

FORMULATION AND EVALUATION OF HERBAL FACE SCRUB

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ABSTRACT

Herbal face scrubs have become increasingly popular in recent years due to their ability to improve skin health and low cost. Herbal cosmetics are made using plant extracts or parts having cosmetic benefits and they are free from harmful effects of synthetic chemicals. Facial scrub is a semi abrasive skin care product applied to face, scalp or body to cleanse and exfoliate the skin. Exfoliation involves the removal of oldest superficial dead skin cells on skin's outermost surface. Exfoliation can be achieved through mechanical or chemical means. Mechanical process involves physically scrubbing the skin with abrasive substance. Current study focuses on preparation and evaluation of a facial scrub with added advantage of moisturization so that step after scrub can be reduced. Our scrub contains herbal cosmeceuticals like Aloe, turmeric, olive oil, rice water etc. Because of

non-comedogenic nature and light weight texture of Aloe it provides hydration and soothing effect on skin. Olive oil incorporation helps in water retention. The preparation was evaluated for various parameters, such as color, odor consistency, pH, spread ability, washability and foamability. The results from the evaluation showed that the scrub was satisfactory after application and found nonirritant to skin plus hydrating the skin, reducing the need to apply moisturizer. Thus, the prepared stable herbal facial scrub formulation is cost effective and contributes to healthy, clear and glowing skin naturally.

KEYWORDS: Scrub, Herbal, Exfoliation, Moisturization, Spread ability.

INTRODUCTION

A Cosmetic is any substance used to clean improve or change the complexion, skin, hair, nails or teeth. Herbal cosmetics are made using plant extracts or parts of plants that have

cosmetic gains and are generally milder and less toxic than synthetic cosmetics. Cosmeceuticals have medicinal benefits which affect the biological functioning of skin depending upon type of functional ingredients they contain.^[1] These are cosmetic products that are not just used for beautification but for different skin ailments. These products improve the functioning /texture of skin by boosting collagen growth by eradicating harmful effects of free radicles, maintain keratin structure in good condition making skin healthier.^[1]

Scrubs

Facial scrub is a semi abrasive skin care product applied to face, scalp or body to cleanse and exfoliate the skin. Exfoliation involves the removal of oldest superficial dead skin cells on skin's outermost surface. Exfoliation can be achieved through mechanical or chemical means. Mechanical process involves physically scrubbing the skin with abrasive substance. Herbal scrubs consist of natural nutrients like vitamins, minerals that keep skin healthy, glowing and lustrous. Using scrub is an essential step in any skin care regimen as these types of products helps to eliminate dead skin cells and oils that build up on surface of skin.

Facial scrubs are prepared by method of mixing. Particle size of facial scrub generally range from 180-840 microns (20-80 mesh size). Facial scrub normally employ finer particles while body scrubs have medium range particles and foot scrubs still larger. Cubic or more regular shapes are preferable for less skin irritation and improved feel.

Simple method for application of scrub is apply scrub in circular motion on forehead, cheeks and chin and then rinse with water other methods are the time or the brush stroke method.

Advantages of Scrub

1. Helps in Removing Dead Cells: Facial or body scrubs are the cosmetic which goes beyond surface level to remove dead skin and reveal the healthy glowing skin below.^[2]
2. Deep cleaning of the skin.
3. Gives glow to skin and smooth texture: Scrubbing actually helps to give glow and smooth texture to skin.
4. Promotes Hydration of Skin: Facial scrubs contents moisturizing agents and hydrating Agents.
5. Exfoliation of skin helps to absorb moisture and it leaves our skin with filling soft and lustrous look

6. Reduces Stress: Exfoliation or scrubbing the skin gives good massage, which gives relaxing feeling and reduces stress.^[2]
7. Exfoliation is an effective way to remove all the dust that accumulates in the skin's pores.^[3]

MATERIALS/HERBS

I. Aloe Vera^[4]


Generic name	Aloe vera leaf	
Synonym	Aloe	
Family	Liliaceae	
Use	Treatment of various skin conditions, including Acne, Eczema and Sunburn	

Fig. 1: Aloe vera gel.

