Coffee–Besan (Gram Flour) Udvartan Scrub for Skin Care: A Proof-of-Concept Study

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Abstract

Facial scrubs are used to cleanse the skin by removing excess oil and dead skin cells from the skin surface. Herbal scrubs prepared from natural ingredients are simple to prepare and suitable for routine skin care. Gram flour (*Cicer arietinum* Linn.) has been traditionally used as a natural skin cleanser, while coffee (*Coffea arabica* Linn.) is also used in skin care as it contains caffeine, chlorogenic acids, and other antioxidant compounds. The present study was undertaken to formulate and evaluate a Coffee–Besan scrub for skin care. The scrub was prepared by mixing gram flour and coffee powder in a ratio of 10:1. The prepared formulation was evaluated for organoleptic characteristics, pH, spreadability, washability, and skin irritation. The formulation was obtained as a uniform brown powder with a characteristic coffee aroma and slightly coarse texture. The pH of the formulation was 5.8. The scrub showed good spreadability and washability, and no redness, itching, burning sensation, or any other visible skin reaction was observed during the skin irritation test. The prepared Coffee–Besan scrub showed satisfactory organoleptic and physical characteristics and may be used as a simple herbal scrub for routine skin care. Further studies are required to evaluate its long-term safety and effectiveness.

Keywords: Coffee, Gram flour, Herbal scrub, Skin care, Exfoliation, Antioxidants.

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Introduction

Skin is the largest organ of the human body and acts as a protective barrier against the external environment. It is continuously exposed to dust, excess oil, sunlight, and other environmental factors. As a result, dead skin cells accumulate on the skin surface, making regular cleansing necessary. Facial scrbs are cosmetic preparations used to cleanse the skin and remove superficial debris.[1] Regular use of facial scrubs helps keep the skin clean, smooth, and fresh.

Herbal scrubs prepared from natural ingredients are preferred for regular skin care because they are simple to prepare and easy to use. They help remove superficial impurities and improve the appearance of the skin. Gentle massage during application also helps clean the skin surface and improves the feel of the skin after washing.

In Ayurveda, *Udvartana* is a procedure in which herbal powder or paste is rubbed over the skin with gentle pressure in the opposite direction of hair growth.[2] For facial application, the herbal powder is mixed with water to prepare a smooth paste before use. It is indicated for cleansing the skin and improving its appearance. According to *Chakrapani*, *Udvartana* is performed as a part of the daily regimen.[3] *Susruta* has described *Udvartana* as *Twakprasadakara* [4] and has classified it into three types according to the form of drugs used, namely *Udvartana*, *Udgarṣaṇa* (rubbing with dry herbal powder), and *Utsādana* (application of herbal paste mixed with oil).[5]

Gram flour (*Cicer arietinum* Linn.), commonly known as Besan or *Chanaka*, has long been used as a traditional cleansing ingredient in skin care. It helps reduce excess oil, removes loose dead skin cells, and provides mild exfoliation. In Ayurveda, *Chanaka* is described to possess *Kaphahara* and *Varnakara* properties.[6]

Coffee (*Coffea arabica* Linn.) contains caffeine, chlorogenic acids, and other antioxidant compounds.[7] The coarse particles of coffee provide gentle exfoliation, while caffeine has been used in cosmetic preparations because of its antioxidant activity and its protective effect against ultraviolet (UV) radiation and photoaging.[8] Coffee also gives a characteristic aroma to the formulation.

During the preparation of Gram flour–Coffee *Udvartana* in our previous work, the combination showed good texture, easy application, and good

skin compatibility. Based on these observations, gram flour and coffee were selected in a ratio of 10:1 for preparing the present Coffee–Besan scrub.

The present proof-of-concept study was undertaken to formulate and evaluate a Coffee–Besan scrub for skin care.

Herbal Scrubs and Their Uses

A herbal scrub should be safe for application on the skin and should not produce irritation during use. The formulation should have a smooth consistency with particles that help clean the skin surface without causing discomfort. It should spread uniformly, be easy to wash with water, and leave no sticky feeling after application.[9] Regular use of a mild herbal scrub helps keep the skin smooth and improves its overall feel. Massage during application allows the scrub to spread evenly over the skin and supports the cleansing process. These qualities make a herbal scrub suitable for routine skin care.

