

# Natural Anti-Oxidant Rich Face Pack From Banana Peel And Herbal Blend

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**Abstract-** This study examines a natural antioxidant-rich face pack formulated from banana peel and an herbal blend. The ingredients include ripened banana peel powder, multani mitti, sandalwood powder, coffee powder, honey, almond oil and rose water, all sourced locally. Powders were sieved (#120), accurately weighed and mixed geometrically using a mortar and pestle to obtain a uniform formulation.

The face pack was evaluated for physical appearance, pH, viscosity, washability, homogeneity, stability, microbial load, spreadability and irritancy. The dried powder showed good flow properties suitable for cosmetic application. Banana peel-based formulations are known to enhance blood circulation, rejuvenate skin, maintain elasticity and cleanse pores. Literature findings support that such face packs have acceptable physical properties and are non-irritant. Further optimization is needed to explore their full cosmetic benefits.

**Keywords-** Herbal, Banana peel powder, Multani mitti, Sandalwood, Anti-oxidant and Face pack.

## I. INTRODUCTION

The concept of beauty is as old as humanity. Perfect and healthy skin is considered the essence of beauty and glamour. Since ancient times, herbs have been used for beautification and are well described in Ayurvedic literature. Plants have always played a vital role in maintaining healthy and glowing skin.<sup>[1]</sup>

Nowadays, many people desire fair and glowing skin. However, common problems like acne, blackheads, pimples, and dark circles often affect youngsters and others alike. According to Ayurvedic principles, such skin issues usually arise from impurities present in the blood. When toxins accumulate in the body due to unhealthy food habits and improper lifestyle, they manifest as various skin disorders. Ayurveda describes several herbs and medicines that are effective in purifying the blood and promoting healthy, clear skin.<sup>[2]</sup>

A good herbal face pack must supply necessary nutrients to the skin. It should penetrate the subcutaneous tissues in order to deliver the required nutrients. Ayurvedic face packs increase skin glow and are the best ayurvedic treatment to increase fairness. Face packs are helpful for preventive, promotive and curative of any skin problems.<sup>[3][4]</sup>

Herbal face packs are used for the purpose like deep cleansing, astringents, stimulating, tanning, hydrating and nourishing. They are used to stimulate blood circulation and rejuvenate the muscle. They maintain the elasticity of skin and remove dirt from skin. The herbal face pack acts by improving blood circulation in the veins of the skin but the effect of facial face pack is generally temporary, so for regular glow or skin-care it should be used 2-3 times a week.<sup>[5]</sup>

## Raw materials:

### 1. RIPENED BANANA PEEL POWDER

- **Scientific name:** Musa
- **Higher classification:** Bananas
- **Kingdom:** Planta
- **Family:** Musaceae
- **Order:** Zingiberales



Recent studies reveal that banana peel is a rich source of bioactive compounds, including: Phenolics, Flavonoids, Carotenoids, Dopamine and Essential minerals. These bioactive compounds provide antioxidant, anti-inflammatory and antimicrobial properties, making banana peel valuable for cosmetic and pharmaceutical applications. Its natural composition supports skin health by reducing oxidative stress, preventing premature aging and promoting skin

hydration. Evaluation of its effectiveness to develop an eco-friendly, safe, and effective skincare product.

## 2. MULTANI MITTI

- **Scientific name:** Fuller's Earth.
- **Synonym:** Multani mitti.
- **Chemical constituents:** Silica, iron oxide, lime, magnesia and water.



Multani Mitti, also known as Fuller's Earth. It is rich in minerals such as magnesium, silica, calcium, iron oxides and dolomite, which give it excellent absorbent and cleansing properties. Multani Mitti is highly valued in skincare formulations due to its ability to remove excess oil, dirt and impurities from the skin, making it an effective natural cleanser. Its cooling and soothing nature helps in reducing skin irritation, inflammation and acne, while also improving blood circulation and imparting a natural glow to the skin. It is a natural ingredient to prepare face packs, masks and scrubs.

