

Formulation and Evaluation of Herbal Face Scrub by Using Tamarind Peel Powder

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ABSTRACT

The main purpose of this study is to prepare a cosmetic containing gel. Using herbal ingredients to combat acne, wrinkles and control oil production is called natural or herbal cosmetics. The skin on the face is frequently in contact with dirt, pollution, and other pollutants. Safe and effective natural substances with anti-depilation, antibacterial, anti-infective, antioxidant, and anti-aging properties are found in the scrub. The main objective of this study was to develop a herbal face scrub with natural components that would prevent and treat a variety of skin issues in addition to managing oil production on the skin's surface. In order to address all of these problems and remove tan lines from the face, use a scrub composed only of natural ingredients that enhances cleansing, softening, moisturising, and skin tone while also getting rid of extra facial hair. The products that enhance skin function are herbal ones. Formulating and assessing a herbal face scrub with natural components that includes orange peel and tamarind peel powder for skin exfoliation and beautiful skin is the aim of this endeavour.

KEY WORDS: *Scrub, Herbal, Spreadability, Consistency, and Exfoliation.*

INTRODUCTION

Growing consumer awareness of the hidden concerns around synthetic ingredients has led to a recent trend toward natural and natural skin care products. Natural face products, Diminutives, have become increasingly fashionable due to their alleged ability to provide nourishment, revitalization, and mild exfoliation. This work aims to investigate the rationale behind the system of natural face diminutives, their essential components, and the methods employed in their assessment. The pores and skin is the body's biggest organ and serves as a protective hedge in opposition to environmental factors, making its care consummate. Face diminutives play a vital function in skincare routines by way of getting relieve of dead pores and skin cells, unclogging pores, and dealing cell development, performing in smoother, lustrously, and more healthy-looking skin. But conventional face scrubs regularly contain harsh abrasives and artificial chemical composites which can beget vexation, vexation, and long-term damage to the pores and skin

A balanced diet should be consumed to keep the skin healthy and supple. Skin issues will be made worse by environmental factors such UV radiation, pollution, dust, and changes in the weather. There are many different types of herbal products, and each has a specific purpose for the skin. Scrubs are an effective way to address many of the issues that cause skin to become dull and lack shine. There are two kinds of scrubs for the skin: body and face scrubs. It removes dead skin cells and exfoliates the skin cells. Scrub can be use on any skin type. Cosmetics are widely used to improve one's appearance and are available in a variety of forms. Skincare products are formulated to address various skin issues, such as skin protection, sun protection, anti-aging, and anti-wrinkle treatments. Herbs and herbal cosmetics have been used for centuries to treat dark circles, oily skin, acne, and pimples. They are also used for cleansing and cosmetic purposes. Scrubbing your face can effectively remove oil, debris, and grime from your pores, keep your skin supple, and encourage the skin's natural renewal process.

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It removes dead skin cells from the skin, exfoliates it, and increases blood circulation. Face scrubs should have light abrasive and non-aggressive qualities. Herbal exfoliating scrubs neutralize environmental damage and lessen the symptoms of age-related changes on the skin. Technically speaking, it can be utilized to cleanse the skin's surface or eliminate dead skin cells by utilizing herbal remedies that contain vitamins.

There are three main skin types: sensitive, oily, and dry. It is recommended to gently massage the skin after using the scrub gel to promote blood circulation and oxygenation in all areas of the skin.

SKIN

The skin, also known as the cutaneous membrane, is the body's largest organ in terms of weight and surface area. The skin's functions include regulating body temperature, serving as a blood reservoir, providing protection from the outside world, cutaneous sensations, excretion and absorption, and the creation of vitamin D. The immune system on the outside stops microbial microbes from entering the body. The largest exterior defense system is the skin.

In addition to serving as the body's outermost layer of defense, skin serves other purposes. It acts as a mechanical wall dividing the body's interior from the outside environment. The temperature of the skin can vary from 30 to 40°C, depending on the surrounding circumstances. One of the human body's easiest organs to administer topically is the skin, which serves as the primary route for topical medication delivery systems. The goal of topical penetration, a reasonable approach to topical formulation, and the fundamental elements of topical drug delivery systems are all covered in detail by this research. Ointment absorption via the skin is dependent on several parameters, the most significant of which are concentration, duration of contact, drug solubility, and physical state of exposed skin layer and body part.

