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### Formulation and Evolution of Papaya Herbal Face Pack

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#### ABSTRACT:

Papaya (*Carica papaya*) is a tropical fruit known for its rich nutritional and therapeutic properties, making it a valuable ingredient in herbal skincare formulations. This study focuses on the formulation and evaluation of a papaya-based herbal face pack designed to improve skin texture, reduce blemishes, and promote a natural glow. The face pack incorporates dried papaya powder along with other herbal ingredients such as Multani mitti (Fuller's earth), neem, turmeric, and sandalwood powder, each selected for their unique benefits in skincare. The enzymatic activity of papaya, particularly the presence of papain, contributes to exfoliation and skin rejuvenation. The formulation was evaluated for its physicochemical properties including pH, texture, spreadability, and stability. The results suggest that the papaya herbal face pack is effective, safe, and suitable for regular cosmetic use, especially for individuals with oily or acne-prone skin. The study highlights the potential of integrating natural ingredients in modern cosmetic products as a safer and eco-friendly alternative to synthetic formulations.

**Keywords :** Papaya face pack , Herbal face pack ,Natural skincare, papaya benefits for skin, Skin brightening , Acne treatment , Anti- Aging skincare , Herbalskincare products , DIY face pack , Organic skincare .

#### Introduction :

Papaya herbal face pack is a natural and effective skincare formulation designed to enhance skin health using the powerful properties of papaya combined with various beneficial herbs. Papaya, often referred to as the “fruit of the angels,” is rich in enzymes, antioxidants, and vitamins such as vitamin A, C, and E. One of its key components, papain, is a natural enzyme that acts as a gentle exfoliant, helping to remove dead skin cells, unclog pores, and promote cell regeneration.

This face pack is often enriched with additional herbal ingredients such as neem, known for its antibacterial properties; turmeric, which provides anti-inflammatory and brightening effects; sandalwood, which soothes the skin; and aloe vera, which hydrates and heals. These ingredients work synergistically to cleanse the skin, reduce acne and blemishes, control oil secretion, and impart a natural glow.

- Regular use of a papaya herbal face pack can help:
- Improve skin texture and tone
- Reduce dark spots, pigmentation, and blemishes
- Control acne and breakouts
- Provide deep hydration and nourishment
- Restore the skin's natural radiance

Free from harmful chemicals, this face pack is suitable for all skin types, especially oily and combination skin. It offers a safe, gentle, and holistic approach to skincare, making it a popular choice in natural and Ayurvedic beauty regimes.

Advantages of Papaya Herbal Face Pack :

1. Exfoliates dead skin cells.
2. Brightens skin tone.
3. Reduces dark spots and pigmentation.
4. Fights acne and inflammation.
5. Slows aging with antioxidants.

6. Hydrates and softens skin.
7. Improves skin texture and glow.

Disadvantages of Papaya Herbal Face Pack :

1. May cause allergic reactions.
2. Can lead to skin irritation.
3. Increases sun sensitivity.
4. Not ideal for all skin types.
5. Has a short shelf life.
6. Might cause temporary staining.

Benefits of Papaya Herbal Face Pack :

1. Exfoliates dead skin
2. Brightens complexion
3. Fights acne and pimples
4. Reduces dark spots and tan
5. Delays aging signs
6. Hydrates and softens skin.
7. Improves texture and glow
8. Natural and chemical-free care

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### **Aim:**

To develop and promote a natural, herbal face pack using papaya and other beneficial herbs to enhance skin health by providing nourishment, exfoliation, and protection from common skin issues such as acne, pigmentation, and dullness.

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### **Objectives:**

- To utilize the natural enzymes of papaya (especially papain) for gentle exfoliation and removal of dead skin cells.
- To reduce skin pigmentation, dark spots, and blemishes through natural brightening agents present in papaya and complementary herbs like turmeric.
- To control acne and prevent breakouts using antibacterial herbs such as neem and tulsi.
- To hydrate and nourish the skin naturally using moisturizing ingredients like aloe vera and honey.
- To improve skin texture and tone by promoting cell regeneration and balancing oil production.
- To offer a chemical-free, eco-friendly alternative to commercial face packs for individuals seeking natural skincare solutions.
- To promote the use of traditional herbal remedies in modern skincare practices for sustainable beauty.

