactant.

Serving as an emulsifier, it is essential for stabilizing and thickening formulations that include ingredients with differing solubilities. This function enables cosmetic products to attain a uniform texture, facilitating smoother and easier application.[51]

II. MATERIALS AND METHODS

Preparation of Sesame Paste

First, roast the sesame seeds until they turn slightly brown. Then, grind them into a fine paste. Mix the sesame paste thoroughly. Then, we get a fine sesame paste with a brown color.



Figure 5: Sesame paste

Preparation of face scrub

In one beaker, dissolve the Carbopol powder first. Stir it thoroughly until the Carbopol is uniformly mixed. Then, take another beaker and heat and mix magnesium sulfate, propylene glycol, mineral oil, GMS powder, stearic acid, and sesame oil uniformly. Next, mix the heated solution with the Carbopol gel while continuously stirring. Then, add sesame paste, neem powder, orange peel powder, and rose water. Finally, add methylparaben and triethanolamine for pH adjustment.



Figure 6 : Formulation for face scrub

S.No.	Ingredients	Quantity Taken (%)
1.	Water	70
2.	Carbopol	2
3.	Magnesium sulphate	1
4.	propylene glycol	5
5.	Sesame oil	6
6.	GMS powder	1
7.	Steric acid	3
8.	Sesame	8
9.	Orange peel	2
10.	Neem powder	1
11.	Rose water	1
12.	Sodium lauryl sulphate	2
13.	Triethanolamine	0.5
14.	Methyl paraben	0.5

III. EVALUATION PARAMETERS

The gel that was prepared underwent evaluation for various parameters including appearance, pH level, consistency, spreadability, extrudability, viscosity, irritability, washability, grittiness, and foamability.

Color:-

Visual examination revealed a brown color in the facial scrub.

Odor: -

The odor was identified as nutty in flavour.

State: -

The semisolid state of the scrub was observed visually.

Consistency: -

Upon visual observation, it has a smooth consistency.

pH: -

The pH of the prepared scrub was measured using pH paper. A small sample of the scrub was placed on the pH paper, indicating a pH range between 4 and 6.

Spreadability:-

A little amount of the scrub is placed on the glass slide and another slide is placed on top of it. Then, a defined weight is placed on the upper slide, which causes the gel to spread out. The time taken for the spread and the extent of spread are measured as part of the evaluation process.

The formula used for calculating spreadability is :-

Where: -

- Spreadability is S
- weight placed on the slide (1 gm) is m
- length of the glass slide (7.5 cm) is L
- time taken in seconds (25 sec) is t

Using this formula, the spreadability is calculated to be 0.3 gm.cm/sec.

Irritability:-

A little amount of scrub was used to the skin and allowed to sit for few minutes, during which no signs of irritation were observed.

Washability:-

After a little quantity of scrub was rubbed on the skin and left for a few minutes, it was rinsed off with water and observed to be easily washable.

Foamability:-

To determine the presence of foam, a small amount of scrub is applied to the skin, followed by the addition of a small amount of water.

IV. RESULT

S.No.	Parameter	Results
1.	Colour	Brown
2.	Odor	Nutty, sweet
3.	PH	5.61
4.	Irritability	Non-irritant

5.	On application	Greasy
6.	Stability	Stable
7.	Consistency	Semisolid
8.	Spreadability	0.3gm.cm/sec
9.	Washability	Quick washable
10.	Homogeneity	Consistent, smooth
11.	Removal	Easily removable

V. CONCLUSION

Compared to other cosmetics on the market, natural and herbal cosmetics are often viewed as simpler, safer, and more effective. A key factor driving their popularity is their compatibility with all skin types. Herbal products are primarily used to promote health and address serious skin conditions. Their usage tends to rise when conventional products fall short in effectiveness or pose potential risks. For instance, the use of a sesame face scrub not only offers effectiveness but also promotes healthier skin. The antioxidant, antiseptic, and anti-aging properties of ingredients like sesame, orange peel, and neem highlight the benefits of using a polyherbal face scrub. The formulation prepared was found to be suitable for the skin and successfully passed all tests in its evaluation, demonstrating its efficacy and safety.

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