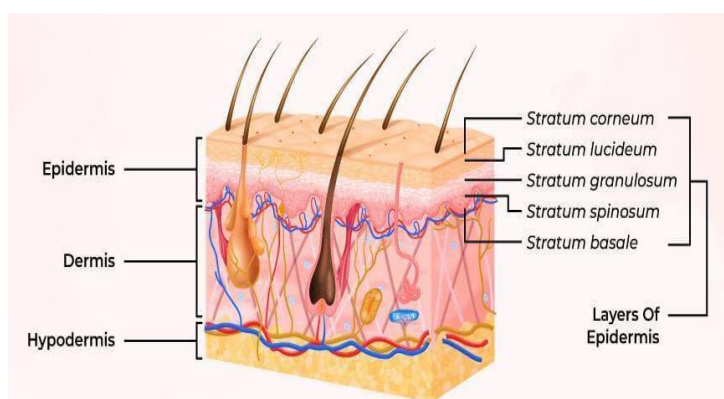


Fig. 1: Layers of the skin

FACE SCRUB

Face scrub is a coarse cream, which contains exfoliating substances. Scrubbing means exfoliating the skin. Scrubbing provides deep cleansing of the face and removes the dirt, oil and sweat present in the skin from the roots. This maintains the glow of the face and removes dead skin. Scrubbing can also get rid of acne marks. The particles of a face scrub rub against your skin to remove all dirt from your pores. Additionally, it removes dead skin cells, resulting in smoother and softer skin. Expansion of a decent facial scour in your week after week skincare routine will give you solid and shining skin.

Face scrubs benefits, including:

Enhancing skin texture and tone: Dead skin cells, grime, and oil can make skin feel dry and dull, and scrubs remove these dead cells.

Cleansing and detoxifying pores: Scrubs eliminate irritants such as dead skin cells that can give the skin a dull appearance, as well as excess sebum that can make the skin greasy and lead to acne.

Fading away marks: By exfoliating the skin, scrubs help to lighten the appearance of blemishes such as acne marks, dark spots, and hyperpigmentation by eliminating dead and damaged skin cells.

Accelerating the growth of new skin cells: Scrubs help new, healthier skin cells grow, resulting in glowing skin

Phyto-constituents

TAMARIND PEEL POWDER

Synonyms: Tamarindus indica peel, Imlikachhilka, Tintiri

Biological Source: Tamarind peel is derived from the fruit of the Tamarind tree (*Tamarindus indica*), a leguminous tree native to tropical Africa.

Family: Fabaceae

Plant part used: Peel

Chemical constituents: Tamarind peel contains various bioactive compounds such as polyphenols, flavonoids, tannins, alkaloids, saponins, and carotenoids. It is also rich in vitamin C, minerals, and dietary fiber.

Uses:

Tamarind peel is known for its potential antioxidant, anti-inflammatory, and antimicrobial properties, making it a valuable ingredient in the skincare industry. It is commonly used in skincare products such as face masks, scrubs, and creams due to its ability to exfoliate the skin cells, improve skin texture, and provide anti-aging benefits.



Fig. 2 Tamarind peel powder

ORANGE PEEL POWDER

Synonyms: Orange zest

Biological source - fresh or dried outer part of the pericarp of *Citrus aurantium* Linn

Family- Rutaceae

Plant part used: Peel

Chemical constituents: Carotenoids (beta-carotene, lutein and beta-cryptoxanthin), flavonoids, alcohols, ketones, aldehydes, esters and terpenes.

Uses:

- Get glowing & youthful skin, Powered with Vitamin C, orange peel powder restores the elasticity of the skin, fights wrinkles. It gives you youthful radiance and is effective in delaying skin aging.
- It gets rid of everyday grime, and dead skin cells, removes blackheads, and whiteheads, unclogs pores, and ensures skin renewal.
- The bleaching effect of orange peel powder reduces skin pigmentation, dark spots, and scars due to acne & skin infections. It evens out your tone & smoothenes your skin texture by increasing collagen production, ensuring you enjoy a beautiful, attractive complexion.



Fig. 1.3 Orange peel powder

MULTANI MITTI

Synonyms: Fuller's earth, bleaching clay, whitening clay, and Bentonite clay

Biological Source: Silica, iron oxides, lime, magnesia, and water

Family: Bentonite clay.