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### **Ingredients used in Formulation :**

#### **1. Papaya peel–**

1. Botanical Information Scientific Name: *Carica papaya* Family: Caricaceae

Common Names: Papaya, Pawpaw

Origin: Native to tropical regions of Central America and southern Mexico

#### **2. Nutritional Composition (Fruit) –**

Papaya is rich in nutrients that benefit both health and skin:

1. Vitamins:
  - Vitamin C (immunity, skin health)
  - Vitamin A (eye and skin health)
  - Vitamin E (antioxidant)

2. Minerals:

Potassium, Magnesium, Calcium

3. Enzymes:

Papain: A proteolytic enzyme that breaks down proteins Chymopapain: Aids in digestion and inflammation control

4. Fiber: Aids digestion and bowel movement
5. Water content: High, making it hydrating
4. Phytochemicals and Enzymes –
  - Papain: Proteolytic enzyme used for digestion, wound healing, and exfoliation
  - Chymopapain: Anti-inflammatory enzyme, used in treating herniated disks
  - Lycopene: A powerful antioxidant with anti-cancer properties
  - Flavonoids: Antioxidant, antimicrobial, anti-inflammatory agents
  - Phenolic acids: Offer protection against oxidative stress
5. Medicinal Uses -
  - Digestive Aid: Papain helps break down proteins and supports digestion
  - Anti-parasitic: Seeds have vermifuge (anti-worm) properties
  - Anti-inflammatory: Used to reduce swelling and pain.
  - Immune Support: High vitamin C boosts immune function
  - Wound Healing: Enzymes help in tissue regeneration
  - Antioxidant Action: Helps neutralize free radicals and reduce disease risk
6. Cosmetic and Skincare Uses
  - Exfoliation: Papain gently removes dead skin cells
  - Anti-Acne: Antibacterial properties help prevent breakouts
  - Skin Brightening: Reduces pigmentation and evens out skin tone
  - Anti-Aging: Rich in antioxidants (vitamin C, A, E) that reduce wrinkles
  - Moisturization: High water content hydrates the skin
  - Scar and Spot Reduction: Enzymatic action helps fade dark spots and acne scars
7. Parts of Papaya Used – Part Use
  - Fruit :Eaten raw or used in cosmetics for skin brightening and hydration
  - Peel :Rich in enzymes, used in exfoliating and anti-pigmentation masks

#### 1. Industrial and Commercial Applications

- Food Industry: Used in juices, jams, salads, desserts, and meat tenderizers (papain)
- Pharmaceuticals: Used in digestive enzyme supplements, anti-inflammatory medicines
- Cosmetics: Found in face packs, soaps, scrubs, lotions, and anti-aging Creams
- Agricultural: Papain used as a natural meat tenderizer or in organic fertilizers
- Traditional Medicine: Used in Ayurveda, Unani, and folk medicine systems

## 2. Safety and Precautions

- Allergies: Some individuals may be allergic to papain or latex in unripe papaya
- Pregnancy: Unripe papaya is traditionally avoided during early pregnancy due to potential uterine stimulant effects
- Dosage: Excessive consumption (especially of seeds or latex) may cause gastrointestinal issues



## 2. Multani Mitti –

Common Name: Multani Mitti Scientific/Commercial Name: Fuller's Earth

Origin: The name "Multani Mitti" comes from Multan, a city in Pakistan, where it was originally found.