Constituents and their Role as Cosmeceuticals

1. Poly saccharide (Glucomannan) and enzyme (Gibberellin) after topical application stimulates fibroblast which produces the collagen and elastin fibers making the skin more elastic and less wrinkled. Aloe gel increases the degree of collagen cross linking thus accelerates wound contraction breaking strength of resulting scar tissue.
2. Monosaccharides (glucose and fructose) and Polysaccharides: Help in binding moisture into the skin, it has cohesive effects on the superficial flaking epidermal cells, which softens the skin.
3. Antioxidant protein (Metallothionein) is generated in the skin upon the administration, which scavenges hydroxyl radicals and prevents suppression of superoxide dismutase and glutathione peroxidase in the skin and protects skin against radiation damage.
4. Enzymes (Auxins and gibberellins) inhibit the cyclooxygenase pathway and reduces prostaglandin E2 production from arachidonic acid and has Anti-inflammatory action
5. The amino acids also soften hardened skin cells and zinc acts as an astringent to tighten pores. It keeps skin hydrated and smooth.
6. Aloe vera contains antiseptic agents like Anthraquinone Lupeol, salicylic acid, urea nitrogen, cinnamomic acid, phenols and sulfur. They all have inhibitory action on fungi, bacteria and viruses thus acts as antimicrobial agent.

II. Turmeric^[5]


Generic name	Curcuma Longa	
Synonym	Saffron	
Family	Zingiberaceae.	
Use	Spice, anti-inflammatory, antimicrobial and antioxidant, treatment of various skin conditions including Acne, Eczema and pigmentation	

Fig.2: Turmeric Powder.

Constituents and their Role as Cosmeceuticals

1. Antioxidant (Curcumin)- Reduce dark spots, blemishes and hyperpigmentation. It acts as potent skin lightening agent by minimizing the appearance of dark circles, boosts circulation, thereby reducing puffiness and lightening the skin around eyes and revealing glow and can fight against acne vulgaris. Curcumin boosts collagen production and strengthens the elasticity of skin thus slows down the aging.
2. Anti-inflammatory (Turmeric) - Give luster to skin, bringing out a natural glow to the skin. Useful to treat acne breakout, reduces skin inflammation and eventually heals the skin. Also treats eczema.
3. Being anti-microbial turmeric can kill the bacteria that causes psoriasis.
4. Hydration- Applying turmeric-infused skincare products helpful to moisturize skin. It boosts the dead skin cell removing process so that new skin cells can regenerate.

III. Rice Water^[6]


Generic name	Oryza sativa	
Synonym	Rice	
Family	Poaceae	
Use	Can be used to reduce redness, itching, and swelling, regular use can help to improve skin tone, fade dark spots, and impart a natural glow	

Fig.3 Rice Water.

Constituents and their Role as Cosmeceuticals

1. Astringent (Starch)- Rice water is potent natural astringent that cleanses pores, balances sebum production also help to reduce oiliness and protect skin from pimples and acne.
2. Amino acids and Enzymes- Rice water inhibit activity of enzyme elastase thus, helps to maintain skin elasticity and can reduce aging signs.

3. Key function of water is to brighten the skin and provide an even skin tone. It keeps skin healthy, glowing and clear.
4. Starch present in rice water protects skin barrier.
5. Cooling effect of rice water soothe Sun damages like sunburn, inflammation, redness, itching and can reduce tanning.

IV. Coffee^[7]


Generic name	Coffea barabica	
Synonym	Coffee	
Family	Rubiaceae	
Use	Stimulant, Natural Exfoliant, moisturizer	

Fig. 4: Coffee Powder.