## 3. SANDALWOOD POWDER

- **Scientific name:** Santalum album
- **Higher classification:** Santalum (Genus)
- **Kingdom:** Plantae
- **Family:** Santalaceae
- **Order:** Santalales



Highly valued for its aromatic, therapeutic and cosmetic properties, it has been used for centuries in traditional medicine, skincare and religious rituals across India, China and other parts of Asia. In Ayurveda, it is considered a cooling agent and is often used to balance the body's heat, reduce pigmentation and improve complexion. It can be used to prevent the dreaded acne on skin. Helps in

lightening scars, pigmentation and tanning. Widely used in perfumes, incense sticks and aromatherapy due to its calming fragrances. Used in making cosmetic powder and traditional medicines.<sup>[6]</sup>

## 4. COFFEE POWDER

- **Scientific name:** Coffea arabica
- **Higher classification:** Genus Coffea
- **Kingdom:** Plantae
- **Family:** Rubiaceae
- **Order:** Gentianales



Skin care happens to be one of the benefits of coffee. Full of antioxidants and anti-ageing properties, coffee is equipped with amazing exploitation abilities that can boost skin health. Applying coffee in the form of face pack reduces skin swelling and puffing by promoting blood circulation. It contains caffeine, a natural stimulant that helps improve alertness and reduce fatigue.<sup>[7]</sup>

## 5. HONEY

- **Biological source:** Honey is the saccharine liquid prepared from the nectar of the flower by the hive- bee Apis mellifera and bees of other species of Apis.
- **Family:** Apidae



Honey is widely used in cooking, baking, beverages and traditional medicine. It also has antibacterial and anti-inflammatory properties, making it useful in skincare and home remedies. Due to its natural origin and health benefits, honey continues to be a staple in households around the world.<sup>[8]</sup>

## 6.ALMOND OIL

- Scientific name: Prunus dulcis
- Higher classification: Prunus (Genus), Amygdaloideae (Subfamily)
- Kingdom: Plantae
- Family: Rosaceae
- Order: Rosales



Almond oil is packed with beneficial compounds such as vitamin E, fatty acids (especially oleic and linoleic acids), antioxidants and anti-inflammatory agents. Renowned for its moisturizing, softening, and nourishing qualities, almond oil is widely used in skincare products, massage oils and hair treatment.<sup>[9]</sup>

## 7.ROSE WATER

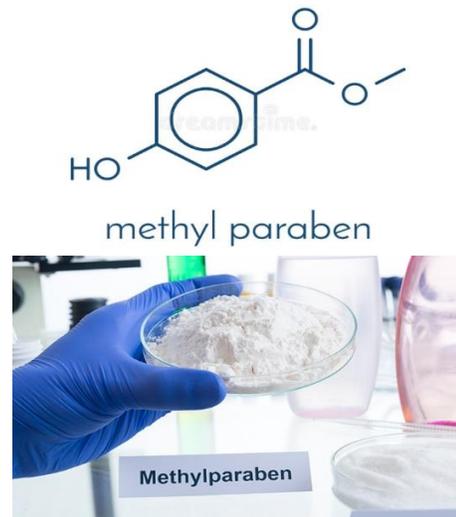
- Scientific name: Rosa damascena
- Higher classification: Genus Rosa
- Kingdom: Plantae
- Family: Rosaceae
- Order: Rosales



Used for centuries across cultures, rose water holds a special place in skincare, culinary arts and traditional medicine. In skincare, rose water is widely used as a toner, facial mist, or ingredient in creams and lotions due to its anti-inflammatory and antioxidant effects. Its gentle, non-irritating nature also makes it a popular choice for use in aromatherapy and personal care routines.<sup>[10]</sup>

## 8.METHYL PARABEN

- Scientific name: Methyl 4-hydroxybenzoate
- Higher classification: Parabens (class of esters of *p*-hydroxybenzoic acid)
- Kingdom: Not applicable (Methylparaben is a synthetic chemical, not a living organism)
- Family: Not applicable (Chemical compound)
- Order: Not applicable



Methyl paraben is a chemical compound widely used as a preservative in cosmetics, pharmaceuticals and food products. It belongs to the paraben family, which consists of esters of para-hydroxybenzoic acid. Its chemical formula is C<sub>8</sub>H<sub>8</sub>O<sub>3</sub> and it is the methyl ester of *p*-hydroxybenzoic acid. Methyl paraben is popular due to its antimicrobial properties, particularly against fungi and its ability to extend the shelf life of products by preventing microbial growth.<sup>[11]</sup>

## II. METHODOLOGY

### List of ingredients and property

SL.NO	INGREDIENTS	PROPERTY
01	Ripened Banana Peel powder	Antioxidant Moisture
02	Multani Mitti	Anti acne & Detoxifier
03	Sandalwood Powder	Anti aging & Anti tanning
04	Coffee Powder	Exfoliant & Anti Inflammatory
05	Honey	Natural

		Humectant
06	Almond Oil	Emollient
07	Rose Water	Perfume
08	Methyl Paraben	Preservative

### Prepared face pack

All the powdered ingredients are passed through sieve no.120#. Weigh all the herbal ingredients accurately. Take ripened banana peel powder, multani mitti, sandalwood and coffee powder. Mix the powders uniformly with the help of mortar and pestle. Triturate them to form uniform mixture. To the triturated mixture add honey. Dissolve a small quantity of methyl paraben in required amount of rose water. The prepared face pack is transferred into a air-tight container.