### 1. Composition :

Multani Mitti is a naturally occurring clay composed of:

1. Silica ( $\text{SiO}_2$ ) – Exfoliates and cleanses the skin
2. Alumina ( $\text{Al}_2\text{O}_3$ ) – Soothes the skin and improves its elasticity
3. Iron Oxide ( $\text{Fe}_2\text{O}_3$ ) – Gives it its characteristic pale yellow to light brown color
4. Magnesium Oxide ( $\text{MgO}$ ) – Helps reduce acne and pimples
5. Calcium Oxide ( $\text{CaO}$ ) – Maintains pH balance of the skin
- 6 Water ( $\text{H}_2\text{O}$ ) – Hydrates and binds the clay

It may also contain small amounts of kaolinite, dolomite, calcite, and bentonite, depending on the source.

### 2. Physical Properties :

- Texture: Fine, soft, powdery clay
- Color: Ranges from off-white to light brown
- pH Level: Slightly alkaline
- Odor: Earthy, mild
- Solubility: Insoluble in water, forms a smooth paste when mixed with liquid
- Absorption: Excellent oil and impurity-absorbing capacity

### 3. Skin Benefits :

Multani Mitti is prized for its multiple cosmetic benefits:

#### 1. Deep Cleansing -

- Absorbs oil, dirt, sweat, and toxins from the skin
- Unclogs and shrinks pores, giving a smooth texture

#### 2. Acne and Pimple Treatment -

- Anti-inflammatory and antibacterial properties help reduce acne
- Soaks excess sebum (oil), preventing future breakouts

### 3. Skin Brightening and Glow –

- Removes dead cells and improves circulation
- Helps lighten pigmentation, tanning, and dark spots

### 4. Soothing and Cooling -

- Calms irritated or inflamed skin
- Often used in sunburn, rash, or insect bite treatments
- Oil Control –
- Best suited for oily and acne-prone skin types
- Gives a matte, fresh appearance
- Traditional and Ayurvedic Uses –

In Ayurveda and Unani medicine, Multani Mitti has been used for centuries:

- As a base for herbal face packs and lepas
- In treatment of skin disorders like acne, eczema, and pigmentation
- Combined with herbs like neem, tulsi, turmeric, or sandalwood for enhanced effects

### 8. Industrial Applications -

- Textile industry: Traditionally used to clean wool (hence the name "Fuller's Earth")
- Pharmaceuticals: Used in ointments and pastes for external applications
- Cosmetics: Incorporated in creams, masks, soaps, and powders
- Oil Refining: Used for decolorizing and purifying oils and fats
- Decontaminants: Used for absorbing chemical spills and toxins

### 9. Precautions –

- Can cause dryness; not ideal for dry or sensitive skin unless combined with moisturizers like honey or aloe vera
- Patch test recommended before use
- Avoid use on broken or extremely irritated skin



### 3. Sandalwood -

Botanical Name: Santalum album (Indian Sandalwood) Family: Santalaceae

Part Used: Heartwood and essential oil extracted from the wood Origin: Native to India, Indonesia, and Australia

1. Types:

- Indian Sandalwood (*Santalum album*) – Most valued and aromatic
- Australian Sandalwood (*Santalum spicatum*) – Similar, but less potent
- Red Sandalwood (*Pterocarpus santalinus*) – Different species; used for skin and health but not aromatic

2. Composition :

Sandalwood Heartwood contains:

- Santalol (Alpha C Beta) – Major active component (up to 90% of oil)
- Tannins
- Resins
- Terpenoids
- Phenolic compounds

Sandalwood Oil is extracted through steam distillation and is rich in: A-santalol – Provides fragrance and antimicrobial properties

B-santalol – Supports relaxation and mood

3. Properties :

Antiseptic – Prevents infections and treats minor wounds Anti- inflammatory – Soothes irritation and swelling

Astringent – Tightens skin and reduces oil Cooling – Relieves heat and sunburn

Aromatic – Used extensively in perfumery and aromatherapy Anti-aging – Fights free radicals and reduces fine lines