Constituents and their Role as Cosmeceuticals

1. Tannins (Antioxidant)- Neutralize, combat free radicals, generated by UV exposure, forms a protective barrier ensuring that skin retains its youthful radiance and resilience over time.
2. Exfoliation-The slightly coarse texture of coffee powder makes it an exceptional natural exfoliant. Unlike harsh chemical scrubs, it gently but effectively removes the layer of dead skin cells, unveiling the fresh, smooth skin underneath.
3. Caffeine- Caffeine when massaged onto the skin in a scrub form, coffee granules improve blood circulation and lymphatic drainage, leading to increased oxygenation and nutrient supply to the skin promoting collagen production also aids in hydration of skin. Collagen is the building block of the skin, responsible for its elasticity and firmness. It can effectively combat sagging and other signs of ageing,
4. Caffeine has a diuretic effect, which help to dehydrate fat cells, reducing the prominence of cellulite. Regular use of coffee scrubs can assist in achieving a more even and toned skin appearance.
5. Caffeine (Anti-inflammatory)- Caffeine in coffee possesses anti-inflammatory properties that help in reducing swelling and redness. When applied topically, caffeine constricts the blood vessels under the skin, significantly reducing inflammation and puffiness, especially around the delicate eye area.
6. Caffeine (Antibacterial)- Help in combating acne-causing bacteria.

V. Honey^[8]


Generic name of bees	Obtained from <i>Apis Mellifera</i>	
Synonym	Honey	
Family name of bees	Apidae	
Use	Sweetner, moisturizer, gentle exfoliator, antiseptic	

Fig.5 Honey.**Constituents and their Role as Cosmeceuticals**

1. Polyphenols (Antioxidant)- Honey contains polyphenols which have greater ability to neutralize free radicals.
2. Antimicrobial- Activity is related to its osmolality, glucose oxidase enzyme and production of hydrogen peroxide. Along with Gluconic acid hydrogen peroxidase is formed from glucose as by product by this enzyme. Hydrogen peroxide has antimicrobial activity.
3. Deeply Moisturization and Hydration of the Skin
4. Effective Pore Cleanser and Gentle Exfoliator
5. Soothing effect on skin and Relieves Sunburn.
6. Acts as viscosity builder

VI. Olive oil^[9]


Generic name	<i>Olea europaea</i> L	
Synonym	Olive oil	
Family	Oleaceae,	
Use	Antioxidant, anti-inflammatory, moisturizer, relieves dry skin	

Fig. 6: Olive oil**Constituents and their Role as Cosmeceuticals**

1. Triacylglycerols (Antioxidants)-Fight free-radicals, protect skin from the damaging effects of pollution, sun exposure, and other environmental factors.
2. Olive oil (Cleanser) – Olive oil is a natural cleanser; gently remove makeup, dirt and impurities without stripping skin's natural oils. It is a gentle alternative to harsh chemical cleansers, making it suitable for all skin types.
3. Glycerol (Moisturizers)- Olive oil is a natural emollient, helps lock in moisture and it forms a protective barrier on its surface, preventing water loss and keeping skin hydrated. Squalene present in olive oil is extremely hydrating.

4. Oleic acid (Anti-inflammatory) - It helps promote wound healing, has smoothening effect, reduce the appearance of scars and help to regulate sebum production.
5. One of the highly effective olive oil benefits for skin is its ability to help nourish and revitalize skin, leaving it with a healthy, radiant glow. Its moisturizing and antioxidant properties contribute to more even-toned complexion.

VII Walnut^[10]


Generic name	Juglans regia	
Synonym	Walnut	
Family	Juglandaceae.	
Use	Improve skin health, heal wounds faster, and treat eczema and acne	

Fig.7: Walnut shells.

Walnuts shells are used as natural exfoliating cleansers. The coarse texture of powder provides natural exfoliation and gentle abrasion that help to improve skin texture without causing irritation.

Jasmine Oil^[10]

Jasmine oil obtained from Jasmine flowers. Jasmine Absolute has a rich, heady, floral aroma. It is a great oil to help calm the mind, popular for use in skincare, massage, and perfumery.

VII. Sodium Lauryl Sulphate^[11]

SLS is a surfactant, lowers the surface tension between interfaces of the ingredients and acts a cleansing and foaming agent. SLS is used in beauty and self-care products as well as in household cleaner.

Formulation

Table 1: Formulation Ingredients of scrubs.