### Procedure of face pack application

Take prepared face pack paste as per the requirement. Apply over the facial skin using brush. Cover the acne and blemishes spots too. Kept as it is for complete drying for 20 to 25 min and then wash with water.<sup>[12]</sup>

### Ideal properties of face pack:

1. It should be non-irritating and non-toxic.
2. It should be stable both physically and chemically.
3. It should be free from gritty particles.
4. It should have pleasant odour.
5. They should be capable of producing significant cleaning of the skin.
6. They should produce a sensation of tightening of the skin after applications.
7. They should form a smooth paste.<sup>[13]</sup>

### Precautions to be taken while using face pack:

Some precautions are useful for better skin glowing, cleaning and nourishment.

1. The face pack is used according to your skin type.
2. Consulted to the skin expert before use of any natural therapy on face.
3. Maximum 20-30 min stay on face and after that wash the face and completely remove the medicaments.
4. When you are applying the face pack on the face, then the face should be completely dried.
5. Do not scrub vigorously.
6. Avoid applying face pack near "eye zone" because the skin around eye is very fragile. The process of removing face pack may damage skin around the eyes.<sup>[14]</sup>

### III. EVALUATION OF FACE PACK

The prepared face pack was evaluated for various parameter as follow:

**1. Physical appearance:** The physical appearance of the formulation was evaluated visually which included:

- Color: The color of the formulations was checked out against white background.
- Odour: The odour of the face pack was checked by manually.
- Consistency: The consistency was checked by applying on skin.
- Greasiness: The greasiness was assessed by the application

**2. pH:** An amount of 20 mg of the formulation was taken in a beaker and was subjected to the pH measurement using a digital pH meter.

**3. Viscosity:** Viscosities of formulated face pack were determined using Brookfield viscometer. The corresponding dial reading on the viscometer was noted. Viscosity of formulation determined at 100 rpm, using spindle number 6.

**4. Washability:** Formulations were applied on the skin and then ease and extent of washing with water were checked manually.

**5. Homogeneity:** Homogeneity was tested by visual inspection after allowing them to set in a container. They are evaluated for their appearance and presence of aggregates.

**6. Irritancy:** Mark an area [1sq.cm] on the left-hand dorsal surface. The face pack was applied the specified area and time was noted. Irritancy, erythema, oedema, was checked if any for regular intervals up to 24 hrs and reported.

**7. Stability test:** The preparation was tested for stability by storing for a period of months at different temperatures. Packaged glass bottles consisting of formulations were kept at different temperatures, such as room temperature and 40°C, and physical parameters such as colour, odor, pH, consistency and odor were measured.

**8. Microbial test:** The antibacterial activities of different formulations were determined by modified agar well diffusion method. In this method, nutrient agar plates were seeded with 0.2 ml of 24 hrs broth culture of *Escherichia coli* and *Pseudomonas aureginosa* acausative organism for acne vulgaris. The agar plates were allowed to solidify. A sterile 8 mm borer was used to cut wells of equidistance in each of the plates. 0.5 ml of formulations, herbal extracts were incubated at 37°C for 24 hours. The antibacterial activities were evaluated by measuring the zones of inhibition (in mm).

**IV. RESULT AND DISCUSSION**

**1.Organoleptic characteristics :**

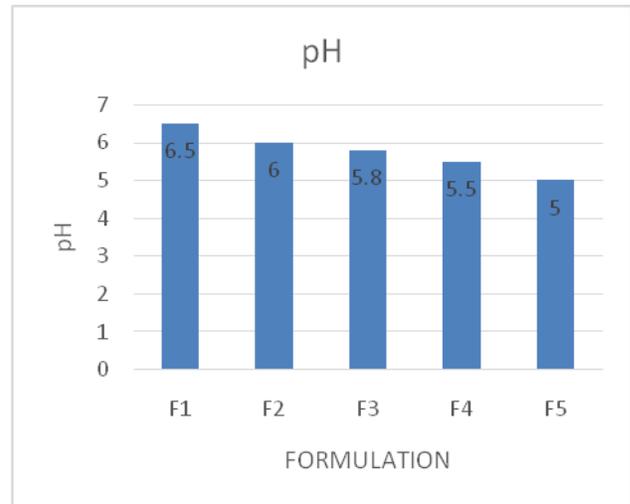
Trial number	Colour	Odour	Consistency	Greasiness
F1	Brownish green	Slight aromatic	Semi solid	No
F2	Dull olive brown	Slight aromatic	Semi solid	No
F3	Olive brown	Slight aromatic	Semi solid	No
F4	Dark olive brown	Slight aromatic	Semi solid	No
F5	Deep olive shade	Slight aromatic	Semi solid	No