Composition of Coffee–Besan Scrub

The Coffee–Besan scrub was prepared using gram flour (*Cicer arietinum* Linn.) and coffee (*Coffea arabica* Linn.) in a ratio of 10:1. Gram flour was selected as the base ingredient because of its traditional cleansing role and mild exfoliating action. Coffee was incorporated to enhance the abrasive cleansing effect and contribute antioxidant activity. The composition of the Coffee–Besan scrub is given in **Table 1**.

Table 1. Composition of Coffee–Besan Scrub

Sr. No.	Ingredient	Botanical name	Quantity
1	Gram flour	*Cicer arietinum* Linn.	10 g
2	Coffee powder	*Coffea arabica* Linn.	1 g
3	Water	q.s.	Sufficient quantity

Materials and Methods

Materials

Coffee beans and split *Chanaka* (Chana Dal) used for the preparation of the Coffee–Besan scrub were procured from reliable sources. The raw materials were authenticated in the laboratory before use and tested for compliance with the Ayurvedic Pharmacopoeia of India (API) parameters.

Coffee (*Coffea arabica* Linn.)

Coffee contains caffeine, chlorogenic acids, and other antioxidant compounds. Its coarse particles assist in mild mechanical removal of surface impurities during application. Caffeine is used in cosmetic preparations because of its antioxidant activity and its protective effect against ultraviolet (UV) radiation and photoaging. It has also been reported to improve protection against UVB-induced skin damage.

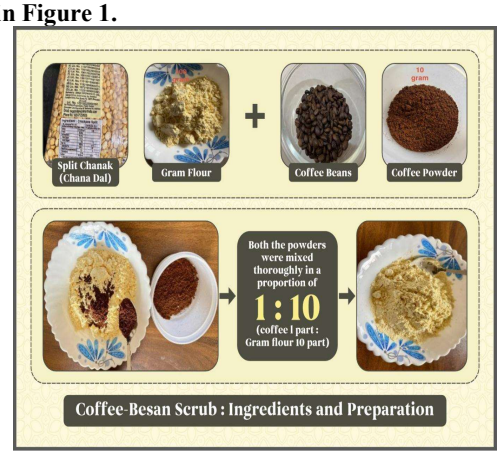
Gram Flour (*Cicer arietinum* Linn.)

Gram flour, commonly known as *Chanaka*, was selected as the main ingredient of the formulation because of its traditional use in skin care. In Ayurveda, *Chanaka* has *Madhura Rasa* and *Ruksha Guna* and is known for its *Deeptivarnyakara* and *Balya* properties.[10] It contains proteins, phenolic compounds, allantoin, and amino acids.[11] Proteins and amino acids help nourish the skin, while phenolic compounds have antioxidant activity. Allantoin helps soothe the skin and maintain a smooth skin surface. These properties make gram flour suitable for use in the present scrub formulation.

Method of Preparation

The Coffee–Besan scrub was prepared under clean and hygienic conditions. Good-quality split *Chanaka* (*Cicer arietinum* Linn.) was cleaned, authenticated, and ground to obtain gram flour. Coffee beans were cleaned, dried, lightly roasted, and powdered separately. Both powders were passed through sieve No. 85 to obtain a uniform particle size suitable for topical application. Gram flour and coffee powder were then mixed thoroughly in a ratio of 10:1 to obtain a uniform powder mixture. The prepared powder was packed in clean, labelled pouches and stored in a dry place until use. Sufficient quantity of water was added at the time of application to prepare a smooth paste suitable for topical application. The method of preparation is summarized in figure 1.

preparation of the Coffee–Besan scrub is shown in Figure 1.