4. Skincare Benefits :

Benefit Explanation -

- Brightens Skin - Reduces dullness, pigmentation, and tanning
- Anti-Acne - Fights bacteria and controls sebum production
- Soothes Irritation - Calms skin affected by rashes, eczema, or insect bites
- Anti-Aging - Reduces wrinkles and maintains skin elasticity
- Even Skin Tone - Treats blemishes, scars, and uneven pigmentation
- Natural Perfume - Adds a long-lasting, earthy aroma to cosmetics and oils

1. Ayurvedic Uses :

In Ayurveda, sandalwood is classified as:

- Rasa (Taste): Tikta (bitter), Madhura (sweet)
- Virya (Potency): Sheeta (cooling)
- Dosha Effect: Balances Pitta and Vata Used for:
  - Treating skin disorders (acne, itching, burns)
  - Reducing fever and inflammation
  - As a medhya (brain tonic) and mood enhancer
  - Part of ubtan (traditional Ayurvedic cleanser and beautifier)

2. Cosmetic and Commercial Uses :

- Face Packs: Combined with rose water, turmeric, Multani mitti, etc.
- Creams & Lotions: For fairness, anti-aging, and moisturizing
- Soaps: Natural fragrance and antibacterial properties

- Aromatherapy Oils: Used for relaxation and stress relief
- Incense C Agarbatti: Traditional and religious use due to its calming scent
- Perfumes: A base note in many high-end fragrances

### 3. Safety and Precautions :

- Generally safe for all skin types
- May cause mild irritation in sensitive individuals (do a patch test)
- Essential oil should be diluted before to be used



## 4 . Saffron–

Botanical Name: *Crocus sativus* Family: Iridaceae Part Used: Dried stigmas (threads) of the flower

Origin: Native to Southwest Asia (Iran, Kashmir, Greece)

### 1. Chemical Composition :

- Saffron is rich in active compounds responsible for its color, aroma, and medicinal properties:
- Crocin – Gives saffron its bright red-golden color; antioxidant
- Picrocrocin – Provides bitter taste
- Safranal– Gives saffron its unique aroma; has sedative and antioxidant effects
- Carotenoids – Including zeaxanthin and lycopene
- Flavonoids – Such as quercetin and kaempferol
- Vitamins – Small amounts of vitamin A, B2 (riboflavin), and C

### 2. Skin Benefits :

Saffron is highly prized in skincare, especially in Ayurvedic and cosmetic traditions:

Benefit Action -

1. Skin Brightening - Reduces pigmentation and dullness, adds natural glow
2. Anti-Acne- Antibacterial properties help reduce breakouts
3. Scar Fading - Helps lighten blemishes and acne scars
4. Anti-Aging- Antioxidants protect skin from free radical damage
5. Improves Complexion - Evens out skin tone and promotes radiance
6. Heals Wounds - Soothing and healing properties for small cuts and inflammation
7. Moisturizing- When combined with milk, honey, or oils, it nourishes dry skin

## 4. Health Benefits :

- Mood Enhancer: Used in treating mild depression and anxiety
- Aphrodisiac: Traditionally known to boost libido
- Antioxidant-rich: Fights oxidative stress and chronic diseases
- Memory Booster: Beneficial for brain health and neuroprotection
- Menstrual Relief: Eases cramps and mood swings
- Digestive Aid: Stimulates appetite and digestion
- Vision Health: Protects retinal cells and slows down age-related degeneration

## 5. Traditional and Ayurvedic Uses -

In Ayurveda, saffron is classified as:

1. Rasa (Taste): Tikta (bitter), Madhura (sweet)
2. Virya (Potency): Ushna (hot)
3. Dosha Effects: Balances Vata and Kapha; used carefully in Pitta disorders

Used in:

- Kumkumadi tailam (saffron oil for glowing skin)
  - Herbal lepa and face packs
  - Swarna Bhasma preparations
  - Enhancing fertility, immunity, and beauty Uses:
1. Culinary: Widely used for flavoring and coloring in cuisines (especially Persian, Indian, Spanish).
  2. Medicinal: Traditionally used for its antioxidant, antidepressant, and anti-inflammatory properties.
  3. Cosmetic: Used in skincare for brightening and anti-aging effects.
  4. Cultural: Used in religious rituals and dyeing fabrics.
6. Cosmetic and Culinary Applications :
- Face packs: Often used with milk, sandalwood, turmeric, or Multani mitti
  - Lotions and creams: For fairness and glow
  - Soaps and serums: Premium ingredient for radiance
  - Culinary: Used in biryani, kheer, tea, sweets for color and flavor
  - Beverages: Saffron milk, herbal teas
7. Storage Precautions :
- Store in airtight containers away from light and moisture
  - Use in small amounts due to potency
  - Adulteration is common; buy from trusted sources
  - Excessive use may cause skin irritation (patch test recommended)





### 5. Milk powder –

Milk powder is a dairy product made by evaporating milk until it becomes dry. It allows for long shelf life without refrigeration and is reconstituted by adding water.

Chemical Composition :

1. Lactose ( $C_{12}H_{22}O_{11}$ ) – Milk sugar
2. Casein and whey proteins
3. Milk fat (various triglycerides)
4. Minerals (mainly calcium and phosphorus)

Types of Milk Powder:

1. Whole Milk Powder (WMP):
  - Contains milk fat (~26–28%)
  - Rich in flavor
  - Used in chocolate, baked goods
2. skimmed Milk Powder (SMP)/ Nonfat Dry Milk (NDM):
  - Very low fat (<1.5%)
  - Higher protein per gram
  - Used in bakery, processed foods
3. Instant Milk Powder:
  - Easier to dissolve
  - Often enriched or fortified
4. Infant Formula:
  - Specially formulated for babies
  - Includes added nutrients like DHA, iron
5. Dairy Whitener:
  - Often includes sugar and additives
  - Used in tea/coffee
  - Reconstituted milk for drinking
  - Baked goods (cakes, cookies, bread)
  - Confectionery (chocolates, candies)
  - Tea, coffee whitener

- Emergency food, travel rations
- Infant nutrition (formula) Benefits of Milk Powder:
  1. Long shelf life – no refrigeration needed
  2. Nutrient-rich – high in protein, calcium, vitamins
  3. Easy to store and transport
  4. Cost-effective
  5. Versatile – used in cooking, baking, drinks
  6. Instant use – just add water to make milk
- Nutritional Value (per 100g, approx.):
  - Calories: 500–520 kcal
  - Protein: 24–27 g
  - Fat:

Whole: 26–28 g

Skimmed: 1–2 g

- Carbohydrates: 35–40 g (mostly lactose)
- Calcium: 900–1200 mg
- Vitamins: A, D, B2 (riboflavin), B12
- Minerals: Potassium, magnesium, phosphorus

Precautions of Milk Powder :

- Store in a cool, dry place to prevent spoilage
- Use clean water when reconstituting
- Check expiry date before use
- Seal tightly after opening to avoid moisture and contamination



## 6. Rice Flour –

Rice flour is a fine powder made by grinding raw or parboiled rice. It is naturally gluten-free and used in various culinary and industrial applications.

Chemical Composition of Milk Powder (approximate for whole milk powder): Water (Moisture) - 2–5% Lactose

- 35–38%

Protein - 24–27% (mainly casein and whey)

Milk Fat - 26–28% (lower in skimmed milk powder) Minerals (Ash) - 5–7% (calcium, phosphorus,

potassium)

Vitamins - Trace(A, D, B2, B12, etc.) Types of Rice Flour:

1. White Rice Flour – Made from polished white rice
2. Brown Rice Flour – Made from whole grain brown rice
3. Glutinous (Sticky) Rice Flour – Made from short-grain sticky rice; used in Asian sweets

Nutritional Value (per 100g, approx.):