S.N.	Ingredients	Quantity	Category
1	Aloe vera	15ml	Antioxidant, moisturizer
2	Honey	5ml	Antiseptic
3	Caffeine	1.5gm	Scrubbing agent
4	Turmeric	0.45gm	Antiseptic/anti-inflammatory
5	Walnut shell powder	2gm	Scrubbing agent
6	Olive oil	1ml	Emollient
7	Jasmine oil	3ml	Perfume
8	Sodium lauryl sulphate	1gm	Foaming agent
9	Rice water	q. s.	Astringent

METHOD OF PRERARATION^[12]

Weigh all ingredients, aloe vera gel (separated from aloe plant in lab) was taken in mortar, to this turmeric, caffeine, honey, walnut shell powder (coarse), sodium lauryl sulphate was added one after other and mixed thoroughly in mortar. Then other ingredients like olive oil and jasmine oil were added slowly with mixing. Finally rice water was added as required. Final product packed in well closed plastic container and stored to check the stability.



Fig. 8: Face Scrub Product.

EVALUATION OF SCRUB

Preparation was evaluated for following parameters.

1 Appearance

Color: Scrub prepared was found to be light yellow colored.

Odor: Scrub had characteristic odor of jasmine oil.

2 State: Preparation was semisolid in nature.

3 Consistency: Consistency of the preparation was found to be smooth visually.

4 PH: PH of prepared scrub was evaluated using PH paper and found to be in range of 4-6

5 Spreadability: It is done to check the Spreadability of preparation on skin. For that small quantity of scrub was placed on a glass slide then it was spread on slide and how much time it took to spread was measured.

Calculation: $S = M \times L/t$

S- Spreadability, M-weight of scrub, L-length of glass slide, t- time in seconds

Spreadability was found to be 0.35gm.cm/sec

6 Irritability: Small amount of scrub was applied on skin and kept for few minutes and found to be no irritable.

7 Washability: Small quantity of scrub was applied on skin and washed with water after few minutes and found to be completely washable.

8 Grittiness: Exfoliants need to have abrasive property so walnut shells were powdered, sieved and added to serve the purpose so few gritty particles were observed in the preparation.

9 Foaming Index: 1gm formulation was added in 5ml water in a test tube; Shaked for 5 min, allowed to stand for 15 min and observed for the height of the foam. Foaming Index was calculated as

Foaming Index= $1000/a$ a is ml in the test tube showing 1 cm height.

Prepared scrub was found to have sufficient foaming and cleaning effect.

10 Moisturization: Preparation was scrubbed on skin and washed after some time. Skin found to be sufficiently moist.

RESULT AND DISCUSSION

Herbal scrubs are natural exfoliants, exfoliation removes sebum oil and unclogs the skin pores, clearing older skin so skin feels soft supple and nourished. Herbal scrub preparation in current study was prepared with the same perspective and found to be satisfactory after evaluation. The preparation was stable with light yellow colored and jasmine perfume. The semisolid preparation was smooth visually and spreadable having a PH in range of 4-6. Further the formulation had presence of few gritty particles working for exfoliation and sufficient foaming leading to complete washing of greasiness of the product, thus easily removable preparation from skin. At the same time our formulation was found nonirritant, leaving the skin hydrated.

CONCLUSION

Herbal cosmetics are easy to prepare, safe and effective after use. One of the main objectives of herbal products is that they can be used for all skin types. The major use of herbal products is for health promotion and therapy for serious skin conditions. In present study, Hydration of skin to significant level may be contributed to high concentration of aloe along with olive oil and honey in the formulation. Scrub application helps in efficient cleaning (exfoliation), clear, glowing skin with even tone. Exfoliation with no irritation of skin is because of scrubbing agents like caffeine and walnut shell powder. Glow imparted upon use of scrub can be aided by enhanced blood flow after scrubbing. Incorporation of rice water, curcumin and olive oil lead to clear and smooth skin appearance. Further complete washing of greasiness of product is attributed to surfactant. Our product can effectuate healthy, glowing skin naturally. All the ingredients incorporated in scrub are easily available and of low cost making final

formulation cost effective On concluding remark, scrub was stable and had satisfactory test results after evaluation. Scrub found to prove intended use after application. Thus, herbal products having natural cosmeceuticals represent promising approach for effective skin exfoliation.

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