Evaluation of Coffee–Besan Scrub

The prepared Coffee–Besan scrub was evaluated for organoleptic characteristics and physical properties. Colour, odour, appearance, and texture were examined by visual observation. The pH of the freshly prepared paste was measured using a calibrated digital pH meter. Spreadability was assessed by applying the paste over the dorsal surface of the hand and observing whether it formed a uniform layer without excessive force. Washability was assessed by rinsing the applied scrub with water and recording whether it was removed completely without visible residue or stickiness. Skin irritation was assessed by applying a small quantity of the scrub over the dorsal surface of the hand and observing for redness, itching, burning sensation, or any other visible reaction during the observation period. The organoleptic characteristics of the prepared formulation are presented in Table 2.

Table 2. Organoleptic Characteristics of Coffee–Besan Scrub

Sr. No.	Parameter	Observation
1	Appearance	Uniform powder
2	Colour	Brownish yellow
3	Odour	Characteristic coffee aroma
4	Texture	Slightly coarse

Results

The Coffee–Besan scrub was prepared successfully by mixing gram flour and coffee powder in a ratio of 10:1. The prepared scrub was brownish yellow in colour with a characteristic coffee aroma. It formed a smooth paste after the addition of water. The pH of the formulation was found to be 5.8, which is close to the normal pH of the skin. The scrub spread easily over the skin surface and was washed off completely with water without leaving any residue. During the skin irritation test, no redness, itching, burning sensation, or any other visible reaction was observed. The prepared formulation showed good physical characteristics and was found suitable for topical application. The evaluation results of the Coffee–Besan scrub are presented in Table 3.

Table 3. Evaluation Results of Coffee–Besan Scrub

Sr. No.	Parameter	Observation
1	pH	5.8
2	Spreadability	Uniform application over the skin surface without excessive force
3	Washability	Removed completely with water without visible residue or stickiness
4	Skin irritation	No redness, itching, burning sensation, or irritation observed

Discussion

Facial scrubs help clear sebum and dead skin cells. Regular exfoliation supports cleanliness and improves skin texture. Herbal scrubs prepared from natural ingredients are simple to prepare and convenient for regular cosmetic use. In this study, a Coffee–Besan scrub was developed to combine the cleansing and mild exfoliating role of gram flour with the abrasive texture and antioxidant potential of coffee.

The formulation was prepared successfully as a uniform powder and showed acceptable organoleptic and physicochemical characteristics for a simple topical scrub. Its coffee aroma, slightly coarse texture, easy spreading, complete washability, and absence of visible irritation support its preliminary suitability for cosmetic application.

Gram flour formed the major part of the formulation because of its established use as a traditional cleansing and exfoliating ingredient. It contains proteins, amino acids, phenolic compounds, and allantoin, which help nourish and maintain the skin. Coffee contains caffeine, chlorogenic acids, and other antioxidant compounds. The coarse particles of coffee support mild mechanical exfoliation, while its characteristic aroma improves the sensory properties of the formulation. Fragrance and texture are important sensory characteristics of cosmetic products and influence product acceptance and user satisfaction during application.[12]

Gram flour and coffee were mixed in a ratio of 10:1 to provide a mild scrubbing effect along with a pleasant coffee aroma and easy application. The pH of the formulation was 5.8, which is close to the normal skin pH. No redness, itching, burning sensation, or any other visible skin reaction was observed during the skin irritation test, indicating good skin compatibility.

However, the findings should be interpreted as preliminary because the evaluation was limited to basic physical parameters and a simple visible irritation observation. Future studies should include

defined sample size, longer observation periods, stability testing, microbial evaluation, standardized scoring scales, and comparison with an existing scrub formulation.

The prepared Coffee–Besan scrub may serve as a simple herbal preparation for regular cosmetic use. Further studies are required to evaluate its long-term safety and effectiveness.

Conclusion

The Coffee–Besan scrub was prepared successfully by mixing gram flour and coffee powder in a ratio of 10:1. The formulation showed acceptable organoleptic characteristics, pH close to normal skin pH, uniform spreadability, complete washability, and no visible skin irritation during preliminary topical observation. These findings suggest that the prepared scrub may be considered a simple herbal cosmetic preparation for regular use. Further studies with standardized evaluation methods, stability assessment, microbial testing, larger sample size, and comparative analysis are needed to confirm its long-term safety and effectiveness.

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