- Calories: 360–380 kcal
- Carbohydrates: 80–85 g
- Protein: 6–8 g
- Fat: 1–2 g
- Fiber: 2–4 g (higher in brown rice flour)
- Gluten: 0 g (naturally gluten-free) Uses:
- Baking (especially gluten-free goods)
- Thickening agent in soups and sauces
- Noodles and rice cakes
- Baby food and porridges
- Skin care (used in DIY masks) Benefits:
- Gluten-free alternative
- Easily digestible
- Light texture for baking
- Suitable for people with celiac disease or gluten sensitivity Precautions of Milk Powder (in short):
- 1. Store properly – Keep in a cool, dry, airtight container to prevent spoilage.
- 2. Avoid moisture – Moisture can cause clumping and bacterial growth.
- 3. Use clean water – Only use safe, boiled or purified water when reconstituting.
- 4. Check expiry date – Expired powder may lose nutrition and become unsafe.
- 5. Watch for allergies – Avoid if lactose intolerant or allergic to dairy. Use within recommended time – Once opened, use within the time stated on the label.



6. Neen (leaves extract) –

Scientific Name: *Azadirachta indica* Family: Meliaceae

Origin: Indian subcontinent

Chemical Components:

1. Azadirachtin – insect-repellent compound
2. Nimbin, Nimbidin – anti-inflammatory and antibacterial
3. Quercetin – antioxidant
4. Fatty acids – in neem oil (oleic, stearic, palmitic acids)

Medicinal & Health Benefits:

1. Antibacterial & antifungal – treats skin infections, acne
  2. Blood purifier – used in traditional detox remedies
  3. Anti-inflammatory – reduces swelling and joint pain
  4. Antiseptic – used in dental care (neem toothpaste, twigs)
  5. Antiparasitic – effective against lice and intestinal worms
- Uses:
- Ayurveda & traditional medicine
  - Pesticides & insect repellents
  - Skin and hair care products

Neem oil – for agriculture and cosmetic use Oral hygiene – chewing sticks, toothpaste

Benefits of Neem Leaves :

1. Antibacterial & antifungal – Treats skin infections, acne, and wounds
2. Blood purifier – Helps detox the body in traditional medicine
3. Boosts immunity – Strengthens defense against infections
4. Controls blood sugar – May help regulate glucose levels
5. Improves oral health – Fights germs, used in mouthwash and toothpastes
6. Aids digestion – Helps with ulcers and intestinal worms
7. Anti-inflammatory – Reduces swelling and joint pain
8. Hair care – Treats dandruff and lice when used in rinses or oils

Precautions of Neem Powder:

1. Avoid in pregnancy – Can cause miscarriage or complications.
2. Not for infants – Maybe toxic to babies and young children.
3. Allergic reactions – Test for skin sensitivity before use.
4. Overuse risk – Excessive consumption can harm liver and kidneys.
5. May lower blood sugar – Diabetics should monitor glucose levels.
6. Drug interactions – Consult a doctor if on medications.
7. Short-term use advised – Long-term use may lead to side effects.



### **.Turmeric –**

Botanical name: *Curcuma longa* Family: Zingiberaceae(Gingerfamily) Partused: Rhizome (underground stem)

Active compound: Curcumin (gives turmeric its yellow color)

Origin: Native to Southand Southeast Asia, primarily India.

Chemical Composition of Turmeric :

1. Curcuminoids – Curcumin, demethoxycurcumin, bisdemethoxycurcumin
2. Volatileoils – Turmerone, atlantone, zingiberene
3. Polysaccharides – Like ukonan(immune-boosting)
4. Proteins, resins, and sugars
5. Minerals – Iron, potassium, manganese
6. Vitamins – Vitamin C, B-complex Properties of Turmeric :

Color: Bright yellow-orange Smell:

Strong, earthy aroma Taste: Bitter, pungent

Solubility: Poor in water, good in alcohol/oil Key compounds: Curcumin and volatile oils

Effects: Anti-inflammatory, antioxidant, antimicrobial Uses: Spice, medicine, natural dye

Health Benefits:

1. Anti-inflammatory – Reduces swelling and pain.
2. Antioxidant – Protectscellsfromdamage.
3. Boosts immunity – Strengthens the body’s defenses.
4. Aids digestion – Stimulates bile production.
5. Supports liverhealth – Helpsdetoxifythebody.
6. Improves skin – Usedfor acne, wounds, and glow.
7. Jointhealth – Commonlyused in arthritis treatment.