Chemical Constituents: Hydrated aluminum silicates, Magnesium chloride, Calcium Bentonite



Fig. 4: Multani Mitti

Material & Methodology

The choice of ingredients and materials used in a herbal face scrub plays a crucial role in determining the effectiveness, safety, and appeal of the product. Here are some key roles that ingredients and materials play in a herbal face scrub:

Tamarind peel powder- Tamarind peel powder is made by crushing the shade-dried peels of tamarind. All you have to do is keep collecting the peels rather than discarding them. Then let them air dry. Once completely dried, grind them into a fine powder and you're done.

Orange peel powder- Crushing the shade-dried orange peels yields orange peel powder. You should simply continue gathering the strips as opposed to discarding them. Then just let them air dry. Simply crush them into a fine powder once they have completely dried out.



Fig. 5 a. Orange Peels Powder



Fig. 5 b. Tamarind peel Powder



Fig. 5 c. Multani mitti

Table: 1 Ingredients used for formulation

S. No.	Name of Ingredients	Category
1.	Tamarind peels powder	Exfoliant
2.	Orange peels powder	Skin glow
3.	Multani Mitti	Cleaning of oil & Dust particle
4.	Carbopol 940	Gelling agent
5.	Citric acid	Preservative
6.	Triethanolamide	Neutralizer
7.	Propylene Glycol	Moisturizer
8.	Sodium Lauryl Sulphate	Foaming agent



Fig: 6 Triethanol Amine



Fig: 7 Propylene Glycol



Fig: 8 Citric Acid



Fig: 9 Sodium Lauryl Sulphate

Formulation Table:

Table 2: Formulation Table

Sr.No.	Name of Ingredients	Category	Quantity(g/ml)
1.	Tamarind Peel Powder	Exfoliant	3
2.	Tamarind Powder	Lighten skin tone and reduce dark spots	4
3.	Multani Mitti	Cleaning of oil and dust particles	4
4.	Carbopol 940	Gelling agent	1
5.	Citric Acid	Preservative	0.025
6.	Triethanolamine	Neutralizer	2
7.	Propylene Glycol	Moisturizer	3
8.	Sodium Lauryl Sulphate	Foaming agent	0.5
9.	Rose Water	Vehicle	Q.S.

PROCEDURE FOR HERBAL FACE SCRUB:

- Measure and gather all the ingredients needed for the herbal face scrub.
- Citric acid was weighed & dissolved in a beaker containing water
- Than Carbopol 940 was added & stirred constantly for 5 min it forms a gel
- Now Sodium Lauryl Sulphate was weighed dissolved separately with water and was added into the above gel
- Then the propylene glycol was added
- Transfer the mixture into a clean, airtight container for storage.
- The tamarind peel powder, tamarind powder and orange peels powder the multani mitti was triturated well into the mortar and pestle.
- If using essential oil for fragrance, add it and stir well.
- Transfer the mixture into a clean, airtight container for storage.
- Label the container with the name of the product and the date of preparation.
- To apply the herbal face scrub, first moisten your face with lukewarm water and then gently massage a small amount of the scrub onto your skin..
- Massage the scrub onto your face in gentle circular motions for 1-2 minutes, being careful to avoid the eye area.
- Wash off the scrub using lukewarm water and gently dry your face with a clean towel..
- For optimal results, use the herbal face scrub 2-3 times per week.



Fig. 10- Face Scrub

Evaluation of Herbal Face Scrub:

The following evaluation parameters were conducted to guarantee the excellence of the prepared face scrub:

1. **Physical Appearance:** The formulation's physical appearance was visually examined, including its color, scent, texture, and consistency.
2. **Homogeneity:** The visual inspection confirmed the uniformity of the formulation.
3. **pH:** The pH of the prepared scrub formulation was measured using a digital pH meter.
4. **Bulk density:** The 100 ml measuring cylinder was filled with the prepared powder, and the bulk density was determined using the formula provided;
5. **Bulk density = mass of the powder/ Bulk volume of a powder**
6. **Tapped density:** The powdered granules were poured into a 100 ml measuring cylinder and tapped 100 times. The volume of the measuring cylinder was then observed, and the tapped density was calculated using the following formula;
7. **Tapped density = mass of the powder/ Tapped volume of a powder**
8. **Hausner's ratio:** Calculated by using the following formula;
9. **Hausner's' ratio = tapped density/ Bulk density**
10. **Carr's index:** Compressibility index is determined by following formula;
11. **Carr's index (%) = Tapped density – Bulk density x 100/ Tapped density**
12. **Angle of repose:** Angle of repose were determined by using funnel method. Following formula was used;
13. **$\Theta = \tan^{-1} [h/r]$**
14. **Where, h = height of powder cone formed**
15. **r = radius of the powder formed Funnel method**
16. **Determination of spreadability of scrub:** A small quantity of the scrub was applied to the glass slide, with another glass slide placed on top. A 20gm wooden weight was then placed on top to allow the scrub to spread. The time taken for the scrub to spread and the resulting area were measured. The amount and area of scrub on the glass slide indicate the spreadability efficiency.,
17. **i.e., Spreadability= $M \times L/T$ Where, M= Mass, L= Length, T=Time**
18. **Irritability:** A small amount of the scrub was applied to the skin's surface and left for a few minutes to observe if any redness or irritation occurred.
19. **Washability:** A small amount of scrub was gently massaged onto the skin and rinsed off with water.
20. **Foamability:** A small quantity of scrub was mixed with water in a measuring cylinder, and the resulting foam was quantified.
21. **Stability study:** The formulation underwent storage under various temperature conditions for a duration of 56 days. It was then assessed for characteristics such as color, scent, pH level, and texture.

Result and Discussion

The laboratory formulated herbal facial scrub was prepared and assessed for various parameters including appearance, pH, viscosity, spreadability, washability, and irritability. It successfully met all the required criteria, making it an effective scrub for achieving healthy and glowing skin. The scrub contained tamarind peel powder and orange peel powder, which exfoliate the skin, lighten skin tone, reduce dark spots, and cleanse oil and dust particles. Tamarind peel powder acts as a natural exfoliant, removing dead skin cells, providing scrubbing properties, and improving blood circulation. It also helps to eliminate oil, sebum, and other skin secretions, resulting in a lighter skin tone. Multani mitti is included to remove dust particles.

Table 3: Organoleptic Properties

S.No.	PARAMETER	OBSERVATION
1	Appearance	Gel
2	Colour	Brown
3	Odour	Slight
4	Texture	Fine
5	Smoothness	Smooth

Table 4: Evaluation parameters

S.No.	PARAMETER	OBSERVATION
1.	Tapped Density	0.55gm/MI
2.	Bulk Density	0.73gm/Cm ³
3.	Car's Index	21.2
4.	Hausner Ratio	1.27
5.	Angle Of Repose	21.5
6.	LOD	0.9%
7.	Ash Value	62
8.	Spreadability	Easily Spreadable
9.	pH	5.04
10.	Irritant	No Irritation
11.	Edema	No Irritation

Test for skin irritation

After using the herbal face Scrub to the specified region, mark a square centimeter on the dorsal surface of the left head. The time was recorded for a whole day and erythema and edema were seen and reported.



Fig. 11: Applying the face scrub



Fig. 12: After removing the face scrub

Discussion

The Herbal Face Scrub was assessed for various morphological parameters, with the color of the formulation appearing as a pale yellow. The scent of the prepared formulations was found to be pleasant and acceptable, making it desirable for cosmetic use. The texture and smoothness of the scrub met the requirements for cosmetic formulations. The evaluation included preformulating studies, characterization of the formulation's organoleptic and physico-chemical properties, as well as general powder, microscopic, and chemical assessments. The analysis of the nature, color, odor, taste, texture, ash values, moisture content, and pH of the dried powders revealed important features for the evaluation. The detailed physicochemical analysis confirmed that the face scrub maintained a suitable pH range and adequate moisture content, contributing to its gentle yet effective cleansing performance. The scrub also helps increase blood circulation in the face, giving the skin a livelier appearance. Face packs are typically left on the skin for fifteen to twenty minutes, allowing the water to evaporate and the resulting film to contract and harden for easy removal.

Conclusion

The aim of this study was to create an herbal scrub using a suitable base to create a gel. The scrub was then evaluated based on various parameters including color, scent, texture, pH level, spread ability, viscosity, and more. The results showed that the scrub met all necessary criteria. This formulation can be used as an effective scrub for achieving healthy and radiant skin. All ingredients used were natural, ensuring minimal to no side effects. The herbal scrub that was prepared proved to be effective in promoting healthy and radiant skin. When applied, the scrub gel enhances blood circulation and boosts oxygen supply to the entire surface of the skin. As a result, the skin becomes noticeably softer, cleaner, and revitalized.

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