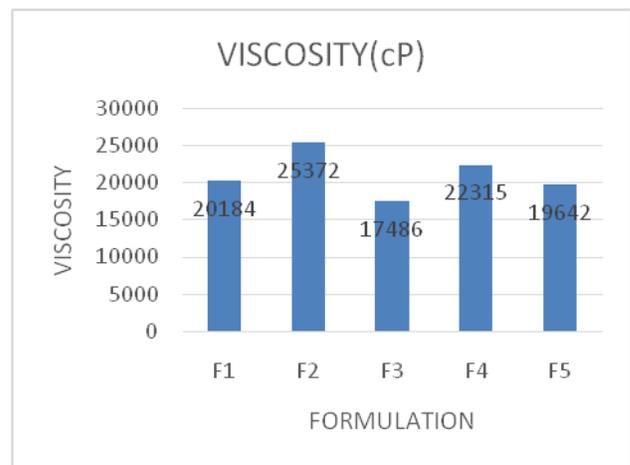
The Organoleptic parameters of the herbal face pack were assessed. The colour of formulation was Brownish. The odour of prepared formulations was pleasant and good acceptable which is desirable to cosmetic formulations. Formulation F5 showed excellent organoleptic characteristics compared to other formulation. It possessed a smooth texture, uniform appearance and pleasant odour, which enhances consumer acceptance.

**2.pH and viscosity:**

Trial number	pH	Viscosity(cP)
F1	6.5	20184
F2	6	25372
F3	5.8	17486
F4	5.5	22315
F5	5	19642



**Graph of pH**



**Graph of viscosity**

**3.Washability and homogeneity:**

Trail number	Washability	Homogeneity
F1	Easily washable	No aggregate

F2	Easily washable	No aggregate
F3	Easily washable	No aggregate
F4	Easily washable	No aggregate
F5	Easily washable	No aggregate

The formulation F5 produces uniform distribution of medicaments in face pack. This was confirmed by visual appearance and by touch.

The washability test is used to evaluate chemical resistance, scrub abrasion resistance, stain resistance and easy to clean. The face pack on skin was easily removed by washing with tap water. The washability of F5 was found to be highly satisfactory.

#### 4. Irritancy test for F5:

SI NO	Parameter	Observation
1	Irritation	No irritation
2	Redness	No redness
3	Swelling	No swelling

The formulation F5 showed absence of irritation, redness and swelling during irritancy studies. This formulation has safe to use on skin.

#### 5. Stability test for F5:

SI NO	Parameter	Room temperature	40° C
1	Colour	No change	No change
2	Odour	No change	No change
3	Texture	Fine	Fine
4	Smoothness	Smooth	Smooth
5	pH	5	5

The stability studies revealed that F5 remained stable under different storage conditions. There were no noticeable changes in color, odor, or consistency over time. This indicates that F5 has good physical and chemical stability, ensuring a longer shelf life and product reliability.

#### 6. Microbial test:

Antimicrobial evaluation was performed with two organisms *Pseudomonas aureginosa*, *E. coli* and the Zone of inhibition was found in formulation. The microbial limit test for F5 indicated the absence of bacterial and fungal growth, confirming that the formulation is free from microbial contamination. This demonstrates that the preservatives used were effective and that the formulation maintains good hygienic quality and safety during storage and use.

### V. CONCLUSION

The project involved the formulation and evaluation of a banana peel-based face pack using powdered banana peel, coffee, sandalwood, and multani mitti. Five formulations (F1–F5) were prepared with varying concentrations of these ingredients. All formulations were evaluated for appearance, colour, odour, consistency, greasiness, pH, washability, homogeneity, stability, microbial quality, viscosity, irritancy, and spreadability. Among them, F5 showed the best results, particularly in physical appearance, spreadability, washability, and homogeneity. Overall, the study concludes that the formulated face pack, especially F5, has good potential to provide clear, healthy, and glowing skin.

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