Uses:

- Culinary: Spice in cooking, especially in Indian cuisine.
- Medicinal: Used in Ayurvedaandtraditional medicine.

- Topical: Applied to skin for wounds and cosmetic purposes.
- Supplements: Available in capsules, teas, or extracts. Precautions:
- May cause upset stomach in large amounts.
- Can interact with blood thinners and diabetes medications.
- Avoid high doses during pregnancy unless advised by a doctor.



Material and profile–

#### 1. Glycerine -

Glycerine, also known as glycerol, is a clear, colorless, and odorless thick liquid with a sweet taste. Chemically, it has the formula  $C_3H_8O_3$  and is highly soluble in water and alcohol. It is commonly derived from natural fats and oils but can also be produced synthetically. Due to its excellent moisturizing properties, glycerine is widely used in skincare and cosmetic products to retain moisture and keep skin soft. It also serves as a solvent, sweetener, and humectant in pharmaceuticals, and as a food additive (E422) to preserve freshness and add sweetness. Beyond these uses, glycerine finds applications in industrial products such as antifreeze, plastics, and explosives. It is generally considered safe for both topical and oral use, although very high concentrations may cause mild skin irritation in sensitive individuals.





## 2. Rosewater–

Rose water is a fragrant liquid made by distilling rose petals with steam. It has a delicate floral aroma and a pale pink or clear appearance. Traditionally used in cosmetics, cooking, and religious rituals, rose water is prized for its soothing and anti-inflammatory properties. It acts as a natural toner and moisturizer for the skin, helping to hydrate, refresh, and reduce redness or irritation. In culinary uses, rosewater adds a subtle floral flavor to desserts and beverages. Rose water also has mild antibacterial effects and can be used to calm minor skin inflammations. It's gentle and suitable for most skin types, making it a popular ingredient in skincare products worldwide.



## Methodology -

Step 1. Collection and Authentication of Ingredients. The following natural ingredients are commonly used:

- Carica papaya (ripe fruit pulp or dried powder)
- Multani mitti (Fuller's earth)
- Curcuma longa (Turmeric)
- Azadirachta indica (Neem leaves powder)
- Santalum album (Sandalwood powder)
- Crocus Sativus (saffron)

### 2. Formulation of Face Pack-

A typical formulation may consist of the following: Papaya powder/pulp - 5g Multani mitti - 3g Turmeric powder

- 1g Neem powder - 2g Sandalwood powder - 2g Rice flour - 2g

Procedure :

1. All dried powders are weighed accurately.
2. The powders are blended uniformly using a mortar and pestle or mechanical blender.
3. The mixture is stored in airtight containers for further use.
4. For application: Mix 5g of the powder with rosewater or milk to make a paste

## Result -

Papaya herbal face pack can give smoother, brighter skin by gently exfoliating dead cells and reducing dark spots. With regular use, it may improve skin tone, reduce acne, and add a natural glow. Results can be seen within a week or two, depending on skin type.



### Finished product analysis of Papaya face pack:

Sr. No	Test	Specification	Observation
1	Description	A soft, smooth yellow- orange powder blend with a mild fruity and herbal aroma	A soft yellow-orange powder with a mild fruity and herbal aroma
2	pH	5.5 – 6.5	5.9
3	Appearance after reconstitution with rose water	Smooth paste, easy to spread without lumps	Smooth paste formed, lump-free and easy to apply



4	Net Filled Volume	As per label claim (e.g., NLT 100 g $\pm$ 5 g)	10 g
5	Leak Test	To Comply	Complies
6	<b>Identification By TLC</b>		
A	Papaya fruit	Complies with Test	Complies
B	Multani mitti	Complies with Test	Complies
C	Sandalwood powder	Complies with Test	Complies
D	Rice powder	Complies with Test	Complies
E	Milk powder	Complies with Test	Complies
F	Glycerine	Complies with Test	Complies
G	Turmeric	Complies with Test	Complies
H	Saffron	Complies with test	Complies
I	Neem powder	Complies with test	Complies
J	Rose water		
7	<b>Microbial limit Test:</b>		
a	Total Bacterial Count	NMT $10^3$ CFU / ml	Not $<1000^{CFU}$ / ml
b	Total fungal Count	NMT $10^2$ CFU / ml	Not $<10$ CFU / ml
c	<i>E. Coli</i>	Absent / ml	Complies
d	<i>Salmonella</i>	Absent / 10 ml	Complies
e	<i>Pseudomonas aeruginosa</i>	Absent /ml	Complies
f	<i>Staphylococcus aureus</i>	Absent / ml	Complies



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Managing Director

Rajendra Jadhav

## Discussion –

Papaya is a popular natural ingredient in skincare due to its rich content of enzymes, vitamins, and antioxidants. When used in an herbal face pack, papaya offers multiple benefits for the skin. The enzyme papain in papaya gently exfoliates dead skin cells, promoting a brighter and smoother complexion. It also helps to reduce pigmentation and acne scars by speeding up cell renewal.

Papaya is packed with vitamins A, C, and E, which nourish the skin, boost collagen production, and protect against free radical damage. This makes the face pack effective for anti-aging and skin rejuvenation. Additionally, the natural moisture content in papaya helps hydrate the skin, leaving it soft and supple.

When combined with other herbal ingredients like turmeric, neem, or honey, a papaya face pack gains extra antimicrobial, anti-inflammatory, and moisturizing properties. These combinations can address issues like acne, uneven skin tone, and dryness.

Using a papaya herbal face pack regularly can result in clearer, healthier, and glowing skin without harsh chemicals. However, people with sensitive skin should do a patch test first since papain can sometimes cause mild irritation.

## Conclusion -

In conclusion, the papaya herbal face pack stands out as a highly effective and natural approach to skincare, leveraging the unique enzymatic properties of papaya along with the therapeutic benefits of complementary herbs. Its ability to gently exfoliate dead skin cells, promote cell regeneration, and provide essential nutrients makes it ideal for achieving a brighter, smoother, and more youthful complexion. The combination of papaya's antioxidants and vitamins with herbal ingredients like turmeric, neem, and honey enhances its antimicrobial, anti-inflammatory, and moisturizing effects, addressing common skin concerns such as acne, pigmentation, dryness, and uneven texture. Moreover, as a chemical-free and affordable option, it appeals to those seeking gentle yet potent skincare remedies rooted in nature. While generally safe, caution is advised for sensitive skin types due to the active enzyme papain, which may cause irritation if overused or applied improperly. Overall, incorporating a papaya herbal face pack into a regular skincare routine can significantly improve skin health and appearance, offering a balanced, nourishing, and holistic solution for maintaining radiant and healthy skin.

## Future scope –

The future scope of papaya herbal face packs is promising, especially as the demand for natural and organic skincare products continues to grow globally. Advances in formulation technology could enhance the stability and potency of papain and other active compounds, improving the pack's effectiveness and shelf life. Research into combining papaya with other innovative herbal ingredients or nanotechnology might boost skin absorption and targeted delivery, offering more personalized skincare solutions.

Additionally, sustainable sourcing and eco-friendly packaging could make papaya-based face packs even more appealing to environmentally conscious consumers.

With increasing awareness about the side effects of synthetic chemicals, papaya herbal face packs have the potential to become a mainstream option not only for beauty but also for therapeutic skincare, including treatments for acne, hyperpigmentation, and aging. Overall, continued scientific validation and product innovation will likely expand their role in both traditional and modern dermatology.

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